Project Manual

Scarborough Health Network
Centenary Hospital
Dialysis Care Unit

OWNER

Scarborough Health Network
Centenary Hospital
2867 Ellesmere Road
Scarborough, Ontario M1E 4B9

CONSULTANT

Kasian Architecture Ontario Incorporated
85 Hanna Avenue, Suite 300
Toronto, Ontario M6K 3S3

Kasian

Project No. 240065

Issued for Tender
April 17, 2024

1.0 GENERAL

1.1 This project manual including specifications is not to be used for construction purposes unless signed and sealed by the Consultants identified in this Section.

2.0 DOCUMNENT RESPONSIBILITY

2.1 Each Section of the specifications identifies in the footer, the Consultant responsible for the preparation of the Section.

3.0 ARCHITECT (Consultant as per CCDC 2):

Kasian Architecture Ontario Incorporated
85 Hanna Avenue
Suite 300
Toronto, Ontario, M6K 3S3

Tel. 416-583-3600

_____
(Signature and title of signing officer) (Date) (Seal)

4.0 STRUCTURAL ENGINEER:

RJC Engineers
100 University Avenue, North Tower, Suite 300
Toronto, Ontario, M5J 1V6

Tel: 416-977-5335

_____
(Signature and title of signing officer) (Date) (Seal)

5.0 MECHANICAL ENGINEER:

EXP Engineering
220 Commerce Valley Drive West, Suite 110
Markham, Ontario, L3T 0A8

Tel.: 905-695-3217

_____
(Signature and title of signing officer) (Date) (Seal)

6.0 ELECTRICAL / ICAT / SECURITY / AV ENGINEER:

EXP Engineering
220 Commerce Valley Drive West, Suite 110
Markham, Ontario, L3T 0A8

Tel.: 905-695-3217

_____
(Signature and title of signing officer) (Date) (Seal)

7.0 ACOUSTIC / VIBRATION ENGINEER:

Aercoustics Engineering Limited
1004 Middlegate Road, Suite 1100
Mississauga, Ontario, L4Y 0G1

Tel.: 647-363-6937

_____
(Signature and title of signing officer) (Date) (Seal)

8.0 FF & E CONSULTANT:

Insight Health Tech Planning Incorporated
5484 Tomken Road, Unit 23
Mississauga, Ontario, L4W 2Z6

Tel.: 289-814-0314

_____
(Signature and title of signing officer) (Date) (Seal)

9.0 SIGNAGE AND WAYFINDING CONSULTANT:

Cygnus Design Group
145 Front Street East, Suite 303
Toronto, Ontario, M5A 1E3

Tel.: 416-728-3847

_____
(Signature and title of signing officer) (Date) (Seal)

10.0 HARDWARE CONSULTANT:

Spyder SC Independent Architectural Hardware Consultants
26 Dale Crescent
Bradford West Gwillimbury, Ontario, L0L 1L0

Tel. 647-271-6489

_____
(Signature and title of signing officer) (Date) (Seal)

11.0 CURTAIN WALL CONSULTANT

Stephenson Engineering, A Salas O'Brien Company
2550 Victoria Park Avenue, Suite 602
Toronto, Ontario, M2J 5A9

Tel. 416-635-9970

_____
(Signature and title of signing officer) (Date) (Seal)

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PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract including the Supplementary General Conditions issued with the Request for Tenders.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.1.1.3. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.1.2. Investigation documents provided by the Owner are issued for information purposes only and will not be included in the Contract Documents. These documents are not included under or governed by the Consultants' seal.

1.1.3. Status of Available Project Information:

1.1.3.1. Available Project information means information of any type and in any form that is expressly identified as available project information in this Section.

1.1.3.2. No available Project information forms part of the Contract Documents unless copied or transcribed into Drawings or Specifications or is expressly listed in the agreement as a Contract Document.

1.1.3.3. Owner's Policies form part of the Contract Documents.

1.1.4. Use and Reliance Upon Available Project Information:

1.1.4.1. Available Project information is made available to Bidders to fulfill the Owner's duty to disclose all relevant Project information to Bidders.

1.1.4.2. Bidders shall interpret and draw their own conclusions about available Project information, including consideration of the time when it was created. Available project information may be time sensitive. The Owner and Consultant assume no responsibility for such interpretations and conclusions.

1.1.4.3. Available Project information, or any part thereof, shall not be construed as contract requirements unless also reflected in Drawings or Specifications, and in case of conflict the Drawings or Specifications shall govern.

1.1.4.4. Bidders, acting reasonably, may rely on available Project information in preparing their bids, subject to any qualifications stated in such available Project information and unless expressly stated otherwise in this Section.

1.2. AVAILABLE PROJECT INFORMATION

1.2.1. Hazardous and toxic substances report:

1.2.1.1. An electronic copy of a hazardous materials and toxic substances report prepared by Owner's consultant for the Place of the Work is available on the project bid document portal. Refer to following:

1.2.1.1.1. "Reassessment of Asbestos-Containing Materials, Scarborough and Rouge Hospital – Centenary Site", issued November 25, 2018, SEL Project Number 128918, prepared by Safetech Environmental Limited.

1.3. OWNER'S PROCEDURE MANUAL

1.3.1. Bidders to include in the Base Bid Price all work implied in, or reasonably inferable from, “Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022”, bound into these specifications.

1.3.2. Bidder to make accommodation in planning and scheduling work impacted by Owner’s Procedure Manual.

1.3.3. Bidder to coordinate requirements and administer work impacted by Owner’s Procedure Manual.

1.3.4. Owner will be interpreter of these documents. In the event that the Owner’s Procedure Manual impact the work of the Construction Contract or cause a delay that could not have been predicted, the Contractor will make a request for consideration. The Consultant will be arbiter of a change to Contract Price and/or Contract Time.

END OF SECTION

SCARBOROUGH HEALTH NETWORK

SCARBOROUGH HEALTH NETWORK CONTRACTOR PROCEDURE MANUAL (General Conditions)

August 2022

Birchmount Hospital – 3030 Birchmount Road, Scarborough ON
Centenary Hospital - 2867 Ellesmere Rd, Scarborough ON
Scarborough General Hospital - 3050 Lawrence Ave E, Scarborough ON M1P 2V5

The Mission of Scarborough Health Network (SHN) is to provide excellent health care to our patients and their families.

Contract or service work will adhere with this mission. Work at the SHN will be organized and scheduled to have the least impact on our patients, their families and SHN staff.

We therefore require that all service personnnel working in SHN be cognizant of this and plan their work and activities accordingly.

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SHN FACILITIES AND PM LEADS CONTACT INFORMATION

All Sites Normal Business Hours are Monday – Friday 8:00 am – 4:00 pm
SHN (416) 438-2911, (416) 495-2400 or Centenary Site (416) 284-8131.

Facilities Planning & Redevelopment and Plant & Facilities Operations:

Facilities Planning & Redevelopment

VP-Redevelopment	Faaiza Ali	Ext # 6714	Cel- 416-509-9145
Interim Director	Ralph Aprile	Ext # 5619	Cel- 647-271-4367
Interim Manager	Dianne Abistado	Ext # 5657	Cel- 416-219-8658
Project Mgt. Lead	Erich Hoyle	Ext # 6159	Cel- 437-223-0858
Project Mgt. Lead	Angeli Persaud	Ext # 5642	Cel- 647-302-6414
Project Coordinator	Moazzizaki Syed	Ext # 8365	Cel- 416-454-9706
Project Coordinator	John Park	Ext # 5652	Cel- 647-929-4939

Plant and Facilities Operations

Director	Tyler Crocker	Ext # 6253	Cel- 416-625-7541
Manager All Sites	Leon Ramkumar	Ext # 7325	Cel- 416-984-5142
Supervisor-General Hospital	Cel- 647-200-1932	Michael Courvoisier	Ext # 6824
Supervisor-Birchmount Hospital		Mohamed Zaman	Ext # 5157 Cel- 647-201-0316
Supervisor- Centenary Hospital	Nash Botros	Ext # 4281	Cel-416-910-0729

For Security:

Call "Locating" at 416-495-2400, Ext # 7233 (General Hospital) or Ext # 2544 (Birchmount Hospital), 416-284-8131 at Ext# 4223 (Centenary Hospital).

RECOMMENDED ACCESS AND ROUTES

- All external personnel, must make prior arrangements to enter the respective site (Hospital) by contacting the appropriate SHN PM Lead (see page 2) during normal business hours.

a) For Centenary Hospital , contractors working for a short-term (no more than 1(one) week) will have to log in and obtain a name tag by security office on Level 1 by South Entrance (Margaret Birch Wing). If working for the long-term (greater than 1(one) week), contractors are required to follow protocols in item b below.

b) For General and Birchmount Hospital(s), contractors will be required to arrange for ID badges through the PM Lead in advance of the work. The badges with card access are limited to head/s of crew/trade only. Contractor crew members are expected to be wearing their company ID and be identified by their company uniform at all times..

a. PM Lead will initiate a notice of start to notify Security of the contractor's duration and location of the work.

b. PM Lead will also request for the required access for the ID badges or keys from Security. Keys will be signed in and out by the PM Lead only.

c. After hours access must be coordinated by the PM Lead. The PM lead will confirm requirements with Security or Shipping and Receiving (for loading docks) in advance.

After hours utility service access or concerns should be requested from the Facility Manager and respective site supervisor in advance. Any urgent issue should be coursed through:
For General Hospital Shift Plant Operator : (647) 504-7564
For Birchmount SHN Shift Plant Operator: (647) 267-2443
For Centenary SHN: all issues and concerns are coursed through the Facility Supervisor

- Traffic through patient and critical areas shall be kept to an absolute minimum throughout the duration of the work. Travel between entrances, public areas and the work area will be via the most direct route and be coordinated with the SHN PM Lead contact in advance.

- Crew traffic, access points and material delivery routes should be planned and agreed upon by all parties in coordination with other PM Leads should there be 2 or more contractors working in the same site for the same period of time. No two contractors are allowed to work on the same project site or use the same access routes at the same time.
- Fire routes or exit doors and stairwells must not be obstructed. Fire doors must not be wedged open or latches disengaged at any time. If keeping fire doors open is required in going about with the repairs or the work, permission should be obtained first from Security and Facilities.

IDENTIFICATION

- **Permanent ID Badge:** Contractors on SHN property who will be considered as on-call technicians on site will be required to purchase a personal photo ID badge from Security. ID badges are not transferable and must be used only by the person to whom it is issued.
- **Card Access:** Arrangements to obtain an ID badge are to be made through the appropriate SHN PM Lead . See attached ID Badge Request Form to request for badge access cards in pg. 23.
- **Temporary ID badge:** Centenary - contractors
- **Site Logs:** Contractors to keep site logs and have staff sign in and out on a daily basis, keeping record and making it available upon SHN's request.

PARKING

- Parking will be at the Contractor's expense via monthly parking rates offered through Scarborough Health Network.
- Please respect all designated Emergency, Restricted, Reserved for Service Technicians, Wheelchair Parking Areas and other posted no parking areas.

KEYS

- Access to mechanical, electrical, elevator shafts and communication rooms may be requested from Facilities or HITS through the SHN PM Lead
- Request to access restricted areas, or after hours access can be made by contacting the SHN PM Lead contact.

MATERIAL OR EQUIPMENT DELIVERY, TRANSPORT AND STORAGE

- Arrangement must be made with the SHN PM Lead contact before any tools, equipment or materials are brought into site to determine acceptable storage and internal delivery routes to work area.

- All materials and equipment deliveries shall be coordinated with the SHN PM Lead contact.
- Use of the elevators for dedicated use for transport shall be arranged with Facilities through the SHN PM Lead contact.
- Where permission is granted to the Contractor to use an elevator, the Contractor shall be responsible for providing protection to the cab interior and is expected to have cab vacuumed and wiped clean before turning it back for operations. Contractor shall cover for costs for repairs should the finishes get damaged while using the elevator.
- The Contractor shall clear and surrender use of the elevator immediately during any h emergency, for such instances like a Code Red or Code Blue/Pink.
- Comply with the requirements noted in the infection control orientation module/CSA requirements during construction when transporting materials, tools & equipment to or from anywork area.

CONTROL OF CONSTRUCTION ELEMENTS

- Noise, dust, odours, etc. shall be minimized (if not eliminated) to ensure end users That these elements are contained and not disruptive. Corrective action to cease or limit inconveniences to the end users shall be implemented immediately upon notification of the SHN PM Lead contact. This may require that work be stopped and rescheduled to a mutually agreed upon time.
- Service interruptions must be coordinated in advance through the SHN PM Lead contact; contractor to follow the SHN's theshutdown procedures (see page 14).
- Submit, as per agreed upon procedure, a request for any work impacting existing services or clinical operations at least 48 hours prior to start time for work.
- HospitalPM Lead is to provide the asbestos reports of the work/site area (if any) in advance of the work for the contractor's reference.
- Contractor is expected to notify the PM Lead for any discovery of asbestos-containing materials (ACMs) on site so next steps can be taken.

SITE CLEANLINESS AND GENERAL UPKEEP

- It is the responsibility of the contractor to keep perimeter areas clean at all times and remove all garbage debris, packaging, surplus material and scrap from the work site on a daily basis. SHN containers and garbage bins may not be used unless written permission is obtained from the SHN PM Lead contact. Contractor shall provide and use their own external garbage bins that will be parked at agreed upon designated spots.
- Contractor should assign a crew member who will regularly ensure that the dust mat gets refreshed and perimeter areas outside of the hoarding be mopped clean with damp cloth, keeping areas in its best ciondition at
- All tools, equipment and materials must be properly labeled; secured and protected (this is strictly enforced in occupied SHN areas). The loss of any such material will be the responsibility of the contractor. The Hospital assumes no responsibility for lost or stolen equipment. Use of SHN's carts, ladders, tools and equipment is not allowed.
- Damage to SHN equipment or property by the contractor must be reported

immediately to the PM Lead contact. The contractor will be charged for the replacement or repair of same.

- Contractors should be aware of areas where use of mobile phones are restricted as this may interfere with life support and monitoring equipment.
- Safety clearances and proper protective enclosure or equipment are required before any cutting, welding, core drilling, open flame work or dust work is done (see page 17-18). Submit a hot work permit (see pg. 22) for such work to the SHN PM Lead contact, to obtain approval from Facilities, a minimum of 48 hours prior to the work commencing.
- Under no condition will it be permissible to connect a machine requiring electrical power to the existing building electrical panels. Contractors and subcontractors shall provide their own exterior located generators unless approved in advance.
- Secure and make safe the building, premises and adjoining premises from damage during the construction period and during any period when the work is closed down for any cause.
- Materials which are to be removed in the existing building should be confirmed with the SHN PM Lead contact as to the requirement and at the time of handover. Where services are connected to such items, services shall be removed and capped / isolated except where required for reuse where they shall be temporarily capped / isolated.
- No signs, advertisements, or notices of any kind shall be placed on or in the building, fences, hoarding or any place on the site except as specifically directed in writing and approved by the SHN PM Lead contact.
- Contractor shall post the following by the hoarding: building permit (if any), notice of project (if required), IPAC activity permit, safety signage, construction notice.
- Contractor shall be responsible for providing the required safety board inside the construction area.

EMERGENCY AND FIRE PROTECTION

- Provide and maintain at all times, ready access to firefighting equipment. Fire extinguishers stored onsite or used as standby firex for hot works should be properly labeled and not expired.
- In the event of a fire emergency, premises, existing fire emergency pulls and fire extinguishers can be used as required.
- In case of a fire or an emergency, the following procedure should be followed:

  R Remove any people from danger.
  E Enclose all doors and windows.
  A Activate the fire alarm pull station.
  C Call 5555. Give floor location and nature of fire.
  T Try to fight the fire with appropriate extinguisher.

- When a fire alarm is activated:
  a) The Code Red alarm will sound coupled with an overhead paging announcement. These are long beeps in between short intervals.
  b) All magnetic door holders will be released and the fire separation doors will be closed.
  c) An announcement will be made identifying the location of the fire; do not go through fire doors or use the elevators.
- All contractors and service persons on hearing the fire alarm will cease work, listen for

the location of the fire and await further instructions. Contractors are required to remain by work area unless instructed to evacuate or once Code Red is lifted.

- If the fire or emergency becomes more critical, a Code Green or an evacuation may be activated. Turn of all equipment then await further instructions if area is affected, if immediate exiting is required and location for assembly.
- If the fire or emergency is all clear, the bells will cease and an announcement will be made that Code has been lifted and declare it "All Clear". Contractors may resume their normal work and circulation in the SHN.

Emergency Codes For SHNs

Code Red	**Fire**
Code White	**Violent Patient / Physical Danger**
Code Green	**Evacuation**
Code Orange	**External Disaster**
Code Orange CBRN	**CBRN Disaster**
Code Brown	**In-Facility Hazardous Spill**
Code Blue	**Medical Emergency Adult**
Code Pink	**Medical Emergency Infant/Child**
Code Yellow	**Missing Person**
Code Black	**Bomb Threat / Suspicious Object**
Code Purple	**Hostage Taking**
Code Silver	**Active Attacker**
Code Grey Button Down	**Air Exclusion**
Code Grey	**Infrastructure loss or failure**
Code Amber	**Missing/Abducted Child**

TEMPORARY FIRE SAFETY AND FIRE ALARM

- While work of this contract is proceeding, contractor shall make certain existing fire alarm systems and life safety systems (i.e. smoke detectors, enunciators, bells, exit light, etc.) are in proper operating condition at all times except when work is being done on said systems (i.e. at evenings, weekends, etc.) and said systems shall be left in proper operating conditions by temporary or permanent means.
- If, during the progress of the work, it is necessary to take all or part of the existing fire alarm system out of service, prior to final installation of the new fire alarm system, the Contractor shall provide adequate fire watch and also advise SHN PM Lead contact of the condition minimum 48 hours in advance. All such shutdowns and need for a fire watch shall be kept to a minimum. The fire watch shall be requested by the PM Lead from Security to have a staff who will be able to patrol the affected areas and initiate a proper fire drill should the need arise.
- Fire alarms should be bypassed on a daily basis, to be coordinated with the Plant Operator or with the Facilities Supervisor. Fire alarms shall be by-passed from start of the work until after the construction clean is complete.
- Contractor shall be responsible for the payment of the fire truck services should they get summoned by alarms should these get activated by construction or cleaning activities within the construction site.

SAFETY PROGRAM

- The contractor will supply the SHN PM Lead with a copy of their construction safety program as well as all workers are to supply their proof of safety training for the specific job duty.
- All work performed in SHN must be in compliance with the hospital's policies and procedures.
- MSDS sheets are to be available on site and readily accessible to the SHN PM Lead contact at their request.
- See Workplace, Health and Safety Program Manual as part of the appendices of this package.

PROPERTY DAMAGE

- Contractor shall be responsible for any damage done to the hospital's facilities, furniture or equipment and have this repaired or replaced as required as charged to the Contractor.
- Architectural, mechanical and electrical drawings indicate the approximate locations of services as far as these are known. The contractor and subcontractors shall take all measures to verify actual location of existing services prior to start of work. Nevertheless, should any mechanical or electrical service line be broken or disrupted by operations specified under this contract, the contractor shall repair service lines and make good all damage to the approval and satisfaction of the SHN PM Lead contact and/or Consultants at the Contractor's expense. It is expected that such incidences be reported to the PM Lead immediately.

INCIDENT REPORTING

- Any unplanned event that impacts facilities or clinical operations that occurs as a result of construction / contractor activities must be reported immediately to the SHN PM Lead contact.
- The contractor shall repair and make good all damage to the acceptance and satisfaction of the SHN PM Lead contact and/or Consultants.

CONTINUITY OF EXISTING SERVICES

operates 24 hours a day, seven days a week, 365 days a year. Disruption to the operation of the SHN must be planned to be kept to a minimum.

- Schedule and coordinate work so that services are not unduly interrupted at any time. Interruption of services must be reviewed and scheduled with the SHN PM Lead contact so that disruption to patients and procedures are kept to a minimum. Generally, service interruptions are to be scheduled to occur after hours.
- To obtain approval to interrupt services complete the shutdown procedure (see page 12) at least 48 hours prior to interruption of services.
- Include the cost of all investigations, including ferro scanning.
- Include the cost of cryogenic freezing of domestic water.

INFECTION CONTROL PROCEDURES DURING CONSTRUCTION

1) Pre-Construction

1.1. Notify Infection Prevention & Control, through the SHN PM Lead contact a minimum of 1 week prior to start of work (except in the case of an unplanned emergency situation requiring immediate attention). Infection Prevention & Control will perform a CSA approved Preventative Measures Analysis* according to population at risk and type of construction activity. This analysis will determine the Infection Control Procedures and any barriers required prior to start, during and in completion of the specific project.

1.2. Ensure all construction personnel associated with each project has received and read a copy of SHN Contractor's Procedure Manual.

1.2.1. Ensure that all sub-trades and all workmen are familiar with and follow the required Infection Control Procedures.

1.3. Identify possible service disruptions e.g. water, electrical, HVAC, Oxygen, etc.

1.4. Review the potential for the contamination of occupied areas from air intakes or ductwork with Engineering; prior to start of work. Review the location of all air intakes so as to prevent cross contamination from the work site.

1.5. Establish with the SHN PM Lead contact and Infection Control a safe traffic pattern for workers, tools, supplies and debris removal.

1.6. Identify and discuss barrier placement with the SHN PM Lead contact and Infection Prevention & Control. For long term / large scale projects, drawings indicating hoarding lines are to be provided.

1.7. All tools, carts, supplies and workers clothing must be clean when entering occupied areas.

1.7.1. Carts used to transport equipment/supplies through an occupied area need to be clean and may need to be covered.

1.8. Before the construction project is started, requirements for cleaning the adjacent areas shall be determined.

1.9. Notify SHN PM Lead contact if all SHN equipment and supplies have not been removed, sealed with poly, or taped in a closet or cupboard prior to barrier installation.

2) Barrier Installation: Short Term / Low Risk Population as determined by Infection Control

1.10. The HEPA fan, if will be required, will be the first equipment that is to be installed and operated inside the project hoarding. DOP testing should be updated and proof of certification should be clearly seen as adhered to the equipment.

1.11. Prior to the start of work, including ceiling tile removal, exploratory opening of walls, ceilings or access hatches and any other dust generating activity, erect barriers, which shall comply with the following:

1.12. Barriers to extend from floor to false (finished) ceiling to completely enclose and isolate the work site from adjacent occupied spaces. If ceiling tiles are to be

becomes dusty or dirty and as requested by SHN staff. Vacuum the walls and ceiling of the anteroom, daily with a HEPA equipped vacuum cleaner.

3) Worksite

1.13. Post signage to maintain site (e.g. "Construction Zone", "Entrance restricted to Construction Personnel only" or "Do Not Shut Off Exhaust Fan").

1.14. Provide an airtight seal to all ductwork from the work site and adjust airflow to ensure that the work site is under negative air pressure to the adjacent areas of the Health Care Facility at all times.

1.15. Securely seal any gaps, holes or leakage paths around any pipes (Including plumbing penetrations and electrical outlets) between construction site and adjacent areas of the SHN.

1.16. Removal of debris, tools, equipment and materials from the work site shall be via an agreed to route and at an agreed to time, generally after hours.

1.16.1. Transport debris in clean containers with tightly fitting lids or completely cover debris with a wet blanket or wrapped in heavy gauge poly. Wipe and/or vacuum clean containers prior to leaving the site to reduce risk of dust transfer to occupied areas.

1.16.2. Cover all rubbish chutes and bins and thoroughly wet rubbish and/or debris prior to placing in chutes. Locate rubbish chutes to prevent dust migrating into air intakes

1.17. Areas of external excavation and the connecting road way must be kept moist at all times to keep dust to a minimum.

1.18. Carefully remove ceiling tiles so as to keep them in a horizontal position until vacuum cleaned with a HEPA-filter equipped vacuum cleaner.

1.18.1. Clean all ductwork, conduits, cable trays etc. and ceiling space with a HEPA equipped vacuum cleaner, prior to or immediately after removal of existing ceiling tiles and prior to start of work. Replace ceiling tiles should work be interrupted or stopped for any reason.

1.19. Seal and make air tight all exterior windows and doors in the vicinity of a) site work b) demolition and c) rubbish bins and chutes.

1.20. Maintain negative pressure within the construction area by using:

- ★ Portable HEPA filter-equipped air filtration units that include pressure gauges and an alarm (High Risk Areas), or
- ★ HEPA-Filter equipped vacuum (Lower risk areas as determined by I.C).

  Filters shall be monitored and replaced if clogged or functioning below the manufacturer's specifications.

  Reminder: Anteroom should be negative to the occupied area, and positive to the worksite. Worksite must be negative to Anteroom and adjacent occupied areas.

1.20.1. * Ensure that the air is either exhausted directly outside and away from intake vents or filter through a HEPA filter before going through regular exhaust and possibly being recirculated. Air movement from all adjacent occupied areas of the health care facility into the construction area shall be monitored to ensure that it exceeds 10m/min and that the negative pressure differential with respect to all adjacent building areas is no less than 7.5 Pa (0.03wc). High-efficiency exhaust fans with High-Efficiency Particulate Air (HEPA) filters shall be used for the duration of the work.

1.21. Maintain barriers throughout the work. Repair or replace as required or instructed. Replace torn or dirty poly sheeting and reapply tape as required to maintain airtight barrier.

1.22. Clean immediately outside the work area with a HEPA filter-equipped vacuum cleaner every day or more frequently if necessary.

1.23. Workers must use the route identified to enter and exit the work site. Workers should not enter the occupied SHN unless the SHN and Infection Control have identified an approved route. Prior to entering an occupied area, dust must be removed from the body, clothing and shoes using a HEPA equipped vacuum cleaner; as well, when workmen leave the work site and enter occupied areas; or workmen must wear coveralls which are to be removed prior to leaving the work site.

1.24. An entrance and if possible an elevator shall be designated by SHN for use by the Contractor to transport material and workmen to and from the work site. DO NOT TRANSPORT construction personnel, materials or debris in an elevator that is used to transport patients, visitors and staff.

1.24.1. Ensure that the dedicated elevator is vacuumed (HEPA) and damp mopped daily (or more often if necessary) to remove dust.

1.24.2. If an elevator is not available for use by the Contractor, workmen must use a designated stairwell.

1.24.3. Contractor shall ensure assigned elevator and/or stairwell remains free of dust and debris and must be cleaned on a daily basis, as required, and at the end of the day.

1.25. In areas designated by the SHN (i.e. Operating Rooms) workmen may be required to wear protective clothing. DO NOT ENTER THESE AREAS without protective clothing if directed.

1.26. For small projects, tools, carts and/or toolboxes are to be clean and may be kept in the area immediately adjacent to entry to the barrier.

1.26.1. For larger projects, toolboxes and equipment are to remain within the work site barriers until completion of work. Do not leave tools or equipment unattended in any occupied areas

1.26.2. Thoroughly vacuum all tools, toolboxes and equipment prior to removal from behind work site barrier.

1.27. Use water or dust abating material to keep dust to a minimum in the construction area.

1.27.1. Provide pest control if required.

1.27.2. Clean the construction area with HEPA filter-equipped vacuum cleaner, a wet mop, or both, as necessary.

1.28. Replace any and all existing or new ceiling tiles, which become wet due to work being done by the contractor.

1.29. Replace any and all drywall that becomes wet due to flooding or work being done by the contractor.

1.30. Use cryogenic procedures to isolate valves and supply water piping. Hot and cold domestic water piping must not be drained. If drained for any reason, coordinate with the SHN to have piping sanitized.

1.31. Report any water leaks or flooding immediately to the SHN PM Lead contact, who will inform Facilities, Infection Control and the affected patient care areas.

4) After Construction

1.32. Infection Prevention & Control / I.P.C. Appointed Designate is required to inspect the site prior to removal of barriers.
1.33. Thoroughly vacuum (HEPA filter-equipped) and/or wet clean the work site and all surfaces of the dust barriers and anterooms in preparation for removal.
1.34. Poly barriers to be erected on the non-construction side of the hard barriers before removal of the hard barriers.
1.35. Thoroughly vacuum and/or wet clean the areas occupied by barriers. Repair finishes damaged by barrier installation or the work and touch up paint as required to leave the site in the same condition or better than, it was prior to start of work.
1.36. The HEPA fan, if any and if required, will be the last piece to be removed from the project site after the hoarding comes down.
1.37. Environmental services to do final clean before removal of the poly barriers.
1.38. Remove barriers at times designated by the SHN.
1.39. Project Manager is required to inspect the site after removal of barriers.

Failure to comply with Infection Control requirements may be cause for stoppage of work. Costs that may be incurred as a result of non-compliance are the responsibility of the Contractor.

*Z317.13-07 CSA Standard Infection Control during Construction or Renovation of Health Care Facilities is used by Infection Control to do Preventive Measures Analysis.

***** Specific reference for 4.8.1 (sections 6.6.2. and 8.3.22) of the above document.

SHN POLICIES

1) Harassment Policy

- Contractors will be responsible for the behavior of their employees while on SHN property. Contractors working at SHN must demonstrate courtesy and respect in interaction with all employees, volunteers, physicians, patients and visitors at SHN and will not engage in any form of abusive or discriminatory behavior. Any violation of the SHN Code of Conduct or Workplace Violence Prevention policy is unacceptable and such behavior will not be tolerated.

2) Asbestos Management Program

- Copies of the Asbestos Management Program (AMP) and asbestos logs are located in the Command Centre office at the General Site.
- AMP applies to all SHN staff as well as all service providers and contractors performing work at SHN General Site.
- Contractor should notify the PM Lead upon discovery of suspected hazardous materials on site.

3) Camera Policy

- Cameras are prohibited within occupied areas of the SHN unless permissions are procured through the SHN PM Lead contact in conjunction with Communications. This may require accompaniment.

4) Planned Shutdown Policy

- Construction managers/contractors and subcontractors must request the scheduling of all construction related utility shutdowns through the appropriate SHN PM Lead Contact. SHN is responsible for the disconnection or shut off of all valves, circuit breakers and smoke detectors for utility outages.

PROCEDURE FOR SHUTDOWN REQUEST

Contractors and sub-contractors shall not shut down, tie into or disrupt any utility systems unless specifically directed or permitted to do so in writing by the appropriate SHN PM Lead contact. Contractors and sub- contractors shall not bag, disconnect, or impede any smoke or heat detection systems. The utilities affected by this policy include but are not limited to all plumbing, fire sprinkler, gases, smoke detection, fire alarm, electrical, telephone, data, security, steam, heating, air conditioning, exhaust and conveying systems. Contractors must never assume the work they are performing in any SHN facility is not covered under this policy. The contractor's request for a utility shutdown must be performed in accordance with the procedures outlined in the "Specific Information" section of this document.

Refer to the Planned Shutdown Policy for the proper procedure, see pg. 19. Use Shutdown Form as found in Appendix A.

REQUEST FOR SHUTDOWN

Project Name: _____

Date Submitted: _____

Building(s) affected: _____

Locations affected _____

Requestor Information

Person Requesting Shutdown _____

Company Name _____

Phone _____

Fax: _____

Cell Phone: _____

Email: _____

Type of Shutdown

- ☐ Water Domestic Cold
- ☐ Water Domestic Hot
- ☐ Electrical
- ☐ HVAC Building Supply
- ☐ HVAC Building Exhaust
- ☐ Fire Alarm Bypass
- ☐ Sprinkler
- ☐ Steam

☐ **Asbestos Log Review Completed**

Other System Shutdowns: _____

Reason for Shutdown _____

_____

_____

Known Building Impacts: _____

Shutdown Start Date_ _____ Time _____ ☐ AM ☐ PM

Shutdown End Date_____Time _____ ☐ AM ☐ PM

Trade Person Performing Shutdown _____

SHN Approval: _____

Shutdown Complete: (Contractor) _____

SAFETY REGULATIONS & WELDING PROCEDURES

Before commencement of any welding, soldering or cutting in SHN, the following precautions and procedures must be strictly adhered to:

1. Person(s) who use the equipment must be competent and have permission to use the equipment.

2. The equipment to be used must first be checked to make sure it is in good and safe operating condition.

When all of the following procedures and precautions have been taken, you may begin to weld, solder or cut.

1. Obtain an approved hot work permit (see page 19) from Facilities. Coordinate for noisy works, it should be done before or after hours or agreed upon reasonable time.

2. Fire alarms to be bypassed every morning, confirm with Facilities once completed prior to welding works.

3. Before starting to weld, solder or cut, make certain there are no combustible materials nearby or opening leading to combustible material, that flame, sparks, hot slag or hot metal might ignite.

4. Be sure to keep a clear space between cylinders and the work. This is important so that cylinders and regulators can always be reached quickly.

5. Never use acetylene at pressures above 15 LBS PER SQ in. Using acetylene at pressures in excess of 15 LBS PER SQ. in. is a hazardous practice. To do so is contrary to insurance regulations and is prohibited by law in many places.

6. Never release acetylene into the air near other welding or cutting or sparks or flames. If it is necessary to release acetylene, release it out in the open, in a place where a mixture with air will not be ignited.

7. Always make sure hose is securely connected before using equipment. When using equipment, after making or remaking connections at the blowpipe and regulators, test for leakage.

8. Never hang a torch with its hose on regulators or cylinder valves. The weight of a torch and hose may strain or damage the regulator, or interfere with the quick closing of the cylinder valve.

9. Use special care when working in restricted or confined spaces (following Occupational Health & Safety Act, Healthcare O.Reg 67-93).

10. Special clothing should be worn, preferably fireproof, but certainly wool, which is relatively resistant to sparks and hot slag.

11. Never do any welding, soldering or cutting on containers until they have been thoroughly cleaned and safeguarded.

12. Protect cylinders, hose, legs and feet when flame cutting. Do not cut material in such a position that will permit sparks, hot metal, or the severed section to fall on the cylinder, hose, legs or feet.

13. Avoid dropping stub ends of welding rods on floor. Put them in a suitable container. Carelessly dropped stub ends are a fire hazard, and also if stepped on, may cause a serious fall, resulting in serious injury. A suitable container partly filled with water and within easy reach is a good place in which to dispose of these short ends.

***** Where welding, soldering or cutting must be done near combustible materials, special precautions should be taken to make certain that flame, sparks, hot slag or hot metal do not reach combustible material, and thus start a fire. It is especially important to take special precautions in the case of portable cutting operations. Cutting produces a greater quantity of sparks and hot slag than does welding and locations where portable cutting equipment is used, must therefore, be thoroughly safeguarded against fire.

Additional Precautions for Safeguarding Against Fire:

- Never use welding, soldering or cutting torch where sparks or open flame of any kind would be a hazard. Flames are a hazard in any rooms containing flammable gas vapors, liquids or dust, or any material that ignites easily.

- Take welding, soldering or cutting work that can be moved to a location where there will be no possibility of setting fires. This must always be done when the metal to be welded, soldered or cut is in a place where open flames are prohibited. This practice may also be sensible in many other locations, even if open flames are allowed. If the work cannot be moved, combustible materials should be taken a safe distance away, if possible. If cutting is to be done this distance may be 30 to 40 feet or more.

- Floors should be swept before the torch is lighted. If flammable materials cannot be moved, use sheet metal guards, flame proof curtains, or similar protection to keep sparks close to the work you are doing.

- Have someone stand by to watch the sparks so that they can give warning if sparks get beyond the protective guards. It is not reasonable to expect whoever is doing the welding or cutting to watch the sparks, since his attention is on the work. In addition, the sparks cannot always be seen easily through goggles.

- Be ready to put out any fire promptly with fire extinguishers, pails of water, water hose, or sand. If there is a possibility that a smoldering fire may have been started, keep a worker at the scene of the work for at least half an hour after the job is completed. Have them look carefully for smoke or fire before leaving.

- Never forget that heavy cutting sparks sometimes fly 25 to 30 feet or more and hold their heat for several seconds after landing.

SCARBOROUGH HEALTH NETWORK | SHN

HOT WORK PERMIT

Start Date: _____ **Start Time:** _____

End Date: _____ **Completion Time:** _____

Job Location:			
Description of Job:			
Company Name:		**Requestors Name**:	
Phone #:		**Cell #:**	
Detailed Area of Work:			

SHN Safety Regulations & Welding Procedures Reviewed	Yes		No	
Is there combustible material in the area or openings to combustible materials	Yes		No	
Is this area considered a restricted of confined space	Yes		No	
Patient Occupancy	Yes		No	

Fire Safety: (request for shutdown must be submitted 48hrs in advance, if required)

Sprinklers to be deactivated	Yes		No	
Smoke detectors in area	Yes		No	
Notification to Security & Fire Department (Facilities Responsibility)	Yes		No	
Fire Extinguisher Available	Yes		No	
Is a spotter required	Yes		No	

Approval:

_____ _____

Signature of Requestor Signature for Facilities

Important Information

It is the responsibility of the requestor to complete the work as described above within the timeframe requested. This is strictly enforced.
Should the requestors be unable to complete the work within the timeframe requested, the requestor must return to the Command Centre office one (1) hour prior to completion time (as per above). All overtime incurred will be the responsibility of the contracted Company.

1 – copy – Posted at Job Site 1 – copy – Remain in Command Centre Office

SCARBOROUGH AND ROUGE SHN

Contractor / Contract Staff / Resident / Instructor / Student and Others

Photo ID Badge / Access Card Request Form

Please complete this form and have it approved by the Head of the Department. All applicants (when applicable) must present a signed letter stating official business in the SHN and Valid Photo ID (i.e., Drivers License, etc.)

Personal Information - PLEASE PRINT CLEARLY. Incomplete form can not be processed.

Identification Number: _____ Date of Application: _____

Last Name: _____ First Name: _____

Position/Title: _____ Department/Unit: _____

Address: _____

City: _____ Province: _____ Postal Code: _____

Bus. Tel #: _____ Res. Tel #: _____

Primary Site
- ☐ General Site
- ☐ Birchmount Site
- ☐ Centenary Site

☐ New ID Badge ☐ Card Status Change

A non-refundable $5.00 charge applies for a new SRH ID Badge / Access Card; please pay fee at the Security / Photo ID office (**Debit Only**)

☐ Lost ☐ Damaged ☐ Not Communicating ☐ Position/Title Change ☐ Department / Unit Change ☐ Name Change

☐ Other: _____ Previous ID Badge #: _____ Previous Name: _____

Lost or Damaged ID Badge replacement incurs a fee of $25.00. All previous ID Badges must be returned to the Security Department.

Access Requirements: Please choose the section(s) that apply to your request.

Building/Security Access
- ☐ Provide General Access to Facility (SHN Building Entrances)
- ☐ Other required access, please specify. _____
- ☐ Locker Room Access: Specify Locker Room Location/Number _____

Parking Access

Do you require parking access? ☐ Yes ☐ No

If yes, please take a copy of this completed form, issued access card, and your payment to arrange for your parking access in person at:

**Birchmount Campus Parking Office - Located on Level 2 across from the Drugstore*

**General Campus Parking Office - Located on ground level in the Parking Garage*

☐ Monthly - Instructor / Student $60.00/month ☐ Monthly - Grarge $66.00/Month (May not be available due to limited space) ☐ Monthly - Surface $46.00/Month

Note: All rates are subject to change at any time without notice

Vehicle Information	Make	Model	Colour	License Plate Number
Vehicle # 1				
Vehicle # 2				

Card Holder Signature _____ Signed Date _____ Unit / Dept. Head Signature (Over Printed Name) _____ Signed Date _____

Submit completed form to Security Department at the General Campus by internal mailing or e-mail to IDBADGE@tsh.to

For Security Department Use Only

Access Card Number Issued: _____

Issued by: _____ Issued Date: _____

Duration of Placement: Start date _____ End date _____

Lost/Damaged card replacement fee payment verified: Yes / No

Card(s) being replaced returned to Security Department: Yes / No Information sent to Parking Office: Yes / No

For Parking Department Use Only

Parking Access Assigned Area/Parking Category: _____ Assigned Date: _____

Rate Applied: $ _____

Request for Interpretation No.:

Posted Date: Initiated Date:

Date Required: Originated By:

Specification Section: Drawing/Detail No.:

Subject:

Description/Question: (required)

Recommendations: (required)

Attachments:

Response:

Attachments:

Response From: Date Received: Date Returned:

Signed by: Date:

Copies: ☐ Owner Consultants: ☐ Structural ☐ Mechanical

☐ Electrical ☐ _____ ☐ _____ ☐ File

Notice Date:	
Work Area Location and Description of Construction Activities:	
Anticipated start of construction:	
Anticipated date for completion of work in this area:	
Construction schedule submitted:	☐
Infection control preventative measures in place:	☐
Schedule of service interruptions submitted:	☐
Temporary fire safety measures installed:	☐
Temporary HVAC systems in place:	☐
Inspection by SHN Project Manager:	☐
Attachments:	

Response From:	te Received:	Date Returned:
Signed by:		Date:

Substitution Request No.:

From: Date:

To:

Specification Section No.: Page:

Specification Title: Article/Paragraph:

Submittals for substitutions to be made in accordance with specification Section 01 25 00 - Substitution Procedures.

Proposed Substitution:

Manufacturer: Phone:

Address: Email:

History: □ New product □ 1-3 years old □ 4-10 years old □ More than 10 years old

Differences between proposed substitution and specified product:

Supporting data attached:

□ Point by point comparative data attached □ Product data sheets attached □ Drawings □ Samples
□ Tests □ Reports □ _____

Reasons for proposing this product:

Similar installations/application:

Project: Architect:

Address: Owner:

Date installed:

Proposed substitution affects other parts of the Work: □ No □ Yes, explain:

Savings to Owner for accepting substitution: $_____

Proposed substitution changes Contract Time: □ No □ Yes, [Add] [Deduct] _____ days

The Contractor certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product
- Same warranty will be furnished for proposed substitution as for specified product
- Same maintenance service and source of replacement parts, as applicable, is available
- Proposed substitution will have no adverse effect on other trades and will not affect or delay the progress schedule
- Proposed substitution is compatible with adjacent materials in this installation
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived
- Proposed substitution does not affect dimensions and functional clearances
- Fees for Consultant's evaluation of proposed substitution, as well as to make changes to the construction documents caused by the substitution, will be taken from the contract value
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects

Signed:

Consultant's Review and Recommendation:

□ Approve substitution

□ Approve substitution as noted

□ Reject substitution – use specified materials

Signed: Date:

Owner's Review and Action:

□ Substitution approved – prepare Change Order

□ Substitution approved as noted – prepare Change Order

□ Substitution rejected – use specified materials

Signed: Date:

PRE-RELEASE AGREEMENT OF ELECTRONIC FILES

Project Name: Dialysis Care Unit - Centenary Hospital

Project Number: 240065

Owner: Scarborough Health Network

Material to be Released: *Describe and list information released* .....

.....

.....

.....

.....

Recipient of Material: *Name of the Recipient, Organization and Complete Address*

.....

.....

.....

.....

Document Format: *Some information may be lost if requested to save down to a lower format:*

.....

Intended Use: *Information provided by requesting company*. S*pecify uses: eg. to prepare shop drawings, to apply for a building permit, for construction, for bidding purposes, to prepare as-built drawings, etc.*

.....

.....

.....

1.1. AGREEMENT AND CONDITIONS FOR ELECTRONIC INFORMATION RELEASE

Kasian Architecture Ontario Incorporated hereafter to be called “the Consultant” agrees to make above referenced files available to

Name of the Recipient: .....

hereafter to be called “the Recipient**”,** on the following terms and conditions:

1.1.1. The Consultant retains all rights of ownership, including copyright, in the electronic documents.

1.1.2. The Recipient agrees not to forward to others, transmit, download or reproduce the electronic documents in any format, whether print or electronic, except as expressly permitted under this agreement.

1.1.3. The electronic information shall not be copied by the recipient nor provided to any other party including any other subcontractor or supplier without prior written agreement by the Consultant.

1.1.4. The Consultant retains physical copies of the materials contained in the electronic documents. Where there is a conflict between the electronic documents and the physical copies, the physical copies shall govern.

1.1.5. All consultant names, client names and references shall be deleted from all electronic information.

1.1.6. The Recipient agrees not to use or reuse the electronic documents in any manner except as expressly permitted by this agreement.

1.1.7. The Recipient agrees to review all the documents related to the Recipient's work. If the Recipient does not review a complete set of documents, the Recipient agrees that the risks and consequences of any review are the sole responsibility of the Recipient.

1.1.8. The Recipient agrees that the Consultant is not responsible, or liable, in any way for the use of the electronic documents by the Recipient or by anyone receiving the electronic documents from the Recipient, other than the use(s) authorized under this agreement.

1.1.9. The Building Information Model and all families created and contained in the BIM or Revit model are the sole intellectual property of the Consultant and remain exclusively for the use of the representatives of the Consultant unless otherwise authorized in writing.

1.1.10. The Consultant expressly disclaims all representations and warranties of any kind, express or implied, in connection with the electronic drawings.

1.1.11. Except for any liability which cannot by law be excluded or limited, the Consultant shall not be liable to anyone for any direct or indirect damages arising from any errors or omissions, completeness of the electronic documents, misuse of the electronic documents, any errors in its computer system, in the software used therewith, or in the electronic files, or for any lost profits, special or consequential damages for any claim arising out of the use of, or inability to use, the electronic files.

1.1.12. The Recipient agrees that use of the electronic documents is at the Recipient's own risk. The Recipient agrees to indemnify and save harmless the Consultant, his/her employees, agents and consultants from and against all claims, losses, demands, costs and expenses (including legal fees), damages or recoveries (including any amounts paid in settlement) arising by reason of, caused by, or alleged to be caused by, the Recipient's reliance on the electronic document.

1.2. FEE FOR ELECTRONIC MATERIAL

1.2.1. Recipient shall pay $1,000.00 for the permitted use of these electronic materials. The Consultant does not guarantee the readability or functionality of the provided media or electronic information by any hardware or software combination.

1.3. AUTHORIZED SIGNATURES

.....

Kasian Architecture Ontario Incorporated: (*Name of the person authorized to release information)*

Date: .....

.....

Recipient: *(Name of the person authorized to request information)*

Date: .....

PART 1 - GENERAL

1.1. SUPPLIER

1.1.1. Supplier's name and address:

_____

_____

_____

_____

1.1.2. Date Product is released to Owner: _____

1.2. SPECIFICATION SECTION NO: _____

1.3. SPECIFICATION SECTION NAME: _____

1.3.1. Product being released to the Owner:

_____

_____

1.3.2. Quantity of Product used for extent of the Work:

_____

1.3.3. Quantity of Product released to the Owner:

_____

1.4. SIGNATURE

1.4.1. Confirmation that Extra Materials as listed above have been received in accordance with specification Section 01 77 00 Closeout Procedures.

Owner's Signature_____

_____
Owner's Name (printed) Date

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.2. SUMMARY

1.2.1. Section Includes: general requirements for the Work including but not limited to following:

1.2.1.1. General description of the Work.

1.2.1.2. Coordination with other contractors.

1.2.1.3. Contract documents.

1.2.1.4. Scope and subdivision of the Work.

1.2.1.5. Format of the specifications.

1.2.1.6. Procedures for discrepancies/conflicts/omissions.

1.2.1.7. Construction phasing.

1.2.1.8. Scheduling.

1.2.1.9. Completion deadlines.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Takeover requirements for partial occupancy: Section 01 14 00 Work Restrictions.

1.2.2.2. Project meetings: Section 01 30 00 Administrative Requirements.

1.2.2.3. Construction progress schedule: Section 01 32 16 Construction Scheduling.

1.2.2.4. Infection control and preventative measures: Section 01 35 33 Infection Control Procedures.

1.2.2.5. Shop drawing, samples and other submittals: Section 01 33 00 Submittal Procedures.

1.2.3. References:

1.2.3.1. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022

1.3. DESCRIPTION OF THE WORK

1.3.1. Work of this Contract includes supplying labour, materials, equipment, services and other related expenses to execute the work specified under Contract Documents.

1.3.2. Term "NIC" means Work of this Project which is not being performed or provided under this Contract; term means "Not In this Contract" or "Not a Part of the Work to be Performed or Provided by Contractor".

1.3.3. "NIC" work may be specified or indicated on Drawings as an aid to Contractor in scheduling amount of time and materials necessary for completion of Contract.

1.4. COORDINATION WITH OTHER CONTRACTORS

1.4.1. Coordinate work with the work of other contractors that will be on site during the time of this contract. The work by other contractors includes installation of hospital equipment, as noted on drawings and schedules.

1.4.2. Coordination includes:

1.4.2.1. Scheduling work to avoid interference and maintain spatial separation of operations and avoid “Constructor” issues related to MOL safety regulations.

1.4.2.2. Erect construction tape to identify separate work areas.

1.4.2.3. Construction schedule to identify the work by other contractors.

1.4.2.4. Obtain necessary shop drawings from other Contractors and proceed to co-ordinate details for installation. Owner's separate equipment Contractor will be responsible to expedite equipment delivery, receive, unload, install, make connections, and test specified equipment, and be responsible for warranty.

1.4.2.5. Cooperation with other contractors allowing them appropriate space, access to their work area, site access, parking, etc.

1.4.3. Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Consultant, in writing, any delays or defects which may interfere with proper execution of Work.

1.4.4. Assume full responsibility for protection and safekeeping of equipment installed under separate Contract.

1.5. CONTRACT DOCUMENTS

1.5.1. All Contract Documents, together with all amendments, and supplemental instructions, are complementary — work specified or shown on any of the Drawings or in any Sections of the Specifications is part of the scope of work of this project. The Contract Documents shall not be interpreted to determine subcontractor responsibility or scope or segregation of work.

1.5.2. All Contractors and Subcontracts and suppliers shall carefully review and become familiar with the complete Contract Documents in order to determine the scope of their work and in order to properly coordinate their work with the work by other Subcontractors.

1.5.3. The Agreement, Definitions, General Conditions of the Agreement, the Supplementary Conditions and the entire Division 01 specifications apply to all portions of the work and to all Subcontractors performing their particular part of the work. It is the Contractor's duty to ensure that all Subcontractors are made aware and understand these requirements before commencing their respective work. Delay and/or extra expense will not be accepted by reason of non-compliance with this requirement.

1.5.4. Specifications and other Contract Documents are generally written in imperative grammatical form. The obligations and responsibilities required by the Contract Documents are those of the Contractor except where expressly stated to be obligations of the Owner or others not party to this contract.

1.6. SCOPE AND SUBDIVISION OF WORK

1.6.1. Reference in the Contract Documents to "approval", "direction", "selection" or other similar words, including the various forms derived there from, means that the required acceptance and/or instructions shall be given by the Consultant.

1.6.2. The word "provide" means that both the supply and installation of products and/or services shall be included in the Work.

1.6.3. Whenever in these Specifications work is requested to be rectified, repaired, made good or replaced, it shall be done so without any cost to the Owner.

1.6.4. Whenever in these Specifications the term "and/or" is used, the Consultant's decision shall govern which one of the possible meanings is to be derived from the sentence where that term occurs.

1.6.5. The various Sections of the Specifications shall not be considered to establish contractual limits for work done by the various contractors or subcontractors. Work specified in the Specifications is divided into Sections for reference purposes only. Division of work between Contractor and Subcontractors is the Contractor's responsibility. The Owner and Consultant assume no responsibility to act as an arbitrator to establish subcontract limits between Sections or Divisions of the Work.

1.6.6. All specifications in the Division 01 Sections shall form an integral part of each and every specification Section of the Specifications including specifications noted on drawings, and specifications that may be

separately bound, and specifications provided in structural, civil, mechanical, electrical, landscaping Divisions.

1.6.7. Whenever in these specifications or the drawings, a building material is marked "existing", it is part of the existing building. When it is not noted as existing, it is part of the work to be supplied and installed.

1.6.8. The "Work Included" and the “Related Sections” articles in part 1 of the individual specification Sections are intended to serve as a reference for the Contractor’s convenience. These articles are meant only as a guide for the Contractor and does not remove the responsibility from the Contractor to do a complete examination of the documents and the site and the site conditions to determine the full extent of the work. The Contractor is to supply all materials for the completion of the work. All materials are to be installed in a completely operating condition. The Contractor is to furnish all labour and equipment needed to carry out the installation of the work.

1.7. SPECIFICATION FORMAT

1.7.1. Specifications are addressed to Contractor. Specifications are not intended as detailed description of installation methods but serve to indicate particular requirements in completing the Work.

1.7.2. Where Contract Documents do not provide sufficient information for complete installation of item, then as supplement, comply with manufacturer's written instructions for quality of work.

1.7.3. Portions of Specifications are written in short form. Therefore, it shall be understood that where item of the Work is stated in heading followed by material, equipment, component, or operation, words "shall be", "shall consist of" or similar words or phrases are implied which denote supply, fabricate and supply, install, provide or commission of such materials, equipment or operations for component of the Work designated by heading.

1.7.4. Where items in Contract Documents are referred to in singular, provide as many as required to complete the Work.

1.7.5. Drawings, Lists or Schedules of Items are intended to show scope and arrangement of work. For location of item described refer to such Drawings, Lists or Schedules unless location stipulated in Specifications.

1.8. DISCREPANCIES/CONFLICTS/OMISSIONS

1.8.1. If discrepancies or conflicts in, or omissions from Drawings, Specifications or other Contract Documents are suspected, or if there is doubt as to meaning or intent thereof, notify Consultant at once. Where there is conflict between Contract Documents, the most stringent requirement shall prevail.

1.8.2. Drawings, Specifications and other Contract Documents are intended to be in compliance with federal, provincial and municipal laws, by-laws, regulations and other requirements of authorities having jurisdiction. Perform work in conformity with such requirements. If discrepancies, conflicts or omissions are suspected, notify Consultant at once.

1.8.3. Comply with Consultant's written instructions or explanations.

1.8.4. Promptly and not later than within 10 Working Days of becoming aware of circumstances which may require a change in the Work or other directions, give written notice to Consultant outlining such circumstances and request written directions. Do no work in affected area, or that would prevent Consultant from properly assessing situation or evaluating change, without its prior written approval. Consultant will act promptly to give Contractor instructions, clarifications or explanations so the Work is not unreasonably delayed.

1.9. CONSTRUCTION PHASING

1.9.1. Construct Work in stages to accommodate Owner's continued use of hospital in adjacent areas during construction.

1.9.2. Co-ordinate activities and Construction Schedule for the required phases as shown in the drawings.

1.9.3. Construction access routes in accordance with Scarborough Health Network Contractor Procedure Manual.

1.9.4. Complete the Sign Off for Construction Area Form Section 00 63 16 in advance of construction start in each work area.

1.9.5. Work to proceed in sequence from one phase to the next:

1.9.5.1. Prerequisites for acceptance of an area in each phase to be considered as ready for takeover shall be as described in GC 12.1 of CCDC 2, 2020 including approval by authorities having jurisdiction.

1.9.5.2. Acceptance by the Owner is mandatory before work may proceed to the next phase. Trades will be required to clean up and re-remobilize as required for sequential phasing.

1.9.5.3. Warranty periods for the phased area shall commence on the date the Owner takes occupancy of the area.

1.9.5.4. Work in the phase area must be ready for complete use occupancy. Where work must be inspected by AHJ involving fire and life safety testing, it may be necessary to isolate building systems as required to permit testing and temporary service.

1.9.5.5. Infection prevention and control procedures to be implemented in accordance with Scarborough Health Network Contractor Procedure Manual procedures. Refer to Section 01 35 33 Infection Control Procedures and CSA Z317.13. The infection control plan shall be reviewed and approved by the Owner before start of construction.

1.9.5.6. Provide temporary exiting, lighting, signage, hoarding, life safety, and fire safety as required for each phase.

1.9.5.7. Equipment and building systems to be started up, and commissioned as part of the turn-over of each phase. Train Owner's staff and provide manuals and maintenance instructions.

1.9.5.8. There shall be no overlapping of construction activities between phases except to the extent described in the drawings, or as specifically agreed to with the Owner. Work to complete deficiencies and incomplete work may continue after completion of a phase only when such work has been discussed and accepted by the Owner.

1.9.5.9. Work, such as deficiency repairs, in a completed phase that has been turned over shall be done only as scheduled with the Owner.

1.9.6. Refer to Section 01 14 00 Work Restrictions for occupancy requirements.

1.10. SCHEDULING

1.10.1. Base sequence and scheduling of construction on maintaining continuous operation and access to the Work during construction, except as noted below:

1.10.1.1. Note restrictions to continuous work activities due to phased construction as shown in drawings.

1.10.1.2. Schedule adequate time for:

1.10.1.2.1. Owner to decant furniture and equipment from phased area in preparation for construction.

1.10.1.2.2. Construction of dust partitions and anteroom.

1.10.1.2.3. Temporary adjustment to air handling and controls.

1.10.1.2.4. Temporary fire protection measures including changes required to fire alarm, monitoring, detection.

1.10.1.2.5. Air pressure testing.

1.10.1.2.6. Inspection and acceptance by SHN Project Manager.

1.11. COMPLETION DEADLINES

1.11.1. Phase and schedule the Work to meet deadlines originally committed to by Contractor.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.2. SUMMARY

1.2.1. Section Includes: general requirements for the Work including but not limited to following:

1.2.1.1. Work restrictions.

1.2.1.2. Construction access to site and work areas.

1.2.1.3. Contractor's use and Owner's use of existing building.

1.2.1.4. Smoking restrictions

1.2.1.5. Occupancy requirements

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Construction phasing: Section 01 10 00 General Requirements.

1.2.2.2. Construction progress schedule: Section 01 32 16 Construction Scheduling.

1.2.2.3. Infection control procedures: Section 01 35 33 Infection Control Procedures

1.2.3. References:

1.2.3.1. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.3. WORK RESTRICTIONS

1.3.1. Existing hospital will maintain operation during the work of this Contract. Do not perform any unscheduled work that may interfere with the building's operation and the usage of the building.

1.3.2. All construction activities which involve temporary disruption to services, utilities, public access and egress, and traffic patterns must be scheduled with the SHN Project Manager.

1.3.3. Confine extent of construction activities to area within each phase as indicated on Drawings. Confine all equipment, materials, debris, offices, storage sheds and storage areas to area defined on drawings.

1.3.4. Assume responsibility for care, custody and control of work area during performance of the Work.

1.3.5. Identification:

1.3.5.1. All workers are required to obtain photo identification badges in accordance with Scarborough Health Network Contractor Procedure Manual.

1.3.6. Incident Reporting:

1.3.6.1. All unplanned events that impact facilities or clinical operations that occurs as a result of construction / contractor activities must be reported immediately to the SHN PM Lead contact in accordance with Scarborough Health Network Contractor Procedure Manual.

1.3.7. Harassment Policy:

1.3.7.1. Comply with Scarborough Health Network Contractor Procedure Manual requirements for harassment policy.

1.4. RESTRICTED HOURS FOR CONSTRUCTION OPERATIONS

1.4.1. General:

1.4.1.1. The work hour restrictions and times for construction operations given below are intended for guidance and costing purposes. Contractor will organize his schedule and cost the work in accordance with these restrictions.

1.4.1.2. All times and work schedules will be reviewed with the SHN Project Manager in planning for each work phase, and will be adjusted as required and must be confirmed by the hospital.

1.4.1.3. Should there be a difference in cost that requires adjustment to the contract cost, as a result of adjustments to the restricted hours, this will be reviewed as part of the work planning before start of work in each phase.

1.4.1.4. Exceptions to these work hour restrictions must be discussed and accepted in writing with the SHN Project Manager before work proceeds.

1.4.2. Construction Work Hours:

1.4.2.1. Construction work hours inside the work area are restricted to 7:00 am to 5:00 pm 7 days of the week.

1.4.2.2. Work will be stopped by the SHN Project Manager at any time if noise levels become disturbing outside the work area.

1.4.3. Delivery and Removal of Materials:

1.4.3.1. Movement of materials to and from the work area are restricted to 7:00 am to 5:00 pm 7 days of the week.

1.4.4. Service Disruptions:

1.4.4.1. Service disruptions is defined as any shut down to any utility, communications, med gas, security or system that would impact the hospital outside of the work area.

1.4.4.2. All service disruptions must be scheduled in accordance with the Scarborough Health Network Contractor Procedure Manual.

1.4.4.3. Advise SHN Project Manager of the planned service interruption, providing times and duration.

1.5. WORK AREA REQUIREMENTS

1.5.1. Ensure that all preconstruction safety measures, dust control, hoardings, fire alarm and exiting, and infection prevention and control procedures are in place, checked, and approved before any construction activity may proceed in each work area.

1.5.2. Complete the Sign Off for Construction Work Area Form, Section 00 63 16.

1.6. CONSTRUCTION ACCESS

1.6.1. Construction access route onto site to be coordinated with SHN Project Manager.

1.6.2. Coordinate access route into hospital, to and from the work area with the SHN Project Manager

1.6.3. Post signs, supervise trades and suppliers. Restrict construction movement only to the access route agreed with SHN Project Manager.

1.6.4. Arrange for delivery and unloading of materials at times and areas designated by the SHN Project Manager. Do not interfere with on-going operations in the hospital, or with vehicular traffic on site or on the streets and pedestrian traffic on the sidewalks.

1.6.5. Transport materials on designated Contractor's access routes. Maintain routes and pavement around building broom clean at all times.

1.6.6. Co-ordinate construction activities and use of premises with SHN Project Manager. Construction personnel are not allowed to enter any other buildings or site areas except the designated work area.

1.6.7. Provide 72 hours notice to the SHN Project Manager prior to entering any occupied areas of the building to carry out work or to take out of use.

1.6.8. Ensure that existing emergency vehicle routes, road system and parking areas are not obstructed at any time.

1.6.9. Access to locked areas to be arranged with SHN Project Manager in accordance with Scarborough Health Network Contractor Procedure Manual.

1.7. CONTRACTOR'S USE OF EXISTING BUILDING

1.7.1. Construction access in accordance with phases as shown on drawing and specified in this Section.

1.7.2. Limit access of construction personnel to existing building only at locations approved by SHN Project Manager.

1.7.3. Ensure that construction personnel perform work in the designated work area as required under the Contract; and that they do not enter other buildings or site areas, except for work in existing building, or for other purposes, and as permitted by the SHN Project Manager.

1.7.4. Restrict all food and drinks to designated lunch space in trailer and not inside the work area.

1.7.5. Keep traffic through existing service areas to an absolute minimum in executing the Work. Take the most direct route while travelling on site.

1.7.6. Minimize noise, dust, odours to ensure hospital personnel and neighbours in areas adjacent to the hospital site are disturbed as little as possible. Implement immediate corrective action to cease or limit disagreeable annoyances upon notification by SHN Project Manager.

1.7.7. Make good damage to building, fixtures, and fittings caused during use by construction personnel by replacement with new work. Include cost of installation and making good of other work thereby affected in replacement.

1.7.8. Assume complete responsibility for security of all work areas including areas outside the work area in the existing building.

1.7.9. Secure work areas in existing building by methods compatible and coordinated with the total security established for building.

1.8. NO SMOKING POLICY

1.8.1. Cooperate, respect and comply with Smoke Free Workplace policy requirements. This policy applies to everyone who visits and works on this Project.

1.8.2. Ensure Contractor's staff, Subcontractors and Suppliers performing work on Contractor's behalf are instructed to comply with Smoke Free Workplace policy requirements. This applies to any space inside and outside the hospital.

1.9. OCCUPANCY REQUIREMENTS

1.9.1. Work to be substantial completed and ready for occupancy as defined in Section 01 17 00 Closeout Procedures, the OBC and the following:

1.9.1.1. Written application from Contractor that the work area is ready for occupancy. Application for partial release of holdback.

1.9.1.2. Final cleaning of the work area

1.9.1.3. Infection control inspection and verification that SHN Project Manager has accepted the work.

1.9.1.4. Submission of as-built documents, warranties, maintenance manuals, and operating instructions.

1.9.1.5. Commissioning, startup, and testing of equipment and demonstration and training for hospital staff.

1.9.1.6. Inspection(s) by Consultants and SHN Project Manager.

1.9.1.7. Completion of deficiencies and record of remaining deficiencies, work remaining to be completed, and work beyond Contractor's control. Schedule for outstanding work items.

1.9.1.8. Submit an Occupancy Permit issued by the Chief Building Official.

1.9.1.9. "Ready for Takeover" certificate from Consultants to validate that the conditions for occupancy have been met in general conformance with the contract documents. Warranties for equipment and materials in area to be occupied will commence on the date of this certificate.

PART 1 - PRODUCTS

Not applicable.

PART 2 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: general requirements for the Work including but not limited to following:

1.2.1.1. Cash flow schedule.

1.2.1.2. Cash Allowances.

1.2.1.3. Progress billing breakdown.

1.2.1.4. Changes in the Work due to a Supplementary Instruction.

1.2.1.5. Contract modification procedures.

1.2.1.6. Change Order and Change Directive.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Product substitution proposals: Section 01 25 00 Substitution Procedures.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CCN: Contemplated Change Notice.

1.3.1.2. CD: Change Directive.

1.3.1.3. CNQ: Change Notice Quotation.

1.3.1.4. CO: Change Order.

1.3.1.5. SI: Supplemental Instruction.

1.3.1.6. VAT: Value Added Taxes, aka HST in Ontario.

1.4. CASH FLOW SCHEDULE

1.4.1. Prior to commencement of the Work, submit a detailed cash flow schedule indicating anticipated billings on a month-by-month basis for duration of the Work, including timing of holdback release.

1.4.2. Update cash flow schedule monthly, recording cumulative as well as monthly totals.

1.5. CASH ALLOWANCES

1.5.1. Include $120,000.00 in the Base Bid Price for the Cash Allowances described below.

1.5.2. Disbursements from Cash Allowances are intended for work not shown or described in the Bid Documents shall be authorized by Consultant via email, as applicable.

1.5.3. Extend to Owner refunds, trade and quantity discounts which may be received in purchasing under Cash Allowances, except cash discounts for prompt payment.

1.5.4. In submitting final adjustments of Cash Allowances, include duplicate, summary statements and copies of receipted invoices substantiating purchases under Cash Allowances.

1.5.5. Cash Allowance No. 1: $120,000: Hazardous material abatement.

1.5.5.1. To be used for abatement of any hazardous materials that may be discovered.

1.6. PROGRESS BILLING BREAKDOWN

1.6.1. Prior to commencement of the Work, submit a detailed progress billing breakdown and obtain approval of Consultant.

1.6.2. Progress billing breakdown shall include itemized values, (each excluding VAT), applied against each of following:

1.6.2.1. Mobilization and start-up.

1.6.2.2. General site expenses.

1.6.2.3. Each and every Trade Subcontractor, indicating the specification Sections in which their work is included.

1.6.2.4. As-built Drawings broken down by Architectural, Structural, Mechanical and Electrical disciplines (minimum 0.5% of Contract Price).

1.6.2.5. Project closeout, comprising separate sums for:

1.6.2.5.1. Manuals, operating instructions, and warranties.

1.6.2.5.2. Maintenance materials.

1.6.2.5.3. Commissioning and training/demonstration for Owner's staff.

1.7. CHANGES IN THE WORK DUE TO A SUPPLEMENTAL INSTRUCTION

1.7.1. Supplemental Instruction does not normally include any change in Contract Price nor in Contract Time. Contractor shall formally notify Consultant in writing within 10 Days that Supplemental Instruction requires an amendment in Contract Price and/or Contract Time. Contractor to take the following action:

1.7.1.1. Request a CCN to be issued by the Consultan

1.7.1.2. Provide a CNQ for review.

1.7.2. If notification has not been received within 10 Days, it is understood that there are no anticipated changes in Contract Price and Contract Time.

1.8. CONTRACT MODIFICATION PROCEDURES

1.8.1. Promptly and not later than 10 Working Days after becoming aware of circumstances which may require a change in Work or other directions, give written notice to Consultant outlining such circumstances and requesting proposed change. Do no work in affected area, or that would prevent Consultant from properly evaluating circumstances and proposed change, without obtaining written acceptance. Consultant will act promptly to give Contractor appropriate instructions so Work is not unreasonably delayed.

1.8.2. Advise Consultant in writing of any contradictions, discrepancies, omissions or errors discovered or revealed. Do not proceed before obtaining clarifications and directions from Consultant in writing. Failure to follow this results in Contractor assuming full responsibility for resulting circumstances and costs.

1.9. CHANGE ORDER AND CHANGE DIRECTIVE

1.9.1. Any variation in the Contract involving a change in total amount of Contract Price or in Contract Time shall be initiated through Consultant in form of a CCN or CD describing work proposed under variation and requesting a CNQ from Contractor.

1.9.2. CCNs or CDs will be issued electronically as PDF to Contractor. Printed copies of these documents, including referenced drawings and schedules, if required, are the responsibility of the Contractor. Should the Contractor require electronic drawing files (Revit, AutoCAD, etc.), these files to be requested from Consultant and shall be at Contractor’s cost.

1.9.3. Immediately inform relevant Subcontractors and Suppliers of proposed change.

1.9.4. Upon receipt of a CCN by Contractor and where specifically directed by Consultant, suspend all work affected by proposed change until a CO is issued, or until CCN is cancelled.

1.9.5. Upon receipt of a CD, begin work described therein as soon as possible and prepare a quotation for the work.

1.9.6. Return 1 copy of the CCN or CD with a CNQ for the work and indication of the impact of the proposed work on the construction schedule.

1.9.7. Include work described in CCN and other work caused, however incidental it may be, by proposed change. Once CO is issued by Owner, no further claims for extra costs or time extensions will be accepted.

1.9.8. If CNQ received is unacceptable, Consultant will request clarification and consultation in order to reach an acceptable CNQ, or issue alternate instructions.

1.9.9. When Consultant deems CNQ acceptable, it will prepare a CO with recommendations to the Owner for approval. Work can proceed only following approval of the CO and execution by the Owner.

1.9.10. Value of changes in work shall be determined and processed in accordance with General Conditions of the Contract, and Supplementary Conditions.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 General Requirements and documents referred to therein.

1.2. GENERAL

1.2.1. Proposed substitutions will not be considered during Bidding. The Base Bid Price is based on specified products and shall not include proposed substitutions.

1.2.2. Product substitution proposals will be considered when Product manufacturer/distributor has submitted verification that specified Products:

1.2.2.1. Are unavailable (providing reasons why).

1.2.2.2. Were ordered in advance and in accordance with manufacturer's recommendations for lead time but timely delivery of specified Products is not possible in order to maintain construction schedule.

1.2.3. Submit substitution proposal on “Section 00 63 25, Substitution Request Form”. Consultant will not respond to substitution requests if not submitted on this form.

1.2.4. Submit following for each Product substitution proposal:

1.2.4.1. Fully detailed and clear description of Products, systems and assemblies proposed with a complete comparison made against original Products, systems and assemblies.

1.2.4.2. Technical Product data.

1.2.4.3. Samples.

1.2.4.4. If requested, on site mock-up for review by Consultant.

1.2.4.5. Difference in price, if any, in form of certified quotations of both selected and proposed substitutions.

1.2.5. Submit Contractor's written recommendation for use of substituted Products and certification that the substituted Products:

1.2.5.1. Will not exceed space requirements allocated for originally specified Products or, if they do, Contractor is including with substitution submission, design drawings, to accommodate substituted Product.

1.2.5.2. Are compatible with and inert to adjacent materials.

1.2.5.3. Will not affect Project schedule due to delays in delivery and installation.

1.2.5.4. Have been priced to include design adjustments required to accommodate substituted Products.

1.2.6. Proposed substitutions require Consultant's review and no objections recorded and requires Owner's acceptance.

1.2.7. Review with no objections recorded against proposed substitution by Consultant/Owner does not relieve Contractor of his responsibility and costs for any affect proposed substitution has on other Products, systems and/or assemblies.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: general project coordination requirements for the Work including but not limited to following:

1.2.1.1. Documents on site.

1.2.1.2. Start-Up Meeting.

1.2.1.3. Owner, Consultant and Contractor meetings

1.2.1.4. Progress meetings

1.2.1.5. Preinstallation, trade meetings.

1.2.1.6. Personnel appointment

1.2.1.7. General review

1.2.1.8. WHMIS requirements

1.2.1.9. Request for Interpretation (RFI).

1.2.1.10. Progress reports

1.2.1.11. Progress photographs

1.2.1.12. On-site documents.

1.2.1.13. As-Built drawings and specifications.

1.2.1.14. Progress documentation

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. As-built drawings: Section 01 77 00 Closeout Procedures.

1.2.3. References:

1.2.3.1. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.3. DOCUMENTS ON SITE

1.3.1. Further to GC 3.9, maintain in good condition and order on site 1 copy of Addenda, proposed changes in Work, Change Orders, test reports, manufacturer's installation and application instructions, progress photographs, as-built drawings, approved progress schedules, minutes of site meetings and other modifications to Contract Documents.

1.4. START-UP MEETING

1.4.1. Presided over by Consultant, after award of Contract.

1.4.2. Attendees:

1.4.2.1. Consultant(s).

1.4.2.2. Contractor.

1.4.2.3. SHN Project Manager.

1.4.2.4. Contractor's Superintendent.

1.4.2.5. Subcontractors (Mechanical, Electrical).

1.4.2.6. Major Equipment Suppliers.

1.4.2.7. Others as appropriate.

1.4.3. Minimum Agenda:

1.4.3.1. List of major Subcontractors and Suppliers.

1.4.3.2. Tentative construction progress schedules.

1.4.3.3. Start date; submission of schedules; long term delivery items.

1.4.3.4. Insurance Certificates, Cash Flow Schedule, Construction Schedule, Shop Drawing submission schedule, bonds including Value Added Taxes, Trade Breakdown including value for Close Out, Work place and Safety & Insurance Board Clearance Certificate, Project Sign.

1.4.3.5. Critical work sequencing.

1.4.3.6. Major equipment and Product deliveries and priorities.

1.4.3.7. Infection prevention and control procedures.

1.4.3.8. Sign Off for Construction Area Form.

1.4.3.9. Designation of responsible personnel.

1.4.3.10. Building Permit status.

1.4.3.11. Procedures for maintaining record documents.

1.4.3.12. Administrative procedures for digital document management.

1.4.3.13. Use of Premises: Office, keys, work and storage areas; Owner's requirements (storage delivery, path of construction activities, vehicle, by foot, carts, exterior and interior, elevator use, washrooms, bin location).

1.4.3.14. Construction facilities, controls, temporary hoarding, dust partitions, parking, hours, noisy work, interruption of services, smoking, cell phone usage and construction aids.

1.4.3.15. Construction scheduling.

1.4.3.16. Temporary utilities.

1.4.3.17. Safety and first-aid procedures.

1.4.3.18. Security procedures.

1.4.3.19. Housekeeping procedures.

1.5. OWNER, CONSULTANT AND CONTRACTOR (OCC) MEETINGS

1.5.1. Purpose: To review policy, financial status and schedule.

1.5.2. Period: monthly, or as requested, on a mutually acceptable schedule.

1.5.3. Attendees:

1.5.3.1. SHN Project Manager.

1.5.3.2. Consultant(s).

1.5.3.3. Contractor.

1.5.4. Chair: Consultant.

1.5.5. Consultant shall prepare minutes recording decisions, comments, instructions required and a report on Schedule. Consultant will distribute minutes to each participant within 5 Working Days.

1.6. SITE COORDINATION AND PROGRESS MEETINGS

1.6.1. Further to GC 3.1, conduct site meetings at regular intervals (every 2 weeks), to identify and resolve construction coordination items, record minutes including significant proceedings and decisions and identify "action by" parties; and reproduce and distribute to meeting participants, copies of minutes within 3 Working Days after each meeting. Consultant also reserves right to call additional special emergency site meetings on short notice without any cost to Owner.

1.6.2. Attendees:

1.6.2.1. Contractor's project manager and site superintendent.

1.6.2.2. Mechanical and Electrical Subcontractors.

1.6.2.3. Subcontractors invited by Contractor.

1.6.2.4. Owner and/or Consultant(s).

1.6.3. Chair: Contractor.

1.6.4. Include following:

1.6.4.1. Prepare agenda for meetings.

1.6.4.2. Distribute written notice of each meeting minimum 7 Days in advance of meeting date, stating time and place, to persons whose presence is required.

1.6.4.3. Make physical arrangements for meetings.

1.6.4.4. Record minutes and attendees; include significant proceedings and decisions.

1.6.4.5. Reproduce and distribute copies of minutes after each meeting to parties attending meeting, to parties affected by decisions made at meeting and to Consultant.

1.6.4.6. Ensure representatives of Contractor, Contractor's consultants, Subcontractors and Suppliers attending meetings are qualified and authorized to act on behalf of entity each represents.

1.6.4.7. Ensure relative information is available to allow meetings to be conducted efficiently.

1.6.4.8. Consultant may attend meetings to ascertain Work is consistent with Contract.

1.6.4.9. Documents and Construction Progress Schedule.

1.6.4.10. Construction Progress Schedule may be reviewed to ensure rapid and efficient completion of Work in accordance with Contract requirements. Keep Consultant informed of progress, of delays and of potential delays during all stages of Work.

1.6.4.11. Review, approval or correction of minutes of previous meeting.

1.6.4.12. Review of work progress since previous meeting.

1.6.4.13. Field observations, problems, conflicts.

1.6.4.14. Problems which impede Construction Progress Schedule.

1.6.4.15. Review of off-site fabrication, delivery schedules.

1.6.4.16. Review of submittals schedules.

1.6.4.17. Review of mock-up and sample installation requirements and schedules.

1.6.4.18. Corrective measures and procedures to regain projected schedules.

1.6.4.19. Quality standards.

1.6.4.20. Pending changes and substitutions.

1.6.4.21. Other business.

1.7. PREINSTALLATION TRADE MEETINGS

1.7.1. If a trade requires a meeting prior to starting work, arrange for such meeting of all parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor, include Consultant who may attend, include Subcontractor performing work of trade involved, Testing Company's Representative and Contractor's consultants of applicable discipline. Review Contract Documents for work included under trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of concrete placement and other matters affecting construction, to permit compliance with intent of trade under consideration.

1.8. PERSONNEL APPOINTMENT

1.8.1. Appoint a senior member of staff, with full authority to commit Contractor to methods and schedules for construction, to participate actively in administration and maintenance of detailed construction schedule. Provide necessary information on progress of the Work to enable a status report to be produced every 2 weeks.

1.8.2. Appoint a site supervisor, and back-up person(s) who will be responsible for day to day contact with the SHN Project Manager on a 24 hour, seven days a week basis, in the event of emergenies.

1.9. GENERAL REVIEW

1.9.1. The Consultant shall conduct periodic field review to review the Work for general conformance with Contract Documents, OBC and Authorities Having Jurisdiction.

1.9.2. Review includes review of Shop Drawings, review of field work and review of reports produced by various inspection and testing agencies and review of Contractor’s records.

1.9.3. Contractor’s daily log to record all site inspections by AHJ, testing agents, in manner suitable for submission to Consultant at completion of Project.

1.10. WHMIS REQUIREMENTS

1.10.1. Comply with WHMIS in accordance with OHSA requirements.

1.10.2. Before commencement of the Work and during full term of Contract, provide a list with current MSDS of all hazardous materials proposed for use on Project.

1.10.3. In addition to submission of MSDS as required under regulations, submit emission reports where available or off-gassing data to help control possible harmful effects to indoor air quality during construction, occupation and including maintenance period.

1.10.4. Label hazardous materials used and/or supplied on Project in accordance with WHMIS requirements.

1.10.5. Provide detailed procedures for safe handling storage and use of hazardous materials. List special precautions and safe clean up and disposal procedures. Conform to Environmental Protection Act and other requirements of authorities for disposal and clean up requirements.

1.10.6. Obtain from Owner, where applicable, a list and MSDS of hazardous materials that may be handled, stored or used by Owner’s employees and/or other contractors retained by the Owner at location where the Work of this Contract will be performed.

1.10.7. Ensure those who handle and/or are exposed to or are likely to handle or be exposed to hazardous materials are fully instructed and trained in accordance with WHMIS requirements.

1.11. REQUEST FOR INTERPRETATION (RFI)

1.11.1. RFI is a formal process used to request an interpretation to information already provided in Contract Documents from Consultant during the Work.

1.11.2. RFI is not used to expand Contract between Owner and Contractor or to add any additional work resulting in an increase in Contract Price or Contract Time. It is only for routine interpretation of Contract Documents.

1.11.3. Submit RFI on “Section 00 63 13, Request for Interpretation Form”. Consultant will not respond to RFI if not submitted on this form.

1.11.4. Where RFI form does not provide sufficient space for complete information to be provided thereon, attach additional sheets as required.

1.11.5. Submit necessary supporting information with RFI form.

1.11.6. RFI Log: Maintain tracking log of RFIs sent to and responses received from Consultant complete with corresponding dates.

1.11.7. Submit RFIs sufficiently in advance of affected parts of the Work so not to cause a delay in the Work. Any costs resulting from failure to do this will not be paid by Owner.

1.11.8. Submit RFIs to Consultant only.

1.11.9. Number RFIs consecutively in 1 sequence in order submitted.

1.11.10. Consultant requires 5 working days for review of RFI from time of Consultant’s receipt to time of Consultant’s return to Contractor. Contractor will establish a steady flow of RFIs for review and avoid accumulation of an excessive quantity of RFIs in a single submission.

1.11.11. Consultant’s response is not considered a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.

1.11.12. Undertake a thorough review of Contract Documents to satisfy a claim, dispute or other matters in question relating to performance of the Work or interpretation of Contract Documents that cannot be resolved by direct reference to Contract Documents. Make a serious effort to resolve questions of interpretation before submitting RFI. When there is an insufficient effort to resolve, in opinion of Consultant, Consultant will not review RFI and reject it.

1.12. PROGRESS REPORTS

1.12.1. Keep a permanent written report on the site of progress of the Work. This record to be available for review by the Owner and Consultant. A copy to be furnished to the Consultant upon request.

1.12.2. Progress report to show:

1.12.2.1. Dates of commencement and completion of every Subcontractor.

1.12.2.2. Reports on daily weather conditions. Indoor and outdoor temperature, protection methods and other such data shall be noted

1.12.2.3. Daily construction activities including excavation, erection and removal of forms, major concrete pours.

1.12.2.4. Particulars pertaining to number of employees of various trades and type and quantity of equipment employed daily.

1.12.2.5. Inspections by Authorities Having Jurisdiction.

1.12.2.6. Report delays (and potential delays) giving reason for delay and action being taken to resolve the problem.

1.13. PROGRESS PHOTOGRAPHS

1.13.1. Use of cameras and taking pictures requires coordination with SHN Project Manager, in accordance with Health Network Contractor Procedure Manual.

1.13.2. Upon commencement of the Work and thereafter at weekly intervals take digital electronic photographs at locations to be determined by the Consultant.

1.13.3. The number of photographs will vary according to the pace and type of construction activities, but will average 20 photographs each week.

1.13.4. Photographs to be full colour.

1.13.5. Provide legend to identify the location, date taken and caption explaining each photograph.

1.13.6. Establish an internet web site with password protected access and post photographs each week in .jpg format, standard resolution.

1.14. ON-SITE DOCUMENTS

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

1.14.1.1. Contract Documents.

1.14.1.2. Specifications.

1.14.1.3. Addenda.

1.14.1.4. Reviewed shop drawings.

1.14.1.5. Reviewed samples.

1.14.1.6. Contemplated Change Notices, Supplementary Instructions, Change Directives and Change Orders.

1.14.1.7. Requests for Interpretation.

1.14.1.8. Supplemental Instructions

1.14.1.9. Manufacturer's installation and application instructions.

1.14.1.10. WMIS Material Safety Data Sheets (MSDS).

1.14.1.11. Construction schedule.

1.14.1.12. Construction Safety plan.

1.14.1.13. Building permit together with approved drawings stamped by the Municipality.

1.14.1.14. As-built drawings in progress.

1.14.1.15. Ontario Building Code.

1.15. PROGRESS DOCUMENTATION

1.15.1. If requested, Consultant will provide progress documentation Drawings and Specifications in[electronic format at Contractor’s expense.

1.15.2. Consultant will not release progress documentation until it has an executed Electronic Release Form in its possession.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: general project coordination requirements for the Work including but not limited to following:

1.2.1.1. General requirements.

1.2.1.2. Project coordination.

1.2.1.3. Site supervision.

1.2.1.4. Construction administration software.

1.2.1.5. Other contractors and suppliers.

1.2.1.6. Interference drawings and templates.

1.2.1.7. Access panels and access doors.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Construction phasing: Section 01 10 00 General Requirements.

1.2.2.2. Start-Up Meeting, Owner – Contractor meetings, Project meetings: Section 01 30 00 Administrative Requirements.

1.2.2.3. Progress reports, progress photographs: Section 01 30 00 Administrative Requirements.

1.2.2.4. Construction schedule: Section 01 32 16 Construction Scheduling.

1.2.2.5. Workmanship, coordination and fastening of materials and equipment: Section 01 60 00 Product Requirements.

1.2.2.6. Field engineering, cutting and patching: Section 01 73 00 Execution.

1.3. GENERAL REQUIREMENTS

1.3.1. Contractor is deemed to possess the necessary technical skills to thoroughly evaluate all requirements contained in Contract Documents and to have included in the Contract Price all costs for the proper implementation of these requirements.

1.3.2. Cooperate and coordinate with other Contractors and ensure that Subcontractors and trades cooperate and coordinate their work to have the Work performed expeditiously and to be satisfactory in all respects at completion. Ensure cooperation of workers in laying out and performing Work. Maintain efficient and continuous supervision.

1.3.3. Ensure that Subcontractors and trades cooperate with other Subcontractors and trades whose work attaches to or is affected by their own work. Ensure that minor adjustments are made to make adjustable work fit fixed work.

1.3.4. Review all Contract Documents and advise the Consultant of any possible conflict before commencing the Work, ordering of materials or preparing shop drawings.

1.3.5. Coordinate the work of the various Sections so that all surfaces and/or components of Work will be properly prepared, finished, cured and/or installed, to interface with subsequent Work without reducing the specified quality of that Work or without impacting the construction schedule.

1.3.6. Pay particular attention to types of ceiling construction and clearances throughout, especially where recessed fixtures are required. Coordinate Work with other Contractors and Subcontractors wherever ventilation ducts or piping installations occur to ensure that conflicts are avoided.

1.3.7. Commencement of Work will constitute acceptance of site conditions and previously completed work.

1.3.8. Deliver materials and/or devices to be installed by other Sections to them well before the installation should commence.

1.4. PROJECT COORDINATION

1.4.1. Study Contract Documents to determine extent of work required by each Section and upon which work of other Sections depend and coordinate scope and extent of work to be performed by each trade. Neither organization of Specifications into Divisions and 3-part Section format nor arrangements of Drawings, Schedules and Standard Drawings shall affect in any way Contractor's control in, or diminish its responsibility for, dividing Work or establishing each trade's scope of work. Claims for additional compensation arising from disputes between trades due to lack of coordination by Contractor will not be considered.

1.4.2. Coordinate work of each Section as required for satisfactory and expeditious completion of Work. Take field dimensions required. Take into account existing installations to assure best arrangements of components in available space. Consult before commencing Work in critical locations. Fabricate and erect Work to suit field dimensions and field conditions.

1.4.3. Provide forms, templates, anchors, sleeves, inserts and accessories or other components required to be fixed to or inserted in Work. As applicable set them in place or instruct related Sections as to their location.

1.4.4. Pay cost of extra work caused by and make up time lost as result of failure to comply with these requirements at proper time.

1.4.5. Coordinate work of all trades including construction sequence, schedule and interfacing of all work. Coordinate work as required to incorporate metric modular components. Coordinate work of each trade as required for satisfactory and expeditious completion of Work. Ensure components to be built in are supplied in time with setting drawings and other related information. Fabricate and erect Work to suit field dimensions and field conditions.

1.4.6. Ensure Contract Documents are fully coordinated with respect to architectural, structural, mechanical, electrical and other specialty requirements.

1.4.7. Cooperate and coordinate with Consultant for moving Owner's equipment into building when Work or substantial part thereof is ready for use for purpose intended.

1.4.8. Subcontractor and Other Contractors Co-ordination:

1.4.8.1. Ensure Subcontractors cooperate with each other to ensure the execution of the Work is carried out expeditiously and is satisfactory in all respects.

1.4.8.2. Ensure Subcontractors examine Contract Documents covering the Work and in particular, those parts that affect the execution and performance of their own parts of the Work.

1.4.8.3. From time to time, examine work of Subcontractors and have corrected defects and deficiencies which may adversely affect the Work.

1.4.8.4. Ensure Work is in compliance with Contract Documents and accept responsibility for delays or costs resulting from failure to inspect, and any replacement required.

1.4.8.5. Be responsible for damage of any kind to the Work. Replace any materials or work so damaged that cannot be repaired or restored to the Consultant's satisfaction. Such repairs or replacements shall be made by the trade that performed the original work.

1.4.8.6. Ensure that all Subcontractors cooperate with other Subcontractors whose work attaches to or is affected by their own work and ensure that minor adjustments are made to make adjustable work fit to fixed work.

1.4.8.7. Ensure Subcontractors requiring foundations or openings to be left for the installation of their work furnish the necessary information to Subcontractors concerned in ample time.

1.4.8.8. Items to be built-in shall be supplied as and when required by Subcontractor building in the items together with forms, templates, anchors, sleeves, inserts, measurements, shop drawings and accessories required to be fixed to or inserted in the Work and set in place, or instruct the related Subcontractors as to their location.

1.4.8.9. Pay the cost of extra work caused by, and make up time lost as the result of, failure to provide the necessary cooperation, information or items to be fixed to or built into the work in adequate time.

1.4.8.10. Cooperate with other contractors working on and in the vicinity of the site.

1.4.9. Setting Out: Be responsible for layout, coordination and placement of openings, sleeves and accessories.

1.4.10. Dimensions:

1.4.10.1. Wall thicknesses shown on Drawings are nominal only. In all cases, determine the actual sizes at the building.

1.4.10.2. Dimensions of shop fabricated portions of the building shall be verified on the site before shop drawings and fabrication have commenced.

1.4.10.3. Where dimensions are not available before fabrication is commenced, the dimensions required shall be agreed upon between the various trades concerned.

1.4.10.4. Owner will not accept claims for extra expense on the part of the Contractor by reason of non-compliance with this article.

1.5. SITE SUPERVISION

1.5.1. Provide the services of a qualified site superintendent, acceptable to the Owner and the Consultant. The site superintendent shall be responsible for full time supervision of all aspects of the Contractor's work from commencement to completion of the work. The site superintendent shall be on site at all times during the execution of the work.

1.6. CONSTRUCTION ADMINISTRATION SOFTWARE

1.6.1.1. Construction contract administration will be managed through software: Onware; www.onware.com

1.6.1.2. Consultant shall provide training as required prior to start of construction.

1.6.1.3. Contractor to appoint Project Manager to be responsible for managing and coordination of construction administration documents through Onware including but not limited to following:

1.6.1.3.1. Request for Interpretation (RFI)

1.6.1.3.2. Request for Substitutions

1.6.1.3.3. All submittals; data sheets, shop drawings, samples, test reports, certificates.

1.6.1.3.4. CCN/CD/CO's

1.6.1.3.5. Progress Claim Applications

1.6.1.3.6. Supplemental Instructions (SI)

1.7. OTHER CONTRACTORS AND SUPPLIERS

1.7.1. Cooperate with other contractors performing work on this project. Work by other Contractors may occur at the same time as work under this Contract. Work by other Contractors may take place in adjacent area to Work under this Contract.

1.7.2. Cooperate with other Contractors and equipment suppliers to ensure that they are not hindered from completing their work expeditiously.

1.8. INTERFERENCE DRAWINGS AND TEMPLATES

1.8.1. Prepare interference drawings as defined in other Sections and submit in accordance with the requirements of Section 01 33 00 Submittals.

1.8.2. Submit sleeving shop drawings to the Consultant for review.

1.8.3. Prepare drawings indicating relationship of new and existing and/or unforeseen conditions at congested areas prior to commencement of Work in area.

1.8.4. Prepare coordination drawings for efficient use of available space and proper sequence of installation, and to resolve conflicts as required. Show clearances required by jurisdictional authorities and/or for easy maintenance of equipment. This applies to limited ceiling space, tight service shafts and areas where proper coordination of trades work could prevent the need for lower ceilings, bulkheads, or furring out, and the like.

1.8.5. Have the mechanical and electrical Subcontractors prepare interference and coordination drawings for their respective Work.

1.8.6. For congested locations, before commencing installation, prepare drawings showing relationship of ductwork, conduit, piping, sprinklers, ceiling supports and framing, fire separations, communication and specialized equipment located within ceiling and shaft spaces.

1.8.7. Prepare and/or obtain and distribute setting drawings, templates and other instructions required to convey information about the location of equipment, holes, sleeves, anchors, fasteners, inserts, access panels and other accessories and devices from one Section to another.

1.8.8. Indicate locations of visible items such as air handling outlets, light fixtures, smoke detectors, sprinkler heads, communication grilles and access panels occurring at these locations.

1.8.9. Prepare floor penetration drawings showing mechanical and electrical floor penetrations and submit for review by Consultant well in advance of formwork construction. Allow sufficient time for modifications to be made without affecting project schedule. Drawings shall be dimensioned showing opening diameter or size and distances between openings. Submit floor penetration drawings in accordance with the requirements of Section 01 33 00 Submittals.

1.8.10. Drawings shall be initialed by responsible Subcontractor involved along with Contractor's signature and submitted to Consultant for information and record purposes.

1.9. ACCESS PANELS AND ACCESS DOORS

1.9.1. Before commencing installation of mechanical and electrical work, prepare, together with the mechanical and electrical subcontractors, on a set of drawings provided for that purpose, a complete layout of all access panels and access doors that will be required.

1.9.2. Submit these layouts for review as specified for shop drawings, and show the exact sizes and locations of access panels and doors.

1.9.3. Revisions may be required to the layout before final review.

1.9.4. Allow Consultant to revise layout or quantity of access doors and panels, by relocating related building services a maximum of 2000 mm (6' - 7") at no extra cost to Owner. Should relocation exceed this

measurement then Contract Price will be adjusted in accordance with provisions for changes in Contract Documents.

1.9.5. Finish access panels and doors to match adjacent wall and/or ceiling finish unless otherwise specified or indicated.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. CONSTRUCTION SCHEDULE PLANNING REQUIREMENTS

1.2.1. Submit a detailed schedule with activities itemized to show the orderly planning, organization and execution of the Work, which schedule will enable the Contractor and the Consultant to monitor the progress of the Work and forecast remaining Work. Include in the schedule, the milestone dates for completion of each phase, or sub - phase and other milestones specified herein.

1.2.2. Review proposed schedule with Subcontractors. Obtain each Subcontractor's written approval and/or concurrence with the proposed schedule prior to submitting same to Consultant.

1.2.3. Consider seasonal weather conditions in the planning and scheduling of the Work influenced by high and low ambient temperatures and/or precipitation to ensure completion of the Work in accordance with the Contract Documents.

1.2.4. Include suitable time contingency provision for foreseeable delays due to weather, material movement logistics, approvals, periods of reduced productivity, equipment failure, inspection, testing and certification.

1.2.5. Incorporate hospital activities such as decanting furniture and equipment from a work area, and setting up equipment before dust partitions can be removed.

1.2.6. Incorporate any other special conditions in planning the Work such as specified non-work periods and restricted hours of work activities.

1.3. SCHEDULE FORMAT AND CONTENT

1.3.1. Prepare computerized critical path schedule using MS Project Plan scheduling software.

1.3.1.1. Identify critical path, float, dependencies, milestone dates, substantial performance, substantial completion for occupancy of each work area, and total completion.

1.3.1.2. Provide a horizontal time scale identifying the first day of each week.

1.3.1.3. Allow sufficient space for modifications and revisions to the schedule as Work progresses.

1.3.1.4. Show actual progress to date for each activity.

1.3.1.5. Prepare construction schedule information in the form of a time-scaled, horizontal bar chart. Detail and format shall be approved by the Consultant.

1.3.2. Provide a separate bar identifying the start and finish of each significant element of construction as required to define a clear progression of activities through each significant Project phase.

1.3.3. Show sufficient detail to identify the major activities and milestone dates for overall planning and coordination purposes. Typical duration of each activity to be ten (10) working days.

1.3.4. Show manufacturing and fabrication time and delivery dates for major equipment and materials.

1.3.5. Ensure that work of all disciplines (i.e., architectural, structural, mechanical, and electrical), hospital equipment contractors and assigned contracts are included on one schedule.

1.3.6. Identify dates for the erection and dismantling of temporary facilities, including inspection and testing of infection control measures, AHJ occupancy permit.

1.3.7. Identify start dates for installation of equipment by Owner or start of work by other contractors.

1.3.8. Identify decisions/approvals required by the SHN Project Manager and/or Consultant. Show dates for submission of shop drawings, material lists, samples, mock-ups.

1.3.9. Include as part of the construction schedule information, “dependency logic” information indicating the major predecessor and successor links between schedule activities.

1.3.10. Show intended working days and holidays used as the basis for the construction schedule information.

1.3.11. Identify commissioning and turnover dates.

1.3.12. Identify any other information relating to the orderly progress of Contract, considered by Consultant or SHN Project Manager to be pertinent.

1.4. SHORT TERM SCHEDULE

1.4.1. On a bi-weekly basis, provide SHN Project Manager with a 2 week short term schedule based on above schedule, indicating important construction activities as the SHN Project Manager and Consultant may see suitable for Project requirements.

1.5. MONITORING AND UPDATING THE SCHEDULE

1.5.1. Update and distribute schedule as required and minimum each month to show:

1.5.1.1. Adding and/or deleting activity relationships

1.5.1.2. Adding and/or deleting activities

1.5.1.3. Changes to original durations

1.5.1.4. Changes to contract milestone dates

1.5.1.5. Performance of work out of sequence

1.5.1.6. Scope changes through Change Orders and Change Directives

1.5.1.7. Progress

1.5.2. Immediately it appears the updated schedule will no longer achieve the milestone dates or overall contract completion date, notify the Consultant and request a formal change to the contract time.

1.5.3. No changes to the schedule reflecting later completion dates of activities or milestones will be accepted as an approved revision to the contract completion date unless specifically accepted by SHN Project Manager in writing.

1.6. TIME IMPACT ANALYSIS FOR CHANGES, DELAYS AND CONTRACTOR REQUESTS FOR EXTENSIONS OF TIME

1.6.1. Immediately changes are initiated or delays are experienced, submit a written time impact analysis illustrating the influence of each change, delay, or request on any milestone or Completion date.

1.6.2. Each time impact analysis shall demonstrate how the change, delay or contractor request will be incorporated into the schedule.

1.6.3. The time impact analysis shall demonstrate the time impact to each and every affected activity.

1.6.4. Activity delays shall not necessarily mean that an extension of any milestone or completion date is warranted. A change or delay may not affect existing critical activities or cause non-critical activities to become critical. A change or delay may result in only absorbing a part of the available total float that may exist within an activity chain of the network, thereby not causing any effect on any milestone or completion date.

1.6.5. Total Float is defined as the amount of time between the early finish date and the late finish date, for each activity in the schedule. Float is not for the exclusive use or benefit of either the Consultant or the Contractor.

1.6.6. Upon acceptance, the time impact analysis shall be incorporated into the schedule for the next schedule update.

1.7. SUBMISSION REQUIREMENTS

1.7.1. Distribute coloured copies of original and updated schedules to:

1.7.1.1. Job Site Office.

1.7.1.2. Subcontractors.

1.7.1.3. SHN Project Manager.

1.7.1.4. All Consultants.

1.7.2. Submit updated construction schedule with each application for payment, clearly indicating progress of Work to date for which money is being claimed.

1.7.3. Submit electronic copy of each schedule update in MS Project to Consultant.

1.7.4. Submit two copies of each time impact analysis within 10 working days to Consultant after the commencement of a delay or the notice of direction for a change is given.

1.7.5. When requested, submit a separate narrative report to identify:

1.7.5.1. Problem areas, anticipated delays, and the impact on the schedule.

1.7.5.2. Corrective action recommended and its effect.

1.7.5.3. The effect of changes on schedules of other prime contractors or hospital activities.

1.7.5.4. Slippage, its impact on completion of the phase and the total project, and possible corrective actions. Appropriate corrective action may include, but not be limited to, assignment of additional labour, trade subcontractors or equipment, shift or overtime work.

1.7.5.5. The costs to improve the schedule or regain lost time as a result of scope changes to the contract.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.1.2. References:

1.1.2.1. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.2. RELATED SECTIONS

1.2.1. Requests for interpretation: Section 01 30 00 Administrative Requirements.

1.2.2. Infection prevention and control plan: Section 01 35 33 Infection Control Procedures.

1.2.3. Field samples and mock-ups, submission of test and mix designs, independent inspection and testing reports, manufacturer's inspection and verification reports, Quality Control Plan: Section 01 40 00 Quality Requirements.

1.2.4. Requests for substitutions: Section 01 25 00 Substitution Procedures.

1.2.5. Submission of operating and maintenance manuals and record drawings, Warranties: Section 01 70 00 Take-Over Procedures.

1.3. SUBMITTAL PROCEDURES

1.3.1. Submit to Consultant and Authorities Having Jurisdiction as required, documents listed to be submitted for review. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time or extra costs and no claim for extension of Contract Time or increase to Contract Price by reason of such default will be allowed. Obtain final approval of authorities having jurisdiction, where required, prior to submitting Shop Drawing or other documentation to Consultant.

1.3.2. Prior to submission to Consultant, Contractor shall review submittals. Submittals not stamped, signed, dated and identified as to specific Project will be returned without being reviewed and considered rejected. Verify field measurements and ensure affected adjacent Work is coordinated. Confirm and correlate information pertaining to fabrication processes, quantities, techniques of construction and installation and similar information.

1.4. SUBMITTALS BEFORE COMMENCEMENT OF WORK

1.4.1. Obtain the documents listed under this heading and supply to Consultant before any on site construction activity:

1.4.1.1. Ministry of Labour Notice of Project

1.4.1.2. Maintenance Bond, deposit(s), permits as may be required by the City of Toronto for work on municipal property.

1.4.1.3. Building Permit or demolition permit

1.4.1.4. Performance Bond and Labour and Material Payment Bond.

1.4.1.5. Insurance Policies required under General Conditions of Contract and Supplementary Conditions.

1.4.1.6. Certificates of good standing from the Workplace Safety and Insurance Board for the Contractor and all Subcontractors. The certificates are to include rate, class number, and firm WSIB number.

1.4.1.7. Safety plan to comply with the Occupational Health and Safety Act, and together with the Contractor's own safety policy for the project:

1.4.1.7.1. In accordance with Scarborough Health Network Contractor Procedure Manual appendix Workplace, Health and Safety Program Manual.

1.4.1.8. Infection Control Plan.

1.4.1.9. Sign Off for Construction Area Form.

1.4.1.10. Quality Control Plan.

1.4.1.11. Waste management plan.

1.4.1.12. SHN Construction Activity Permit.

1.5. SUBMISSIONS BEFORE THE FIRST PROGRESS PAYMENT APPLICATION

1.5.1. Submit the documents listed under this heading and supply to Consultant before commencement of work by the applicable trade and/or the first application for payment is submitted:

1.5.1.1. Shop drawing and sample schedule.

1.5.1.2. List of all shop drawings and samples to be submitted prepared as a shop drawing log. Identify specification Section number, product name, subcontractor responsible and status.

1.5.1.3. List of all required operation and maintenance manuals, warranties, and other closeout submittals. Identify specification Section number, material or component, subcontractor responsible and status.

1.5.1.4. Permits for temporary structures, hoists, hoardings, street occupancy, boulevard protection, etc.

1.5.1.5. Construction cost breakdown or schedule of values.

1.5.1.6. Estimate of monthly progress claims (cash flow schedule).

1.5.1.7. Construction schedule.

1.5.1.8. Complete list of Subcontractors with addresses, phone numbers and personnel along with Contractor's list of personnel.

1.6. SHOP DRAWINGS

1.6.1. Shop Drawing Schedule: Submit a Shop Drawing schedule in accordance with GC 3.10.

1.6.2. Fabrication: Do not fabricate until Shop Drawings are indicated as "REVIEWED" or "REVIEWED AS NOTED".

1.6.3. Consultant's Shop Drawing Review:

1.6.3.1. Consultant's review of Shop Drawings is for sole purpose of ascertaining conformance with general design concept.

1.6.3.2. Consultant's review does not provide approval of items which remain Contractor's responsibility.

1.6.3.3. Without limitation, among other things, Contractor remains responsible for:

1.6.3.3.1. detail design inherent in Shop Drawings.

1.6.3.3.2. errors and omissions in Shop Drawings.

1.6.3.3.3. meeting requirements of Contract Documents.

1.6.3.3.4. confirmed and correlated site dimensions.

1.6.3.3.5. information that pertains solely to fabrication processes, techniques of construction and installation.

1.6.3.3.6. co-ordination of work of all trades.

1.6.4. Shop Drawing Requirements:

1.6.4.1. Indicate following minimum requirements as applicable:

1.6.4.1.1. plans, sections and details.

1.6.4.1.2. verified site dimensions.

1.6.4.1.3. materials thicknesses and finishes.

1.6.4.1.4. methods of setting and sealing.

1.6.4.1.5. methods of securing, fastening and anchoring including field connections.

1.6.4.1.6. signed and sealed Shop Drawings and calculations where specifically required herein.

1.6.4.2. Do not make Product substitutions on Shop Drawings without Consultant's written acceptance in accordance with Product substitution proposal process or they will be rejected. Replace rejected Product substitutions and complete Work in accordance with Contract Documents.

1.6.4.3. Verify that field measurements and affected adjacent Work are coordinated.

1.6.4.4. Prepare shop drawings in SI metric units.

1.6.4.5. Determine which Shop Drawings the local Building Department will require for its approval and submit 2 final copies of each Shop Drawing to local Building Department. Obtain approval and pay associated charges and fees.

1.6.5. Shop Drawing Procedures:

1.6.5.1. Provide Shop Drawings required by Contract Documents.

1.6.5.2. Execute following prior to submitting Shop Drawings to Consultant:

1.6.5.2.1. review, check and mark-up Shop Drawings with comments and revisions and re-direct back to Subcontractor (“REVISE AND RESUBMIT”, etc.) in the first instance if required prior to forwarding to Consultant.

1.6.5.2.2. stamp each Shop Drawing with Contractor’s Shop Drawing stamp.

1.6.5.2.3. insert applicable Specification Section reference, e.g. "10 28 00" for Section 10 28 00, Washroom Accessories.

1.6.5.2.4. insert Contractor's review date and signature of Contractor's reviewer.

1.6.5.3. Submit prints or digital drawings or both, as determined at the project start-up and general procedures meeting.

1.6.5.3.1. For prints, submit following for Consultant's review:

1.6.5.3.1.1. 1 print of each stamped Shop Drawing, to be returned to Contractor.

1.6.5.3.1.2. 3 prints of each stamped Shop Drawing, not returned to Contractor.

1.6.5.3.1.3. If catalogue cuts are acceptable to Consultant, submit as many copies of catalogue cuts for review as agreed to. Only 1 set to be returned to Contractor.

1.6.5.3.2. For digital submissions, submit following for Consultant's review:

1.6.5.3.2.1. 1 digital copy of each stamped Shop Drawing.

1.6.5.3.3. If catalogue cuts are acceptable to Consultant, submit a digital copy of catalogue cuts for review as agreed to.

1.6.5.4. Reproductions of Consultant's Contract Documents are not acceptable as Shop Drawings.

1.6.5.5. Shop Drawings not conforming to above criteria will be automatically returned without review. Any resulting delays will be Contractor's responsibility.

1.6.5.6. Shop Drawings submitted without specified licensed engineer's design and stamp will be automatically returned without review. Any resulting delays will be Contractor's responsibility.

1.6.5.7. Do not resubmit Shop Drawings indicated as "REVIEWED" and "REVIEWED AS NOTED".

1.6.5.8. Resubmit Shop Drawings indicated as "REVISE AND RESUBMIT" with required changes and comments addressed. Insert letter "R" after Shop Drawing number on resubmitted Shop Drawings, re-date and re-sign. Identify revisions from earlier submissions graphically on revised Shop Drawings.

1.6.5.9. Consultant requires 14 Days for review of Shop Drawings from time of Consultant's receipt to time of Consultant's return to Contractor. Contractor will establish a steady flow of Shop Drawings for review and avoid accumulation of an excessive quantity of Shop Drawings in a single submission.

1.7. INTERFERENCE DRAWINGS

1.7.1. Prepare drawings indicating relationship of new and existing and/or unforeseen conditions at congested areas prior to commencement of work in area.

1.7.2. For congested locations, before commencing installation, prepare drawings showing relationship of ductwork, conduit, piping, sprinklers, ceiling supports and framing, communication and specialized equipment located within ceiling and shaft spaces.

1.7.3. Indicate locations (height above floor, dimension to grid line) of visible items such as air handling outlets, light fixtures, smoke detectors, sprinkler heads, communication grilles and access panels occurring at these locations.

1.7.4. Ensure interference drawings are initialed by a responsible person of each Subcontractor involved along with Contractor's signature and submitted to Consultant for information and record purposes.

1.8. SAMPLES

1.8.1. Definition: A sample is a separated part of a Product or an assembly and is an illustrative or typical example of that Product or assembly.

1.8.2. General:

1.8.2.1. The purpose of samples is to establish an acceptable quality or quality range for the Products to be incorporated into the Work.

1.8.2.2. Provide samples required by and as described in Contract Documents for Consultant's review. Provide samples additional to those specified as the Consultant may request for Consultant's review.

1.8.2.3. Review samples obtained from Subcontractors and Suppliers before submitting them to Consultant. Contractor represents by the act of reviewing that he has checked and co-ordinated each sample against the requirements of Contract Documents.

1.8.2.4. Revise and resubmit samples rejected by Consultant.

1.8.2.5. Revise and resubmit samples for approval of colours, patterns, direction of grain, sheen, graphics, details and for quality of finish as many times as may be necessary.

1.8.2.6. Submit final reviewed samples to Authorities Having Jurisdiction, wherein authorities require samples.

1.8.2.7. Consultant's review is for conformity to the design concept only. Consultant's review or approval does not mean the Consultant accepts responsibility for the detail design inherent within the samples. Review or approval does not relieve Contractor from the responsibility of meeting the requirements of Contract Documents.

1.8.3. Deviations and Substitutions: Samples submitted with the intent or the appearance of the intent to use the samples submission process as a means of introducing substitutions to or deviations from the requirements of Contract Documents will cause their rejection.

1.8.4. Deliver samples to Consultant as directed with charges prepaid and allow for 1 of samples to be kept by Consultant.

1.8.5. Unless otherwise specified, submit samples in sufficient quantity for Contractor, Subcontractor, Consultant, Owner, and AHJ to each retain an approved sample, as applicable.

1.8.6. Identify each sample with:

1.8.6.1. Project name and Project number.

1.8.6.2. Contractor's name

1.8.6.3. Subcontractor's name

1.8.6.4. Supplier's name

1.8.6.5. Product's generic name

1.8.6.6. Product manufacturer's name

1.8.6.7. Product's trade or brand name

1.8.6.8. Product's model number

1.8.6.9. Date of submission.

1.8.7. Number and register samples and revised samples to correspond with the applicable section, article and paragraph numbers of the Contract specifications, using the specification section number and the applicable article and paragraph numbers within the section.

1.8.8. Colours:

1.8.8.1. Colour and gloss value selection by Consultant. Obtain direction on colour and gloss value in advance of need. If requested, submit samples for colour and gloss selection. Follow colour schedule provided by Consultant and use colours and gloss designated.

1.8.9. Contractor's Certification:

1.8.9.1. Confirm review of each sample (including resubmission) by applying a stamp to the sample or to a tag permanently attached to the sample. Have the stamp contain Contractor's name and the date and the signature of Contractor's authorized representative.

1.8.9.2. Consultant will reject samples not stamped, dated or signed by Contractor and will require them to be resubmitted.

1.8.10. Contractor's Distribution to Consultants:

1.8.10.1. In order to receive the Consultant's consideration:

1.8.10.1.1. Hand deliver, courier or mail samples, accompanied by a transmittal and prepaid, to the Consultant's business address or to a location designated by the Consultant;

1.8.10.1.2. Have the transmittal signed by the Contractor, dated and containing a complete listing of the samples being delivered;

1.8.10.1.3. Have samples identified and numbered as specified.

1.8.10.2. Sequence submission of samples in an orderly and timely manner.

1.8.11. Consultant’s Review Coordination:

1.8.11.1. Consultant will issue a letter to Contractor that contains the review and/or resubmission requirements.

1.8.11.2. When final review is achieved, Consultant will stamp, sign, date and deliver one of the duplicates of the sample to the Place of the Work, to serve as a quality control sample.

1.9. MISCELLANEOUS SUBMITTALS

1.9.1. Supply submittals required by Contract Documents (e.g. plans, reports, certifications, results, records, etc.) for Consultant's review.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.1.2. Related Work:

1.1.2.1. Dust control partitions and temporary controls: Section 01 50 00 Temporary Facilities and Controls

1.2. REFERENCES

1.2.1. Abbreviations and Acronyms:

1.2.1.1. HEPA: High Efficiency Particulate Air.

1.2.2. Definitions:

1.2.2.1. Refer to CAN/CSA Z317.13 for definition of terms used in this Section.

1.2.2.2. NADCA: National Air Duct Cleaners Association

1.2.2.3. SMACNA: Sheet Metal and Air Conditioning Contractor's National Association Inc.

1.2.3. Reference Standards:

1.2.3.1. ANSI/IICRC R520-2015 – Standard for Professional Mold Remediation, 3rd edition.

1.2.3.2. CAN/CSA Z317.13-22 - Infection Control during Construction or Renovation of Health Care Facilities.

1.2.3.3. CSA Z317.1:21 - Special requirements for plumbing installations in health care facilities

1.2.3.4. CSA Z317.2:19 - Special requirements for heating, ventilation, and air conditioning (HVAC) systems in health care facilities

1.2.3.5. CSA Z8000-18 - Canadian health care facilities

1.2.3.6. CSA-Z8001-13 (R2018) - Commissioning of health care facilities

1.2.3.7. CCA Mould Guidelines for the Canadian Construction Industry - 2018

1.2.3.8. EACC (Environmental Abatement Council of Canada) Performance Leak Testing Guideline for HEPA Filtered Equipment, 2021

1.2.3.9. NADCA General Specifications for the Cleaning and Restoration of Commercial Heating, Ventilating and Air Conditioning Systems

1.2.3.10. SMACNA's Duct Cleanliness for New Construction Guidelines - 2000

1.2.3.11. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.3. SUBMITTALS

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

1.3.2. Submit a written infection control plan that is specific to this project. Plan to describe procedures, processes, and safeguards that will be used to maintain appropriate infection control preventive measures:

1.3.2.1. Table of contents shall be in accordance with CAN/CSA Z317.13 Annex D.

1.3.2.2. Include a description of measures to minimize the potential for mould growth including prevention of water from spilling/accumulating in the building and ongoing monitoring and regular inspections, in accordance with CCA Mould Guidelines for the Canadian Construction Industry.

1.3.3. Submit a preventative measures analysis in accordance with CAN/CSA Z317.13 Annex C.

1.3.4. Submit preventative measures checklist for each stage of construction, for every phase. Refer to CAN/CSA Z317.13 Annex G.

1.3.5. Submit Sign Off for Construction Area Form before starting work in each work area, Section 00 63 16.

1.4. CLOSEOUT SUBMITTALS

1.4.1. Submit written confirmation that:

1.4.1.1. HVAC system cleaning and balancing is complete.

1.4.1.2. Disinfection of plumbing system is completed.

1.4.1.3. Final construction cleaning is completed and verified.

1.5. INFECTION PREVENTION AND CONTROL

1.5.1. Conform to requirements of CAN/CSA Z317.13 and the SHN Infection Control Procedures. Where there is a conflict between requirements of the standard, or SHN Procedures, or these Specifications, conform to the more restrictive requirement. The Consultant will be the arbiter of any questions in interpretation.

1.5.2. Comply with Scarborough Health Network Contractor Procedure Manual requirements for infection control procures, and the following:

1.5.2.1. Contractors and staff working at Centenary Hospital are obliged to comply with these infection control procedures and are required to attend meetings and/or orientation sessions with representatives of Occupational Safety & Facilities Development Department and Infection Prevention & Control Department of SHN at start of construction activities.

1.5.2.2. Construction activities in health care facilities pose a potential threat of infection to current and future patients, particularly those with reduced immunity. Take measures to prevent and control the risk of construction related infections. Plan with SHN Project Manager and implement preventative measures through out duration of Contract. Educate personnel on site regarding planned construction activity, location, duration, population risk group to ensure preventative measures are identified, initiated and maintained. Ensure appropriate preventative measures are in place and establish clear line of communication among those involved in this Project.

1.5.2.3. Ensure Contractors and Subcontractors are aware at all times that ongoing functions and activities of existing facility/hospital will continue. SHN Project Manager and/or representative of Occupational Safety & Facilities Development Department and Infection Prevention & Control Department has authority to stop construction when in their opinion precautions are necessary to prevent infection. Contractor shall suspend activities in the area, for a reasonable period of time without additional cost to Owner.

1.5.2.4. Aspergillosis and related nosocomial (hospital acquired) fungal infections are caused through inhalation by immunocompromised persons of aspergillus spores, or other related spores, which can be present in construction environment. Spores are known to be prolifically present in construction dust, debris and earthwork excavation dust. Control of construction dust, debris and excavation dust, as required in this Section is imperative to help prevent outbreaks of aspergillosis or related nosocomial fungal infections in immunocompromised persons.

1.5.2.5. Inhalation of aspergillus spores or other fungal spores by immunocompromised persons can lead to serious complications and death.

1.5.2.6. Construction activity types are defined by CAN/CSA Z317.13. Contact SHN Project Manager if any issue is questionable under this Standard.

1.5.3. Procedure Classification Determination:

1.5.3.1. This Project has been designated by Owner in accordance with CAN/CSA Z317.13:

1.5.3.1.1. Population Risk Group and Geographical Area: Group 4,

1.5.3.1.2. Health Care Facility Class: Class A HCF Acute Care.

1.5.3.1.3. Construction Activity Type D

1.5.3.1.4. Preventative Measure IV.

1.5.3.2. Infection Prevention and Control Measures:

1.5.3.2.1. Initiate, perform and adhere to “Preventative Measure IV” work in accordance with Article 7 of CAN/CSA Z317.13.

1.5.3.3. Any deviation/changes to this classification must be approved by SHN Project Manager in conjunction with Infection Control and/or Occupational Health & Safety.

1.5.3.4. Coordinate and evaluate other work required to be performed outside the Work for “Preventative Measure” level with SHN Project Manager prior to work being performed.

1.5.3.5. Additional Owner’s Requirements: “Sign Off for Construction Areas” sheet appended to this Section must be completed by Contractor in consultation with Owner prior to work commencing.

1.5.4. Mechanical Equipment and Ductwork:

1.5.4.1. Ductwork to be handled and installed in accordance with SMACNA’s Duct Cleanliness for New Construction Guidelines

1.5.4.2. Ductwork shall remain sealed until it is incorporated into the work.

1.5.4.3. At the completion of construction, all ductwork shall be cleaned in accordance with NADCA General Specifications for the Cleaning and Restoration of Commercial Heating, Ventilating and Air Conditioning Systems and CSA Z317.2

1.5.5. Plumbing:

1.5.5.1. Ensure integrity of plumbing and drainage system by checking for leaks or minimizing dead end reservoirs.

1.5.5.2. Remove features conducive to stagnation, such as long pipe runs and dead ends (piping no longer used), from plumbing systems.

1.5.5.3. Avoid collection of tanks and long pipes that allow water to stagnate.

1.5.5.4. Schedule water interruption during low activity with approval of authorities at health facility. Flush water lines prior to reuse. Ensure water temperature meets standards set by health care facility. Do not use gaskets and items made of materials that support microbial growth. Maintain dry environment and report any water leaks that occur to walls and substructures.

1.5.5.5. Flush water lines at work areas and adjacent patient care areas before patients are readmitted.

1.5.5.6. Following construction and prior to occupancy, water systems shall be disinfected and tested in accordance with CSA Z317.1

1.5.6. Submit infection prevention and control plan to Consultant for review with SHN Project Manager prior to construction of infection prevention and control guidelines.

1.5.7. Ensure supply and installation of starters, disconnecting means, associated power and control wiring as required for above requirements from exhaust fan to nearest suitable power source in order to provide fully operational exhaust system.

1.5.8. Include costs associated with installation, operation and removal of temporary exhaust system.

1.6. TEMPORARY MEASURES

1.6.1. Temporary Ventilation:

1.6.1.1. Provide temporary ventilation system within construction area and adjacent areas to ensure it is functioning properly, before commencing work, throughout construction period and at completion. Where possible disable ventilation system in work area until construction is complete.

1.6.1.1.1. Temporary ventilation system to establish air pressure differentials between the anteroom, the work area, and the adjacent areas as shown in CAN/CSA Z317.13 para. 6.6.1.11 Figure 1.

1.6.1.1.2. Provide at each construction area entrance an alarming air pressure monitor, calibrated and set to alarm at pressure below required recommended and designed levels. Minimum 0.03” of water column at 7.5 Pa.

1.6.1.1.3. Do not commence dust generating work until required recommended and acceptable designed pressure levels are achieved.

1.6.1.1.4. When air pressure in construction areas drops below acceptable standards, cease and desist any work and rectify cause of pressure drop, until satisfactory levels are achieved.

1.6.1.1.5. Assess air flow, air pressure and air exchange rates as well as examining, cleaning and evaluating integrity of filters and ducts.

1.6.1.1.6. Cap and seal existing supply, return and exhaust duct openings at construction areas. Cap duct during construction. Immediately seal new ducts added and installed with plastic sheeting (re-seal as required) to minimize entry of dust and/or contaminants into duct work.

1.6.1.1.7. Ensure provision for exhaust fan to maintain space under negative pressure. Direct exhaust discharge without interruption to outside as designated by SHN Project Manager away from intake vents or filtered through a HEPA filter before being re-circulated.

1.6.1.1.8. As an alternative, provide portable fan/filter unit to maintain space under negative pressure. Ensure unit is complete with 3 stage filtration: 99.99% HEPA, 40% pre-filter and 25 mm (1") thick fibreglass media pre-filter. Ensure fan discharges to suitable location outside construction zone. Be responsible for replacing filters as required to ensure proper operation. Replace fibreglass pre-filter on daily basis.]

1.6.1.1.9. Ensure proposed approach to exhaust method is reviewed by Hospital Engineering Staff, Hospital Infection Prevention and Control Staff and Consultants affected by these requirements prior to commencing exhaust work.

1.6.1.1.10. Perform periodic monitoring and reporting that negative air pressure is being maintained.

1.6.1.2. Anteroom Dust Barrier:

1.6.1.2.1. Construct anteroom for each work area in accordance with CAN/CSA Z317.13 Figure E4 and the following minimum requirements:

1.6.1.2.1.1. Provide minimum 3658 mm (12' - 0") long x 2440 mm (8' - 0") wide vestibule, sealed to floor and structure above. Provide locking door. Ensure construction side of vestibule is provided with a double flap of 0.762 mm (30 mil) thick polyethylene sheeting. Equip vestibule with temporary lighting and power.

1.6.1.2.1.2. Provide temporary dust proof partitions to prevent dust infiltration into adjacent areas during construction.

1.6.1.2.1.3. Block off supply and return to prevent dust infiltration into adjacent areas during construction.

1.6.1.2.1.4. Erect impermeable temporary dust proof partitions from structure including plenum above ceiling to floor using temporary dust tight partitions in accordance with Section 01 50 00.

1.6.1.2.1.5. Ensure windows, doors, plumbing penetrations, electrical outlets and intake and exhaust vents are properly sealed with plastic and taped within construction areas.

1.6.1.2.1.6. Vacuum work area with HEPA filtered vacuums daily or more frequently if needed. Vacuum air ducts and spaces above ceiling if necessary.

1.6.1.2.1.7. Ensure workers wear protective clothing that is removed each time they leave construction area before going into patient care areas. Ensure personnel entering construction areas wear shoe covers.

1.6.1.2.1.8. Execute work by methods that minimize dust generation from construction activities; wet mop and vacuum as necessary; provide means to minimize dust migration into atmosphere by using drop sheets, by water misting work surface before cutting and by placing dust mat at entrance to and exit from work areas.

1.6.1.2.1.9. Do not remove temporary anteroom or dust proof partitions until work in the area is complete and area has been cleaned thoroughly and inspected by SHN Project Manager.

1.6.1.2.1.10. Remove dust barrier carefully to minimize spreading dust and other debris particles associated with construction.

1.6.1.2.1.11. Maintain construction areas clean and clear of debris throughout work. Remove debris at end of each Day. Erect external chute if construction is not taking place on ground floor level.

1.7. PREVENTION AND REMEDIATION OF MOULD

1.7.1. Administrative controls to prevent mould growth:

1.7.1.1. Follow recommendations described in CCA Mould Guidelines for the Canadian Construction Industry

1.7.1.2. Designate a person responsible to ensure that the mould prevention procedures as part of the infection control plan are followed, and make regular inspections of the work.

1.7.1.3. Prepare records to document water intrusion (incident reports), for rejecting unfit shipments (non-conformance reports), worker orientation and review meetings, and documenting routine inspections.

1.7.1.4. Records should be kept in a secure location at the site, and the information contained in the plans and records should be communicated to all site staff during site/worker orientations. Records will be submitted as part of the closeout documents.

1.7.2. Exercise continuous quality control and enforce mould control requirements upon Subcontractors and establish proper Product storage and delivery sequence to protect Products from weather and other exposures conducive to mould growth.

1.7.3. Take special care while handling and storing materials, without limitation, such as particleboard, plywood, cellulose materials, wallpaper, ceiling panels, gypsum boards and materials with kraft paper back up.

1.7.4. Protect all materials during shipping, handling and storage from exposure to dust and moisture in accordance with CAN/CSA Z317.13:

1.7.4.1. Wrap materials with impervious wrap

1.7.4.2. Load and unload materials at indoor facilities. Deliver materials in enclosed vehicles.

1.7.5. Test moisture-susceptible materials that have been exposed to moisture. Reject materials that exceed moisture values described in CAN/CSA Z317.13.

1.7.6. Provide worker orientation as described in CCA Mould Guidelines for the Canadian Construction Industry:

1.7.6.1. Ensure workers are not exposed to amplified moulds. Take every reasonable precaution in circumstances for protection of workers, as air movement and handling of contaminated material can release spores into atmosphere which can cause adverse health effects.

1.7.7. Monitor humidity levels and provide adequate ventilation in storage areas. Be watchful of any moisture condition in storage areas. Do not use materials which have been damaged by exposure to moisture and/or showing signs of mould growth.

1.7.8. Inspect installations, including HVAC systems to ensure they remain clean and moisture free.

1.7.9. Where mould is suspected or discovered in the existing building, stop work and report conditions to SHN Facilities Planning & Redevelopment.

1.7.10. Mould remediation in accordance with ANSI/IICRC R520.

1.8. INFECTIOUS DISEASE SCREENING

1.8.1. SHN Project Manager may screen daily individual staff of Contractor, Subcontractors and Suppliers for Infectious Diseases. Contractor shall cooperate and abide by medical findings of screening without claim for additional compensation.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide quality requirements including but not limited to following:

1.2.1.1. Regulatory requirements.

1.2.1.2. Quality control plan.

1.2.1.3. Reference documents.

1.2.1.4. Acronyms.

1.2.1.5. Abbreviations.

1.2.1.6. Washroom accessories abbreviations.

1.2.1.7. Building science requirements.

1.2.1.8. Design integrity and architectural requirements.

1.2.1.9. Tolerances.

1.2.1.10. Qualifications.

1.2.1.11. Engineer’s qualifications.

1.2.1.12. Testing agency qualifications.

1.2.1.13. Payment for quality control services.

1.2.1.14. Cooperation with testing and inspection companies.

1.2.1.15. Schedules for testing.

1.2.1.16. Source quality control.

1.2.1.17. Site quality control.

1.2.1.18. Testing and inspection of mechanical and electrical systems.

1.2.1.19. Project mock-ups.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Requirements for site supervision: Section 01 31 13 Project Coordination.

1.3. REFERENCES

1.3.1. Reference Standards:

1.3.1.1. CSA W47.1-19 - Certification of Companies for Fusion Welding of Steel

1.3.1.2. CSA W59-18 - Welded Steel Construction (Metal Arc Welding)

1.3.1.3. CSA W178.1-18 - Certification of Welding Inspection Organizations

1.3.1.4. CSA W178.2-18 - Certification of Welding Inspectors

1.3.1.5. NFPA 101-18 - Life Safety Code

1.4. REGULATORY REQUIREMENTS

1.4.1. Comply with The Building Code Act, as amended, OBC as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Code. Where Code or Contract Documents do not cover particular requirement which is covered by OBC, as amended, conform to requirements of OBC including its related supplements. Where Contract Documents exceed Code requirements, satisfy such additional requirements.

1.4.2. Conform to NFPA 101 for exit requirements as applicable.

1.4.3. Conform to OFC enacted under The Fire Marshall's Act, including latest amendments.

1.4.4. Where material is designated in Contract Documents for certain application, unless otherwise specified, that material shall conform to standards designated in OBC and in absence of more restrictive requirement comply with Division B, Part 9 "Housing and Small Buildings" of the Code. Similarly, unless otherwise specified and not required otherwise by OBC, installation methods and standards of workmanship shall also conform to standards of Division B, Part 9. Where specific requirements for a material are not specified for certain use, select from choice offered in Division B, Part 9.

1.4.5. Unless otherwise indicated, obtain and pay for all other permits, licenses and certificates of inspection. Ensure permits, licenses and certificates included under specific Sections are provided as specified. Forward copies of all permits to Consultant before commencing work.

1.4.6. Conform to hours of work, rates of wages paid, terms of employment and working conditions in accordance with Ontario Fair Wage Program - Labour Conditions for Industrial, Commercial and Institutional Sector Construction Contract. Comply with all requirements of the Workplace Safety & Insurance Boards Act, including payments due thereunder.

1.4.7. Apply the Trades Qualification and Apprenticeship Act, R.S.O. 1990, Chapter T-17, including latest amendments and regulations, to performance of this Contract.

1.5. QUALITY CONTROL PLAN

1.5.1. Contractor Quality Control:

1.5.1.1. Prior to the start of construction activities, Contractor shall submit a quality control plan and schedule of quality control activities that is satisfactory to Owner. Contractor shall implement the program so that the Work is designed and constructed in accordance with the requirements of the Contract Documents.

1.5.1.2. Owner's review of Contractor's quality control plan or the results there under shall not negate Contractor's responsibility for meeting the requirements of the Contract Documents.

1.5.1.3. Owner shall have the right at any time throughout the course of the Work to arrange for independent inspections and testing of various components of the Work. Contractor shall fully cooperate and provide assistance as necessary to ensure that independent inspection or testing is properly and efficiently performed in a timely manner.

1.6. REFERENCE DOCUMENTS

1.6.1. Where reference is made to codes, specification standards, manuals, contract forms, installation, application and maintenance instructions, produced by various organizations, conform to edition of standards specified or, if not specified, to latest edition as amended and revised to date of Contract.

1.6.2. Amendments to reference documents after award of Contract affecting Contract Price shall be dealt with in accordance with Part 6, Changes in the Work of General Conditions of the Stipulated Price Contract.

1.7. ACRONYMS

1.7.1. Following acronyms are used in Contract Documents:

AA	Aluminum Association (USA)
ACI	American Concrete Institute

AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute; www.ansi.org
ASHRAE	American Society of Heating, Refrigeration and Air-conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	ASTM International; www.astm.org
AWI	American Woodwork Institute (USA)
AWMAC	Architectural Woodwork Manufacturer's Association of Canada
AWWA	American Water Works Association
BCA	Building Commissioning Association
BCLMA	British Columbia Lumber Manufacturer's Association
BHMA	Building Hardware Manufacturer's Association
BMEC	Building Materials Evaluation Commission
CCA	Canadian Construction Association
CCDC	Canadian Construction Documents Committee
CEC	Canadian Electrical Code (published by CSA)
CGA	Canadian Gas Association; www.cga.ca
CGSB	Canadian General Standards Board
CISC	Canadian Institute of Steel Construction
CLA	Canadian Lumbermen's Association
CMHC	Canadian Mortgage and Housing Corporation
COFI	Council of Forest Industries of British Columbia
CPCI	Canadian Prestressed Concrete Institute
CPMA	Canadian Paint Manufacturer's Association
CRCA	Canadian Roofing Contractor's Association
CSA	CSA Group; www.csagroup.org
CSDMA	Canadian Sheet Door Manufacturers Association; www.csdma.org
CSPI	Corrugated Steel Pipe Institute
CSSBI	Canadian Sheet Steel Building Institute
CWC	Canadian Wood Council
DND	Department of National Defence, Construction Material Board
EEMAC	Electrical and Electronic Manufacturers Association of Canada
ECP	Environmental Choice Program
ESA	Electrical Safety Authority
FM	FM Global; www.fmglobal.com
GANA	Glass Association of North America; www.glasswebsite.com
IEEE	Institute of Electrical and Electronic Engineers
IGMAC	Insulated Glass Manufacturers Association of Canada
MTO	Ministry of Transportation, Province of Ontario
MPI	Master Painters Institute
NAAMM	National Association of Architectural Metal Manufacturers
NBCC	National Building Code of Canada, 2010
NEMA	National Electrical Manufacturer's Association (USA)
NFPA	National Fire Protection Association; www.nfpa.org
NHLA	National Hardwood Lumber Association (USA)

NL

GA	National Lumber Grades Authority
NRCC	National Research Council Canada
OBC	Ontario Building Code, "Building Code", Ontario Regulation 332/12, including amendments thereto
OFC	Ontario Fire Code, "The Fire Code", Ontario Regulation 388/97, including amendments thereto
OIRCA	Ontario Industrial Roofing Contractor's Association
OMCA	Ontario Masonry Contractors' Association
OPCA	Ontario Painting Contractors Association
OPSS	Ontario Provincial Standards Section
SJI	Steel Joist Institute
SSPC	The Society for Protective Coatings (formerly known as Steel Structures Painting Council)
TSSA	Technical Standards & Safety Authority; www.tssa.org
TTMAC	Terrazzo Tile & Marble Association of Canada; www.ttmac.com
ULC	Underwriters Laboratories of Canada; www.canada.ul.com
UL	UL LLC; www.ul.com
WHI	Warnock Hersey (Intertek); www.intertek.com

1.8. ABBREVIATIONS

1.8.1. Abbreviations are defined on drawings where they appear.

1.8.2. Washroom Accessories Abbreviations: refer to Section 10 28 00 Washroom Accessories.

1.9. QUALITY ASSURANCE

1.9.1. Study and be aware of principles discussed in above documents in order to understand their significance to Contract Documents.

1.9.2. Some information in above reference documents may not be applicable to the Work and no recommendations or statement therein is a mandatory requirement of Contract unless required by Contract Documents.

1.10. PROCEDURES, SEQUENCES AND COORDINATION OF CONSTRUCTION

1.10.1. Employ procedures, sequences and coordination of construction to install the Work in accordance with principles of building science explained in above reference documents as applicable.

1.10.2. Provide special care at the sealed junction of different Products which make up airseal system to assure lasting continuity.

1.10.3. Verify compatibility of fasteners and adhesives with surfaces to which they are applied.

1.10.4. Fasten and adhere Products making up airseal system to withstand wind loads required of exterior cladding system.

1.10.5. Design and provide airseals, firestopping at miscellaneous penetrations of airseal system including mechanical and electrical service penetrations. Accommodate vibration and thermal movement.

1.10.6. Provide exterior rain screen assemblies in accordance with building science principles. Compartmentalize rain screens to reduce air pressure differentials across assemblies.

1.10.7. Provide thermal insulation to exterior of vapour diffusion barrier. Note vapour diffusion barrier is often same as airseal system. Apply thermal insulation to vapour diffusion barrier to eliminate air pockets, channels and other discontinuities.

1.10.8. Minimize thermal bridges.

1.10.9. Apply building science principles to building interior spaces with differing environments, e.g. differing temperature and humidity conditions.

1.10.10. Comply with other building science requirements as part of application of building science principles identified in other Sections of the Work.

1.10.11. Do Work in neat and careful manner to retain Work plumb, square and straight.

1.10.12. Ensure Work is properly related to form close joints and appropriately aligned junctions, edges and surfaces and is free of warp, twist, wind, wave or other irregularities.

1.10.13. When required by Specifications or by manufacturer's recommendations, have manufacturer, Supplier or accredited agent, inspect work which incorporates their Products.

1.10.14. Do not permit materials to come in contact with other materials whether in presence of moisture, or otherwise, if conditions will result in corrosion, stain or discolouration or deterioration of completed Work. Provide compatible, durable separators where such contact is unavoidable.

1.11. DESIGN INTEGRITY AND ARCHITECTURAL REQUIREMENTS

1.11.1. Air/Vapour Barrier Integrity:

1.11.1.1. This Project incorporates design principles of positive air leakage and vapour diffusion control at building enclosure line. Drawing details illustrate continuity of air/vapour barrier at penetrating elements such as door, window and louvre frames.

1.11.1.2. Provide a continuous, unbroken and non-perforated air and vapour barrier to totally enclose building envelope and to separate interior and exterior environments.

1.11.2. Continuity of Fire Separations:

1.11.2.1. Conform to following requirements to maintain continuity of fire separations:

1.11.2.1.1. Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are noncombustible and are tightly fitted.

1.11.2.1.2. Where a fire separation required to be of noncombustible construction terminates at exterior wall, underside of floor, ceiling or roof structures and at floors, fire stop opening with an approved Listed material referenced in Section 01 60 00.

1.11.2.2. Do not use combustible members, fastenings and like to anchor fixtures to fire separations.

1.12. TOLERANCES

1.12.1. Unless more stringent tolerances are required by a Section of the Specifications or a referenced standard, meet following tolerances for installed work:

1.12.1.1. “plumb” means plumb within 6 mm in 3 m (1/4" in 10' - 0").

1.12.1.2. “level” means level within 6 mm in 3 m (1/4" in 10' - 0").

1.12.1.3. “square” means not in excess of 10 seconds, less or more than 90°.

1.12.1.4. “straight” means within 8 mm in 3 m (5/16" in 10' - 0"), under a 3 m (10' - 0") straightedge.

1.13. QUALIFICATIONS

1.13.1. For manufacturer’s, fabricator’s and installer’s qualifications, conform to requirements specified under respective trade Section as applicable. Where applicable, manufacturer’s field services shall be obtained as specified under respective trade Section.

1.13.2. Quality Control System Protocol:

1.13.2.1. Prior to commencement of Work, establish quality control system protocols, rules, related chain of commands and commitment to provide quality work as intended in Contract Documents for Work.

1.13.2.2. Retain services of quality control staff, shop and field supervisors complete with their skills, knowledge, duties and responsibilities. Upon request provide full resume of supervisors showing their qualifications.

1.14. ENGINEER'S QUALIFICATIONS

1.14.1. Employ a licensed engineer registered to practice in Province of Ontario carrying a minimum $2,000,000.00 professional liability insurance to:

1.14.1.1. design components of work of this Project specific to their license to practice.

1.14.1.2. be responsible for determining sizes or other specific requirements within their license to practice in accordance with applicable codes and regulations.

1.14.1.3. be responsible for production and review of Shop Drawings.

1.14.1.4. inspect work of this Section during fabrication and erection/installation.

1.14.1.5. be responsible for sealing and signing each Shop Drawing and associated calculations performed.

1.14.1.6. provide site administration and inspection of this part of the Work.

1.14.1.7. Certification: Submit certification stating performance of engineered work will perform as required.

1.15. TESTING AGENCY QUALIFICATIONS

1.15.1. Conduct testing in accordance with requirements of OBC unless advised otherwise in Contract Documents or by Consultant. Obtain certification where required by applicable codes and standards.

1.15.2. Ensure testing agency is an independent testing agency with experience and capability to conduct testing indicated, as documented according to ASTM E329.

1.15.3. Qualifications of Inspectors: Submit list of inspectors to be employed on this Project and obtain Consultant approval.

1.15.4. Ensure testing and inspection is performed by qualified inspectors and/or technologist certified by Professional Engineer or performed directly by Professional Engineer in conformance with applicable codes and certification programs.

1.15.5. Ensure inspectors are qualified to perform type of inspection or testing required.

1.15.6. Perform concrete testing using a testing company conforming to requirements of CSA A283 as required for this Project. Inspection report format and distribution requirements will be established by Consultant.

1.16. PAYMENT FOR QUALITY CONTROL SERVICES

1.16.1. Appoint and pay independent inspection and testing company or consultant to verify requirements of Contract Documents. Be responsible for quality control, employ quality control staff, supervisors and implement quality control procedures.

1.16.2. Conform to GC 2.3 as required. Inspection and testing required by Contract Documents, OBC and Regulations and/or by authorities having jurisdiction is Contractor's responsibility and paid for by Contractor.

1.16.3. Inspection by Contractor does not relieve Contractor of its responsibility for performance of Work in accordance of Contract Documents. Be responsible for care and control of Work.

1.16.4. Owner may appoint separate inspection and testing companies for certain work where specifically stated or where it may later require. Wherever documents state that inspection and testing companies may be

appointed by Owner, give adequate notice to Consultant to determine if such inspection and testing companies will be appointed.

1.16.5. Services performed by inspection and testing companies and other consultants are a function to assist Consultant and do not to replace Contractor's responsibility for conforming to requirements of Contract Documents. Contractor is responsible for continuous checking and inspections to ensure Contract performance is in accordance with Contract Documents as the Work proceeds. In such cases, following will apply:

1.16.5.1. If tests or inspections reveal work not in accordance with Contract then Contractor shall bear cost of such tests and further tests as required, to verify acceptability of corrected work.

1.16.5.2. Consultant will advise Contractor of work to be inspected and companies appointed therefor and will supply them with necessary Drawings and Specifications.

1.16.5.3. Advise Consultant and applicable inspection and testing companies not less than 5 Working Days prior to commencement of work to be inspected or tested and ensure proper facilities and coordination are provided. Do no work without required inspection and testing.

1.16.6. Establish schedule of testing, number of testing reports, submission and distribution of testing reports. Inspection and testing reports shall provide all pertinent data regarding site conditions, dates, test references, Product identification, procedures and description, instructions and recommendations and other relevant information. Identify clearly Products not meeting requirements of Contract Documents and provide measures and recommendations for correcting situation. Advise Consultant promptly when Product or system fails to meet applicable Standards.

1.16.7. Materials and work not in accordance with requirements of Contract Documents will be rejected at any time during progress of the Work. Defective material and work, whenever found prior to final completion of the Work, may be rejected regardless of previous inspection or testing.

1.17. COOPERATION WITH TESTING AND INSPECTION COMPANIES

1.17.1. Representatives of the testing laboratories shall have access to work at all times; provide facilities for such access in order that the laboratories may properly perform its function.

1.17.2. Cooperate with testing and inspection companies and give adequate notification of any changes in source of supply, additional work shifts and any other proposed changes.

1.17.3. Prior to commencing significant segments of work, give Consultant and independent testing and inspection agencies appropriate notification so as to afford them reasonable opportunity to review work previously completed. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

1.17.4. Ensure no Product is installed before it is tested when a test is specified, nor work executed where a test or inspection is required and the inspectors cannot attend.

1.17.5. Cooperate in permitting access for inspection to all places where work is being done or material is stored prior to shipping.

1.17.6. Allow free access to testing agencies and supply necessary sampling materials for tests. Supply additional labour required to assist the testing and inspection companies in making tests.

1.17.7. Cost of above labour and material shall be borne by individual Subcontractors concerned.

1.17.8. Testing and inspection service does not relieve Contractor and Subcontractor of their responsibility for normal shop inspection, quality control of production and for errors made by them.

1.18. SCHEDULES FOR TESTING

1.18.1. Establishing Schedule:

1.18.1.1. By advance discussion with selected testing laboratories, determine the time required for laboratories to perform their tests and to issue each of their findings.

1.18.1.2. Provide required time within construction schedule.

1.18.2. Adherence to Schedule:

1.18.2.1. Contractor shall advise testing laboratories in advance when testing of work is required.

1.18.2.2. When testing laboratories are ready to test according to predetermined schedule, but are prevented from testing or taking specimens due to incompleteness of work, extra costs for testing attributable to the delay may be back-charged to Contractor and shall not be borne by Owner.

1.19. SOURCE QUALITY CONTROL

1.19.1. Refer to respective trade Sections for source quality control requirements.

1.20. SITE QUALITY CONTROL

1.20.1. Contractor shall perform inspection and testing required by OBC or governing authorities, required by Contract Documents and as required to clearly demonstrate compatibility of materials, integrity of systems and quality of work performance.

1.20.2. Inspection and testing may apply without limitations to cast-in-place concrete, concrete products, waterproofing, structural steel, welding, building envelope, roofing, and other requirements of Contract.

1.20.3. Cooperate and coordinate testing and inspection requirements with testing agency for designated requirements.

1.20.4. Provide full cooperation to testing company by providing assistance on site as well submitting samples of fill materials.

1.20.5. Refer to respective trade Sections for field quality control requirements.

1.21. TESTING AND INSPECTION OF MECHANICAL AND ELECTRICAL SYSTEMS

1.21.1. Provide testing and inspection of Mechanical and Electrical Systems as defined in Contract Documents under trade Sections of Divisions 21, 22, 23, 26, 27 and 28 respectively.

1.22. PROJECT MOCK-UPS

1.22.1. Arrange with Consultant to assist in preparing a schedule fixing the dates for mock-up review. Prior to manufacture and delivery of Products, arrange for Consultant's and Owner's review and acceptance of mock-ups. Allow time for modifications and subsequent reviews. Failure to obtain review and acceptance of mock-ups in ample time will not be considered sufficient reason for extensions to Contract Time or for extra costs.

1.22.2. After samples have been approved and when requested by Owner, Contractor shall prepare mock-ups as required by Contract Documents or as may be reasonably requested by Owner, in a location as determined by Owner.

1.22.3. Mock-ups shall conform to standards specified for Products and workmanship and shall include assembly components. Ensure mock-ups for approval are complete with items requested, including finishes, colours, accessories, etc.

1.22.4. Mock-up is intended to allow Owner to review design, material selection, colours and finishes, prior to the parts of the Work affected, proceeding. Ensure mock-up is provided by Contractor in sufficient time to allow for review, modifications and approval, without affecting Contract Time.

1.22.5. Owner may require modifications to mock-up prior to approval. Where modifications result in a change from the design Drawings and Specifications, change will be evaluated and processed in accordance with Contract Documents.

1.22.6. Provide following types of mock-ups:

1.22.6.1. Transportable Mock-Ups. Refer to Sections for size requirements. Arrange and pay for delivery and pick-up.

1.22.6.2. Site Mock-Ups: Refer to Sections to determine if mock-ups will form part of Work or are built separately. Demolish mock-ups built separately after work of applicable Section is completed and Consultant has reviewed that part of Work. Obtain Consultant's acceptance of location of site mock-ups.

1.22.6.3. Progressive Mock-Ups: A mock-up room will be designated by the Consultant for installation of work in a progressive, sequential way. All components of work for example – steel studs, gypsum board installation, finishing, painting, ceiling suspension, etc. will be completed and then reviewed. The stages of work installations to be established at the project Start-Up meeting.

1.22.7. Modify mock-ups in accordance with Consultant's review at no additional cost to Owner.

1.22.8. Mock-ups are used to refine design of components. Changes to mock-ups will be made. Allow time in schedule for revisions to be made to mock-ups and Shop Drawings. Mock-up review and revisions will not be accepted as basis of claim for delay or additional cost.

1.22.9. Provide mock-ups using personnel assigned to the Work and Products and techniques to be used on the Work.

1.22.10. Mock-ups shall serve as standard for remaining parts of the Work.

1.22.11. Refer to each Section of the Work for additional mock-up requirements.

1.22.12. Provide mock-ups required by Contract Documents.

1.22.13. When approved, mock-up becomes standard of acceptable work for portion of Work which they represent.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.1.2. References:

1.1.2.1. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.1.2.2. CSA B167-16(R2021) – Overhead Cranes, Gantry Cranes, Monorails, Hoists, and Jib Cranes.

1.1.2.3. Ontario Occupational Health and Safety Act (OHSA), 2023.

1.1.3. Be responsible for arranging, obtaining and paying for any permit necessary for temporary facilities and controls. Provide and maintain all temporary facilities and controls.

1.1.4. Remove them when directed and/or when no longer required.

1.1.5. Payment for temporary facilities and controls shall be made by Contractor unless specified otherwise. Provide and maintain adequate temporary supports, structures, light, power, heat, ventilation, and water in accordance with GC 3.3, as required by all trades and to produce environment for Work to proceed without delay at all times of year. Cost of temporary facilities shall be included in Contract Price.

1.1.6. Pay for installation, light, power and water used, maintenance and removal.

1.2. TEMPORARY UTILITIES

1.2.1. Temporary Water Supply:

1.2.1.1. Arrange with SHN Project Manager for use of existing water service for construction purposes at the Place of the Work. Coordinate with SHN Project Manager.

1.2.1.2. Provide connections, piping and fittings for distribution of water and, upon completion of the Work, remove such temporary distribution.

1.2.2. Temporary Power:

1.2.2.1. Existing hospital power is available for use for hand tools, temporary lighting, fans. Refer to Scarborough Health Network Contractor Procedure Manual.

1.2.2.2. Provide continuous temporary power and lighting service.

1.2.3. Temporary Lighting:

1.2.3.1. Contractor shall provide task lighting necessary for the execution of the Work and for safety.

1.2.3.2. Level of illumination on all floors and stairs shall be not less than 161 lux (15 lumens per square foot or 15 foot candles). When finishing trades are performing work, provide illumination comparable to final illumination. Extension cords, lamps and hoses shall be provided by those using them in accordance with governing regulations and ordinances.

1.2.3.3. Locate and secure lighting systems to prevent displacement, falling or interference.

1.2.3.4. Provide devices to protect fixtures, bulbs and tubes from accidental breakage.

1.2.3.5. Remove temporary lighting from the areas of the Work and restore surfaces damaged due to installation and removal of temporary lighting, prior to Owner's take-over of the respective parts of the Work.

1.2.4. Temporary Heating, Ventilation and Air Conditioning:

1.2.4.1. Provide temporary heating, ventilation and air conditioning for enclosed building until Substantial Performance of the Work to ensure adequate protection of work under way and of completed work. Temporary heating, ventilation and air conditioning without limitation includes heating, cooling and desiccant de-humidification equipment, associated power cables, gas lines, temporary duct work and accessories.

1.2.4.2. Provide controlled environment for construction drying and curing of construction work to prevent growth of mold and speed up drying of concrete to meet moisture emission levels required by finish flooring installation. Conform to following performance requirements, except where more stringent requirements are required by work of other Sections:

1.2.4.2.1. Supply Air: Minimum 1 air change every 120 minutes.

1.2.4.2.2. Filtration of Out Air: 100%.

1.2.4.2.3. Temperatures: Minimum between 15 deg C (59 deg F) and 27 deg C (80 deg F).

1.2.4.2.4. Relative Humidity: Maintain at or below 50% RH.

1.2.4.2.5. Ensure moisture content in wood and hardwood materials is stabilized to maximum percentage recommended by AWI/AWMAC requirements.

1.2.4.2.6. Control condensation and maintain environmental conditions, including air and surface temperatures suitable for surface preparation, application and curing of paints and coatings.

1.2.4.2.7. Noise Criteria: Conform to requirements specified in Contract Documents.

1.2.4.3. Submit schematic equipment layout, duct and/or pipe route, staging, sequencing layouts, enclosure and barricade construction.

1.2.4.4. Submit Product data, climate control equipment, temperature and humidity controls, duct, duct accessories, pipe and piping accessories materials and construction. Where placed outside, anchor and securely attach temporary supply canvas spiral duct to withstand wind damage. Ensure interior distribution polyethylene tubing has perforations to distribute air evenly throughout areas being served.

1.2.4.5. Provide proper heating for drying out of new work. Maintain minimum temperature specified herein. Uniformly distribute heat to avoid hot or cool areas or excessive drying. Protect concrete, masonry, excavations, backfilling and other work from frost during construction.

1.2.4.6. Dehumidify interior spaces continuously during installation and curing periods required for moisture emitting work to maintain required relative humidity levels, including without limitations work of involving:

1.2.4.6.1. Joint compounds, skim coating, gypsum board work and plaster.

1.2.4.6.2. Cementitious materials.

1.2.4.6.3. Paints.

1.2.4.6.4. Spray applied fireproofing.

1.2.4.6.5. Finish carpentry, casework, wood paneling, wood flooring and other millwork.

1.2.4.7. As soon as construction is sufficiently advanced, and in order to prevent delays in progress of Work, enclose building using necessary tarpaulins, plastic sheeting or glazing and temporary doors, with locks to doors.

1.2.4.8. Construction heaters used inside building must be vented to outside or be flameless type. Do not use direct fired space heaters and propane, salamander type heaters. Ventilate heated areas and keep building free of exhaust and combustion gases.

1.2.4.9. Maintain supervision of operation of temporary heating and ventilation equipment. Maintain temporary climate control equipment in service until completion of building commissioning or when use is no longer required as directed by Consultant.

1.2.4.10. Remove climate control equipment from site at successful commissioning of new HVAC equipment.

1.2.4.11. Do not use any of permanent facilities and controls without obtaining written permission from Consultant.

1.2.5. Service Tie-Ins to Existing:

1.2.5.1. Comply with Scarborough Health Network Contractor Procedure Manual requirements for procedures for shutdown request. Use Shutdown Form as found in Appendix A

1.2.5.2. Complete service tie-ins and connections to existing services at times suitable to SHN Project Manager and in accordance with the work hour restrictions specified in Section 01 40 00 Work Restrictions.

1.2.5.3. Submit a plan showing details of the tie-ins (including proposed time and duration of the shutdowns) with minimum 10 days notice for review and approval by the SHN Project Manager prior to proceeding.

1.2.6. Use of Building HVAC System:

1.2.6.1. Before any portion of HVAC system will be considered by SHN Project Manager and Consultant for use by Contractor, verify following requirements:

1.2.6.1.1. Equipment must be properly commissioned with safety and operating contract devices operational.

1.2.6.1.2. Proper electrical power requirements and equipment operating within nameplate ratings.

1.2.6.1.3. Rotation of equipment certified.

1.2.6.1.4. Flow rates of equipment verified to be within design tolerances.

1.2.6.1.5. Submission of operation and maintenance data.

1.2.6.1.6. Service and maintain systems and equipment in accordance with operation and maintenance data.

1.2.6.2. Temporary Ventilation: Ensure odours, dust, gasses and volatile materials due to construction activities do not enter into the building or into the building's mechanical systems.

1.2.6.3. On completion of Work for which permanent heating system was used, replace filters, inspect and replace defective bearings and lubricate all bearings and clean strainer baskets. This includes painting of equipment if required, repacking of pumps, cleaning out of ductwork; all as determined by Consultant.

1.2.6.4. Pay costs for providing and maintaining temporary heat, if and when using permanent heating system.

1.2.6.5. Be responsible for damage to the Work due to failure in providing adequate heat and protection during construction.

1.2.7. Temporary Drainage:

1.2.7.1. Protect excavation, trenches and building from damage by rainwater, ground water, backing up of drains or sewers and other water, frost and other weather conditions. Provide sheeting, piling, shoring, pumps, equipment, temporary drainage, protective covering and enclosures. Provide necessary pumps including spare pump for keeping project free of water throughout construction period.

1.2.7.2. Keep site properly and efficiently drained during construction and until completion. Be responsible for disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of the Work or due to operations which may cause water to flow elsewhere. Drain water away from site without causing any danger to public health.

1.3. TEMPORARY PROTECTION

1.3.1. Provide and maintain following temporary protection at all times:

1.3.1.1. Window Openings: Translucent, weatherproof protection until windows and glazing are installed.

1.3.1.2. Door Openings: Minimum wood doors, frames, hinges, locks and bolts to exterior and interior to existing areas.

1.3.1.3. Air Intakes: Provide protection against infiltration of dirt, dust and other deleterious matter.

1.3.2. Temporary Dust Tight Partitions:

1.3.2.1. Construct anteroom at entrance to work area as described in Section 01 35 33 Infection Control Procedures.

1.3.2.2. Construct dust proof partitions to separate work areas from adjacent areas.

1.3.2.3. Construct dust control partitions in accordance with CAN/CSA Z317.13 Figure E.3 Option A and the following:

1.3.2.3.1. Construct temporary dust tight partitions as fire separations having a fire resistance rating of 3/4 hour consisting of 16 mm (5/8") gypsum board, both sides on steel stud partition conforming to ULC Design No. W407 and to ULC Design No. W408.

1.3.2.3.2. Paint public sides of partitions with minimum 2 coats of low VOC paint in colours selected by Consultant.

1.3.2.3.3. Seal edges and joints to achieve positive protection.

1.3.2.3.4. Provide lockable door(s) in temporary dust tight partition(s) where indicated on Drawings and extra key to Consultant.

1.3.2.3.5. Remove temporary dust tight partitions promptly when no longer required and Make Good adjacent surfaces.

1.3.2.3.6. Temporary dust tight partitions are to remain in-place until acceptance of construction in the work area and approval by the SHN Project Manager.

1.3.3. Roof and Waterproofing Protection: planking or other protection to prevent damage from falling materials, construction traffic, etc.

1.3.4. Scaffolding Enclosures: to enable the Work to continue during inclement weather and winter conditions.

1.3.5. Emergency Vehicle Access: Do not allow any construction vehicles to block emergency vehicle routes at any time.

1.3.6. Observe Scarborough Health Network Contractor Procedure Manual requirements for fire protection

1.3.7. Temporary Fire Protection:

1.3.7.1. Provide and maintain sufficient temporary standpipes and connections, fire hose, valves, temporary cabinets and extinguishers, to comply with requirements of the governing Municipal and Provincial authorities to satisfaction of Consultant and local fire department and insurance authorities in order to protect the property of Owner and Contractor against fire hazards during construction.

1.3.7.2. Adjust and modify temporary fire protection facilities to accommodate progress of the Work.

1.3.7.3. Bulk storage of flammable liquids and other hazardous materials is not allowed on site.

1.3.7.4. Handle flammable liquids in approved containers.

1.3.7.5. Bringing in, use and disposal of gasoline, benzine or other flammable materials must be handled with good and safe practice as required by authorities having jurisdictions.

1.3.7.6. Maintain temporary fire protection systems in operation 24 hours a Day.

1.3.7.7. Provide and maintain temporary access routes to exits, clear and visibly identified, 24 hours a Day.

1.3.7.8. Take necessary precautions to eliminate fire hazards and to prevent damage to work, building materials, equipment and other property both public and private having to do with the Work. Inspect work of this Contract at least once a week for this purpose.

1.3.7.9. Provide fire protection to satisfaction of Consultant, to authorities having jurisdiction and to insurance authorities stipulated by SHN Project Manager. Maintain in operation 24 hours a Day.

1.3.7.10. Provide and maintain free access from street to fire hydrants and to outside connections for standpipes or other fire extinguishing equipment, permanent or temporary; and maintain free access to control valves and hoses on fire lines within building and to all portable fire extinguishers. Ensure devices are visibly identified 24 hours a Day.

1.3.7.11. Fire Extinguishers:

1.3.7.11.1. Provide and maintain in working order, suitable Underwriters' labelled fire extinguishers and locate in prominent positions, to approval of authorities having jurisdiction. Such extinguishers remain property of Contractor.

1.3.7.11.2. Remove from building at date of Substantial Performance of the Work.

1.3.7.11.3. Store and locate materials and equipment packed in cardboard cartons, wood crates and other combustible containers in orderly and accessible manner. Place approved types of fire fighting equipment in vicinity of materials or equipment packed in this type of crate or carton until permanent fire protection and equipment are available.

1.3.7.12. Store rags and waste containing oil, grease or other flammable materials in an approved metal container and remove from site at end of each Working Day.

1.3.7.13. Only fire resistant tarpaulins are permitted on site.

1.3.7.14. Provide temporary standpipes as work proceeds in accordance with the regulations under the Occupational Health and Safety Act.

1.3.7.15. In eliminating fire risks, or effectively controlling site activities to minimize fire risk, observe following precautions as a minimum:

1.3.7.15.1. Prior to commencing work in any area, ensure workers are acquainted with the location of all fire-fighting apparatus and are familiar with its proper use and apparatus is in good working order.

1.3.7.15.2. Stop all work immediately when any deficiencies in fire protection are encountered after work commences. This includes deficiencies in the existing building that may be discovered during the course of work. Notify Consultant, seek instructions and remedy all such deficiencies before resuming any other work.

1.3.7.15.3. In areas where spraying with water will not cause damage, including areas at roof level, thoroughly wet area before commencing welding, oxyacetylene

cutting, brazing, grinding or other hot work and keep area thoroughly wet until at least 1/2 hour following the last of previously stipulated hot work ceases. In areas where spraying with water would cause damage, provide approved fire retardant mats or blankets to cover all areas which might be reached by sparks, flame, hot slag, or other hot material from welding, cutting, brazing, grinding, or other hot work. In addition, provide blank flanges, plugs, caps, or other suitable means to seal openings and/or hot material and fill those items with water before commencing hot work. Stop all work immediately if water is lost or drained from any of those rubber-lined items. These requirements for rubber-lined items also apply to all other items with combustible linings.

1.3.7.15.4. When electric or gas welding, brazing, cutting and performing any operation with an open flame within 3000 mm (10') or above space that may be occupied by persons, keep a portable fire extinguisher within 3000 mm (10') or above of operator at all times.

1.3.7.15.5. Provide adequate fire watch at all times when welding, burning, cutting, brazing, or other hot work is in progress and until such times as the source of ignition or flame has been extinguished and for longer as required. Ensure each fire watcher has a suitable fire extinguisher on hand at all times.

1.3.7.15.6. Ensure fire watchers have no duties other than fire protection and that fire watch continues through coffee breaks, meal periods and after normal work hours as necessary to ensure fire watch for at least 1/2 hour after welding, burning, brazing, cutting and similar hot work ceases.

1.3.7.15.7. Comply with the rules and regulations of the Fire Marshall Act and the Accident Prevention Regulations of The Workplace Safety Insurance Board.

1.3.7.16. Notify the Fire Department, SHN Project Manager, and Consultant immediately should a fire of any nature occur whether the fire has been extinguished or not. Notify the Fire Department, SHN Project Manager, and Consultant of any fire alarm shutdowns; notify once fire alarm has been recertified and operational.

1.3.7.17. If Contractor is the cause of a false alarm, it may be required to reimburse Owner for any charges from the Municipal Department resulting from the false alarm.

1.3.7.18. Establish a log book maintained by the Contractor which records all activity affecting the Owner’s fire alarm system. The log book shall record the date, time, trade, worker's name, nature and location of work performed, zone or zones affected, status of the system while work was performed, time and date of completion of the operation, and status of the system upon completion of the Work. At the end of each Working Day, Contractor shall review the log and sign indicating system is fully operational, except as recorded by the log. Inform SHN Project Manager of system status and which zones may be affected daily prior to the commencement of any new operation that affects the fire alarm system. Comply with Scarborough Health Network Contractor Procedure Manual, for notification requirements.

1.3.7.19. Fire Watch:

1.3.7.19.1. A fire watch is required for each of the following activities regardless of the number, duration or size of activity in operation on a single floor or in a single area:

1.3.7.19.1.1. Any open flame activity (e.g. Soldering and welding).

1.3.7.19.1.2. Shutdown of fire detection system.

1.3.7.19.1.3. Shutdown of sprinkler system.

1.3.7.19.1.4. Any other situation Consultant may deem appropriate.

1.3.8. Welding:

1.3.8.1. Comply with Scarborough Health Network Contractor Procedure Manual requirements for welding procedures and obtain “Hot Work Permit”.

1.3.8.2. Where gas welding or cutting is to be done within 3000 mm (10’) of combustible material or above combustible material or above spaces that may be occupied by persons, provide protective shields of non-combustible material.

1.3.8.3. Place tanks supplying gases for welding or cutting at no greater distance from the Work than is necessary. Securely fasten tanks in an upright position. Do not expose the tanks to sunlight or to high temperature.

1.4. CONSTRUCTION FACILITIES

1.4.1. Contractor's Field Offices and Sheds:

1.4.1.1. Provide Contractor's field offices and storage sheds where shown on drawings. Provide offices and sheds, properly painted and maintained.

1.4.1.2. Provide following field office facilities:

1.4.1.2.1. A room to accommodate 20 persons for site conference and job meetings, heated and air conditioned to maintain a temperature of 21 deg C (70 deg F) +/-2 deg C (4 deg F).

1.4.1.2.2. Telephone services for Contractor's own use.

1.4.1.2.3. One facsimile machine on a dedicated telephone line.

1.4.1.2.4. One photocopy machine.

1.4.1.2.5. One computer with internet access.

1.4.1.2.6. "No Smoking" signs.

1.4.1.2.7. Provide proper flammable and explosive materials storage.

1.4.2. Sanitary Facilities:

1.4.2.1. Provide and maintain temporary facilities for use by workers in compliance with Occupational Health and Safety Act, applicable codes and by-laws. Provide portable, weatherproof toilets, serviced at least weekly, which may be replaced by adequate, permanent or temporary water closets, urinals and basins when plumbing system has been installed, tested and approved.

1.4.2.2. When water and drain connections within building are completed, provide temporary water closets, urinals and flushing devices complete with temporary screens and partitions and temporary wood washroom entrance doors. Install units in acceptable locations throughout building, convenient to labour force and clearly mark "For use of Trades only".

1.4.2.3. Misuse of water closets and washing facilities or fouling of building by workers shall constitute grounds for instant dismissal from site.

1.4.3. Garbage Removal:

1.4.3.1. Procedures to be reviewed with the SHN Project Manager.

1.4.3.2. Removal of construction debris from the work area to exterior shall be during time periods as specified in Section 01 14 00 Work Restrictions. Bag or wrap all materials and tape closed. Place bags in containers with tightly fitted closed lids. Use clean, rubber wheeled carts to transport to exterior garbage bid.

1.4.3.3. Do not use Owner’s garbage bin facilities for removal of construction rubbish and debris. Provide garbage bins with lid. Coordinate location and pick-up schedule of garbage bins with SHN Project Manager.

1.4.3.4. Repair damage to site surface upon removal of garbage bin.

1.4.4. Snow Removal:

1.4.4.1. Allow no accumulation of ice and snow on site and on roof deck when roofing operations are scheduled to take place.

1.4.4.2. Be responsible for general clearing of snow from site circulation paths at hoarding, Contractor's parking areas and elsewhere as required to permit access to the Work, parking and uninterrupted construction progress. Spread deicing salt which is not detrimental to adjacent components and surroundings.

1.4.4.3. Maintain trailer area, storage areas as well as work areas of this Contract and assigned Subcontracts free of ice and snow to maintain progress of the Work. Place cleared snow in areas on site as directed by Consultant.

1.5. SAFETY PROGRAM

1.5.1. Conform to GC 3.6, undertake role of "Constructor" as defined under The Occupational Health and Safety Act, as amended. Be responsible to provide full safety program for anyone who gets paid for services on site including management, labour, delivery drivers, service personnel and others involved for services on site. Arrange for pre-project meeting related to safety, joint safety inspections with Contractor's consultant where required, site safety training and safety committees complete with accident investigation procedures.

1.5.2. Prior to commencement of construction, design fire safety plan in conjunction with local Fire Chief. Post fire plan throughout construction as recommended. Do not allow accumulation of waste that may constitute fire hazard.

1.5.3. Conform to Construction Safety Association of Ontario's Manual on Propane in construction. Watch work area for minimum of 30 minutes after hot work is completed. Provide site fire security when required by local building department and/or municipal fire department. Ensure water supply is adequate for fire fighting.

1.5.4. Provide on site such equipment and medical facilities as are necessary to furnish first aid to anyone who may be injured in connection with Work in accordance with regulations of Occupational Health and Safety Act (Ontario).

1.5.5. Promptly report in writing to Consultant all accidents arising out of or in connection with performance of Work, whether on or adjacent to site, which caused death, personal injury or property damage, giving full details and statements of witnesses. In addition, in case of death, serious injuries or damages, report accident immediately by telephone or messenger to Consultant.

1.5.6. If any claim is made by anyone against Contractor or any Subcontractor on account of any accident or damage, promptly report facts in writing to Consultant, giving full details of claim.

1.6. CONSTRUCTION AIDS

1.6.1. Construction Hoists:

1.6.1.1. Comply with CSA B-167.

1.6.1.2. Provide, install, maintain, locate where directed and pay costs for hoisting equipment if required. Position equipment so not to interfere with Work. Operate equipment by qualified hoist operator along with well trained flag and signal persons. Trade Sections shall make their own financial and schedule arrangements with Contractor for use thereof. Provide concrete pads for hoisting equipment.

1.6.2. Scaffolding:

1.6.2.1. Comply with Guideline no. 23 of the Occupational Health and Safety Act.

1.6.2.2. Erect fixed or mobile scaffolding as applicable independent of walls. Use it in manner as to interfere as little as possible with other Sections. When not in use, move it as necessary to permit installation of other work. Construct and maintain scaffolding in rigid, secure and safe

manner. Remove it promptly when no longer required or remove it at end of each Day and store in secure place as directed.

1.7. VEHICULAR ACCESS AND PARKING

1.7.1. Construction site access routes for delivery of materials and removal of garbage or material for recycling are shown on the drawings.

1.7.2. Maintain access sidewalks, roadways and similar facilities as may be required for access to the Work. Do not block public roads, or impede traffic during work of this Project and if required to temporarily block traffic then provide flag person to direct traffic acceptable to Municipal authorities. Ensure access is available for emergency vehicles. Comply with fire plan for vehicular traffic.

1.7.3. Parking for Contractor's vehicles in accordance with Scarborough Health Network Contractor Procedure Manual. SHN Project Manager to advise specific location and quantity of parking spaces available.

1.7.4. Do not be nuisance to public traffic any time. Manage construction traffic by using designated routes and by providing trained flag persons to direct public traffic as appropriate.

1.8. TEMPORARY BARRIERS AND ENCLOSURES

1.8.1. Occupation of Public Property: no occupancy of municipal property is not permitted.

1.8.2. Exterior Hoarding:

1.8.2.1. Provide hoarding and gates in accordance with the requirements of the Municipality, the Occupational Health and Safety Act, Regulations for Construction Projects and other authorities having jurisdiction to:

1.8.2.1.1. Protect public, Owner's occupants, personnel and property from injury and damage.

1.8.2.1.2. Exclude non-construction personnel and public from parts of the Place of the Work under construction.

1.8.2.1.3. Provide temporary egress routes from the hospital.

1.8.2.2. Modular "Fast Fencing Sections", 1829 mm (6 ft) high are acceptable except where there is the possibility of overhead work.

1.8.2.3. Protection for Overhead Work: construct covered wood frame hoarding:

1.8.2.3.1. Wood Hoarding and Boardwalk Framing: National Lumber Grades Authority No. 1 Grade SPF.

1.8.2.3.2. Plywood Hoarding Sheathing: Exterior COFI Select tight face, 19 mm (3/4") th.

1.8.2.3.3. Wire Mesh Vision Portals: 50 mm x 50 mm x 3.4 mm (2" x 2" x 1/8") galvanized.

1.8.2.3.4. Gates and Pass Doors: Selected by Contractor.

1.8.2.3.5. Gate and pass door hardware shall be selected by Contractor including fire exit hardware.

1.8.2.3.6. Temporary Roofing and Cladding (Minimum): Waterproof tarpaulins.

1.8.2.3.7. Maintain hoarding in a clean condition, free of unauthorized bills, signs and defacement.

1.8.2.4. Post adequate warning signage, prominently displayed and within view of each other on hoarding, warning of the illegality and danger of unauthorized trespassing into the parts of the Place of the Work under construction.

1.8.2.5. Maintain Access to Exits and Exits, for emergency escape through or around hoarding to a safe area of refuge acceptable to authorities having jurisdiction.

1.8.2.6. Relocate and reconstruct hoarding to accommodate phasing of the Work.

1.8.2.7. Remove and dispose of hoarding upon completion of the parts of the Work.

1.8.3. Temporary Fall Arrest Systems:

1.8.3.1. Provide temporary fall arrest systems for work on the roof of the building.

1.9. TEMPORARY CONTROLS

1.9.1. Exterior Pollution Control: Take appropriate dust control measures to avoid contamination of adjacent areas near site from dust. Respond immediately to complaints of dust received from public, authorities, or Consultant. Keep public and private roads free of dust, mud and construction debris resulting from trucks employed on this Project.

1.9.2. Noise and Vibration Control: Control noise and vibration generated by Work. Respond immediately to complaints of noise and vibration received from public, authorities or Consultant.

1.9.3. Pest Control: Be responsible to provide control measures, restraining procedures and treatments to prevent infestation and spread of insects, rodents and other pests deemed to be present at site and/or noticed during course of the Work. Carry out fumigation, pest control procedure and posting of warning signs, notices including contents of such notices in accordance with requirements of Pesticides Act and any other Authorities Having Jurisdiction.

1.9.4. Wayfinding Signage:

1.9.4.1. Coordinate temporary wayfinding signage with SHN Project Manager.

1.9.4.2. Signage text, size, colour, mounting locations, as per SHN standards.

1.9.5. Designated Lunch Area:

1.9.5.1. Food and drink, except water, is not allowed in the work areas. Provide designated lunch area to be used by workers in trailer outside of the hospital.

1.10. PROJECT IDENTIFICATION

1.10.1. Provide a Project sign as detailed and including:

1.10.1.1. Material: Minimum 19 mm (3/4") exterior grade plywood with reinforced resin facing.

1.10.1.2. Size: 2400 mm (8') high x 3660 (12') wide.

1.10.1.3. Support: Wood frame.

1.10.1.4. Mounting Height and Location: As directed by Consultant.

1.10.1.5. Trim: Wood moulding at perimeter.

1.10.1.6. Information Required: Project name, Centenary Hospital, Ministry of Health name and logo, Consultants names, Contractor's name.

1.10.1.7. Layout and Colours: To Consultant's acceptance.

1.10.2. Contractor's signs, flags, etc., bearing name of Contractor, may only be installed with Consultant's prior approval and in accordance with Scarborough Health Network Contractor Procedure Manual.

1.10.3. Remove Project signs at completion of the Work.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. REFERENCES

1.2.1. Reference Standards:

1.2.1.1. ANSI/ASME B18.6.3-13 - Machine Screws, Tapping Screws, and Metallic Drive Screws(Inch Series)

1.2.1.2. CSA W47.1-19 - Certification of Companies for Fusion Welding of Steel

1.2.1.3. CSA W47.2-11 (R2020) - Certification of Companies for Fusion Welding of Aluminum

1.2.1.4. CSA W59-2018 - Welded Steel Construction (Metal Arc Welding)

1.2.1.5. CSA W59.2-2018 - Welded Aluminum Construction

1.2.1.6. CAN/ULC-S101-14-REV1 - Standard Methods of Fire Endurance Tests of Building Construction and Materials

1.2.1.7. CAN/ULC-S107-19 - Methods of Fire Tests of Roof Coverings

1.3. BASIC PRODUCT REQUIREMENTS

1.3.1. Standards and Codes:

1.3.1.1. Contract forms, codes, specifications, standards, manuals and installation, application and maintenance instructions, referred to in the specifications unless otherwise specified and unless stated otherwise in the governing building code, shall be the latest published editions at the date of Contractor's bid submission.

1.3.1.2. Conform to standards, in whole or in part, as specifically stated in the Specifications.

1.3.1.3. If there is a question as to whether any Product or system is in conformance with applicable standards, Consultant reserves the right to have such Products or systems tested at Contractor's cost to prove or disprove conformance.

1.3.1.4. Cost for such testing will be borne by Owner in the event of conformance with Contract Documents or by Contractor in the event of non-conformance.

1.3.2. Material, Machinery, Equipment and Fixtures: Product employed in the Work shall be those which affect indoor air quality as little as possible. Provide adequate ventilation during installation of finishing materials to avoid effect on indoor air quality.

1.3.3. Ensure materials, machinery, equipment and fixtures are not damaged or defective and of quality specified and compatible for purpose intended. If requested provide evidence as to type, source and quality. Remove and replace defective Products, at own expense, regardless of previous reviews and be responsible for delays and expenses caused thereby. Replace factory finished equipment, or parts thereof, whose paint finish is damaged and cannot be reasonably remedied by paint touch-up.

1.3.4. When conflict occurs between specified technical description and manufacturer's standard model numbers and/or manufacturer's printed description of given model number, technical description specified in Contract Documents shall govern. Manufacturers shall make necessary modifications in their manufacturing methods to meet requirements specified.

1.3.5. Do not expose trademarks, labels and nameplates, including applied labels, in finished Work. Remove visible trademarks and labels except those which are giving operating instructions, which are essential to obtain identification of mechanical and electrical equipment for maintenance and replacement purposes and for mandatory fire ratings.

1.3.6. In general Owner retains right to select all choices available within specified Products colours, finishes and other options unless specified otherwise.

1.3.7. Basis of design:

1.3.7.1. Performance specifications: when no manufacturer or product is specified, propose a product that complies with the performance criteria specified. Submit product data in accordance with Section 01 33 00 Submittal Procedures.

1.3.7.2. When a product is identified as the basis of design, and several manufacturers are listed, Contractor to use the product named or propose a comparable product from the manufacturers listed. The product named as basis of design is included in the Bid Price. Products from other manufacturers listed will be considered after the contract award.

1.3.7.3. When only one product is specified as the basis for design, and no other manufacturers or products are listed, the specified product shall be part of the Bid Price and shall be provided.

1.3.7.4. After contract award, Contractors may propose alternative products from those specified in accordance with the procedures described in Section 01 25 00 Substitution Procedures.

1.3.8. Number of Items: In cases where an assembly or a Product is referred to in the singular number, it is intended that such reference mean as many assemblies or Products as necessary shall be provided to complete the Work.

1.3.9. Quality:

1.3.9.1. Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in the Work, except where specifically specified, shall be new (except where expressly specified otherwise), not damaged or defective, and of the best quality (comparable with the specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

1.3.9.2. Defective Products, whenever identified prior to the completion of Work, will be rejected, regardless or previous inspections. Inspection does not relieve responsibility, but is a precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

1.3.9.3. Should any dispute arise as to the quality or fitness of Products, the decision rests strictly with Consultant based upon the requirements of the Contract Documents.

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

1.3.10. Trademarks and Labels:

1.3.10.1. Trademarks and labels, including applied trademarks and labels, are not acceptable in the finished Work, except those required for giving operating instructions, which are essential to obtain identification of mechanical and electrical equipment, for maintenance and replacement purposes, for mandatory fire ratings, operating instructions, or when located in mechanical, electrical and control rooms.

1.3.10.2. Remove trademarks and labels by grinding, if necessary, painting out where the particular surface is being painted or if on plated parts, replace with new plain plated or non-ferrous metal parts.

1.3.11. Availability:

1.3.11.1. Immediately upon signing the Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of Products are likely or possible, or Products are no longer available, or a specified manufacturer is no longer in business, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.

1.3.11.2. In the event of failure to notify Consultant at commencement of the Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available Products of similar character, at no increase in Contract Price.

1.3.11.3. No substitution of materials will be allowed on basis of long deliveries, unless such long delivery problems are identified at time of Bidding.

1.3.12. Gauges:

1.3.12.1. Interpret gauges of uncoated steel sheet based on manufacturer's standard gauge (msg), stainless steel sheet based on "United States Standard Gauge (Revised)" and non-ferrous sheet metals based on "Brown & Sharpe Gauge". For galvanized steel sheet based on galvanized sheet gauge (ga).

1.3.12.2. Interpret gauges specified for wire as "Steel Standard" and for non-ferrous wire, as "American".

1.3.13. Fire Rating:

1.3.13.1. Where material, component or assembly is required to be fire rated, fire rating shall be determined on basis of results of tests conducted in conformance with CAN/ULC-S101 by 1 of following testing authorities acceptable to authorities having jurisdiction:

1.3.13.1.1. Underwriters Laboratories of Canada (ULC); www.ulc.ca

1.3.13.1.2. Underwriters Laboratories Inc. (UL); www.ul.com

1.3.13.1.3. FM Global; www.allendale.com

1.3.13.1.4. National Research Council of Canada; www.nrc.ca

1.3.13.1.5. National Board of Fire Underwriters.

1.3.13.1.6. Warnock Hersey – Intertek; www.intertek.com

1.3.13.2. Where reference is made to only 1 testing authority, an equivalent fire rating as determined or listed by another of aforementioned testing authorities is acceptable if approved by Authorities Having Jurisdiction. Obtain and submit such approval of authorities, in writing, when requesting acceptance of a proposed equivalent rating or test design.

1.3.13.3. Ensure engineering judgements are sealed by a licensed engineer.

1.3.14. Roof Covering Classification:

1.3.14.1. Roof Covering classification shall be determined in accordance with CAN/ULC-S107.

1.3.14.2. Unless permitted by Code, every roof covering shall have Class A, B, or C classification as determined in accordance with Code requirements.

1.3.15. Trademarks and Labels: Do not expose trademarks and labels, including applied labels, in finished Work. Remove visible trademarks and labels except those which are essential to obtain identification of mechanical and electrical equipment for maintenance and replacement purposes and for mandatory fire ratings.

1.3.16. Documents on Site: Keep on site at all times, 1 copy of Drawings and Specifications, including a Consultant's reviewed and stamped set of Shop Drawings, coordination drawings and interference drawings.

1.4. PRODUCT DELIVERY, HANDLING AND STORAGE

1.4.1. Storage, Handling and Protection:

1.4.1.1. Handle and store Products in a manner to prevent damage, adulteration, deterioration and soiling to the Products, other building components, assemblies, other products, the structure, the site and surrounding property and in accordance with manufacturer's instructions when applicable.

1.4.1.2. Store packaged or bundled Products in original and undamaged condition, with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in the Work, except where otherwise specified for a specific item.

1.4.1.3. Store Products subject to damage from weather in weatherproof enclosures.

1.4.1.4. Store cementitious Products clear of earth or concrete floors, and away from walls.

1.4.1.5. Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

1.4.1.6. Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

1.4.1.7. Store and mix paints in a heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

1.4.1.8. Remove and replace damaged Products at own expense and to the satisfaction of the Consultant.

1.4.1.9. Schedule deliveries so as to minimize storage at the site, but without causing delays due to late deliveries.

1.4.1.10. Take delivery of and off-load Products promptly and any charges due to delays in off-loading shall be borne by Contractor. Ensure damage to Products prior to off-loading is duly reported to the Supplier and the carrier.

1.4.1.11. Locate Products such that proper inspection thereof may be carried out.

1.4.1.12. Do not store Products that may be detrimental to finished surfaces where finishing has commenced or has been completed.

1.4.1.13. Be responsible for any additional handling or transportation of the Products that is necessary.

1.4.1.14. After installation and before initial operations, protect Products against, weather, dust, dirt and dampness in a manner satisfactory to Owner and Consultant and in accordance with the manufacturer's instructions.

1.4.1.15. Be responsible for rectifying any damage to Products, ensuring such repairs are acceptable to Owner, Owner's consultant and to Product manufacturer so that warranties and guarantees are not invalidated.

1.4.2. Transportation:

1.4.2.1. Pay costs of transportation of Products required in the performance of the Work.

1.4.2.2. Transportation costs of Products supplied by the Owner will be paid for FOB by Owner. Unload, handle and store such Products.

1.5. OWNER SUPPLIED PRODUCTS

1.5.1. Co-ordinate with Owner, Owner's other contractors any off-loading, storage and protection of materials, equipment, furniture and fixtures performed by Owner's contractors to minimize traffic and congestion.

1.5.2. Be responsible for the off-loading, storage, placement, and protection of any owner procured materials and equipment, in accordance with the Work, to the same extent that it is responsible for Products, in accordance with requirements specified herein.

1.5.3. Deliveries:

1.5.3.1. Arrange for delivery of Products, construction equipment and temporary facilities to arrive when needed, and at times to minimize interference with vehicular traffic on the streets, and with pedestrian traffic on sidewalks.

1.5.3.2. Co-ordinate with other contractors their respective deliveries, especially in respect to the use of elevators and loading docks.

1.5.3.3. Delivery times are restricted and must be coordinated with SHN Project Manager.

1.6. WORKMANSHIP

1.6.1. General:

1.6.1.1. Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce the required results.

1.6.1.2. Do not employ any unfit person or anyone unskilled in their required duties.

1.6.1.3. Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant whose decision is final.

1.6.2. Protection of Work in Progress: Adequately protect work completed or in progress, existing buildings and equipment, lawns, trees, fencing, service poles, wires, utilities above and below ground, and paving located on this and adjoining properties. Work and items damaged or defaced due to failure in providing such protection are to be removed and replaced, or repaired, as directed by the Consultant, at no increase in Contract Price.

1.6.3. Overloading: Prevent overloading of any part of the building, structure, falsework, form work and scaffolding. Do not cut, drill or sleeve any load bearing members unless specifically indicated, without written approval of Consultant. Make good any damages due to overloading at no cost to Owner.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: general requirements for the Work including but not limited to following:

1.2.1.1. Professional engineers' service

1.2.1.2. Examination of the work area.

1.2.1.3. Preparation of the work area.

1.2.1.4. Materials and products used in the work.

1.2.1.5. Execution of the work.

1.2.1.6. Alterations and repairs to existing construction.

1.2.1.7. Roofing patching.

1.2.1.8. Cleaning.

1.2.1.9. Protecting installed construction.

1.2.1.10. Correction of work after completion.

1.2.2. Related Work:

1.2.2.1. Hoarding and Dust Screens: stud framing and gypsum board sheathing materials - refer to Section 01 50 00 - Temporary Facilities and Controls.

1.3. REFERENCES

1.3.1. Reference Standards:

1.3.1.1. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.4. PROFESSIONAL ENGINEERS' SERVICE

1.4.1. Obtain full time engineering service from professional engineer licensed to practice in Province of Ontario in applicable discipline. Engineering service shall include without limitation, design of structural elements and full inspection services during fabrication, erection and administration during construction.

1.5. EXAMINATION

1.5.1. Make a careful examination of the Place of the Work and investigate conditions relating to the work to be undertaken, including access, obstacles, and interference this might cause to other trades, which may be caused during the performance of the Work.

1.5.2. Make a careful examination of the extent of the Work to be performed and any and all matters which are referred to in the Contract Documents, or which are necessary for the full and proper construction of the Project and the conditions under which it will be performed.

1.5.3. Contractor is held to have examined site and ascertained extent and nature of conditions affecting performance of Work before tendering, including location of concealed/buried services that may have to be protected, removed or relocated.

1.5.4. Before commencement of Work and/or ordering of equipment and materials thoroughly investigate all conditions related to the site.

1.5.5. Plan work to accommodate all requirements and limitations discovered by the above investigation so that the work can be completed without any inconvenience or additional costs.

1.5.6. The details of existing conditions and construction are based on the information available at the time of the preparation of the contract documents. If during construction, conditions are revealed which differ from the assumed conditions, advise the Consultant before proceeding.

1.5.7. Each subcontractor is to examine the substrate their work is to attach to, including a thorough examination of the drawings, specifications and the general contractor's as-builts, to determine whether the substrate is compatible with their work. The initiation of their work confirms their thorough examination and acceptance of the substrate.

1.5.8. Report unsatisfactory conditions likely to prevent the proper installation of Work.

1.5.9. Commencement of the Work implies acceptance of conditions.

1.6. PREPARATION

1.6.1. Planning, Scheduling & Coordination of Alterations:

1.6.1.1. Plan and schedule alterations to accommodate anticipated difficulties, indicated on and inferable from the Contract Documents.

1.6.1.2. Plan, schedule and coordinate alterations to accommodate on-going operations of Owner with minimal disruption.

1.6.1.3. Plan, schedule and coordinate alterations, required in Owner-occupied spaces or adjoining or below the Place of the Work, on a room-by-room basis and in accordance with a schedule mutually agreed upon with SHN Project Manager. Requests for access to occupied areas shall be made to SHN Project Manager a minimum of 1 week in advance of requested access time.

1.6.1.4. Co-ordinate alterations with other contractors and proceed with the Work expeditiously.

1.6.2. Surveying:

1.6.2.1. SHN Project Manager may supply Drawings to show line of Place of the Work.

1.6.2.2. Engage registered Ontario Land Surveyor to make survey of perimeter footings (and foundations) once constructed, to verify they are properly located with respect to property lines, elevations, easements and other buildings. Submit 3 copies of survey showing such verification.

1.6.2.3. Engage registered Ontario Land Surveyor to lay out building, to determine unconfirmed dimensions and elevations, other construction work and to provide as-built survey identifying permanent bench marks. Establish on site grades, lines, levels, dimensions, and location of existing roads, sidewalks, buried utilities and other similar features on site. Carefully preserve bench marks, reference points and other reference marks.

1.6.2.4. Lay out work in accordance with lines, levels and dimensions indicated and/or provided on bench marks established by survey.

1.6.2.5. Verify lines, levels and dimensions. Thicknesses shown on Drawings are nominal only. Ascertain actual sizes on site. Report errors or inconsistencies in Drawings and obtain direction before commencing Work. Ensure work is executed in accordance with verified dimensions and positions indicated which maintain levels and clearances to adjacent work as set out in Contract Documents.

1.6.2.6. Except as provided by survey, provide lines, levels and dimensions necessary to relate your work to work of other Sections.

1.6.2.7. Location of electrical and mechanical service lines, curbs, light standards, trees and contours shown or specified but not dimensioned shall be considered approximate.

1.6.2.8. Confer with Consultant to determine actual location of items not dimensioned as may be required to suit job conditions. Relocate as directed within +/-1500 mm (5' - 0") horizontally. Do such relocation without increasing Contract Price.

1.6.2.9. SHN Project Manager will accept no claims for extra expenses incurred by Contractor for not complying with requirements of this Section.

1.6.3. Existing Services:

1.6.3.1. Before commencing Work, establish location and extent of existing services in area of Work and notify Consultant of findings.

1.6.3.2. Where job conditions require reasonable changes in indicated locations and arrangements, make such changes with approval of Consultant at no additional cost to Owner. Similarly, where existing conditions interfere with new installation and require relocation, such relocation is included in Work.

1.6.3.3. Whenever it is necessary to cut, interfere with, or connect to existing services or facility do so at hours and times recommended by governing authorities and approved by Consultant; and with minimum disturbance to occupants, pedestrian and vehicular traffic and public and private property.

1.6.3.4. Submit schedule of interruption to services and obtain approval from Consultant for each proposed shut-down of active service or facility. Adhere to approved schedule and provide notice to affected parties.

1.6.3.5. If unknown services are encountered, immediately notify Consultant and confirm findings in writing. Obtain Consultant's written direction if such services require cutting, capping or relocation to do Work.

1.6.4. Access for Large Equipment:

1.6.4.1. Where new mechanical and electrical equipment is located in existing areas of building, do necessary cutting, dismantling and reassembling of equipment, modifications to equipment, hoisting, shoring and patching required for installation of such equipment in space provided.

1.6.4.2. Where Drawings show specific locations of walls, ceilings, slabs and like being broken out for access for equipment, this is merely to indicate an architectural preference for route, and it is not intended that Drawings necessarily show all such breaking out required.

1.6.5. Material or Equipment Delivery, Transport And Storage: in accordance with Scarborough Health Network Contractor Procedure Manual.

1.7. MATERIALS

1.7.1. Repair Materials:

1.7.1.1. Use repair materials identical to existing materials:

1.7.1.1.1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1.7.1.1.2. Use a material whose installed performance equals or surpasses that of existing material.

1.7.1.1.3. Comply with material and installation requirements specified in individual Specification Sections.

1.7.1.2. Floor Patching and Levelling Compounds: Cement based, trowelable, self levelling compounds compatible with specified floor finishes; gypsum based products are not acceptable for work of this Section.

1.7.1.3. Concrete Unit Masonry: Lightweight concrete masonry units, and mortar, cut and trimmed to fit existing opening to be filled. Provide standard hollow core units, square end units and bond beam units as indicated on drawings.

1.7.1.4. Prefinished Sheet Steel: Prefinished sheet steel, colour to match existing radiation cabinets, bent and profiled to match existing radiation cabinets.

1.7.1.5. Gypsum Board Patching Compounds: Joint compound to ASTM C 475/C 475M, bedding and finishing types thinned to provide skim coat consistency to patch and prepare existing gypsum board walls ready for new finishes in accordance with Section 09 21 16 - Gypsum Board Assemblies

1.7.2. Hoarding and Dust Screens: Refer to Section 01 56 00 - Temporary Barriers and Enclosures for stud framing and gypsum board sheathing materials

1.7.3. Where Specification requirements include design of a Product or system, and minimum material requirements are specified, design of such Product or system shall employ materials specified within applicable Section. Where materials or components are not specified, Contractor shall augment materials with those of its choice within applicable Code limitations while maintaining integrity of design and architectural requirements.

1.7.4. Defective Products, whenever identified prior to completion of Work, will be rejected, regardless of previous reviews. Review does not relieve responsibility, but is a precaution against oversight or error. Remove and replace defective and/or damaged Products at own expense and be responsible for delays and expenses caused by rejection.

1.7.5. Ensure new materials used to repair damage are compatible with existing work.

1.7.6. Anchors and Fasteners:

1.7.6.1. Supply appropriate anchors, fasteners, accessories and adhesives required for fabrication and erection of Work.

1.7.6.2. Unless specified otherwise use exposed metal fastenings and accessories of same texture, colour and finish as Product being fastened.

1.7.6.3. Use metal fastenings of same material as metal component being fastened, or of metal which will not generate electrolytic action and cause damage to fastening or metal component under moist conditions. In general use non-corrosive or hot dip galvanized steel anchors occurring on or in exterior wall, slab or other exterior locations, unless higher standard is indicated or specified.

1.7.6.4. Fastening devices or adhesives shall be of appropriate type, used in sufficient quantity and in such manner to provide positive, permanent fastening which will not shift, work loose or fail during occupancy of building due to vibration or other causes resulting from normal use of building. Install anchors at spacing to provide required load/stress carrying capacity. Do not use wood plugs.

1.7.6.5. Lay out fastenings neatly, evenly spaced and aligned. Keep exposed fastenings to minimum.

1.7.6.6. Supply adequate instructions and templates and, if necessary supervise installation, where fastenings or accessories for your Section are required to be built into work of other Sections.

1.7.7. Powder Actuated Fastenings:

1.7.7.1. Powder actuated fasteners shall not be used for the support of ceilings.

1.7.7.2. Do not use powder actuated fastening devices, which are used in tension, without approval.

1.7.7.3. Powder actuated fastenings shall not be used on any portion of the Work, unless written consent for a specific use is obtained from the Consultant.

1.7.8. Only low velocity tools will be permitted under any condition. Operators to be qualified and to be in possession of a valid operator's certificate. Tools and operation shall conform to CAN3-Z166.5-Series.

1.7.9. Do not use fastenings which will cause spalling, cracking, or deformation or deterioration of material being fastened by or to.

1.7.10. Use adhesives specified, or if not specified, those recommended by manufacturer of materials involved, compatible with materials to be joined and effective in forming permanent joint of adequate strength.

1.7.11. Use screws, nails, staples and other similar, driven fasteners suitable to materials to be joined and to conditions under which they are installed and used. Ensure in finished work, fasteners are sized to take durable hold under stress to be encountered without damage to, or weakening of, elements secured together and fastenings will not corrode or cause staining of exposed surfaces.

1.7.12. Security Screws: Complying with ANSI/ASME B18.6.3; provide only tamper-resistant Torx-Plus® or break off type screws as specified and noted on Drawings. Provide flathead security screws where Torx-Plus® or breakoff is indicated to be counter sunk otherwise provide only trusshead or buttonhead for Torx-Plus® and only roundhead for breakoff type. Torx-Plus® Temper resistant screws with heads having a deep hex-lobular recess with a solid post formed in the centre requiring a special metal driver to install or remove screw. Fasteners and tools shall be of type produced by licensed manufacturer. Break-Off head security screws with drive heads having an additional hexagonal shaped head designed to break off after installation at a predetermined torque level. Grind remaining portion of neck smooth after hex-head is broken off. Acceptable manufacturers, Temper Proof Screws Inc or Folger Adam Security Inc, or Sentry Security Fasteners, Inc. or Temper proof Screw Co.

1.7.13. Do brazing or soldering to form durable connections of strength adequate to resist stresses to be encountered without deformation of elements joined. Prepare base metals and use methods and materials to ensure clean joint, and to prevent staining, corrosion, discolouration, deformation or other damage to finished Work.

1.7.14. Do welding to CSA W59 for steel and to CSA W59.2-M for aluminum, unless specified otherwise. Have welding performed by companies certified operatives to CSA W47.1 or CSA W47.2.

1.7.15. Provide accessory items or materials required, such as brackets, cleats, connectors, sealants, lubricants, cleaners, protection and similar items, whether specified or not, so Work is complete and performs as required.

1.8. EXECUTION

1.8.1. Existing Conditions:

1.8.1.1. Make Good surfaces and finishes damaged or disturbed due to Work of this Contract to match existing. Ensure materials used to repair damage are compatible with existing work.

1.8.1.2. Restore site to condition equal to or, if specified elsewhere, to condition better than existing conditions.

1.8.1.3. Restore lands outside of limits of Work which are disturbed due to Work to original condition in addition to complying with requirements of General Conditions of the Contract.

1.8.2. Installation - General:

1.8.2.1. Except where specified otherwise, use each Product in accordance with manufacturer's published or written instructions, Specifications or recommendations regarding handling, storage, preparation, site conditions, ancillary Products or accessories, methods of installation, protection and cleaning. Submit copy of such instructions and indicate if and where there is discrepancy between them and requirements of Specifications and obtain direction.

1.8.2.2. Whenever specific reference to following manufacturer's directions or instructions is made in Specifications, submit copies as requested thereof for review before commencing such work.

1.8.2.3. Do Work in accordance with industry practice for type of work unless Contract Documents stipulate more precise requirements. Do not let unskilled, incompetent workers perform work.

1.8.2.4. Do Work in neat and careful manner to retain Work plumb, square and straight.

1.8.2.5. Ensure Work is properly related to form close joints and appropriately aligned junctions, edges and surfaces and is free of warp, twist, wind, wave or other irregularities.

1.8.2.6. When required by Specifications or by manufacturer's recommendations, have manufacturer, supplier or accredited agent, inspect work which incorporates their Products.

1.8.2.7. Do not permit materials to come in contact with other materials whether in presence of moisture or otherwise if conditions will result in corrosion, stain or discolouration or deterioration of completed Work. Provide compatible, durable separators where such contact is unavoidable.

1.8.2.8. Use of explosives on this Project is not acceptable.

1.8.2.9. Load no part of structure during construction with load greater than it is calculated to bear safely when completed. Make every temporary support as strong as permanent support. Place no load on concrete structure until it has sufficient strength to safely carry such load.

1.8.3. Installation - Mechanical & Electrical Work:

1.8.3.1. Mechanical and electrical drawings indicate approximate locations diagrammatically. Prior to installation, request and obtain final locations and arrangement drawings for plumbing, heating and electrical fixtures and outlets, ducts, conduits and pipes. Allow Consultant to adjust final locations within a 1500 mm (5') radius from diagrammatic position indicated, without change to Contract Price.

1.8.3.2. Align and cluster devices and fitments neatly in accordance with specified mounting heights, properly aligned horizontally and vertically.

1.8.3.3. Lay out mechanical and electrical work in advance of concrete placement and furring installation to allow for its proper concealment.

1.8.3.4. Test and inspect work before applying pipe covering and before Work is concealed.

1.8.3.5. Ensure identification of electrical and mechanical system installations and other automated systems or equipment is recorded and located on as-built drawings.

1.8.3.6. Concealment:

1.8.3.6.1. In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

1.8.3.6.2. Before installation, inform Consultant if there is a conflict with services situation. Install as directed by Consultant.

1.8.3.6.3. If in doubt as to method of concealment, or intention of Contract Documents in this connection, request clarification from Consultant before proceeding with work in question.

1.8.3.6.4. Where services are to left exposed, arrange in a neat and logical manner in straight lines and following walls.

1.8.3.7. Install and arrange fixtures, equipment, ducts, piping and conduit to conserve as much headroom and space as possible, and avoid interference and obstruction of access. Observe good installation practice for safety, access, maintenance and follow manufacturer's recommendations. Location of fixtures, access panels, outlets and mechanical and electrical

components indicated are approximate. Make changes requested to comply with these requirements at no additional cost to Owner.

1.8.4. Manufacturers' Written Instructions:

1.8.4.1. Unless specified otherwise, install each Product in accordance with manufacturer's published written instructions regarding handling, storage, preparation, methods of installation, protection and cleaning. Take into account site conditions and provide ancillary Products or accessories.

1.8.4.2. Conform to manufacturer's recommended installation temperatures. If finishes are installed at temperatures different from operation or service temperatures, make provisions for expansion and contraction in service as acceptable to manufacturer and Consultant. Repair resulting damage should expansion provisions prove inadequate.

1.8.4.3. Notify Consultant, in writing, of conflicts between Contract Documents and manufacturer's instructions, so Consultant may establish course of action to be taken. If requested, make a copy of those instructions available at site.

1.8.4.4. Improper installation or erection of Products, due to failure to comply with these requirements, shall require removal and re-installation at no increase in Contract Price.

1.8.4.5. Whenever specific reference to following manufacturer's directions or instructions is made in Specifications, upon request submit copies thereof for review before commencing such work.

1.8.5. Barrier Free Design Requirements:

1.8.5.1. Conform to OBC requirements for barrier free installations.

1.8.5.2. Install switches, telephones, fire-alarm pull stations, washroom accessories and other equipment and devices requiring accessibility by building staff and public, excluding mechanical and electrical room installations, to meet barrier-free requirements. If there is conflict between this requirement and any other building code requirement bring to attention of Consultant prior to installation.

1.8.6. Built in Items: Provide and coordinate location of chases, slots and reglets including frames, sleeves, inserts, anchors, fasteners and bolts, forms and templates.

1.8.7. Patents: Verify existence or exclusivity of patent licenses for Products prior to installation.

1.9. ALTERATIONS, REPAIRS, CUTTING AND PATCHING

1.9.1. General:

1.9.1.1. Refer to Section 02 41 00. Conform to Owner's Policies and Procedures for Contractors and shut down protocol where applicable.

1.9.1.2. Perform work in a manner such as to cause a minimum of noise and interference to use of existing premises and services. Provide maximum safety for occupants during work.

1.9.1.3. Throughout entire construction period, provide proper and safe means of fire exit from all zones of existing building at all times, to approval of authorities having jurisdiction.

1.9.1.4. Wherever it becomes necessary to cut or interfere in any manner with existing apparatus for short periods of time, do work at such times as agreed upon with SHN Project Manager and Consultant.

1.9.1.5. If unscheduled disturbance to use of existing premises and services is required to complete work, inform SHN Project Manager with advance notice of 1 week minimum. Provide information of requirements and perform work at times directed by SHN Project Manager.

1.9.1.6. Make provisions to join new work to existing and to install new supporting members, anchors and other items necessary for completion of work. Provide temporary bracing where required.

1.9.1.7. Proceed with demolition of or alterations to any portion of existing building only after approval of Consultant has been obtained and after weather tight and dustproof screens have been erected to provide thorough protection to adjoining areas and rooms.

1.9.1.8. When permission has been granted to proceed with alterations in existing building, carry out work expeditiously and continuously to completion.

1.9.1.9. Carry out work so as to minimize dust migration. Protect items sensitive to and which could be damaged by dust. Where practical, keep demolition areas wetted.

1.9.1.10. During performance of work, adequately protect work completed and in progress, and existing work to remain, such as floors, finishes, trim and similar components, as completely as possible to minimize replacement of damaged work by each Subcontractor and trade. Work damaged or defaced due to failure to provide adequate protection shall be repaired or removed and replaced as directed by Consultant.

1.9.1.11. Properly coordinate work of various Sections and trades. Take into consideration existing installations to assure best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment and items, in available space. Under no circumstances will any extra payment be allowed due to failure by Contractor to coordinate work.

1.9.1.12. Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction work.

1.9.1.13. Cutting, patching and making good of existing work to accommodate new work and requirements specified under other Sections shall be done in conjunction with work specified herein. Coordinate such work.

1.9.1.14. Employ tradesmen qualified in work being cut and patched to perform work correctly and skillfully.

1.9.1.15. Do not undermine, damage or endanger existing structure, footings, foundations, pipe lines, electrical conduit and wiring by digging, cutting or any other operation in performance of Work of this Contract. Immediately repair and Make Good existing work so affected, including working after regular working hours, to Consultant's approval, recommendation and satisfaction at no additional cost to Owner.

1.9.1.16. Cut off, cap, divert or remove existing services in areas being altered which are affected by changes as required or as directed by municipal authorities and utility company concerned and Consultant. Protect and maintain active services to existing building.

1.9.1.17. Where new work connects with existing and where existing work is altered, perform necessary cutting and fitting required to make satisfactory connections with existing work under this Contract, so as to leave entire work in a finished condition. Match new Work exactly with existing work in material, form, construction and finish unless otherwise noted or specified. Make joining work inconspicuous.

1.9.1.18. Make Good materials, surfaces, and finishes damaged or disturbed due to work of this Contract.

1.9.1.19. Except where structural requirements are indicated on Drawings, do not cut, drill or sleeve load bearing members without first obtaining Consultant's written authorization for each condition.

1.9.1.20. Perform drilling of existing work carefully, leaving a clean hole no larger than required.

1.9.1.21. Make cuts clean and true with smooth edges. Fit units to tolerances established by existing work and in conformance with best standard practice for applicable class of work.

1.9.1.22. Fill unused and unfilled sleeves and holes in non-fire rated floors and partitions not otherwise filled, by approved means. If unused sleeve is in fire or sound barrier, fill in manner to restore

or maintain fire or sound barrier rating. Filling of openings in fire rated floors and partitions specified under Section 07 84 00.

1.9.1.23. If non-designated and unclassified sprayed fire resisting, sound absorbing, or insulation applications are encountered, inform Consultant for examination and instructions. Restore damaged non-asbestos type fireproofing to original condition before covering with finishes.

1.9.1.24. Work shown on Drawings, Schedules and Specifications may or may not be all work required to be done in existing building. Make Good and execute all necessary work including incidentals to make a complete job of alterations work.

1.9.2. Roof Patching

1.9.2.1. Cut existing protected membrane roofing in order that new AHU can be installed.

1.9.2.2. Provide weather protection and workers fall arrest barricades as required.

1.9.2.3. Clean existing roof membrane and make ready for patching in accordance with the membrane manufacturer’s recommendations.

1.9.2.4. Verify existing roof membrane material and ensure compatibility with new roofing repair materials.

1.9.2.5. Install membrane to extend onto field of existing roofing membrane, and up curb for new AHU.

1.9.2.6. Install concrete pavers as shown:

1.9.2.6.1. Precast concrete conforming to CSA A231.2 having a minimum strength of 35 MPa (5000 psi), steam cured, 4% and 6% entrained air, with edges chamfered and non-slip finish,

1.9.2.6.2. Size: 610 mm x 610 mm x 64 mm (24" x 24" x 2-1/2") thick.

1.9.2.7. Install flashing to match existing.

1.9.3. Repair Existing Lath And Plaster

1.9.3.1. Patch and repair existing plaster finishes with new plaster to match, where mechanical and electrical and architectural work of this Contract penetrate existing plaster finishes as specified herein.

1.9.3.2. Perform patch and repair of existing plaster finishes by Subcontractor having continuous experience in successful installation of plaster work type and quality as specified herein.

1.9.3.3. Provide ventilation to properly dry plaster during and subsequent to its installation. In enclosed areas lacking proper ventilation and air circulation, provide additional temporary, portable mechanical ventilation to remove moisture laden air in plastering area as fast as possible.

1.9.3.4. Install plaster in accordance with ASTM C926, ASTM C843 and manufacturer’s written instructions.

1.9.4. Cutting And Patching - Structural Alterations

1.9.4.1. Prior to cutting and drilling through structural and load bearing members, (e.g. slabs, columns, beams and shear walls), obtain Consultant's review and written acceptance of cut location and layout.

1.9.4.2. Locate existing reinforcement and conduit and obtain approval of Consultant before coring or cutting existing or new slabs, beams or walls. Retain an independent testing company to locate existing reinforcement and conduit in the areas of proposed openings and to mark locations of surfaces of slabs and walls on which cores and cuts are started. Scan concrete using non-destructive methods to accurately locate reinforcement and conduit. Remove toppings prior to locating reinforcement and conduit. Mark locations and sizes of cores and

openings and locations of reinforcement and conduit using indelible markers with red for top bars, green for bottom bars and black for cores, openings and conduit. Consultant will review marked-up locations once a week. If locations are not acceptable to Consultant, relocate proposed openings and repeat process at no extra cost to the Contract.

1.9.5. Cutting And Patching - Fire Separation Alterations

1.9.5.1. Maintain fire separations for duration of work of this Section.

1.9.5.2. Provide fire and smoke penetration sealants at alterations and repairs in accordance with Section 07 84 00.

1.9.5.3. Provide continuous and solid framing, blocking or masonry work around service penetrations through fire separations in accordance with the fire penetration sealant design to maintain the continuity of the fire separation.

1.9.6. Removal of Floor Finishes:

1.9.6.1. Prepare existing surface acceptable to Consultant, suitable and compatible with subsequent applied underlayment or applied finish. Remove existing flooring and bases where indicated unless specified to be carried out under other Sections. Remove carpet and adhesive/setting bed materials completely, down to concrete substrate. Prepare, mix and apply coats to neutralize residues adhesives and setting beds and to provide suitable substrate to receive scheduled flooring in accordance with manufacturer’s instructions.

1.9.6.2. Shot blast existing concrete or prepare existing surfaces by or means acceptable to Consultant. Level slabs as required to accommodate flooring with self leveling underlayment to suit application. Grind existing concrete slab as required, clean surfaces and remove residue adhesives. Remove ridges and trowel marks and scrape substrate to a smooth level surface. Surfaces shall be clean, free of gouges, matter detrimental to bond of underlayment and flooring and be ready to receive underlayment and flooring. Prepare for flush application of new flooring material.

1.9.6.3. Fill new and existing depressions, dished areas, low spots, voids, gaps, cracks, joints, holes and other substrate defects with skim coat and self-leveling topping to achieve a flat substrate to within following tolerances: 3 mm (1/8") total maximum deviation +/- along 3000 mm (10') straight edge applied omni-directionally over entire floor area.

1.9.6.4. Underlayment shall have compressive strength of 4000 psi after 28 Days and tolerance specified above.

1.9.6.5. Coordinate with substrate preparation specified in floor finish Section.

1.9.7. Temporary Ceiling Removal:

1.9.7.1. Coordinate with electrical and mechanical trades to assess complete scope of temporary ceiling removals to allow for feeder runs and like by those sections (extent of ceiling removal has not been shown on architectural plans).

1.9.7.2. Provide temporary protection, signage and barriers to protect others.

1.9.7.3. Remove tile, panels and tee bar suspension from area required by other trades.

1.9.7.4. Upon completion of work of other trades and all required inspections, replace tee-bar and acoustic tile. Where tile or tee-bar are damaged, bent, discoloured, scratched or otherwise appear of lesser quality than surrounding area, replace with new material.

1.9.7.5. Plaster ceilings in existing institution may be forming part of membrane fire separation having a fire resistance rating. Verify and maintain existing fire rating.

1.9.7.6. Remove and replace gypsum board bulkheads and ceilings in areas designated and as required. Make Good and match existing finishes.

1.10. CLEANING

1.10.1. Progress Cleaning:

1.10.1.1. Observe Scarborough Health Network Contractor Procedure Manual requirements for site cleanliness and general upkeep.

1.10.1.2. Keep access areas to Work in tidy condition, free from accumulation of waste products and debris during construction and on completion, other than caused by Owner's crew or other contractors. Do not dispose of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems or into streams or waterways.

1.10.1.3. Keep site and building, including concealed spaces, free from accumulation of dirt, debris, garbage and excess material. Remove oily rags and waste from premises at close of each Day work is performed, or more often if required.

1.10.1.4. Remove waste material and debris from site at end of each Working Day. Remove from finished surfaces deposits which could stain, harden, set or become difficult to remove.

1.10.1.5. Remove rubbish and surplus materials promptly and dispose of in a legal manner. Do not allow scrap piles to accumulate. Do not permit fires.

1.10.1.6. Lower waste materials in a controlled manner with minimum handling; do not drop or throw materials from heights. Schedule cleaning operations so dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces. Sprinkle dusty debris with water.

1.10.1.7. Sweep adjacent roads and sidewalks daily to remove dirt and clods of earth deposited on adjacent public and private properties by construction traffic.

1.10.1.8. Vacuum-clean using HEPA filter interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations. Vacuum studs spaces, cavities, before enclosing. Vacuum clean any ductwork that might have been uncovered. Vacuum clean ceilings where work was performed above.

1.10.2. Final Cleaning: Perform daily cleaning of the work area and final cleaning in accordance with CAN/CSA Z317.13 and the following

1.10.2.1. Prior to occupancy, clean the Place of the Work thoroughly, free of rubbish and surplus material. Dispose of rubbish and debris. Vacate the Place of the Work in a clean and tidy condition satisfactory to Consultant.

1.10.2.2. Dismantle and remove work of Section 01 50 00 from the Place of the Work.

1.10.2.3. Prior to cleaning, submit to Consultant a complete list of manufacturers' cleaning/ maintenance instructions for all components of the Work.

1.10.2.4. Final finishing is in addition to and compatible with cleaning and finishing specified in trade Sections.

1.10.2.5. Clean new and existing components in accordance with manufacturers' recommendations including, but not limited to:

1.10.2.5.1. Floors:

1.10.2.5.1.1. Tile/Terrazzo/Vinyl/Stone Flooring: Sweep floor free of debris; clean corners and base boards free of marks and dirt. Scrub new flooring using appropriate solutions to remove factory installed protective coatings. Strip existing flooring using appropriate chemical solution to remove any existing floor finish coating and base seal coatings. Apply to new and existing flooring 2 coats of sealer recommended by manufacturer of flooring materials. Let floor completely dry between coats. Use prime quality top line Products. Do not apply finish to baseboards.

1.10.2.5.1.2. Vacuum carpet flooring using power brush equipped vacuum cleaner. Remove stains using approved stain removal methodology. Where carpet is exposed to extensive dry wall dust and other fine dust particles, carpet shall be pile lifted using rotary pile lifting machine. In addition, carpet shall be cleaned using extraction method approved by manufacturer.

1.10.2.5.2. Walls shall be completely dusted and all marks removed. Where necessary wall shall be washed if painting is not an option.

1.10.2.5.3. Ceilings.

1.10.2.5.4. Window coverings.

1.10.2.5.5. Doors, windows and frames.

1.10.2.5.6. Electrical switch gear.

1.10.2.5.7. Exposed interior and exterior glazed surfaces.

1.10.2.5.8. Hardware.

1.10.2.5.9. Mechanical and electrical fixtures and equipment.

1.10.2.5.10. Stainless steel, anodized aluminum, brass, bronze and other metals.

1.10.2.5.11. The place of the work outside building envelope: remove debris, rake sod, sweep sidewalks and pavement.

1.10.2.6. Use experienced cleaners or professional cleaners for final cleaning. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

1.10.2.7. Final cleaning includes, without limitations, requirements specified herein, removal of surplus materials, tools, construction machinery and equipment from site. Carry out final cleaning in accordance with manufacturer’s instructions for each material. Clean Work in accordance with applicable Sections and/or manufacturer's directions.

1.10.2.8. Remove stains, spots, marks, dust, smudges caused by Work within work areas of this Contract. Remove from decorative work, electrical and mechanical fixtures, furniture fitments, walls, ceiling and floors.

1.10.2.9. Clean and polish interior [and exterior] glass, windows, entrances, skylights, mirrors, hardware, wall tile, stainless steel, chrome, porcelain, baked enamel, plastic laminate, mechanical, plumbing fixtures and electrical fixtures.

1.10.2.10. Vacuum clean and dust building interiors, behind grilles, louvres and screens. Vacuum clean ducts, fans, blowers and coils if units were operated without filters during construction.

1.10.2.11. Broom clean and wash interior as well as exterior walks, paved surfaces, concrete floors, steps and other similar surfaces.

1.10.2.12. Replace broken, damaged, disfigured or scratched glass and mirrors, which are part of Work.

1.10.2.13. Make Good any damage caused outside work area. Include doing necessary cleaning required due to Work.

1.10.2.14. Use appropriate apparatus and cleaning materials.

1.10.2.15. Close rooms and areas finished by cleaners, painters and decorators to all but authorized persons.

1.10.2.16. Upon completion of final cleaning, remove cleaning equipment, excess materials and debris from building and site.

1.11. PROTECTING INSTALLED CONSTRUCTION

1.11.1. Protection of Work During Construction:

1.11.1.1. Provide continuous protection to public, Work, Owner's property and adjacent property during construction. Protect work of other trades from damage while performing subsequent work.

1.11.1.2. Protect finished flooring from damage. Make special efforts and take measures when moving heavy loads or equipment over them. Keep floors free of oils, grime, grease or other materials likely to discolour them or affect bond of applied surfaces.

1.11.1.3. Protect, relocate and maintain existing, active services wherever they are encountered. Wherever inactive services are encountered, cap them off and remove unwanted portion, with approval of Authorities Having Jurisdiction or public utility concerned in manner approved by them.

1.11.1.4. Adequately protect floors and roofs from damage. Take special measures when moving heavy loads or equipment on them.

1.11.1.5. Keep floors free of oils, grease or other materials likely to discolour them or affect bond of applied surfaces including fumes generated by temporary heating devices. Take care not to spill or allow oil, grease, gasoline, diesel and fuel oil, chemicals and other substances to contaminate soil or water on or adjacent to site. Should such contamination accidentally occur report it immediately and clean up to satisfaction of Consultant.

1.11.1.6. Protect work of other Sections from damage resulting from your work.

1.11.1.7. Damaged work shall be Made Good wherever possible by Section whose work is damaged but at expense of those causing damage.

1.11.1.8. Protect glass and other finishes against heat, slag and weld splatter using suitable protective shields or covers.

1.11.1.9. Provide and maintain in working order, suitable Underwriters' labelled fire extinguishers and locate in suitable positions, to approval of authorities having jurisdiction.

1.11.1.10. Provide minimum of 3 safety helmets for Consultant and any other authorized visitors to site if required.

1.11.1.11. Protect public and those employed on Work from injury. Equipment (mobile) when not in use shall have keys removed and locked up in secure location.

1.12. CORRECTION AFTER COMPLETION

1.12.1. In conformance with General Conditions of the Contract, Make Good any defects and deficiencies due to faulty materials or quality of performance that become apparent in Work within 12 months from date of Certificate of Substantial Performance or for such longer period as specified for certain Products in Contract Documents.

1.12.2. Conform to requirements of General Conditions of the Contract and provide Warranty for 12 month period and for extended period where applicable, in writing in an approved form acceptable to Consultant.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SECTION INCLUDES

1.2.1. Starting equipment in preparation for adjusting and commissioning.

1.2.2. To bring the facility to a fully operational state, free of deficiencies, in the most efficient and timely manner achievable.

1.2.3. Contractor's and Owner's responsibilities during each of the successive phases of facility start-up:

1.2.4. Contractor start-up in preparation for occupancy.

1.2.5. Performance testing that leads to acceptance of the Work.

1.3. RELATED SECTIONS

1.3.1. Construction phases: Section 01 10 00 General Requirements.

1.3.2. Infection prevention inspections and reporting: Section 01 35 33 Infection Control Procedures.

1.3.3. Closeout procedures, demonstration and training for hospital staff: Section 01 77 00 Closeout Procedures.

1.4. GENERAL REQUIREMENTS

1.4.1. The process for start-up is as follows;

1.4.1.1. Contractor completes the work and notifies the Consultant that the system is ready for verification.

1.4.1.2. Contractor completes cleaning and inspection of work area and equipment.

1.4.1.3. Consultant, SHN Project Manager attend at verification/demonstration. System is accepted as complete or rejected. Deficiencies are identified.

1.4.1.4. Process repeats until system is accepted.

1.4.1.5. All systems to be accepted before application for Substantial Performance.

1.5. STARTING AND ADJUSTING

1.5.1. Trial Usage and Instructions - Mechanical:

1.5.1.1. Thoroughly instruct Owner’s authorized representative(s) in safe operation of systems and equipment after installation and prior to Substantial Performance of the Work. Coordinate with Consultant and arrange schedule for instruction times. Ensure operating, maintenance and or documents have been submitted to Consultant prior to demonstration. Submit a commissioning schedule to Consultant 1 week prior to commissioning of each system.

1.5.1.2. Arrange and pay for services of qualified service engineers and manufacturers' representatives to instruct Consultant on specialized portions of installation, such as refrigeration machines, boilers, automatic controls and water treatment.

1.5.1.3. Submit a complete record of instructions as part of maintenance instructions and data book given to Consultant. For each instructional period, supply following data:

1.5.1.3.1. Date.

1.5.1.3.2. System or equipment involved.

1.5.1.3.3. Names of persons giving instructions.

1.5.1.3.4. Names of persons being instructed.

1.5.1.3.5. Other persons present.

1.5.1.3.6. Carry out instructional period during a continuous period of 30 Days unless otherwise agreed with Consultant.

1.5.1.4. Permit Consultant trial usage of systems or parts of systems for purpose of testing and learning operational procedures. Trial usage shall not affect warranties nor be construed as acceptance and no claim for damage shall be made against Consultant for any injury or breakage to any part or parts of above due to aforementioned tests, where such injuries or breakage are caused by a weakness or inadequacy of parts, or by defective materials or quality of performance of any kind.

1.5.1.5. Obtain and submit to Consultant, signature of Owner's representatives stating they understand system and equipment installation, operation and maintenance requirements.

1.5.1.6. Obtain and submit to Consultant, letters from manufacturers of equipment and systems indicating their technical representatives have inspected and tested systems and have approved methods of installation, connections and operation.

1.5.1.7. Only exception to foregoing requirements for acceptance of equipment and systems, will be 'fine tuning' which may be performed after Substantial Performance of Work and prior to Completion of Contract.

1.5.1.8. In conjunction with foregoing requirements, Contractor shall arrange necessary inspections and obtain written approval and acceptance of equipment and systems requiring approval by authorities and correction of unacceptable items to satisfaction of authorities.

1.5.2. Trial Usage and Instructions - Electrical:

1.5.2.1. Provide services of manufacturers' specialized representatives to instruct Owner's representatives in operation of systems and equipment after installation and prior to Substantial Performance of Work. Coordinate with Consultant and arrange schedule for instruction times. Ensure operating, maintenance and documents have been submitted to Consultant prior to demonstration. Submit a commissioning schedule to Consultant, 1 week prior to commissioning of each system.

1.5.2.2. Permit Owner's representatives, in order to familiarize themselves with equipment, to operate systems for a reasonable period of time as arranged.

1.5.2.3. Trial usage of equipment by Owner's representatives shall not affect warranties, nor be construed as acceptance of equipment or system and no claim for damage shall be made against Owner for injury or breakage to any part or parts of above due to aforementioned tests, where such injuries or breakage are caused by a weakness or inadequacy of parts, or by defective materials or quality of performance of any kind.

1.5.2.4. Review information provided in maintenance instructions and data book with Consultant to ensure Owner's representatives have a complete understanding of electrical equipment and systems and their operation.

1.6. STARTING SYSTEMS

1.6.1. Coordinate schedule for start-up of various equipment and systems.

1.6.2. Notify Consultant seven (7) days prior to start-up of each item.

1.6.3. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

1.6.4. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

1.6.5. Verify that wiring and support components for equipment are complete and tested.

1.6.6. Execute start-up under supervision of manufacturer's representative and Contractors' personnel in accordance with manufacturers' instructions.

1.6.7. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

1.6.8. Submit a written report in accordance with Section 01 33 00 Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.6.9. Schedule verification/demonstration of the system with the SHN Project Manager, and Consultant. Deficiencies will be noted and acceptance will be contingent on the system being fully operational, meeting all code and life safety requirements, and able to fully serve the intended purpose. The verification report will signed by all parties.

1.6.10. Following verification and acceptance of the system schedule training of owner's staff as required by the specifications.

1.7. START-UP REPORT

1.7.1. Contractor to develop a report format for all systems.

1.7.2. Submit project specific, edited report forms in electronic format within ninety (90) days of award of contract. Assemble completed report forms into a commissioning manual on the following subjects:

1.7.3. Each mechanical system.

1.7.4. Each electrical system

1.7.5. Include manufacturer's equipment start-up reports and test certificates as an appendix to the commissioning manual.

1.7.6. The commissioning manual will be kept on site for use by appropriate Contractors.

1.7.7. Maintain this manual current.

1.7.8. Following, is an example of the report headings with data to be filled in by Contractor:

1.7.8.1. Technical Data

1.7.8.2. Specified:

1.7.8.3. Shop Drawing:

1.7.8.4. Installed:

1.7.8.5. Verified:

1.7.8.6. Date/Checked By:

1.7.9. Static Checks

1.7.9.1. Confirmation of Completion: Contractor to confirm all items listed are completed

1.7.9.2. Date / Checked By: Contractor to sign when the installation of the equipment and or systems are complete and ready for the Consultant to verify.

1.7.10. Operational Checks

1.7.10.1. System demonstrations and operational checks will be performed by by the Contractor or manufacturer, and will be co-ordinated and witnessed by the Owner's representative and Consultant.

1.8. SUBMISSIONS

1.8.1. Advise Consultant of report forms required for equipment and systems.

1.8.2. Provide manufacturer's start-up forms for equipment or systems.

1.8.3. Submit completed and verified commissioning manual to the SHN Project Manager with all data entered and sign-offs, prior to Substantial Performance of the Work.

1.9. CONTRACTOR START UP

1.9.1. Contractor to perform the following during start-up:

1.9.1.1. Start equipment and systems.

1.9.1.2. Test, adjust and balance equipment and systems.

1.9.1.3. Demonstrate equipment and systems.

1.9.2. Complete and submit start-up reports including:

1.9.2.1. Contractor's system and equipment start up reports.

1.9.2.2. Manufacturers' equipment start up reports.

1.9.3. Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.

1.9.4. Correct Contract deficiencies and defects identified as a result of the foregoing and as may be identified by the Consultant or SHN Project Manager.

1.10. PERFORMANCE TESTING

1.10.1. Performance testing to be performed and:

1.10.1.1. completed prior to application for Substantial Performance,

1.10.1.2. completed when all systems have been balanced and tested and are operating to the satisfactory of the Consultant.

1.10.2. Correct Contract deficiencies and defects previously outstanding and those identified during performance testing.

1.11. SEASONAL CONSTRAINTS

1.11.1. Notwithstanding requirements in this section, additional separate cycles of Contractor start-up, performance testing and fine tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.

1.12. PARTIAL UTILIZATION OF WORK

1.12.1. Applicable requirements specified in this Section apply to every phase of the Work to be utilized and turned over to the Owner.

1.12.2. Start up of systems for Owner’s use of areas in advance of Substantial Performance shall constitute acceptance of the system and will activate the warranty period. Owner will responsible to maintain, service, lubricate, replace filters, pay utility charges, etc.

1.12.3. Early Occupancy Operation and Maintenance: for systems or areas which are to be placed into operation with each phase and prior to Substantial Performance, include but not limited to chilled water system, power systems, Fire Alarm, Building Automation Systems, security, HVAC system, etc, and areas including the Shipping/Receiving.

1.12.4. Provide written maintenance procedures that will be followed, for review by the SHN Project Manager prior to use. .

1.12.5. Submit confirmation from equipment manufacturer that maintenance during construction phase, prior to turnover is adequate and that warranty will not be limited or voided.

1.13. SCHEDULE OF COMMISSIONING RESPONSIBILITIES – MECHANICAL SYSTEMS

1.13.1. Excavation and Backfilling:

1.13.1.1. Consultant: Provide inspections for general conformance to contract drawings. Review ITA report.

1.13.1.2. Contractor; Co-ordinate with Owner's representative.

1.13.2. Pipe Welding:

1.13.2.1. Consultant: Provide inspections for general conformance to contract drawings. Review Contractor report.

1.13.2.2. Contractor: Independent testing of welds; provide reports.

1.13.3. Adjustable Frequency Drives:

1.13.3.1. Consultant: Provide inspections for general conformance to contract drawings, review/accept factory test documentation.

1.13.3.2. Manufacturer: factory tests; factory representative for start up and training of Owner's personnel.

1.13.3.3. Contractor: provide reports confirming factory tests.

1.13.3.4. Owners representative: review factory tests; witness start up.

1.13.4. Three Phase Motors:

1.13.4.1. Consultant: Provide inspections for general conformance to contract drawings, review/accept factory motor tests, review Owner's random testing.

1.13.4.2. Manufacturer: factory tests.

1.13.4.3. Owners representative: Test motors on random basis.

1.13.5. Sound Attenuation; Vibration Isolation:

1.13.5.1. Consultant: Provide inspections for general conformance to contract drawings, review/accept Contractors testing agency data.

1.13.5.2. Manufacturer: Installation inspection at site.

1.13.5.3. Contractor: Provide independent testing

1.13.5.4. Owners representative: witness and verify testing/acceptance.

1.13.6. Fire Pump:

1.13.6.1. Consultant: Provide inspections for general conformance to contract drawings, review/accept Contractor's field tests/documentation.

1.13.6.2. Contractor: testing re NFPA; arrange witness of testing by authorities.

1.13.6.3. Owners representative: witness field tests.

1.13.7. Wet/Dry Sprinklers:

1.13.7.1. Consultant: Provide inspections for general conformance to contract drawings, review/accept Contractors field tests/documentation.

1.13.7.2. Contractor: provide testing re NFPA; provide certifications and approvals.

1.13.7.3. Owners representative: Witness tests.

1.13.8. Plumbing Systems:

1.13.8.1. Consultant: Provide inspections for general conformance to contract drawings, review pressure tests; witness flushing and disinfecting.

1.13.8.2. Contractor: pressure test; disinfect; provide independent lab testing after disinfecting.

1.13.8.3. Owner's representative: witness flushing/disinfecting.

1.13.9. Drainage and Vent Piping:

1.13.9.1. Consultant: Provide inspections for general conformance to contract drawings.

1.13.9.2. Contractor: testing in accordance with Building code and authorities having jurisdiction.

1.13.9.3. Owner's representative; witness tests

1.13.10. Pumps:

1.13.10.1. Consultant: Provide inspections for general conformance to contract drawings; review factory test data.

1.13.10.2. Manufacturer: Factory Tests; representative for start-up/training

1.13.11. Medical gas Systems:

1.13.11.1. Consultant: Provide inspections for general conformance to contract drawings, review pressure tests; flow and purity tests.

1.13.11.2. Contractor: pressure test as per TSSA.

1.13.11.3. Owner's representative: flow and purity tests

1.13.11.4. Owner's representative: witness pressure tests; witness flow and purity tests.

1.13.12. Carbon Monoxide Gas Detection:

1.13.12.1. Consultant: Provide inspections for general conformance to contract drawings, review/approve start up/calibration report.

1.13.12.2. Manufacturer: factory representative for start up/calibration/ follow-up.

1.13.12.3. Owner's representative: witness start-up and calibration

1.13.13. Glycol Systems:

1.13.13.1. Consultant: Provide inspections for general conformance to contract drawings. Review/Approve lab tests (concentration); Contractor's report.

1.13.13.2. Contractor: Test concentration; report on testing.

1.13.13.3. Owners representative: Witness tests.

1.13.14. Water Specialties:

1.13.14.1. Consultant: Provide inspections for general conformance to contract drawing.

1.13.14.2. Contractor: test operation and controls or make-up pump and alarm.

1.13.14.3. Owner's representative: witness testing of pump and alarms.

1.13.15. HVAC Water Treatment:

1.13.15.1. Consultant: Provide inspections for general conformance to contract drawing; review chemical analysis on start-up.

1.13.15.2. Contractor: Pressure test, flush and clean lines; provide start up chemical analysis; provide monthly service and treatment analysis; years supply of chemicals.

1.13.15.3. Owner's representative: witness flush, cleaning.

1.13.16. Refrigerant Detection:

1.13.16.1. Consultant: Provide inspections for general conformance to contract drawing.

1.13.16.2. Manufacturer: Factory representative for field test/start up unit and calibration; provide start up report; training to Owner.

1.13.16.3. Owner's representative: Witness start up and calibration.

1.13.17. Chillers:

1.13.17.1. Consultant: Provide inspections for general conformance to contract drawing. Review factory/field load test reports.

1.13.17.2. Manufacturer: factor/field load tests; review installation; supervise charging and start-up.

1.13.17.3. Owner's representative; witness factory/field load tests; charging and start-up.

1.13.18. Cooling Towers:

1.13.18.1. Consultant: Provide inspections for general conformance to contract drawing.

1.13.18.2. Manufacturer: Review installation.

1.13.18.3. Owner's representative; witness start-up, balancing, performance tests.

1.13.19. Humidifiers:

1.13.19.1. Consultant: Provide inspections for general conformance to contract drawing.

1.13.19.2. Manufacturer: representative for field review/testing.

1.13.20. Radiant Floor:

1.13.20.1. Consultant: Provide inspections for general conformance to contract drawing.

1.13.20.2. Contractor; Filling, testing and balancing.

1.13.20.3. Owner's representative: Witness/verify filling, testing and balancing.

1.13.21. Air Distribution:

1.13.21.1. Consultant: Provide inspections for general conformance to contract drawing; review balancing reports

1.13.21.2. Contractor: Independent air balancing agent

1.13.21.3. Owner's representative: monitor review air balancing.

1.13.22. Ductwork/Volume boxes:

1.13.22.1. Consultant: Provide inspections for general conformance to contract drawing; review/approve duct leakage tests.

1.13.22.2. Contractor: duct leakage tests/report.

1.13.22.3. Owner's representative: Witness duct leakage tests.

1.13.23. Air Handling Systems:

1.13.23.1. Consultant: Provide inspections for general conformance to contract drawing; factory inspection witness factory tests.

1.13.23.2. Manufacturer; provide for factory inspection; factory testing; supervise field installation.

1.13.23.3. Owner's representative: factory inspection; factory testing.

1.13.24. Fans:

1.13.24.1. Consultant: Provide inspections for general conformance to contract drawing.

1.13.24.2. Contractor: Air balancing fans.

1.13.24.3. Owner's representative: review air balance reports.

1.13.25. Testing Adjusting and Balancing:

1.13.25.1. Consultant: review TAB Contractor report; acceptance of same.

1.13.25.2. Contractor: provide independent TAB Contractor to verify systems and provide reports.

1.13.25.3. Owner's representative: review reports.

1.13.26. Controls and Instrumentation:

1.13.26.1. Consultant: Provide inspections for general conformance to contract drawing. Review Contractor's completion report. Attend with Owners representative for verification tests. Allow 1 week for 's verification tests.

1.13.26.2. Contractor: Provide completion tests as per Section 15900 Item 3.4. Provide technician for Owners verification tests of each system including; graphics, operation of devices, calibrations, sequences. Allow 1 week for Owner's verification tests.

1.13.26.3. Owner's representative: system by system verification of control systems including; graphics, operation of devices, calibrations, sequences.

1.14. SCHEDULE OF COMMISSIONING RESPONSIBILITIES - ELECTRICAL SYSTEMS

1.14.1. Concrete encased duct banks; trenching:

1.14.1.1. Consultant: Provide inspections for general conformance to contract drawing. Inspections during concreting and backfilling; review data.

1.14.1.2. Owner's representative: solid compaction in trenches

1.14.1.3. Owner's representative: review ITA test reports

1.14.2. Excavation and Backfilling:

1.14.2.1. Consultant: Provide inspections for general conformance to contract drawings. Review ITA report.

1.14.2.2. Contractor; Co-ordinate with Owner's representative.

1.14.2.3. Owner's representative: test granular materials to specifications; test compaction of backfill.

1.14.3. Bus Ducts, Wire and Cable:

1.14.3.1. Consultant: Provide inspections for general conformance to contract drawing. Review Field test data

1.14.3.2. Contractor: Provide cable manufacturer's inspection and report. Provide field tests.

1.14.3.3. Owner's representative: Review field tests.

1.14.4. Load Break Switchgear:

1.14.4.1. Consultant: Provide inspections for general conformance to contract drawing. Review Factory test reports.

1.14.4.2. Manufacturer: Factory tests.

1.14.4.3. Owner's representative; Witness/review factory tests.

1.14.5. Liquid Filled Transformers:

1.14.5.1. Consultant: Provide inspections for general conformance to contract drawing. Witness Factory tests.

1.14.5.2. Manufacturer: Factory tests

1.14.5.3. Owners representative; Witness/review factory tests

1.14.6. Primary grounding:

1.14.6.1. Consultant: Provide inspections for general conformance to contract drawing. Review Field test data.

1.14.6.2. Contractor: Provide field tests.

1.14.6.3. Owner's representative: Review field tests.

1.14.7. Low Voltage Switchboard:

1.14.7.1. Consultant: Provide inspections for general conformance to contract drawing. Review co-ordination settings, witness factory test, witness on site tests.

1.14.7.2. Manufacturer: provide factory tests.

1.14.7.3. Contractor: on site tests.

1.14.7.4. Owner's representative: witness factory test, witness on site tests

1.14.8. Secondary Grounding:

1.14.8.1. Consultant: Provide inspections for general conformance to contract drawing. Approve field testing methods and witness tests.

1.14.8.2. Contractor: provide field testing.

1.14.8.3. Owner's representative; witness testing.

1.14.9. Dry Transformer - refer to Section 16461:

1.14.9.1. Consultant: Provide inspections for general conformance to contract drawing. Witness field tests.

1.14.9.2. Contractor: Provide field testing

1.14.9.3. Owner's representative; witness testing.

1.14.10. Emergency Lighting:

1.14.10.1. Consultant: Provide inspections for general conformance to contract drawing. Witness field tests.

1.14.10.2. Contractor: Provide field testing.

1.14.10.3. Owners representative; witness testing.

1.14.11. Fire Alarm:

1.14.11.1. Consultant: Provide inspections for general conformance to contract drawing. Review/approve verification tests.

1.14.11.2. Manufacturer: verification tests

1.14.11.3. Owner's representative; witness testing.

1.14.12. Voice/Data System:

1.14.12.1. Consultant: Provide inspections for general conformance to contract drawing. Review verification test report.

1.14.12.2. Contractor: verification tests

1.14.12.3. Owner representative; witness verification tests.

1.14.13. Nurse Call:

1.14.13.1. Consultant: Provide inspections for general conformance to contract drawing. Review verification tests.

1.14.13.2. Manufacturer: verification tests, demonstrate system.

1.14.13.3. Owner representative; witness verification tests.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 1 requirements and documents referred to therein.

1.2. REFERENCES

1.2.1. Reference Standards:

1.2.1.1. OAA/OGCA Document 100 – 2018 (Reissued 2019) Recommended Procedures Concerning Substantial Performance of Construction Contracts and Completion Take-Over of Projects.

1.2.2. Definitions:

1.2.2.1. Certificate: A document attesting to the truth of a fact; in construction. A certificate is prepared by a professional, either an architect or an engineer.

1.2.2.2. Certificate of Substantial Performance: A certificate issued under the appropriate lien legislation attesting that the contract between the Owner and the Contractor is substantially complete.

1.2.2.3. Guaranty: A three-party agreement in which the third party (such as a surety) guarantees the performance of an obligation to the Owner in the event of default of the Contractor.

1.2.2.4. Holdback: 10% of the monetary amount payable under the construction contract, is held as security for a certain period. Holdbacks will be released on a phase by phase basis.

1.2.2.5. Lien: A legal claim on real property to satisfy a debt owed to the lien claimant by the property Owner, in accordance with the Construction Act.

1.2.2.6. Maintenance: The act of keeping a building system, process or property in proper and efficient working condition.

1.2.2.7. Post-occupancy Evaluation: An assessment of the performance of a work area after it has been occupied.

1.2.2.8. Ready-for-Takeover: In accordance with Canadian Construction Document Committee (CCDC) used to describe a set of contractual and regulatory requirements that must be satisfied prior to achieving a financial milestone for the release of the project close-out payment(s).

1.2.2.9. Substantial Completion: when the work or portion of the work is ready for occupancy and an occupancy permit has been issued by the Chief Building Official in accordance with the OBC,

1.2.2.10. Substantial Performance: as defined in the Construction Act

1.2.2.11. Warranty: A two-party agreement which provides an assurance by a Contractor to the Owner that the Contractor will assume stipulated responsibilities for correction of defects in the goods within a period of time as stated in the contract or in the specifications.

1.3. TAKEOVER PROCEDURE

1.3.1. Owner occupancy of work areas by phases in accordance with the requirements for occupancy Section 01 14 00 Work Restrictions.

1.4. CLOSEOUT PROCEDURES

1.4.1. Final Site Review: Consultant will perform final review in accordance with provisions under final Certificate for Payment. Conform to Construction Lien Act for commencement, procedure and release

of hold back fund. Lien Period commencement, procedure and release of hold back monies will be in accordance with Construction Act.

1.4.1.1. Conform to requirements of following General Conditions of Contract for closeout procedures:

1.4.1.1.1. Comply also with recommended takeover procedures contained in OAA/OGCA Document No. 100, except as modified by Contract Documents. In case of conflict with Contract Documents conform to more stringent requirements. Procedure described in document consists of following stages:

1.4.1.1.1.1. Stage 1 Contract Submissions

1.4.1.1.1.2. Stage 2 Contractor's Inspection for Substantial Performance

1.4.1.1.1.3. Stage 3 Contractor's Application for Certificate of Substantial Performance

1.4.1.1.1.4. Stage 4 Certificate of Substantial Performance

1.4.1.1.1.5. Stage 5 Certificate for Payment of Basic Statutory Holdback Monies

1.4.1.1.1.6. Stage 6 Contractor’s Completion of the Contract

1.4.1.1.1.7. Stage 7 Certificate for Payment of Monies for Finishing Holdback

1.4.1.1.1.8. Stage 8 Final Payment Certificate

1.4.1.1.1.9. Stage 9 Warranty-Guarantee Period(s)

1.4.1.2. All stages will be reviewed at first Coordination Site Meeting to ensure all parties understand their responsibilities.

1.4.2. Substantial Performance Review: Provide a written request to Consultant for Substantial Performance review of Work. Such request shall include a reconciliation of compliance with money test given in Construction Act in addition to all documentation specified in Contract Documents.

1.4.3. Certification of Substantial Performance: Prepare Certificate of Substantial Performance in a form required by Construction Act. When issued attach a normal progress Certificate showing statement of account to date and sub-titled "SUBSTANTIAL PERFORMANCE". Wherever practicable, accompany it with Final Change Order, sub-titled "FINAL". Consolidate all expenditures from cash allowances.

1.4.4. Defect and Deficiency:

1.4.4.1. A defect is an item of Work required by Contract which has been installed but requires repair and/or replacement at a specific time.

1.4.4.2. A deficiency is an item of Work required by Contract which has not been installed or put into operating condition.

1.4.4.3. A warranty item is an item of Work, installed under Contract which manufacturer or installer agrees to maintain in, or restore to perfect condition for a specific period of time, after Owner's acceptance of Work as being substantially performed.

1.4.4.4. When, in Consultant's opinion, Work under Contract is substantially performed and prior to final review by SHN Project Manager, a preliminary review shall be made at which time defects and deficiencies are listed, taking care to distinguish between preliminary and final reviews.

1.4.5. Deficiency Review:

1.4.5.1. Provide a written request to Consultant for deficiency review of Work. Ensure such request includes a statement by Contractor that Work to be reviewed by Consultant for deficiencies is, to best of his knowledge, in compliance with Contract Documents, reviewed Shop Drawings, samples and previously instructed corrections by Consultant have been corrected.

1.4.5.2. Provide a schedule of planned deficiency reviews having regard to foregoing.

1.4.6. Deficiency Lists:

1.4.6.1. Neither Owner's representatives, nor Consultant will be responsible for issue of extensive lists of deficiencies. Contractor assumes prime responsibility for ensuring items shown on Drawings and described in Specifications are completely his. Any reviews to approve Certificates of Substantial Performance will be immediately canceled if it becomes obvious that extensive deficiencies are outstanding.

1.4.6.2. Promptly correct deficiencies noted by Consultant. Do not proceed with installation of subsequent parts of Work until deficiencies have been corrected. Make every effort to ensure both defects and deficiencies are Made Good prior to final review.

1.4.6.3. During review, a decision will be made as to which elements must be completed at a later date due to uncontrollable circumstances such as weather, which defects must be rectified before building can be accepted and which defects are to be treated as warranty items.

1.4.6.4. Make Good deficiencies before Contract is considered complete.

1.4.6.5. Contractor will provide Consultant an electronic punch list prior to conducting their review. Ensure punch list includes a complete list of items identified in Contract that Contractor and his Subcontractors feel still incomplete or deficient in any way. Effectively identify each room or area so Consultant can reference that room or area in punch list during their review of Work. Deficiency list is made up of items identified in punch list plus any other items found by Consultant deemed to be incomplete or deficient.

1.4.7. Notification of Correction of Deficiencies: Advise Consultant in writing, upon completion of rectification of deficiencies noted by Consultant. Failure to provide such notification may be cause to withhold final payment.

1.4.8. Documents:

1.4.8.1. Within 21 Days of commencement of Work, Contractor shall make first submittal required by OAA/OGCA Document No. 100.

1.4.8.2. Submit documents in accordance with requirements of Contract Documents.

1.4.8.3. Submit required documents along with request for Certificate of Substantial Performance. Consultant's review for Substantial Performance is not required until such submittal is received.

1.4.9. Final Review for Final Payment:

1.4.9.1. Further to requirements of CCDC 2 General Conditions, final review of Work shall constitute review precedent to issuance of final certificate of payment.

1.4.9.2. If there are any further deficiencies determined by this review, they shall be listed by Consultant and provided to Contractor. This list shall be recognized as final deficiency list for purposes of acceptance of Work under Contract.

1.4.9.3. Such deficiencies shall be corrected by a date mutually agreed upon between Consultant and Contractor, unless a specific date is required by Contract and a re-review by Consultant shall be called for by Contractor following his own review to take place within 7 Days from date of request.

1.4.9.4. Contractor shall thereafter submit his invoice for final payment.

1.4.10. End of Warranty Period Review:

1.4.10.1. At beginning of 12th month after Substantial Performance of Contract in accordance with CCDC 2 General Conditions, SHN Project Manager, Contractor and Consultant, along with key Subcontractors as designated by Consultant, carry out a complete review of building and its systems to determine which deficiencies are to be rectified under warranty.

1.4.10.2. Prior to completion of warranty period, arrange with Consultant to carry out complete review of defects and deficiencies which have been observed during warranty period to determine which are to be corrected.

1.5. CLOSEOUT SUBMITTALS

1.5.1. Certificate of Substantial Performance:

1.5.1.1. Conform to Construction Act and publish copy of Certificate of Substantial Performance once in a construction trade newspaper.

1.5.1.2. Submit promptly copies of construction trade newspaper containing publication of copy of Certificate of Substantial Performance.

1.5.2. Infection Control Report:

1.5.2.1. Submit Report confirming the Place of the Work is free from mould contamination.

1.5.2.2. Submit above Report along with mould preventative maintenance plan and recommendations to Consultant prior to Owner using the Place of the Work for the purpose intended or obtaining Certificate of Substantial Performance of the Work, whichever date comes first.

1.5.3. Pre-Start Health and Safety Review Reports (PSR): Submit all exemption documents or PSR reports prior to Substantial Performance of the Work in accordance with Section 01 40 00.

1.5.4. Product Record Documents:

1.5.4.1. Obtain from Consultant and pay cost for 1 copy of Specifications and 1 set of white prints of Contract Drawings at commencement of Work and 10 Days prior to date of Substantial Performance; Submit “as-built” site set of Drawings and Specifications; “as built”.

1.5.4.2. Have items relating to mechanical and electrical work recorded by respective trade.

1.5.4.3. Add "AS-BUILT RECORD" at each drawing title block and on title page of Specifications.

1.5.4.4. Record following changes and deviations on record drawings:

1.5.4.4.1. depths of various elements of foundation in relationship to first floor level.

1.5.4.4.2. field changes of dimensions.

1.5.4.4.3. other significant deviations and changes which are concealed in construction and cannot be identified by visual review.

1.5.4.4.4. show actual locations of following on record drawings:

1.5.4.4.4.1. access doors and panels.

1.5.4.4.4.2. inverts of services at key points within building, at points where entering and leaving building, and at property lines. Dimension services in relation to structure and building grid lines.

1.5.4.4.4.3. duct work, piping, conduit, mechanical and electrical equipment and associated work.

1.5.4.4.4.4. concealed piping, conduit, equipment and conveying systems, including such items provided for future use.

1.5.4.4.4.5. record following information on record Specifications:

1.5.4.4.4.5.1. Products, materials and other items selected from those specified.

1.5.4.4.4.5.2. accepted substitutions and accepted alternatives.

1.5.4.4.4.5.3. other accepted changes and deviations to items specified.

1.5.4.5. Have record drawing white prints and Specifications available for review at all times.

1.5.5. Maintenance Instructions and Data Book: Provide Consultant with 3 sets of operating and maintenance instructions and data books, 10 Days prior to advising Consultant that Work is substantially performed which include:

1.5.5.1. Complete listing of Subcontractors' names, addresses and telephone numbers with notation as to which portions of Contract have been provided by them.

1.5.5.2. Complete listing of materials, Products and equipment including serial numbers, manufacturer's names and sources of supply.

1.5.5.3. Description of each system, with description of each major component of systems.

1.5.5.4. Operation and installation instructions for each assembly, component and system.

1.5.5.5. Complete cleaning and maintenance instructions for each finish, assembly, component and system, including warnings of harmful practices.

1.5.5.6. Lists of spare parts for each assembly, component and system complete with names, addresses and telephone numbers of Suppliers.

1.5.5.7. Operating curves of mechanical and electrical equipment.

1.5.5.8. A lubrication schedule of all equipment.

1.5.5.9. Page-size Valve Tag Schedule and Flow Diagrams.

1.5.5.10. Water treatment procedures and tests.

1.5.5.11. Final balancing reports for mechanical systems.

1.5.5.12. Installation manual or installation instructions for each mechanical, electrical or architectural item, stamped and signed by Subcontractors submitting them.

1.5.5.13. Record drawings of mechanical, electrical and special installations.

1.5.5.14. Final reviewed Shop Drawings.

1.5.5.15. Copies of all warranties, properly executed.

1.5.5.16. Provide books consisting of 3-ring hard cover loose-leaf binders, indexed as to contents and identified on binding edges as "Maintenance Instructions and Data Book, for (Project name)". Ensure binders contain name of Contractor and date of Substantial Performance of the Work.

1.5.5.17. Organize and label contents into applicable categories of work, parallel to Specification Sections and provide a Table of Contents.

1.5.5.18. Use consistent terminology.

1.5.5.19. Submit maintenance and operation instructions which are manufacturer's latest published editions at date of submission.

1.5.5.20. Should any finish, Product or assembly be injured or damaged by faulty maintenance materials, practices not warned against in maintenance manual or by failure to provide proper maintenance manuals in time, rectify such damage or injury at no additional cost to Owner.

1.5.6. Distribution System Diagrams: Prior to date of Substantial Performance, submit framed single line diagrams of electrical distribution systems.

1.6. DEMONSTRATIONS FOR OWNER’S PERSONNEL

1.6.1. Ensure that operating and maintenance manuals have been submitted in time for review before training sessions.

1.6.2. Provide qualified technicians to demonstrate operation and/or maintenance of systems to Owner’s staff.

1.6.3. Training sessions to include equipment manufacturer’s technician, hospital service staff, SHN Project Manager, Contractor, subcontractor and installer responsible for installation, Consultant.

1.6.4. For each new HVAC or electrical equipment or system, provide 3 separate demonstration and training sessions for hospital staff, to be scheduled with SHN Project Manager.

1.6.5. Prepare a video recording of training sessions for each piece of equipment. Submit 2 copies of video recordings in format to be coordinated with SHN Project Manager.

1.7. MISCELLANEOUS CLOSEOUT SUBMITTALS

1.7.1. Submit following to SHN Project Manager:

1.7.1.1. Keys.

1.7.1.2. Hydro certificate.

1.7.1.3. One valve directory, framed behind glass and installed in main Mechanical Room.

1.7.1.4. Electrical panel directories, inside panels.

1.7.1.5. Elevator as-built circuit drawings, parts list, and date book.

1.7.1.6. One electrical riser diagram, framed behind glass and mounted.

1.8. PRODUCT WARRANTIES

1.8.1. Examine Sections of the Specifications to ensure inclusion of Warranties specified.

1.8.2. In addition to requirements of the CCDC 2 General Conditions, Contractor shall note extended warranty periods required by Contract Documents for certain Products, systems and assemblies as specified under their respective Sections.

1.8.3. Spare Parts:

1.8.3.1. Supply extra maintenance materials and/or spare parts and store in a locked room as directed by SHN Project Manager.

1.8.3.2. Suitably package maintenance materials in accordance with manufacturer's instructions and label to identify Product type, manufacturer, Product name, colour number, dye lot and quantity.

1.8.3.3. Store maintenance materials, e.g., positioning, proper side up, etc., in accordance with manufacturer's recommendations.

1.8.3.4. Complete Maintenance Material Form Section 00 65 37 for each material.

PART 1 - PRODUCTS

Not applicable.

PART 2 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide demolition and salvage including but not limited to following:

1.2.1.1. Selective demolition of interior walls and ceilings as shown in drawings including doors and frames.

1.2.1.2. Removal of existing flooring, base, wall finishes.

1.2.1.3. New and or enlarged openings in floors and roof structure.

1.2.1.1. Items to be salvaged for reinstallation as part of the scope of work in this project:

1.2.1.1.1. Lockers and cabinets.

1.2.1.1.2. Corridor crash rails

1.2.1.1.3. Paper towel dispensers and other miscellaneous items identified on drawings.

1.2.1.1.4. Acoustic ceiling panels in existing ceilings to remain.

1.2.1.2. Items to be salvaged to be turned over to the Owner:

1.2.1.2.1. As noted on drawings.

1.2.2. This section does not include the following:

1.2.2.1. Removal of hazardous materials or asbestos abatement.

1.2.2.2. Demolition of exterior building components or structural elements.

1.2.2.3. Mechanical or electrical equipment, except as required to make minor modifications to allow the work to be completed.

1.2.3. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.3.1. Construction phasing, and work restrictions: Section 01 14 00 Work Restrictions.

1.2.3.2. Infection prevention and control requirements: Section 01 35 33 Infection Control Procedures.

1.2.3.3. Alteration and repair requirements, making good: Section 01 73 00, Execution.

1.3. REFERENCES

1.3.1. Definitions:

1.3.1.1. Hand Demolition: Systematic demolition of structures by workers using hand-held tools.

1.3.1.2. Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos, PCB's, CFC's, HCFC's, poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.3.1.3. Construction Waste Management Plan: Written plan addressing opportunities for reduction, reuse, or recycling of materials.

1.3.1.4. Construction Waste Management Report: Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials.

1.3.2. Reference Standards:

1.3.2.1. CSA S350-M80(03) - Code of Practice for Safety in Demolition of Structures

1.3.2.2. NFPA 241 - 2022, Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.3.2.3. Scarborough Health Network Contractor Procedure Manual (General Conditions) August 2022.

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, inspection of construction to be demolished, methods to be used, sequence and quality control, Project staffing, restrictions due to environmental protection requirements and other matters affecting demolition, to permit compliance with intent of this Section.

1.4.2. Review structural load limitations of existing structures. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays. Review and finalize protection requirements.

1.4.3. Coordination: Coordinate with Owner for the material ownership including but not limited to:

1.4.3.1. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor’s property and shall be removed from Project site.

1.4.4. Pre-Demolition Meetings:

1.4.4.1. Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor, SHN Project Manager, and Consultant for each work area.

1.4.4.1.1. Confirm extent of salvaged and demolished materials

1.4.4.1.2. Review [Contractor]'s demolition plan

1.4.4.1.3. Verify existing site conditions adjacent to demolition work

1.4.4.1.4. Coordination with other construction sub trades

1.4.4.2. Make a site inspection with SHN Project Manager and Consultant to examine existing conditions and areas adjacent to demolition work.

1.4.5. Scheduling:

1.4.5.1. Where practicable, remove or neutralize hazardous or toxic materials before demolition begins.

1.4.5.2. Phase selective demolition to be coordinated with Owner to accommodate new construction.

1.5. ACTION AND INFORMATIONAL SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Action Submittals: Provide the following submittals before starting any work of this Section

1.5.2.1. Schedule of Demolition Activities: Coordinate with Section 01 32 16 - Construction Scheduling. Submit demolition, schedule showing timing and sequencing of the work in each work area. Deviation from schedule will not be permitted without approval from SHN Project Manager.

1.5.2.2. Construction Waste Management Plan: to identify materials for reduction, reuse, or recycling:

1.5.2.2.1. Descriptions of and anticipated quantities of materials to be salvaged, reused, recycled and landfilled.

1.5.2.2.2. Number and location of dumpsters.

1.5.2.2.3. Schedule and anticipated frequency of tippage.

1.5.2.2.4. Name and address of haulers, waste facilities and waste receiving organizations

1.5.3. Informational Submittals: Provide the following submittals when requested by the Consultant:

1.5.3.1. Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Consultants for work of similar complexity and extent.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Submit copies of certified bills of lading or receipts from authorized disposal sites and reuse and recycling facilities for material removed from site.

1.7. QUALITY ASSURANCE

1.7.1. Comply with National Building Code, Part 8, Construction Safety Measures at Construction and Demolition Sites.

1.7.2. Do work in accordance with CSA S350 and NFPA 241 and comply with pertinent codes, regulations and insurance carriers providing coverage for this work.

1.7.3. Execute the work in strict accordance with The Occupational Health and Safety Act and Regulations for Construction Projects, latest addition. Keep copy of the Act at the place of the Work at all times.

1.8. DELIVERY, STORAGE AND HANDLIING

1.8.1. Ensure ceiling material being reclaimed has not come into contact or in any way contain hazardous materials or special waste.

1.8.2. Ensure ceiling material being reclaimed is dry and free from debris.

1.8.3. Comply with hauling and disposal regulations of Authority Having Jurisdiction.

1.9. EXISTING CONDITIONS

1.9.1. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1.9.1.1. Hazardous materials will be as defined in the Hazardous Materials Act.

1.9.1.2. Hazardous materials, if found or suspected, will be removed by Owner before start of the Work. Do not disturb Hazardous Substances or items suspected of containing Hazardous Substances.

1.10. SITE CONDITIONS

1.10.1. Review "Designated Substance Report" and take appropriate precautions.

1.10.2. If material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify SHN Project Manager immediately.

1.10.3. Proceed only after receipt of written instructions have been received from SHN Project Manager.

1.10.4. Demolition performed on this Project in hospital areas adjacent to patient care areas. Every part of the demolition work must be carefully planned, scheduled, and coordinated with the SHN Protect Manager, including:

1.10.4.1. Hours of operation

1.10.4.2. Dust control, infection prevention and control.

1.10.4.3. Disruption to existing mechanical or electrical services, fire alarm, sprinkler, communications systems.

1.10.4.4. Noise control.

1.10.4.5. Protection to existing building

1.10.4.6. Access to the work area including procedures for movement and removal of materials.

1.10.5. Conform to restrictions for maintaining on-going hospital functions including roads, streets, sidewalks, passageways. Do not place or store materials anywhere outside of the work area.

1.11. MAINTENANCE MATERIAL SUBMITTALS

1.11.1. Bundle 25 existing acoustic ceiling panels, as selected from the ceiling removals by the SHN Project Manager for Owner's future maintenance use.

1.11.2. Execute Section 00 65 37.

PART 2 - PRODUCTS

2.1. MATERIALS

2.1.1. Description:

2.1.1.1. Regulatory Requirements:

2.1.1.1.1. Conform to The Occupational Health and Safety Act and Regulation for Construction Projects

2.1.1.1.2. Conform to OBC, especially Division C, Part 1, Article 1.2.2.3 as applicable.

2.1.1.1.3. Conform to Fire Code, Regulation under Fire Marshal Act especially Part 8.

2.1.1.1.4. Conform to requirements of Section 01 50 00.

2.1.2. Provide materials necessary for temporary bracing and shoring. On completion, remove temporary materials from site.

2.1.3. Materials and Products Removed From Existing Building

2.1.3.1. Refer to drawings for existing items that are designated to be carefully removed and reinstalled or relocated.

2.1.3.2. Refer to drawings for existing items that are to be carefully removed and handed over to the Owner.

2.1.3.3. Materials resulting from demolition and not required to be retained shall be removed promptly from site in accordance with requirements of authorities having jurisdiction and in safe manner to minimize danger at site and during disposal.

2.1.3.4. Materials that are to be removed from the site and can be reused should be sent to the appropriate facility. Submit a waste management plan to Consultant including items for recycling.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Review Project Record Documents of existing construction provided by Owner.

3.1.2. Consultant does not guarantee that existing conditions are the same as those indicated in Construction Documents.

3.1.3. Preliminary Survey:

3.1.3.1. Before commencing demolition operations in each work area, examine the area determine type of construction, materials, condition of structure, finishes to remain, and site conditions.

3.1.3.2. Assess potential effect of removal of any part or parts on remainder of structure before such part(s) are removed.

3.1.3.3. Prepare a complete photographic record of all finishes and equipment to remain. Note any damages, missing items, breaches in fire rated construction, potential hazardous materials, conditions that are different from what is shown in the Construction Documents, and any other items of concern that could impact the construction. Submit report of existing conditions before start of demolition operations, for each work area.

3.1.4. Existing Services:

3.1.4.1. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.

3.1.4.2. Identify all services and systems exposed as part of the demolition.

3.1.4.3. Verify services are cut off and properly capped before commencing associated or effected demolition.

3.1.4.4. Provide and maintain temporary fire alarm and fire protection services required during demolition to satisfaction of authorities having jurisdiction, fire departments and SHN Project Manager.

3.1.4.5. Verify prior to commencement work of this Section that disconnection and capping of medical gas, electrical and mechanical services have been carried out.

3.1.4.6. Verify that dust control hoardings, and infection prevention measures have been completed, inspected and accepted before proceeding.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions:

3.2.1.1. Post suitable warning signs outside of work area for protection of patients and public. Supervise entrance to work area to prevent entrance by unauthorized persons. If requested, provide lockable doors to prevent public entering danger zone.

3.2.1.2. Post warning signs on electrical lines and equipment which must remain energized to serve other portions of the building during period of demolition.

3.2.1.3. Provide fire extinguishers acceptable to fire prevention authorities in locations and of type suitable to enable personnel to deal with fire occurring during progress of work.

3.2.1.4. Ensure that temporary fire separations are in place to maintain the integrity of existing fire separations, before commencement of demolition work.

3.2.2. Environmental Protection:

3.2.2.1. Do not interfere with infection control air pressure systems, ventilation and dust proof hoardings at any time.

3.2.2.2. Prevent extraneous materials from contaminating ductwork, or cavities in the structure beyond the work area by providing temporary enclosures during demolition work.

3.2.2.3. Removal of all demolition materials shall be in sealed containers.

3.2.3. Protection to Existing Services:

3.2.3.1. Provide protection required to enable existing building services, systems and equipment to remain in continuous and normal operations.

3.2.3.2. Demolition shall be carried out in a manner to ensure the minimum of disruption to Owner, and other contractors working in the building.

3.3. DEMOLITION — GENERAL

3.3.1. Execute work in conformance to Scarborough Health Network Contractor Procedure Manual. Notify SHN Project Manager before disrupting building access or services.

3.3.2. Carry out demolition in accordance with CSA S350-M. Demolish structure and remove materials from site. Use hand tools only. Use of pneumatic or hydraulic equipment must be reviewed and approved. Adhere to manufacturer's recommendations in use of hand held tools while conforming to the Occupational Health and Safety Act requirements. The use of chutes to lower demolition materials and debris must be coordinated with SHN Project Manager. Do not create falling materials hazard.

3.3.3. Do not demolish spray or trowel-applied friable materials, materials suspected of containing PCBs or other hazardous materials. Where such materials are encountered notify SHN Project Manager immediately. Do not proceed until instructions have been received from SHN Project Manager.

3.3.4. Remove mechanical and electrical items indicated to be removed. Remove all abandoned services, communication lines, electrical wiring, plumbing, and ductwork.

3.3.5. The use of pneumatic or electrical jack hammers is not permitted.

3.3.6. Report any existing conditions uncovered by the demolition work that require remediation. This includes:

3.3.6.1. Damaged or unsafe services.

3.3.6.2. Unsupported services, structural members or missing hangers.

3.3.6.3. Incomplete insulation, vapour retarder or air barrier.

3.3.6.4. Incomplete or unacceptable fire separation, missing seals, fire dampers, fireproofing or firestopping.

3.3.7. Minimize noise. Avoid use of noisy equipment. Proposed methods for demolition to be reviewed at the pre-construction meetings ahead of the work in each work area.

3.3.8. Firestopping and Smoke Seal: In event work of this Section impacts on integrity of fire separations, ensure trade performing firestopping is notified.

3.3.9. Demolition for new services:

3.3.9.1. Cut openings through existing walls, partitions, roofs and floors. Establish exact location of steel reinforcing and conduits in existing concrete slabs or walls before cutting. Locate using non destructive, non ionizing radio frequency locators, magnetic scanning or X-ray. Scanning procedures and proposed methods and equipment to be reviewed with SHN Project Manager before proceeding. Be responsible for damage to existing steel reinforcing and be liable for structural failure.

3.3.9.2. Neatly cut openings and holes plumb, square and true to dimensions required. Use cutting methods least likely to damage remaining or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3.3.9.3. Openings to allow passage of ducts shall be closed tight to perimeters of duct at all locations where fire dampers are required.

3.3.10. Where items are to be removed from existing structure or surfaces that are to remain in place, remove those items complete with hangers, brackets and other readily removable supports and fastenings:

3.3.11. Building Services:

3.3.11.1. Arrange with SHN Project Manager to disconnect or interrupt existing hospital services. Cut-off and cap existing building services under Owner's supervision.

3.3.11.2. Coordinate with Mechanical and Electrical respectively for removal, relocation and reinstallation of mechanical and electrical items.

3.3.11.3. Prevent demolition debris from entering building drains.

3.3.12. Relocation of Salvaged Items:

3.3.12.1. Carefully remove, store, protect and re-install where applicable existing materials and equipment noted on Drawings to be retained and relocated. Relocate items to be retained and store them in areas directed by Consultant. In addition to items indicated on Drawings, Owner still reserves the right to retain any items or materials.

3.3.13. In areas where work is required to be performed over acoustic ceilings composed of lay-in panels in a supporting grid, panels shall be carefully removed to avoid damage and replaced when the work is completed. If existing lay-in panels in a room are damaged and cannot be matched with new panels, then all the panels in that room shall be replaced with new units to the Consultant's approval at no additional cost to the Owner.

3.3.14. Restore disturbed fireproofing membranes or coverings to existing structural steel members and open web steel joists with materials and methods acceptable by the authorities having jurisdiction.

3.4. STOCKPILING

3.4.1. Label stockpiles, indicating material type and quantity.

3.4.2. Designate appropriate security resources/measures to prevent vandalism, damage and theft.

3.4.3. Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.4.4. Separate from general waste stream each of following materials. Stockpile materials in neat and orderly fashion for alternate disposal. Stockpile materials in accordance with applicable fire and safety regulations.

3.4.4.1. Glass fibre ceiling tiles.

3.4.4.2. Wood fibre ceiling tiles.

3.4.4.3. Wiring and conduit.

3.4.4.4. Outlets/switches.

3.4.4.5. Floor receptacles.

3.4.4.6. Metal duct work, baffles, HVAC equipment.

3.4.4.7. Demountable partitions.

3.4.4.8. Drapes.

3.4.4.9. Tracks and blinds.

3.4.4.10. Insulation batts.

3.4.4.11. Miscellaneous metals.

3.4.4.12. Carpet.

3.5. DEMOLITION - STRUCTURAL STEEL, EQUIPMENT SUPPORTS

3.5.1. Dismantle steel members and maintain structure stable. Do not place excessive loads on components.

3.5.2. Install adequate temporary guys and supports to ensure stability and to prevent excessive loading.

3.5.3. Support each component being disconnected from structure, and lower, do not drop, component after it is disconnected.

3.6. CUTTING EXISTING ROOFING

3.6.1. Remove portions of existing metal flashing and roofing system in areas indicated in drawings. Protect areas exposed by removal from the elements, rain, snow. Protection shall be installed immediately as removal Work proceeds and disturbed areas shall be made watertight at end of each Work shift.

3.7. REMOVAL OF CONCRETE

3.7.1. Saw cut and remove portions of existing concrete slabs and deck to allow for new installations as indicated. Cut or break-up concrete into small pieces. Do not allow pieces to fall on floor slab or ceilings below.

3.7.2. Cut slabs in smooth, uniform, straight lines. Take care to remove only as much as required.

3.7.3. Do slab cutting and removal in accordance with structural requirements, do not endanger Work or property.

3.7.4. Where reinforcing steel is to be left in place, use saw cuts from surface of concrete reinforcing steel around perimeter(s) of area(s) to be demolished, chip concrete without damaging reinforcing steel. Retouch damaged epoxy coating of existing reinforcing steel.

3.7.5. Take precautions to adequately support structure, provide bracing required for safety and execution of the Work. Coordinate with structural requirements

3.8. REMOVAL OF EXISTING WINDOWS

3.8.1. Remove existing window frames and glazing where indicated on drawings. Protect areas exposed by removal from the elements, rain, snow. Protection shall be installed immediately as removal Work proceeds and disturbed areas shall be made watertight at end of each work shift.

3.9. REMOVAL OF CEILINGS AND WALLS

3.9.1. Remove existing ceilings as shown in drawings and as required for installation of new partitions, equipment and/or new mechanical or electrical services.

3.9.2. Carefully remove acoustical ceiling panels keeping panels horizontal as much as possible. Vacuum clean top surface immediately upon removal using HEPA filter equiped vacuum cleaner.

3.9.3. Clean surfaces of all existing air ducts, conduits, piping and equipment above ceiling before any work is started using HEPA filter equiped vacuum cleaner.

3.9.4. Store and protect ceiling panels for re-installation after work above ceiling is complete, except where new ceilings are indicated. Replace damaged ceiling components with new materials to match existing.

3.9.5. Remove existing walls or portions thereof, where indicated and provide openings where required. Cut surfaces in smooth, uniform, straight, plumb lines.

3.9.6. When removing ceilings, remove entire ceiling systems including hangers and remove hangers used for support of light fixtures in such areas.

3.9.7. Take precautions to adequately support structure, provide bracing required for safety and execution of the work. Coordinate with structural requirements.

3.9.8. With reference to Ont. Reg 278, follow appropriate abatement procedures for all Type 1, Type 2, and Type 3 Operations as described in the regulation. This includes the removal of gypsum board and joint compound material. The cost for this hazardous materials abatement is included in the guaranteed price contract, not part of a cash allowance.

3.10. REMOVAL OF MASONRY

3.10.1. Remove masonry units not more than 1 block at a time, carefully lowered to the floor. Masonry shall neither be loosened in large masses nor permitted to fall in mass on floors.

3.10.2. Provide adequate temporary support where openings have been cut in masonry walls to prevent masonry displacement, cracking or other damage until permanent support is in place. Coordinate installation of new lintels in existing walls with structural work, metal fabrications work and masonry work.

3.11. REMOVAL OF RESILIENT FLOOR FINISHES

3.11.1. Strip all adhesive, underlayment or other cleavage membranes.

3.11.2. Coordinate surface preparation of concrete slab with flooring trades in Division 09. Leave substrate flush, smooth and level suitable for new floor finish.

3.12. REMOVAL OF CARPET

3.12.1. Remove underpad, if any.

3.12.2. Remove carpet edging and grippers at walls and vertical surfaces.

3.12.3. Strip all adhesive, underlayment or other cleavage membranes.

3.12.4. Leave substrate suitable for new floor finish.

3.13. REMOVAL OF CERAMIC AND QUARRY TILE

3.13.1. Remove mortar setting bed.

3.13.2. Strip all adhesive, underlayment or other cleavage membranes.

3.13.3. Leave substrate suitable for new floor finish and underlayment.

3.14. EXISTING SLAB PREPARATION

3.14.1. Remove existing floor finishes and bases as noted above.

3.14.2. At existing locations where flooring and base has been removed, where concrete curbs, bases, steps and pads have been removed, grind and patch existing concrete slabs as required and clean slab and base surfaces, remove ridges, bumps, adhesives and other matter detrimental to bond of levelling coat, new finish application or underlayment. Surfaces shall be smooth, level and free of gouges; prepare for levelling coat and/or new finish application specified in respective Sections or underlayment.

3.14.3. At existing locations designated to receive new flooring, remove paint, old adhesives, and hard applied finishes by grinding or other approved means, as required to accommodate new flooring. Prepare for flooring application. Coordinate requirements with Work specified in flooring Sections.

3.14.4. At existing locations where slabs have been contaminated with oil, grease, resins or other such material not compatible with subsequent applied underlayment or flooring, remove contaminants by blast tracking or prepare existing surfaces by other approved means.

3.14.5. Rinse subfloor and vacuum clean.

3.15. MISCELLANEOUS DEMOLITION

3.15.1. Remove millwork items, washroom accessories, fitments, and other such components as indicated on the drawings.

3.15.2. Remove fixtures, tracks, shelves, doors, frames, and railings that are attached to partitions and ceilings identified to be removed in the drawings.

3.16. CUTTING AND PATCHING

3.16.1. Obtain Consultant's approval before cutting, boring or sleeving load-bearing members.

3.16.2. Cut and patch as required to make work fit.

3.16.3. Make cuts with clean, true, smooth edges.

3.16.4. Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.

3.16.5. Patch openings created where mechanical and electrical services are removed in existing building.

3.16.6. Use specialists in affected materials to execute cutting, fitting and remedial work.

3.16.7. Make good surfaces exposed or disturbed by work with material and finish to match existing adjoining surfaces.

3.17. CLEANING

3.17.1. Waste Management:

3.17.1.1. Clear away dirt, rubbish and loose litter resulting from work of this Section, minimum daily. Keep dust to a minimum. Sweep clean work area daily. Remove demolished materials from the work area daily.

3.17.1.2. Removal of debris from the work are to be done at times scheduled with SHN Project Manager, using designated route to exterior location on site. Use covered wheeled bins only to transport materials from the work area.

3.17.1.3. Demolition materials to be placed in covered bins in location on site where shown on drawings.

3.17.1.4. Maintain site area around bins clean, safe and secure.

3.17.1.5. Selling or burning of materials on site is not permitted.

3.17.1.6. Conform to Waste Management Plan for delivery of materials to suitable recycling yards. Conform to requirements of authorities having jurisdiction regarding disposal of other waste materials.

3.17.1.7. Materials prohibited from municipality waste management facilities shall be removed from site and disposed of at companies specializing in handling contaminated materials.

3.17.1.8. Obtain weigh bills and receipts to document the disposal of all waste materials including recycled materials. Submit copies of these receipts as part of the closeout documents specified in Section 01 77 00 Closeout Procedures.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide concrete floor finishing including but not limited to following:

1.2.1.1. Finishing slabs on grade, suspended slabs.

1.2.1.2. Surface treatment with concrete hardener, sealer, and slip resistant coatings.

1.2.1.3. Curing and sealing.

1.2.1.4. Non-metallic quartz floor finish.

1.2.1.5. Premoulded joint filler.

1.2.1.6. Sawcutting construction and control joints in concrete.

1.2.1.7. Caulking construction and control joints over premoulded joint filler with sealant.

1.2.2. Related Sections Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Cast-in-Place Concrete: Section 03 30 00 Cast-In-Place Concrete

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. ACI: American Concrete Institute; https://www.concrete.org/

1.3.1.2. ADA: Americans with Disabilities Act; www.ada.gov.

1.3.1.3. ANSI ; American National Standards Institute

1.3.1.4. MSDS: Material Safety Data Sheets.

1.3.1.5. VOC: Volatile Organic Compound.

1.3.2. Reference Standards:

1.3.2.1. ACI 302.1R-15 - Guide for Concrete Floor and Slab Construction

1.3.2.2. ANSI A326.3-2017 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials

1.3.2.3. CSA A23.1:19/A23:19 - Concrete Materials and Methods of Concrete Construction/ Methods of Test for Concrete

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Pre-Installation Meetings:

1.4.1.1. Prior to commencement of work, arrange for Project site meeting of all parties associated with work of this Section. Include manufacturer’s technical representative, Contractor, Installers performing work of this Section, subcontractors installing finishes over these products (if applicable) and Testing Company's Representative.

1.4.1.2. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of placement and other matters affecting construction.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data:

1.5.2.1. Submit manufacturer's Product data, performance criteria and other documentation for each material specified in this Section proposed for use, including:

1.5.2.1.1. liquid curing/sealing and curing/hardener.

1.5.2.1.2. joint sealant and primer.

1.5.2.2. Include product characteristics, performance criteria, physical size, finish and limitations.

1.5.3. Submit concrete moisture test results.

1.5.4. Maintenance Data:

1.5.4.1. Submit maintenance manuals with complete detailed and specific instructions for maintaining, preserving and keeping clean surfaces of this work and which give adequate warning of maintenance practices or materials detrimental to sealed surfaces.

1.5.5. Safety: Provide WHMIS Material Safety Data Sheets.

1.6. QUALITY ASSURANCE

1.6.1. Perform Work in accordance with ACI 302.1

1.6.2. Installers Qualifications:

1.6.2.1. Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.6.2.2. Submit letter signed by manufacturer naming the installers and certifying that they have been trained in the application and safety measures for the products of this Section, and have 5 years experience.

1.6.2.3. Submit name and qualifications for the on-site lead supervisor who will be in full time attendance on site and directing the work of this Section.

1.6.3. Mock-Ups:

1.6.3.1. Provide site mock-up for concrete finishes indicating methods and materials, and procedures proposed to achieve concrete finishes in accordance with Division 01 General Requirements, and to comply with following requirements, using materials indicated for completed work:

1.6.3.1.1. Build mock-ups in location and of size as directed by Consultant.

1.6.3.1.2. Obtain Consultant's acceptance of mock-ups before starting construction;

1.6.3.1.3. Mock-up to be used throughout construction period and used as standard of acceptance for subsequent architectural concrete work.

1.6.3.1.4. Mock-up may form part of permanent structure when accepted by Consultant. Repair or replace unacceptable mock-ups at no additional cost to Owner.

1.6.3.1.5. In presence of Owner and Consultant, damage part of exposed face for each finish, colour, and texture, and demonstrate materials and techniques proposed for repairs to match adjacent undamaged surfaces.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Storage and Handling Requirements: Store materials on site in manner to prevent damage. Protect materials from inclement weather. Comply with CSA A23.1, Clause 7.1.

1.7.2. Deliver materials in manufacturer's packaging including application instructions.

1.8. SITE CONDITIONS

1.8.1. Temporary Lighting: Minimum 1-200 W light source, placed 2.5 m (8’) above floor surface, for each 40 m2 (430 sq ft) floor being finished.

1.8.2. Electrical power: Provide sufficient electrical power to operate equipment normally used during construction

1.8.3. Make work area water tight protected against rain and detrimental weather conditions.

1.8.4. Temperature: Maintain minimum 10 degrees C ambient temperature for 7 days before installation and minimum 48 hours after completion of work and maintain relative humidity maximum 40% during same period.

1.8.4.1. During hot weather, conform to CSA A23.1, Clause 7.4.

1.8.4.2. During cold weather, provide temporary heating and enclosures required. Mix, place and protect concrete in accordance with CSA A23.1, Clause 7.4.

1.8.5. Moisture: Ensure concrete substrate within moisture limits prescribed by manufacturer.

1.8.6. Safety:

1.8.6.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.8.6.2. Comply with manufacturer’s printed instructions regarding ventilation, breathing apparatus for workmen and protective clothing.

1.8.6.3. Provide CO2 or dry chemical fire extinguishers available in the immediate work area.

1.8.7. Ventilation: Provide continuous ventilation during and after coating application.

1.9. WARRANTY

1.9.1. Manufacturer Warranty: Warrant work of this Section for period of 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

1.9.2. Defects include but are not limited to; failure of floor finish remaining in place and bonding to structural slab and finish becoming defective and spalling and/or cracking.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Adsil Corporation; www.mymicroguard.com

2.1.1.2. BASF; www.master-builders-solutions.basf.com

2.1.1.3. CPD Construction Products; www.cpd.ca

2.1.1.4. Euclid Chemical Canada Ltd.; www.euclidchemical.com

2.1.1.5. Master® Builders Solutions; www.master-builders-solutions.basf.com

2.1.1.6. Sika Canada Inc.; www.sika.ca

2.1.1.7. W.R. Meadows of Canada; www.wrmeadows.com

2.1.2. Basis of Design: supply products from Sika Canada. Products from manufacturers listed will be considered provided they meet the performance requirements and are submitted in accordance with Division 01 General Requirements. Products from manufacturers not listed will not be considered.

2.2. DESIGN/PERFORMANCE REQUIREMENTS

2.2.1. Product quality and quality of work in accordance with Division 01 General Requirements.

2.2.2. Submit written declaration components used are compatible and will not adversely affect finished flooring products and their installation adhesives.

2.2.3. Supply liquid admixtures for concrete from single manufacturer. Supply liquid curing/sealing compound by same manufacturer which is supplying shake hardener.

2.3. HARDENERS

2.3.1. Non-Metallic Hardener: factory pre-mixed dry shake:

2.3.1.1. Type 1:“Diamag 7” by Sika Canada: Compressive Strength: 50 MPa (7250 psi) 28 day to ASTM C109

2.3.1.2. Type 2: “EmeriCrete® SH” by Sika Canada: Compressive Strength: >70 MPa (10150 psi) 28 day to ASTM C109

2.4. CURING COMPOUNDS

2.4.1. Acrylic emulsion cure and seal “Florseal WB-25” by Sika Canada:

2.4.1.1. Moisture retention of ASTM C309: Type 1, Class A

2.4.1.2. Alkali resistance, acid resistance, adhesion-promoting qualities and UV light degradation properties of ASTM C1315: Type 1, Class A

2.4.1.3. Adhesion requirements of ASTM C1315: Type 1, Class A

2.4.1.4. VOC Content: < 250 g/L

2.5. DENSIFIER

2.5.1. One-component liquid sodium silicate “Sikafloor®-3S” by Sika Canada:

2.5.1.1. Abrasion Resistance: 35 % increase in abrasion resistance (Wheel H-22/1000 g / 500 cycles) to ASTM D4060

2.5.1.2. Water vapour transmission: will not act as a vapour barrier to ASTM E96

2.6. MOIST CURE

2.6.1. Laminated waterproof paper: laminations of kraft paper and water resistant materials capable of retaining moisture in the concrete and tough enough to remain intact for the specified curing time.

2.6.2. Water: Water conforming to CSA A23.1, Clause 4.2.2, clear and entirely free from any elements which might cause staining of concrete.

2.7. JOINT SEALERS

2.7.1. For exposed locations: 2 component, chemically reactive polyurethane or polysulfide modified sealant over premoulded joint filler; self-levelling, grey colour, “Sikaflex 2C/SL” by Sika Canada Inc..

2.7.2. For slabs to receive architectural flooring finish: mix 1 part cement 2 parts sand 1 part additive. Additive: “Albitol” by Sika Canada Inc.

2.7.3. For expansion joints: “Sikaflex 2C NS/SL” polyurethane sealant by Sika Canada Inc.

2.7.4. For control joints which will not receive a resinous flooring finish: “Sikafloor 524 EZ Polyurea” by Sika Canada Inc.

2.7.5. For isolation joints: “Sikaflex 2C SL” polyurethane sealant by Sika Canada Inc.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Surface Preparation:

3.2.1.1. After concrete has been placed, strike off concrete level and flush to screeds with true straight edge.

3.2.1.2. Immediately after striking off concrete, level and consolidate with wooden darby or bull float. Complete levelling and consolidation before free moisture (bleeding) rises to surfaces.

3.2.1.3. Wait until concrete stiffens sufficiently to sustain foot pressure with only about 6 mm (1/4") indentation.

3.2.1.4. Float concrete with hand float or with power float. If free bleed water remains on surface at this time, remove it before floating.

3.3. INSTALLATION

3.3.1. Floor Finishing:

3.3.1.1. Laser screed floor slabs as scheduled herein, using laser screed vehicle. Laser vibratory screed is to be operated only by trained and qualified personnel who are familiar with equipment.

3.3.1.2. Power screed interior floor slabs with mechanical vibratory screeding equipment. Machine float and machine trowel floor surfaces to smooth, level and dense surfaces free from trowel marks, ridges and depressions, except where specified otherwise.

3.3.1.3. Power screed exterior floor slabs with mechanical vibratory screeding equipment. Float using magnesium floats and trowel to level and dense surfaces and finish to sidewalk "swirl" texture.

3.3.1.4. Use hand held vibrators and hand screed, float and trowel areas where power equipment is inaccessible, to same density and surface quality specified for floors finished with power operated equipment.

3.3.1.5. For concrete mixes containing steel fibre reinforcement, ensure finishing process leaves surface free of protruding fibres. If fibres protrude from surface after concrete has set, remove protruding fibres by grinding.

3.3.2. Non-Metallic Quartz Hardener:

3.3.2.1. In areas indicated to receive non-metallic quartz hardener, power screed floor slab and float.

3.3.2.2. Over floated concrete (at plastic stage), apply premixed non-metallic quartz shake in 2 equal applications at right angles to total application rate of 7.5 kg/m2 (1.5 lbs/sq ft) of floor area. Distribute evenly. Do not throw shake.

3.3.2.3. Float between application of shake and after second shake application with power float.

3.3.2.4. Machine trowel to smooth, level and dense surface, in uniform colour, free from trowel marks, ridges, pinholes and other defects.

3.3.3. Concrete Densifier: In areas to receive concrete densifier prepare surfaces as recommended and apply at rate of application in accordance with manufacturer's recommendation for desired level of finish. Level 2 hard shell medium sheen.

3.4. STEEL TROWEL FINISH

3.4.1. After floating, trowel surface with steel hand or flat trowel keeping blade flat at first and raising blade angle a little more on subsequent passes. Leave surface smooth, dense, of fine uniform texture without a swirl.

3.5. SLIP RESISTANT SWIRL FINISH

3.5.1. During final trowelling, impart a slightly rough and textured surface to the concrete by spin trowelling, moving the trowel in a "swirling" or circular motion in such a way as to produce a spin trowelled (swirled) texture or pattern on the surface.

3.6. BROOM FINISH FOR BOND

3.6.1. After floating, broom the substrate with a stiff bristle broom in one direction.

3.7. BROOM FINISH FOR SLIP RESISTANCE

3.7.1. After steel trowelling, lightly broom the surface with a bristle push broom to obtain a fine even texture finish.

3.8. CURING/SEALING OF FLOORS:

3.8.1. Liquid Curing/Sealing Compound:

3.8.1.1. Prior to sawcutting operations cure and seal floor with 1 coat of liquid curing/sealing compound by method and at rate recommended by manufacturer.

3.8.1.2. Apply second coat 28 Days following concrete cure.

3.8.2. Water Curing:

3.8.2.1. Water cure floors designated to be surfaced with ceramic or quarry tile, epoxy or urethane. Do not use curing/sealing compound.

3.8.2.2. Water down entire floor area and cover with curing blankets for minimum 7 Days. Sheet coverage includes exposed edges. Provide suitable weights to prevent blow-off or displacement of sheets. Do not use polyethylene sheets or burlap.

3.8.2.3. Remove cover after minimum 7 consecutive Days. Allow to air dry until concrete has developed design strength.

3.9. SAWCUTTING OF CONTROL JOINTS AND CONSTRUCTION JOINTS:

3.9.1. Sawcut control joints and construction joints in slabs where indicated on Drawings, 5 mm wide x 50 mm deep (3/16" x 2") for slabs on grade, in straight lines. For slabs on permanent metal floor deck sawcut control joints and construction as follows:

3.9.1.1. Service Areas: 5 mm wide x 19 mm deep (3/16" x 3/4").

3.9.2. Unless soft cut method is used, perform sawcutting 12 to 24 hrs after concrete has been placed, depending on when saw can run over concrete surface without leaving tread marks, when concrete can be sawn without dislodging aggregate and before uncontrolled shrinkage has occurred. Do not postpone sawing operations beyond these time limitations. Do not sawcut concrete, not utilizing retarding admixtures placed with temperature exceeding 26 deg C (79 deg F) later than 12 hrs after placing.

3.9.3. Continuously spray water on saw blade at all times during sawing. Grind edges of sawcuts to eliminate burrs; do not grind to bevel or chamfer joint edges. In sawcutting floor slabs on metal deck, run wet vacuum cleaner immediately behind sawcutting equipment.

3.9.4. After sawing and grinding, clean joints with jet of water and blow-out with compressed air. Immediately broom clean, residue caused by sawing operation as work progresses.

3.9.5. When cleaned joints are dry and prior to traffic being allowed over area, install temporary filler using polyethylene rope in such joints to prevent contamination of same.

3.10. JOINT SEALANT:

3.10.1. Following joint sealant installation specifications do not apply in areas of concrete slab to receive subsequent floor finishes such as tile, carpet, resilient tile and epoxy topping system.

3.10.2. Do not fill isolation joints, construction joints and control joints sooner than 120 Days after concrete placement. Execute joint sealing during cool, dry ambient conditions when slab is in contracted state to minimize future joint separation at sealant filled joints.

3.10.3. Remove temporary filler from sawcut joints. Remove 6 mm (1/4") scored strip from top of premoulded joint filler. Clean joints and blow clean with compressed air.

3.10.4. Reinstall backer rod into construction/expansion joints, set to proper sealant depth per sealant manufacturer's printed directions. Fill remainder of joint with standard joint sealant.

3.10.5. No sooner than 120 Days, fill interior sawn construction and control joints in concrete slabs full depth with heavy duty sawcut joint sealant in accordance with manufacturer's printed directions.

3.10.6. Caulk over premoulded isolation joint fillers with specified standard joint filler sealant.

3.10.7. Prime wall of joint as recommended by sealant manufacturer. Mix sealant as directed by manufacturer. Coat surfaces of metal in contact with sealant with primer as recommended by sealant manufacturer.

3.10.8. Fill exterior sawn construction and control joints and over premoulded isolation joint filler with specified standard joint sealant.

3.10.9. Comply with manufacturer's application and substrate temperature requirements. Mask floor to edge of joints and fill joint with sealant. After initial set, prime sealant surface with sealant and refill joints with sealant as required to produce slightly convex joint surface.

3.11. REPAIR

3.11.1. Crack Repair:

3.11.1.1. After concrete has cured, examine concrete floor surfaces and repair cracks. Route cracks out with mechanical router to minimum depth of 13 mm (1/2"). Then clean and fill cracks in same manner as control joints.

3.11.1.2. Correct defects in defined traffic floor only by grinding or removal and replacement of defective slabs. Areas requiring corrective work will be identified by Consultant. Verify corrected areas with Consultant.

3.11.1.3. Perform corrective work at times convenient to Consultant and at no cost to Owner.

3.12. SITE QUALITY CONTROL

3.12.1. Testing of concrete where coating or sealer to be applied:

3.12.1.1. Test floors that have been cured for minimum 28 days, and after patching or levelling compound is fully cured. Surface moisture content: Maximum 4%, tested by moisture meter. Do one test for every 500 sq.ft. or fraction thereof.

3.12.1.2. Submit test results clearly indicating the areas and locations for each test.

3.12.2. Manufacturer Services:

3.12.2.1. Provide services of a trained concrete technician from staff of surface hardener manufacturer to give assistance to this Section in proper use of material during initial periods of installation.

3.12.2.2. Give 3 Days notice to surface hardener manufacturer in advance of commencing work.

3.12.3. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.13. PROTECTION

3.13.1. Allow sealer to dry completely. Cover entire floor surface with strong scuff resistant, non-staining kraft paper with laps taped to seal out dust and dirt from contacting finished surface.

3.13.2. Covering shall remain in place for at least 10 days. No construction work or high point loading from scaffolding, equipment or materials shall be imposed on floor.

3.14. SCHEDULES

3.14.1. Floor Finishes Schedule:

3.14.1.1. Resilient Flooring:

3.14.1.1.1. Finish: Steel trowel followed by blastrack.

3.14.1.1.2. Hardener: None required.

3.14.1.1.3. Curing: Curing/sealing compound, or water curing.

3.14.1.2. Trowel Applied Composition Flooring (Epoxy, Urethane Acrylic, Neoprene, Polyester):

3.14.1.2.1. Finish: Steel trowel followed by blastrack.

3.14.1.2.2. Hardener: If recommended by composition flooring material manufacturer.

3.14.1.2.3. Curing: Water curing.

3.14.1.3. Liquid Applied Rubber or Plastic Membrane (Mechanical Waterproofing):

3.14.1.3.1. Finish: Steel trowel.

3.14.1.3.2. Hardener: None required.

3.14.1.3.3. Curing: Water curing.

3.14.1.4. Finished Concrete, Standard Exposed:

3.14.1.4.1. Finish: Steel trowel.

3.14.1.4.2. Curing: Curing/sealing compound.

3.14.1.5. Moderate or Heavy Duty:

3.14.1.5.1. Finish: Steel trowel.

3.14.1.5.2. Hardener: Non-metallic shake.

3.14.1.5.3. Curing: Curing/sealing compound.

3.14.1.6. Interior Stairs and Pedestrian Ramps:

3.14.1.6.1. Finish: Swirled.

3.14.1.6.2. Hardener: Non-metallic shake.

3.14.1.6.3. Curing: Curing/sealing compound, or water curing.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide masonry units including but not limited to following:

1.2.1.1. Concrete block masonry with sequestered carbon dioxide.

1.2.1.2. Reinforced concrete block masonry.

1.2.1.3. Block lintels and other special units.

1.2.1.4. Masonry mortar.

1.2.1.5. Masonry reinforcing.

1.2.1.6. Control joints and preformed joint filler.

1.2.1.7. Compressible filler.

1.2.1.8. Concrete fill for reinforced masonry.

1.2.1.9. Anchor bolts for securing wood coping atop masonry.

1.2.1.10. Building recesses to receive recessed work of this contract; i.e. Washroom accessories, fire extinguisher cabinets, drinking fountains, electrical panels, boxes and other work as shown or specified.

1.2.1.11. Cleaning masonry.

1.2.2. Products installed but not supplied under this Section:

1.2.2.1. Loose steel lintels.

1.2.2.2. Access doors.

1.2.3. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.3.1. Supply of miscellaneous steel required to be built-in, or installed in masonry: Section 05 50 00, Metal Fabrications.

1.2.3.2. Grouting hollow metal frames in fire rated masonry walls: Section 06 90 00, General Installations.

1.2.3.3. Firestopping and smoke seals: Section 07 84 00, Firestopping and Smoke Seals.

1.2.3.4. Caulking of interior control joints; caulking between masonry walls and adjacent materials: Section 07 92 00, Joint Sealants.

1.2.3.5. Sleeves for mechanical and electrical works penetrating masonry walls or partitions, including packing and sealing same: Division 21, Fire Suppression, Division 22, Plumbing, Division 23, Heat, Ventilating and Air Conditioning, Division 26, Electrical, Division 27, Communications and Division 28, Electronic Safety and Security.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. HVAC: Heating, Ventilating and Air Conditioning.

1.3.1.2. NRC: Noise Reduction Coefficient.

1.3.1.3. NRCC: National Research Council Canada; www.nrc-cnrc.ca.

1.3.1.4. SBS: Styrene Butadiene Styrene.

1.3.1.5. SCM: Supplementary Cementitious Materials.

1.3.1.6. STC: Sound Transmission Class.

1.3.1.7. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Reference Standards:

1.3.2.1. ASTM A123/A123M-18 - Standard Specification for Zinc (Hot-Dip Galvanized)Coatings on Iron and Steel Products

1.3.2.2. ASTM A153/A153M-16a - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

1.3.2.3. ASTM A580/A580M-18 - Standard Specification for Stainless Steel Wire

1.3.2.4. ASTM A666-15 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar

1.3.2.5. ASTM A1064/A1064M-18a - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

1.3.2.6. ASTM C207-18 - Standard Specification for Hydrated Lime for Masonry Purposes

1.3.2.7. CSA A123.3-05(R2020), Asphalt Saturated Organic Roofing Felt

1.3.2.8. CSA A165 Series-14(R2019) - CSA Standards on Concrete Masonry Units

1.3.2.9. CAN/CSA-A179-14(R2019) - Mortar and Grout for Unit Masonry

1.3.2.10. CSA A370-14(R2018) - Connectors for Masonry

1.3.2.11. CSA A371-14(R2019) - Masonry Construction for Buildings

1.3.2.12. CAN/CSA-A3000-18 - Cementitious Materials Compendium

1.3.2.13. CSA S304.1-14(R2019) - Design of Masonry Structures

1.4. SUBMITTALS

1.4.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.4.2. Test and Evaluation Reports:

1.4.2.1. Submit laboratory test reports certifying compliance of masonry units and mortar ingredients as specified herein.

1.4.2.2. Submit manufacturer’s certificate verifying quantity and source (location company) of sequestered carbon dioxide.

1.4.2.3. Submit manufacturer's certificate verifying masonry reinforcement supplied to Project conforms to ASTM A153/A153M, Class B-2 hot dipped galvanized requirements.

1.4.2.4. Submit manufacturer’s certificate verifying stainless steel masonry reinforcement is type 304/316; wire ties/reinforcing conforms to ASTM A580/A580M and plates/strips/sheets conform to ASTM A666.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers. Membership in good standing in OMCA.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Storage and Handling Requirements:

1.6.1.1. Handle, stack and store masonry units on skids and/or under tarps on site to avoid chipping, protect against staining and moisture entry.

1.6.1.2. Do not store or locate materials, plant and equipment in areas which will obstruct access to work by others.

1.7. SITE CONDITIONS

1.7.1. Ambient Conditions:

1.7.1.1. Provide uniformly distributed and continuous heating. Prevent stratification and cold spots.

1.7.1.2. Maintain masonry continuously at minimum 4 deg C (39 deg F) during placement and for 48 hours after placement.

1.7.1.3. Employ protection and heating methods which will prevent evaporation of moisture from masonry during curing.

1.8. WARRANTY

1.8.1. Manufacturer Warranty: Warrant air/vapour barrier work of this Section for period of 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; material remaining air and water tight.

PART 2 - PRODUCTS

2.1. MATERIALS

2.1.1. Performance/Design Criteria:

2.1.1.1. Concrete Block Fire and Smoke Separations: Refer to Ontario Concrete Block Association, Metric Technical Manual and provide hollow or solid block assemblies to achieve required fire ratings. Fire and smoke masonry separations shall conform to OBC requirements with respect to materials, classification, equivalent thicknesses, fire resistant ratings, type of concrete and other requirements of authorities having jurisdiction or provide fire rated, ULC listed concrete block assemblies for fire separations.

2.1.1.2. Conform to requirements of CSA S304.1 for determination of loads acting on connectors and design requirements and to CSA A370 and CSA A371 for construction requirements, except where more stringent requirements are noted and/or indicated on Drawings and specified herein.

2.1.2. Obtain each masonry unit from 1 manufacturer. Provide units of uniform texture and colour for each kind required.

2.1.3. Concrete Blocks: Normal and lightweight units, metric modular units with low carbon footprint conforming to CSA A165.1, Normal Type(s) Hollow Units: H/15/A/O, Full Solid Units: SF/15/A/O and Semi-Solid Units: SS/15/A/O, Lightweight Type(s) Hollow Units: Type H/15/C/O, Full Solid Units: Type SF/15/C/O and Semi-Solid Units: Type SS/15/C/O. Acceptable Products: “Carbon Cure®” by Brampton Brick Limited; www.bramptonbrick.com, Permacon; www.permaconpro.ca or “Autoclave Block” by Day & Campbell Limited; www.daycampbell.com.

2.1.4. Ensure exposed surfaces are free of cracks, chips or other blemishes and broken corners. Include required sash blocks for control joints, solid block where noted and concrete block lintels over openings in concrete block walls unless steel lintels are shown.

2.1.5. Unless shown otherwise, external corners on exposed interior block masonry shall be bullnosed units or alternatively, regular units with corners ground smooth with Carborundum grinder.

2.1.6. Dampproofing for Interior Masonry Partitions on Slab-On-Grade: No. 15 asphalt impregnated non-perforated roofing felt complying with CSA A123.3.

2.1.7. Lateral Support and Anchorage for Masonry Walls: In accordance with CSA S304.1 and as specified and supplied as part of work of Section 05 50 00.

2.1.8. Block Filler:

2.1.8.1. Dry pack grout to consist of 1 part Portland Cement, 1-1/2 parts sand, 2 parts 9 mm (3/8") pea gravel with only sufficient water to dampen mixture.

2.1.8.2. Measure and mix block filler in accordance with CAN/CSA-A179; mix filler to consistency in accordance with manufacturer's recommendations; do not mix different types of grout in same mixer used for mixing of mortar unless mixer is thoroughly cleaned. Use and place grout in its final position within 2-1/2 hours of mixing it. Discard grout not used within 2-1/2 hours. Use coarse grout where required, in spaces 50 mm (2") or more in least horizontal dimension. Use fine grout in spaces less than 50 mm (2") in horizontal dimension.

2.1.9. Bituminous Paint: Supply "810-07 Non-Fibered Asphalt Roof and Foundation Coating" by Henry Company; www.ca.henry.com.

2.1.10. Anchor Bolts: Minimum 9 mm (3/8") dia steel. In length shown on Drawings, hot dip galvanized.

2.1.11. Compressible Filler: "Backerseal" by Emseal Corporation; www.emseal.com.

2.1.12. Premoulded Filler: "Rodofoam PR grade" by GCP Applied Technologies, Inc. or "Rescor Expansion Joint Filler" by W. R. Meadows of Canada Ltd. Premoulded filler shall be twice thickness of opening to be filled.

2.1.13. Stone Wool Filler: Stone wool batt insulation by Roxul Inc.; www.roxul.com.

2.1.14. Horizontal Joint Material:

2.1.14.1. "NS – Closed Cell Neoprene Sponge" by Hohmann & Barnard, Inc.; www.h-b.com.

2.1.14.2. Size: 9 mm (3/8") thick x 75 mm (3") wide x roll length.

2.1.15. Rubber Concrete Block Control Joint Material: "RS Series - Regular Rubber Control Joint" by Hohmann & Barnard, Inc.; www.h-b.com or "Titewall BL-A Control Joint" by Blok-Lok Limited; www.blok-lok.com.

2.1.16. Control Joint Bond Break: CAN/CGSB-51.34-M, 0.15 mm (6 mil) thick clear polyethylene cut into 1 piece strips with width to suit wall thickness.

2.1.17. Sealant: Polyurethane, tested for non-staining of masonry conforming to requirements of Section 07 92 00. Colour selected by Consultant.

2.1.18. Masonry Reinforcement:

2.1.18.1. Masonry Connectors and Reinforcement: Performance tolerance requirements and corrosion protection for masonry connectors and horizontal reinforcing in accordance with requirements of CSA A370, CSA A371 and ASTM A1064/A1064M. Provide corrosion and dielectric protection for anchors, connectors, ties, reinforcement and other metal accessories to suit wall design and thickness as follows:

2.1.18.1.1. Hot Dip Galvanized: For interior masonry in heavy moisture environment; hot dip galvanized after fabrication with min zinc coating in accordance with ASTM A153/A153M Class B for wire ties/reinforcing 458 g/m² (1.5 oz/sq ft)

and ASTM A123/A123M for plates/strips/sheets 610 g/m² (2.0 oz/sq ft) (on each face).

2.1.18.2. Masonry Reinforcement for Interior Single Wythe Walls: “120 Truss-Mesh” by Hohmann & Barnard, Inc.; www.h-b.com or “BL30" by Blok-Lok Limited; www.blok-lok.com, 3.8 mm (9 ga) deformed wire for single block wythes; sized 50 mm (2") narrower than wall or partition. Provide shop fabricated corners, intersections and curved configuration where required. Finish as specified herein depending upon location of walls.

2.1.18.3. Adjustable Masonry Reinforcement for Interior Composite Walls: “BL36" by Blok-Lok Limited; www.blok-lok.com or “170-ML Truss Adjustable Eye-Wire” by Hohmann & Barnard, Inc.; www.h-b.com, 4.8 mm (3/16") nominal dia deformed wire; sized 50 mm (2") narrower than wall or partition. Hot dipped galvanized finish as specified herein.

2.1.19. Mortar:

2.1.19.1. Mortar and Grout for Unit Masonry: Conforming to CAN/CSA-A179.

2.1.19.2. Masonry Cement: Conforming to CAN/CSA-A3000.

2.1.19.3. Hydrated Lime: Conforming to ASTM C207; Lime Type "S".

2.1.19.4. White Portland Cement: Federal White Type GU (Type 10).

2.1.19.5. Cement: Cement meeting requirements of CAN/CSA-A3000.

2.1.19.6. Sand: Clean, sharp, washed and conforming in all respects to requirements of CAN/CSA-A179.

2.1.19.7. Water for Mortar Mixing: Potable, free from any deleterious substances.

2.1.20. Fabrication:

2.1.20.1. Masonry Lintels: Fabricate masonry block lintels as indicated on Drawings. Section 03 20 00 shall supply and set reinforcing bars into masonry block lintels over openings in block masonry wall in accordance with lintel schedule noted on Structural Drawings. Use concrete, not mortar, to fill block.

2.1.20.2. Cutting Units: Cut masonry units with wet saw; pre-soak units using clean water prior to cutting them and clean units using a stiff fibre brush and clean water. Allow units to surface dry prior to placement in wall system.

2.1.21. Mixes:

2.1.21.1. Mortar Mixing:

2.1.21.1.1. Mix required amount from site silo (including colour load at pre-set rate) as required. Take representative samples for testing consistency of strength (and colour) according to CAN/CSA-A179. Use mortar within 2 hours after mixing at temperature of 26 deg C (79 deg F), or 2-1/2 hours at temperatures under 10 deg C (50 deg F).

2.1.21.1.2. Mix mortar in a mechanical batch mixer. Do not hand mix except for work of a very minor nature.

2.1.21.1.3. Mix mortar colour pigment and masonry or Portland cement in accordance with manufacturer's instructions and adjust loading as required to produce mortar matching accepted sample.

2.1.21.1.4. Provide mortar within 2 hours of mixing. Discard mortar after 2 hours. Mortar may be re-tempered within 2 hours of mixing to replace water lost by evaporation (1 hour when temperature is over 26 deg C (79 deg F)).

2.1.21.2. Proprietary Mortar Mixes: Lafarge Canada Inc, St. Lawrence Cement Company or Daubois Inc. materials conforming to mix requirements specified.

2.1.21.3. Site Silo Mortar Mixes: Daubois Inc., Maxi-Mix Ltd. or Jiffy Concrete Products conforming to mix requirements specified.

2.1.21.4. Load Bearing Masonry Unit Mortar: 1/2 part Portland cement (CAN/CSA-A3000 Normal) to 1 part masonry cement (CAN/CSA-A3000 Type H) to 4-1/2 parts damp sand plus water to produce mortar with a minimum compressive strength of 12.5 MPa (1813 psi) at 28 Days of age, conforming to CAN/CSA-A179, Type "S".

2.1.21.5. For Bedding Steel Bearing Plates, Lintels, for Laying Bearing Courses Under Concentrated Loads and for Laying Masonry Below Grade: Use Type 'S' cement mortar, having a compressive strength of 12.5 MPa (1813 psi) minimum.

2.1.21.6. Use Type "N" mortar, having compressive strength of 5 MPa (725 psi) minimum.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions:

3.2.1.1. Provide temporary bracing for masonry work during erection to prevent damage due to winds or other lateral loads until permanent structure provides adequate bracing.

3.2.2. Surface Preparation:

3.2.2.1. Apply bituminous paint to steel buried in masonry.

3.2.2.2. Do not mix in water until cement and aggregate have been combined.

3.2.2.3. Maintain mortar continuously at minimum 10 deg C (50 deg F) during mixture.

3.2.2.4. Do not provide chemicals, additives or other contaminants to mortar mixture without review by Consultant.

3.2.2.5. Wet exposed masonry surfaces minimum once every 24 hours for 14 Days to minimize and retard surface evaporation.

3.3. INSTALLATION

3.3.1. Provide scaffolding required to complete work of this Section. Provide scaffolding independently supported from floor or ground.

3.3.2. Conform to the OHSA; erect scaffolding adequate for proper execution of work, maintain and remove on completion. Lay masonry from scaffolds erected on same side as face work. Do not support scaffolding from finished building surfaces.

3.3.3. Conform to CSA S304.1 and CSA A371 for masonry work.

3.3.4. Do masonry mortar and grout work in accordance with CAN/CSA-A179 and CSA A371 except where specified otherwise.

3.3.5. Execute masonry work under continuous supervision and direction of a competent foreman.

3.3.6. Lay and set masonry units using experienced mechanics.

3.3.7. Do not erect more than 1500 mm (5') in height of any wall in any 1 Working Day and do not raise any part of wall more than 600 mm (24") above remainder at any time.

3.3.8. Do not tooth at wall terminations. Rake back 1/2 unit length where stop-off occurs in horizontal run of masonry.

3.3.9. Lay up units true to line with accurately spaced courses. Keep bond plumb throughout. Provide corners and reveals plumb and true. Provide horizontal and vertical joints of uniform thickness in straight lines. Keep exposed faces free from stains, chips and cracks. Keep tolerance in plane 3 mm in 2400 mm (1/8" in 8').

3.3.10. Provide running bond unless indicated otherwise.

3.3.11. Avoid overplumbing and pounding of masonry corners and jambs after setting position. After mortar has set, if adjustment is required, remove mortar and replace with new mortar.

3.3.12. Install masonry wall base anchors in masonry foundation walls to line up with voids in masonry walls above as indicated on Drawings. Solidly fill voids between anchors and masonry with mortar.

3.3.13. Dampproof Coursing of Interior Partitions: Below first masonry course of inner wythe at floors on grade. Extend dampproofing through full thickness of inner wythe.

3.3.14. Laying Concrete Block:

3.3.14.1. Do not wet concrete block before laying. Lay first course of block work in full beds of mortar with joints of uniform thickness. Provide 100% solid blocks at following locations:

3.3.14.1.1. Top course of interior block walls and block back-up wythes.

3.3.14.1.2. At sills of openings e.g. windows, louvres, etc.

3.3.14.1.3. Top course of block below beams, joists and lintels bearing on walls.

3.3.14.2. Provide square end blocks at jambs of openings.

3.3.14.3. Provide concrete masonry units with face shells and end joints fully filled with mortar. Do not slush mortar into joints.

3.3.14.4. Provide damming and grout fill to vertical concrete block wall cavities at control joints.

3.3.14.5. Extend block partitions, both fire rated and non-fire rated, up to within 25 mm (1") of underside of structure above unless otherwise indicated, to allow for structural deflection.

3.3.14.6. Where gypsum board is applied directly to block walls, level walls to 3 mm in 3000 mm (1/8” in 10').

3.3.15. Concrete Block Lintels:

3.3.15.1. Unless indicated otherwise on Structural Drawings, provide concrete block lintels over openings in masonry walls. Refer to Mechanical and Electrical Drawings for location of ducts and equipment mounted in or projecting through masonry walls. Refer to Structural Drawings for Lintel Schedules.

3.3.15.2. Unless otherwise noted in Door and Frame Schedule, set precast U-shaped reinforced block lintels for full thickness of wall plus minimum 200 mm (8") bearing. Provide reinforcement as indicated on Structural Drawings.

3.3.15.3. Fill lintels with concrete and leave shoring in place for minimum 10 Days before removal.

3.3.15.4. Set concrete blocks over lintel unit in a full mortar bedding.

3.3.16. Lateral Support Angles:

3.3.16.1. Install lateral support angles to underside of structure, at 2000 mm (6' - 6") oc, for lateral stability of [interior masonry walls] and [back-up wythe masonry walls].

3.3.16.2. Install lateral supports at either horizontal or vertical intervals spaced at not more than:

3.3.16.2.1. 20 x wall thickness for solid wall of solid units.

3.3.16.2.2. 18 x wall thickness for solid wall of hollow units.

3.3.16.2.3. 36 x wall thickness for partitions.

3.3.17. Joint Tooling:

3.3.17.1. Provide joints in masonry, firmly pointed, compacted and tooled.

3.3.17.2. Interior Masonry Joint Tooling:

3.3.17.2.1. Exposed: Concave joints.

3.3.17.2.2. Concealed: Flush joints.

3.3.18. Built-In Work:

3.3.18.1. Solidly build items of hollow metal work and miscellaneous metal work, including but not limited to grilles, hose cabinets, electrical panels into masonry work, and ensure they are set square and true in walls and partitions.

3.3.18.2. Cut for and build into masonry, anchors, sleeves, inserts, reglets, piping, conduit, outlet boxes, metal flashings and leave chases, slots or openings required for fixing of work of other Sections. Build chases into masonry walls; do not cut.

3.3.18.3. Firestopping and Smoke Seal: Firestopping and smoke seals around penetrations, at control joints and deflection spaces in fire separations shall be part of work of Section 07 84 00. Provide assistance as required to trade performing firestopping.

3.3.18.4. Access Doors: Install access doors and panels in accordance with manufacturer's recommendations.

3.3.19. Control Joints: Provide vertical control joints in masonry walls where indicated and as detailed on Drawings. Unless otherwise indicated on Drawings, provide vertical and horizontal control joints as follows:

3.3.19.1. At column grid locations.

3.3.19.2. At abrupt changes in wall height.

3.3.19.3. At changes in wall thickness, such as those at pipe or duct chases and those adjacent to columns or pilasters.

3.3.19.4. Above joints in foundations and floors.

3.3.19.5. Below joints in roofs and floors that bear on wall.

3.3.19.6. At a distance of not over 1/2 allowable joint spacing from bonded intersections or corners.

3.3.19.7. At 1 or both sides of door and window openings unless other crack control measures are used, such as joint reinforcement or bond beams.

3.3.19.8. Obtain consultant's review of exact locations of control joints.

3.3.20. Movement/Expansion Joints: Provide vertical movement/expansion joints in masonry walls where indicated and as detailed on Drawings. Unless otherwise indicated on Drawings, provide vertical and horizontal control joints as follows:

3.3.20.1. Below shelf angle supports.

3.3.20.2. Near changes in wall direction (such as building corners).

3.3.20.3. At changes of building height.

3.3.20.4. At changes in wall thickness.

3.3.20.5. Periodically along continuous lengths of wall.

3.3.20.6. At wall openings (such as windows and doors) and

3.3.20.7. At changes of building materials.

3.3.20.8. In exterior cavity walls with concrete block backup, form vertical control joints in concrete block backup with control joint filler.

3.3.20.9. Provide slip plane under steel angles and plates.

3.3.21. Masonry Reinforcement:

3.3.21.1. Install masonry connectors and masonry reinforcement in accordance with CSA A370 and CSA A371.

3.3.21.2. Provide block reinforcement, adjustable veneer ties and veneer anchors in accordance with manufacturer's instructions. Reinforce blockwork.

3.3.21.3. Supervise and coordinate installation of veneer anchors.

3.3.21.4. Reinforce load bearing interior masonry partitions every alternate horizontal joint with continuous block reinforcing.

3.3.22. Beams, Lintels, Shelf Angles, Shelf Angle Brackets and Spacers: Install bearing plates and pads, angles, beams, lintels, shelf angles and spacers accurately in position.

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work:

3.4.1.1. Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4.1.2. Replace masonry units stained or chipped, or materials affected by inadequate protection.

3.5. CLEANING

3.5.1. Keep wall clean and free of mortar stains during laying. Allow mortar droppings which adhere to wall to dry out but not set. Then rub with small piece of masonry followed by brushing to remove all traces. On completion of masonry construction, after mortar is thoroughly set and cured, clean masonry thoroughly.

3.5.2. Protect windows, trim and metal from cleaning agents.

3.5.3. Remove mortar with wood paddles and scrapers before wetting. Saturate masonry with clean water and flush off loose mortar and dirt. Clean blockwork using water, scrubbing brushes and wood paddles only.

3.5.4. Clean masonry to be left exposed, using procedures as outlined herein and, where this is inadequate, try following recommendations outlined in BIA’s Technical Note No. 20, June 2006.

3.5.5. Should these methods prove inadequate consult masonry manufacturer before undertaking unusual cleaning procedures and obtain Consultant's prior consent.

3.5.6. Clean adjacent surfaces completely, which have been soiled or otherwise marred.

END OF SECTION

PART 1 - GENERAL

1.1. SUMMARY

1.1.1. Section Includes: Provide metal fabrications including but not limited to following:

1.1.1.1. Structural metal stud framing system in exterior wall assemblies including:

1.1.1.1.1. Wall studs subjected to lateral loads (no axial loads other than self weight and weight of applied finishes).

1.1.1.1.2. Steel bridging.

1.1.1.1.3. Top and bottom track.

1.1.1.1.4. Head, sill and jamb members for wall openings.

1.1.1.1.5. Studs, bridging and track connections.

1.1.1.1.6. Top and bottom connections to structure complete details to accommodate structure deflections.

1.1.1.2. Metal air seal in conditions that require air barrier continuity and as shown in drawings.

1.1.2. Products installed but not supplied under this Section:

1.1.2.1. Cladding support clips.

1.1.3. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.1.3.1. Wall sheathing: Section 06 16 00 - Sheathing

1.1.3.2. Provision of insulation: Section 07 21 00 - Thermal Insulation.

1.1.3.3. Provisions of flexible air vapour barriers to maintain integrity of air/vapour barrier: Section 07 27 00 - Air Barriers.

1.1.3.4. Provision of sealants and caulking: Section 07 92 00 - Joint Sealants.

1.1.3.5. Metal wall panels: Section 07 46 19 – Metal Siding

1.1.3.6. Lightweight steel stud framing: Section 09 22 16 - Non-Structural Metal Framing

1.2. REFERENCES

1.2.1. Definitions:

1.2.1.1. Delegated Design: certain detailed design aspects of the Work, as described in this Section, are assigned to a professional engineer engaged by the Contractor, specializing in the type of work being deferred.

1.2.2. Reference Standards:

1.2.2.1. ASTM A307-21 - Standard Specification for Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength

1.2.2.2. ASTM A325-14 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

1.2.2.3. ASTM A653/A653M-20 - Standard Specification for Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

1.2.2.4. ASTM F3125/F3125M-23 - Standard Specification for High Strength Structural Bolts, Steel, and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions

1.2.2.5. CAN/CSA-S136-(R2021) - North America Specification for the Design of Cold Formed Steel Structural Members including supplement CSA-S136.1-12

1.2.2.6. CAN/CGSB-1.181-99 - Ready-Mixed Organic Zinc-Rich Coating

1.2.2.7. CAN/CGSB-7.1-98 - Lightweight Steel Wall Framing Components

1.2.2.8. CAN/ULC-S101 -14-REV1 - Standard Methods of Fire Tests of Building Construction and Materials

1.2.2.9. CSA W47.1-19 - Certification of Companies for Fusion Welding of Steel Structures

1.2.2.10. CSA W59-18(R2023) - Welded Steel Construction (Metal Arc Welding)

1.3. ADMINISTRATIVE REQUIREMENTS

1.3.1. Coordination: Coordinate structural assemblies with adjoining construction and work specified in separate Sections.

1.3.2. Preinstallation Meeting:

1.3.2.1. Conduct a pre-installation meeting in accordance with Section 01 30 00 – Administrative Requirements.

1.3.2.2. Prior to start of work, arrange for Project site meeting of parties associated with work of this Section. Presided over by Contractor, and Subcontractor performing work of this trade.

1.4. SUBMITTALS

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

1.4.2. Product Data Sheets: Submit manufacturer's product data sheets for products to be used in the work of this section. Manufacturer's product data sheets shall include:

1.4.2.1. Material and product physical properties and characteristics including size, finish.

1.4.2.2. Performance criteria.

1.4.2.3. Limitations of products.

1.4.2.4. Submit product data for mechanical fasteners indicating sizes, load capacities and type of corrosion protection.

1.4.3. Shop Drawings: In addition to minimum requirements indicate following:

1.4.3.1. Wall studs subjected to lateral loads (no axial loads other than self weight and weight of applied finishes).

1.4.3.2. Indicate design loads on Shop Drawings.

1.4.3.3. Steel bridging.

1.4.3.4. Top and bottom track.

1.4.3.5. Head, sill and jamb members for wall openings.

1.4.3.6. Studs, bridging and track connections.

1.4.3.7. Top and bottom connections to structure complete details to accommodate structure deflections.

1.4.4. Ensure a licensed engineer specified herein is responsible for:

1.4.4.1. Production and review of shop drawings.

1.4.4.2. Shop drawings and calculations to be prepared by a structural engineer, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, shop drawings, field review reports and other submittals prepared by them.

1.4.4.3. Indicate plans and grid lines, structural members and connection details, bearing and anchorage details including wall cladding, framed openings, accessories, schedule of materials and finishes, camber and loadings, fasteners and welds.

1.4.4.4. Indicate details for reinforcing as required to accommodate mechanical, electrical and other equipment.

1.4.4.5. Describe requirements for components related to this Work but provided by others.

1.4.4.6. Coordinate with other Sections to obtain necessary information required to detail this Work including methods of integration and securing.

1.4.4.7. Submit erection drawings for review, before construction.

1.4.4.8. Indicate erection dimensions and methods.

1.4.4.9. If requested by Consultant, submit calculations certified by a licensed engineer to design structures and registered in Province of Ontario, substantiating sizes for members and connections based on the design loads before fabrication and erection.

1.4.5. Samples: If requested by Consultant submit following samples in sizes indicated:

1.4.5.1. One of each structural metal stud, track and bracing minimum 300 mm (12") long.

1.4.5.2. One 300 mm x 300 mm (12" x 12") sample of metal airseal and lap sealant.

1.4.6. Certificates:

1.4.6.1. Submit certified copies of mill reports covering chemical and mechanical properties, and coating designation of steel used in this work.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.5.1.2. Companies engaged in welding shall be certified by the Canadian Welding Bureau to CSA W47 .1 Companies shall have welding procedures approved and welders qualified for the base material types and thicknesses that are to be welded.

1.5.1.3. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

1.5.2. Certifications: Ensure maximum deflections under specified loads conform to L/360. Limit deflection so integrity of air/vapour barrier will be maintained at design loading. Permanent deformation of members due to applied loads is not permitted. Notwithstanding limits specified herein, structural steel framing system shall not deflect under design loads sufficient to cause noise, breaking of sealants, or to break integrity of insulation thermal blanket or air/vapour barrier seal.

1.6. DELEGATED DESIGN

1.6.1. The lightweight steel structure assembly shall be designed by a licensed engineer employed by the manufacturer. The design shall include member size, spacing, steel gauge, reinforcing and bracing as required.

1.6.2. The design shall meet the performance and design criteria specified in the Contract Documents including:

1.6.2.1. Design shall be based on Limit States Design principles using factored loads and resistances.

1.6.2.2. Loads and load factors shall be in accordance with the National Building Code of Canada. Wind and snow load calculations shall be based on a 1 in 50 year probability.

1.6.2.3. Resistances and resistance factors shall be determined in accordance with the National Building Code of Canada and CAN/CSA-S136.

1.6.2.4. Conform to the requirements of fire rated assemblies which have been tested in accordance with CAN/ULC-S101 to provide a fire resistance rating as indicated in the drawings.

1.6.2.5. Drawings indicate the design intent. Adjust stud and joist size and material thicknesses and spacing as required by the design intent. Use greater or lesser stud and joist depths as required.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Delivery and Acceptance Requirements: Transport of materials to site storage compound in a manner to prevent in-transit damage.

1.7.2. Storage and Handling Requirements:

1.7.2.1. Store materials off ground and in accordance with manufacturer's recommendations

1.7.2.2. Products shall be protected from conditions that may cause physical damage or corrosion.

1.7.3. Handling and lifting of prefabricated panels shall not cause permanent distortion to any member or collateral material.

1.8. SITE CONDITIONS

1.8.1. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before panel fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Bailey Metal Products Ltd.; www.bmp-group.com

2.1.1.2. CertainTeed Corporation; www.certainteed.com

2.1.1.3. CGC Inc.; www.cgcinc.com

2.1.1.4. Fusion Building Products; www.fusionbp.ca

2.1.1.5. Georgia-Pacific Canada, Inc.; www.gp.com

2.1.1.6. Roll Formed Specialty; www.rollformed.com

2.1.1.7. Unifix Inc.; www.unifixinc.ca

2.2. DESIGN AND PERFORMANCE CRITERIA:

2.2.1. Design work of this Section to meet or exceed following design requirements:

2.2.1.1. Base design on Limit States Design principles using factored loads and resistance. Determine resistance and resistance factors in accordance with OBC and CAN/CSA S136 requirements.

2.2.1.2. Design diagonally braced stud wall to act as a shear wall. The location of the shear wall is indicated on the drawings.

2.2.1.3. For stud walls, provide head, sill and jamb members and connections to frame all door openings and other openings larger than 100 mm in any dimension.

2.2.1.4. Loads:

2.2.1.4.1. Determine loads and load factors in accordance with OBC requirements. For wind load calculations, base velocity pressure on 1 in 50 probability of being exceeded in any 1 year for design strength and 1 in 30 for deflection.

2.2.1.4.2. Design metal framing for wall studs system supporting metal panel cladding.

2.2.1.4.3. Design for local loading due to anchorage of cladding and interior wall mounted fixtures where required to meet design requirements.

2.2.1.5. Deflection:

2.2.1.5.1. Ensure maximum deflections under specified loads conform to L/720 for wall framing. Notwithstanding limits specified herein, structural steel framing system shall not deflect under design loads sufficient to cause noise, breaking of sealants, or to break integrity of insulation thermal blanket or air/vapour barrier seal.

2.2.1.6. Member sizes:

2.2.1.6.1. Stud and joist depths are shown on the drawings. Adjust stud and joist material thicknesses and spacing as required by the design criteria. Use greater or lesser stud and joist depths only if approved by the Consultant.

2.2.1.6.2. Design metal framing with minimum design thickness for bridging channel shall be 1.22 mm (0.044“). Use greater bridging channel thickness to meet design criteria.

2.2.1.6.3. Design metal framing with minimum design thickness for clips of 1.52 mm (0.052"). Use greater clip thickness to meet design criteria.

2.2.1.6.4. The minimum thickness for clip angles shall be 1.367 mm for studs and 1.720 for joists. Use greater clip angle thickness if required by the design criteria.

2.2.1.6.5. Compute section properties on basis of nominal core thickness.

2.2.1.6.6. The minimum steel thickness exclusive of coating shall be marked on each member by embossing, stamping with indelible ink or by colour coding.

2.2.1.7. Connections:

2.2.1.7.1. Design metal framing exterior wall systems and their connections to withstand their own weight, weight of exterior sheathing, motion of operable elements, minimum design loads, pressure, suction of wind and internal pressure.

2.2.1.7.2. Design connections to accommodate vertical deflection movement of structure, frame shortening and vertical tolerances without imposing axial loads on to framing. Leave a minimum gap of 13 mm (1/2"). Larger gaps may be required to accommodate structural movement. Co-ordinate with design requirements.

2.2.1.7.3. Limit free play and movement in connections perpendicular to plane of framing to +/-0.51 mm (0.02") relative to building structure.

2.2.1.7.4. Use bolts, welding or sheet metal screws for connections between wind bearing steel stud members.

2.2.1.7.5. Provide head, sill and jamb members and connections to frame openings larger than 100 mm (4") in any dimension.

2.2.1.7.6. Anchor top and bottom track to structure at a maximum spacing of 800 mm (32") oc. Closer spacings may be required to satisfy structural design requirements.

2.2.1.8. Design bridging:

2.2.1.8.1. To prevent member rotation and member translation perpendicular to minor axis. Provide for secondary stress effects due to torsion between lines of bridging. Do

not rely on collateral sheathing to help restrain member rotation and translation perpendicular to minor axis.

2.2.1.8.2. Provide bridging at 1500 mm (60") oc maximum. Space bridging at equal intervals over span length of member. Closer spacings may be required to satisfy structural design requirements.

2.2.1.8.3. The minimum thickness for bridging channel shall be 1.087 mm for studs and 1.367 mm for joists. Use greater bridging channel design thickness if required by the design criteria.

2.2.1.8.4. Design anchorage and splice details for bridging. Bridging connectors: Models 'SUBH', 'MSUBH', or 'LSUBH' depending on the engineering framing design, by Simpson Strong Tie; www.strongtie.com

2.2.1.9. Conform to requirements of fire rated assemblies which have been tested in accordance with CAN/ULC-S101 and provide fire resistance rating noted on Drawings.

2.2.1.10. Building sway due to all effects, 1/400 of building height or 1/500 of storey height.

2.2.1.11. Design components and assemblies to accommodate specified erection tolerances of structure.

2.2.1.12. Construct work to provide for expansion and contraction of components as will be caused by ambient temperature range without causing buckling, failure of joint seals, undue stress on fasteners or other effects detrimental to appearance or performance.

2.3. MATERIALS

2.3.1. Lightweight Steel Framing Members and Accessories:

2.3.1.1. Steel shall conform to the requirements of CAN/CSA-S136 and shall be identified as to specification, grade, mechanical properties, coating type and thickness.

2.3.1.2. Lightweight Steel Framing members shall have a minimum coating of Z180 galvanizing in accordance with ASTM-A653/A653M.

2.3.1.3. Wind bearing steel studs and tracks minimum 150 mm (6") wide, minimum 33 mils designation thickness (0.836 mm (0.0329") base steel thickness) of following minimum grades conforming to requirements of CSA S136:

2.3.1.3.1. Grade A (33 ksi yield) @ min 43 mils designation thickness (1.087 mm (0.0428") base steel thickness).

2.3.1.3.2. Grade D (50 ksi yield) @ min 54 mils designation thickness (1.367 mm (0.0538") base steel thickness) and 68 mils designation thickness (1.720 mm (0.0677") base steel thickness).

2.3.1.4. Top Track: Telescopic 2 piece slip track. Fill deflection cavity with batt insulation.

2.3.1.5. Bottom Track: Provide 9 mm (3/8") diameter weep holes draining through exterior flange at 800 mm (32") oc.

2.3.1.6. Colour code ends of individual gauges of studs as follows:

2.3.1.6.1. 43 mils designation thickness (1.087 mm (0.0429") base steel thickness): yellow.

2.3.1.6.2. 54 mils designation thickness (1.367 mm (0.0538") base steel thickness): green.

2.3.1.6.3. 68 mils designation thickness (1.720 mm (0.0677") base steel thickness): orange.

2.3.2. Metal Air Seal and Lap Sealant:

2.3.2.1. Metal Air Seal: Minimum 0.759 mm (22 ga) of Grade A, ASTM A653/A653M, Galvalume, AZ150 steel.

2.3.2.2. Ensure metal air seal is flat, without ribs.

2.3.2.3. Fasteners and weld.

2.3.2.4. Lap Sealant: Non-Compression Tape, preformed, 100% solids, cross linked butyl rubber, polyisobutylene, hardness 65 Durometer, unaffected by UV, "Tremco 440 Tape" by Tremco Canada. Ensure tape is sufficiently wide and thick to completely cover bite area.

2.3.3. Fasteners and Welds:

2.3.3.1. Bolts and nuts shall conform to the requirements of ASTM A307 or ASTM A325. Provide washers. Hot-dip galvanized bolts, nuts and washers.

2.3.3.2. Sheet metal screws shall have a minimum coating thickness of .008 mm of zinc. Other coatings providing equal or better corrosion protection may be used.

2.3.3.3. Welding materials shall conform to the requirements of CSA W59.

2.3.3.4. Welding electrodes shall be of the 490 MPa minimum tensile strength series.

2.3.3.5. Zinc rich paint for touching up welds and damaged metallic coatings shall conform to CAN/CGSB-1.181.

2.3.3.6. Concrete anchors shall have a minimum coating thickness of .008 mm of zinc. Other coatings providing equal or better corrosion protection may be used.

2.3.3.7. Powder actuated/low velocity fasteners are not permitted.

2.3.4. Bituminous Coating: Supply "Henry 810-14" by Henry a Carlisle Company; www.henry.com

2.4. FABRICATION

2.4.1. Do not commence fabrication until Shop Drawings and erection drawings have been reviewed and have been accepted.

2.4.2. Except as noted herein, ensure fabricated wall framing components conform to requirements of CAN/CGSB-7.1.

2.4.3. Insofar as practical, execute fitting and assembly in shop with various parts or assemblies ready for erection at building site.

2.4.4. Provide cutouts centred in webs of members to accommodate services. Limit dimensions of un-reinforced cutouts to suite design requirements and effects on strength and stiffness of members.

2.4.5. Take field measurements and levels required to verify or supplement those shown on Drawings for proper layout and installation of work. Coordinate dimensional tolerances in adjacent building elements and confirm prior to commencement of work.

2.4.6. Accurately machine file and fit frames rigidly together at joints, corners and mitres. Match components carefully to produce perfect continuity of line and design.

2.4.7. Fabrication Tolerances: Provide light-weight steel framing true and plumb within following tolerances:

2.4.7.1. Track and Framing:

2.4.7.2. Member Depth: +/-0.76 mm, (+/-0.03").

2.4.7.3. Flange Width: +/-0.76 mm (+/-0.03") (where exterior board is attached directly to flange.)

2.4.7.4. Minimum Flange Width: 32 mm (1-1/4”).

2.4.7.5. Lip length: +3 mm (+1/8").

2.4.7.6. Thickness: -0 mm (-0").

2.4.7.7. Corner Angles: +/-3 degrees.

2.4.7.8. Framing Length: +/-3 mm (+/-1/8").

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. ERECTION

3.2.1. Methods of construction may be either piece by piece (stick-built) or by fabrication into panels (panelized) either on or off site.

3.2.2. Erect Lightweight Steel Framing true and plumb within the specified tolerances.

3.2.3. Install temporary bracing as necessary to withstand all loads to which the structure may be subject during erection and subsequent construction. Temporary bracing shall be left in place as long as required for the safety and integrity of the structure. Ensure that during erection a margin of safety consistent with the requirements if the National Building Code and CAN/CSA-S136 exists in the uncompleted structure.

3.2.4. Align web cut-outs in stud and joists as required for the installation of the through-the-knockout style bridging and services.

3.2.5. Install bridging and secure to studs using connector clips.

3.2.6. Make all field measurements necessary to ensure the proper fit of all members.

3.2.7. Cutting of members may be by saw or shear. Torch cutting is not permitted.

3.2.8. Reinforce cut-outs in studs or joists where the distance from the centerline of the cut-out to the end of the member is less than 300 mm.

3.2.9. All axially loaded members shall be aligned vertically to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at roof/wall and floor/wall intersections.

3.2.10. Maintain complete bearing under tracks to provide for load transfer in axially loaded assemblies.

3.2.11. Locate joists or their end stiffeners directly over axial load bearing studs. Alternatively, a load distribution member shall be provided to transfer loads. The use of track as a load distribution member is not permitted.

3.2.12. Anchor top and bottom tracks securely to structure at 800 mm o.c. maximum unless a closer spacing is shown on the shop drawings. Place one additional anchor within 100 mm of the end of each piece of track and additionally as required by the shop drawings.

3.2.13. Install additional studs at abutting walls, openings, terminations against other materials and on each side at corners unless explicitly detailed otherwise on the shop drawings.

3.2.14. Splicing of axial load bearing members is not permitted.

3.2.15. Install insulation in jamb and header assemblies that will be non-accessible after their installation into the wall. Ensure that insulation is kept dry and not compressed.

3.2.16. Handling and lifting of prefabricated panels shall not cause permanent distortion to any member or collateral material.

3.2.17. Fasteners and Welds:

3.2.17.1. Ensure that connected parts are in contact. Provide clamping before welding or installing screws as required.

3.2.17.1. Ensure companies engaged in welding are certified by Canadian Welding Bureau to CSA W47.1. Ensure companies have welding procedures approved and welders qualified for base material types and thicknesses being welded.

3.2.17.2. Welds shall conform to CAN/CSA S136, CSA W59 and ANSI/AWS D1.3, whichever is applicable.

3.2.17.3. For material less than 3 mm thick, shop drawings may show nominal weld leg sizes. For such material, the effective throats of welds shall not be less than the thickness of the thinnest connected part.

3.2.17.4. Touch-up welds and coatings damaged by welding with zinc rich paint. Prior to touching-up prepare surface in accordance with paint manufacturer's recommendations.

3.2.17.5. Sheet metal screws shall be of the minimum diameter indicated on the shop drawings, but not less than a #8.

3.2.17.6. Penetration of sheet metal screws beyond joined materials shall be not less than three exposed threads.

3.2.17.7. Sheet metal screw thread types, drilling capability and installation shall conform to the manufacturer's recommendations.

3.2.17.8. Sheet metal screws covered by sheathing materials shall have low profile heads.

3.2.17.9. Install concrete anchors in accordance with manufacturer's recommendations.

3.2.17.10. Ensure connections between light-weight steel framing members are bolts or sheet metal screws. Welded connections are only acceptable if touched-up with zinc-rich paint.

3.2.17.1. Install veneer anchors and cladding girts in accordance with manufacturer's recommendations. Ensure connectors attach to web side of stud with fasteners loaded in shear and have thin vertical edge to minimize accumulation of mortar droppings.

3.2.18. Mechanically fasten track and clip angles to concrete slab by drill-in fastenings. Bear cost of repair satisfactory to Consultant of concrete chipped by drilling or fixing operations.

3.2.19. Secure framing at top with sliding connection. Provide inner and outer track deflection head under steel beams and decks.

3.2.20. Field Cutting:

3.2.20.1. Cut members using saw or shear. Torch cutting is not permitted.

3.2.20.2. Limit field cut holes into light-weight steel framing to 64 mm (2-1/2") maximum across member web 110 mm (4-3/8") maximum along member length, 610 mm (24") oc minimum.

3.2.20.3. Apply 1 coat of zinc-rich paint to galvanized surfaces which have been damaged or had coating removed.

3.2.20.4. Co-ordinate with other Sections for installation of anchors and ties required for work specified under other Sections.

3.2.21. Metal Air Seal:

3.2.21.1. Provide metal air seal using self-tapping sheet metal screws fastened at minimum 300 mm (12") oc. Do not provide pop rivets.

3.2.21.2. Secure metal air seal to exposed leg of inner track of telescopic 2-piece top track.

3.2.21.3. Overlap metal air seal horizontal and vertical edges 50 mm (2").

3.2.21.4. Cut, fit and form metal air seal as required to accommodate framing and other obstructions.

3.2.21.5. Provide lap tape between overlaps of metal airseal sheets on screw line to provide a continuous airseal.

3.2.21.6. Provide miscellaneous sealant neatly installed to complete metal airseal system as appropriate to the detailing and site conditions.

3.2.22. Erection Tolerances:

3.2.22.1. Definitions:

3.2.22.1.1. Camber: the deviation from straightness of a member or any portion of a member with respect to its major axis

3.2.22.1.2. Sweep: the deviation from straightness of a member or any portion of a member with respect to its minor axis.

3.2.22.2. For axial load bearing studs, out of plumbness and out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

3.2.22.3. For wind bearing studs, out of plumbness shall not exceed 1/500th of the member length. Out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

3.2.22.4. For joists, out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

3.2.22.5. For track, camber shall not exceed 1/1000th of the member length.

3.2.22.6. Squareness of prefabricated panels shall be not more than 3 mm out of square within the length of that panel.

3.2.22.7. Studs shall seat into top and bottom tracks. The gap between the end of the stud and the web of the track shall not exceed 3.2 mm for either axial or wind bearing studs.

3.2.22.8. Align adjacent or abutting members in the same plane to within ± 0.5 mm maximum.

3.2.22.9. Spacing of studs shall not be more than ± 3 mm from design spacing. The cumulative error in spacing shall not exceed the requirements of the finishing materials.

3.3. FIELD QUALITY CONTROL

3.3.1. Conduct Quality Control:

3.3.1.1. Structural Engineer Field Review: Professional Structural Engineer shall provide field review reports of site inspections of engineered components. Reports to cover the work inspected complete with any details of discovered deficiencies.

3.3.1.2. Field reviews shall include review of mill test reports, welded and screwed connections, connections to the main structure, member sizes, location and material thickness, coating thickness, erection tolerances, and all field cutting.

3.3.1.3. Replace members with localized damage.

3.4. CLEANING

3.4.1. Keep installed work clean as work progresses.

3.4.2. Clean and Make Good surfaces soiled or otherwise damaged in connection with this work. Pay cost of replacing finishes or materials that cannot be satisfactorily touched up, cleaned or have been damaged by improper cleaning materials and methods.

3.4.3. Upon completion of this work, remove debris, equipment and excess material resulting from this work from site.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide metal fabrications including but not limited to following:

1.2.1.1. Interior handrails.

1.2.1.2. Lateral support for masonry walls.

1.2.1.3. Hospital equipment supports

1.2.1.4. Metal supports associated with architectural woodwork.

1.2.1.5. Miscellaneous steel fabrications and/or framing required for structural support not specifically described on Structural Drawings, engineered to suit applications indicated on Drawings.

1.2.1.6. Other miscellaneous sections and framing required to complete the Work and/or inferable in Contract Documents but not explicitly shown on Drawings.

1.2.1.7. Other miscellaneous sections and framing as defined under “Appendix F” of CISC Code of Standard Practice for Structural Steel.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Installation of miscellaneous metal fabrications in concrete: Section 03 10 00 Concrete Formwork and Section 03 30 00, Cast-In-Place Concrete.

1.2.2.2. Installation of metal fabrications in masonry: Section 04 22 00 Concrete Masonry Units.

1.2.2.3. Provision of rooftop safety guardrail and fall protection system: Section 05 52 17 Rooftop Guardrail.

1.2.2.4. Provision of architectural woodwork: Section 06 40 00 Architectural Woodwork.

1.2.2.5. Provision of rooftop access stair and landing at AHU: Section 07 72 46 Rooftop Access Stair and Platform.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CISC: Canadian Institute of Steel Construction; www.cisc-icca.ca.

1.3.1.2. DFT: Dry Film Thickness.

1.3.1.3. OBC: Ontario Building Code.

1.3.1.4. SSPC: The Society for Protective Coatings (formerly known as Steel Structures Painting Council); www.sspc.org.

1.3.2. Definitions:

1.3.2.1. Architectural Grade: Architectural quality fabrications of metal materials shall be free of scratches, pitting, roughness, marring, discolouration, seams, staining and other imperfections with the quality of workmanship conforming to the workmanship classifications

of Class 1 as defined in NAAMM AMP 555, paragraph 8.3 of Section 8, Quality Control or Assurance and as follows:

1.3.2.1.1. Exposed surfaces are finished smooth with pits, mill marks, nicks and scratches filled or ground off. Defects shall not show when painted or polished. Remove sharp corners and edges.

1.3.2.1.2. Conceal welds where possible. Where welding cannot be concealed behind finished surfaces, finish joints to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 Welds, no evidence of a welded joint.

1.3.2.1.3. Use only flat head countersunk bolts in exposed locations unless indicated otherwise.

1.3.2.1.4. Distortions shall not be visible.

1.3.2.1.5. Exposed joints shall be fitted to hairline finish.

1.3.2.1.6. Cope or mitre corner joints.

1.3.2.1.7. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.

1.3.2.1.8. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the work.

1.3.2.1.9. Cut, drill, and punch metals cleanly. Remove burrs and ease edges to a radius of approximately 1 mm (0.040"). Remove sharp or rough areas on exposed surfaces.

1.3.3. Reference Standards:

1.3.3.1. ANSI/UL 263-11 - Fire-resistance Ratings

1.3.3.2. ASME B46.1-2019 - Surface Texture (Surface Roughness, Waviness, and Lay)

1.3.3.3. ASTM A53/A53M-20 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

1.3.3.4. ASTM A123/A123M-18 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

1.3.3.5. ASTM A153/A153M-16a - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

1.3.3.6. ASTM A240/A240M-20a - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

1.3.3.7. ASTM A269/A269M-15a(2019) - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

1.3.3.8. ASTM A276/A276M-17 - Standard Specification for Stainless Steel Bars and Shapes

1.3.3.9. ASTM A307-21 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength

1.3.3.10. ASTM A480/A480M-20a - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

1.3.3.11. ASTM A510/A510M-18 - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and AlloySteel

1.3.3.12. ASTM A511/A511M-21a - Standard Specification for Seamless Stainless Steel Mechanical Tubing and Hollow Bar

1.3.3.13. ASTM A554-16 - Standard Specification for Welded Stainless Steel Mechanical Tubing

1.3.3.14. ASTM A653/A653M-20 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

1.3.3.15. ASTM B117-19 - Standard Practice for Operating Salt Spray (Fog) Apparatus

1.3.3.16. ASTM C881/C881M-2020a - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

1.3.3.17. ASTM C1107/C1107M-20 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

1.3.3.18. ASTM E119-20 Standard Test Methods for Fire Tests of Building Construction and Materials

1.3.3.19. ASTM E736/E736M-19 - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

1.3.3.20. ASTM F836M-20 - Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric)

1.3.3.21. ASTM F844-19 - Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use

1.3.3.22. ASTM F3125/F3125M-22 - Standard Specification for High Strength Structural Bolts, Steel, and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions

1.3.3.23. CAN/CGSB-1.181-99 -- Ready-Mixed Organic Zinc-Rich Coating

1.3.3.24. CAN/CGSB-85.10-99 - Protective Coatings for Metals

1.3.3.25. CSA G40.20-13/G40.21-13(r2013), - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel CSA W48-18 - Filler Metals and Allied Materials for Metal Arc Welding

1.3.3.26. CSA W59-18 - Welded Steel Construction (Metal Arc Welding)

1.3.3.27. CSA W117.2-19 - Safety in Welding, Cutting, and Allied Processes

1.3.3.28. SSPC-SP 6/NACE No. 3- 2006 - Commercial Blast Cleaning

1.3.3.29. CISC Code of Standard Practices for Structural Steel, 9th Edition

1.4. SUBMITTALS

1.4.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.4.2. Shop Drawings:

1.4.2.1. Submit Shop Drawings for work of this Section. In addition to minimum requirements indicate following:

1.4.2.1.1. Large scale details of members, materials and connections.

1.4.2.1.2. Jointing details.

1.4.2.1.3. Methods of setting, sealing, securing, anchorage.

1.4.2.1.4. Field connections.

1.4.2.2. Ensure a licensed engineer specified herein is responsible for:

1.4.2.2.1. Production and review of Shop Drawings.

1.4.2.2.2. Sealing and signing each Shop Drawing and any associated calculations performed.

1.4.3. Samples:

1.4.3.1. Submit samples of exposed metal fabrications representing final finish.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.5.1.2. Welding: Provide welding in accordance with CSA W59 performed by a fabricator and mechanics fully approved by the Canadian Welding Bureau.

1.5.1.3. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

1.5.2. Certifications:

1.5.2.1. Welders employed on this Project may be asked by Consultant at any time for their welding certificate.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Delivery and Acceptance Requirements: Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off-the-ground, undercover storage locations. Do not load areas beyond the designed limits.

1.6.2. Storage and Handling Requirements:

1.6.2.1. Handle and store metal materials at job site in such a manner to prevent damage to other materials, (to existing buildings) or property.

1.6.2.2. Handle components with care, and provide protection for surfaces against marring or other damage. Ship and store members with cardboard or other resilient spacers between surfaces. Use lifting chokers of material that will not damage surface of steel members.

PART 2 - PRODUCTS

2.1. MATERIALS

2.1.1. Performance/Design Criteria:

2.1.1.1. Structural Design: Employ a licensed engineer specified herein to:

2.1.1.1.1. Design components for work of this Section requiring structural performance.

2.1.1.1.2. Be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations.

2.1.2. Structural Shapes, Plates, etc.: New material conforming to CSA G40.20 and CSA G40.21, Grade 300W.

2.1.3. Hollow Structural Sections (HSS): New material conforming to CSA G40.20 and CSA G40.21, Grade 350W, Class H.

2.1.4. Stainless Steel:

2.1.4.1. Seamless and Welded Austenitic Stainless Steel Tubing: Type 304 in accordance with ASTM A269/A269M, ID Seamless - ASTM A511/A511M or Welded - ASTM A554 tube polished to a “No. 4 Finish” typically having a surface roughness average (Ra) ranging from 20 - 25 micro inches when measured in accordance with ASME B46.1 by CFF Stainless Steels Inc.; www.cffstainless.com.

2.1.4.2. Bars and Shapes: Type 304 to ASTM A276/A276M, polished to a “No. 4 Finish” typically having a surface roughness average (Ra) ranging from 20 - 25 micro inches when measured in accordance with ASME B46.1 by CFF Stainless Steels Inc.; www.cffstainless.com.

2.1.4.3. Flat-Rolled Plate and Sheet: Type 304 in accordance with ASTM A240/A240M and ASTM A480/A480M, polished to “No. 4 Finish” typically having a surface roughness average (Ra) ranging from 20 - 25 micro inches when measured in accordance with ASME B46.1 by CFF Stainless Steels Inc.; www.cffstainless.com.

2.1.4.4. Mechanical Tubing: Type 304 in accordance with ASTM A554, with “No. 4 Finish” typically having a surface roughness average (Ra) ranging from 20 - 25 micro inches when measured in accordance with ASME B46.1 by CFF Stainless Steels Inc.; www.cffstainless.com.

2.1.4.5. Provide highest architectural quality in various forms, straight and true. Ensure there are no scratches, scars, creases, buckles, ripples or chatter marks. Provide finish surfaces suitable for polishing where required. Ensure finished surfaces exposed to view are free of pitting, seam marks, roller marks, oil-canning, stains, discolourations or other imperfections.

2.1.4.6. Refer to Drawings for stainless steel work.

2.1.5. Structural Aluminum: To CSA HA series - M, Type 6061-T6, clear anodized.

2.1.6. Welding Materials: Conforming to CSA W48 and CSA W59.

2.1.7. High Strength Bolts:

2.1.7.1. Supply bolts, nuts and washers conforming to ASTM F3125/F3125M. Supply each type and size of bolt and nut of same manufacture and of same lot.

2.1.7.2. Bolts: Heavy, hexagon head high strength structural bolts, of standard size, of lengths required for thickness of members joined and for type of connection.

2.1.7.3. Nuts: Heavy hexagon semi-finished nuts.

2.1.7.4. Washers: Flat and smooth hardened washers, quenched and tempered to suit applications and conforms to ASTM F844. Provide AISI Type 304 stainless steel washers at exterior locations.

2.1.7.5. Hardened Steel Washers: To suit applications and conforms to ASTM F836M.

2.1.7.6. Stainless Steel Bolts: To suit applications and conforms to ASTM F836M.

2.1.7.7. Stainless Steel Nuts: To suit applications and conforms to ASTM F836M.

2.1.7.8. Lock Washers: Helical spring type steel “lock” washers to suit applications and conforms to Federal specification FF-W-84. Provide AISI Type 304 stainless steel lock washers at exterior locations.

2.1.7.9. Exterior Vandal Resistant Fasteners: AISI Type 304 stainless steel, dual pin type vandal resistant fasteners to suit applications and acceptable to Consultant.

2.1.7.10. Security Fasteners: Button head "Torx® Plus R" screw tamper resistant #10, 25 mm (1") long 2 per glass stop minimum stainless steel machine screws.

2.1.8. Common or Ordinary Bolts and Anchor Bolts: Unfinished bolts conforming to ASTM A307, Grade A, with hexagon heads and nuts where exposed in the finish work. Supply common bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm (1/4") beyond nut, without the use of washers. Supply anchor bolts of lengths noted, but projecting not less than 13 mm (1/2") beyond nut unless otherwise noted.

2.1.9. Dielectric Separator: Provide best grade, quick drying non-staining alkali resistant bituminous paint or epoxy resin solution or membrane type for Consultant’s review.

2.1.10. Galvanized Primer Paint: Zinc rich conforming to CAN/CGSB-1.181 for new galvanized metal.

2.1.11. High Performance Corrosion Protection for Perimeter Steel: 1 component, moisture cured, micaceous iron oxide/zinc filled primer, UL Classified in accordance with ANSI/UL 263 (ASTM E119), corrosion protection in accordance with ASTM B117, meeting Class B Slip Certification in accordance with American Institute of Steel Construction (AISC) requirements for slip critical bolted connections, tested in accordance with ASTM E736/E736M for its suitability for application of primer over steel to receive sprayed fireproofing, "Series 394, PerimePrime™" by Tnemec Company Incorporated; www.tnemec.com.

2.1.12. Steel Pipe Handrails: Conforming to ASTM A53/A53M, Type "S", Schedule 40, Grade A steel pipe of sizes shown.

2.1.13. Steel Pipe Bumpers: Conforming to ASTM A53/A53M, Schedule 80 steel pipe of sizes shown.

2.1.14. Grout: Provide 1 of following:

2.1.14.1. Epoxy Resin Grout: 2-component, mineral-filled epoxy resin conforming to ASTM C881/C881M, of type, grade and class to suit requirements; "Sika AnchorFix®-3001" by Sika Canada Inc., "REZI-WELD™-3/2 Epoxy Grout-Patch Kit" by W.R. Meadows of Canada or "EUCO #452 EPOXY SYSTEM" by Euclid Chemical Canada Inc.

2.1.14.2. Pre-mixed, non-shrink, non-metallic, cementitious grout, containing no chlorides, conforming to ASTM C1107/C1107M; "M-Bed Standard" by Sika Canada Inc., "CG-86 Construction Grout" by W.R. Meadows of Canada or "NS Grout" by Euclid Chemical Canada Inc.

2.1.15. Galvanizing: Hot dipped galvanizing with minimum zinc coating of 600 g/m^2.

2.1.16. Galvanized Sheet Steel: Supply 0.91 mm (20 ga) core thickness commercial quality to ASTM A653/A653M, CS Type A, with Z275 (G90) zinc coating designation to ASTM A653/A653M.

2.1.17. Expanded Steel Mesh: Flattened, expanded, carbon steel mesh of 10 msg gauge thickness, weighing minimum 51 kg/10 m^2 (112 lbs/100 sq ft), style 33 mm (1.330") SWD x 81 mm (3.200") LWD, 292 mm (11-1/2") - No.9 by Gerard Daniel Worldwide, Canadian Division, Expanded Metal Corporation or Dramex International.

2.1.18. Welded Steel Wire Mesh: 50 mm x 50 mm x 3.4 mm (2" x 2" x 0.135") diameter, welded carbon steel wire mesh conforming to ASTM A510/A510M by Gerard Daniel Worldwide, Canadian Division.

2.1.19. Handrail Wall Brackets: In accordance with OBC requirements and to meet design requirements indicated on Drawings.

2.1.20. Fabrication:

2.1.20.1. Fabricate each item of work of this Section in accordance with following general requirements:

2.1.20.1.1. Members square and straight.

2.1.20.1.2. Members plumb and true.

2.1.20.1.3. Joints accurately and tightly fitted.

2.1.20.1.4. Intersecting members in true, flush planes.

2.1.20.1.5. Fasteners concealed.

2.1.20.1.6. Steel connections.

2.1.20.2. Fabricate, fit and assemble work in shop where possible. Where shop fabrication is not possible, make trial assembly in shop.

2.1.20.3. Provide hangers, rods, bars, bolts, anchors, brackets, rivets, bearing plates and bracing, fitting, drilling, stopping, soldering, as required for a complete assembly.

2.1.20.4. Isolate dissimilar metals including stainless steel and galvanized steel using dielectric separator to prevent galvanic corrosion.

2.1.20.5. Weld connections unless otherwise indicated.

2.1.20.6. Provide architectural grade finish for all steel members which will come in contact with hands – handrails, ladder stringers, bench supports.

2.1.20.7. Shop Welding:

2.1.20.7.1. Execute welding to avoid damage or distortion to the Work. Should there be, in the opinion of Consultant or Inspection Company, doubt as to adequacy of welds, they shall be tested for efficiency and any work not meeting Standards be removed and replaced with new work satisfactory to Consultant. Carry out welding in accordance with following standards:

2.1.20.7.1.1. CSA W48- for Electrodes (If rods are used, only coated rods are allowed).

2.1.20.7.1.2. CSA W59 - for design of connections and workmanship.

2.1.20.7.1.3. CSA W117.2 - for safety.

2.1.20.7.2. Thoroughly clean welded joints and steel exposed for a sufficient space to properly perform welding operation. Neatly finish welds. Ensure welds exposed to view and finish painted are continuous and ground smooth.

2.1.20.8. Provide exposed metal fastenings and accessories of same material, texture, colour and finish as base metal to which they are applied or fastened.

2.1.21. Finishes:

2.1.21.1. Cleaning and Shop Painting:

2.1.21.1.1. Clean steel to SSPC-SP 6 and remove loose mill scale, weld flux and splatter.

2.1.21.1.2. Shop prime steel except for steel to receive sprayed fire-resistive materials with 1 coat of primer paint to DFT of 0.025 mm (1 mil). Paint on dry surfaces, free from rust, scale and grease. Do not paint when temperature is lower than 7 deg C (45 deg F). Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature and humidity conditions.

2.1.21.1.3. Shop prime non-galvanized perimeter steel members and structural steel members to receive sprayed fire-resistive materials with 1 coat of high performance corrosion protection primer to DFT of 0.025 mm (1 mil). Paint on dry surfaces, free from rust, scale or grease. Do not paint when temperature is lower than 7 deg C (45 deg F). Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature and humidity conditions.

2.1.21.1.4. Shop prime galvanized steel in accordance with CAN/CGSB-85.10.

2.1.21.1.5. Clean but do not paint surfaces being welded in the field and surfaces in contact after assembly.

2.1.21.2. Hot Dip Galvanizing:

2.1.21.2.1. After fabrication, hot dip galvanize specific miscellaneous steel items noted on Drawings and/or called for herein. Plug relief vents air tight. After galvanizing, remove plugs, ream holes to proper size and re-tap threads. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with “Zinc Clad® 5 Organic Zinc-Rich Primer” by The Sherwin-Williams Company; www.sherwin-williams.com in accordance with manufacturer’s printed directions.

2.1.21.2.2. Galvanize members exposed to elements when in final location; members embedded on exterior side of exterior walls; members imbedded in concrete; members specified in this Section or noted on Drawings.

2.1.21.2.3. Hot-dip galvanize members in accordance with requirements of following ASTM standards with minimum coating weights or thicknesses as specified:

2.1.21.2.3.1. Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strips: ASTM A123/A123M; average weight of zinc coating g/m^2 (oz/sq ft) of actual surface, for 4.8 mm (3/16") and less thickness members 460 g/m^2 (1.5 oz/sq ft), for 6 mm (1/4") and heavier members 705 g/m^2 (2.3 oz/sq ft).

2.1.21.2.3.2. Iron and Steel Hardware: ASTM A153/A153M; minimum weight of zinc coating, in g/m^2 (oz/sq ft) of surface shall be in accordance with Table 1 of ASTM A153/A153M, for the various classes of materials used on the Project.

2.1.21.2.3.3. Steel Sheet: ASTM A653/A653M; weight of zinc coating, per sq ft on both sides of sheet. Coating designation Z275 (G90), minimized spangle and chemically treated.

2.1.21.3. Colour: To be selected by Consultant.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Erect work of this Section plumb, square, true and level.

3.2.2. Securely anchor work of this Section and rivet, weld or bolt to structural framing of the building. Where secured to concrete, provide bolts for setting in concrete. Provide expansion bolt supports to masonry.

3.2.3. Provide necessary fitting, setting and cutting required in connection with the fitting of work of this Section to other parts of the Work.

3.2.4. Field Painting: Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up with matching paint, shop primer damaged during transit and installation.

3.3. SITE QUALITY CONTROL

3.3.1. Site Tests and Inspections:

3.3.1.1. Structural Inspection: Ensure a licensed engineer specified herein inspects work of this Section during erection/installation and submits sealed and signed Field Review Report within 5 Days of site visit.

3.3.2. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. CLEANING

3.4.1. On completion of installation, carefully clean metal work.

3.5. SCHEDULES

3.5.1. INTERIOR HANDRAILS AND GUARDRAILS

3.5.1.1. Pipe Handrail:

3.5.1.1.1. Material and Finish: Provide minimum 3 mm (1/8") wall thickness, Type 304 stainless steel handrail pipe.

3.5.1.1.2. Outside Diameter: 38 mm (1-1/2").

3.5.1.1.3. Provide closed pipe ends and grind welds smooth.

3.5.1.2. Provide Type 304 stainless steel brackets and escutcheons and finish to match handrails.

3.5.1.3. Stainless Steel Finish: No. 4 finish.

3.5.1.4. Fabricate as detailed.

3.5.2. LATERAL SUPPORTS FOR MASONRY WALLS

3.5.2.1. Lateral support of interior masonry walls: Supply 75 mm x 75 mm x 6 mm (3" x 3" x 1/4") steel angles 300 mm (12") long to be secured to underside of structure as part of the work of Section 04 20 00.

3.5.2.2. Lateral support of exterior walls, inner wythe: Supply 100 mm (4") x block width x 6 mm (1/4") [bent steel plate] 300 mm (12") long to be secured to underside of structure as part of the work of Section 04 20 00.

3.5.2.3. Finish: Galvanized for exterior walls, prime painted for interior walls.

3.5.3. ARCHITECTURAL WOODWORK

3.5.3.1. Provide miscellaneous steel items required as part of work of Section 06 40 00, e.g.: valance supports, vanity support brackets.

3.5.3.2. Finish: Prime painted.

3.5.4. MISCELLANEOUS SECTIONS AND FRAMING

3.5.4.1. Provide miscellaneous steel sections as defined under “Appendix F” of CISC Code of Standard Practice for Structural Steel which are not shown or identified on Structural Drawings, or specified under another Section of Specifications.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide safety railing including but not limited to following:

1.2.1.1. Roof mounted guardrail system.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of rooftop access stair and platform system: Section 07 52 46 Rooftop Access Stair and Platform.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. OHSA: Occupational Health and Safety Act Ontario

1.3.1.2. OSHA – Occupational Safety and Health Standards

1.3.2. Reference Standards:

1.3.2.1. ANSI/ASSE A1264.1-2017 - Safety Requirements For Workplace Walking/Working Surfaces And Their Access; Workplace, Floor, Wall And Roof Openings; Stairs And Guardrail/Handrail Systems

1.3.2.2. ASTM A123/A123M: Standard Specification for Zinc (Hot-Dip Galvanized) coatings on Iron and Steel products, covers individual steel pieces as well as assemblies of various classes of materials.

1.3.2.3. ASTM A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Hardware applies to hardware products such as castings, fasteners, rolled and forged products.

1.3.2.4. ASTM A479/A479M-21 – Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels

1.3.2.5. ASTM A787-01 – Standard Specification for Electric-Resistance-Welded Metallic-Coated Carbon Steel Mechanical Tubing.

1.3.2.6. Occupational Health and Safety Act Ontario Regulation 213/91 Construction Projects

1.3.2.7. Occupational Health and Safety Act R.R.O. 1990, Regulation 851, Industrial Establishments.

1.3.2.8. OSHA Part 1910 – Occupational Safety and Health Standards

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Verify site dimensions before submitting shop drawings.

1.4.2. Preinstallation Meetings:

1.4.2.1. Arrange preinstallation meeting 1 week prior to commencing work with all parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor include Consultant who may attend, and Owner's representative.

1.5. ACTION SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data: Submit Product information for the system work specified in this Section:

1.5.2.1. Submit manufacturer's installation instructions.

1.5.3. Shop Drawings:

1.5.3.1. Submit Shop Drawings for work of this Section. In addition to minimum requirements indicate following:

1.5.3.1.1. Large scale details of members, materials and connections.

1.5.3.1.2. Jointing details.

1.5.3.1.3. Methods of setting, securing, anchorage.

1.5.3.2. Ensure a licensed engineer specified herein is responsible for:

1.5.3.2.1. Production and review of Shop Drawings.

1.5.3.2.2. Sealing and signing each Shop Drawing and any associated calculations performed.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the installation of this or similar modular systems and assemblies specified and with approval and training of the Product manufacturer.

1.6.1.2. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Delivery and Acceptance Requirements: Coordinate deliveries to comply with construction schedule and arrange ahead for delivery time, roof protection and storage locations.

1.7.2. Storage and Handling Requirements:

1.7.2.1. Handle and store metal materials at job site in such a manner to prevent damage to other materials, existing buildings, rooftop equipment, or roof.

1.7.2.2. Handle components with care and provide protection for surfaces against marring or other damage. Ship and store members with cardboard or other resilient spacers between surfaces. Use lifting chokers of material that will not damage surface of members.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Basis of Design: “5001 RoofBarrier Guardrail System” by Skyline Group; www.skylinegroupintl.com

2.1.2. Alternate systems will be considered provided they meet the requirements of this specification and submitted in accordance with Section 01 25 00 Substitution Procedures.

2.2. MATERIALS

2.2.1. Regulatory Requirements:

2.2.1.1. Comply with applicable Health and Safety Regulations:

2.2.1.1.1. Occupational Health and Safety Act Ontario Regulation 213/91

2.2.1.1.2. Ontario: Occupational Health and Safety Act R.R.O. 1990, Regulation 851, Industrial Establishments

2.2.1.1.3. OSHA Part 1910 – Occupational Safety and Health Standards and ANSI/ASSE A1264.1

2.2.2. Performance/Design Criteria:

2.2.2.1. Structural Design: Employ a licensed engineer specified herein to:

2.2.2.1.1. Design system members, bases, connections, and anchorage as required to provide guardrail protection.

2.2.2.1.2. Be responsible for determining sizes, yield strengths, gauge thicknesses and support spacing to provide proper guardrail protection to applicable codes and regulations.

2.2.2.2. Steel metal railing consisting of the following components:

2.2.2.2.1. Rails

2.2.2.2.2. Posts

2.2.2.2.3. Outriggers

2.2.2.2.4. Clamp fittings

2.2.2.2.5. Weighted bases

2.2.2.2.6. Fasteners

2.2.2.2.7. Mats

2.2.3. Rails: 11 ga. ASTM A787 Type 3 steel, 42 mm (1 5/8”) diameter.

2.2.4. Clamps: Malleable cast iron

2.2.5. Weighted Bases: 44W Steel

2.2.6. Mats: Rubber

2.3. AUXILIARY MATERIALS

2.3.1. Provide materials and types of fasteners, protective coatings, and other auxiliary components required by manufacturer for a complete installation.

2.3.2. Fasteners: Manufacturer-recommended for application and metals specified:

2.3.2.1. Sets screws: to ASTM A479/A479M; 304 or 305 Stainless Steel

2.3.2.2. Machine screws: 18-8 Stainless Steel

2.4. FABRICATION

2.4.1. Fabricate work square, true, and accurate. Deburr all cut edges. Properly fit and secure all joints.

2.5. FINISHES

2.5.1. Hot Dip Galvanizing:

2.5.1.1. After fabrication, hot dip galvanize specific miscellaneous steel items noted on Drawings and/or called for herein. Plug relief vents air tight. After galvanizing, remove plugs, ream holes to proper size and re-tap threads. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with “Zinc Clad® 5 Organic Zinc-Rich Primer” by The Sherwin-Williams Company; www.sherwin-williams.com in accordance with manufacturer’s printed directions.

2.5.1.2. Galvanize members exposed to elements when in final location; members embedded on exterior side of exterior walls; members imbedded in concrete; members specified in this Section or noted on Drawings.

2.5.1.3. Hot-dip galvanize members in accordance with requirements of following ASTM standards with minimum coating weights or thicknesses as specified:

2.5.1.3.1. Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strips: ASTM A123/A123M; average weight of zinc coating g/m2 (oz/sq ft) of actual surface, for 4.8 mm (3/16") and less thickness members 460 g/m^2 (1.5 oz/sq ft), for 6 mm (1/4") and heavier members 705 g/m^2 (2.3 oz/sq ft).

2.5.1.3.2. Iron and Steel Hardware: ASTM A153/A153M; minimum weight of zinc coating, in g/m^2 (oz/sq ft) of surface shall be in accordance with Table 1 of ASTM A153/A153M, for the various classes of materials used in the work.

2.5.2. Weighted Bases: Powdercoated black.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Proceed with installation only after unacceptable conditions have been remedied.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Assemble and install guardrail system in accordance with manufacturer's instructions, and accepted shop drawings

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide rough carpentry including but not limited to following:

1.2.1.1. Miscellaneous interior carpentry.

1.2.1.2. Wood furring, grounds, nailers, blocking, and equipment mounting panels.

1.2.1.3. Roofing carpentry.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of concrete formwork: Section 03 10 00, Concrete Forming.]

1.2.2.2. Provision of architectural woodwork: Section 06 40 00, Architectural Woodwork.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CCA: Chromated Copper Arsenate.

1.3.1.2. COFI: Council of Forest Industries; www.cofi.org.

1.3.1.3. FSC: Forest Stewardship Council; www.fsccanada.org.

1.3.1.4. HVAC: Heating, Ventilating and Air Conditioning.

1.3.1.5. NLGA: National Lumber Grades Authority; www.nlga.org.

1.3.1.6. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.1.7. UL: Underwriters Laboratories Inc.; www.ul.com.

1.3.2. Definitions:

1.3.2.1. Exposed Framing: Framing not concealed by other construction.

1.3.2.2. Dimension Lumber: Lumber of 50 mm (2”) nominal or greater but less than 125 mm (5”) nominal in least dimension.

1.3.2.3. Timber: Lumber of 125 mm (5”) nominal or greater in least dimension.

1.3.3. Reference Standards:

1.3.3.1. ALSC PS 20-20 Revision 1 - American Softwood Lumber Standard

1.3.3.2. ASTM A123/123M-18 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

1.3.3.3. ASTM A307-21 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength

1.3.3.4. ASTM A563-15 - Standard Specification for Carbon and Alloy Steel Nuts

1.3.3.5. ASTM F1667-2021A - Standard Specification for Driven Fasteners: Nails, Spikes and Staples

1.3.3.6. CSA O80 Series-08 (R2020) - Wood Preservation

1.3.3.7. CSA O112 Series-1997 (R2006) - Standards for Wood Adhesives

1.3.3.8. CSA O121-17 - Douglas Fir Plywood

1.3.3.9. CAN/ULC-S102-18 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.3.10. FSC STD-01-001 V5-2 (2015), "FSC Principles and Criteria for Forest Stewardship":

1.4. ACTION SUBMITTALS

1.4.1. Product Data:

1.4.1.1. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

1.4.1.2. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

1.4.1.3. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.

1.4.1.4. For fire-retardant-treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.

1.5. QUALITY ASSURANCE

1.5.1. Certifications:

1.5.1.1. Grading:

1.5.1.1.1. Provide lumber bearing the grading stamps of an agency certified by the Canadian Lumber Standards Administration Board for identification.

1.5.1.1.2. Provide roof sheathing bearing the COFI grading stamp for identification.

1.5.1.1.3. Provide "treated" and "fire treated" wood and plywood bearing the stamp of the Canadian Wood Preservers Bureau.

1.5.1.2. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":

1.5.1.2.1. Dimension lumber framing.

1.5.1.2.2. Miscellaneous lumber.

1.5.1.2.3. Interior wood trim.

1.5.1.2.4. Shelving and coat rods.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1.6.2. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

1.6.3. Storage and Handling Requirements:

1.6.3.1. Store lumber in a dry place and protect from dampness and damage.

1.6.3.2. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

1.7. PROJECT CONDITIONS

1.7.1. Wood treated with chemicals containing chromium or arsenic may be used only in locations that will completely enclose the wood with finish materials such as roofing.

1.8. WARRANTY

1.8.1. Warranty for preservative chemical treatment against disintegration of wood cells due to fungal decay or termite attack for a period of 5 years following Substantial Performance.

PART 2 - PRODUCTS

2.1. LUMBER, GENERAL

2.1.1. Certified Wood: Lumber and plywood shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship".

2.1.2. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

2.1.3. Where nominal sizes are indicated, provide actual sizes required by ALSC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

2.1.3.1. Provide dressed lumber, S4S, unless otherwise indicated.

2.1.3.2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 50 mm (2") nominal thickness or less, unless otherwise indicated.

2.1.4. Softwood Lumber: Of grades conforming to NLGA's "Standard Grading Rules for Canadian Lumber", graded as follows:

2.1.4.1. Light Framing: Species Group D, Standard Grade.

2.1.4.2. Studding: Species Group D, Stud Grade.

2.1.4.3. Structural Light Framing: Species Group D, No. 1 Grade.

2.1.4.4. Appearance Lumber: Species Group B, Appearance Grade.

2.1.5. Hardwood Lumber: Of grades conforming to grading rules of U.S. National Hardwood Lumber Association, solid Yellow Birch, select or better.

2.1.6. "Treated" Wood and Plywood (Decay and Termite Resistant):

2.1.6.1. Provide vacuum/pressure impregnated lumber treated in accordance with CSA O80.

2.1.6.2. Retention/Penetration Standards: Conform to CSA O80.1 for Use Categories (UC):

2.1.6.2.1. UC1 for dry interior construction

2.1.6.2.2. UC2 for dry interior that are not in contact with the ground but can be exposed to dampness

2.1.6.2.3. UC3 for exterior construction that is not in ground contact

2.1.6.2.3.1. UC3.1 for exterior above ground construction with coated wood products and rapid run off of water

2.1.6.2.3.2. UC3.2 for exterior above ground construction with uncoated wood products or poor run off of water

2.1.6.2.4. UC4 for exterior construction that is in ground or freshwater contact

2.1.6.2.4.1. UC4.1 for non-critical components

2.1.6.2.4.2. UC4.2 for critical structural components or components that are difficult to replace

2.1.6.2.5. UC5A for wood used in Coastal waters including brackish water, salt water and adjacent mud zone

2.1.6.3. Provide treated wood kiln dried to maximum 12% moisture content.

2.1.6.4. Do not use chemicals containing chromium or arsenic without prior Owner approval.

2.1.6.5. Mark each treated item with the Quality Mark Requirements of an inspection agency approved by Health Canada's Pest Management Regulatory Agency.

2.1.6.6. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:

2.1.6.6.1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapour barriers, and waterproofing.

2.1.6.6.2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.1.6.6.3. Plywood.

2.1.6.7. Cut end liquid wood preservative as recommended by manufacturer of treated wood. Acceptable Products: "K-33® CCA" by Timber Specialties Co.; www.timberspecialties.com or "Wolman® AG" by Lonza; www.wolmanizedwood.com. "Wolman™ Woodlife® Coppercoat™" by Rust-Oleum; www.rustoleum.com or same CCA preservative as used for shop impregnation.

2.1.7. "Fire Treated" Wood and Plywood:

2.1.7.1. Interior Fire Retardant Treated Lumber and Plywood: Pressure treated lumber and plywood with fire retardant chemicals to meet an UL FR-5 rating with a surface-burning characteristics rating of 25 or less for flamespread, fuel contributed and smoke developed in accordance with CAN/ULC-S102.

2.1.7.2. Ensure each piece of fire retardant treated lumber and plywood bears a ULC label or imprint attesting to this rating.

2.1.7.2.1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

2.1.7.3. Do not resurface or rip fire treated wood if it affects the ULC Label.

2.1.7.4. Provide fire treated wood kiln dried to max 19% moisture content.

2.1.7.5. Application: Treat items indicated on Drawings, and the following:

2.1.7.5.1. Concealed blocking.

2.1.7.5.2. Plywood backing panels.

2.1.8. Fire Resistant Barrier: Non-toxic, water based latex fire resistant coating with proprietary fibers, 68% solids, each container or package bearing ULC label, "Firefree F 88" by Firefree Coatings, Inc.; www.firefree.com

2.1.9. Rough Hardware: Supply rough hardware to frame and fix rough carpentry. This includes bolts, anchors, nails, expansion shields and other fastenings required. Hot dip galvanize hardware for exterior work; elsewhere, provide cadmium plated hardware. Provide spiral thread nails except as indicated otherwise.

2.2. MISCELLANEOUS LUMBER

2.2.1. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, concealed framing lumber, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

2.2.2. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per NLGA Standard Grading Rules for Canadian Lumber. For board-size lumber, provide No. 2 White Pine, No. 2 Red Pine, or No. 1 Construction Eastern Spruce, Balsam Fir or Jack Pine, kiln dried, free from sap, shakes, splits, knots and other defects.

2.2.3. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

2.2.4. Moisture Content: 19 percent maximum for lumber items are not specified to receive wood preservative treatment.

2.3. PLYWOOD PANELS

2.3.1. Plywood: 13 mm (1/2") thick or as shown, Douglas Fir plywood (DFP), grade stamped, conforming to CSA O121:

2.3.1.1. For telephone and electrical equipment backing panels: G2S, Grade A, sanded, fire-retardant treated

2.3.1.2. For concrete formwork: G1S, Grade A, sanded, exterior grade

2.3.1.3. For hoarding, underlayment: Grade B, unsanded, face openings filled

2.3.1.4. For sheathing, miscellaneous concealed plywood: Grade C, unsanded

2.4. FASTENERS

2.4.1. General: Provide fasteners of size and type indicated that comply with requirements specified in this Section for material and manufacture.

2.4.2. Where miscellaneous carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A123/A123M or of Type 304 stainless steel.

2.4.3. Nails, Wire, Brads, and Staples: ASTM F1667.

2.4.4. General purpose adhesive: to CSA O112.9.

2.4.5. Bolts: Steel bolts complying with ASTM A307, Grade A; with ASTM A563 hex nuts and, where indicated, flat washers.

2.4.6. Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices , recommended for purpose by manufacturer.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

3.2.2. Properly frame together parts of the Work with members accurately cut to size, closely fitted, well spiked and erected in a substantial manner, plumb, level, square and true to dimension.

3.2.3. Locate joints over bearing or supporting surfaces.

3.2.4. Provide running members full length wherever possible.

3.2.5. Design for expansion and contraction of the materials.

3.2.6. After cutting, drilling and fitting "treated" wood and plywood but before installation, apply 1 full coat of wood preservative to exposed surfaces, including ends of blocking, furring, nailers and rough carpentry.

3.2.7. Provide fasteners and rough hardware for a rigid and secure installation.

3.2.8. Mix intumescent paint coating product to manufacturer's recommendations. Do not thin or strain. Apply primer and paint coating providing fire resistant barrier in accordance with manufacturer's recommendations to achieve requirements of authorities having jurisdiction. Apply at rate 3.2 m^2/ℓ (125 sq ft/gal) to obtain dry film thickness of 0.25 mm (10 mils).

3.2.9. Miscellaneous Interior Carpentry: Provide plywood, blocking, furring, nailers, rough carpentry, grounds and nailing strips as indicated and/or as required for proper installation.

3.2.10. Equipment Mounting Panels:

3.2.10.1. Provide 19 mm (3/4") thick exposed plywood backboard panels. Refer to Electrical Drawings for sizes and locations and securely mount panels to wall surfaces.

3.2.10.2. Provide "fire treated" plywood.

3.2.11. Roof Carpentry:

3.2.11.1. Install continuous wood nailers around roof perimeters, curbs and roof openings at edges of insulation. Use cadmium plated self tapping screws for securing wood to metal deck and cadmium plated lag screws for securing wood to concrete as shown. Install cut cant strips and continuous nailers on copings and curbs as detailed.

3.2.11.2. Install continuous wood nailers along roof control joints, building and roof expansion joints as shown. Fasten nailers as specified.

3.2.11.3. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.2.11.4. Protect rough carpentry from weather.

3.2.12. Wood Grounds, Nailers, Blocking, And Sleepers:

3.2.12.1. Install where shown and where required for screeding or attaching other work. Cut and shape to required size. Coordinate locations with other work involved.

3.2.12.2. Attach to substrates to support applied loading.

3.2.13. Wood Furring:

3.2.13.1. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.2.13.2. Furring to Receive Plywood Paneling: Install 1x3 nominal-size furring at 24 inches o.c., horizontally and vertically. Select furring with no knots capable of producing bent-over nails and damage to paneling.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

END OF SECTION

PART 1 - GENERAL

1.1. SUMMARY

1.1.1. Section Includes: Provide rough carpentry including but not limited to following:

1.1.1.1. Wall sheathing.

1.1.2. Related Sections:

1.1.2.1. Section 05 41 00 Structural Metal Stud Framing.

1.1.2.2. Section 06 10 00 Rough Carpentry.

1.1.2.3. Section 09 29 00 Gypsum Board.

1.2. REFERENCES

1.2.1. Abbreviations and Acronyms:

1.2.1.1. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.2.1.2. UL: Underwriters Laboratories Inc.; www.ul.com.

1.2.2. Reference Standards:

1.2.2.1. ASTM A123/123M-17 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

1.2.2.2. ASTM C473-19 - Standard Test Methods for Physical Testing of Gypsum Panel Products

1.2.2.3. ASTM C518-21 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

1.2.2.4. ASTM C1177/C1177M-17 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

1.2.2.5. ASTM C1280-18(r2023) - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.

1.2.2.6. ASTM D3273-2021 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

1.2.2.7. ASTM D6329-98(2023) - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers.

1.2.2.8. ASTM E72-22 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.

1.2.2.9. ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials

1.2.2.10. ASTM E96-23 - Standard Test Methods for Water Vapor Transmission of Materials.

1.2.2.11. CAN/ULC-S102-18-REV1 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.2.2.12. CAN/ULC-S114-18 - Standard Method of Test for Determination of Non- Combustibility in Building Materials

1.2.2.13. CSA O112 Series-1977(R2006), Standards for Wood Adhesives

1.3. ACTION SUBMITTALS

1.3.1. Product Data:

1.3.1.1. Manufacturer’s specifications and installation instructions for each product specified.

1.4. DELIVERY, STORAGE AND HANDLING

1.4.1. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack panels flat. Provide for air circulation within and around stacks and under temporary coverings.

1.5. WARRANTY

1.5.1. Provide manufacturer's warranty against defects including delamination, deterioration, and decay for 1 year following Substantial Performance.

1.5.2. Provide manufacturer's warranty for manufacturing defects for 1 year following Substantial Performance.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. CertainTeed Corporation

2.1.2. CGC Inc

2.1.3. Georgia-Pacific Canada, Inc

2.2. MATERIALS

2.2.1. Exterior Sheathing: Glass mat reinforced, treated core gypsum board conforming to ASTM C1177/C1177M:

2.2.1.1. Non combustible in accordance with ASTM E136/CAN/ULC-S114

2.2.1.2. Fire properties tested to ASTM E84/CAN/ULC-S102:

2.2.1.2.1. Flame spread 0

2.2.1.2.2. Smoke developed 0

2.2.1.3. Mold resistance: no mould growth after 4 weeks exposure ASTM D3273 rating of 10

2.2.1.4. Thickness: 19 mm (5/8").

2.2.1.5. Width: 1200 mm (4').

2.2.1.6. Length: maximum practical length.

2.2.1.7. Weight: 1.9 lb/sq. ft.

2.2.1.8. Edges: Square.

2.2.1.9. Surfacing: Fiberglass mat on face, back, and long edges.

2.2.1.10. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 540 pounds per square foot, dry.

2.2.1.11. Flexural Strength, Parallel (ASTM C473): 80 lbf, parallel.

2.2.1.12. Humidified Deflection (ASTM C1177): Not more than 1/4 inch.

2.2.1.13. Permeance (ASTM E96): Not less than 23 perms.

2.2.1.14. R-Value (ASTM C518): 0.56.

2.2.1.15. Mold Resistance (ASTM D3273): 10, in a test as manufactured.

2.2.1.16. Microbial Resistance (ASTM D6329, UL Environmental GREENGUARD 3-week protocol): Will not support microbial growth.

2.2.1.17. Acceptable products:

2.2.1.17.1. “DensGlass® Exterior Sheathing” by Georgia-Pacific Canada, Inc.,

2.2.1.17.2. “GlasRoc Sheathing” by CertainTeed Corporation

2.2.1.17.3. “Securock Glass-Mat Sheathing” by CGC Inc

2.3. FASTENERS

2.3.1. General: Provide fasteners of size and type indicated that comply with requirements specified in this Section for material and manufacture.

2.3.2. Exterior sheathing: provide fasteners with a hot-dip zinc coating per ASTM A123/A123M or of Type 304 stainless steel.

2.3.3. General purpose adhesive: to CSA O112.9.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. General: In accordance with GA-253, ASTM C1280 and the manufacturer’s recommendations.

3.2.2. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

3.2.3. Provide running members full length wherever possible.

3.2.4. Minimum Fastening Requirements:

3.2.4.1. Perimeter Edge of Each Board: 200 mm (8") oc max.

3.2.4.2. Intermediate Supports: 300 mm (12") oc max.

3.2.5. Provide exterior sheathing neatly with tight butt joints and without gaps and holes.

3.2.6. Bear edges of exterior sheathing fully onto structural framing.

3.2.7. Do not crush exterior sheathing edges.

3.2.8. Do not countersink fasteners below exterior paper skin of exterior sheathing boards.

3.2.9. Secure exterior sheathing to exposed leg of inner track of telescopic 2-piece top track.

3.2.10. Provide ready to receive air/vapour barrier membrane.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide architectural woodwork including but not limited to following:

1.2.1.1. Wood casework.

1.2.1.2. Laminated casework.

1.2.1.3. Casework drawers and doors.

1.2.1.4. Edgebanding for casework and casework doors.

1.2.1.5. Countertops.

1.2.1.6. Casework hardware.

1.2.1.7. Casework accessories.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Building in and anchoring of steel frames in masonry partitions: Section 04 20 00, Masonry Units.

1.2.2.2. Metal brackets to wood benches: Section 05 50 00, Metal Fabrications.

1.2.2.3. Solid surfacing countertops, backsplashes: Section 06 61 16 Solid Surfacing Fabrications.

1.2.2.4. Installation of pre-engineered wood door frames and partition wall frames: Section 06 90 00, General Installations.

1.2.2.5. Supply of hollow metal doors and frames: Section 08 11 13, Steel Doors and Frames.

1.2.2.6. Supply of wood doors: Section 08 14 00, Wood Doors.

1.2.2.7. Supply of door hardware: Section 08 71 00, Door Hardware.

1.2.2.8. Glass and glazing: Section 08 80 00, Glass and Glazing.

1.2.2.9. Building in and anchoring of steel frames in gypsum board partitions: Section 09 21 16, Gypsum Board Assemblies.

1.2.2.10. Filling nail holes and provision of finish painting: Section 09 91 00, Painting.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. AWMAC/WI: Architectural Woodwork Manufacturers Association of Canada/Woodwork Institute; www.awmac.com.

1.3.1.2. FSC: Forest Stewardship Council; www.fsccanada.org.

1.3.1.3. GIS: AWMAC's Guarantee and Inspection Service.

1.3.1.4. HVAC: Heating, Ventilating and Air Conditioning.

1.3.1.5. HPDL: High Pressure Decorative Laminate

1.3.1.6. LPDL: Low Pressure Decorative Laminate

1.3.1.7. MDF: Medium Density Fibreboard.

1.3.1.8. NAAWS: North American Architectural Woodwork Standards.

1.3.1.9. NAUF: No Added Urea-Formaldehyde.

1.3.1.10. NEMA: National Electrical Manufacturers Association; www.nema.org.

1.3.1.11. SCAQMD: South Coast Air Quality Management District; www.aqmd.gov.

1.3.1.12. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Reference Standards:

1.3.2.1. ANSI/BHMA A156.9-2020 – Cabinet Hardware

1.3.2.2. ANSI/BHMA A156.18-2020 - Materials And Finishes

1.3.2.3. ANSI/NPA A208.1-2022 - Particleboard

1.3.2.4. ANSI/NPA A208.2-2022 - Medium Density Fiberboard (MDF) For Interior Applications

1.3.2.5. ANSI/NEMA LD 3-05 - High-Pressure Decorative Laminates

1.3.2.6. CAN/ULC-S102-18 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.2.7. CSA O112 Series-M77(06) - CSA Standards for Wood Adhesives

1.3.2.8. NAAWS: North American Architectural Woodwork Standards – 4.0, 2021

1.3.2.9. Principles & Criteria by Forest Stewardship Council Canada

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meetings:

1.4.1.1. Conduct a pre-installation meeting. The following minimum items shall be reviewed at the pre-installation meeting:

1.4.1.1.1. Verify project requirements.

1.4.1.1.2. Review installation conditions under which work is to be performed including possible site concerns.

1.4.1.1.3. Review locations of backing required for casework installation as shown on casework shop drawings.

1.4.1.1.4. Review method of attachment for backing to wall system as shown on architectural drawings.

1.4.1.1.5. Coordination requirements with other subtrades.

1.4.1.2. Key personnel shall attend the pre-installation meeting including but not limited to:

1.4.1.2.1.1.1. Casework manufacturer

1.4.1.2.1.1.2. Casework installer

1.4.1.2.1.1.3. Framing sub-contractor

1.4.1.2.1.1.4. Related work subtrade personnel.

1.5. ACTION SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Shop Drawings:

1.5.2.1. Submit Shop Drawings for work of this Section in accordance with Section 1 of NAAWS.

1.5.2.2. On casework and countertop elevations show location of backing required for attachment within walls.

1.5.2.3. Clearly indicate material being supplied and show connections, attachments, reinforcing, anchorage and location of exposed fastenings.

1.5.2.4. Clearly indicate material being supplied.

1.5.3. Samples: Submit samples in following sizes:

1.5.3.1. Minimum 300 mm (12") long x 300 mm (12") wide x 25 mm (1") thick solid wood.

1.5.3.2. Minimum 300 mm (12") square and of specified thickness, veneer mounted on 19 mm (3/4") particle board and finished as specified.

1.5.3.3. Each type of hardware.

1.5.3.4. Each plastic laminate in manufacturer's standard chip size.

1.5.3.5. Minimum 300 mm (12") square x 25 mm (1") thick counter top materials.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operation and Maintenance Data: Submit maintenance instructions in accordance with Section 01 77 00 Closeout Procedures.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Provide work of this Section in accordance with NAAWS produced by AWMAC/WI, except as specified otherwise herein and by reference are hereby made a part of this Section. Ensure any reference to grades and terminology in this Section is as defined in NAAWS.

1.7.1.2. Requirements of this Section govern and modify NAAWS.

1.7.1.3. Woodwork Manufacturer Qualifications:

1.7.1.3.1. Member in Good Standing of AWMAC.

1.7.1.3.2. Minimum 5 years of production experience similar to this project, whose qualifications indicate ability to comply with requirements of this Section.

1.7.1.3.3. Minimum one project in past 5 years where value of woodwork within 20 percent of cost of woodwork for this Project.

1.7.1.4. Installers:

1.7.1.4.1. Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and be a member of AWMAC/WI.

1.8. DELIVERY, STORAGE, AND HANDLING

1.8.1. Delivery and Acceptance Requirements:

1.8.1.1. Do not deliver finished Products during rainy or damp weather.

1.8.1.2. Do not deliver work of this Section until building and storage areas are sufficiently dry so Products will not be damaged by excessive changes in moisture content.

1.8.1.3. Deliver Products of this Section in accordance with Section 2, Rule 2.4.4.1 of NAAWS.

1.8.1.4. Do not deliver damaged Products.

1.8.2. Storage and Handling Requirements:

1.8.2.1. Store and handle Products of this Section in accordance with Section 2, Rules 2.4.4.2 and 2.4.4.3 of NAAWS.

1.8.2.2. Cover finished plastic laminate surfaces and varnished surfaces with heavy kraft paper and put in cartons for protection. Protect installed plastic laminate surfaces by acceptable means. Do not remove protective covers until immediately prior to final cleaning.

1.8.2.3. Maintain indoor temperature and humidity within range recommended by AWMAC's Standards (NAAWS).

1.9. WARRANTY

1.9.1. Manufacturer Warranty: Warrant work of this Section for a period of 2 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

1.9.2. Defects include but are not limited to, delamination of plastic laminate, opening of seams, warpage and extensive colour fading.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. High Pressure, Paper Base, Decorative Laminates (PLAM):

2.1.1.1. Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1.1. Arborite; www.arborite.com

2.1.1.1.2. Formica Inc.; www.formica.com

2.1.1.1.3. Industrial Laminates/Norplex, Inc.; www.micarta.com

2.1.1.1.4. Nevamar Company, LLC; www.nevamar.com

2.1.1.1.5. Pionite Decorative Laminates; www.pionite.com

2.1.1.1.6. Wilsonart Canada; www.wilsonart.com

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Work in conformance with the Architectural Woodwork Manufacturer's Association of Canada quality standards manual 4.0

2.2.2. Materials, methods, construction and installation to be in accordance with AWMAC Standards for Custom Grade, except as modified in these specifications.

2.2.3. Ensure millwork (e.g. countertops, wall cabinets, etc.) are capable of supporting structural loads without deflection in accordance with "casework integrity" in "Appendix" of NAAWS.

2.3. MATERIALS

2.3.1. Framing Lumber: Select Merchantable Western White Spruce, kiln dried, or sound material of any species may be used for concealed members, free from sap, shakes, knots, splits and other defects.

2.3.2. Architectural Lumber: Clear, straight, kiln dried, Select Yellow Birch for fitments and door jambs. Provide kiln dried lumber to 7% moisture content, free from blemishes that would be apparent after finish is applied.

2.4. PANEL MATERIALS

2.4.1. Panel material schedule; except where indicated or specified otherwise:

2.4.1.1. Thickness: 19 mm (3/4"), minimum.

2.4.1.2. Maximum moisture content at time of installation: 10% to 12%.

2.4.2. Plywood:

2.4.2.1. Backing grade, veneer core:

2.4.2.1.1. Softwood plywood to CSA O151-04

2.4.2.1.2. Douglas Fir plywood to CSA O121-M1978.

2.4.3. Particleboard; medium density (MDF):

2.4.3.1. Medium density panels, meeting requirements of ANSI/NPA A208.2, balanced design, manufactured from 100% recycled materials, without use of formaldehyde resins, of minimum density of 770 kg/m3 (48 lb/cu ft) maximum Flame Spread rating of 25 with a maximum Smoke Developed of 200 when tested to CAN/ULC-S102. Do not use MDF panels in moist areas. "Excel+ MDF" by Uniboard Canada Inc.; www.uniboard.com or CanFibre Group Ltd.

2.4.3.2. Particleboard Laminating Core: Particleboard core of minimum 720 kg/m3 (45 lbs/cu ft) density conforming to ANSI/NPA A208.1, Grade R, sanded both sides.

2.5. PLASTIC LAMINATE (PLAM)

2.5.1. Melamine (LPDL):

2.5.1.1. Conforming to ANSI A208.1-1999, grade M3, 19 mm (3/4") minimum thick, complete with matching non-yellowing edge trim, unless otherwise noted.

2.5.2. High Pressure, Paper Base, Decorative Laminates (HPDL):

2.5.2.1. To ANSI/NEMA LD 3-2005, classified as general purpose grade (HGS) (both horizontal and vertical trades) and post forming grade (HGP) (both horizontal and vertical grades).

2.5.2.2. Provide types and thicknesses conforming to ANSI/NEMA LD 3 and Section 4, “Table: 4-046 – HPDL TYPES and Minimum Performance Requirements” of NAAWS.

2.5.2.3. Plastic Laminate Adhesive: Provide in accordance with Section 4, Rule 4.4.4.6.4 and “adhesive usage guidelines” in “Appendix” of NAAWS.

2.5.2.4. PLAM-1: “Premium” by Wilsonart, “Fawn Cypress” 8208K-60, matte finish.

2.5.2.5. PLAM-2: “Solids” by Wilsonart, “Designer White” D354-60, matte finish

2.6. FASTENERS AND ADHESIVES

2.6.1. Fasteners:

2.6.1.1. Wood screws: FF-S-111D Amendment 1 (1989), type, size, material and finish as required for the condition of use.

2.6.1.2. Nails: FED FF-N-105, type, size material and finish as required for the condition of use.

2.6.1.3. Anchors: Type, size material and finish as required for the condition of use.

2.6.1.4. Fastening devices shall be set or countersunk flush with surface of framing member. No exposed fasteners permitted. Exposed fasteners shall be flat head hex socket cap screws and matching joint connector sex bolts (also known as Chicago screws or post and screw) by Murakoshi, distributed by Richelieu, Spaenaur Joint Connector bolt with decorative head, hex drive series.

2.6.1.5. At butt joints in railing caps and counter surfaces, employ assembling bolts to ensure tight structural joint.

2.6.2. Adhesives: Moisture resistant complying with FS MMM-A-125, Type II, or FED MMM-A- 188, Type I, II or III; type best suited for the purpose.

2.7. HARDWARE

2.7.1. Casework hardware: to ANSI/BHMA A156.9.

2.7.1.1. Shallow Drawer Slides: “1375” by Knape & Vogt Manufacturing Company; www.knapeandvogt.com or “3832” by Accuride; www.accuride.com, full extension type with a capacity of 34 kg (75 lb).

2.7.1.2. Deep Drawer Slides: “1485” by Knape & Vogt Manufacturing Company or “4005” by Accuride, full extension type with a capacity of 68 kg (150 lb).

2.7.1.3. Flipper Door Slides (Non-adjustable): “1432” by Accuride; www.accuride.com or Knape & Vogt Manufacturing Company; www.knapeandvogt.com.

2.7.1.4. Recessed Shelf Pilasters, Standards and Clips: Provide “KV255" pilaster and “KV256" clip supports by Knape & Vogt Manufacturing Company; www.knapeandvogt.com or “120-10 Series” pilasters and “1903-2G” clip supports by Richelieu Hardware Ltd.; www.richelieu.com.

2.7.1.5. Sliding Glass Door Track: “992ZC” by Knape & Vogt Manufacturing Company; www.knapeandvogt.com, complete assembly.

2.7.1.6. Concealed Hinges: “Euromat Topsafe” by Hettich Canada L.P.; www.hettich.com, minimum 170 degree opening angle and is self closing. Supply manufacturer's recommended number of hinges to suit door size and thickness.

2.7.1.7. Piano Hinges: Nickel plated [flash brass] finish; “Product #3225180” by Richelieu Hardware Ltd.; www.richelieu.com. Provide piano hinges along full length of door

2.7.1.8. Back-Mounted Pulls: ANSI/BHMA A156.9-2003, B02011.

2.7.1.9. Wire Pulls (Doors and Drawers): “CBH 220" by Canadian Builders Hardware Mfg. Inc.; www.cbhmfg.com, 100 mm (4").

2.7.1.10. Knobs (Doors and Drawers): “BK.K771.PB” by Belwith Keeler; www.belwithkeeler.net, brass in 32 mm (1-1/4") diameter.

2.7.1.11. Door Locks: Keyed cylinder cam lock type C4 (satin brass, clear coated on brass base) finish.

2.7.1.12. Drawer Locks: “0738 Drawer Lock” by CCL Security Products; www.cclsecurity.com, C4 (satin brass, clear coated on brass base) finish.

2.7.1.13. Keyboard System: “Humanscale/Neutral” by Design Keyboard System, www.humanscale.com with second generation arm, big platform support and gel palm rest in Graphite Shade. Provide “Model #2G500G” distributed by CTI Business Interiors.

2.7.1.14. Keyboard Slides (Non-Adjustable): “2009” by Accuride or Knape & Vogt Manufacturing Company; www.knapeandvogt.com.

2.7.1.15. Keyboard Slides (Adjustable): “WK.14647” by Weber Knapp Company; www.weberknapp.com, black in colour with a capacity of 20 kg (45 lb).

2.7.1.16. Plastic Hooks: “HC.H 520" by Hewi; www.hewi.com, 100 mm (4") in size.

2.7.1.17. Closet Coat Rods: “KV660" 27 mm (1-1/16") od stainless steel rod complete with “KV734" and “KV735" polished chrome flanges by Knape & Vogt Manufacturing Company; www.knapeandvogt.com. Size rods to suit closet widths.

2.7.1.18. Grommets: “Round Grommets" by Richelieu Hardware Ltd.; www.richelieu.com, 63 mm (2-1/2") drilling diameter, black in colour. Provide 4 grommets per workstation and locate as directed by Province.

2.7.1.19. Closet Shelving: “Closet Maid” by Clairson International, 400 mm (16") deep continuous length shelves and rod around inside closet perimeter with brackets at 610 mm (24") oc maximum.

2.7.1.20. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.

2.7.1.21. Shelf Rests: ANSI/BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.

2.7.1.22. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA finish number indicated.

2.7.1.22.1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base.

2.7.1.22.2. Bright Brass, Clear Coated: BHMA 605 for brass base; BHMA 632 for steel base.

2.7.1.22.3. Satin Brass, Blackened, Bright Relieved, Clear Coated: BHMA 610 for brass base; BHMA 636 for steel base.

2.7.1.22.4. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.

2.7.1.22.5. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.

2.7.1.22.6. Satin Stainless Steel: BHMA 630.

2.7.1.23. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.7.2. Fabrication:

2.7.2.1. General:

2.7.2.1.1. Materials and methods of construction to meet requirements of AWMAC's Standards (NAAWS) for Custom grade.

2.7.2.1.2. Fabricate joints accurately fitted, coped where possible and well glued up. Fabricate joints mitred to perfect fit and alignments carefully matched.

2.7.2.1.3. Fabricate finished woodwork in 1 piece where possible. Fabricate running members in the longest lengths obtainable.

2.7.2.1.4. Fabricate to conceal fastenings.

2.7.2.1.5. Provide plastic laminate work in shop where practical and/or possible.

2.7.2.1.6. Fabricate exposed gables to match the required exposed finishes.

2.7.2.2. Plastic Laminate Casework:

2.7.2.2.1. Construction Type: Frameless.

2.7.2.2.2. Cabinet and door interface: flush overlay.

2.7.2.2.3. Exposed Surfaces HPDL, color, finish and pattern direction color and pattern as selected by Consultant and meeting requirements of AWMAC's Standards (NAAWS) for Grade specified.

2.7.2.2.4. Exposed interior surfaces: LPDL of a color and pattern as selected by Consultant.

2.7.2.2.5. Semi-exposed surfaces: LPDL of a color and pattern as selected by Consultant.

2.7.2.2.6. Edgeband: PVC

2.7.2.3. Drawers:

2.7.2.3.1. Sides: Particle board with LPDL surfaces.

2.7.2.3.2. Bottoms: MDF with melamine surfaces.

2.7.2.3.3. Joinery: Meeting requirements of AWMAC's Standards (NAAWS) for Grade specified.

2.7.2.4. Countertops:

2.7.2.4.1. Fabricate and assemble countertops and splashbacks in shop to profiles and lengths required.

2.7.2.4.2. Fabricate cutouts for services penetrations as required.

2.7.2.4.3. Verify governing dimensions before fabricating items which abut wall surfaces.

2.7.2.4.4. Provide cutouts required and round internal corners, chamfer edges and seal exposed core.

2.7.2.4.5. Provide sidesplashes at abutting ends of counters and at adjoining walls, unless otherwise indicated.

2.7.2.4.6. Provide a 6 mm (1/4") drip groove approximately 13 mm (1/2") in from the underside edge.

2.7.2.4.7. Laminated Plastic Countertops:

2.7.2.4.7.1. Core material: Water resistant particle board.

2.7.2.4.7.2. Back splashes: height and profile as shown on drawings.

2.7.2.4.7.3. Front edges: As shown on plans.

2.7.2.4.8. Solid Surface Countertops:

2.7.2.4.8.1. Back splashes: height and profile as shown on drawings.

2.7.2.4.8.2. Front edges: As shown on plans.

2.7.2.5. Exposed wood construction:

2.7.2.5.1. Fabricate joints carefully matched for grain and colour.

2.7.2.5.2. Fabricate millwork with slow fed machines free from sticker and/or sander markings, with sections and moulding work cut accurately to profiles.

2.7.2.5.3. Sandpaper woodwork, smooth removing burrs, feathers, sleeves, raised grain and sharp arises and leave exposed surfaces perfectly clean and smooth ready for finishing.

2.7.2.5.4. Provide edges noted to be solid, as minimum 6 mm (1/4") thick wood to match exposed veneer, glued to core prior to the application of face veneers.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Install work of this Section in accordance with appropriate Section of NAAWS.

3.2.2. Provide work of this Section true and straight and securely fastened in place.

3.2.3. Mitre exposed corners.

3.2.4. Fit and scribe work abutting other building components.

3.2.5. Countersink mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end.

3.2.6. Provide plastic laminate countertops plumb and true, neatly scribed to adjoining surfaces.

3.2.7. Thoroughly fix and anchor work of this Section into position.

3.2.8. Mechanical and Electrical Fittings:

3.2.8.1. Provide openings required to accommodate mechanical and electrical fittings as part of the work of this Section and provide a core sealant to protect counter cores which are exposed to accommodate:

3.2.8.1.1. mechanical services and fittings.

3.2.8.1.2. washroom accessories.

3.2.8.2. Mechanical and electrical fittings and services will be provided as part of the work of Divisions 21, 22, 23, 26, 27 and 28.

3.2.9. Installation of Hardware:

3.2.9.1. Install architectural woodwork hardware in accordance with manufacturer's requirements and templates. Adjust architectural woodwork hardware to provide smooth operation and ensure clearances are maintained. Repair damage to adjacent surfaces resulting from failure to conform with this requirement.

3.2.9.2. Provide lubricants required and use in manner to ensure smooth function of hardware consistent with manufacturer's recommendations.

3.2.9.3. Verify fastening components are tightened securely. Align screws, bolts and similar fastenings such that relationship of screw head indentations, similar surfaces and slots are perpendicular to matching vertical or horizontal position when on same surface. Do not burr or otherwise mar edges of surfaces of hardware components. Repair defects caused by work of this Section in an acceptable manner.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. ADJUSTING & TOUCH UP

3.4.1. Adjust all moving and operating parts to function smoothly and correctly.

3.4.2. Fill and retouch all nicks, chips and scratches. Replace all un-repairable damaged items.

3.5. CLEANUP

3.5.1. Upon completion of installation, clean installed items of pencil and ink marks and broom clean the area of operation.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide Solid Surfacing (SS) fabrications including but not limited to following:

1.2.1.1. Millwork counter tops with sinks and cove backsplashes.

1.2.1.2. Counter tops for nurses stations - reception areas.

1.2.1.3. Vanity tops.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of finish carpentry and architectural woodwork: Section 06 40 00, Architectural Woodwork.

1.2.2.2. Provision of elastomeric joint sealants: Section 07 92 00, Joint Sealants.

1.2.2.3. Provision of wall protection: Section 10 26 23, Protective Wall Covering.

1.2.2.4. Provision of plumbing and plumbing fixtures: Division 22, Plumbing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. HPDL: High-Pressure Decorative Laminates

1.3.1.2. MDF: Medium Density Fibreboard.

1.3.2. Definitions:

1.3.2.1. Solid Polymer Surface: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.3.3. Reference Standards:

1.3.3.1. ANSI/NEMA LD 3-05 - High-Pressure Decorative Laminates (HPDL)

1.3.3.2. ASTM C920-18 - Standard Specification for Elastomeric Joint Sealants

1.3.3.3. ASTM D638-22 - Standard Test Method for Tensile Properties of Plastics

1.3.3.4. ASTM D785-23 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials

1.3.3.5. ASTM D790-17 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

1.3.3.6. ASTM E84-21a - Standard Test Method for Surface Burning Characteristics of Building Materials

1.3.3.7. ASTM E228-17 - Standard Test Method for Linear Thermal Expansion of Solid Materials with a Push-Rod Dilatometer

1.3.3.8. ASTM G21-15 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

1.3.3.9. ASTM G155-21 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

1.3.3.10. NFPA 255-06 - Standard Method of Test of Surface Burning Characteristics of Building Materials

1.3.3.11. CAN/ULC-S102-18 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.3.12. UL 723-2018 - Test for Surface Burning Characteristics of Building Materials

1.3.3.13. UL 2824-13 - GREENGUARD Certification Program, Method for Measuring Microbial Resistance from Various Sources Using Static Environmental Chambers

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meetings:

1.4.1.1. Arrange preinstallation meeting 1 week prior to commencing work with all parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor, include Consultant who may attend, Subcontractor performing work of this trade, Owner’s representative, testing company's representative and consultants of applicable discipline.

1.4.1.2. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data:

1.5.2.1. Indicate Product description including solid surface sheets, fabrication information and compliance with specified performance requirements. Submit Product data with resistance to list of chemicals.

1.5.3. Shop Drawings:

1.5.3.1. Submit Shop Drawings for work of this Section. Indicate plans, sections, dimensions, component sizes, edge details, thermosetting requirements, fabrication details, attachment provisions, sizes of furring, blocking, including concealed blocking and coordination requirements with adjacent work. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in solid surface.

1.5.4. Coordination Drawings:

1.5.4.1. Submit coordination drawings indicating plumbing and miscellaneous steel work indicating locations of wall rated or non-rated, blocking requirements, locations and recessed wall items and similar items.

1.5.5. Samples:

1.5.5.1. Submit samples in accordance with Section 01 30 00. Submit minimum 150 mm x 150 mm (6" x 6") samples. Cut sample and seam together for representation of inconspicuous seam. Indicate full range of colour and pattern variation. Reviewed samples with no objections recorded will be retained as standard for work.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operation and Maintenance Data:

1.6.1.1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in Project closeout documents.

1.6.1.2. Provide a commercial care and maintenance kit and video. Review maintenance procedures and warranty details with Owner upon completion.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7.2. Mock-Ups:

1.7.2.1. Prior to final review of Shop Drawings, erect 1 full size mock-up of each component at Project site demonstrating quality of materials and execution for Consultant's review.

1.7.2.2. Should mock-up have objections recorded, rework or remake until no objections are recorded. Remove rejected units from Project site.

1.7.2.3. Mock-up will be used as standard for acceptance of subsequent work.

1.7.2.4. Mock-ups may remain as part of finished work.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Delivery and Acceptance Requirements: Deliver no components to Project site until areas are ready for installation.

1.8.2. Storage and Handling Requirements:

1.8.2.1. Store components indoors prior to installation.

1.8.2.2. Handle materials to prevent damage to finished surfaces.

1.9. WARRANTY

1.9.1. Manufacturer Warranty: Provide manufacturer's standard warranty for material only for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Corian® by DuPont; www.corian.com

2.1.1.2. Samsung Chemical USA; www.staron.com

2.1.1.3. Wilsonart Contract; www.wilsonartcontract.com

2.1.2. Substitution Limitations: This Specification is based on DuPont's Products. Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification.

2.2. MATERIALS

2.2.1. Solid Surfacing Material (SS):

2.2.1.1. Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment; not coated, laminated or of composite construction; meeting following criteria:

2.2.1.1.1. Flammability: Flame Spread Index: 0 and Smoke Development Index: 5 when tested to CAN/ULC-S102.

2.2.1.2. Thickness: 19 mm (3/4”).

2.2.1.3. Ensure material has minimum physical and performance properties specified under “Performance/Design Criteria”.

2.2.1.4. Ensure superficial damage to a depth of 0.25 mm (0.010") is repairable by sanding and polishing.

2.2.1.5. SS-1: Dupont Corian, colour: “Limestone Prima”.

2.2.2. Adhesive for Bonding to Other Products: One component silicone to ASTM C920.

2.2.3. Sealant: A standard mildew-resistant, FDA/UL® and NSF/ANSI 51 compliant in food zone area, recognized silicone colour matched sealant or clear silicone sealant.

2.2.4. Sink/Bowl Mounting Hardware: Manufacturer's approved bowl clips, brass inserts and fasteners for attachment of undermount sinks/bowls.

2.3. COMPONENTS

2.3.1. Window Sills: 13 mm (1/2") thick solid surfacing material, adhesively joined with inconspicuous seams.

2.3.2. Counter Perimeter Frame: Ensure 19 mm (3/4") thick, moisture resistant cores for counter tops in wet areas having sinks or lavatories are 19 mm (3/4") thick exterior grade plywood with waterproof adhesive, CSA O115-M (G/SO) Fir or Poplar plywood, veneer core only. Ensure fire retardant Product contains fire-retardant chemicals injected with raw materials during manufacturing and achieves a maximum flame-spread rating of 25 with a maximum smoke development of 200 when tested to CAN/ULC-S102. Acceptable Product by Uniboard Canada or The Canfibre Group Limited.

2.3.3. Counter Tops with Undermount Bowls: 12 mm (1/2") thick countertop of 100% acrylic solid surfacing material, cast to desired profiles and sizes having edge details as indicated on Drawings conforming to CSA B45.5/IAPMO Z124, complete with undermount bowl(s) as shown on Drawings. Provide countertops complete with backsplashes of size shown on Drawings. Use undermount hardware according to manufacturer's instructions. Ensure vanity top and backsplash is colour; non-coved as selected by Consultant.

2.3.4. Fabrication:

2.3.4.1. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and solid surfacing manufacturer requirements. Form joints between components to create inconspicuous seams using manufacturer’s standard joint adhesive. Provide factory cutouts for plumbing fittings and bath accessories as indicated on Drawings.

2.3.4.2. Where indicated, thermoform corners and edges or other objects to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.

2.3.4.3. Ensure no blistering, whitening and cracking of components during forming.

2.3.4.4. Fabricate backsplashes from solid surfacing material with optional radius cove where counter and backsplashes meet as indicated on Drawings. Backsplashes for most colours may be fabricated by traditional means discussed in K-25294 *Backsplashes*. Colours with metallic/mica particle or veined colours creating directional aesthetics (K-26833 Directional

Aesthetics) may require the techniques in Technical Bulletin K-28235 Thermoformed Backsplash.

2.3.4.5. Form joints between components using manufacturer's standard joint adhesive. Ensure joints are inconspicuous in appearance and without voids. Attach 50 mm (2") wide reinforcing strip of solid polymer material under each joint.

2.3.4.6. Provide holes and cutouts for plumbing and bath accessories as indicated on Drawings.

2.3.4.7. Rout and finish component edges to a smooth, uniform finish. Rout cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.

2.3.4.8. Finish: Ensure surfaces have uniform finish, as noted in the Finishes Schedule:

2.3.4.8.1. Matte, with a 60° gloss rating of 5 - 20.

2.3.4.8.2. Semi-gloss, with a 60° gloss rating of 25 - 50.

2.3.4.8.3. Polished, with a 60° gloss rating of 55 - 80.

2.3.4.9. Fabrication Tolerances:

2.3.4.9.1. Variation in Component Size: +/-3 mm (+/-1/8").

2.3.4.9.2. Location of Openings: +/-3 mm (+/-1/8") from indicated location.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

3.1.1.2. Verify actual site dimensions and location of adjacent materials prior to commencing work.

3.1.1.3. Examine cabinets upon which counter tops are to be installed. Verify cabinets are level to within 3 mm in 3 m (1/8" in 10' - 0").

3.1.1.4. Notify Consultant in writing of any conditions which would be detrimental to installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.

3.2.2. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.

3.2.3. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer’s written recommendations using adhesive in colour to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.

3.2.4. Install countertops with no more than 3 mm (1/8") sag, bow or other variation from a straight line.

3.2.5. Adhere undermount/submount/bevel mount sinks/bowls to countertops using manufacturer's recommended adhesive and mounting hardware.

3.2.6. Adhere topmount sinks/bowls to countertops using manufacturer recommended adhesives and colour-matched silicone sealant.

3.2.7. Seal between wall and components with joint sealant as specified herein and in Section 07 92 00, as applicable.

3.2.8. Provide backsplashes and endsplashes as indicated on Drawings. Adhere to countertops using a standard colour-coordinated silicone sealant. Adhere applied sidesplashes to countertops using a standard colour-coordinated silicone sealant. Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer's standard colour-coordinated joint adhesive.

3.2.9. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Ensure components are clean on date of Substantial Performance of the Work.

3.2.10. Coordinate connections of plumbing fixtures with Division 22. Make plumbing connections to sinks in accordance with Division 22.

3.3. REPAIR

3.3.1. Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer's "Fabrication and Installation Manual".

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.5. CLEANING

3.5.1. Remove excess adhesive and sealant from visible surfaces.

3.5.2. Clean surfaces in accordance with manufacturer's "Care and Maintenance Instructions".

3.6. PROTECTION

3.6.1. Provide protective coverings to prevent physical damage or staining following installation for duration of Project.

3.6.2. Protect surfaces from damage until date of Substantial Performance of the Work.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide general installations including but not limited to following:

1.2.1.1. Installation of hollow metal doors and frames.

1.2.1.2. Continuous grouting of fire rated frames in concrete and concrete block walls.

1.2.1.3. Spot grouting of door frames in gypsum board partitions.

1.2.1.4. Installation of wood doors.

1.2.1.5. Installation of door hardware.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be

1.2.2.1. Provision of concrete block wall: Section 04 20 00, Masonry Units.

1.2.2.2. Provision of architectural woodwork: Section 06 40 00, Architectural Woodwork.

1.2.2.3. Supply of hollow metal doors and frames: Section 08 11 13, Hollow Metal Doors and Frames.

1.2.2.4. Supply of wood doors: Section 08 14 00, Wood Doors.

1.2.2.5. Supply of door hardware: Section 08 71 00, Door Hardware.

1.2.2.6. Installation of steel frame partitions: Section 09 22 16, Non-Structural Metal Framing.

1.2.2.7. Electrical fittings and services: Division 26, Electrical.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. DHI: Door and Hardware Institute Canada; www.dhicanada.ca.

1.3.1.2. HVAC: Heating, Ventilating and Air Conditioning.

1.3.1.3. NFPA: National Fire Protection Association; www.nfpa.org.

1.3.2. Reference Standards:

1.3.2.1. ANSI/WDMA I.S. 1A – 2021 - Industry Standard for Architectural Flush Wood Doors

1.3.2.2. ASTM C305-2020 - Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency

1.3.2.3. ASTM C1107/C1107M-20 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

1.3.2.4. NFPA 80-2022 - Standard for Fire Doors and Other Opening Protectives

1.3.2.5. CAN/ULC-S702-14 - Standard for Mineral Fibre Thermal Insulation for Buildings

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meeting:

1.4.1.1. Prior to start of work, arrange for site meeting of parties associated with work of this Section. Presided over by Contractor, include Consultant, Subcontractor, and manufacturer's representative.

1.4.1.2. Review work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of hardware, hardware to be used, installation of methods and procedures related to electrified door hardware, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of this Section. Also discuss following items:

1.4.1.2.1. Electrical roughing in and other preparatory work performed by other trades.

1.4.1.2.2. Sequence of operation of each type of electrified door hardware.

1.4.1.2.3. Construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

1.4.1.2.4. Required testing, inspecting and certifying procedures.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. ChemRex Inc.; www.chemrex.com

2.1.1.2. CPD Construction Products; www.cpd.ca

2.1.1.3. Euclid Canada; www.euclidchemical.com

2.1.1.4. Sika Canada Inc.; www.sikacanada.com

2.1.1.5. W.R. Meadows of Canada; www.wrmeadows.com

2.2. MATERIALS

2.2.1. Doors, Frames and Hardware: Refer to following Sections for Products to be installed as part of the work of this Section:

2.2.1.1. Section 06 40 00, Architectural Woodwork.

2.2.1.2. Section 08 11 13, Hollow Metal Doors and Frames.

2.2.1.3. Section 08 14 00, Wood Doors.

2.2.1.4. Section 08 71 00, Door Hardware.

2.2.2. Spot Grout: Proportion when used at metal door frames; 1 part hardwall plaster to not more than 2-1/2 parts "Perlite" by weight, with enough water added for "hand pack" consistency and/or use "Gyproc 90" by Georgia-Pacific Canada, Inc. or "Durabond 90" by CGC Inc.

2.2.3. Continuous Grout: Pre-mixed, non-shrink, non-metallic, cementitious grout, containing no chlorides, conforming to ASTM C1107/C1107M; "M-Bed Standard" by Sika Canada Inc., "CG-86 Construction Grout" by W.R. Meadows of Canada Ltd., "Set Grout" by ChemRex Inc., or "NS Grout" by Euclid Canada.

2.2.4. Batt Insulation: Preformed mineral (glass and stone wool) fibre, conforming to CAN/ULC-S702, "EcoTouch™ QuietZone® PINK™ FIBERGLAS® Acoustic Insulation" by Owens Corning Canada LP, "Roxul AFB - Acoustical Fire Batts" by Roxul Inc. or "Thermafibre Sound Attenuation Blankets" by CertainTeed Corporation, of type, minimum thickness, width to suit metal framing spacing and other miscellaneous spacings as indicated on Drawings.

2.2.5. Threshold Sealant: As recommended by installer in accordance with Section 07 92 00.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Fire Labeled Doors and Frames:

3.2.1.1. Install fire labeled doors and frames in accordance with manufacturer's printed instructions and NFPA 80.

3.2.1.2. Verify labeled doors and frames are placed in their designated openings. Review, inspect and certify where required by authorities having jurisdiction.

3.2.2. Hollow Metal Doors:

3.2.2.1. Install hollow metal doors in accordance with manufacturer's instructions.

3.2.2.2. Install in accordance with following edge clearances unless otherwise indicated:

3.2.2.2.1. Between doors and frames at head and jambs: 3 mm (1/8").

3.2.2.2.2. At door bottom: 19 mm (3/4") maximum to unfinished floor, 16 mm (5/8") maximum to finished floor unless indicated to be undercut.

3.2.2.2.3. Between meeting edges of pairs of doors: 3 mm (1/8").

3.2.3. Hollow Metal Frames:

3.2.3.1. Install hollow metal frames in accordance with manufacturer's instructions.

3.2.3.2. Set frames plumb, square, level and at correct elevation, maintaining uniform door width and height.

3.2.3.3. Secure anchorages and connections to adjacent construction.

3.2.3.4. Remove temporary steel shipping jamb spreaders prior to setting 1-piece welded frames. Brace frames rigidly in position while being built in. Use precisely-dimensioned installation spreaders at sill and third-points of door opening height to maintain door opening width during building-in. Follow manufacturer’s instructions regarding proper use of floor and jamb anchors. Remove installation spreaders only after mortar has set, where applicable.

3.2.3.5. Allow for deflection to prevent structural loads from being transmitted to frame.

3.2.3.6. Provide batt insulation to completely fill pressed steel frames of exterior doors and adjacent cavities.

3.2.3.7. Spot Grouting:

3.2.3.7.1. Coordinate spot grouting with Section 09 21 16.

3.2.3.7.2. Provide spot grout to increase rigidity of frame and improve resistance to frame rotation caused by weight of door.

3.2.3.7.3. Comply with manufacturer’s recommendations for surface preparation, cleaning, forming, mixing, placement and curing of grout.

3.2.3.7.4. Mix grout in accordance with ASTM C305 requirements.

3.2.3.7.5. Spot grout at strike and hinge side jambs at steel door frames set in gypsum board partitions, walls and other similar locations in accordance with

manufacturer's recommendations. Immediately insert gypsum panels into jamb and attach to framing. Do not terminate gypsum board against trim.

3.2.3.7.6. Do not use pumped slurry method to perform spot grouting.

3.2.3.8. Continuous Grouting:

3.2.3.8.1. Coordinate continuous grouting with Section 03 30 00 and Section 04 20 00 respectively.

3.2.3.8.2. Comply with manufacturer's recommendations for surface preparation, cleaning, forming, mixing, placement and curing of grout.

3.2.3.8.3. Mix grout in accordance with ASTM C305 requirements.

3.2.3.8.4. Provide grouting employing established procedures recommended by manufacturers. Use minimum water required to produce placement consistency.

3.2.3.8.5. Grout pressed steel door, screen and sidelight frames in masonry and concrete fire rated walls solid with grout. Do not use pumped slurry method to perform grouting.

3.2.4. Wood Doors:

3.2.4.1. Install wood doors in accordance with manufacturer's instructions and recommendations of ANSI/WDMA I.S. 1A.

3.2.4.2. Condition doors to average temperature and humidity in area of installation for not less than 48 hours prior to installation.

3.2.4.3. Install doors in a neat and workmanlike manner free from hammer or tool marks, open joints or slivers.

3.2.4.4. Set plumb, level, square and true. Install doors after building humidity is at an acceptable level.

3.2.4.5. Install in accordance with following edge clearances unless otherwise indicated:

3.2.4.5.1. Between doors and frames: at head and jambs: 3 mm (1/8").

3.2.4.5.2. At door bottom: 19 mm (3/4") maximum to unfinished floor unless doors are indicated to be undercut.

3.2.4.5.3. Between meeting edges of pairs of doors: 3 mm (1/8").

3.2.4.6. Cut, drill and prepare doors to template to receive hardware.

3.2.4.7. Ensure smoke gaskets are in-place before pre-finished door installation.

3.2.5. Door Hardware:

3.2.5.1. Install hardware to doors and frames in accordance with manufacturer's packaged installation, template and adjusting instructions.

3.2.5.2. Adjust hardware to provide smooth operation of doors and ensure clearances are maintained. Provide lubricants to allow smooth function of hardware consistent with manufacturer's recommendations.

3.2.5.3. Mount hardware at heights in accordance with the "Recommended Locations for Builder's Hardware" by DHI Canada except as otherwise indicated on the Documents or required by the authorities having jurisdiction.

3.2.5.4. Install door louvres and frame bumpers.

3.2.5.5. Tighten fastening components snugly. Do not burr or otherwise mar the edges of surfaces of hardware components. Repair defects resulting from work of this Section in accordance with Consultant's review.

3.2.5.6. Set exterior door thresholds in a continuous bed of sealant to prevent water and air intrusion beneath sill.

3.2.5.7. Unless otherwise indicated, mounting heights for door hardware is as follows:

3.2.5.7.1. Locksets - 1023 mm (40-5/16") from floor to centre line of knob.

3.2.5.7.2. Deadlocks - 1100 mm (43-5/16") from floor to centre line of cylinder.

3.2.5.7.3. Panic Bolts - 1023 mm (40-5/16") from floor to centre line of bar.

3.2.5.7.4. Pulls - 1041 mm (41") from floor to centre line of pull.

3.2.5.7.5. Push Plates - 1100 mm (43-5/16") from floor to centre line of plate.

3.2.5.7.6. Guard Bars - 1066 mm (42") from floor to centre line of bar.

3.2.5.8. Provide locked room for storage of door hardware at the job site and a person responsible for control and distribution of door hardware.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. ADJUSTING

3.4.1. Adjust doors and hardware and other moving or operating parts to function smoothly and correctly.

3.5. CLEANING

3.5.1. Carefully wipe clean doors of dust created due to work of this Project.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide building insulation including but not limited to following:

1.2.1.1. Batt and loose insulation.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Foam sealant to maintain air / vapour barrier and insulation at joints and gaps around frames: Section 07 27 00 – Air and Vapour Barriers.

1.2.2.2. Metal wall siding system: Section 07 46 19 - Metal Siding.

1.2.2.3. Acoustical insulation batts: Section 09 29 00 – Gypsum Board

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. LTTR: Long Term Thermal Resistance.

1.3.1.2. NRCC: National Research Council of Canada; www.nrc-cnrc.gc.ca.

1.3.1.3. OBC: Ontario Building Code.

1.3.1.4. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Reference Standards:

1.3.2.1. ASTM C1338-2019:R2022 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings

1.3.2.2. ASTM E84-23d - Standard Test Method for Surface Burning Characteristics of Building Materials

1.3.2.3. ASTM E119-22 - Standard Test Methods for Fire Tests of Building Construction and Materials

1.3.2.4. ASTM E136-2024:REV A - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

1.3.2.5. .21 CAN/ULC-S702.1 -2021 - Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination: Coordinate work of other Subcontractors adjacent and penetrating board insulation which must be completed before or after insulation work.

1.4.2. Preinstallation Meetings:

1.4.2.1. Prior to commencement of work, arrange for Project site meeting of all parties associated with work of this Section in accordance with Section 01 30 00 – Administrative Requirements.

1.4.2.2. Arrange preinstallation meeting 2 weeks prior to commencing work with parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor, include Consultant who may attend, and Subcontractor performing work of this trade.

1.4.2.3. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

1.4.2.4. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

1.4.3. Scheduling:

1.4.3.1. Co-operate fully with other Subcontractors on the Work and promptly proceed with this work as rapidly as job conditions permit.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Installers:

1.5.1.1.1. Provide work of this Section executed by competent installers with minimum of 5 years experience in application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.5.1.1.2. Employ only skilled mechanics having experience in the work specified and having an understanding of the design principles of the thermal and air/vapour barriers which they are providing.

1.5.2. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1.5.2.1. Surface-Burning Characteristics: ASTM E84.

1.5.2.2. Fire-Resistance Ratings: ASTM E119.

1.5.2.3. Combustion Characteristics: ASTM E136.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Delivery and Acceptance Requirements: Deliver materials to site in original wrappings with labels intact and store in areas directed by Consultant.

1.6.2. Storage and Handling Requirements:

1.6.2.1. Store insulation on raised platforms and protect with waterproof covers. Prevent exposure of insulation to sun.

1.6.2.2. Store materials inside buildings for 24 hours prior to installation.

1.7. SITE CONDITIONS

1.7.1. Ambient Conditions: Maintain surface and ambient temperatures during application and curing of adhesive at temperature recommended by manufacturer of type of adhesive used.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Johns Manville Canada Inc.; www.jm.com

2.1.1.2. Owens Corning Canada LP; www.insulation.owenscorning.ca

2.1.1.3. Rockwool.; www.rockwool.com

2.1.2. Substitution Limitations: Comparable Products from other manufacturers not listed herein will be accepted provided:

2.1.2.1. They are submitted in accordance with Section 01 25 00 - Substitution Procedures

2.1.2.2. Meet requirements of this Specification.

2.1.2.3. Acceptance by Owner.

2.2. PERFORMANCE / DESIGN CRITERIA

2.2.1. Exterior envelope is based on "Rain Screen Principle" by NRCC. This requires construction behind cladding act as an air/vapour barrier to prevent passage of moisture laden air and diffusion of water vapour. To ensure continuity of air/vapour barrier within construction specified herein and with adjacent barrier construction is part of responsibility of this Section.

2.2.2. Refer to Drawings for thicknesses of insulation required. Select appropriate products from list of materials on basis of their maintaining thermal value of envelope, total compatibility when incorporated into finished system while ensuring substrate conditions as well as their ability to adhere components permanently, where applicable in rigid manner and maintain flexibility where required in finished work.

2.2.3. Ensure insulation materials and their facings do not support fungal growth when tested in accordance with ASTM C1338.

2.3. MATERIALS

2.3.1. Batt Insulation: Preformed light density glass fibre or stone wool batt or roll insulation, conforming to CAN/ULC-S702, thickness as indicated on Drawings. Acceptable products:

2.3.1.1. “Thermal Batt FIBERGLAS™ Insulation” by Owens Corning Canada LP,

2.3.1.2. “Rockwool Plus Batts” by Rockwool Inc.

2.3.1.3. “PEBS Filler Blanket™” by Johns Manville Canada Inc.

2.3.1.4. Loose Insulation: Loose stone wool insulation, CAN/ULC-S702, Type 4, thickness as indicated on Drawings.

2.3.2. Mechanical Fasteners:

2.3.2.1. Self-Adhered Insulation Clips: Impale type, perforated 50 mm x 50 mm (2" x 2") cold rolled steel adhesive back, spindle of length to suit insulation plus 25 mm (1") with speed washers. Acceptable Products:

2.3.2.1.1. “Self-Adhering TACTOO® Insul-Hangers” by AGM Industries, Inc.; www.agmind.com,

2.3.2.1.2. “Stic-Klip Type N Fasteners” by Eckel Industries of Canada Limited: www.eckelacoustics.com;.

2.3.2.1.3. “Self-Adhering TACTOO® Insul-Hangers” by Continental Studwelding Ltd.; www.constud.ca.

2.3.2.2. Glued Insulation Clips: Impale type, perforated 50 mm x 50 mm (2" x 2") cold rolled galvanized steel, spindle of length to suit insulation plus 25 mm (1") with speed washers. Acceptable Products:

2.3.2.2.1. “Perforated TACTOO® Insul-Hangers” by AGM Industries, Inc.; www.agmind.com

2.3.2.2.2. “Stic-Klip Type N Fasteners” by Eckel Industries of Canada Limited: www.eckelacoustics.com;.

2.3.2.2.3. “Perforated TACTOO® Insul-Hangers” by Continental Studwelding Ltd.; www.constud.ca.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.

3.1.2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2. PREPARATION

3.2.1. Surface Preparation: Ensure surfaces to receive adhesive or insulation are dry, firm, straight and free from loose material, projections, ice, frost, slick, grease, oil or other matter detrimental to bond of adhesive or uniform bedding of insulation.

3.3. INSTALLATION

3.3.1. Install insulation when conditions meet requirements specified under “Preparation”.

3.3.2. Install insulation to maintain continuity of thermal protection to building elements and spaces as indicated on Drawings.

3.3.3. Fit insulation tight to electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other projections or openings.

3.3.4. Install materials in accordance with manufacturer's instructions.

3.3.5. Do not cover insulation installed under this Section until it has been reviewed by Consultant.

3.3.6. Batt Insulation:

3.3.6.1. Install batt or roll insulations where indicated on Drawings.

3.3.6.2. Fit batt between framing and press firmly into place. Butt tightly at joints, free of gaps.

3.3.6.3. Insulate behind pipes, ducts, electric conduits and outlets or junction boxes. Cut insulation to fit around and behind obstructions and non-standard spaces.

3.3.6.4. Place insulation over soffit grid system sealing around metal hangers and at wall on all sides. Carry insulation up wall and fit around steel or in masonry voids and over plaster ceiling.

3.3.7. Loose Insulation:

3.3.7.1. Pour or pack or pneumatically place loose wall insulation above ceiling between joists or in walls between studs or between wythes exterior cavity walls or where indicated on Drawings to thicknesses indicated.

3.3.7.2. Ensure areas exposed to outside air are insulated.

3.3.7.3. Provide vapour barrier before application of ceiling finish.

END OF SECTION

PART 1 - GENERAL INSTRUCTIONS

1.1. SUMMARY

1.1.1. Section Includes: Provide miscellaneous vapour barriers including but not limited to following:

1.1.1.1. Underslab vapour retarder.

1.1.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.1.2.1. Cutting concrete floors for new mechanical services: Section 01 73 00 Execution, Structural Specifications, Mechanical Specifications.

1.2. REFERENCES

1.2.1. Abbreviations and Acronyms:

1.2.1.1. MSDS: Material Safety Data Sheets.

1.2.2. Reference Standards:

1.2.2.1. ASTM E1643 – 18a Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

1.2.2.2. ASTM E1745 - 17 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

1.3. ADMINISTRATIVE REQUIREMENTS

1.3.1. Co-ordination: Co-ordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays.

1.3.2. Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week before starting work of this Section to verify project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer’s written installation instructions.

1.3.3. Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:

1.3.3.1. Owner;

1.3.3.2. Consultant;

1.3.3.3. Trade making sawcuts to existing concrete floor.

1.3.4. Ensure meeting agenda includes review of methods and procedures related to air barrier installation including co-ordination with related work. Provide manufacturer's printed instructions for review.

1.3.5. Record meeting proceedings including corrective measures and other actions required to ensure successful completion of work and distribute to each attendee within 1 week of meeting.

1.4. SUBMITTALS

1.4.1. Samples: Submit samples in accordance with requirements of Section 01 30 00.

1.4.2. Product Data:

1.4.2.1. Manufacturer’s product data

1.4.2.2. Complete set of test results as per paragraph 9.3 of ASTM E1745 (including all after conditioning permeance testing). Include a letter from the manufacturer certifying that the testing was conducted in compliance with paragraph 8.1 of ASTM E1745.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Installers: Provide work of this Section executed by competent installers with minimum of 2 years experience in application of Products, systems and assemblies specified or similar high performance vapour barriers.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Storage and Handling Requirements:

1.6.1.1. Store materials in weathertight enclosure raised clear of ground so they are protected from sunlight, weather exposure, moisture and deterioration.

1.6.1.2. Protect materials during handling and application to prevent damage or contamination

1.6.1.3. Comply with manufacturer's printed recommendations for handling of materials.

1.7. WARRANTY

1.7.1. Manufacturer Warranty: Warrant work of this Section for period of 3 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

PART 2 - PRODUCTS

2.1. MATERIALS

2.1.1. Performance/Design Criteria:

2.1.1.1. Permeance as tested after conditioning to ASTM E1745 paragraphs 7.1.2 – 7.1.5: less than 0.010 perms (gr/ft^2/hr/in-Hg) (0.570 ng/(Pa / s /m^2)).

2.1.1.2. Water vapour: to ASTM E1745: meets or exceeds Class A.

2.1.1.3. Minimum thickness of the plastic retarder material to ACI 302.1R-04: 0.38 mm (15 mils).

2.1.2. Description:

2.1.2.1. Underslab Vapour Retarder: Provide Class A vapour retarder having a conditioned perm rating of 0.01 or better, is minimum 0.381 mm (15 mil) thick and a minimum puncture resistance of 2.2 kg in accordance with ASTM E1745,

2.1.2.2. Acceptable Products:

2.1.2.2.1. “Florprufe™ 120 Vapor Barrier” by GCP Applied Technologies, Inc.; www.gcpat.com,

2.1.2.2.2. “VaporFLEX® 15” by Layfield Geosynthetics & Industrial Fabrics Ltd.; www.geomembranes.com,

2.1.2.2.3. “Stego Wrap Vapour Barrier” by Stego Industries, LLC; www.stegoindustries.com,

2.1.2.2.4. "Perminator® 15" by W.R. Meadows of Canada; www.wrmeadows.com. Provide "Preprufe® Tape" by GCP Applied Technologies, Inc.

2.1.2.3. "VaporFLEX® Polymer Tape" by Layfield Geosynthetics & Industrial Fabrics Ltd., "Stego Tape" by Stego Industries, LLC or "Perminator® Tape" by W.R. Meadows of Canada for joints.

2.1.3. Joint Seaming Tape: high density polyethylene tape with pressure sensitive adhesive. Minimum width 100 mm (4") as supplied by the membrane manufacturer.

2.1.1. Acceptable Products:

2.1.1.1. "VaporFLEX® Polymer Tape" by Layfield Geosynthetics & Industrial Fabrics Ltd.

2.1.1.2. "Stego Tape" by Stego Industries, LLC

2.1.1.3. "Perminator® Tape" by W.R. Meadows of Canada for joints.

2.1.2. Mastic: as supplied by the membrane manufacturer.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Ensure that subsoil material and compaction have been verified by geotechnical inspector.

3.1.1.2. Do not install vapour barrier over frozen ground.

3.1.2. Level and tamp or roll sub base as required in accordance with manufacturer's instructions.

3.1.3. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Do not install vapour barrier until other work which penetrates membrane has been completed.

3.2.2. Immediately after backfill over mechanical and electrical services is completed, place and compact fill as required to bring level up to elevation of underside of porous fill provided in Structural Specifications.

3.2.3. Inspect moisture content of fill prior to placing. Limit addition of water only to extent required to provide optimum moisture content for compaction. Puddling or flooding with water to compact fill is not permitted.

3.2.4. Place vapour retarder overtop limestone screenings in accordance with manufacturer's installation instructions and ASTM E1643:

3.2.4.1. Unroll vapour barrier with the longest dimension parallel with the direction of the pour.

3.2.4.2. Use sheets of largest practical size to minimize joints.

3.2.4.3. Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed

3.2.4.4. Clean existing exposed vapour barrier of dirt that would affect bond with mastic or tape.

3.2.4.5. Lap vapour barrier over existing vapour barrier and extend vertically up walls, columns, and other structures minimum 100 mm (4") and tape seal with double sided tape or mastic as recommended by manufacturer.

3.2.4.6. Overlap joints 150 mm (6 inches) and seal with manufacturer's tape.

3.2.4.7. Seal penetrations (including pipes) with manufacturer's mastic.

3.2.4.8. Repair damaged areas by cutting patches of vapour barrier/retarder, overlapping damaged area 150 mm (6 inches) and taping all four sides with tape.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

END OF THIS SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide miscellaneous air/vapour barriers including but not limited to following:

1.2.1.1. Air barriers

1.2.1.2. Vapour retarders.

1.2.1.3. Air sealing to supplement and provide continuity of main and primary air/vapour barrier assembly including sealing and/or filling of perimeter of door and window openings, crevices, gaps, cracks in walls, roof/wall connections, mechanical and electrical penetrations in walls, floors, roofs, curtain wall mullions, beams, columns enclosures and other similar locations with polyurethane foam consisting of a single mix of chemical in pressurized container formulated to cure when exposed to moisture present in air to provide and maintain air/vapour barrier integrity and impermeable barrier to air infiltration or loss.

1.2.1.4. Coordination of work of this Section with other trades working on building envelope.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of exterior wall sheathing: Section 06 16 00 - Sheathing.

1.3. REFERENCES

1.3.1. Reference Standards:

1.3.1.1. AATCC 127 – 2019 - Test Method for Water Resistance: Hydrostatic Pressure Test.

1.3.1.2. ASTM C1193- 2016 R23 - Standard Guide for Use of Joint Sealants

1.3.1.3. ASTM D6135-97 - Standard Practice for Application of Self-Adhering Modified Bituminous Waterproofing

1.3.1.4. ASTM E84-2023D, - Standard Test Method for Surface Burning Characteristics of Building Materials

1.3.1.5. ASTM E96/E96M-23 - Standard Test Methods for Water Vapor Transmission of Materials

1.3.1.6. ASTM E2178-2021a - Standard Test Method for Air Permeance of Building Materials

1.3.1.7. CAN/ULC S102-18-REV1, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.1.8. CAN/ULC-S705.2-2020 -- Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density - Application

1.3.1.9. CAN/ULC S741- 08(R2020) - Standard for Air Barrier Materials - Specification

1.3.1.10. CAN/ULC S742:2020 - Standard for Air Barrier Assemblies – Specification

1.3.1.11. ICC AC38 – 2021 – Acceptance Criteria for Water-Resistive Barriers

1.3.1.12. NFPA 285-2023 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination: Coordinate installation of membrane with work by other Sections.

1.4.2. Preinstallation Meeting: Conduct conference at Project Site.

1.4.2.1. Prior to commencement of work, arrange for Project site meeting of all parties associated with work of this Section in accordance with Section 01 30 00 Administration Requirements.

1.4.2.2. Review requirements for air barrier products and installation, project and manufacturer's details, and inspection requirements, and coordination and sequencing of air barrier work with work of other Sections.

1.4.2.3. Review manufacturer's instructions for air barrier application meeting Project requirements for substrates specified, including three-dimensional video model demonstrating proper application of components at wall openings.

1.4.2.1. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

1.4.3. Scheduling:

1.4.3.1. Co-operate fully with other Subcontractors on the Work and promptly proceed with this work as rapidly as job conditions permit.

1.4.3.2. Coordinate installation of membrane air barrier with completion of roofing and other work requiring interface with air barrier.

1.4.3.3. Schedule work so air barrier applications may be inspected prior to concealment.

1.4.3.4. Ensure air barrier materials are cured before covering with other materials.

1.4.3.5. Cooperate and coordinate with inspection and testing agency. Do not cover any installed air barrier membrane unless it has been inspected, tested and accepted.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures.

1.5.2. Product Schedule:

1.5.2.1. Submit schedule to identify proposed air/vapour/liquid water barrier products for each wall type and assembly including transitions.

1.5.3. Product Data: For each type of air/vapour/liquid water barrier product specified, including:

1.5.3.1. Technical data indicating compliance with requirements.

1.5.3.2. Substrate preparation instructions and recommendations.

1.5.3.3. Manufacturer’s instructions showing the recommended procedures and sequence of installation of products.

1.5.4. Samples:

1.5.4.1. If requested by Consultant, submit samples:

1.5.4.1.1. 200 mm square sample of membrane

1.5.4.1.2. 300 mm long tape

1.5.5. Certificate:

1.5.5.1. Submit letter from the product manufacturer(s) confirming compatibility of products and confirming that products are suitable for use for purposes intended.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers:

1.6.1.1.1. Provide work of this Section executed by competent installers with minimum of 5 years experience in application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.6.1.1.2. Employ only skilled mechanics having experience in the work specified and having an understanding of the design principles of the thermal and air/vapour/liquid water barrier which they are providing.

1.6.1.2. Manufacturer's Assurance: manufacturer to submit written confirmation of compatibility and continuity across all air/vapour/liquid water barrier components and at typical transitions.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

1.7.2. Storage and Handling Requirements:

1.7.2.1. Store materials in weathertight enclosure raised clear of ground so they are protected from sunlight, weather exposure, moisture and deterioration.

1.7.2.2. Store at temperatures at or above 4 C, free from contact with cold or frozen surfaces.

1.7.2.3. Protect materials during handling and application to prevent damage or contamination.

1.8. ENVIRONMENTAL REQUIREMENTS

1.8.1. Environmental Limitations: Apply air/vapour/liquid water barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturer.

1.8.2. Protect substrates from environmental conditions that affect air barrier performance.

1.8.3. Do not apply air/vapour/liquid water barrier to a damp or wet substrate or during snow, rain, fog, or mist unless confirmed by the manufacturer that the air/vapour/liquid water barrier material is suitable for such applications.

1.9. WARRANTY

1.9.1. Manufacturer Warranty: Warrant materials of this Section for period of 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include:

1.9.1.1. Fail to achieve air tight and watertight seal.

1.9.1.2. Exhibit loss of adhesion or cohesion.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. BASF Wall Systems; www.enershield.basf.com

2.1.1.2. Dorken Products, Inc.; www.dorken.com

2.1.1.3. GCP Applied Technologies, Inc.; www.gcpat.com

2.1.1.4. Henry a Carlisle Company; www.henry.com

2.1.1.5. IKO Industries Ltd.; www.iko.com

2.1.1.6. Kemper System Canada Inc.; www.kempersystem.ca

2.1.1.7. Soprema Inc.; www.soprema.ca

2.1.1.8. SRP Canada Inc.; www.srpcanada.ca

2.1.1.9. Tremco Canada; www.tremcosealants.com

2.1.1.10. W.R.Meadows of Canada; www.wrmeadows.com

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Single source responsibility: Materials shall be sourced from one manufacturer including sheet membranes, air barrier sealants, primers, mastics and adhesives. Exception will be considered with verification for each manufacturer of compatibility.

2.2.2. Water vapour permeance tested to ASTM E96 Method A:

2.2.2.1. For air/liquid water barrier systems (vapour permeable):

2.2.2.1.1. Membrane: minimum 1658 ng/Pa.m².s (29 Perms)

2.2.2.1.2. Membrane including primer and sheathing: minimum 1030 ng/Pa.m².s (18 Perms).

2.2.3. Air Barriers:

2.2.3.1. Air Permeance: CAN/ULC S742: Class A1, 0.0011 L/s-m^2 (0.0002 cfm/ft^2) @ 75 Pa per ASTM E2178, or < 0.02 L/s/m^2 (< 0.004 cfm/ft.^{2}) @ 75 Pa to CAN/ULC S741

2.2.3.2. Air barrier membrane is able to withstand a wind gust of 2 kPa (42 psf), cyclic pressure of 1.4 kPa and sustained wind pressure of 0.0043 kPa. Air pressure from either direction, with no increase in EqLA.

2.2.4. Water Resistance: Pass AATCC 127 or ICC AC38.

2.2.5. Sheet membrane barrier shall be capable of performing as a continuous air barrier and as a liquid water drainage plane transitioned to adjacent flashings and discharging water to the building exterior. The membrane will also serve as a vapour permeable barrier.

2.2.6. Sheet membrane shall accommodate substrate movement and seal expansion and control joints, construction material transitions, opening transitions, penetrations, and perimeter conditions without moisture deterioration and air leakage exceeding performance requirements.

2.2.7. Fire Propagation Characteristics:

2.2.7.1. Provide air barrier system qualified as a component of a comparable wall assembly that has been tested and passed NFPA 285.

2.2.7.2. Sheet membranes:

2.2.7.2.1. Flame Spread Rating (FSR): 5 tested to CAN/ULC S102

2.2.7.2.2. Flame Spread Index (FSI): 5 tested to ASTM E84

2.2.7.2.3. Smoke Developed Classification (SDC): 15 tested to CAN/ULC S102

2.2.7.2.4. Smoke Developed Index (SDI): 5 tested to ASTM E84

2.2.8. Material Compatibility: Of various materials specified herein, select combination of base materials, transition, bridging and reinforcing membranes, adhesives and accessories so when cured, they are compatible and give bonding characteristics equivalent to shear strength of selected air/vapour barrier materials used.

2.3. MATERIALS

2.3.1. Vapour Retarder:

2.3.1.1. Polyethylene sheet of minimum 0.15 mm (6 mil) thickness to CAN/CGSB-51.33-M, Type 2. Supply minimum 1800 mm (6') roll widths.

2.3.1.2. Joint sealing tape: High density, air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals.

2.3.1.3. Sealant: Asbestos free non hardening sealant, compatible with vapour retarder materials, recommended by vapour retarder manufacturer.

2.3.2. Vapour Permeable Air Barriers :

2.3.2.1. Self-adhesive vapour permeable air barrier membrane with a tri-laminated complex facer.

2.3.2.2. Primer: acceptable products:

2.3.2.2.1. “Elastocol Stick H_2O” by Soprema Inc.

2.3.2.2.2. “Blueskin Adhesive” or “Hi Tac Primer” by Henry a Carlisle Company

2.3.2.2.3. “DELTA®-LVC Primer” by Dorken Products, Inc.

2.3.2.3. Membrane: acceptable products:

2.3.2.3.1.1. “Sopraseal Stick VP” by Soprema Inc.

2.3.2.3.1.2. “Blueskin VP® 160” by Henry a Carlisle Company,

2.3.2.3.1.3. “AquaBarrier VP” by IKO Industries

2.3.2.3.1.4. “SRP AirOutshield™ SA 280” by SRP Canada Inc.

2.3.2.3.1.5. “DELTA®-VENT SA” by Dorken Products, Inc.

2.3.2.3.1.6. “Air-Shield SMP” by W. R. Meadows of Canada

2.4. POLYURETHANE FOAM SEALANT

2.4.1. Polyurethane Foam Insulation: One-component foam, complying with CAN/ULC S710.1, slow rise, Compressive Strength: 34 kPa (5 psi), Shear Strength: 83 kPa (12 psi); Closed Cell Content: <50%; tack free within 10 minutes; cuttable within 1 hour, ULC classified sealant for insulating, sealing, bonding, filling, preventing air infiltration. Ensure 1 component foams meet CAN/ULC S102 and ASTM E84 flame spread requirements for caulks and sealants, flame Spread 25, cure in place within 24 hours to densities between 16.02 to 32.04 kg/m3 (1.0 to 2.0 lb/cu ft) and carry R-value of 0.03 w/m•k (4 to 5 per inch). Cured foam can be trimmed, sanded and/or painted.

2.4.2. Acceptable products:

2.4.2.1. “TremGlaze LEF” by Tremco; www.tremcosealants.com

2.4.2.2. “Great Stuff Pro” by Dupont; www.dupont.com

2.4.2.3. “IPF Green” by Rivenco; www.rivenco.com

2.4.2.4. “Propink Comfortseal Gun Foam” by Owens Corning; www.owenscorning.com

2.4.2.5. “Sika Boom® Expanding Foam Sealants”

2.5. ACCESSORY MATERIALS

2.5.1. General: Accessory materials as described in manufacturer's written installation instructions, recommended to produce complete air barrier assembly meeting performance requirements, and compatible with air barrier membrane material and adjacent materials.

2.5.2. Ensure appropriate manufacturer approved accessories and materials are used in conjunction with liquid applied membrane.

2.5.3. Transition Membrane: use compatible sheet membrane from products described in this Section.

2.5.3.1. Tear Strength: 110 lb/in (19.3 kN/m).

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.1.2. Examine surface to receive membranes to assure they are smooth, dry and free from conditions that will adversely affect execution, permanence, or quality of work.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Clean, prepare, and treat substrate in accordance with air barrier manufacturer's written instructions.

3.2.2. Remove projections and excess materials and fill voids with substrate patching material.

3.2.3. Prepare and treat joints and cracks in substrate per ASTM C1193 and air barrier manufacturer's written instructions.

3.3. APPLICATION OF TRANSITION MEMBRANES

3.3.1. General: Install strips and accessory materials according to air barrier manufacturer's written instructions and according to recommendations in ASTM D6135. Install strips and transition strips to form connect and seal sheet air barrier material to adjacent components of building air barrier system, including, but not limited to, curtain wall systems, air ductwork, and other openings and penetrations.

3.3.2. Primer: Apply primer to substrates when recommended by manufacturer. Apply at required rate. Re-prime areas not covered within 24 hours.

3.3.2.1. Prime concealed perimeter frame surfaces of curtain walls and ductwork.

3.3.2.2. Prime other substrates when recommended by air barrier manufacturer.

3.3.3. Self-Adhesive Transition Membrane: Apply strips to form air and liquid water tight junction with other construction; apply material so that a minimum of 3 inches (75 mm) coverage is achieved over each substrate.

3.3.3.1. Assembly Transitions: Connect and seal exterior wall air barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

3.3.3.2. Rough Openings: Treat rough openings with a joint sealant bead in joints, followed by a base coat of air barrier membrane, install fabric and a final top coat of air barrier membrane

3.3.3.3. Opening Transitions: Fill gaps at perimeter of openings with foam sealant and level with termination mastic.

3.3.3.4. Penetrations: Fill gaps at perimeter of penetrations with foam sealant and level with termination mastic. Seal transition strips around penetrating objects with termination mastic.

3.3.3.5. Joints: Bridge and cover isolation joints, expansion joints, and discontinuous joints between separate assemblies utilizing overlapping modified bituminous strips.

3.3.3.6. Changes in Plane: Apply termination mastic beads at corners and edges to form smooth transition.

3.3.3.7. Substrate Gaps: Cover gaps with stainless steel sheet mechanically attached to substrate and providing continuous support for air barrier.

3.4. INSTALLATION – VAPOUR RETARDER

3.4.1. Ensure services are installed and inspected before installation of retarder.

3.4.2. Install sheet vapour retarder on warm side of exterior wall assemblies before installation of gypsum board to form continuous retarder.

3.4.3. Use sheets of largest practical size to minimize joints.

3.4.4. Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

3.4.5. Seal perimeter of sheet vapour barrier as follows:

3.4.5.1. Apply continuous bead of sealant to substrate at perimeter of sheets.

3.4.5.2. Lap sheet over sealant and press into sealant bead.

3.4.5.3. Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4.6. Seal lap joints of sheet vapour retarder as follows:

3.4.6.1. Attach first sheet to substrate.

3.4.6.2. Apply continuous bead of sealant over solid backing at joint.

3.4.6.3. Lap adjoining sheet and press into sealant bead in accordance with manufacturer's requirements.

3.4.6.4. Apply tape across joints.

3.4.7. Seal vapour retarder sheet around air ductwork as follows:

3.4.7.1. Apply continuous bead of sealant to ductwork and metal stud framing around ductwork.

3.4.7.2. Lap sheet over sealant and press into sealant bead.

3.4.7.3. Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4.7.4. Apply tape across edges of retarder sheet to the ductwork.

3.4.8. Seal electrical outlet device boxes that penetrate vapour barrier as follows:

3.4.8.1. Install moulded box vapour barrier. Wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.

3.4.8.2. Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.4.9. Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.5. CRACK AND JOINT TREATMENT

3.5.1. Treatment of joints or cracks larger than 6.35 mm (¼”) and less than 12.7 mm (½”):

3.5.1.1. Prefill any joints or cracks with the liquid flashing material.

3.5.1.2. Apply a generous bead of material over the joint.

3.5.1.3. Press and spread liquid flashing into the joint.

3.5.1.4. Allow material to skin over prior to full application of liquid flashing into the rough opening.

3.5.2. Treatment of joints or cracks larger than 12.7 mm (½”):

3.5.2.1. Install backer rod into the joint to control depth of liquid flashing material.

3.5.2.2. Apply a generous bead of material over and into the joint.

3.5.2.3. Press, and spread liquid flashing into the joint.

3.5.2.4. Smooth out using a spreader tool or putty knife

3.5.2.5. Allow material to cure prior to full application of liquid flashing into the rough opening.

3.6. PENETRATIONS

3.6.1. Self-Adhesive Transition Membrane:

3.6.1.1. Pre-cut air barrier membrane to length to fully cover the penetration.

3.6.1.2. Prepare air barrier membrane for application by cutting slits a minimum 63.5 mm (2 ½”) down the strip of membrane.

3.6.1.3. Apply membrane around penetration and apply a bead of liquid flashing at termination point on the penetration.

3.6.1.4. Apply full sheet of SAT membrane cut around the penetration and seal the cut edge with liquid flashing.

3.6.2. Pre-treat all penetrations with a bead of liquid flashing around the penetration ensuring full coverage of the gap.

3.6.3. Lay sheet of membrane over sheathing and around the penetration and roll press into place.

3.6.4. Apply liquid flashing over penetration and onto the air barrier membrane 75 mm (3”) in all directions in a continuous installation.

3.7. AIR BARRIER MEMBRANE

3.7.1. Begin installation after mechanical insulation clips have been applied to substrate, have cured and are examined for bond.

3.7.2. Priming:

3.7.2.1. Apply fluid primer to surfaces and allow to dry tack-free. Prime only areas to be covered by membrane within same Day. Re-prime surfaces not covered within same Day.

3.7.2.2. Apply primers at a rate recommended by membrane manufacturer.

3.7.3. Flashing, Corner Reinforcing and Transition Membrane:

3.7.3.1. Install membrane flashing in 900 mm (36") widths wherever possible. Where applicable, bring flashing a minimum of 150 mm (6") onto horizontal surfaces and a minimum of 200 mm (8") up walls from horizontal elevation shown.

3.7.3.2. SAT membrane will be acceptable materials for transition conditions at frames and the like.

3.7.3.3. Stagger flashing and membrane seams.

3.7.3.4. Install flashing to protrusions, expansion joints, control joints and the like. Bring flashing a minimum of 150 mm (6") onto membrane.

3.7.4. Installation:

3.7.4.1. Install membrane in accordance with manufacturer's printed instructions over flashings and corner reinforcement.

3.7.4.2. Lay membrane without buckles, fishmouths and avoid stretching membrane. Where membrane cannot extend at least 100 mm (4") onto horizontal surface, terminate in a horizontal reglet and seal.

3.7.4.3. Lap membranes 50 mm (2") on side laps and 100 mm (4") on end laps. Stagger end laps.

3.7.4.4. Roll membrane with a hand roller.

3.7.5. Inspection: Inspect membrane for punctures, misaligned seams and fishmouths, apply additional layer of membrane over affected area, extending minimum of 150 mm (6") beyond damaged area in all directions.

3.8. INSTALLATION FOAM SEALANT

3.8.1. Install air sealing foamed-in-place insulating materials in accordance with CAN/ULC-S705.2, to OBC requirements, in accordance with manufacturer's instructions, and acceptable to authorities having jurisdiction to provide required air seal.

3.8.2. Prevent overspray and remove masking materials.

3.8.3. Apply insulation within recommended application temperature ranges. Consult manufacturer when insulation cannot be applied within specified ranges.

3.8.4. In low humidity, mist area with water to aid cure of 1-component insulation.

3.8.5. Provide foamed-in-place insulation to full area of surfaces indicated to be insulated and to provide a uniform and continuous thermal and air seal barrier.

3.8.6. Provide foamed-in-place insulation over projecting anchors and fastenings, around pipes, ducts, obstructions, openings and corners.

3.8.7. Provide foamed-in-place insulation free of voids and imbedded foreign materials.

3.8.8. Paint or cover foam exposed to ultra-violet radiation.

3.8.9. Avoid overfilling restricted spaces.

3.8.10. Use 1-component foam for cracks or openings 6 mm (1/4") to 50 mm (2") wide. Use 2- component foam insulation for gaps over 50 mm (2") wide and for voids in hidden cavities.

3.8.11. To provide continuity with air/vapour barrier, and provide additional insulation, seal following areas:

3.8.11.1. Various roof areas including sloped roof/wall junctions, penetrations of all kinds and roof/wall junctions.

3.8.11.2. Junction of roof air/vapour barrier and wall air/vapour barrier.

3.8.11.3. Ensure continuity of air and vapour seal between wall and window frame is in accordance with requirements of CSA A440. Curtain wall jambs and sills in cavity walls. Window frames at walls and columns where applicable.

3.8.11.4. In cavity wall construction at wall junctions, window perimeters, air ductwork. At intervals in cavity wall to achieve compartmentalization. In masonry, curtain wall systems at window perimeters and at metal panel interface locations.

3.8.11.5. Sliding door head, jambs and threshold.

3.8.11.6. Where gypsum board meets roof slab and floor slab.

3.8.11.7. Junctions at roof scuppers and other mechanical equipment located on roof.

3.8.11.8. Where deck flutes run perpendicular to wall, foam open flutes completely out to fascia.

3.8.11.9. Where steel deck is parallel to wall, fill void with either 1-component or 2-component material, depending on gap size.

3.8.11.10. Where closed flutes occur, punch flutes and inject foam through holes. Locate holes as close to wall as possible so that plane of injected and cured foam within closed flute is level with plane of exposed foam in open flutes.

3.8.12. Inspect roof perimeter for air leakage paths such as fluted deck itself, truss and structural beam penetrations above and below top of wall, open mortar joints and conduit and pipe penetrations.

3.8.13. Use smoke tester kits to identify and locate leakage.

3.8.14. Use both 1-component and 2-component foam insulation in combination to create a continuous foamed-in-place seal between wall and roof air/vapour barrier.

3.9. SITE QUALITY CONTROL

3.9.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.9.2. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.9.3. Air Seal Membrane Continuity: Ensure air/vapour/liquid water barrier provides an impermeable membrane seal to resist infiltration and exfiltration of air and moisture. Ensure function of air/vapour/liquid water barrier membrane as indicated.

3.10. PROTECTION

3.10.1. Protect surrounding surfaces against damage from this work.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide metal siding system including but not limited to following:

1.2.1.1. Un- insulated metal siding system.

1.2.1.2. Sub-girts.

1.2.1.3. Closures, flashings and corner stiffeners.

1.2.1.4. Caulking and sealants.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Structural steel stud wall framing: Section 05 41 00 – Structural Metal Stud Framing.

1.2.2.2. Wall sheathing: Section 06 16 00 – Sheathing

1.2.2.3. Air barrier: Section 07 27 00 – Air and Vapour Barriers

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. SSPC: The Society for Protective Coatings (formerly known as Steel Structures Painting Council); www.sspc.org.

1.3.2. Reference Standards:

1.3.2.1. ASTM A653/A653M-20 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

1.3.2.2. ASTM D1187/D1187M-97(2018) - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal

1.3.2.3. CAN/CGSB-1.181-99 -- Ready-Mixed Organic Zinc-Rich Coating

1.3.2.4. CAN/CSA-S136-(R2021) - North America Specification for the Design of Cold Formed Steel Structural Members including supplement CSA-S136.1-12

1.4. SUBMITTALS

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

1.4.2. Shop Drawings:

1.4.2.1. Submit Shop Drawings for fabrication and installation of metal siding. Show materials, gauges, dimensions, layouts and installation details.

1.4.2.2. Ensure a licensed engineer specified herein is responsible for:

1.4.2.2.1. Production and review of Shop Drawings.

1.4.2.2.2. Sealing and signing each Shop Drawing and any associated calculations performed.

1.4.2.3. Samples: Submit 2 - 300 mm x 300 mm (12" x 12") prefinished sample sections of siding profile including colour specified. Ensure finished work matches accepted samples in colour, gloss and texture.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.5.1.2. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Delivery and Acceptance Requirements: Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off-the-ground, undercover storage locations. Do not load areas beyond the designed limits.

1.6.2. Storage and Handling Requirements:

1.6.2.1. Handle and store metal materials at job site in such a manner to prevent damage to other materials, (to existing buildings) or property.

1.6.2.2. Store materials on site in a manner to prevent damage thereto, or deterioration of finish. Galvanized surfaces which show evidence of "white rust" will not be accepted.

1.6.2.3. Handle components with care, and provide protection for surfaces against marring or other damage. Ship and store members with cardboard or other resilient spacers between surfaces. Use lifting chokers of material that will not damage surface of steel members.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Vicwest; www.vicwest.com

2.1.2. Substitution Limitations: Comparable Products from other manufacturers not listed herein will be reviewed provided they meet requirements of this Specification.

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Design metal siding and fasteners to support a positive wind load of 0.9 kN/m^2 (20 psf) and a negative wind load of 0.5 kN/m^2 (12 psf), with maximum deflection of L/180 of the span at full load.

2.2.2. Concealed fastening.

2.2.3. Ensure unit stress does not exceed 138 MPa (20,000 psi).

2.2.4. Ensure general design is based on CSA S136.

2.2.5. Structural Design: Employ a licensed engineer specified herein to:

2.2.5.1. Design components for work of this Section requiring structural performance.

2.2.5.2. Be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations.

2.3. MATERIALS

2.3.1. Exterior Sheets:

2.3.1.1. Steel Sheet: Conforming to ASTM A653/A653M, CS, Type A, with a minimum base steel thickness of 0.759 mm (22 ga), finished with Z275 (G90) zinc coating in accordance with CSSBI Standards and prepainted with finishes specified herein.

2.3.1.2. Exterior Sheet Profile: “AD 300R” by Vicwest.

2.3.2. Thermal Clip System: Provide “RVRS T-Clip System” by Engineered Assemblies Inc.; www.engineeredassemblies.com or “Fiberglass Thermal Spacer” by Cascadia Windows Ltd.; www.cascadiawindows.com.

2.3.3. Sub-Girts, Z-bars: Sheet steel in 1.219 mm (0.048") base thickness, finished with Z275 (G90) zinc coating.

2.3.4. Supply standard concealed fasteners compatible with preformed siding used

2.3.5. Closures and Flashings: Supply same material as specified for exterior sheets, prepainted to match adjacent siding where exposed to view. Ensure metal thickness is as required but not less than 0.759 mm (22 ga) base thickness.

2.3.6. Corner Stiffeners: Steel sheet in required thickness, finished with Z275 (G90) zinc coating.

2.3.7. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers or cold-applied asphalt emulsion complying with ASTM D1187.

2.3.8. Zinc Rich Primer: Supply primer for touch up if galvanized, supply “Zinc Clad® 5 Organic Zinc-Rich Primer” by The Sherwin-Williams Company; www.sherwin-williams.com conforming to CAN/CGSB-1.181.

2.3.9. Finishes:

2.3.9.1. Primer and silicone modified polyester - SMP, 2 coat system (primer/colour coat), “WeatherXL™” by The Valspar Corporation; www.valspar.com:

2.3.9.2. Colours and Sheen: To be selected by Consultant

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Backpainting: Factory paint backside of un-insulated metal siding and flashings including Z-bars with 2 coats of bituminous paint specified.

3.2.2. Install thermal clips to structural steel studs using manufacturer's recommended spacing and to suit wind loads and siding design.

3.2.3. Install corner supports, interior corner pieces, closures and related accessories etc.

3.2.4. Install exterior face sheets to sub-girts and thermal clip system in accordance with manufacturer's standards for non-exposed fastenings.

3.2.5. Ensure face sheets are 1 piece full height of siding. Ensure there is no apparent difference between face sheets of same colour. Remove and replace off-colour sheets to satisfaction of Consultant.

3.2.6. Install corner pieces, closures, flashings, etc. where shown and where required. Provide formed steel closures around openings.

3.2.7. Bed flashings, closures and corner pieces in sealant to provide a weathertight installation.

3.2.8. Prime surfaces and apply sealant around siding and openings in siding and below metal flashings to siding in accordance with manufacturer's printed directions for a weatherproof siding assembly.

3.3. REPAIR

3.3.1. Touch up marred siding surfaces with air dry formulation to match pre-finished siding, or replace if necessary.

3.3.2. Clean and touch up marred galvanized surfaces after installation, with zinc rich primer.

3.4. SITE QUALITY CONTROL

3.4.1. Site Tests and Inspections:

3.4.1.1. Structural Inspection: Ensure a licensed engineer specified herein inspects work of this Section during erection/installation and submits sealed and signed Field Review Report within 5 Days of site visit.

3.4.2. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.5. CLEANING

3.5.1. Leave siding work clean and free of grime, dirt and sealant stains. Remove stains on adjacent work of other trades resulting from sealant work.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide metal fabrications including but not limited to following:

1.2.1.1. Modular aluminum stair and platform system for new rooftop AHU.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of concrete pavers: Section 01 73 00 Execution.

1.2.2.2. Provision of rooftop safety guardrail and fall protection system: Section 05 52 17 Rooftop Guardrail.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. OHSA: Occupational Health and Safety Act Ontario

1.3.1.2. OSHA – Occupational Safety and Health Standards

1.3.1.3. SSPC: The Society for Protective Coatings (formerly known as Steel Structures Painting Council); www.sspc.org.

1.3.2. Reference Standards:

1.3.2.1. ANSI/ASSE A1264.1-2017 - Safety Requirements for Workplace Walking/Working Surfaces And Their Access; Workplace, Floor, Wall And Roof Openings; Stairs And Guardrail/Handrail Systems

1.3.2.2. ASTM B209/B209M-14 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

1.3.2.3. ASTM B221/B221M – 21 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

1.3.2.4. Occupational Health and Safety Act Ontario Regulation 213/91 Construction Projects

1.3.2.5. Occupational Health and Safety Act R.R.O. 1990, Regulation 851, Industrial Establishments.

1.3.2.6. OSHA Part 1910 – Occupational Safety and Health Standards

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Verify site dimensions before submitting shop drawings. Coordinate work of this Section with the AHU Manufacturer. Verify requirements for clearances, and access.

1.4.2. Preinstallation Meetings:

1.4.2.1. Arrange preinstallation meeting 1 week prior to commencing work with all parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor include Consultant who may attend, and Owner's representative.

1.5. ACTION SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data: Submit Product information for the system work specified in this Section:

1.5.2.1. Submit manufacturer's installation instructions.

1.5.3. Shop Drawings:

1.5.3.1. Submit Shop Drawings for work of this Section. In addition to minimum requirements indicate following:

1.5.3.1.1. Large scale details of members, materials and connections.

1.5.3.1.2. Jointing details. Removeable panel joints.

1.5.3.1.3. Methods of setting, securing, anchorage.

1.5.3.2. Ensure a licensed engineer specified herein is responsible for:

1.5.3.2.1. Production and review of Shop Drawings.

1.5.3.2.2. Sealing and signing each Shop Drawing and any associated calculations performed.

1.5.4. Samples:

1.5.4.1. Submit samples of exposed metal fabrications representing final finish.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the installation of this or similar modular systems and assemblies specified and with approval and training of the Product manufacturer.

1.6.1.2. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Delivery and Acceptance Requirements: Coordinate deliveries to comply with construction schedule and arrange ahead for delivery time, roof protection and storage locations.

1.7.2. Storage and Handling Requirements:

1.7.2.1. Handle and store metal materials at job site in such a manner to prevent damage to other materials, existing buildings, rooftop equipment, or roof.

1.7.2.2. Handle components with care and provide protection for surfaces against marring or other damage. Ship and store members with cardboard or other resilient spacers between surfaces. Use lifting chokers of material that will not damage surface of members.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Basis of Design: Skyline Group; www.skylinegroupintl.com

2.1.2. Alternate systems will be considered provided they meet the requirements of this specification and submitted in accordance with Section 01 25 00 Substitution Procedures.

2.2. MATERIALS

2.2.1. Regulatory Requirements:

2.2.1.1. Comply with applicable Health and Safety Regulations:

2.2.1.1.1. Occupational Health and Safety Act Ontario Regulation 213/91

2.2.1.1.2. Ontario: Occupational Health and Safety Act R.R.O. 1990, Regulation 851, Industrial Establishments

2.2.1.1.3. OSHA Part 1910 – Occupational Safety and Health Standards and ANSI/ASSE A1264.1

2.2.2. Performance/Design Criteria:

2.2.2.1. Structural Design: Employ a licensed engineer specified herein to:

2.2.2.1.1. Design components for work of this Section requiring structural performance for concentrated and uniformly distributed loads.

2.2.2.1.2. Be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement in accordance with applicable codes and regulations.

2.2.2.2. Platform around AHU to coordinated with AHU manufacturer to provide proper clearances.

2.2.2.3. Removable platform sections. Platform panel sizes to be such that they can be removed by 1 person without the use of special tools.

2.2.2.4. Modular stair with landing and handrail system consisting of high strength profiled aluminum with fully modular and adjustable componentry.

2.2.2.5. Aluminum metal framing designed to provide access to AHU consisting of the following components:

2.2.2.5.1. Handrails including handrail splices, elbows, end caps, and braces,

2.2.2.5.2. Guardrail around platform.

2.2.2.5.3. Kneerails including knee rail splices, elbows, and end caps

2.2.2.5.4. Posts

2.2.2.5.5. Supports including bracing

2.2.2.5.6. Stair treads with slip-resistant surface

2.2.2.5.7. Platform with slip-resistant surface

2.2.2.5.8. Support framing, brackets, connectors anchors, fasteners to connect system to AHU platform and rooftop pads.

2.2.2.5.9. Auxiliary materials required for a complete installation.

2.2.3. Aluminum Extrusions: to ASTM B221M, or CSA HA series - M, Type 6061-T6. Ensure aluminum finish is clear anodized in accordance with Aluminum Association; www.aluminum.org, Finish Designation AA-M12C22A41, Class I, minimum 0.018 mm (0.7 mils).

2.2.4. Fasteners:

2.2.4.1. Manufacturer-recommended for application and metals specified:

2.2.4.1.1. Drilling screws: to ASTM A479/A479M; Type 410 or 18-8 Stainless Steel.

2.2.4.1.2. Machine screws: 18-8 Stainless Steel.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Proceed with installation only after unacceptable conditions have been remedied.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Assemble and install modular roof stair system in accordance with manufacturer's instructions, and accepted shop drawings

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide firestopping and smoke seals including but not limited to following:

1.2.1.1. Firestopping and smoke seals in accordance with Code requirements, at openings and around penetrations, at un-penetrated openings, at projecting and recessed items and at openings and joints within fire separations and assemblies having fire resistance rating, excluding those inside sealed mechanical and electrical assemblies (e.g. inside ducts, dampers, bus ducts, etc.).

1.2.1.2. Firestopping and smoke seals in accordance with Code requirements, at openings and spaces at perimeter edge conditions, excluding those inside sealed mechanical and electrical assemblies (e.g. inside ducts, dampers, bus ducts, etc.).

1.2.1.3. Firestopping and smoke seals between back of curtain wall and edge of slab.

1.2.1.4. Seals to form draft tight barriers to retard passage of flame and smoke and where specifically designated, passage of liquids while passing hose stream test.

1.2.1.5. Ensure seal provides and maintains a fire-resistance rating as determined by OBC for adjacent floor, wall or other fire separation assembly to requirements of and as acceptable to authorities having jurisdiction and to Consultant.

1.2.1.6. Firestopping and smoke seals in and around fire separations, including spaces around mechanical and electrical penetrations, at tops of fire walls, between slab edges and other gaps and penetrations at fire assemblies.

1.2.1.7. Ensure Divisions 21, 22, 23, 26, 27 and 28 respectively are responsible for firestopping and smoke seals within mechanical (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside electrical bus ducts). Ensure firestopping and smoke seals around outside of such mechanical and electrical assemblies where they penetrate fire-rated separations are part of work of this Section.

1.2.1.8. Systems and specified Products are only a guide and may not address all firestopping conditions pertaining to situations which may be present in the Work. Provide firestopping and smoke seal required for the Work. These Products and systems are not presented to restrict other tested and approved listed assemblies of other manufacturers designing assemblies conforming to Code and resolving firestopping required for the Work.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Cutting and patching: Section 01 73 00, Execution.

1.2.2.2. Poured concrete slabs and walls: Section 03 30 00, Cast-in-Place Concrete.

1.2.2.3. Masonry partitions including mortaring in of fire dampers: Section 04 20 00, Concrete Masonry Units.

1.2.2.4. Temporary sheet steel covers: Section 05 50 00, Metal Fabrications.

1.2.2.5. Sealants and caulking: Section 07 92 00, Joint Sealants.

1.2.2.6. Gypsum board partitions: Section 09 21 16, Non-Structural Metal Framing.

1.2.2.7. Firestopping and smoke seals inside mechanical assemblies: Division 21, Fire Suppression, Division 22, Plumbing and Division 23, Heating Ventilating and Air Conditioning.

1.2.2.8. Firestopping and smoke seals inside electrical assemblies: Division 26, Electrical, Division 27, Communications and Division 28, Electronic Safety and Security.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. IAQ: Indoor Air Quality.

1.3.1.2. IFC: International Firestop Council; www.firestop.org.

1.3.1.3. OBC: Ontario Building Code.

1.3.1.4. UL: Underwriters Laboratories Inc.; www.ul.com.

1.3.1.5. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Definitions:

1.3.2.1. Firestop System Types:

1.3.2.1.1. Head of Wall Joint Firestop Systems (HW): Systems intended for installation in vertical separations between wall and floor or roof structures. Ensure these systems do not incorporate penetrating items such as pipes or cables.

1.3.2.1.2. Joint Firestop Systems (JF): Systems intended for installation in openings such as construction joints, gaps and spaces in floors or walls or at floor and wall intersections in accordance with approved systems. Ensure these systems do not incorporate penetrating items such as pipes or cables.

1.3.2.1.3. Perimeter Joint Firestop Systems (PJ): Perimeter joint firestop system rating are governed by lowest of fire resistance ratings of individual components (i.e. wall, floor or joint system). These systems consist of floor with fire endurance rating, exterior wall with or without fire endurance rating and perimeter joint system. Ensure these perimeter joint firestop systems do not incorporate penetrating items such as pipes or cables.

1.3.2.1.4. Service Penetration Firestop Systems (SP): Systems intended for installation in openings of limited dimensions and shape in floor or wall assemblies in accordance with approved systems. Ensure penetrating pipes, cable trays and similar items are in exact accordance with approved systems.

1.3.2.1.5. Service Penetration for Combustible Systems (SPC): Systems intended for installation in openings of limited dimensions and shape in floor or wall assemblies in accordance with approved systems. Ensure penetrating pipes are in exact accordance with approved systems. These systems are tested with a minimum differential pressure of 50 Pa between exposed and unexposed surfaces of assembly to meet Code requirements for Combustible Pipes for Use in Drain, Waste and Vent Piping.

1.3.2.2. Ratings: Rating of firestop system applies to its use in specific assembly of materials, penetration and floor or walls in which it is tested as follows:

1.3.2.2.1. F Rating: When system remains in opening during fire test for rating period without permitting passage of flame through openings or occurrence of flaming on any element of unexposed side of assembly.

1.3.2.2.2. FT Rating: When system remains in opening during fire test in accordance with F Rating requirement and additionally, transmission of heat through firestop system during rating period shall not have been such as to raise

temperature of any thermocouple on unexposed surface of system more than 163 deg C (325 deg F) above initial temperature.

1.3.2.2.3. FH Rating requirement and additionally, during hose stream test firestop system shall not develop any opening that would permit a projection of water from stream beyond unexposed side.

1.3.2.2.4. FTH Rating: When system remains in opening during fire test and hose stream test within limitations described for F, FT and FH ratings.

1.3.2.2.5. L Rating: Based on volume of air flowing, per unit of time through opening around test sample under specified pressure difference applied across surface of system. L Ratings are intended to determine acceptability of firestop systems with reference to control of air movement through assembly. Rating is expressed in litres per second (ℓ/s) per linear metre of opening for joint systems.

1.3.3. Reference Standards:

1.3.3.1. ASTM G21 -15 - Standard practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

1.3.3.2. CAN/ULC-S101-14-REV 1 - Standard Methods of Fire Endurance Tests of Building Construction and Materials

1.3.3.3. CAN/ULC-S102-18 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.3.4. CAN/ULC-S115-18 - Standard Method of Fire Tests of Firestop Systems

1.3.3.5. ULC Guide No. 40 U19 - Firestop Systems

1.3.3.6. ULC Guide No. 40 U19.13 - Firestop Systems Components

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Coordinate construction of openings and penetrating items to ensure that through-penetration fire-stop systems are installed according to specified requirements.

1.4.1.2. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire-stop systems.

1.4.1.3. Notify manufacturer's representative at least seven days in advance of through-penetration fire-stop system installations; confirm dates and times on days preceding each series of installations.

1.4.1.4. Do not cover up through-penetration fire-stop system installations that will become concealed behind other construction until manufacturer's representative and building inspector, if required by Authorities Having Jurisdiction, have examined each installation.

1.4.2. Preinstallation Meetings:

1.4.2.1. Arrange preinstallation meeting 1 week prior to commencing work with all parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor include Consultant who may attend, Subcontractor performing work of this trade, Owner’s representative, testing company's representative and consultants of applicable discipline.

1.4.2.2. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality

control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data:

1.5.2.1. Submit manufacturers' specifications and technical data for each material including compositions, limitations, documentation conforming ULC and/or cUL firestop system proposed for this Project and manufacturers' installation instructions.

1.5.3. Shop Drawings:

1.5.3.1. Submit complete and detailed Shop Drawings for each condition encountered on site. Indicate following:

1.5.3.1.1. ULC and/or cUL assembly number certification and material safety data sheets.

1.5.3.1.2. Required temperature rise and flame rating.

1.5.3.1.3. Hose stream rating (where applicable).

1.5.3.1.4. Thickness.

1.5.3.1.5. Proposed installation methods.

1.5.3.1.6. Material of firestopping and smoke seals, primers, reinforcements, support and securement methods, damming materials, reinforcements and anchorages /fastenings.

1.5.3.1.7. Size of opening.

1.5.3.1.8. Adjacent materials.

1.5.3.1.9. Number of penetrations.

1.5.3.2. Designate on Shop Drawings fixed penetrants, relative positions, number of penetrations, expansion and control joints in rated slabs and walls, firestopping details at receptacles and similar poke-through devices and surrounding permanent materials. Identify re-entry locations.

1.5.3.3. Submit fireproofing manufacturer's written verification that manufacturers have identified where firestopping is required, have selected correct firestop system and applicators have been trained by system manufacturers. Products, systems and assemblies have been installed in accordance with manufacturer's requirements.

1.5.4. Samples:

1.5.4.1. Submit only as requested and in accordance with Section 01 33 00, various types of firestopping and smoke seal material.

1.5.5. Certificates:

1.5.5.1. Submit manufacturer's verification that installed firestopping and smoke seal materials comply with specified requirements.

1.5.5.2. Submit copies of ULC, Warnock Hersey and/or cUL Listing cards for review.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operational and Maintenance Data: Provide maintenance data for materials and prefabricated devices, providing descriptions sufficient for identification on site in accordance with requirements of Section 01 77 00.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide work of this Section executed by competent installers experienced, trained, licensed and approved, by material or system manufacturer for application of materials and systems being used having minimum 5 years experience in application of Products, systems and assemblies specified.

1.7.2. Ensure firestopping systems conform to requirements of CAN/ULC-S115 tested assemblies that provide fire rating as shown.

1.7.3. Source Limitations: Obtain through-penetration fire-stop systems, for each kind of penetration and construction condition indicated, from a single manufacturer.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's sealed and labelled containers. Materials are subject to Consultant's inspection.

1.8.2. Storage and Handling Requirements:

1.8.2.1. Store materials inside building for 24 hours prior to use; store in area designated by Consultant. Protect from damage and environmental conditions detrimental to material.

1.8.2.2. Comply with manufacturer's temperature, relative humidity and substrate moisture content for storage, mixing, application and curing of Products.

1.9. SITE CONDITIONS

1.9.1. Ambient Conditions:

1.9.1.1. Comply with manufacturer's recommended requirements for temperature, relative humidity, moisture content and presence of any sealer or release agents on substrate during application and curing of materials. Ensure surfaces are dry and frost free.

1.9.1.2. Maintain minimum temperature of 5 deg C (40 deg F) for minimum period of 1 week before application, during application and until application is fully cured.

1.9.1.3. Ventilate areas in which firestopping is being applied. Protect water-soluble material from wetting until fully cured.

1.10. WARRANTY

1.10.1. Manufacturer Warranty: Warrant work of this Section against defects and deficiencies for period of 5 years in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no additional expense to Owner. Defects include but are not limited to cracking, breakdown of bond, failure to stay in place or bleeding.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. 3M Canada; www.3m.ca

2.1.1.2. A/D Fire Protection Systems Inc.; www.adfire.com

2.1.1.3. Hilti (Canada) Corporation; www.hilti.ca

2.1.1.4. Tremco Canada; www.tremcosealants.com

2.1.2. Substitution Limitations: This Specification is based on Hilti (Canada) Corporation's Products. Comparable Products from manufacturers listed herein will be reviewed provided they meet requirements of this Specification. No further substitutions will be permitted.

2.2. MATERIALS

2.2.1. Performance/Design Criteria:

2.2.1.1. Ensure firestop systems intended for installation in fire separations have assigned fire ratings as defined herein when tested in accordance with CAN/ULC-S115. Ensure firestop systems intended for use in fire resistive wall and/or floor assemblies are evaluated in accordance with CAN/ULC-S101 (Refer to ULC Guide No. 40 U19).

2.2.1.2. For "L Rating" systems, ensure results do not exceed 5.0 cfm/sq ft of penetration opening at both ambient and elevated temperatures.

2.2.1.3. Mould Resistance: Provide penetration firestopping with mould and mildew resistance rating of 0 or 1 in accordance with ASTM G21.

2.2.1.4. Supply materials and systems capable of effectively impeding passage of fire, smoke, gasses and where specifically indicated passage of liquids. Use only firestop systems that have been ULC and/or cUL tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire rating involved for each separate instance.

2.2.1.5. Ensure firestopping system provides fire-resistance rating, flame and temperature not less than fire resistance rating of surrounding floor, wall or assembly, in accordance with requirements of OBC.

2.2.1.6. Firestop System Rating: Where applicable, comply with F Rating based on number of hours system can resist flames and gases; T Rating based on maximum temperature rise of 163 deg C (325 deg F) above ambient for any thermocouple in addition to flame, gas and stream performance and H Rating based on capacity to withstand hose stream after burn. Design combined and/or built-up site systems in accordance with approved restrictions and technical evaluations acceptable to Consultant and authorities having jurisdiction.

2.2.1.7. Ensure systems provide fire and temperature rating in accordance with those outlined in OBC and effectively impeding passage of flame, smoke and gasses.

2.2.1.8. Firestopping seals except for wall joints in visible areas must be of easily identifiable colour, such as red or yellow to be clearly distinguished from other building materials.

2.2.1.9. Ensure service penetration components and assemblies, including back-up materials and supports are certified in accordance with CAN/ULC-S115 or CAN/ULC-S101 and be ULC listed by a certified authority recognized by building Code officials in locality in which Building is situated.

2.2.1.10. Ensure suitability of Products for application and compatibility of materials with surfaces to which it will be applied.

2.2.1.11. Ensure site system assembly is in accordance with CAN/ULC-S115 labeled and listed system design limitations, unless proposed assembly is approved by authorities having jurisdiction and meets Consultant's review. Design combined and/or built-up site systems in accordance with approved restrictions and technical evaluations acceptable to authorities having jurisdiction as reviewed by Consultant. Engineering Judgements from firestopping manufacturers reviewed by Consultant and authorities having jurisdiction may be used for conditions where a ULC and/or cUL firestopping system is not available. Ensure Engineering Judgements are performed in accordance with IFC's "Recommended IFC Guidelines for Evaluating Firestop Systems in Engineering Judgments (EJs)"

2.2.1.12. Ensure sealants and putty for overhead and vertical joints are non-sagging; seals for floors, self-levelling. Ensure flexible fire stop sealant provides movement capability in fire rated joint

applications. Ensure sealants are compatible with base materials such as without limitations masonry, concrete, metal, gypsum board and other similar items.

2.2.1.13. Ensure Products have a compressive strength capable of providing self support at a penetrating item and shall maintain their integrity as tested in a ULC vertical application.

2.2.1.14. Ensure Products are compatible with abutting dissimilar architectural coatings and finishes at floors, walls, ceilings, waterproofing membranes and the like. Check with Room Finish Schedule and manufacturer of selected materials being installed.

2.2.1.15. Integral Pipe Sleeves/Firestopping Components: Other Sections within Divisions 21, 22 and 23 may specify fire-rated pipe sleeves, cast-in pipe/sleeve assemblies and integral firestopped penetration devices and accessories listed by authorized testing and certification authorities. These systems may eliminate need for separate firestopping applications at certain designated locations and it is responsibility of this Section to determine any and all locations where such devices will be utilized on Project.

2.2.1.16. Do not provide Products containing asbestos.

2.2.1.17. Firestopping System 1 (JF and/or PJ Systems):

2.2.1.17.1. This Firestopping System is primarily an expansion, control and perimeter seal without smoke resistance and be non-combustible, semi-rigid, felt fire protection. Certified assembly of 1 of listed manufacturers and acceptable to Consultant.

2.2.1.17.2. Ensure blanket type firestopping is listed and labelled in accordance with ULC Guide No. 40 U19 or 40 U19.13, with reference to “JF System Listings”.

2.2.1.17.3. Where required by listing, ensure impaling clips are heavy gauge galvanized wire or 25 mm (1") wide x 0.607 mm (24 ga) galvanized steel, Z formed with horizontal bottom and dimensions conforming to location of firestopping and width of void to be filled. Ensure compression of joint do not damage clips.

2.2.1.18. Firestopping System 2: Same materials as in System 1, but without use of impaling clips and with smoke and fluid seal with hose stream resistance. Certified assembly of 1 of listed manufacturers and acceptable to Consultant.

2.2.1.19. Firestopping System 3: Fire, gas, fluid and hose stream resistant elastomeric sealant with movement capabilities, ULC labeled assembly of 1 of listed manufacturers and acceptable to Consultant. Ensure materials have elastic characteristics where used at openings subject to movement. Intumescent pads may form part of this system, at Contractor’s option.

2.2.1.20. Firestopping System 4: Ensure firestopping, gas, fluid and hose stream resistant seals at openings intended for ease of re-entry such as cables be an elastomeric seal or proprietary assembly of following types; a cementitious or rigid seal at such locations is not permitted. Certified assembly of 1 of listed manufacturers and acceptable to Consultant.

2.2.1.21. Firestopping System 4-A: Where openings are considered large such as at cable trays and bus ducts. Certified assembly of 1 of listed manufacturers and acceptable to Consultant.

2.2.1.22. Firestopping System 5 (Cavity Wall Compartment Closer and Firestopping): Strips of "RXL Safe" semi-rigid mineral fibre insulation by Roxul Inc.; www.roxul.com 75 mm (3") wide by depth of cavity plus 13 mm (1/2") with galvanized skewers for securement at 300 mm (12") oc., or compressed 25% to fill depth of cavity.

2.2.2. Primers: To manufacturer's recommendations for specific material, substrate and end use.

2.2.3. Damming and Backup Materials, Supports and Anchoring Devices: Non-combustible, to manufacturer's recommendations in accordance with tested assembly being installed and as acceptable to authorities having jurisdiction. Ensure sheet steel covers over temporarily unused sleeves in tenant and similar spaces are minimum 0.912 mm (20 ga) thick galvanized sheet steel formed to a tight fit over opening

with specified firestopping materials installed beneath. Combustible materials are acceptable only if they are approved under ULC or cUL systems, otherwise they should be removed after permanent firestop materials have cured.

2.2.4. Pre-Installed Firestop Devices: For use with non-combustible and combustible pipes (closed and open systems), conduit and/or cable bundles penetrating concrete floors, provide 1 of following Products:

2.2.4.1. “Cast-In Firestop Device (CP 680-P)” by Hilti (Canada) Corporation.

2.2.4.2. “Cast-In Firestop Device (CP 680-PX)” by Hilti (Canada) Corporation for use with XFR pipe.

2.2.4.3. “Cast-In Firestop Device (CP 680-M)” by Hilti (Canada) Corporation for use with non-combustible penetrants.

2.2.4.4. “Firestop Drop-In Device (CFS-DID)” by Hilti (Canada) Corporation for use with non-combustible and combustible penetrants.

2.2.5. Pre-Formed Materials: For use with standard head-joint top tracks and bottom-joint tracks and slip-type head joints in fire-rated construction at top or bottom of partition, provide following Product:

2.2.5.1. “Firestop Top Track Seal (CFS-TTS)” by Hilti (Canada) Corporation.

2.2.6. Re-Penetrable, Round Cable Management Devices:

2.2.6.1. For use with new cable bundles penetrating gypsum board or masonry walls, provide following Product:

2.2.6.1.1. “Speed Sleeve (CP 653)” by Hilti (Canada) Corporation with integrated smoke seal fabric membrane.

2.2.6.2. For use with existing cable bundles penetrating gypsum board or masonry walls, provide 1 of following Products:

2.2.6.2.1. “Firestop Cable Collar (CFS-CC)” by Hilti (Canada) Corporation.

2.2.6.2.2. “Firestop Retrofit Sleeve Kit (CFS-SL RK)” by Hilti (Canada) Corporation.

2.2.7. Single or Cable Bundles up to 25 mm (1”) Diameter: Penetrating gypsum board, masonry, concrete walls or wood floor assemblies, provide following Product:

2.2.7.1. “Firestop Cable Disc (CFS-D 1”)” by Hilti (Canada) Corporation

2.2.8. Pipe and Duct Insulation and Wrappings Compatible with Firestopping Systems: "TREMstop WS" by Tremco Canada or “3M™ Fire Barrier Duct Wrap 615” by 3M Canada.

2.2.9. Intumescent Pads: “Firestop Block (CFS-BL)” by Hilti (Canada) Corporation or “3M™ Fire Barrier Putty Sleeve Kits” by 3M Canada.

2.2.10. Re-Entry Pillows: Permanently pliable, “Firestop Block (CFS-BL)” by Hilti (Canada) Corporation, "TREMstop PS" by Tremco Canada or “3M™ Fire Barrier Self Locking Pillows” by 3M Canada.

2.2.11. Mixes:

2.2.11.1. Mix materials at correct temperature and in accordance with manufacturer's directions.

2.2.11.2. Cleaning Materials: As recommended by firestop manufacturer.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.1.2. Verify openings, dimensions and surfaces conform to fire and smoke seal assembly.

3.1.1.3. Examine sizes of penetrating service, percentage fill and sleeve or opening sizes with exact annular space calculations, anticipated movement and conditions necessary to establish correct type, thickness and installation of back-up materials and seals.

3.1.1.4. Since firestop systems do not re-establish structural integrity of load bearing partitions/ assemblies, or support live loads and traffic, consult structural engineer prior to penetrating any load bearing assembly.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Surface Preparation:

3.2.1.1. Provide primer or surface conditioner if required by Product manufacturer. Prime surfaces in accordance with manufacturer's directions.

3.2.1.2. Remove combustible material and loose material detrimental to bond from edges of penetration. Clean, prime or otherwise prepare substrate material to manufacturer's recommendation.

3.2.1.3. Remove insulation from insulated pipe and duct where such pipes or ducts penetrate a fire separation unless ULC certified assembly permits such insulation to remain within assembly, or where mechanical trades have installed special fire rated insulated sleeves. Ensure continuity of thermal and vapour barriers where such are removed, altered or replaced, to satisfaction of Divisions 21, 23 and 23 and Consultant.

3.2.1.4. Alternatively, ensure pipe and duct insulation and wrappings occurring within openings to receive firestopping and smoke seals under this Section are installed prior to work of this Section and insulation and wrappings within fire seals are ULC listed components of system to be installed under this Section, unless ULC certified assembly permits such other insulation and wrappings to remain within assembly. Coordinate work of this Section with Divisions 21, 22 and 23.

3.2.1.5. Clean bonding surfaces to remove deleterious substances including dust, paint, rust, oil, grease, moisture, frost and other foreign matter which may otherwise impair effective bonding.

3.3. INSTALLATION

3.3.1. Do not apply firestop material to surfaces previously painted or treated with sealer, curing compound, water repellent to other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

3.3.2. Provide temporary forming, packing and bracing materials necessary to contain firestopping. Upon completion, remove forming and damming materials not required to remain as part of system.

3.3.3. Install damming and firestopping materials as per manufacturer's instructions.

3.3.4. Mix and apply firestopping and smoke seals in accordance with manufacturer's instructions and tested designs to provide required fire (temperature and flame) rated seal, to prevent passage of smoke and where specifically designated, passage of fluids.

3.3.5. Provide temporary forming and packing as required. Apply materials with sufficient pressure to properly fill and consolidate mass to seal openings.

3.3.6. Tool or trowel exposed surfaces. Allow materials to cure by not covering up materials until full curing has taken place.

3.3.7. Where a designated system described hereinafter does not meet Code requirements for particular service condition, substitute with next higher system meeting required rating.

3.3.8. Notify Consultant when completed installations are ready for inspection and prior to concealing or enclosing firestopping and smoke seals.

3.3.9. System 1:

3.3.9.1. Install fire rated joint firestopping by compressing material minimum of 25% to ensure complete sealing and to follow irregularities of concrete slabs at perimeter of building where junction occurs with back of cladding system. Apply firestopping sealant of spray over compressed mineral wool.

3.3.9.2. Butt succeeding sections of firestopping material tightly up against preceding. Leave no voids.

3.3.9.3. Provide firestopping between exterior wall cladding and concrete floor slab. Secure and support to suit design requirements.

3.3.9.4. Use this System for joint seals through fire-resistance rated floor slabs, ceilings and roofs unless otherwise stipulated.

3.3.10. System 2:

3.3.10.1. At fire-rated masonry walls and gypsum board partitions which extend nominally to within 19 mm (3/4") of underside of deck above, insert fire rated joint assembly firestopping material in 25% compression in accordance with ULC test requirements and manufacturer's instructions. Provide adequate depth of material to fill gap flush with face of wall, except as otherwise specified. Apply firestopping sealant of spray over compressed mineral wool.

3.3.10.2. Insert at intersection of fire-resistance rated masonry and gypsum board partitions.

3.3.10.3. Insert at both sides of control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

3.3.10.4. Where wall/slab junction is exposed in finished work, keep fibre back 9 mm (3/8") from face of block and apply fire-resistant sealant to gap, tooling to a concave joint.

3.3.10.5. At perimeter slab locations where this system would otherwise be exposed in finished work and where smoke seal is required, provide cover spray material of thickness as recommended by manufacturer of System 3 material set flush with top of slab and tooled smooth. Minimum cover spray thickness 3 mm (1/8"). Where anticipated movement in joint width is inevitable, select sealant with elastic capabilities.

3.3.11. System 3:

3.3.11.1. This System establishes fire rated firestopping for service penetrations throughout the Project. Seal gaps and holes in fire-rated walls and slabs and composite construction through which conduit, wire, cables, ductwork, piping and other protrusions pass as a result of work using fire-resistant penetration sealant. Include opening which have been formed, sleeved and cored.

3.3.11.2. Apply at unpenetrated openings and sleeves installed for future use through fire-resistance rated assemblies.

3.3.11.3. Apply this System between spaces having different air pressures. (See Mechanical Drawings for pressurized areas and locations of moving penetrants.)

3.3.11.4. Apply at "wet" rooms supported by suspended slabs at locations over Electrical and Equipment Rooms or similar areas containing power devices in which future re-entry is not required.

3.3.11.5. Apply at Mechanical Rooms and similar rooms having systems containing liquids, including piping runs, unless such rooms are located over slab-on-grade.

3.3.11.6. Install System 3 materials at elevator shafts, duct shafts and other similar locations over occupied spaces.

3.3.11.7. Install 6 mm to 9 mm (1/4" to 3/8") bead of firestop caulking at interface of retaining angles around fire dampers, where angles meet fire-rated assembly and between retaining angles and fire damper, both sides of penetration. At floor locations, sealant bead at top of assembly is adequate.

3.3.11.8. Where necessary, remove insulation from insulated pipe and duct where such services penetrate a fire separation unless certified assembly permits such insulation to remain within assembly. Apply wrapping materials as listed herein.

3.3.11.9. Install System 3 materials at open wall joints, including expansion joints between fire rated enclosures and assemblies.

3.3.12. Systems 4 and 4A: Install at following locations:

3.3.12.1. At Electrical, Electrical Switchgear, Electrical Transformer Rooms and at Telephone Equipment Rooms requiring re-entry for additional services.

3.3.12.2. Install at communications and computer cable penetration points throughout.

3.3.13. System 5: Maintain maximum cavity wall compartments to lesser of following 2 criteria by bridging gap between cavity back-up material and back face of brick with full-depth strips of compartment closer and firestopping material, securing in position with mechanical fasteners and sealing against firm, primary cavity materials:

3.3.13.1. 10 m² (100 sq ft).

3.3.13.2. Division B, Part 3, Paragraph 3.1.11 of OBC.

3.3.14. Accessories: At hollow fire-rated walls, apply intumescent pads to back surfaces and cable entry points of electrical boxes, panels and other service penetration points, ensuring close coordination with electrical, mechanical and drywall trades. Where greater dimension of panel exceeds 500 mm (20"), gypsum board trades construct fire-rated enclosure around recessed panels.

3.3.15. Penetration Sizing: Ensure following regulates sizing of service penetrations to be firestopped, other than for fire dampered openings:

3.3.15.1. Ensure single, circular penetration is sleeved by work of Divisions 21, 22, 23, 26, 27 and 28.

3.3.15.2. Multiple penetrations of circular elements are defined as more than 1 circular penetration having a maximum space of 100 mm (4") between closest faces of such penetrating elements. Forming of such multiple penetrations is responsibility of respective trades whose service penetrates rated assembly and such formed opening shall be square or rectangular frame around group of penetrations in which maximum clearance between outer penetration element and face of opening shall be 25 mm (1").

3.3.15.3. Create single and multiple rectangular penetrations in same manner as specified above, but edge clearance may be increased to a maximum of 50 mm (2").

3.3.15.4. Exception; at fire dampers, clearances are governed by testing authorities' requirements.

3.3.15.5. For purposes of this Specification, a moving penetrant is defined as a penetrating device having an anticipated movement of greater than 9 mm (3/8") when measured at right angles to face of rated assembly.

3.3.16. Cable Tray Penetrations:

3.3.16.1. Seal (firestop) cable tray penetrations with re-enterable/re-penetrable matrices/devices with applicable ratings determined in accordance with CAN/ULC-S115 having a minimum L Rating not exceeding 5.0 cfm/sq ft of penetration opening at both ambient and elevated temperatures. For penetrations through a fire wall or horizontal fire separation provide a firestop system with a FT Rating as determined by ULC or cUL which is equal to fire resistance rating of construction being penetrated.

3.3.16.2. Ensure ULC or cUL tested listings for cable tray and cable penetrations conform to annular space requirements, (construction assembly type, penetrating item type and fire-rating) for each separate instance per manufacturer's listings.

3.4. SITE QUALITY CONTROL

3.4.1. Site Tests and Inspections:

3.4.1.1. Perform a series of 5 fog tests to random locations as designated by Consultant. Should any penetration, joint or void, under jurisdiction of this Section, emit visible fog, make repairs and replace deficiencies and re-perform fog test at no additional cost to Owner.

3.4.1.2. Ensure fog units (machines) have a formulation output range of (1.5 gal/hr). Formulation particle size 0.5 - 25 µm. Ensure fogging agent is non-toxic, non-staining and provides a heavy fog at 30 ppm with a permissible airborne level concentration of 50 ppm.

3.4.1.3. Fog at a rate of 4 s/100 cu ft. Maintain fog density until inspection is complete.

3.4.1.4. Independent inspection and testing company may be appointed by Owner to carry out additional inspection and testing as directed by Consultant. Tests include 3 fog tests per floor at random locations.

3.4.1.5. Where work or materials fail to meet requirements as indicated by test results, pay costs of additional inspection and testing required for new replacement work or materials.

3.4.2. Ensure firestopping systems do not affect structural integrity of load bearing walls and assemblies. Coordinate with Consultant prior to penetrating any load bearing assembly. For unusual firestop application for which no tested system is available, ensure manufacturers submit their proposal to local authorities having jurisdiction for their review and approval prior to installation.

3.4.3. Ensure work of this Section is by 1 Subcontractor responsible for firestopping materials and systems for all work except as specified herein.

3.4.4. Conform to both temperature and flame ratings of standards listed hereinafter and other requirements of authorities having jurisdiction.

3.4.5. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4.6. Manufacturer Services: Consult with Product manufacturer's technical representative about following items:

3.4.6.1. fire stopping system for fire separation required.

3.4.6.2. curing characteristics of materials specified.

3.4.6.3. joint characteristics as built.

3.4.6.4. to be on-site during initial installation of firestop systems to train appropriate Subcontractor personnel in proper selection and installation procedures. Ensure this is done per manufacturer's written recommendations published in their literature and drawing details.

3.5. CLEANING

3.5.1. Remove excess materials and debris and clean adjacent surfaces immediately after application to satisfaction of Consultant. Remove and or correct staining and discolouring of adjacent surfaces as directed.

3.5.2. Remove temporary dams after initial set of firestopping and smoke seal materials where such materials are left exposed in finished areas and flame spread rating of such materials exceed a value of 25, in accordance with CAN/ULC-S102.

3.6. PROTECTION

3.6.1. Fully protect walls, windows, floors and other surfaces around areas to be firestopped from marring or damage. Mask where necessary to avoid spillage on to adjoining surfaces. Mask areas adjacent to openings, where necessary to prevent contamination or marring of adjacent surface materials. Remove masking after seal has been completed and an initial set has been achieved. Remove stains on adjacent surfaces as required.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide joints sealants including but not limited to following:

1.2.1.1. Interior:

1.2.1.1.1. Control and expansion joints on exposed interior surfaces of exterior walls.

1.2.1.1.2. Perimeter joints of exterior openings where indicated.

1.2.1.1.3. Perimeter joints between interior wall surfaces and frames for interior doors and windows.

1.2.1.1.4. Joints between plumbing fixtures and adjoining walls, floors and counters.

1.2.1.1.5. Joints between different materials listed above.

1.2.1.1.6. Other joints as indicated.

1.2.1.2. Mildew resistant sealants.

1.2.1.3. Self leveling sealants.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Filling and sealing of sawcut joints in concrete slab: Section 03 35 00 Concrete Curing and Finishes.

1.2.2.2. Masonry control and expansion joint fillers and gaskets: Section 04 22 00, Concrete Unit Masonry.

1.2.2.3. Firestopping and smoke seals: Section 07 84 00, Firestopping and Smoke Seals.

1.2.2.4. Sealing of joints around sound attenuating gypsum board partitions: Section 09 21 16, Non-Structural Metal Framing.

1.2.2.5. Read other Sections of Specifications for extent of sealing specified in those Sections. Do other sealing indicated, specified or required.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. IPA: Isopropyl Alcohol (99.9% pure).

1.3.1.2. MEK: Methyl-ethyl-ketone.

1.3.1.3. SWRI: Sealant, Waterproofing, & Restoration Institute; www.swrionline.org.

1.3.2. Reference Standards:

1.3.2.1. ASTM C661-15(2022) - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

1.3.2.2. ASTM C719-14(2019) - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

1.3.2.3. ASTM C834-17 - Standard Specification for Latex Sealants

1.3.2.4. ASTM C920-18 - Standard Specification for Elastomeric Joint Sealants

1.3.2.5. ASTM C1021-08(2019) - Standard Practice for Laboratories Engaged in Testing of Building Sealants

1.3.2.6. ASTM C 1193-2016 - Standard Guide for Use of Joint Sealants

1.3.2.7. ASTM C1248-18 - Standard Test Method for Staining of Porous Substrate by Joint Sealants

1.3.2.8. ASTM C 1330-18 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meeting:

1.4.1.1. Prior to start of work, arrange for Project site meeting of parties associated with work of this Section. Presided over by Contractor, include Consultant who may attend, Subcontractor performing work of this trade, Contractor's consultants of applicable discipline and manufacturer’s representative.

1.4.1.2. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of this Section. Discuss also following items:

1.4.1.2.1. Verify with sealant manufacturer that specified sealants are compatible with and will satisfactorily adhere to substrates.

1.4.1.2.2. Weather conditions under which work will be done.

1.4.1.2.3. Anticipated frequency and extent of joint movement.

1.4.1.2.4. Joint design.

1.4.1.2.5. Suitability of durometer hardness and other properties of material to be used.

1.4.1.2.6. Recommendations of manufacturer for mixing of multi-component sealants.

1.4.1.2.7. Number of beads to be used in sealing operation and priming operation if required.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data:

1.5.2.1. Submit Product information from sealant manufacturer prior to commencement of work of this Section verifying:

1.5.2.1.1. Selected sealant materials are from those specified.

1.5.2.1.2. Joint sealant schedule indicating application, joint location and designation.

1.5.2.1.3. Composition and physical characteristics.

1.5.2.1.4. Surface preparation requirements.

1.5.2.1.5. Priming and application procedures.

1.5.2.1.6. Suitability of sealants for purposes intended and joint design.

1.5.2.1.7. Test report on adhesion, compatibility and staining effect on samples of adjacent materials used on Project.

1.5.2.1.8. Sealants compatibility with other materials and Products with which they come in contact including but not limited to sealants provided under other Sections, insulation adhesives, bitumens, brick, stone, concrete, masonry, metals and metal finishes, ceramic tile, plastic laminates and paints.

1.5.2.1.9. Suitability of sealants for temperature and humidity conditions at time of application.

1.5.3. Test and Evaluation Reports:

1.5.3.1. Compatibility Testing Report: Submit in accordance with Section 01 30 00. Prior to supply or installation, test exterior sealant materials for compatibility with joint substrates. Test for staining and adhesion including substrates treated with sealers, curing compounds and water repellants, etc. Submit a written report of test results to Consultant.

1.5.3.2. Colour: Submit colours for acceptance in accordance with following general colour hierarchy i.e. Between 2 dissimilar materials, colour the sealant to match the material with the higher relative position on the colour hierarchy scale (highest is at ".1"):

1.5.3.2.1. Concrete.

1.5.3.2.2. Masonry.

1.5.3.2.3. Metal extrusions.

1.5.3.2.4. Metal (formed).

1.5.4. Samples:

1.5.4.1. Submit samples in accordance with Section 01 30 00. Provide cured, colour samples of manufacturer's standard range of colours in each type of sealant and caulking compound for colour selection by Consultant.

1.5.4.2. Submit samples of primer, bond breaker tape and joint backing material, if requested.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers who have a membership in good standing with SWRI and have minimum of 5 years experience in application of Products, systems and assemblies specified and with approval and training of

1.6.2. Preconstruction Testing:

1.6.2.1. Test for compatibility of sealant and accessory Products with joint substrates. Provide test results and written recommendations for primers and substrate preparation required for proper adhesion. For materials failing tests, obtain joint sealant manufacturer’s written instructions for corrective measures, including use of specialty formulated primers.

1.6.2.2. Test elastomeric joint sealants for compliance with requirements of ASTM C920 and where applicable, to other standard test methods.

1.6.2.3. Test elastomeric joint sealants for compliance with requirements of ASTM C719 for adhesion and cohesion under cyclic movement, adhesion-in peel and indentation hardness.

1.6.2.4. Test other joint sealants for compliance with requirements indicated by referencing standard Specifications and test methods.

1.6.3. Include lists of completed Projects with Name of Consultants and contact persons.

1.6.4. Mock-Ups: Conform to requirements of Section 01 40 00. At site, in area(s) designated by Consultant, erect sample panels 1 m (39") long for each type of sealant joint design, showing location, size, shape and depth of joint complete with backup materials, primer, caulking and sealant, bond, colour and quality of installation work.

1.6.5. If requested conduct field test for joints designated. Construct additional samples if required to obtain acceptance.

1.6.6. Do no sealant work until samples have been accepted. Ensure accepted samples become standard of comparison for sealant and caulking work on site and become part of work.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Delivery and Acceptance Requirements: Deliver caulking and sealant materials to site in original, unopened containers with manufacturers' labels and seals intact. Labels to identify manufacturer's name, brand name of Product, grade and type, application directions and shelf life or expiry date of Product.

1.7.2. Storage and Handling Requirements:

1.7.2.1. Handle and store materials in accordance with manufacturer's printed directions. Store flammable materials in safe, approved containers to eliminate fire hazards.

1.7.2.2. Do not use caulking and sealant materials that have been stored for period of time exceeding maximum recommended shelf life of materials.

1.8. PROJECT CONDITIONS

1.8.1. Ambient Conditions:

1.8.1.1. Do not apply any sealant under adverse weather conditions, when joints to be sealed are damp, wet or frozen or when at ambient temperatures below 5 deg C (40 deg F). Maintain minimum temperature of application during application and for 8 hours after application. Consult manufacturer for specific instructions before proceeding and obtain Consultant's approval.

1.8.1.2. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated and until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8.2. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

1.8.3. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.9. WARRANTY

1.9.1. Manufacturer Warranty: Warrant work of this Section for period of 10 years for silicone type sealants and 5 years for other sealants against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

1.9.2. Defects include but are not limited to; cracking, crumbling, melting, shrinkage, sag, failure of adhesion, cohesion or reversion, air and moisture leakage, marbling or streaking due to improper mixing, discolouration due to dirt pick-up during curing and staining of adjacent materials.

PART 2 - PRODUCTS

2.1. PERFORMANCE/DESIGN CRITERIA

2.1.1. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2.1.2. Provide exterior and interior elastomeric joint sealants establishing and maintaining water tightwatertight, water resistant and air tight continuous joint seals without staining or deteriorating joint substrates.

2.1.3. Provide Products with capability, when tested for adhesion and cohesion under maximum cyclic movement in accordance with ASTM C719, to withstand required percentage change in joint width existing at time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated.

2.1.4. Where non-staining elastomeric sealants are applied to porous substrates, provide Products that have undergone testing according to ASTM C1248 and have not stained porous joint substrates indicated for Project.

2.1.5. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint-Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated.

2.1.6. Stain-Test-Response Characteristics: Where elastomeric sealants are specified in the Elastomeric Joint- Sealant Schedule to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C1248 and have not stained porous joint substrates indicated for Project.

2.1.7. Continuous-Immersion-Test-Response Characteristics: Where elastomeric sealants will be immersed continuously in water, provide products that have undergone testing according to ASTM C1247, including initial six-week immersion period and have not failed in adhesion or cohesion when tested with substrates indicated for Project.

2.1.8. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with SCAQMD Rule #1168 and the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):

2.1.8.1. Architectural Sealants: 250 g/L.

2.1.8.2. Sealant Primers for Nonporous Substrates: 250 g/L.

2.1.8.3. Sealant Primers for Porous Substrates: 775 g/L.

2.1.9. Colours of Exposed Joint Sealants: Manufacturer’s standard color to be selected by Consultant.

2.2. ELASTOMERIC JOINT SEALANTS

2.2.1. Elastomeric Sealant Standard: Comply with ASTM C920 and other requirements indicated for each liquid- applied sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

2.2.2. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint- Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated.

2.2.3. Stain-Test-Response Characteristics: Where elastomeric sealants are specified in the Elastomeric Joint-Sealant Schedule to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C1248 and have not stained porous joint substrates indicated for Project.

2.2.4. Continuous-Immersion-Test-Response Characteristics: Where elastomeric sealants will be immersed continuously in water, provide products that have undergone testing according to ASTM C1247, including initial six-week immersion period and additional immersion periods specified below, and have not failed in adhesion or cohesion when tested with substrates indicated for Project.

2.2.5. Single-Component, Non sag, Urethane Joint Sealant (Group U1): Type S, Grade NS, Class 100/50, for Use NT.

2.2.5.1. Products: provide products by one of the following:

2.2.5.1.1. Sikaflex – 15LM; Sika Corporation, Construction Products Division.

2.2.5.1.2. Vulkem 921; Tremco Incorporated.

2.2.6. Single-Component, Non sag, Urethane Products (Group U2): Type S, Grade NS, Class 25, for Use NT.

2.2.6.1. Products: provide products by one of the following:

2.2.6.1.1. MasterSeal NP100 or MasterSeal Ultra; BASF Building Systems.

2.2.6.1.2. Chem-Calk 900; Chem-Calk 915; Bostik Inc.

2.2.6.1.3. Bondaflex PUR 25 or Bondaflex PUR 40 FC; May National Associates, Inc.

2.2.6.1.4. Elasto-Thane 230 Type II; Pacific Polymers International.

2.2.6.1.5. Dynatrol I-XL Hybrid; Pecora Corporation.

2.2.6.1.6. Flexiprene 1000; or PSI-901; Polymeric Systems, Inc.

2.2.6.1.7. SM7100 Permathane; Schnee-Morehead, Inc

2.2.6.1.8. Sikaflex - 1a; Sika Corporation, Construction Products Division.

2.2.6.1.9. DyMonic or Vulkem 116; Tremco Incorporated

2.2.7. Multicomponent, Non sag, Urethane Products (Group U5): Type M, Grade NS, Class 50, for Use NT.

2.2.7.1. Products: provide products by one of the following:

2.2.7.1.1. Dynatrol II; Pecora Corporation.

2.2.7.1.2. Flexiprene 2000 or PSI-270; Polymeric Systems, Inc.

2.2.7.1.3. Dymonic 100, Dymeric 240 or Dymeric 240 FC; Tremco.

2.2.8. Multicomponent, Non-sag, Urethane Joint Sealant (Group U6): Type M, Grade NS, Class 25, for Use NT.

2.2.8.1. Products: provide products by one of the following:

2.2.8.1.1. MasterSeal NP 2; BASF Building Systems.

2.2.8.1.2. Chem Calk 500; Bostik, Inc.

2.2.8.1.3. Bondaflex PUR 2 NS; May National Associates, Inc.

2.2.8.1.4. Dynatred; Pecora Corporation.

2.2.8.1.5. Sikaflex - 2c NS or Sikaflex - 2c EZ Mix; Sika Corporation, Construction Products Division.

2.2.8.1.6. Vulkem 227; Tremco Incorporated.

2.3. SILICONE JOINT SEALANTS

2.3.1. Silicone Sealant Standard: Comply with ASTM C920.

2.3.2. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant Products (Group S1): Type S, Grade N, Class 25, for Use NT.

2.3.2.1. Products: provide products by one of the following:

2.3.2.1.1. Omniplus; BASF Buidling Systems.

2.3.2.1.2. 786 Mildew Resistant; Dow Corning Corporation.

2.3.2.1.3. Sanitary SCS1700; GE Advanced Materials – Silicones.

2.3.2.1.4. Bondaflex Sil 100 WF; May National Associates, Inc..

2.3.2.1.5. Tremsil 200 Sanitary; Tremco Incorporated.

2.3.3. Mildew-Resistant, Single-Component, Neutral-Curing Silicone Joint Sealant Products (Group S2): Type S, Grade NS, Class 25, for Use NT.

2.3.3.1. Products: provide products by one of the following:

2.3.3.2. 898 NST; Pecora Corporation.

2.3.3.3. Tremsil 200 Sanitary; Tremco Incorporated.

2.3.3.4. ADSEAL KB 4800 Series; ASFAST Corporation.

2.3.3.5. TruSil 100; Everkem Diversified Products, Inc.

2.3.3.6. Sikasil GP; Sika Corporation.

2.3.4. Single-Component, Non sag, Neutral-Curing Silicone Joint Sealant Products (Group S4): Type S, Grade NS, Class 50, for Use NT.

2.3.4.1. Products: provide products by one of the following:

2.3.4.1.1. Omniseal 50; BASF Building Systems.

2.3.4.1.2. Dowsil 790 or Dowsil 795; Dow Corning Corporation.

2.3.4.1.3. SilPruf NB SCS9000; GE Advanced Materials – Silicones.

2.3.4.1.4. Pecora 864 NST, 890 NST, or 895 NST; Pecora Corporation.

2.3.4.1.5. SikaSil-C995, Sikasil WS-290, or Sikasil WS-295; Sika Corporation, Construction Products Division.

2.3.4.1.6. Spectrem 1, Spectrem 3, or Spectrem 4-TS; Tremco Incorporated.

2.3.4.1.7. ADSEAL LM 4600 Series or ADSEAL DWS 4580 Series; ADFAST Corporation

2.4. LATEX JOINT SEALANTS

2.4.1. Latex Sealant Standard: Comply with ASTM C834.

2.4.2. Acrylic Latex or Siliconized Acrylic Latex Products (Group LS): Type OP, Grade NF.

2.4.2.1. Products: provide products by one of the following:

2.4.2.1.1. Chem-Calk 600; Bostik Inc.

2.4.2.1.2. AC-20+; Pecora Corporation

2.4.2.1.3. Sonolac; BASF Building Systems

2.4.2.1.4. Tremflex 834; Tremco Incorporated.

2.4.2.1.5. Bondaflex 600; May National Associates, Inc.

2.4.2.1.6. EcoTex 25; Everkem Diversified Products, Inc.

2.4.2.1.7. Titebond GREENchoice Acoustical Smoke and Sound Sealant; Franklin International, Inc.

2.4.2.1.8. 950A, Bolt Quickdry, or Powerhouse Siliconized Acrylic Latex Sealant; Sherwin-Williams Company.

2.5. SOLVENT-RELEASE-CURING JOINT SEALANTS

2.5.1. Butyl Joint Sealant Standard: Comply with ASTM C1311.

2.5.2. Butyl-Rubber-Based Joint Sealant Products (Group BR):

2.5.2.1. Products: provide products by one of the following:

2.5.2.1.1. Chem-Calk 300; Bostik Inc.

2.5.2.1.2. BC-158; Pecora Corporation.

2.5.2.1.3. Tremco Butyl Sealant; Tremco Incorporated.

2.5.2.1.4. FSI-96 Butyl Rubber; Fastener Systems, Inc.

2.6. ACOUSTICAL JOINT SEALANTS

2.6.1. Acoustical Joint Sealant Standard: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C834.

2.6.2. Acoustical Joint Sealant (Group AS):

2.6.2.1. Products: provide products by one of the following:

2.6.2.1.1. AC-20 FTR or AIS-919; Pecora Corporation.

2.6.2.1.2. SHEETROCK Acoustical Sealant; USG Corporation.

2.7. JOINT-SEALANT BACKING

2.7.1. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

2.7.2. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Provide any Type schedule below, as approved in writing by joint-sealant manufacturer for joint application indicated, and as follows:

2.7.2.1. Schedule:

TYPE	DESCRIPTION	COMMENT
C	Closed-cell material with a surface skin	
O	Open-cell material	Not permitted for horizontal and sloped surfaces
B	Bicellular material with a surface skin	

2.7.3. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8. MISCELLANEOUS MATERIALS

2.8.1. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

2.8.2. Bond Breaker Tape: As recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8.3. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint

substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

2.8.4. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints. Leave no residue.

2.8.5. Preformed Expanding Foam Sealant:

2.8.5.1. Preformed, precompressed, open-cell foam sealant that is manufactured from high-density urethane foam

2.8.5.2. Impregnated with a nondrying, water-repellent agent;

2.8.5.3. Self expanding to fill joint widths indicated

2.8.5.4. Coated on one side with a pressure-sensitive adhesive and covered with protective wrapping;

2.8.5.5. Watertight and airtight seal.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Examine joints for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Ensure joints are suitable to accept and receive sealants.

3.1.1.2. Examine joint sizes and where depth of joint exceed required depth of sealant correct to achieve proper following width/depth ratio:

3.1.1.2.1. Maintain 2:1 Width/Depth Ratio: Ensure maximum sealant depth is 13 mm (1/2”) and minimum contact width with each substrate is 6 mm (1/4"). Confirm width/depth ratios with sealant manufacturers.

3.1.1.3. Verify joint surfaces are clean, sound, free of defects and dimensions are within sealant manufacturer’s size requirements.

3.1.1.4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.1.1.5. Do not apply sealant to masonry until mortar has cured.

3.1.2. Preinstallation Testing: Before any sealing work is commenced, test materials for indications of staining or poor adhesion.

3.1.3. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2.2. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

3.2.2.1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

3.2.2.2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of

developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:

3.2.2.2.1. Concrete.

3.2.2.2.2. Masonry.

3.2.2.2.3. Unglazed surfaces of ceramic tile.

3.2.2.3. Remove laitance and form-release agents from concrete.

3.2.2.4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

3.2.2.4.1. Metal.

3.2.2.4.2. Glass.

3.2.2.4.3. Glazed surfaces of ceramic tile.

3.2.2.5. Clean ferrous metals of rust, mill scale and foreign materials by wire brushing, grinding or sanding.

3.2.2.6. Wipe non-porous surfaces such as metal and glass to be sealed, except pre-coated metals, with cellulose sponges or clean rags soaked with ethyl alcohol, ketone solvent, xylol or toluol and wipe dry with clean cloth. Where joints are to be sealed with silicone based sealants clean joint with MEK or xylol. Do not allow solvent to air-dry without wiping. Clean pre-coated metals with solutions or compounds which will not injure finish and which are compatible with joint primer and sealant. Check ferrous metal surfaces are painted before applying sealant.

3.2.3. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3. INSTALLATION OF JOINT SEALANTS

3.3.1. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

3.3.2. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

3.3.3. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

3.3.3.1. Do not leave gaps between ends of sealant backings.

3.3.3.2. Do not stretch, twist, puncture, or tear sealant backings.

3.3.3.3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

3.3.4. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.

3.3.5. Install sealants by proven techniques to comply with the following and at the same time backings are installed:

3.3.5.1. Place sealants so they directly contact and fully wet joint substrates.

3.3.5.2. Completely fill recesses provided for each joint configuration.

3.3.5.3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

3.3.6. Force sealant into joint and against sides of joints to obtain uniform adhesion. Use sufficient pressure to completely fill voids in joint regardless of variation in joint widths and to proper joint depth as prepared. Ensure full firm contact with interfaces of joint. Superficial pointing with skin bead is not acceptable.

3.3.7. Finish face of compound to form smooth, uniform beads. At recesses in angular surfaces, finish compound with flat face, flush with face of materials at each side. At recesses in flush surfaces, finish compound with concave face flush with face of materials at each side.

3.3.8. Compound may be tooled, provided such tooling does not damage seal or tear compound. Avoid pulling of sealant from sides.

3.3.9. Tool surfaces as soon as possible after sealant application or before any skin formation has occurred, particularly when using silicone sealants.

3.3.10. Ensure joint surfaces are straight, neatly finished, free from ridges, wrinkles, sags, dirt, stains, air pockets and embedded foreign matter or other defacement and be uniform in colour, free from marbling and/or colour streaking due to improper mixing or use of out of shelf life Products.

3.3.11. Tooling of Non sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

3.3.11.1. Remove excess sealants from surfaces adjacent to joint.

3.3.11.2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3.3.11.3. Provide concave joint configuration per Figure 8A in ASTM C1193, unless otherwise indicated.

3.4. INSTALLATION OF PREFORMED EXPANDING FOAM SEALANTS

3.4.1. Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints.

3.4.2. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.5. SITE QUALITY CONTROL

3.5.1. Site Tests and Inspections:

3.5.1.1. Inspect joints for complete fill, for absence of voids and for joint configuration complying with specified requirements. Record results in a manner acceptable to Consultant.

3.5.1.2. Tests may include sampling of installed Product where adhesion, cohesion or reversion failure is suspected.

3.5.1.3. Where work or materials fail to meet requirements as indicated by test results, pay costs of additional inspection and testing required for new replacement work or materials.

3.5.2. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.5.3. Manufacturer Services:

3.5.3.1. Prior to commencement of sealing, arrange for sealant manufacturer's technical representative to visit the Place of the Work and inspect surfaces and joints to be sealed.

3.5.3.2. Confirm in writing by manufacturer’s representative to be on site throughout construction period work to inspect application of sealant and surface preparation.

3.5.3.3. Consult with manufacturer's technical representative about following items:

3.5.3.3.1. Weather conditions under which work will be done.

3.5.3.3.2. Anticipated frequency of joint movement.

3.5.3.3.3. Shape factor of the joint.

3.5.3.3.4. Durometer hardness, slump and curing characteristics of materials specified.

3.5.3.3.5. Joint characteristics as built.

3.5.3.3.6. Installation procedures to be adopted.

3.5.3.3.7. Mixing procedures to be adopted.

3.5.3.3.8. Conditions under which the work will be done, in order that any alternative recommendations may be made should adverse conditions exist.

3.6. CLEANING

3.6.1. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7. PROTECTION

3.7.1. Provide approved, non-staining means of protection for completed joint sealant installations where required to protect work from mechanical, thermal, chemical and other damage by construction operations and traffic.

3.7.2. Maintain protection securely in place until completion of Work. Remove protection when so directed by Consultant.

3.8. JOINT-SEALANT SCHEDULE

3.8.1. Schedule Designations for Elastomeric Sealants Based on ASTM C920:

CHARACTERISTIC	MARK	DESCRIPTION
Sealant Material:	S	Silicone
	U	Urethane
	H	Hybrid
Type:	S	Single component
	M	Multi-component
Grade:	P	Pourable
	NS	Non Sag
Class:	100/50	100% extension / 50% compression
	50	50% extension and compression
	25	25% extension and compression
Use:	NT	Non Traffic
	T	Traffic
Group:	1, 2, etc.	Applicable to sealant groups specified in Part 2

3.8.2. Sealant Designations for Non-Elastomeric Sealants:

CHARACTERISTIC	MARK	DESCRIPTION
Sealant Material:	E	Epoxy
	L	Latex
	B	Butyl (solvent release)

3.8.3. Interior Joint Applications

HORIZONTAL AND VERTICAL NON-TRAFFIC JOINTS	MATERIAL	TYPE	GRADE	CLASS	USE	GROUP
Control and expansion joints on exposed openings where indicated	U	S	NS	100/50	NT	U1
	U	S	NS	25	NT	U2
	U	M	NS	50	NT	U5
	U	M	NS	25	NT	U6
	S	S	NS	50	NT	S4
Perimeter joints of exterior openings where indicated	U	S	NS	100/50	NT	U1
	U	S	NS	25	NT	U2
	U	M	NS	50	NT	U5
	U	M	NS	25	NT	U6
Concealed at base, head, and other openings in gypsum walls where indicated in Division 09	L	S	NS	-	NT	AS
Vertical control joints on exposed surfaces of interior unit masonry walls and partitions	L	-	-	-	NT	LS
Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances	L	-	-	-	NT	LS
Joints between metal trim, frames, fixtures, and adjacent metal construction	B	-	-	-	NT	BR
Joints between wall and roof deck, floor and millwork	S	-	-	-	NT	LS
Joints between gyp wall and millwork at wet locations	S	S	NS	25	NT	S2

Joints between plumbing fixtures and adjoining walls, floors, and counters	S	S	NS	25	NT	S1
	S	S	NS	25	NT	S2
Joints not otherwise indicated	L	-	-	-	NT	LS

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide hollow metal doors and frames including but not limited to following:

1.2.1.1. Supply of interior hollow metal doors.

1.2.1.2. Supply of interior fire-rated hollow metal doors.

1.2.1.3. Supply of hollow metal door frames.

1.2.1.4. Preparation of hollow metal doors and frames for door hardware.

1.2.1.5. Glazing stops.

1.2.1.6. Preparation of hollow metal doors and frames for switchable glass and security system including CSA approved wiring, conduit and junction boxes for electronic hardware.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Building in hollow metal door frames in masonry walls: Section 04 20 00, Masonry Units.

1.2.2.2. Setting in place hollow metal door frames in masonry: Section 06 90 00, General Installations.

1.2.2.3. Hanging of doors and installation of door hardware: Section 06 90 00, General Installations.

1.2.2.4. Caulking and/or sealing door frames: Section 07 92 00, Joint Sealants.

1.2.2.5. Supply of door hardware: Section 08 71 00, Door Hardware.

1.2.2.6. Provision of glazing including switchable glass: Section 08 80 00, Glass and Glazing.

1.2.2.7. Installation of snap-in clips and frames in gypsum board partitions: Section 09 21 16, Non-Structural Metal Framing.

1.2.2.8. Finish painting doors and frames: Section 09 91 00, Painting.

1.2.2.9. Metal grilles supplied by Division 23, Heating, Ventilating and Air Conditioning installed by Section 06 90 00, General Installations.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CSDMA: Canadian Steel Door Manufacturers Association; www.csdma.org.

1.3.1.2. HMMA: Hollow Metal Manufacturers Association; www.naamm.org/hmma/.

1.3.1.3. NAAMM: National Association of Architectural Metal Manufacturers; www.naamm.org.

1.3.1.4. OBC: Ontario Building Code.

1.3.1.5. PVC: Polyvinyl-Chloride.

1.3.1.6. RRPC: Resin Reinforced Polychloroprene.

1.3.1.7. STC: Sound Transmission Class.

1.3.1.8. TL: Transmission Loss.

1.3.1.9. TRR: Temperature Rise Rated.

1.3.1.10. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Reference Standards:

1.3.2.1. ANSI/SDI A250.4-2021 - Test Procedure and Acceptance Criteria for – Physical Endurance for Steel Doors, Frames and Frame Anchors

1.3.2.2. ANSI/SDI A250.10-(2020) - Test Procedure and Acceptance Criteria for – Prime Painted Steel Surfaces for Steel Doors and Frames

1.3.2.3. ASTM A653/A653M-20 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

1.3.2.4. ASTM C177-19 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

1.3.2.5. ASTM C518-21 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

1.3.2.6. ASTM E90-09(2016) - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

1.3.2.7. ASTM E413-16 Classification for Rating Sound Insulation

1.3.2.8. CSA W59-18 - Welded Steel Construction (Metal Arc Welding)

1.3.2.9. NAAMM-HMMA 860-18 - Guide Specifications for Hollow Metal Doors and Frames

1.3.2.10. NFPA 80-2022 - Standard for Fire Doors and Other Opening Protectives

1.3.2.11. NFPA 252-2022 - Standard for Fire Tests of Door Assemblies

1.3.2.12. NFPA 257-2022 - Standard for Fire Tests of Window Assemblies and Glass Block Assemblies

1.3.2.13. CAN/ULC-S104-15 - Standard Method for Fire Tests of Door Assemblies

1.3.2.14. CAN/ULC-S105-16 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104

1.3.2.15. CAN4-S106-15 - Standard Method for Fire Test of Window and Glass Block Assemblies

1.3.2.16. CAN/ULC-S702-14 - Standard for Mineral Fibre Thermal Insulation for Buildings

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Cooperate fully with door hardware distributor's representative during preparation of shop drawings and execution of shop fabrication. Be responsible to provide adequate reinforcing, clearances, for door hardware specified and for accurate installation of door and door hardware on site.

1.4.2. Preinstallation Meetings:

1.4.2.1. Conduct a pre-installation meeting in accordance with requirements of Division 01 General Requirements supplemented herein.

1.4.2.2. The following minimum items shall be reviewed at the pre-installation meeting:

1.4.2.2.1. Verify project requirements.

1.4.2.2.2. Review installation conditions under which work is to be performed including possible site concerns.

1.4.2.2.3. Inspection of surfaces to receive the work.

1.4.2.2.4. Coordination requirements with other subtrades.

1.4.2.3. Key personnel shall attend the pre-installation meeting including but not limited to:

1.4.2.3.1. Steel door and frame installer subtrade personnel.

1.4.2.3.2. Related work subtrade personnel.

1.5. ACTION SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data Sheets:

1.5.2.1. Submit manufacturer's product data sheets for products to be used in the work of this section. Manufacturer's product data sheets shall include:

1.5.2.1.1. Material and product physical properties and characteristics including size.

1.5.2.1.2. Performance criteria.

1.5.2.1.3. Limitations of products.

1.5.3. Shop Drawings:

1.5.3.1. Indicate door location using numbering system per door and frame schedule.

1.5.3.2. Include size, and hand of each door, elevation of each door type; beveling of door edges, construction type core and edge construction not covered in product data.

1.5.3.3. Indicate dimensions and locations of cut-outs including requirements for grilles, louvers and glass openings.

1.5.3.4. Indicate fire ratings for fire rated doors and frames.

1.5.3.5. For each door and frame scheduled for electrical hardware, show following items in addition to minimum requirements (coordinate with Division 26):

1.5.3.5.1. Location and size of junction boxes and conduit for electrical hardware and wiring (electrical junction back boxes by this Section).

1.5.3.5.2. Conduit cutouts (conduit and connectors by Division 26).

1.5.3.5.3. Other information related to electrical hardware or interrelated systems such as fire alarm and security systems/controls.

1.5.3.6. Provide details of door hardware locations, anchorage and fastening methods.

1.5.4. Samples: If Requested, provide 1 cut-away corner sample minimum 300 mm (12") square for each type of door and frame to indicated following:

1.5.4.1. Doors:

1.5.4.1.1. Core.

1.5.4.1.2. Reinforcing.

1.5.4.1.3. Facing.

1.5.4.1.4. Framing.

1.5.4.1.5. Insulation if applicable.

1.5.4.1.6. Glazing if applicable.

1.5.4.1.7. Factory applied finishes if applicable.

1.5.4.2. Frames:

1.5.4.2.1. Frame profile.

1.5.4.2.2. Corner joints.

1.5.4.2.3. Floor and wall anchors.

1.5.4.2.4. Silencers.

1.5.5. Test and Evaluation Reports: Submit following test and evaluation reports in accordance with NAAMM-HMMA 860:

1.5.5.1. Hollow metal door and frame assemblies supplied under this Section meet acceptance criteria of ANSI/SDI A250.4, Level A.

1.5.5.2. Primer applied on hollow metal door and frame assemblies meet acceptance criteria of ANSI/SDI A250.10.

1.5.5.3. Insulated doors supplied in exterior openings meet specified thermal resistance rating.

1.5.5.4. Acoustic door and frame assemblies provide the STC and sound TL values specified with the critical frequency range, as determined and scheduled by the Consultant.

1.5.5.5. Ensure reports include name of testing authority, date of test, location of test facility, description of test specimen, procedures used in testing and indicate compliance with specified acceptance criteria.

1.5.5.6. Submit in addition to fire label, certificate to substantiate design and construction of fire-rated screen assemblies, if required by Consultant or Authorities Having Jurisdiction.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Manufacturers:

1.6.1.1.1. Provide doors and frames manufactured by a firm specializing in the design and production of hollow metal steel doors and frames.

1.6.1.1.2. Manufacturer of doors and frames shall be a member in good standing of the Canadian Steel Door Manufacturers Association (CSDMA) and/or Hollow Metal Manufacturers Association (HMMA) ensuring Product quality meets standards set by these associations.

1.6.2. Quality Standard:

1.6.2.1. Perform work of this section in accordance with requirements of Canadian Steel Door Manufacturer's Association (CSDMA) “Guide Specification for Installation and Storage of Hollow Metal Doors and Frames”.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Comply with CSDMA, Guide Specification For Installation and Storage of Hollow Metal Doors and Frames.

1.7.2. Delivery and Acceptance Requirements:

1.7.2.1. Identify Products with a label indicating: manufacturer’s name, Consultant’s opening number, Product description and dimensions.

1.7.2.2. Protect doors and frames during shipping.

1.7.2.3. Inspect materials thoroughly upon receipt and report discrepancies, deficiencies and damage immediately in writing to Consultant. Note damages on carrier’s Bill of Lading.

1.7.3. Storage and Handling:

1.7.3.1. Store and protect doors and frames during storage in accordance with NAAMM-HMMA 840. Coordinate this requirement with Section 06 90 00 for installing doors.

1.7.3.2. Remove wrappings or coverings from doors upon delivery at site. Store doors in vertical position, spaced by blocking at least 100 mm (4") off ground to permit air circulation between them.

1.8. WARRANTY

1.8.1. Manufacturer Warranty: Warrant work manufactured from ASTM A653/A653M, A40 galvannealed steel, touched up only with zinc-rich rust inhibitive primer where coating was removed during its manufacture for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; rust perforation when stored, installed and finish painted in accordance with manufacturer's written instructions.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Baron Steel Doors & Frames; www.baronmetal.com

2.1.1.2. Daybar Industries Limited; www.daybar.com

2.1.1.3. Fleming Door Products Ltd.; www.flemingdoor.com

2.1.1.4. Gensteel Doors, Inc.; www.gensteeldoors.com

2.1.1.5. Shanahan's Limited Partnership; www.shanahans.com

2.1.2. Provide doors and frames for work of this Section by a single source manufacturer.

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Ensure Product is manufactured by a firm experienced in design and production of standard and custom commercial metal door and frame assemblies, integration of builders' or electronic hardware and glazing assemblies and other items affecting work.

2.2.2. Cycle Test Acceptance Criteria: Ensure door and frame assembly is testing in accordance with ANSI/SDI A250.4 for "High Usage" and is certified as Level "A" (1,000,000 cycles).

2.2.3. Twist Test Acceptance Criteria: Maximum permanent deflection not to exceed 3 mm (1/8") under a maximum 136 kg (300 lb) load, total deflection not to exceed 32 mm (1-1/4") when tested in accordance with ANSI/SDI A250.4. Ensure tests are conducted by an independent nationally recognized accredited laboratory.

2.2.4. Test fire rated doors, frames, transom frames and sidelight assemblies in accordance with requirements of CAN/ULC-S104 and NFPA 252. Test borrowed lights and screens in accordance with CAN4-S106-M and NFPA 257. Ensure Products are listed by a nationally recognized testing agency acceptable to authorities having jurisdiction having factory inspection services.

2.2.5. Ensure core materials for exterior doors attain a thermal resistance of RSI = 1.53 (R = 8.7) when tested in accordance with ASTM C177 or ASTM C518.

2.2.6. Sound Control Steel Doors and Frames:

2.2.6.1. Provide acoustic assemblies as indicated on Drawings and noted on Door Schedule tested as a fully operable unit in accordance with requirements of ASTM E90 and ASTM E413.

2.2.6.2. Supply and install doors and frames to meet STC ratings as scheduled or Indicated.

2.2.6.3. Doors and frames with STC ratings shall accept standard door hardware.

2.2.6.4. Supply and install door cores, insulated frames, perimeter acoustic seals, and automatic door bottoms to meet STC ratings.

2.3. MATERIALS

2.3.1. Steel:

2.3.1.1. Fabricated from tensioned levelled steel to ASTM A924/A924M-18, galvanized to ASTM A653/A653M, Commercial Steel CS, Type B.

2.3.1.2. Steel shall be free of scale, pitting, coil breaks, surface blemishes, buckles, waves, and other defects.

2.3.1.3. Minimum sheet thickness; coated sheet steel complying with ASTM A653/A653M in accordance with Appendix 1: Steel Thicknesses and gauges of CSDMA “Recommended Specifications for Commercial Steel Door and Frame Products”.

2.3.1.4. Galvanneal coating finish, designation ZF120 (A40).

2.3.2. Door Core Materials:

2.3.2.1. Honeycomb:

2.3.2.1.1. Structural small cell, 25 mm maximum Kraft paper 'honeycomb', sanded to required thickness.

2.3.2.1.2. Minimum weight of 36.3 kg per ream.

2.3.2.1.3. Minimum density of 16.5 kg/m².

2.3.2.2. Insulation:

2.3.2.2.1. Minimum density of 24 kg/m² fibreglass insulation conforming to ASTM C665 or CAN/ULC S702.

2.3.2.3. Temperature Rise Rated (TRR):

2.3.2.3.1. Solid slab core of non-combustible, inorganic composite to limit temperature rise on the “unexposed” side of door to 250°C at 60 Minutes to CAN/ULC-S104, ASTM E2074 or NFPA 252.

2.3.2.4. Polyisocyanurate:

2.3.2.4.1. Closed cell, faced board with a thermal value of minimum RSI 2.17 (R12.3) conforming to ASTM C1289.

2.3.2.5. Steel stiffeners:

2.3.2.5.1. Continuous vertical formed steel sections, 0.813 mm minimum thickness, spaced not more than 150 mm apart, welded at 150 mm on center maximum to each face sheet.

2.3.2.5.2. Fill voids with minimum density of 24 kg/m3 fibreglass insulation conforming to with ASTM C665.

2.3.3. Door Frame Materials:

2.3.3.1. Fibreglass Insulation:

2.3.3.1.1. Fibreglass batt, minimum density 24 kg/m³ (1.5lbs/ft³) conforming to ASTM C665-17 or CAN/ULC S702.

2.3.4. Adhesives:

2.3.4.1. Heat resistant, single component, polyurethane reactive (water) hot melt, thermoset adhesive.

2.3.4.2. Rigid Insulation Cores:

2.3.4.2.1. Heat resistant, epoxy resin based, low viscosity, contact cement.

2.3.4.3. Lock Seam Doors:

2.3.4.3.1. Fire resistant, resin reinforced polychloroprene, high viscosity sealant-adhesive.

2.3.5. Primer:

2.3.5.1. Rust inhibitive for touch-up.

2.3.6. Door Silencers (Bumpers): Single stud rubber/neoprene type.

2.3.7. Exterior Top Caps: Rigid PVC extrusion conforming to CGSB 41-GP-19Ma.

2.3.8. Fasteners for Stops: Cadmium plated steel, counter sunk flat or oval head sheet metal Phillips screws.

2.3.9. Mortar Guard Boxes: Minimum 0.8 mm thick (22 ga) steel.

2.3.10. Frame Anchors:

2.3.10.1. Floor Anchors: Minimum 3 mm (1/8") thick adjustable floor anchors with 2 holes for bolting to floor.

2.3.10.2. Wall Anchors:

2.3.10.2.1. Masonry T-strap Type Wall Anchors: Minimum 1.2 mm thick (18 ga) steel

2.3.10.2.2. Existing Masonry/Concrete Wall Type Anchors: Minimum 0.912 mm thick (20 ga) steel.

2.3.10.2.3. Masonry Stirrup-strap Type 50 mm x 250 mm (2" x 10"): Minimum 1.519 mm thick (16 ga) steel.

2.3.10.2.4. Steel/Wood Stud Type: Minimum 0.912 mm thick (20 ga) steel.

2.3.10.2.5. Steel/Wood Stud Tension and Associated Wall Type: Minimum 0.912 mm thick (20 ga) steel.

2.3.11. Fire Rated Door and Frame Assemblies: Conform to CAN/ULC-S104, CAN/ULC-S105, NFPA 80 and NFPA 252.

2.4. FABRICATION

2.4.1. Permit access by an approved inspection and testing company for purpose of inspecting at random doors under fabrication.

2.4.2. Welding: Carry out welding in accordance with CSA W59.

2.4.3. Grind exposed welds smooth and flush. Fill open joints, seams and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arises and profiles and sand down to smooth, true, uniform finish.

2.4.4. Hardware Requirements: Blank, mortise, reinforce, drill and tap doors and frames to receive mortised templated hardware. Check hardware list for requirements.

2.4.5. Frames - General:

2.4.5.1. Fabricate frames for doors, screens and borrowed lights to profiles indicated.

2.4.5.2. Ensure exterior frames are welded type construction. Ensure interior frames are welded type construction.

2.4.5.3. Reinforce frame as required for surface mounted hardware. For door frames wider than 1500 mm (5'), reinforce door frame head and jamb and mullions at junction of head.

2.4.5.4. Protect mortise cut outs with mortar guard boxes. Omit for gypsum board applications.

2.4.5.5. Where frames occur in masonry provide strip strap, T-strap or wire type anchors. Where frames occur in gypsum board provide stud type anchors.

2.4.5.6. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb. Provide 2 anchors for rebate opening heights up to and including 1500 mm (5') and 1 additional anchor for each additional 760 mm (30") of height or fraction thereof, except as indicated below. For frames in previously placed concrete, masonry or structural steel provide anchors located not more than 150 mm (6") from top and bottom of each jamb and intermediate anchors at 660 mm (26") on centre maximum.

2.4.5.7. Where floor finishes allow, fabricate frames to extend 38 mm (1-1/2") below finished floor level. Where frames are to terminate at finished floor level, provide plates for anchorage to slabs.

2.4.5.8. Prepare each door opening for single stud door silencers: 3 for single door openings placed opposite hinges: 2 for double door openings approximately 150 mm (6") each side of centreline of head stop.

2.4.5.9. Provide 0.912 mm thick (20 ga) steel snap-in or welded-in “Z” type stud anchors for door frames installed in steel stud gypsum board partitions. Ensure snap-in clips are supplied to Section 09 21 16.

2.4.5.10. Factory apply touch-up primer to areas where zinc coating has been removed during fabrication.

2.4.5.11. Construct door frames of labelled fire doors as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by nationally recognized listing agency to individual manufacturers and tested in conformance with CAN/ULC-S104. Ensure ratings for frames match doors as minimum requirement. Locate label on frame jamb on hinge side, so it is concealed when door is closed.

2.4.6. Hollow Metal Door Frames:

2.4.6.1. Steel:

2.4.6.1.1. Interior: Minimum 1.519 mm thick (16 ga) steel.

2.4.6.1.2. Exterior: Minimum 1.9 mm thick (14 ga) steel.

2.4.6.2. Reinforcements:

2.4.6.2.1. Lock and Strike Reinforcements: Minimum 1.519 mm thick (16 ga) steel.

2.4.6.2.2. Hinge Reinforcements: Minimum 3.4 mm thick (10 ga) steel.

2.4.6.2.3. Flush Bolt Reinforcement: Minimum 1.519 mm thick (16 ga) steel.

2.4.6.2.4. Reinforcement for Surface Applied Hardware: Minimum 1.2 mm thick (18 ga) steel.

2.4.6.2.5. Concealed Door Closer or Holder Reinforcements: Minimum 2.6 mm thick (12 ga) steel.

2.4.6.2.6. Top and Bottom End Channels: Minimum 1.2 mm thick (18 ga) steel.

2.4.6.3. Jamb Shipping Bars: Minimum 0.912 mm thick (20 ga) steel.

2.4.7. Sidelight and Window Frame Assemblies:

2.4.7.1. Steel: Minimum 1.519 mm thick (16 ga) steel.

2.4.7.2. Glazing Stops: Minimum 0.912 mm thick (20 ga) steel, formed, drilled and countersunk for fastenings.

2.4.8. Welded Type Frames:

2.4.8.1. Mitre corners of frames. Cut frame mitres accurately and weld continuously on returns and inside of frame faces.

2.4.8.2. When required due to site access or due to shipping limitations, fabricate frame Product for large openings in sections, with splice joints for field assembly. Provide alignment plates or angles at each joint, fabricated of same metal thickness as frame. Indicate joints for field assembly on Shop Drawings.

2.4.8.3. Accurately cope and securely weld butt joints of mullions, transom bars, centre rails and sills. Grind welded joints to a smooth, uniform finish.

2.4.8.4. Securely attach floor anchors to inside of each jamb profile.

2.4.8.5. Weld in 2 temporary jamb shipping bars at each frame to maintain alignment during shipment.

2.4.8.6. Use formed channel glazing stops, minimum 16 mm (5/8") in height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

2.4.9. Doors - General:

2.4.9.1. Fabricate doors to be swing type flush with 1 continuous face free from joints, tool markings and abrasions and with provisions for glass and/or louvre openings as indicated on Door Schedule and Drawings.

2.4.9.2. Coordinate louvre openings with Division 23.

2.4.9.3. Fabricate exterior doors using insulated steel stiffened construction. Fabricate interior doors using honeycomb construction.

2.4.9.4. For honeycomb doors, ensure longitudinal edges have mechanically interlocked, adhesive assisted seams (tack welded at 150 mm (6") oc), filled and sanded flush.

2.4.9.5. For heavy duty and exterior hollow metal doors, ensure longitudinal edges have continuously welded seams, filled and sanded flush full height of door.

2.4.9.6. Fabricate doors with top and bottom inverted recessed spot welded channels.

2.4.9.7. Reinforce, blank, drill and tap doors for mortised, templated hardware.

2.4.9.8. Reinforce doors for surface mounted hardware.

2.4.9.9. Undercut 19 mm (3/4") for air intake at washrooms.

2.4.9.10. Factory prepare holes 13 mm (1/2") diameter and larger. Factory prepare holes less than 13 mm (1/2") when required for function of device for knob, lever, cylinder, turn pieces or when these holes overlap function holes.

2.4.9.11. Fabricate fire rated door assemblies as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by nationally recognized listing agency to individual manufacturer and tested in conformance with CAN/ULC-S104. Provide labels for fire rated doors.

2.4.9.12. Fabricate fire rated doors where indicated in Door [and Frame] Schedule or Drawings, to meet required maximum temperature rise on unexposed side of door in accordance with Nova Scotia Building Code and ULC requirements.

2.4.9.13. Construct stile and rail doors in same manner as flush doors.

2.4.9.14. Construct panels to match doors.

2.4.9.15. Reinforce panels to prevent oil canning. Install panels with concealed fasteners and reinforce to accommodate hardware as required. Provide door top and rebated matching panel where no transom mullion occurs.

2.4.10. Interior Moderate Duty Hollow Metal Doors:

2.4.10.1. Face Sheets: 1.2 mm thick (18 ga) minimum galvannealed steel sheet.

2.4.10.2. Vertical Stiffeners: 0.912 mm thick (20 ga) minimum unprimed steel sheet.

2.4.10.3. Glazing Stops: 0.912 mm thick (20 ga) minimum unprimed steel sheet, formed, drilled and countersunk for fastenings.

2.4.11. Interior Heavy Duty Hollow Metal Doors and Transom Panels:

2.4.11.1. Face Sheets: 1.519 mm thick (16 ga) minimum galvannealed steel sheet.

2.4.11.2. Vertical Stiffeners: 0.912 mm thick (20 ga) minimum unprimed steel sheet.

2.4.11.3. Glazing Stops: 1.519 mm thick (16 ga) minimum unprimed steel sheet, formed, drilled and countersunk for fastenings.

2.4.12. Interior Moderate Duty Fire Rated Hollow Metal Doors:

2.4.12.1. Face Sheets: 1.2 mm thick (18 ga) minimum galvannealed steel sheet.

2.4.12.2. Vertical Stiffeners: 0.912 mm thick (20 ga) minimum unprimed steel sheet.

2.4.13. Interior Heavy Duty Fire Rated Hollow Metal Doors:

2.4.13.1. Face Sheets: 1.519 mm thick (16 ga) minimum galvannealed steel sheet.

2.4.13.2. Vertical Stiffeners: 0.912 mm thick (20 ga) minimum unprimed steel sheet.

2.4.14. Doors (Steel Stiffened Construction):

2.4.14.1. Fabricate door faces with a single sheet of galvannealed steel welded to steel stiffeners.

2.4.14.2. Reinforce steel stiffened doors with 0.912 mm thick (20 ga) continuous interlocking vertical steel stiffeners spaced 150 mm (6") oc maximum, spot welded at 150 mm (6”) oc maximum to face sheets. Fill voids with mineral wool insulation specified herein.

2.4.15. Doors (Honeycomb Core Construction):

2.4.15.1. Fabricate each face sheet for exterior door using a sheet steel laminated under pressure to polyurethane core. Ensure core completely fills inside hollow of door.

2.4.15.2. Fabricate each face sheet for interior door using a sheet steel laminated under pressure to honeycomb core.

2.4.15.3. Reinforce, stiffen and sound deaden doors with core laminated to inside faces of panels. Ensure core completely fills inside hollow of door.

2.4.16. Fabrication Tolerances:

2.4.16.1. Frames:

2.4.16.1.1. Width and Height: +1.6 mm (+1/16”), -0.8 mm (-1/32”).

2.4.16.1.2. Face, Stop and Rabbet: +/-0.8 mm (+/-1/32”).

2.4.16.1.3. Jamb Depth: +/-1.6 mm (+/-1/16”).

2.4.16.2. Doors:

2.4.16.2.1.1. Width and Height: +/-1.2 mm (+/-3/64”).

2.4.16.2.1.2. Thickness: +/-1.6 mm (+/-1/16”).

2.4.16.2.1.3. Edge Flatness: 1.6 mm (1/16”) maximum.

2.4.16.2.1.4. Surface Flatness: 3 mm (1/8”) maximum.

2.4.16.2.1.5. Door Twist: +/-1.6 mm (+/-1/16”).

2.4.16.3. Hardware:

2.4.16.3.1.1. Cutouts: Template dimension +0.38 mm (+0.015”), -0 mm (-0”).

2.4.16.3.1.2. Location: +/-0.8 mm (+/-1/32”).

2.4.16.3.1.3. Between Hinge Centrelines: +/-0.4 mm (+/-1/64”).

2.4.17. Prime Painting: Apply factory touch up primer at areas where zinc coating has been damaged during fabrication.

PART 3 - EXECUTION

3.1. INSTALLATION

3.1.1. Supply hollow metal doors and frames to Section 06 90 00 for installation.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide hollow metal doors and frames including but not limited to following:

1.2.1.1. Plastic laminate wood doors and transoms.

1.2.1.2. Fire rated plastic laminate wood doors.

1.2.1.3. Door louvres.

1.2.1.4. Glass stops.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Setting aluminum and steel door frames in masonry: Section 04 22 00 Concrete Unit Masonry.

1.2.2.2. Setting aluminum and steel door frames in place: Section 06 90 00, General Installations.

1.2.2.3. Installation of plastic laminate wood doors and door hardware: Section 06 90 00, General Installations.

1.2.2.4. Supply steel door frames: Section 08 11 13, Steel Doors and Frames.

1.2.2.5. Supply of door hardware: Section 08 71 00 Door Hardware.

1.2.2.6. Supply of glass: Section 08 80 00 Glass and Glazing.

1.2.2.7. Setting steel and aluminum door frames in gypsum board partitions: Section 09 29 16 Non Structural Metal Framing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. AWMAC/WI: Architectural Woodwork Manufacturers Association of Canada/Woodwork Institute; www.awmac.com.

1.3.1.2. ITS: (Warnock Hersey) - Certification Listings for Fire Doors.

1.3.1.3. NAAWS: North American Architectural Woodwork Standards – 3.1, 2017, as amended.

1.3.2. Reference Standards:

1.3.2.1. ANSI/NEMA LD 3-05 - High-Pressure Decorative Laminates

1.3.2.2. ANSI/WDMA I.S. 1A-2021 - Industry Standard for Interior Architectural Flush Wood Doors

1.3.2.3. ASTM E90-09(16) - Standard Test Method for Laboratory Measurement of Sound Transmission Loss of Building Partitions

1.3.2.4. ASTM E413-2022 - Classification for Rating Sound Insulation

1.3.2.5. NFPA 80-2022 - Standard for Fire Doors and Other Opening Protectives

1.3.2.6. NFPA 252-2022 - Standard Methods of Fire Tests of Door Assemblies

1.3.2.7. CAN/ULC-S104-15 - Standard Method for Fire Tests of Door Assemblies

1.3.2.8. CAN/ULC-S105-16 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104

1.3.2.9. UL 10B Ed.10-2018 – Standard for Fire Tests for Door Assemblies

1.4. ACTION SUBMITTALS

1.4.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.4.2. Shop Drawings:

1.4.2.1. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1.4.2.2. Dimensions and locations of blocking.

1.4.2.3. Indicate dimensions and locations of mortises and holes for hardware.

1.4.2.4. Indicate dimensions and locations of cutouts.

1.4.2.5. Indicate fire ratings for fire doors.

1.4.3. Samples for Verification:

1.4.3.1. Plastic laminate, 150 mm (6 inches) square, for each color, texture, and pattern selected.

1.4.3.2. Corner sections of doors, approximately 200 mm x 250 mm (8 by 10 inches), with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

1.4.3.3. Frames for light openings, 150 mm (6 inches) long, for each material, type, and finish required.

1.5. QUALITY ASSURANCE

1.5.1. Requirements of this Section govern and modify NAAWS.

1.5.2. Qualifications:

1.5.2.1. Provide work of this Section in accordance with Section 9 of NAAWS produced by AWMAC/WI, except as specified otherwise herein and by reference are hereby made a part of this Section. Ensure any reference to grades and terminology in this Section is as defined in NAAWS.

1.5.2.2. Installers:

1.5.2.2.1. Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and be a member of AWMAC/WI.

1.5.3. Source Limitations:

1.5.3.1. Obtain flush wood doors through one source from a single manufacturer.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Delivery and Acceptance Requirements:

1.6.1.1. Comply with requirements of referenced standard and manufacturer's written instructions.

1.6.1.2. Package doors individually in plastic bags or cardboard cartons.

1.6.1.3. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6.1.4. Do not deliver finished Products during rainy or damp weather.

1.6.1.5. Do not deliver work of this Section until the building and storage areas are sufficiently dry so Products will not be damaged by excessive changes in moisture content.

1.6.1.6. Deliver Products of this Section in accordance with Section 2, Rule 2.4.4.1 of NAAWS.

1.6.1.7. Do not deliver and install damaged Products. Replace in accordance with the requirements of this Section.

1.6.2. Storage and Handling Requirements:

1.6.2.1. Store and handle Products of this Section in accordance with Section 2, Rule 2.4.4.2 of NAAWS.

1.6.2.2. Remove from the Place of the Work, doors having scratches or other blemishes which cannot be removed by sanding and replace with new unblemished doors.

1.7. PROJECT CONDITIONS

1.7.1. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg. F. and relative humidity between 25 and 55 percent during the remainder of the construction period.

1.8. WARRANTY

1.8.1. Warranty: Warrant work of this Section against defects and deficiencies for life of installation. Promptly correct defects and deficiencies which become apparent during warranty period, to satisfaction of Consultant and at no expense to Owner.

1.8.2. Defects include, but are not limited to, bubbling, delamination of faces, or edges, warp, twist bow exceeding 6 mm (1/4") and telegraphing of core. "Correct" referred to herein includes labour and materials for removal, repair, refinishing and replacement of Products provided as part of work of this Section, installing hardware, finishing, hanging and fitting

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Baillargeon; www.baillargeondoors.com

2.1.1.2. Lambton Doors; www.lambtondoors.com

2.1.1.3. Marshfield-Algoma™ by Masonite Architectural; www.marshfielddoors.com

2.1.1.4. Poncraft Door Company; www.poncraft.com

2.1.1.5. RK Doors Inc.; www.rkdoors.ca

2.1.1.6. VT Industries, Inc.; www.vtindustries.com

2.1.2. Basis-of-Design Product: The design for plastic laminate doors is based on Poncraft Door, PC-HPDL-5 door. Comparable products from Manufacturers listed above will be accepted provided they satisfy the performance criteria and are acceptable to the Consultant.

2.2. MATERIALS

2.2.1. Regulatory Requirements:

2.2.1.1. Submit certification that fire-rated door and panel construction has been tested in conformance to CAN/ULC-S104, CAN/ULC-S105 or UL 10B, NFPA 80 and NFPA 252 as indicated on Drawings and Schedule.

2.2.1.2. Ensure plastic laminate wood doors requiring fire-rating carry either UL or ITS (Warnock Hersey) label.

2.2.1.3. Submit certification that acoustic rated door construction meets ASTM E90 and ASTM E413 classification as indicated on Drawings or Schedule.

2.2.1.4. Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

2.2.1.4.1. Test Pressure: After 5 minutes into the test, the neutral pressure level in furnace shall be established at 1016 mm (40 inches) or less above the sill

2.2.2. Plastic Laminate Wood Doors:

2.2.2.1. Core: 448 kg/m3 (28 pcf) density solid particle core, mat-formed.

2.2.2.2. Stiles: Minimum 30 mm (1-3/16") wide laminated low density wood with minimum 22 mm (7/8") Maple or Birch edge strips, before trim.

2.2.2.3. Rails: Minimum 30 mm (1-3/16") wide softwood.

2.2.2.4. Plastic Laminate Adhesive: Provide in accordance with Section 4, Rule 4.4.4.6.4 and “adhesive usage guidelines” in “Appendix” of NAAWS.

2.2.2.5. Crossbands: Minimum 1.6 mm (1/16") thick composite complete with veneer.

2.2.2.6. High Pressure, Paper Base, Decorative Laminates (HPDL): Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.2.2.6.1. Arborite; www.arborite.com

2.2.2.6.2. Formica Inc.; www.formica.com

2.2.2.6.3. Nevamar Company, LLC; www.nevamar.com

2.2.2.6.4. Wilsonart Canada; www.wilsonart.com

2.2.2.6.5. Provide types and thicknesses conforming to ANSI/NEMA LD 3 and Section 4, “Table: 4-046 – HPDL TYPES and MINIMUM PERFORMANCE REQUIREMENTS” of NAAWS.

2.2.2.6.6. Colours and Finishes: Provide full colour range including solid, woodgrain and printed pattern, suede or matte finish, later selected by Consultant.

2.2.2.7. Vision Framing: Solid Birch stops.

2.2.3. Fire-Rated Plastic Laminate Wood Doors (20 Minute):

2.2.3.1. Core: 448 kg/m3 (28 pcf) density solid particle core, mat-formed.

2.2.3.2. Stiles: Minimum 30 mm (1-3/16") wide laminated low density wood with minimum 22 mm (7/8") Maple or Birch edge strip facing, before trim.

2.2.3.3. Rails: Minimum 30 mm (1-3/16") wide softwood.

2.2.3.4. Plastic Laminate Adhesive: Provide in accordance with Section 4, Rule 4.4.4.6.4 and “adhesive usage guidelines” in “Appendix” of NAAWS.

2.2.3.5. Crossbands: Minimum 1.6 mm (1/16") thick composite complete with veneer.

2.2.3.6. High Pressure, Paper Base, Decorative Laminates (HPDL): Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.2.3.6.1. Arborite; www.arborite.com

2.2.3.6.2. Formica Inc.; www.formica.com

2.2.3.6.3. Nevamar Company, LLC; www.nevamar.com

2.2.3.6.4. Wilsonart Canada; www.wilsonart.com

2.2.3.6.5. Provide types and thicknesses conforming to ANSI/NEMA LD 3 and Section 4, “Table: 4-046 – HPDL Types and Minimum Performance Requirements” of NAAWS.

2.2.3.6.6. Colours and Finishes: Provide full colour range including solid, woodgrain and printed pattern, suede or matte finish, later selected by Consultant.

2.2.3.7. Vision Frames for Fire Doors: Solid wood with intumescent incorporated, veneer wrapped steel, of same species as facing or rolled painted steel with mitre corners; prepared for countersink style tamperproof screws.

2.2.4. Fire-Rated Plastic Laminate Wood Doors (45, 60 & 90 Minute):

2.2.4.1. Core: Mineral or agrifibre core.

2.2.4.2. Stiles: Approved fire retardant reinforcement minimum 19 mm (3/4"). On doors over 900 mm (36") wide, provide additional 25 mm (1") of approved fire retardant reinforcement to hinge stile of door.

2.2.4.3. Top Rail: Approved fire retardant reinforcement minimum 35 mm (1-3/8") after trim.

2.2.4.4. Bottom Rail: Approved fire retardant reinforcement minimum 35 mm (1-3/8") after trim.

2.2.4.5. Interior Blocking: Approved fire retardant reinforcement minimum 127 mm (5") high at top and bottom rails and at mid height of door.

2.2.4.6. Crossbands: As required to conform to door manufacturer’s labelling authority.

2.2.4.7. High Pressure, Paper Base, Decorative Laminates (HPDL): Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.2.4.7.1. Arborite; www.arborite.com

2.2.4.7.2. Formica Inc.; www.formica.com

2.2.4.7.3. Nevamar Company, LLC; www.nevamar.com

2.2.4.7.4. Wilsonart Canada; www.wilsonart.com

2.2.4.7.5. Provide types and thicknesses conforming to ANSI/NEMA LD 3 and Section 4, “Table: 4-046 – HPDL Types and Minimum Performance Requirements” of NAAWS.

2.2.4.7.6. Colours and Finishes: Provide full colour range including solid, woodgrain and printed pattern, suede or matte finish, later selected by Consultant.

2.2.4.8. Vision Frames for Fire Doors: Solid wood with intumescent incorporated, veneer wrapped steel, of same species as facing or rolled painted steel with mitre corners; prepared for countersink style tamperproof screws.

2.2.5. Glazing: Provided as part of the work of Section 08 80 00.

2.2.6. Hardware: Coordinate location of interior blocking with work of Section 08 71 00. Hardware is supplied by Section 08 71 00 for installation as part of the work of Section 06 90 00.

2.2.7. Astragal for Fire-Rated Pairs of Doors: Steel T shaped astragal, overlapping and recessed at face edge specifically for pairs of doors.

2.2.8. Door Louvres: Hart & Cooley Model #20WF steel louvres as manufactured by Airvector Inc. - standard aluminum finish.

2.2.9. Fabrication:

2.2.9.1. Fabricate doors in accordance with Section 9 of NAAWS except as specified herein.

2.2.9.2. Fabricate plastic laminate wood doors 45 mm (1-3/4") thick, unless otherwise indicated.

2.2.9.3. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions.

2.2.9.4. Factory cut glass light and louvre openings. Ensure openings are square with internal corners slightly rounded. Ensure portion between cutout and door edge is not less than 127 mm (5") wide at any point. Ensure cut out area is not greater than 40% of area of door face. Ensure cut out does not exceed half height of door.

2.2.9.5. Provide hardwood glass stops, finished to match face veneer, for vision panels in unrated doors.

2.2.9.6. Provide metal glass stops for vision panels in fire-rated labelled doors. Ensure glass size conforms to OBC requirements.

2.2.9.7. Fabricate plastic laminate wood doors with necessary interior blocking to suit hardware installation.

2.2.9.8. Fabricate following bevels at 1.6 mm (1/16") in 50 mm (2"):

2.2.9.8.1. Single Doors: Bevel both stiles.

2.2.9.8.2. Pairs of Doors: Bevel hanging styles and bevel and rabbet meeting styles.

2.2.9.9. Fabricate plastic laminate wood doors with following edge clearances:

2.2.9.9.1. 3 mm (1/8") clearance at top and sides.

2.2.9.9.2. 6 mm (1/4") clearance at bottom to top of carpets and thresholds unless doors are indicated in the Door Schedule to be undercut.

2.3. SOURCE QUALITY CONTROL

2.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

PART 3 - EXECUTION

3.1. INSTALLATION

3.1.1. Installation of plastic laminate wood doors and door hardware forms part of the work of Section 06 90 00.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide access doors and frames including but not limited to following:

1.2.1.1. Access doors and frames.

1.2.1.2. Fire-rated access doors and frames.

1.2.1.3. Fire-rated floor doors.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Building in access door frames in masonry walls: Section 04 22 00 Concrete Unit Masonry.

1.2.2.2. Caulking and/or sealing door frames: Section 07 92 00 Joint Sealants.

1.2.2.3. Installation of snap-in clips and frames in gypsum board partitions: Section 09 29 00 Gypsum Board.

1.2.2.4. Finish painting doors and frames: Section 09 91 00 Painting.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. SSPC: The Society for Protective Coatings (formerly known as Steel Structures Painting Council); www.sspc.org.

1.3.1.2. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Reference Standards:

1.3.2.1. ANSI/UL 10B-08 Fire Tests of Door Assemblies

1.3.2.2. ANSI/UL 263-11 - Standard for Safety for Fire Tests of Building Construction and Materials

1.3.2.3. ASTM A36/A36M-14 - Standard Specification for Carbon Structural Steel

1.3.2.4. ASTM A123/A123M-18 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

1.3.2.5. ASTM A153/A153M-16a - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

1.3.2.6. ASTM A653/A653M-20 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

1.3.2.7. ASTM A879/A879M-12(2017) - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

1.3.2.8. ASTM A1008/A1008M-18 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength, Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

1.3.2.9. ASTM A1011/A1011M-18a - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

1.3.2.10. ASTM E119-18ce1 - Standard Test Methods for Fire Tests of Building Construction and Materials

1.3.2.11. NFPA 80-2022 - Standard for Fire Doors and Other Opening Protectives

1.3.2.12. NFPA 252-2022 - Standard for Fire Tests of Door Assemblies

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment and indicate on schedule specified in "Submittals" Article.

1.4.2. Preinstallation Meetings:

1.4.2.1. Conduct a pre-installation meeting in accordance with requirements of Division 01 General Requirements supplemented herein.

1.4.2.2. The following minimum items shall be reviewed at the pre-installation meeting:

1.4.2.2.1. Verify project requirements.

1.4.2.2.2. Review installation conditions under which work is to be performed including possible site concerns.

1.4.2.2.3. Inspection of surfaces to receive the work.

1.4.2.2.4. Coordination requirements with other subtrades.

1.5. ACTION SUBMITTALS

1.5.1. Submit submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data Sheets:

1.5.2.1. Submit manufacturer’s product data sheets for products to be used in the work of this section.

1.5.3. Shop Drawings:

1.5.3.1. Submit Shop Drawings for work of this Section. In addition to the minimum requirements indicate following:

1.5.3.1.1. Face or ceiling placement.

1.5.3.1.2. Tolerances and clearances.

1.5.3.1.3. Method of attaching door frames to surrounding construction.

1.5.3.1.4. Finishes.

1.5.3.1.5. Hardware.

1.5.4. Schedule: Provide complete door and frame schedule, including types, general locations, sizes, construction details, latching or locking provisions, and other data pertinent to installation.

1.5.5. Certificates:

1.5.5.1. Submit in addition to fire label, certificate to substantiate design and construction of fire-rated access doors and frames, if required by authorities having jurisdiction.

1.5.6. Test and Evaluation Reports:

1.5.6.1. Submit following test and evaluation reports:

1.5.6.1.1. Ensure reports include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Acudor Products, Inc.; www.acudor.com

2.1.1.2. Bar-Co, Inc. by Alfab, Inc.; www.alfabinc.com

2.1.1.3. Cendrex Inc.; www.cendrex.com

2.1.1.4. Cesco Products; www.cescoproducts.com

2.1.1.5. Elmdor/Stoneman Manufacturing Company; www.elmdorstoneman.com

2.1.1.6. Jensen Industries; www.jensen-ind.com

2.1.1.7. Karp Associates, Inc.; www.karpinc.com

2.1.1.8. Larsen's Manufacturing Company; www.larsensmfg.com

2.1.1.9. Nystrom Building Products Co.; www.nystrom.com

2.1.1.10. Williams Brothers Corporation of America; www.wbdoors.com

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Fire-Rated Access Doors and Frames: Ensure units comply with NFPA 80 and are labeled and listed by ULC, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction per test method indicated:

2.3. MATERIALS

2.3.1. Steel Plates, Shapes and Bars: ASTM A36/A36M.

2.3.2. Hot-Dip Galvanized Steel: Coat to comply with ASTM A123/A123M for steel and iron products and ASTM A153/A153M for steel and iron hardware.

2.3.3. Steel Sheet:

2.3.3.1. Hot-Rolled: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, and surface defects; pickled and oiled.

2.3.3.2. Cold-Rolled: ASTM A1008/A1008M, Commercial Steel (CS); stretcher-leveled standard of flatness.

2.3.3.3. Electrolytic Zinc Coated: ASTM A879/A879M, Commercial Steel (CS), with Class C coating and phosphate treatment to prepare surface for painting.

2.3.3.4. Metallic Coated: ASTM A653/A653M, Commercial Steel (CS), Type B, with A60 zinc-iron-alloy (galvannealed) coating or G60 mill-phosphatized zinc coating; stretcher-leveled standard of flatness.

2.3.4. Drywall Beads: Edge trim formed from 0.759 mm (22 ga) zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum panels indicated.

2.3.5. Plaster Beads: Casing bead formed from 0.759 mm (22 ga) zinc-coated steel sheet with flange formed out of expanded metal lath and in size to suit thickness of plaster.

2.4. MANUFACTURED UNITS

2.4.1. Flush, Insulated, Fire-Rated Access Doors and Frames with Exposed Trim:

2.4.1.1. Material: Prime-painted steel sheet.

2.4.1.2. Fire-Resistance Rating: to be specified by Professional of Record to suit application.

2.4.1.3. Temperature-Rise Rating: 250 deg F at the end of 30 minutes.

2.4.1.4. Door: Flush panel with core of mineral-fiber insulation enclosed in sheet metal; minimum thickness of 0.912 mm (20 ga).

2.4.1.5. Frame: Minimum 1.519 mm (16 ga) thick sheet metal with 25 mm (1”) wide, surface-mounted trim.

2.4.1.6. Hinges: Continuous piano hinge.

2.4.1.7. Automatic Closer: Spring type.

2.4.1.8. Latch: Self-latching bolt operated by flush screwdriver with interior release.

2.4.2. Flush, Insulated, Fire-Rated Access Doors and Trimless Frames:

2.4.2.1. Material: Prime-painted steel sheet.

2.4.2.2. Surface Type: Gypsum board.

2.4.2.3. Locations: Walls and ceilings.

2.4.2.4. Fire-Resistance Rating: As required. To be specified by Professional of Record to suit application.

2.4.2.5. Temperature-Rise Rating: 250 deg F at the end of 30 minutes.

2.4.2.6. Door: Flush panel with core of mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.912 mm (20 ga).

2.4.2.7. Frame: Minimum 1.519 mm (16 ga) thick sheet metal with drywall bead.

2.4.2.8. Hinges: Continuous piano hinge.

2.4.2.9. Automatic Closer: Spring type.

2.4.2.10. Latch: Self-latching bolt operated by knurled knob with interior release.

2.4.3. Flush, Uninsulated, Fire-Rated Access Doors and Frames with Exposed Trim:

2.4.3.1. Material: Prime-painted steel sheet.

2.4.3.2. Locations: Masonry wall surfaces.

2.4.3.3. Fire-Resistance Rating: As required. To be specified by Professional of Record to suit application.

2.4.3.4. Door: Minimum 0.912 mm (20 ga) thick sheet metal, flush construction.

2.4.3.5. Frame: Minimum 1.519 mm (16 ga) thick sheet metal with 32 mm (1-1/4”) wide, surface-mounted trim.

2.4.3.6. Hinges: Continuous piano hinge.

2.4.3.7. Automatic Closer: Spring type.

2.4.3.8. Latch: Self-latching bolt operated by knurled knob.

2.4.4. Flush Access Doors and Frames with Exposed Trim:

2.4.4.1. Material: Prime-painted steel sheet.

2.4.4.2. Surface Type: Masonry.

2.4.4.3. Locations: Walls and ceilings.

2.4.4.4. Door: Minimum 0.912 mm (20 ga) thick sheet metal, set flush with exposed face flange of frame.

2.4.4.5. Frame: Minimum 1.519 mm (16 ga) thick sheet metal with 32 mm (1-1/4") wide, surface-mounted trim.

2.4.4.6. Hinges: Spring-loaded concealed pin type.

2.4.4.7. Latch: Screwdriver- operated cam latch.

2.4.5. Flush Access Doors and Trimless Frames:

2.4.5.1. Material: Prime-painted steel sheet.

2.4.5.2. Surface Type: Gypsum board.

2.4.5.3. Locations: Walls and ceilings.

2.4.5.4. Door: Minimum 1.519 mm (16 ga) thick sheet metal, set flush with surrounding finish surfaces.

2.4.5.5. Frame: Minimum 1.519 mm (16 ga) thick sheet metal with bead for type of surface indicated.

2.4.5.6. Hinges: Spring-loaded concealed pin type.

2.4.5.7. Latch: Screwdriver- operated cam latch.

2.4.6. Recessed Access Doors and Trimless Frames:

2.4.6.1. Material: Prime-painted steel sheet.

2.4.6.2. Surface Type: Gypsum board.

2.4.6.3. Locations: Walls and ceilings.

2.4.6.4. Door: Minimum 1.519 mm (16 ga) thick sheet metal in the form of a pan recessed 16 mm (5/8") for infill of finish matching surface type indicated.

2.4.6.5. Reinforce panel as required to prevent buckling.

2.4.6.6. Frame: Minimum 1.519 mm (16 ga) thick sheet metal with bead or edge for surface type indicated.

2.4.6.7. Hinges: Spring-loaded concealed pin type.

2.4.6.8. Latch: Screwdriver-operated cam latch with plastic grommet for access through pan recess.

2.4.7. Fire-Rated Floor Door: Provide 914 mm x 1220 mm (36" x 48") sized 2 hour fire-rated aluminum type floor door with continuous heavy-duty type 316 stainless steel hinge; acceptable Products: "BA-FRFD Floor Door" by Best Access Doors; www.bestaccessdoors.com or "Type FR" by Bilco Canada; www.bilco.com.

2.5. FABRICATION

2.5.1. Shop Assembly: Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed as follows:

2.5.1.1. For cylinder lock, furnish 2 keys per lock and key locks alike.

2.5.1.2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

2.6. FINISHES

2.6.1.1. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in SSPC-Paint 25; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated and capability to provide sound foundation for field-applied topcoats despite prolonged exposure.

2.6.1.2. Shop Primer for Metallic-Coated Steel: Organic zinc-rich primer complying with SSPC-Paint 20 and compatible with topcoat.

2.6.1.3. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.1.2. Size and Location Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment and indicate on schedule.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Advise installers of other work about specific requirements relating to access door and floor door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts and anchoring devices.

3.2.2. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

3.2.3. Install access doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. ADJUSTING

3.4.1. Adjust doors and hardware after installation for proper operation.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide ICU entrances including but not limited to following:

1.2.1.1. Manually operated ICU sliding entrance doors assemblies.

1.2.1.2. Break away emergency egress.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of glazing types: Section 08 06 80, Glazing Schedule.

1.2.2.2. Hardware supplied by Section 08 71 00, Door Hardware installed by Section 06 90 00, General Installations.

1.2.2.3. Glazing requirements: Section 08 80 00, Glass and Glazing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. IAQ: Indoor Air Quality.

1.3.1.2. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Reference Standards:

1.3.2.1. AAMA 611-2014 - Voluntary Specification for Anodized Architectural Aluminum.

1.3.2.2. ANSI A117.1-2017 - Accessible and Usable Buildings and Facilities.

1.3.2.3. ANSI Z97.1-2015(R2020) - Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test

1.3.2.4. ANSI/UL 325-2020 - Door, Drapery, Gate, Louver, and Window Operators and Systems

1.3.2.5. ANSI/UL 1784 -Edition 4, 2015 – Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives.

1.3.2.6. ASTM B209M-14 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)

1.3.2.7. ASTM B221M-21 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

1.4. SUBMITTALS

1.4.1. Submittals in accordance with Section 01 33 00 Submittal Procedures

1.4.2. Product Data:

1.4.2.1. Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.

1.4.3. Shop Drawings:

1.4.3.1. Submit Shop Drawings for work of this Section. In addition to minimum requirements, indicate layout, profiles, Product components including anchorage, accessories, finish and glazing details.

1.4.3.2. Verify actual dimensions of openings to receive ICU/CCU entrances by field measurements and indicate on shop drawings.

1.5. CLOSEOUT SUBMITTALS

1.5.1. Operational and Maintenance Data: Submit maintenance instructions in accordance with Section 01 70 00.

1.5.2. Manual to include name, address, and contact information of manufacturers providing the entrance and their nearest service representatives.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.6.2. Source Limitations: Obtain each type of door, frame, operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Delivery and Acceptance Requirements: Deliver materials in sealed cartons and containers with manufacturer's name and Product description clearly marked thereon.

1.8. WARRANTY

1.8.1. Manufacturer Warranty: Warrant work of this Section for period of 2 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; leakage in excess of the specified tolerances and limits, glass breakage.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Assa Abloy; www.assaabloyentrance.ca

2.1.1.2. Dormakaba; www.dormakaba.com

2.1.1.3. Horton Automatics; www.hortondoors.com

2.1.1.4. Stanley Canada Inc.; www.stanleyaccesstechnologies.com

2.1.2. Substitution Limitations: This Specification is based on Assa Abloy Entrance Systems Canada Inc. Comparable Products from manufacturers listed herein will be considered provided they meet requirements of this Specification.

2.2. MATERIALS

2.2.1. Performance/Design Criteria:

2.2.1.1. Emergency Breakaway:

2.2.1.1.1. Full Breakout System: Interior sliding active leaves and sidelites swing out from any position in sliding mode.

2.2.1.1.2. Breakaway Pressure: Field adjustable to building code requirements, maximum of 22.7 kg (50 lbs).

2.2.1.2. Design, fabricate and provide doors in full compliance with specified performance requirements. Upon request demonstrate and provide test complying to standards specified:

2.2.1.2.1. ANSI/UL 325 listed.

2.2.1.2.2. NFPA 101.

2.2.1.2.3. ULC approved.

2.2.2. Doors and Frames: Aluminum sections, ASTM B209M, size accurately formed as shown on Drawings, extruded aluminum alloy AA-6063-T5 for aluminum except surfaces receiving anodizing which shall be AA-6061-T6. Ensure surfaces are free from defects impairing appearance, strength and durability.

2.2.3. Aluminum Sheet: ASTM B221M, minimum thickness 3.2 mm (1/8") of type and characteristics to match finished extrusions; sheet which is not exposed shall be Alcan Utility, AA-3003 mill finished.

2.2.4. Exposed Stainless Steel: Type 304.

2.2.5. Screws, Bolts and Fasteners: Cadmium plated as recommended by door manufacturer, concealed and non-corrosive.

2.2.6. Glass and Glazing:

2.2.6.1. Ensure glass (particularly heat-strengthened, tempered and laminated) bears manufacturer's labels on bottom inner right hand corner indicating quality.

2.2.6.2. Ensure heat-strengthened and tempered glass meets following roller wave distortion criteria:

2.2.6.2.1. Maximum peak to valley measurement of 0.076 mm (0.003”) for every 300 mm (12”) in any direction.

2.2.6.2.2. Roller distortion and/or ripples runs in same direction for entire project.

2.2.6.2.3. Unless precluded by manufacturing process, orient roller-wave in the horizontal direction. Ensure glass is heat-treated through the horizontal tempering process.

2.2.6.3. Tempered Glass: Clear transparent conforming to ASTM C1048, Kind FT and meeting requirements of ANSI Z97.1 minimum 6 mm (1/4”) thick. Ensure surface compression is equal to or greater than 68.9 MPa (10 000 psi).

2.2.6.4. Field-glazed or pre-glazed.

2.2.7. Door Carriers:

2.2.7.1. Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 36.51 mm (1-7/16 inch) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.

2.2.7.2. 2 self-aligning anti-risers per leaf.

2.2.8. Vertical Jambs:

2.2.8.1. Manual Single Slide 2-panel or Bi-Part 4 Panel 45 mm (1-3/4") by 115 mm (4-1/2").

2.2.8.2. Manual Single Slide Telescopic 45 mm (1-3/4”) by 152 mm (6”).

2.2.9. Header:

2.2.9.1. Span: Maximum 3658 mm (12' - 0") without intermediate supports when using 6 mm (1/4") glass.

2.2.9.2. Size:

2.2.9.2.1. Manual Single Slide 2-panel or Bi-Part 4 Panel: 114 mm (4-1/2”) wide by114 mm (4-1/2") high

2.2.9.2.2. Manual Single Slide Telescopic: 152 mm (6”) wide by 114 mm (4-1/2”) high.

2.2.9.2.3. Manual Single Slide 2-Panel: (8-9/16” wide x 114 mm (4-1/2” high).

2.2.9.2.4. Manual Single Slide Telescopic 3-panel: 270.8 mm (10-11/16”) wide by 114 mm (4-1/2”) high.

2.2.9.3. Design: Closed header.

2.2.10. Stiles: Narrow - 55 mm (2-1/8”).

2.3. MANUFACTURED UNITS

2.3.1. Design requirements for all units:

2.3.1.1. Full Break Out

2.3.1.2. Trackless.

2.3.1.3. Anti-Static.

2.3.1.4. Self-Close.

2.3.1.5. Hold Open.

2.3.1.6. Micro-Shield antibacterial coating on hardware.

2.3.1.7. Glazing: 6 mm (1/4") tempered laminate glass.

2.3.2. Manual Single Slide, SO-SX- or SX; Manual Telescoping Doors: SO-SX-SX or SX-SX-SO; 2-panel single Slide, SO-SX- or SX-SO; as shown in the door and frame schedule on the drawings:

2.3.2.1. Package Widths: Minimum 2134 mm (7' - 0") to maximum 2744 mm (9' - 0").

2.3.2.2. Acceptable Products:

2.3.2.2.1. “Versamax 2.0” by ASSA ABLOY.

2.3.2.2.2. “Profiler-ICU®” by Horton Automatics.

2.3.2.2.3. “Series 7000” by Stanley Magic Door Division of Stanley Canada

2.3.3. Fabrication:

2.3.3.1. Design and anchor work so there will be no objectionable distortion or seriously stressed fastenings as metal expands and contracts. Design and fabricate expansion joints to ensure they will be and remain, permanently watertight. Reinforce as required.

2.3.3.2. Insofar as practicable, jig assemble components in the shop and partially disassemble where necessary before moving to site and re-assemble just prior to installation.

2.3.3.3. Fit and assemble in the shop accurately square and true.

2.3.3.4. Provide hairline joints.

2.3.3.5. Provide glazing to sliding doors and sidelights.

2.3.3.6. Design fastening and anchoring, for thermal expansion, building deflection and construction tolerances.

2.3.3.7. Provide units complete with accessories including trim, drip and anchor members.

2.3.4. Finishes:

2.3.4.1. Aluminum Finishes: Anodized: Clear, AA-C22A31 Class II, minimum 0.01 mm (0.4 mils) thick.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Examine and measure areas to receive doors. Notify Consultant of conditions that would adversely affect installation or subsequent utilization of doors. Do not proceed with installation until unsatisfactory conditions are corrected.

3.1.1.2. Verify proper support has been provided at operator header.

3.1.1.3. Verify installation dimensions are acceptable to Product manufacturer. Ensure openings to receive frames are plumb, level, square and within tolerance.

3.1.1.4. Verify floor is level within 6 mm (1/4”) across opening width, smooth and conditions are suitable for safety and system performance.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Ensure doors are installed by certified technicians in accordance with ANSI regulations.

3.2.2. Install doors and beam plumb, level, square, true to line and without warp or rack.

3.2.3. Anchor frames securely in place. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Consultant. Paint surfaces of aluminum which will be in contact with masonry, bedding mortar, wood, concrete, and gypsum board with grey bituminous paint.

3.2.4. Repair minor damages to finish in accordance with manufacturer's instructions and as reviewed by Consultant. Remove and replace damaged components that cannot be successfully repaired as determined by Consultant.

3.2.5. Pack voids in exterior installations tightly with loose fiberglass insulation.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.3.2. Manufacturer Services:

3.3.2.1. Ensure manufacturer's representative provides technical assistance and guidance for installation of doors.

3.3.2.2. Before placing doors in operation, have certified technician inspect and approve doors for compliance with this Section. Ensure certified technician is approved by manufacturer.

3.4. ADJUSTING

3.4.1. Adjust doors for proper operation in accordance with manufacturer's instructions. Adjust and test completed installation in accordance with manufacturer’s written recommendations.

3.5. CLEANING

3.5.1. Just prior to completion of work and when directed by Consultant, clean aluminum and glass.

3.6. PROTECTION

3.6.1. Protect installed doors and finish to ensure, except for normal weathering, doors and finish will be without damage or deterioration at time of substantial completion.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide glass and glazing including but not limited to following:

1.2.1.1. Glazing hollow metal doors.

1.2.1.2. Glazing borrowed lights and screens.

1.2.1.3. Glazing borrowed lights and screens with fire-rated ceramic glass.

1.2.1.4. Glazing wood doors.

1.2.1.5. Glazing plastic laminate wood doors.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of architectural woodwork: Section 06 40 00, Architectural Woodwork.

1.2.2.2. Supply of hollow steel doors and frames: Section 08 11 13, Hollow Metal Doors and Frames.

1.2.2.3. Supply of wood doors: Section 08 14 23, Plastic Laminate Faced Wood Doors.

1.2.2.4. Provision of unit mirrors: Section 10 28 00, Washroom Accessories.

1.2.2.5. Glazed hose cabinets and valve directory: Division 21, Fire Suppression.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. EPDM: Ethylene Propylene Diene Monomer.

1.3.1.2. ESA: Electrical Safety Authority; www.esasafe.com.

1.3.1.3. GANA: Glass Association of North America; www.glasswebsite.com.

1.3.1.4. MSVD: Magnetically Sputtered Vacuum Deposition.

1.3.1.5. OBC: Ontario Building Code.

1.3.1.6. PVB: Polyvinyl Butyral.

1.3.1.7. PVC: Polyvinyl Chloride.

1.3.1.8. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Definitions:

1.3.2.1. Glass Terminology: Conform to ASTM C162 for glossary of terms and definitions of glazing terminology.

1.3.2.2. Deterioration of Coated Glass:

1.3.2.2.1. Defects developed from normal use that are attributed to manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions.

1.3.2.2.2. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

1.3.2.3. Deterioration of Insulating Glass:

1.3.2.3.1. Failure of hermetic seal under normal use that is attributed to manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions.

1.3.2.3.2. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.3.2.4. Deterioration of Laminated Glass:

1.3.2.4.1. Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer’s written instructions.

1.3.2.4.2. Defects include edge separation, delaminating material obstructing vision through glass and blemishes exceeding those allowed by referenced laminated glass standards.

1.3.2.5. Interspace:

1.3.2.5.1. Space between lites of insulating-glass unit that contains dehydrated air or specified gas.

1.3.2.6. Manufacturer:

1.3.2.6.1. A firm that produces primary glass or fabricated glass products as defined in referenced glazing publications.

1.3.2.7. Pattern Glass:

1.3.2.7.1. One type of rolled glass having a pattern impressed on 1 or both sides for light control, bath enclosures and decorative glazing. Sometimes called “rolled”, “figured”, or “obscure” glass.

1.3.2.8. Sandblasted Finish:

1.3.2.8.1. Surface treatment for flat glass obtained by spraying glass with hard particles to roughen 1 or both surfaces of glass. Effect is to increase obscurity and diffusion.

1.3.2.9. United Inches:

1.3.2.9.1. Total of 1 width and 1 height of a lite of glass in inches.

1.3.3. Reference Standards:

1.3.3.1. ANSI Z97.1-09(R2017) - Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test

1.3.3.2. ASTM C162-05(15) - Standard Terminology of Glass and Glass Products

1.3.3.3. ASTM C1115-2017 R22 - Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories

1.3.3.4. ASTM D2240-15(2021) - Standard Test Method for Rubber Property - Durometer Hardness

1.3.3.5. ASTM E1300-16 - Standard Practice for Determining Load Resistance of Glass in Buildings

1.3.3.6. CAN/CGSB 12.1-2017 – Safety Glazing

1.3.3.7. CAN/CGSB 12.3-M91 (R2017) Flat, Clear Float Glass

1.3.3.8. CAN/CGSB 12.8-M97 – Insulating Glass Units

1.3.3.9. CAN/CGSB-12.20-M89 - Structural Design of Glass for Buildings

1.3.3.10. CAN/ULC-S104-15 - Standard Method for Fire Tests of Door Assemblies

1.3.3.11. CAN4-S106-15 - Standard Method for Fire Tests of Window and Glass Block Assemblies

1.3.3.12. GANA 01-0300 - Glass Information Bulletin – Proper Procedures for Cleaning Architectural Glass Products

1.3.3.13. NFPA 80-2022 - Standard for Fire Doors and Other Opening Protectives

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meetings:

1.4.1.1. Arrange pre-installation meeting 1 week prior to commencing work in accordance with the requirements specified in Division 01 General Requirements, supplemented herein:

1.4.1.2. The following minimum items shall be reviewed at the pre-installation meeting:

1.4.1.2.1. Verify project requirements.

1.4.1.2.2. Review installation conditions under which work is to be performed including substrate conditions and possible site concerns.

1.4.1.2.3. Inspection of surfaces to receive the work;

1.4.1.2.4. Review ambient installation requirements.

1.4.1.2.5. Coordination requirements with other subtrades.

1.4.1.2.6. Review manufacturer's installation instructions, procedures to be adopted, and warranty requirements.

1.4.1.3. Review installation methods, procedures, time schedule and conditions under which work shall proceed including manufacturer's written instructions and coordination required with related work.

1.4.1.4. Review and finalize construction schedule, verify availability of materials, experienced installer, equipment and facilities needed to make progress and avoid delays.

1.5. INFORMATIONAL SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures..

1.5.2. Product Data:

1.5.2.1. Submit manufacturer’s product data sheets for each glass product and glazing material indicated. Manufacturer’s product data sheets shall include:

1.5.2.1.1. Material and product physical properties and characteristics including size and finish.

1.5.2.1.2. Limitations of products

1.5.3. Samples:

1.5.3.1. Submit samples of each type of glass product indicated, other than monolithic clear float glass.

1.5.3.1.1. Samples shall show maximum range of visible difference for each glass type.

1.5.3.1.2. Submit samples of glass edge for exposed glass edges.

1.5.3.1.3. Fire-rated ceramic glass.

1.5.3.2. Submit 305 mm (12") long samples of each colour required, except black, for each type of sealant or gasket exposed to view.

1.5.3.3. Ensure samples are clearly labelled with manufacturer's name and type.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operational and Maintenance Data: Provide maintenance data in accordance with Section 01 70 00 indicating cleaning instructions for inclusion into Maintenance Manual.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide experienced installer who is trained and experienced in glass and glazing requirements of this Section including familiarization with standards specified herein and capable to instruct installation requirements of this Section.

1.7.2. Quality Standard:

1.7.2.1. Comply with recommendations in the publications below, except where more stringent requirements are Indicated in Contract Documents. Refer to these publications for glazing terms not otherwise defined in this section.

1.7.2.1.1. GANA Glazing Manual.

1.7.2.1.2. GANA Engineering Standards Manual.

1.7.2.1.3. GANA Laminated Glazing Reference Manual.

1.7.3. Single Source Responsibility:

1.7.3.1. Provide materials from a single manufacturer or fabricator for each kind and condition of glass Indicated and composed of primary glass obtained from a single source for each type and class required.

1.7.4. Mock-Ups:

1.7.4.1. Mock-ups will be used to judge quality of work, substrate preparation, operation of equipment and material application.

1.7.4.2. Locate where directed.

1.7.4.3. Allow 48 hours for inspection of mock-up before proceeding with work.

1.7.4.4. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work. Remove mock-up and dispose of materials when no longer required and when directed.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Deliver, store and handle materials with manufacturer's written instructions.

1.8.2. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.8.3. Store materials off ground and in accordance with product manufacturer's recommendations in clean, dry, well-ventilated area.

1.8.4. Store and protect glazing and frames from nicks, scratches, and blemishes.

1.8.5. Protect surfaces with strippable coating.

1.8.6. Replace defective or damaged materials with new.

1.8.7. Protect glass from edge damage during handling. For insulating glass units exposed to substantial altitude changes, comply with insulating glass manufacturers written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.9. SITE CONDITIONS

1.9.1. Ambient Conditions: Do not perform glazing when temperature is less than 7 deg C (44 deg F) or sash or frames are wet, damp or frosted.

1.10. WARRANTY

1.10.1. Manufacturer Warranty: Warrant work of this Section for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. AGC Glass Company North America; www.yourglass.com

2.1.1.2. Cardinal Glass Industries; www.cardinalcorp.com

2.1.1.3. Dow Corning; www.dowcorning.com

2.1.1.4. Guardian Industries Corp.; www.guardian.com

2.1.1.5. Innovative Glass Corporation; www.innovativeglasscorp.com

2.1.1.6. Momentive Performance Materials; www.momentive.com

2.1.1.7. Pilkington Special Glass Limited; www.pilkington.com

2.1.1.8. Polytronix, Inc.; www.polytronixglass.com

2.1.1.9. Smartglass International; www.smartglassinternational.com

2.1.1.10. TGP Technical Glass Products; www.fireglass.com

2.1.1.11. Tremco Canada; www.tremcosealants.com

2.1.1.12. Vetrotech USA; www.vetrotechusa.com

2.1.1.13. Vitro Architectural Glass; www.vitro.com

2.1.2. Single Source Responsibility for Sealants, Gaskets and Other Glazing Accessories: Ensure consistent quality of performance by providing glazing sealant and seals from single manufacturer.

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Regulatory Requirements:

2.2.1.1. Fire Rated Glass: Each lite shall bear permanent, non-removable label of ULC certifying it for use in tested and rated fire protective assemblies.

2.2.2. Design Requirements:

2.2.2.1. Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follows:

2.2.2.2. Design glass and glazing located less than 1,070 mm (42”) above finished floor, to requirements of the Ontario Building Code. Glass at guards, balustrades, and where glass is likely to be subjected to human impact shall comply with safety glass requirements of CAN/CGSB 12.20-M89 and CAN/CGSB 12.1-M90.

2.2.2.3. Provide annealed, heat strengthened, and tempered lights where required by the National Building Code, and where required for the various solar exposures on the building.

2.2.2.4. Glass thicknesses and glass types specified, Indicated, or scheduled in the drawings are minimums required. Glass designer/engineer to modify as required to satisfy design and OBC requirements, and requirements of authorities having jurisdiction, and any such modifications shall be clearly Indicated on shop drawings. Validate glass thicknesses in accordance with ASTM E1300

2.3. GLASS

2.3.1. Free from bubbles, waves, discolouration and other defects and of following types for locations indicated on Drawings or noted on Door Schedule. Ensure glass (particularly heat-strengthened, tempered and laminated) bears manufacturer's labels on bottom inner right hand corner indicating quality.

2.3.2. Float Glass (CGL): Clear transparent float glass, minimum 6 mm (1/4") thick conforming to ASTM C1036, Type I, Class 1.

2.3.3. Tempered Glass (TGL): Clear transparent tempered glass conforming to ASTM C1048, Kind FT and meeting requirements of ANSI Z97.1, minimum 6 mm (1/4”) thick. Ensure surface compression is equal to or greater than 69 MPa (10 000 psi).

2.3.4. Laminated Glass (LGL): Clear transparent laminated float glass conforming to ASTM C1172, Kind LA and meeting requirements of ANSI Z97.1, minimum 6 mm (1/4") thick overall; clear PVB interlayer of 1.6 mm (0.060") thickness.

2.3.5. Tempered Laminated Glass (TLGL): Clear transparent laminated tempered glass conforming to ASTM C1172, Kind LT and meeting requirements of ANSI Z97.1, minimum 6 mm (1/4") thick overall; clear PVB interlayer of 1.6 mm (0.060") thickness.

2.3.6. Heat-Strengthened Glass (HSGL): Clear transparent heat-strengthened glass conforming to ASTM C1048, Kind HS. Perform heat-strengthening using horizontal tong free method; surface compression less than 52 MPa (7500 psi).

2.3.7. Fire-Rated Ceramic Glass (FRCGL):

2.3.7.1. Fire-rated ceramic glass clear and wireless glazing materials installed as transoms, borrowed lights and screens in fire-rated frames.

2.3.7.2. Impact and safety rating conforming to ANSI Z97.1; thickness to suit design, fire-rating requirements and in accordance with manufacturer’s recommendations conforming to approved testing agencies acceptable to authorities having jurisdiction for respective performance criteria.

2.3.7.3. Test fire-rating in accordance with CAN/ULC-S104 and CAN4-S106-M as applicable and acceptable to authorities having jurisdiction for specific application.

2.3.7.4. 5 mm (3/16”) thick (20 minute to 3 hour fire-rating), non-impact safety fire-rated ceramic glass; “FireLite® Premium” or “PYRAN® Platinum” by TGP Technical Glass Products or “Keralite® Select Standard” by Vetrotech USA respectively.

2.3.7.5. 5 mm (3/16”) thick (20 minute to 3 hour fire-rating), impact safety fire-rated ceramic glass with an approved surface-applied safety film; “FireLite® Premium NT” or “PYRAN® Platinum F” by TGP Technical Glass Products or “Keralite® Select Filmed” by Vetrotech USA.

2.3.7.6. 8 mm (5/16”) total thickness (20 minute to 3 hour fire-rating), impact safety laminated fire-rated ceramic glass; “FireLite Plus®” or “PYRAN® Platinum L” by TGP Technical Glass Products or “Keralite® Select Laminated” by Vetrotech USA.

2.3.7.7. Provide glazing tapes and setting blocks in accordance with applicable ULC Listing for approved fire-rated glazing Product. Butyl tapes and setting blocks are not permitted.

2.3.8. Obscure Transparent Float Glass (OGL): Minimum 6 mm (1/4") thick, conforming to CAN/CGSB-12.13-M, Type 2 tempered , Style A, pattern to be selected by Consultant.

2.3.9. Sand Blasted Glass (SBGL): 6 mm (1/4") thick heat-strengthened, clear float glass conforming to ASTM C1036, Type I, Class 1, suitable for custom etching and sand blasting to create art matching accepted sample in Consultant's possession.

2.4. GLAZING, SEALING COMPOUNDS AND ACCESSORIES:

2.4.1. General:

2.4.1.1. Select glazing sealants, tapes, gaskets and additional glazing materials of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

2.4.1.2. Ensure glazing, sealing compounds and accessories are compatible with contact surfaces of frames, other accessories used in glazing system and contact surfaces of compounds used on insulated glass units. Wood or other organic materials are not acceptable for use in glazing systems including spacer blocks.

2.4.1.3. Glazing Compound: Non-hardening modified oil type. Colour to match adjacent surfaces unless indicated otherwise.

2.4.1.4. Sealant Compound: One component type, elastomeric chemical curing, ASTM C920, Type S, Grade NS. Colour to match adjacent surfaces unless indicated otherwise.

2.4.1.5. Sealant Compound: ASTM C920, multi-component chemical curing, Type M, Grade NS. Colour to match adjacent surfaces.

2.4.2. Glazing Gaskets:

2.4.2.1. Moulded or extruded gaskets of profile and hardness required to maintain watertight seal, made from preformed silicone to ASTM C1115.

2.4.3. Setting Blocks:

2.4.3.1. Silicone material with Shore, Type A durometer hardness of 85, plus or minus 5 to ASTM D2240, to suit glazing method, glass light weight and area, length of 25 mm for each square meter of glazing, minimum 100 mm x width of glazing rabbet space minus 1.5 mm (1/16”) x height.

2.4.4. Spacer Shims:

2.4.4.1. Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm (3”) long x one (1) half height of glazing stop x thickness to suit application. Self- adhesive on one (1) face.

2.4.5. Glazing Tape:

2.4.5.1. Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; 3 mm (1/8”) x 12 mm (1/2”) size; black colour.

2.4.6. Glazing Splines:

2.4.6.1. Resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, black colour.

2.4.7. Sealant Compound:

2.4.7.1. One component, silicone base chemical curing. Colour to match adjacent surfaces.

2.4.8. Sealant for Interior Glass-to-Glass Butt Glazing Installation:

2.4.8.1. Translucent 1 part silicone sealant conforming to ASTM C920, Type S, Grade NS, "Tremsil® 200 General Construction Grade Silicone Sealant" by Tremco Canada or "Dow Corning 999-

A Silicone Building & Glazing Sealant" by Dow Corning or “GE Contractors SCS1000 Silicone Sealant” by Momentive Performance Materials.

2.4.9. Cleaners, Primers and Sealers:

2.4.9.1. Type recommended by sealant or gasket manufacturer.

2.5. FABRICATION

2.5.1. Label each light of glass and/or plastic glazing with registered name of Product and weight and quality of glass and/or plastic glazing.

2.5.2. Check dimensions on job site before cutting materials.

2.5.3. Grind and chamfer edges of unframed glass and mirrors. Grind and chamfer edges of glass shelves and sliding doors.

2.5.4. Ensure minimum bite or lap of glass and/or plastic glazing on stops and rabbets as recommended by glass and/or plastic glazing manufacturer.

2.5.5. Glass Etching:

2.5.5.1. Perform in-shop sand etching on glass for decorative custom art or logo as shown on Drawings and/or to approved sample using screening and sand blasting technique. Analyze custom art and logo to determine extent of etching and type of aggregate and method of etching. Etching may be achieved using screen and proprietary etching cream or screen and sand blasting. Sand blasting may include sand, glass beads or similar aggregate blasted at substrate with compressed air at various air pressures to obtain higher quality and more even finish such as very fine acid looking etch to more rugged sand blasted look.

2.5.5.2. Protect glass areas not required to be etched or sandblasted against getting marked using self adhesive vinyl or other proprietary protective coatings.

2.5.5.3. Ensure sand etching is in an even or staged application with required clear perimeter band as shown. Sand etch image with aggregate and air pressure required on each side of the glass to achieve depth to an art image. Match etching surface treatment to accepted sample.

2.5.5.4. Remove protective self adhesive vinyl or other protective coating on completion of this process and clean substrate.

2.5.5.5. Apply coating of specified sealer in accordance with manufacturer's instructions.

2.5.5.6. Clean and wash glass with a soft wipe cloth and plenty of warm water and then dry glass with squeegee or clean dry cloth.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.1.2. Ensure glass is not more than 4 mm (3/16") less than the rebate size in either dimension, with allowance for edge spacers, shims and setting blocks as required.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Surface Preparation:

3.2.1.1. Thoroughly clean glass rebates and glass of dust, dirt, mortar and other foreign materials prior to glazing. Remove oils and grease with non-staining solvents such as Xycol or Methyl Ethyl Ketone solutions.

3.2.1.2. Properly prime, before glazing, glazing rebates in wood doors.

3.3. INSTALLATION

3.3.1. Perform work of this Section in accordance with “GANA Glazing Manual, 2008” and “GANA Laminated Glazing Reference Manual, 2019” for laminated glazing installation methods.

3.3.2. If required, thoroughly mix glazing compound as recommended by manufacturer. Thinning of glazing compound will not be permitted.

3.3.3. Carefully remove glazing stops and replace after glazing. Take care to prevent damage to stops.

3.3.4. Doors, Screens, Sidelites and Interior Windows:

3.3.4.1. Place setting blocks on sill at 1/4 points from each corner unless otherwise directed by glazing manufacturer.

3.3.4.2. Place continuous glazing gaskets on edges of glass.

3.3.4.3. Centre and space each piece of glass with spacers located and installed according to manufacturer's directions.

3.3.4.4. Place glass so no voids occur between glass and glazing material and glazing stops.

3.3.4.5. Secure glass in place with stops, secured in place with screws.

3.3.5. Glazing Sealant:

3.3.5.1. Apply glazing sealant to clean, dry, grease and oil free surfaces. Provide exposed glazing sealant smooth, free from ridges, wrinkles, air pockets and embedded foreign materials.

3.3.5.2. Prime surfaces if required by glazing sealant manufacturer.

3.3.5.3. Trim glazing sealant flush with tops of stops and glazing channels.

3.3.5.4. Remove excess glazing sealant or droppings which would set up or become difficult to remove from finished surfaces. Do not use chemicals, scrapers, or other tools which would affect finished surfaces.

3.3.6. Interior Glazing:

3.3.6.1. Fire Rated Hollow Metal Doors and Screens: Set glass in fire rated metals doors and screens on continuous setting block with 3 mm (1/8") gap between glazing stop glass and embed in glazing compound in accordance with NFPA 80 and OBC requirements. Strike and point exposed joints between metal and glass or install glass in accordance to ULC tested proprietary methods of installation.

3.3.6.2. Tape/Tape Method:

3.3.6.2.1. Cut glazing tape to proper length and install against permanent stop projecting 1.6 mm (1/16") above sightline.

3.3.6.2.2. Place glazing tape on free perimeter of glass projecting 1.6 mm (1/16") above sightline.

3.3.6.2.3. Trim off excess tape to sightline.

3.3.6.3. Combination Method-Tape/Sealant:

3.3.6.3.1. Cut glazing tape to proper length and install against permanent stop projecting 1.6 mm (1/16") above sightline.

3.3.6.3.2. Fill gap between glass and applied stop with sealant to depth equal to bite of frame on glass to uniform and level line.

3.3.6.3.3. Trim off excess tape to sightline.

3.3.6.4. Compound/Compound Method:

3.3.6.4.1. Apply sealant to back and bottom of rabbet.

3.3.6.4.2. Bed glass in position with non hardening compound sealant.

3.3.6.4.3. Position and secure glass of smaller dimension only using spring wire or glaziers' clips. Apply face compound and trim sealant to slope away from light.

3.3.6.4.4. Place gasket against permanent stop and position glass sheet.

3.3.6.4.5. Apply removable stops. Install gaskets in frame channels.

3.3.6.5. Two Sided Butt - Joint Glazing:

3.3.6.5.1. 2 sided glazing at head and sill use wet, dry, or wet/dry glazing systems.

3.3.6.5.2. Position glazing so that vertical edges are spaced slightly apart and seal with silicone sealant.

3.3.6.5.3. Grind vertical joint with slight kerf and polish for aesthetics.

3.4. SITE QUALITY CONTROL

3.4.1. Site Tests and Inspections:

3.4.1.1. Ensure framing to be glazed is plumb, secure and permanently fixed in position.

3.4.2. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.5. CLEANING

3.5.1. Clean installed glass and metal frequently during construction. Avoid etching and staining glass and metal during construction.

3.5.2. Remove sealant and compound droppings from finished surface.

3.5.3. Clean and polish glass in accordance with GANA 01-0300 including removal of markings indicating presence of glass.

3.6. PROTECTION

3.6.1. Provide and maintain necessary protection of completed work against damage.

3.6.2. Do not mark or attach anything directly to exposed glass and framing surfaces.

3.6.3. If welding is to take place above or near completed glazing work, protect glass with plywood or other suitable means to reduce likelihood of weld spatter damaging glass surfaces.

3.6.4. Protect glass from other trades, workers, tools and other similar materials. Avoid storing materials adjacent to glass.

3.6.5. Replace cracked, broken, or defective glass at no additional cost to Owner and to Consultant's satisfaction.

3.6.6. Identification of Glazing: Mark glass lites with temporary, easily removable, large safety markings, immediately after glass installation. Maintain safety markings until final clean-up.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes::

1.2.1.1. decorative film for interior applications.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Glass and glazing: Section 08 80 00 Glass and Glazing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. PVC: Polyvinyl Chloride.

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meetings:

1.4.1.1. Arrange pre-installation meeting 1 week prior to commencing work in accordance with the requirements specified in Division 01 General Requirements, supplemented herein:

1.4.1.2. Review installation methods, procedures, time schedule and conditions under which work shall proceed including manufacturer's written instructions and coordination required with related work.

1.5. INFORMATIONAL SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures..

1.5.2. Product Data:

1.5.2.1. Submit manufacturer’s product data sheets for each material indicated. Manufacturer’s product data sheets shall include:

1.5.2.1.1. Material and product physical properties and characteristics

1.5.2.1.2. Installation instructions.

1.5.3. Samples:

1.5.3.1. Submit samples of each type of film product indicated,

1.5.3.2. Submit 305 mm (12") square samples of each film

1.5.3.3. Ensure samples are clearly labelled with manufacturer's name and type.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operational and Maintenance Data: Provide maintenance data in accordance with Section 01 70 00 indicating cleaning instructions for inclusion into Maintenance Manual.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide experienced installer who is trained and experienced in the installation of products of this Section including familiarization with manufacturer's recommended procedures.

1.7.2. Single Source Responsibility:

1.7.2.1. Obtain each type of decorative film through one source from a single manufacturer to provide products of consistent quality in appearance and physical properties.

1.7.3. Mock-Ups:

1.7.3.1. Construct mock-ups to include application of film. Coordinate with work of other sections.

1.7.3.2. Mock-ups will be used to judge quality of work, substrate preparation, and material application.

1.7.3.3. Locate where directed.

1.7.3.4. Allow 48 hours for inspection of mock-up before proceeding with work.

1.7.3.5. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Deliver, store and handle materials with manufacturer's written instructions.

1.8.2. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.8.3. Protect decorative film to comply with manufacturer's written directions and as needed to prevent damage to glass and any decorative surfaces.

1.8.4. Retain packaging and sequencing numbers for decorative film.

1.9. PROJECT CONDITIONS

1.9.1. Environmental Limitations: Do not install decorative glass until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.9.2. Field Measurements: Verify dimensions to fit by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Avery Dennison Graphics Division; Etchmark A5861-S.

2.1.1.2. FDC Graphic Films, Inc.; Series 2100/2200, 007 Frosted Silver Metallic.

2.1.1.3. Spar-Cal Division, Spartan International; Etchlight.

2.1.1.4. 3M Commercial Graphics Division; Scotchcal Frosted Crystal,

2.2. PERFORMANCE/DESIGN CRITERIA

2.2.1. Cast PVC Film: Translucent, dimensionally stable cast PVC film, 2-mil- (0.05-mm-) mini-mum thickness, with pressure-sensitive clear adhesive back for adhering to glass and re-leasable protective backing.

2.3. FABRICATION

2.3.1. Cast PVC Film: Apply squarely aligned to glass edges, uniformly smooth, and free from tears, air bubbles, wrinkles, and rough edges, in single sheet completely overlaying the back face of clean glass, according to manufacturer's written instructions, including surface preparation and application temperature limitations.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Examine glass surfaces for compliance with the following:

3.1.1.1.1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.

3.1.1.1.2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Install window film in accordance with manufacturer’s printed instructions by experienced film applicators as recommended by glass film manufacturer.

3.2.2. Ensure glass surfaces are clean and ambient temperature is between 16 deg C and 38 deg C (61 deg F and 100 deg F).

3.2.3. Whenever 2 or more pieces of same colour translucent film are seamed together as a continuous band of colour, they must match to ensure uniform reflected daytime colour and transmitted night appearance.

3.2.4. Install film in series true in line with uniform orientation, pattern and similar characteristics.

3.3. CLEANING AND PROTECTION

3.3.1. Protect decorative film from damage immediately after installation by attaching crossed streamers to framing and held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

3.3.2. Protect decorative film from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass and film manufacturers.

3.3.3. Remove and replace PVC film that is abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

3.3.4. Wash decorative film on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass and film as recommended in writing by glass manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide gypsum board assemblies work including but not limited to following:

1.2.1.1. Interior metal support systems for gypsum board partitions, ceilings, shaftwalls and other assemblies as Indicated on drawings.

1.2.1.2. Supplementary steel supports for ceilings.

1.2.1.3. Reinforcement for suspension systems for lighting fixtures, access hatches, etc.

1.2.1.4. Concealed sheet steel reinforcing.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Miscellaneous steel sections and/or framing required to provide additional structural support to suit Project requirements: Section 05 50 00 Metal Fabrications.

1.2.2.2. Provision of wood framing (studs, joists, etc.): Section 06 10 00, Rough Carpentry.

1.2.2.3. Installation of hollow metal door frames and frame anchors in gypsum board partitions: Section 06 90 00, General Installations.

1.2.2.4. Firestopping, smoke seals and penetration firestopping: Section 07 84 00 Firestopping and Smoke Seals.

1.2.2.5. Gypsum board, acoustic insulation: Section 09 29 00 Gypsum Board.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CSA: Canadian Standards Association; www.csa.ca.

1.3.1.2. HVAC: Heating, Ventilating and Air Conditioning.

1.3.1.3. OBC: Ontario Building Code.

1.3.1.4. STC: Sound Transmission Class.

1.3.1.5. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Definitions:

1.3.2.1. Shaft Wall Systems: Non-structural metal framing and gypsum board assemblies designed for erection entirely from room side of shaft except for the application of finish layer on shaft side, where required to form an enclosure.

1.3.2.2. Wet Areas: Wet areas as related to non-structural; metal framing shall include showers, janitor rooms, and washrooms.

1.3.3. Reference Standards:

1.3.3.1. ASTM A653/A653M-20 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

1.3.3.2. ASTM A641/A641M-19 Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire

1.3.3.3. ASTM C635/C635M-17 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

1.3.3.4. ASTM C645-18 - Standard Specification for Nonstructural Steel Framing Members.

1.3.3.5. ASTM C754-20 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

1.3.3.6. ASTM E90-09(2016) - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

1.3.3.7. ASTM E488/E488M-22 - Standard Test Methods for Strength of Anchors in Concrete Elements

1.3.3.8. CSA S136(R2021) - North American Specification for Design of Cold-Formed Steel Structural Members

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Coordinate wall mounted equipment requirements and locations with SHN Project Manager. Provide suitable blocking to support equipment and unistruct mounting supports by SHN.

1.4.2. Sequencing:

1.4.2.1. Coordinate installation and cooperate with mechanical and electrical trades to accommodate mechanical electrical items and any other work required to be incorporated into or coordinated with ceiling and soffit systems.

1.4.2.2. Cooperate and coordinate with Sections applying wet trades and trades installing mechanical and electrical services. Coordinate stud layout at partitions accommodating wall mounted fixtures by other trades.

1.5. INFORMATIONAL SUBMITTALS

1.5.1. Submit submittals in accordance with Section 01 33 00 Submittal Procedures..

1.5.2. Product Data Sheets:

1.5.2.1. Submit manufacturer’s product data sheets for products to be for used in the work of this section. Manufacturer’s product data sheets shall include:

1.5.2.1.1. Material and product physical properties and characteristics including physical size, finish.

1.5.2.1.2. Performance criteria.

1.5.2.1.3. Limitations of products.

1.5.2.2. Submit fire resistance rating test listings for fire rated assemblies.

1.5.3. Shop Drawings:

1.5.3.1. Submit engineered shop drawings prepared, stamped, and signed by Professional Structural Engineer for non-structural metal framing.

1.5.3.2. Submit engineered shop drawings prepared, stamped, and signed by Professional Structural Engineer for the seismic design of connections and restraint of the non-structural metal framing.

1.5.3.3. Include the manufacturer's load test data and design tables for the metal support system and hanger supports.

1.5.3.4. Submit drawings to locate all expansion and control joints in partitions and ceilings.

1.5.3.5. Submit drawings to locate all fire rated partitions.

1.5.4. Samples:

1.5.4.1. If requested, submit 300 mm (12”) long samples of non-structural metal framing.

1.5.5. Reports and Certificates:

1.5.5.1. Submit certification from licensed engineer registered in Province of Ontario, ensuring his/her seal and signature is affixed to certificate, stating that installed suspended ceiling system is capable of supporting its own weight and weight of lighting, grilles and other mechanical and electrical fixtures required by Mechanical and Electrical Divisions.

1.5.5.2. Obtain approval of electrical utility authorities having jurisdiction for support of light fixtures, by ceiling grid and supports, to satisfy requirements of electrical inspection department of Ontario Hydro. Adjust grid, fixing devices and support hangers as required to obtain approval.

1.5.5.3. Field Report:

1.5.5.3.1. Professional Structural Engineer to submit written Field Report acknowledging review and acceptance of installations.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.6.1.2. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Metal framing manufacturer list: Products of the following manufacturers are acceptable subject to conformance to requirements of drawings, schedules and specifications:

2.1.1.1. Bailey Metal Products; www.bmp-group.com

2.1.1.2. CGC Inc; www.cgcinc.com

2.1.1.3. ClarkDietrich Building Systems; https://www.clarkdietrich.com

2.1.1.4. MarinoWare: Div. of Ware Industries Inc.: www.marinoware.com

2.1.1.5. Substitutions in accordance with Section 01 25 00 Substitution Procedures.

2.1.2. Noise control isolater materials manufacturer list: Products of the following manufacturers are acceptable subject to conformance to requirements of drawings, schedules and specifications:

2.1.2.1. Bailey Metal Products; www.bmp-group.com

2.1.2.2. ClarkDietrich Building Systems; www.clarkdietrich.com

2.1.2.3. Kinetics Noise Control; www.kineticsnoise.com

2.1.2.4. Substitutions in accordance with Division 01 General Requirements.

2.1.3. GWB acoustic spring hanger manufacturers list: Products of the following manufacturers are acceptable subject to conformance to requirements of drawings, schedules and specifications:

2.1.3.1. Tecoustics; www.tecoustics.com

2.1.3.2. Vibro-Acoustics; vibro-acoustics.com

2.1.3.3. Substitutions in accordance with Section 01 25 00 Substitution Procedures.

2.1.4. Proprietary direct hung ceiling framing suspension system manufacturer list: Products of the following manufacturers are acceptable subject to conformance to requirements of drawings, schedules and specifications:

2.1.4.1. Rockfon; https://www.rockfon.com/

2.1.4.2. CGC Inc; www.cgcinc.com

2.1.4.3. Substitutions in accordance with Section 01 25 00 Substitution Procedures.

2.2. DESIGN / PERFORMANCE REQUIREMENTS

2.2.1. Regulatory Requirements:

2.2.1.1. Fire Resistance Rating:

2.2.1.1.1. Where gypsum board systems with fire resistance ratings are Indicated or scheduled on drawings, provide materials and installations that are identical with those of applicable assemblies tested by fire testing laboratories acceptable to authorities having jurisdiction.

2.2.1.1.2. Fire rated construction, including ceilings, partitions or fire protective membranes and furring shall be constructed to approved ULC design, or other test design acceptable to authorities having jurisdiction, to provide fire ratings Indicated or scheduled on drawings.

2.2.1.1.3. Coordinate with Section 09 29 00 Gypsum Board.

2.2.2. Design Requirements:

2.2.2.1. Design non-structural metal framing to withstand own dead load, super-imposed dead loads, to maximum allowable deflection of L/360, without permanent deformation.

2.2.2.2. Design steel stud reinforcements from hollow structural steel, stud, angle and steel plate sections, galvanized sheet steel minimum 1.214 mm (18 ga) where required to support of manufactured components without limitations items such as washroom accessories, expansion control covers and similar items. Design weld connections ensuring rigid and secure installation capable of offering resistance to minimum 227 kg (500 lb) pull force. Do not design using wood blocking for this purpose.

2.2.2.3. Design fire rated construction including ceiling, partition or fire protective membranes and furring to approved ULC design or other design acceptable to authorities having jurisdiction, to provide design fire rating indicated and/or required. Submit written evidence of acceptable test design.

2.2.2.4. Sound rated construction shall have STC rating tested in accordance with ASTM E90. Coordinate with Section 09 29 00 Gypsum Board.

2.2.3. Structural Design:

2.2.3.1. Professional Structural Engineer shall design non-structural metal framing for work of this Section.

2.2.3.2. Professional Structural Engineer shall design seismic connections and restraint of the non-structural metal framing for work of this Section.

2.2.3.3. Ceiling suspension systems:

2.2.3.3.1. Design ceiling suspension system in accordance with manufacturer's printed directions and conforming to ASTM C754 requirements. Do not suspend and items from structural steel deck. Do not support work of this Section

from, nor make attachments to, ducts, pipes, conduits or support framing of other trades.

2.2.3.3.2. Design suspended ceiling systems for adequate support of electrical fixtures as required by current bulletin of Electrical Inspection Department of Ontario Hydro.

2.2.3.3.3. Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.

2.2.3.3.4. Design suspension system to support weight of mechanical and electrical items such as air grilles, lighting fixtures, drapery track, drapes and with adequate support to allow rotation/ relocation of light fixtures.

2.2.3.4. Design interior partitions and ceilings using a maximum deflection criteria of L/240 with a minimum lateral load of 0.239 kPa (5 psf) unless otherwise specified herein. Where tile is being applied or height is greater than 3 m (10') use L/360 with a minimum lateral load of 0.239 kPa (5 psf).

2.2.3.5. Determine appropriate steel stud size and thickness as required for height and loading.

2.2.3.6. Ensure partitions acting as guards, including walls around shafts or where floor elevation on 1 side of a wall is more than 600 mm (23-5/8") higher than elevation of floor or ground on other side complies with OBC, Division B, Part 4, Article 4.1.5.16. Provide Shop Drawings bearing seal of a licensed engineer registered in Province of Ontario confirming this requirement.

2.2.3.7. Design sub-framing as necessary to accommodate and circumvent conflicts and interfaces where ducts or other equipment prevent regular spacing of hangers.

2.2.3.8. Shaft Walls:

2.2.3.8.1. Provide gypsum board shaft wall systems designed and tested by the panel board manufacturer to withstand lateral design loading (air pressure), applied transiently and cyclically, for maximum heights of partitions required, within deflection limit of L/360 of partition height.

2.3. PARTITION SUPPORT MATERIALS

2.3.1. General:

2.3.1.1. Metal framing shall comply with ASTM C645 and as specified.

2.3.1.2. Metal framing shall be galvanized sheet steel, zinc coating designation Z120 (G40) unless otherwise specified.

2.3.1.3. Metal framing in shower rooms, other wet areas shall be galvanized sheet steel, zinc coating designation Z275 (G90) unless otherwise specified.

2.3.2. Steel Studs:

2.3.2.1. Steel Studs: CSA S136 and ASTM C645, galvanized sheet steel, minimum 18 mils designation thickness (0.455 mm (0.0179") minimum base steel thickness) (previously 25 ga), minimum Z120 (G40) zinc coating, screw able with crimped web and returned flange, of depth shown in maximum continuous lengths possible. Provide thicker steel where required due to height.

2.3.2.2. Heavy Duty Steel Studs at Openings: CSA S136 and ASTM C645, galvanized sheet steel, minimum 54 mils designation thickness 1.367 mm (0.0538") minimum base steel thickness) (previously 16 ga), minimum Z120 (G40) zinc coating, screw able with crimped web and returned flange, of depth shown in maximum continuous lengths possible. Provide thicker steel where required due to height.

2.3.2.3. Studs Supporting Cement Boards, Abuse Resistant Gypsum Boards: CSA S136 and ASTM C645, galvanized sheet steel, minimum 33 mils designation thickness (0.836 mm (0.0329") minimum base steel thickness) (previously 20 ga structural). Provide 50 mm (2") deep flanges on ceiling tracks to allow for deflection of structure. Use 92 mm (3-5/8") width unless otherwise noted. Use 0.914 mm (20 ga) solid web members at ceiling and floor tracks.

2.3.2.4. Provide knockout openings in web at 460 mm (18") oc to accommodate (if required) horizontal mechanical and electrical service lines and bracing.

2.3.3. Floor and Ceiling Partition Track for Gypsum Board:

2.3.3.1. CSA S136 and ASTM C645, galvanized sheet steel, minimum 18 mils designation thickness (0.455 mm (0.0179") minimum base steel thickness) (previously 25 ga), minimum Z120 (G40) zinc coating, with minimum 30 mm (1-1/4") legs, top track having longer legs where required to compensate for deflection of structure above. Width to suit steel studs.

2.3.3.2. For openings wider than 914 mm (3’-0”), provide 0.91 mm (0.035”) (20 gauge) minimum thickness for header except at heavy duty studs, header shall match metal thickness of heavy duty studs.

2.3.4. Runner Fasteners:

2.3.4.1. To concrete and masonry: Use stub nails or power-driven fasteners.

2.3.4.2. To metal concrete inserts: Use 10 mm (0.393”) Type S-12 pan head screws.

2.3.4.3. To suspended ceilings: Use prefinished clips to match ceiling grid in accordance with Section 09 51 13 - Acoustical Panel Ceilings

2.3.5. Bracing Channels:

2.3.5.1. 19 mm (3/4”) x 10 mm (0.393”) x 1.22 mm (0.048”) cold rolled galvanized steel.

2.4. CEILING SUPPORT MATERIALS

2.4.1. General:

2.4.1.1. Metal framing and support materials shall comply with ASTM C645 and as specified.

2.4.1.2. Metal framing shall be galvanized sheet steel, zinc coating designation Z120 (G40) unless otherwise specified.

2.4.1.3. Size ceiling support components to comply with ASTM C754 unless otherwise Indicated on drawings or specified.

2.4.2. Main Runners:

2.4.2.1. Steel channels, hot or cold rolled; galvanized where used in shower rooms, other wet areas, with rust inhibitive paint finish where used elsewhere indoors.

2.4.3. Hanger Wire:

2.4.3.1. ASTM A641/A641M, soft, Class 1 galvanized, minimum 3.26 mm (0.128”) (8 AWG).

2.4.4. Hanger Rods and Flats:

2.4.4.1. Galvanized steel.

2.4.4.2. Size devices for 5 times load imposed by completed system as determined in accordance with ASTM E488/E488M.

2.4.4.3. Inserts for Concrete Slabs: Tie wire anchors, “Red Head TW-1614" by ITW Canada Inc., “Parabolt Wire Hanger” distributed by Acrow-Richmond Ltd., “T-14 Eyebolt” by Ramset Ltd. or “Tie Wire Drive TW-932" by Isometric Ltd. Powder actuated fastening systems are not permitted.

2.4.4.4. Screws, clips, bolts, concrete inserts or other devices for ceiling hangers whose suitability for use intended has been proven through standard construction practices or by certified test data.

2.4.4.5. Hangers: Comply with ASTM C754 for maximum ceiling area and loads to be supported.

2.4.4.6. Hanger Isolator:

2.4.4.6.1. Steel spring encased in welded steel brackets of size recommended by manufacturer to suit load conditions and to provide minimum 30 mm (1-3/16") static deflection with at least 50% over load reserve deflection capacity.

2.4.4.6.2. Factory pre-compress spring element to within 6 mm (1/4") of anticipated operating height. Ensure brackets are cadmium plated designed to carry 500% overload without failure. Design hangers to accommodate rod misalignment over 30 degree arc.

2.4.4.6.3. Equip hanger assembly with eyebolts both top and bottom.

2.4.4.6.4. Ensure sound spring isolator hangers are by Kinetics Noise Control, Inc.; www.kineticsnoise.ca, Model LPSH Hanger by Vibration Mounting& Controls, Inc, Vibro-Acoustics; www.vibro-acoustics.com or Mason Industries, Inc.; www.mason-industries.com represented by Tecoustics..

2.4.4.7. Tie wire: 1.519 mm (16 ga) nominal diameter galvanized, soft annealed steel.

2.4.4.8. Zinc-plated or stainless steel fasteners exposed to condensation, and corrosion.

2.4.4.9. Runner (Carry) Channels:

2.4.4.9.1. Minimum 1.50 mm (16 gauge) thick cold rolled steel, primer painted or zinc coated for interior locations:

2.4.4.9.2. 38 mm (1.5”) x 12.7 mm (1/2”) where supported at maximum 914 mm (3’-0”) on centre.

2.4.4.9.3. 38 mm (1.5”) x 19 mm (3/4”) where supported at maximum 1,220 mm (4’-0”) on centre.

2.4.5. Proprietary Direct Hung Ceiling Framing Suspension System (optional):

2.4.5.1. Fire rated and non-fire rated, provide factory fabricated, proprietary system in lieu of channel and cross furring framing system.

2.4.5.2. Provide interlocking cold-rolled sheet steel grid, ASTM C635/C635M, heavy duty.

2.5. FURRING SUPPORT MATERIALS

2.5.1. General:

2.5.1.1. Metal framing shall comply with ASTM C645 and as specified.

2.5.1.2. Metal framing shall be galvanized sheet steel, zinc coating designation Z120 (G40) unless otherwise specified.

2.5.2. Furring Channels:

2.5.2.1. CSA S136 and ASTM C645, galvanized sheet steel, minimum 33 mils designation thickness (0.836 mm (0.0329") minimum base steel thickness) (previously 20 ga structural) or minimum 18 mils designation thickness (0.455 mm (0.0179") minimum base steel thickness) (previously 25 ga), minimum Z120 (G40) zinc coating, screw channels, 67 mm (2-5/8") wide x 22 mm (7/8") deep.

2.5.3. Carrying Channels for Gypsum Board:

2.5.3.1. CSA S136 and ASTM C645, galvanized sheet steel, minimum 43 mils designation thickness (1.087 mm (0.0428") minimum base steel thickness) (previously 18 ga), minimum Z120 (G40) zinc coating, 38 mm (1-1/2") high with 19 mm (3/4") flanges, for primary carrying member in suspended ceilings and as horizontal stiffeners or bracing in steel stud systems.

2.5.4. Carrying Channels for Cement Board: CSA S136 and ASTM C645, galvanized sheet steel, minimum 54 mils designation thickness (1.367 mm (0.0538") minimum base steel thickness) (previously 16 ga), minimum Z120 (G40) zinc coating, 38 mm (1-1/2") high with 19 mm (3/4") flanges, for primary carrying member in suspended ceilings and as horizontal stiffeners or bracing in steel stud systems.

2.5.5. Resilient furring channels:

2.5.5.1. Resilient channel suspends gypsum board 13 mm (1/2") from the metal stud framing.

2.5.5.2. Acceptable products:

2.5.5.2.1. “RC Plus Resilient Channel” by Bailey Metal Products; /www.bmp-group.com

2.5.5.2.2. “RC1 Pro Resilient Channel (RCUR)” by ClarkDietrich Building Systems; https://www.clarkdietrich.com

2.5.5.2.3. Substitutions in accordance with Section 01 25 00 Submittal Procedures.

2.5.6. “Z”-Furring:

2.5.6.1. Manufacturer's standard screw type galvanized steel, z-shaped furring members; ASTM A653/A653M G60, 0.914 mm (0.035”) (20 gauge) minimum thickness of base metal, of depth Indicated, designed for mechanical attachment of insulation boards or blankets.

2.5.7. Fasteners:

2.5.7.1. Type and size recommended by furring manufacturer for substrate and application Indicated.

2.5.8. Furring Isolator:

2.5.8.1. Basis of design:

2.5.8.1.1. “Kinetics IsoMax Sound Isolation Clips for Walls and Ceilings” by Kinetics Noise Control.

2.5.8.1.2. Substitutions in accordance with Section 01 25 00 Submittal Procedures.

2.5.9. Furring Anchorages:

2.5.9.1. 1.62 mm (16 AWG) galvanized wire ties, wire type clips, bolts, nails or screws as recommended by furring manufacturer.

2.6. SHAFT WALL SUPPORT MATERIALS

2.6.1. Supply components from same manufacturer. Ensure components are compatible and tested by approved independent testing facilities acceptable to authorities having jurisdiction.

2.6.2. Ensure shaftwall framing, shaftliner, gypsum board and joint treatment materials provide 1, 2 or 3 hour fire resistance rating as noted on Drawings when tested in accordance with CAN/ULC-S101.

2.6.3. Shaftwall Framing including Galvanized Steel Studs and Runners: 64 mm (2-1/2"), minimum 18 mils designation (0.455 mm (0.0179”) minimum base steel thickness) (previously 25 ga) thick galvanized steel, designed for use in shaft wall construction. C-T Studs, J-L Corner and J track and other associated components by Georgia-Pacific Canada, Inc. or C-H or C-T and E studs, J runners and other associated components, “Sheetrock® Brand Glass-Mat Liner Panels” by CGC Inc. or “Dens Glass Ultra Shaftliner” by Georgia-Pacific Canada, Inc. fabricated specially for gypsum shaftliner and facing boards in lengths up to 3600 mm (12'). Ensure shaftwall system for elevator shafts does not have pointed ends of screws penetrating into shaft.

2.7. ACCESSORIES

2.7.1. Backer Plates:

2.7.1.1. Galvanized steel, 1.214 mm (18 ga) thick minimum, Z275 (G90) zinc coated by hot-dip process, minimum 150 mm (6”) wide x 1.50 mm (6”) thick x lengths to suit size of items to be attached; fastened to studs for attachment of surface mounted fittings and accessories.

2.7.1.2. Elimination of backer plates or direct attachment of accessories or equipment to metal framing will not be permitted.

2.7.2. Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, width equal to track width, with self sticking adhesive on one face, lengths as required.

PART 3 - EXECUTION

3.1. INSTALLATION

3.1.1. General:

3.1.1.1. Non-structural metal framing shall comply with ASTM C754 and product manufacturer’s written requirements.

3.1.1.2. Do not bridge building expansion joints with support system; frame both sides of joints.

3.1.1.3. In double stud walls, do not bridge across the studs on the opposite sides of the wall with gypsum board or metal cross bracing.

3.1.1.4. Place studs vertically at 400 mm (16") oc unless otherwise specified, not more than 50 mm (2") from abutting walls, and at each side of openings and corners. Position studs in tracks. Cross brace studs as required to provide rigid installation.

3.1.1.5. Provide heavy duty double boxed studs at each side of openings to extend in 1 piece from floor to underside of structure above.

3.1.1.6. Thermally separate the metal studs from the exterior concrete or masonry.

3.1.1.7. Provide sufficient clearances between the work of this section and structural elements to prevent the transference of structural loads.

3.1.1.8. Attach backer plates to the framing to support the load of, and to withstand, the withdrawal and shear forces imposed by the items installed upon the work of this section.

3.1.1.9. Install insulating strip under stud shoe tracks of partitions on slabs on grade.

3.1.2. Furring:

3.1.2.1. Shim furring to achieve the required installation tolerances specified in this section.

3.1.2.2. Erect the resilient furring as follows:

3.1.2.2.1. to a maximum of 610 mm (2’-0”) on centre;

3.1.2.2.2. not more than 150 mm (6”) from a ceiling/wall juncture, unless otherwise specified on the drawings;

3.1.2.2.3. secure to the framing support with 25 mm (1”) gypsum board screws;

3.1.2.2.4. with a 150 mm (6”) continuous strip of 13 mm (1/2”) interior gypsum board along the base of the partitions where resilient furring is installed unless otherwise required by resilient furring manufacturer’s written installation requirements.

3.1.2.2.5. with the resilient furring channel transverse to the framing members; and

3.1.2.2.6. with the outer leg of the resilient furring oriented upwards on the partitions.

3.1.3. Suspended and Furred Ceilings:

3.1.3.1. Space the hangers at a maximum of 914 mm (3'-0") on centre along the runner channels and not more than 150 mm (6") from the ends unless otherwise required by engineered shop drawings.

3.1.3.2. Space the runner channels at a maximum of 1,220 mm (4'-0") on centre and not more than 150 mm (6") from boundary walls, interruptions in the continuity; and changes in direction unless otherwise required by engineered shop drawings

3.1.3.3. Run the runner channels transversely to the structural framing members.

3.1.3.4. Lap the members by at least 200 mm (8") and wire each end with two loops where there is splicing.

3.1.3.5. Stagger the splices throughout the framing system.

3.1.3.6. Bend the hanger sharply under the bottom flange of the runner channel and securely wire with a saddle tie to attach to the rod hangers.

3.1.3.7. Erect the cross furring channels transversely across the runner channels at a maximum of 400 mm (1-3.75") on centre except at a maximum of 305 mm (12") on centre at fire rated assemblies.

3.1.3.7.1. Erect the cross furring channels not more than 150 mm (6") from boundary wall openings, interruptions in the ceiling continuity, and changes in direction.

3.1.3.8. Size GWB acoustic spring hangers to suit design loads in accordance with reviewed shop drawings.

3.1.4. Partition Framing Installation

3.1.4.1. Install partition tracks at the floor and underside of the structure.

3.1.4.2. Secure partition tracks to the concrete with screwed or shot fasteners located 50 mm (2") from each end and spaced at a maximum of 610 mm (2'-0") on centre.

3.1.4.3. Extend one (1) runner to the end of the partition corner and butt the other runner to it, minus the clearance for the gypsum board thickness.

3.1.4.4. Place interior studs as follows, unless otherwise Indicated on drawings:

3.1.4.4.1. a minimum of 400 mm (1-3.75") on centre;

3.1.4.4.2. a maximum of 50 mm (2") from abutting walls, abutting openings and each side of corners;

3.1.4.4.3. a minimum of 19 mm (3/4") on centre for the deflection under beams and structural slabs to avoid the transmission of structural loads to the studs, or install 50 mm leg ceiling tracks.

3.1.4.5. Install three studs at the corners and intermediate intersections of the partitions.

3.1.4.6. Extend partition framing above the ceilings to the underside of the structure, unless otherwise Indicated on the drawings.

3.1.4.7. Install chase walls consisting of two parallel steel stud partitions.

3.1.4.8. Install lateral support bracing channels:

3.1.4.8.1. for partitions over 3 m (10'-0") in vertical span;

3.1.4.8.2. at mid-height to a maximum vertical spacing of 2,440 mm (8'-0") on centre;

3.1.4.8.3. with at least one (1) 19 mm (3/4") horizontal bracing channel;

3.1.4.8.4. to extend the full length of the partition; and

3.1.4.8.5. to overlap at least two (2) stud spaces at the ends of the bracing channels.

3.1.4.9. Stiffen partitions a maximum of 150 mm (6”) from the top and bottom of the openings and across two full stud spaces at each side of the openings with a horizontal bracing channel.

3.1.5. Shaft Wall:

3.1.5.1. Construct shaft wall assemblies to provide fire resistance ratings indicated, from both sides, and to maintain airtight seal.

3.1.5.2. Install shaft wall studs at centres to meet design requirements in accordance with manufacturer's instructions or fire rated test design. Provide framing to enclose sides, tops and bottoms of shafts terminating at floor or in ceiling space, to maintain fire rating of shaft assembly.

3.1.5.3. Install shaft wall liner in accordance with manufacturer's instructions at areas where specially designed studs require shaft wall liner panel application as required.

3.1.5.4. Apply continuous sealant around partitions to ensure airtight shaft enclosures. Firestopping and smoke seals at penetrations specified under Section 07 84 00.

3.1.5.5. Where shaft wall height exceeds maximum available panel height, ensure liner panel joints are positioned within upper and lower third points of wall and staggered to prevent continuous horizontal joint.

3.1.5.6. Frame around duct openings through shaft walls with 'J' runners.

3.1.6. Concrete Anchors:

3.1.6.1. Provide anchorage points in reinforced concrete floor slab underside in accordance with gypsum board manufacturer’s written suspension requirements.

3.1.6.2. Provide anchors; minimum installation depth, and method of expansion as recommended by the anchor manufacturer’s written requirements.

3.1.7. Installation Tolerances:

3.1.7.1. Install non-structural metal framing plumb, level, straight, tight and secured, to the following maximum tolerances:

3.1.7.1.1. Plumb and level: 3 mm (1/8") in 3 m (10’-0”).

3.1.7.1.2. Variation from Indicated position: 10 mm (3/8").

3.1.7.1.3. Variation between the planes of abutting edges or ends: 1.5 mm (1/16”)

3.2. FIELD QUALITY CONTROL

3.2.1. Structural Engineer Field Review:

3.2.1.1. Ensure a licensed engineer specified herein inspects work of this Section during erection/installation and submits sealed and signed Field Review Report within 5 Days of site visit..

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide gypsum board assemblies work including but not limited to following:

1.2.1.1. Gypsum board ceilings, partitions, shaft wall, bulkheads and soffits.

1.2.1.2. Corner beads, casing beads, trim, control joints and corner reinforcement.

1.2.1.3. Taping and filling.

1.2.1.4. Sound attenuation batts.

1.2.1.5. Installation of access hatches, panels and doors supplied by other trades in gypsum board walls and ceilings as required.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Grouting of door frames: Section 06 90 00, General Installations.

1.2.2.2. Installation of hollow metal door frames and frame anchors in gypsum board partitions: Section 06 90 00, General Installations.

1.2.2.3. Firestopping, smoke seals and penetration firestopping: Section 07 84 00, Firestopping and Smoke Seals.

1.2.2.4. Erection of steel stud framing and support systems: Section 09 22 16 Non-Structural Metal Framing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CSA: Canadian Standards Association; www.csa.ca.

1.3.1.2. HVAC: Heating, Ventilating and Air Conditioning.

1.3.1.3. OBC: Ontario Building Code.

1.3.1.4. STC: Sound Transmission Class.

1.3.1.5. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.2. Definitions:

1.3.2.1. Shaft Wall Systems: Non-structural metal framing and gypsum board assemblies designed for erection entirely from room side of shaft except for the application of finish layer on shaft side, where required to form an enclosure.

1.3.2.2. Wet Areas: Wet areas as related to non-structural; metal framing shall include showers, janitor rooms, and washrooms.

1.3.3. Reference Standards:

1.3.3.1. ASTM C475/C475M-17 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board

1.3.3.2. ASTM C840-20 - Standard Specification for Application and Finishing of Gypsum Board

1.3.3.3. ASTM C954-18 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

1.3.3.4. ASTM C1178/C1178M-18 - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel

1.3.3.5. ASTM C1396/C1396M-2022 - Standard Specification for Gypsum Board

1.3.3.6. ASTM C1629/C1629M-19 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels

1.3.3.7. ASTM D3273-21 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

1.3.3.8. ASTM E695 -03(2015)e1 - Standard Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading

1.3.3.9. CAN/CGSB-51.33-M89- Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction

1.3.3.10. CAN/ULC-S114-18 - Standard Method of Test for Determination of Non- Combustibility in Building Materials

1.3.3.11. CAN/ULC-S702-14, Standard for Mineral Fibre Insulation for Buildings.

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Sequencing:

1.4.1.1. Coordinate installation and cooperate with mechanical and electrical trades to accommodate mechanical electrical items and any other work required to be incorporated into or coordinated with ceiling and soffit systems.

1.4.1.2. Cooperate and coordinate with Sections applying wet trades and trades installing mechanical and electrical services. Coordinate stud layout at partitions accommodating wall mounted fixtures by other trades.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Shop Drawings:

1.5.2.1. Submit Shop Drawings showing design, construction, control joint layout, sound attenuating construction, adjacent construction, elevations, finishes and relevant details of furring, enclosures and partitions which require fire rating.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Storage and Handling Requirements:

1.7.1.1. No outside storage permitted. Store in clean, dry area, off ground. Provide adequate ventilation to avoid excess moisture, surface relative humidity and mould or fungal growth. Remove immediately any board showing signs of mould, mildew or fungal growth.

1.7.1.2. Stack gypsum board flat on level and dry surface without overhanging boards. Prevent sagging and damage to edges, ends and surfaces. Protect bagged Products from moisture or wetting.

1.8. SITE CONDITIONS

1.8.1. Ambient Conditions:

1.8.1.1. Do not install work of this Section in any area unless satisfied that work in place has dried out and that no further installation of materials requiring wetness, moisture or dampness is contemplated. Ensure relative humidity in area of work of this Section does not exceed 55% for duration of Project.

1.8.1.2. Ensure temperature of surrounding areas is min 13 deg C (55 deg F) and max 21 deg C (70 deg F) for 7 Days before and during application of gypsum board; maintain for 4 Days thereafter. Ensure heat is provided at appropriate time before work has started to bring surrounding and adjacent materials up to required temperature and maintained as specified. Avoid concentrated or irregular heating during drying by means of deflectors or protective screens.

1.8.1.3. Ensure ventilation is provided for proper drying of joint filler and adhesive and to prevent excessive humidity. Do not force dry adhesives and joint treatment.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Bailey Metal Products Ltd.; www.bmp-group.com

2.1.1.2. CertainTeed Corporation; www.certainteed.com

2.1.1.3. CGC Inc; www.cgcinc.com

2.1.1.4. Georgia-Pacific Canada, Inc.; www.gpgypsum.com

2.1.1.5. Roll Formed Specialty; www.rollformed.com

2.1.1.6. Trim-Tex Inc.; www.trim-tex.com

2.2. MATERIALS

2.2.1. Screws for Sheet Steel Members: ASTM C954, self-drilling, self-tapping gypsum board screws, 25 mm (1") long #6 for single layer application, 41 mm (1-5/8") long #7 for double layer application and as follows:

2.2.1.1. For single layer application over steel framing; self-drilling, self-tapping, case hardened, No. 6 contoured Phillips head or Type S bugle head, sized for minimum 15.9 mm (5/8") penetration into steel framing. Ensure fasteners are corrosion resistant. Use drill point screws for abuse resistant gypsum fibre panels.

2.2.1.2. For double layer application over gypsum backing board and existing gypsum board; 38 mm (1-1/2") Type G bugle head. For each additional layer of board, increase length of fasteners proportionally.

2.2.2. Fasteners for Cement Board: Galvanized or coated streaker type screw, 32 mm (1-1/4") long.

2.2.3. Gypsum Board (GB or GWB): Conforming to ASTM C1396/C1396M. Unless indicated otherwise use 1200 mm (4') wide standard facing board in maximum continuous lengths up to 3600 mm (12'), beveled and/or tapered edges to suit design requirements with butted square ends:

2.2.3.1. Gypsum Board (Walls): Provide 15.9 mm (5/8") thick with tapered edges unless otherwise specified as follows:

2.2.3.1.1. Provide 9.5 mm (3/8") thick gypsum board on curved walls.

2.2.3.2. Gypsum Board (Ceiling): Provide 15.9 mm (5/8") thick with tapered edges unless otherwise specified as follows:

2.2.3.2.1. Use anti sag sheets.

2.2.4. Moisture Resistant Gypsum Board (MRGB): ASTM C1658/C1658M, glass mat reinforced, silicone treated core gypsum board, ASTM D3273 with a rating of 10, no mould growth after 4 weeks exposure, 12.7 mm (1/2") or Type X, 15.9 mm (5/8") "DensArmor Plus® High Performance Interior Panel" by Georgia-Pacific Canada, Inc. or "CGC Sheetrock® Brand Glass-Mat Panels Mold Tough®" by CGC Inc.

2.2.5. Fire Rated Gypsum Board having Testing Agency Fire Rating Identification Stamp on Each Sheet: ASTM C1396/C1396M, Type X, 12.7 mm (1/2") and/or 15.9 mm (5/8") thick gypsum board 1200 mm (4') wide, maximum practical length and tapered edge as required by each fire resistance assembly. "Gyproc Fireguard Type X or Type C" by Georgia-Pacific Canada, Inc., "CGC Sheetrock Firecode or Firecode C" by CGC Inc. or "ProRoc Type X or Type C" by CertainTeed Corporation.

2.2.6. Gypsum Board Tile Backer Board: ASTM C1178/C1178M, glass mat reinforced, water-resistant gypsum core board, with a rating of 10 in accordance with ASTM D3273, no mould growth after 4 weeks exposure, 15.9 mm (5/8") thick plain or Type X; "DensShield® Tile Backer" by Georgia-Pacific Canada, Inc. or "CGC Durock® Brand Glass-Mat Tile Backerboard" by CGC Inc. or "GlasRock® Diamondback® Tile Backer" by CertainTeed Corporation.

2.2.7. Abuse Resistant Gypsum Board (ARGB): Provide 1 of following:

2.2.7.1. Enhanced gypsum core encased in heavy duty paper facers on front and back, 15.9 mm (5/8"), conforming to ASTM C1396/C1396M and attaining a maximum of 0.014" as tested to ASTM D4060 (H-18 abrasion wheel, 500 grams, 200 cycles), a maximum of 0.123" indentation as tested to ASTM D5420 (72 in lbs) and a minimum of (133 ft lbs) as tested to ASTM E695 (50 lb bag) and ASTM C1629/C1629M Type X in fire rated assemblies, "ProRoc Abuse Resistant Type X" by CertainTeed Corporation or "CGC Sheetrock® Brand Mold Tough® AR Firecode Core" by CGC Inc.

2.2.7.2. Enhanced gypsum core encased in fibreglass facers on front and back, 15.9 mm (5/8"), conforming to ASTM C1396/C1396M and attaining a maximum of 0.014" as tested to ASTM D4060 (H-18 abrasion wheel, 500 grams, 200 cycles), a maximum of 0.123" indentation as tested to ASTM D5420 (72 in lbs) and a minimum of (133 ft lbs) as tested to ASTM E695 (50 lb bag) and ASTM C1629/C1629M Type X in fire rated assemblies, "DensAmor Plus® Abuse Guard" by Georgia-Pacific Canada, Inc.

2.2.8. Core Board: 25 mm (1") by 600 mm (24") sizes with tongue and grooved edges.

2.2.9. Cement Board (CEM.BD): 13 mm (1/2") thick water-resistant tile backer board, "Durock Cement Board Next Gen" by CGC Inc., "Wonder Board" by Roc-Crete Ltd. or "PermaBase Cement Board" by Unifix Inc.

2.2.10. Dust Barrier: Minimum 0.152 mm (6 mil) polyethylene, CAN/CGSB-51.33-M, Type 2.

2.2.11. Resilient Sponge Tape: Self-sticking adhesive on 1 side, closed cell neoprene sponge tape, "Rubatex®" by Rubatex Corp., "Foamflex # 1220" by Jacobs & Thompson Inc.; www.foamparts.com or "Backerseal™ (Greyflex)™" by Emseal LLC; www.emseal.com.

2.2.12. Laminating Compound: Asbestos-free, as recommended by manufacturer. Manufacturer's standard, multi-purpose construction adhesive, "Sheetrock Brand Laminating Compound" by CGC Inc., "Dehydratine 9T" by Grace Construction Products or "Stangard Foamastic" by Standard Chemicals Ltd. At fire-rated construction, use adhesive which conforms to that used in applicable fire tests.

2.2.13. Joint Tape: Conforming to ASTM C475/C475M, provide following:

2.2.13.1. Regular Gypsum Board: Use either kraft paper joint tape with feathered edges and minute perforations 50 mm (2") wide.

2.2.13.2. MRGB or Cement Board: Use glass fibre tape only, open weave, with pressure sensitive adhesive 1 side, “Durock Cement Board Tape” by CGC Inc.

2.2.14. Joint Fillers and Topping Compound: Either slow or fast setting, low shrinkage type free of asbestos fillers and as recommended by manufacturer. Use “Gyproc 90" by Georgia-Pacific Canada, Inc. or “Durabond 90" by CGC Inc. at exterior soffits.

2.2.15. Sealant for Moisture Resistant Gypsum Board Edges: “Sheetrock Brand W/R Sealant” by CGC Inc., or similar type acceptable to Consultant.

2.2.16. Corner Beads:

2.2.16.1. “PG1 Platinum Square Nose Tape-On Trims” by Bailey Metal Products Ltd. or “Fast Edge” paper by Trim-Tex at corners, reveals, or similar. Provide custom shapes of similar materials and design as noted.

2.2.16.2. Bullnose Corner Bead: “PG1BX Platinum Bullnose Corners” by Bailey Metal Products Ltd. or “Mud Set 350 Bull™ Corner Bead” by Trim-Tex. Include 350 Bull™ Molded Corners & Accessories.

2.2.17. Trim: “PG4 Platinum Tape-On L-Trims” by Bailey Metal Products Ltd.

2.2.18. Rigid Vinyl Inside/Outside Corner Fillets: Rigid vinyl incorporating continuous fins for fastening and gypsum board joint compound filling. Punch fins with staggered holes to facilitate screw securement. Ensure vinyl is primed to accept materials associated with wall finishes. Provide following components:

2.2.18.1. Inside Corner: “R. Bullnose Inside Corner Bead” by Trim-Tex Inc. for 38 mm (1-1/2") radius.

2.2.18.2. Outside Corner: “R. Bullnose Corner Bead” by Trim-Tex Inc. for 38 mm (1-1/2") radius.

2.2.18.3. Splayed Inside Corner: “Inside Splayed R. Bullnose Inside Corner Bead” by Trim-Tex Inc. for 38 mm (1-1/2") radius.

2.2.18.4. Splayed Outside Corner: “Outside Splayed R. Bullnose Corner Bead” by Trim-Tex Inc. for 38 mm (1-1/2") radius.

2.2.18.5. Accessories: Provide “0913, 0914 and 0915" by Trim-Tex Inc. as required.

2.2.19. Flexible Casing Beads: 0.531 mm (25 ga) steel, wipe coated, angle shaped in size to fit over edge of gypsum board, to suit curved applications.

2.2.20. Reveals: “Gordon #312-1/2” by Gordon Incorporated or “STR-050-050" by Pittcon Industries aluminum trim reveal at back of aluminum window insulated panels, mill finish for site painting. Provide following components:

2.2.20.1. Outside Corner:

2.2.20.1.1. “Model SO-9-075" by Pittcon Industries for 19 mm (3/4") radius.

2.2.20.1.2. “Final Forms I, 100 Series, Part No. 134-90" by Gordon Incorporated for 19 mm (3/4") radius.

2.2.21. Reveals:

2.2.21.1. Soffit Shadow Mould: Fry Reglet "W" molding sized to suit soffit finish thickness or equal by Gordon Incorporated.

2.2.22. Control Joints: Pre-fabricated control joints prepared to suit site conditions; “No. 093” by CGC Inc. zinc alloy control joint.

2.2.23. Access Doors and Panels:

2.2.23.1. Supplied as part of Divisions 21, 22, 23, 26, 27 and 28 for installation as part of this Section.

2.2.23.2. Access Panels for Items Other Than Mechanical and Electrical: “N/W Series, Flush Non-Rated Access Panels” by Nystrom Building Products; www.nystrom.com or “DW-5040" by Acudor Products Inc.; www.acudoracornltd.com, sized to suit requirements of other Sections, but minimum size 406 mm x 406 mm (16" x 16") with drywall bead frame and key operated cylinder lock.

2.2.24. Shaft Wall:

2.2.24.1. Shaft wall support framing: refer to Section 09 22 16 Non-Structural Metal Framing.

2.2.24.2. Liner Panels: 25 mm (1") shaft wall liner panels with bevelled edges.

2.2.24.3. Face Boards: 13 mm (1/2") or 16 mm (5/8") thick fire rated gypsum boards.

2.2.25. Sound Control Materials:

2.2.25.1. Sound Attenuation Batts: CAN/ULC-S702, mineral (glass and rock wool) fibre, flame spread and smoke developed in conformance with OBC requirements and other authorities having jurisdiction in accordance with CAN/ULC-S102. Non-combustible in accordance with requirements of CAN/ULC-S114. Acceptable Products: “EcoTouch™ QuietZone® PINK™ FIBERGLAS® Acoustical Insulation” by Owens Corning Canada LP; www.insulation-owenscorning.ca or “Roxul AFB - Acoustical Fire Batts” by Roxul Inc.; www.roxul.com, of sufficient thickness to meet required STC rating for sound-rated partitions and of width to suit metal framing spacing.

2.2.25.2. Strip Impalement Clips: 25 mm (1") wide strip of “Insul-Hold” by Insul-Hold Co., Inc.; www.insulhold.com, fabricated from 0.531 mm (25 ga) galvanized sheet metal in 30 m (100') rolls with punch-out insulation securement arrows. Alternatively, use special studs with punch-out impalement strips.

2.2.25.3. Acoustic Sealant: Single component, non-hardening, non-skinning synthetic rubber sealant; “Tremco Acoustical Sealant” by Tremco Canada; www.tremcosealants.com.

2.2.25.4. Elastomeric Sealant: As recommended by manufacturer of fibre-reinforced gypsum sheathing board.

2.2.25.5. Gaskets: Closed cell neoprene, 3 mm (1/8") thick x 64 mm (2-1/2") wide.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Ensure that services, blocking and supports to be installed in partitions have been installed and inspected before closing in with gypsum board.

3.2.2. Vacuum clean stud track spaces before starting the days installation.

3.3. INSTALLATION

3.3.1. Gypsum Board Application:

3.3.1.1. Provide gypsum board in accordance with manufacturer's written installation instructions and finish to requirements of ASTM C840. Install MRGB on any wall/partition with a paint finish containing a plumbing fixture (i.e. water closets, sinks, tubs, etc.). Install gypsum board tile backer board on any wall/partition requiring a tile finish.

3.3.1.2. Provide metal trim casing bead at junctions with dissimilar materials. Provide reveals at junctions with dissimilar materials where indicated.

3.3.1.3. Provide curved uniform surfaces by wetting or dampening board or scoring back gypsum board and form to profiles indicated. Provide additional screws and framing members to maintain design curve. Apply joint compound and trowel smooth to provide continuous, smooth radius free from flat spots, facets and trowel marks. Allow gypsum boards to dry thoroughly before handling.

3.3.1.4. Provide finished work plumb, level and true, free from perceptible waves or ridges and square with adjoining work.

3.3.1.5. Cut and fit gypsum board to accommodate or fit around other parts of the Work. Provide work of this Section accurately and neatly.

3.3.1.6. Butt gypsum board sheets together in moderate contact. Do not force into place. Place tapered or wrapped edges next to 1 another.

3.3.1.7. Provide gypsum board perpendicular to framing and in lengths that will span ceilings and walls without creating end (butt) joints. If butt joints do occur stagger and locate them as far from centre of walls and ceilings as possible. Accurately fit exposed butt joints together and make edges smooth.

3.3.1.8. Support ends and edges on framing.

3.3.1.9. Fasten gypsum board to metal furring and steel studs with screws. Space screws at 200 mm (8") oc at board edges and 300 mm (12") oc on board field.

3.3.1.10. Gypsum Board - Single Layer:

3.3.1.10.1. Ceilings: Apply gypsum board to metal furring with screws. Erect board with long dimension parallel to supports. Locate end joints over supporting members. Space screws at 200 mm (8") oc.

3.3.1.10.2. Partitions: Apply gypsum board to steel studs with screws. Erect board with long dimension parallel to supports. Locate end joints over supporting members. Locate vertical joints at least 300 mm (12") from jamb lines of openings. Space screws at 200 mm (8") oc at board edges and 300 mm (12") oc on board field.

3.3.1.10.3. Ceiling and Partition Fasteners: Ensure perimeter screws are not less than 9 mm (3/8") nor more than 13 mm (1/2") from edges and ends are opposite screws on adjacent boards. Drive screws with power screw-gun and set with countersunk head slightly below surface of board.

3.3.1.10.4. Joints: Finish all joints unless specified otherwise.

3.3.1.11. Gypsum Board - Double Layer:

3.3.1.11.1. Lay out work to minimize end joints on face layer; to offset parallel joints between face and base layers by at least 250 mm (10") and to apply face layer at right angles to base layer.

3.3.1.11.2. Base Layer: Ensure base layer is same as face layer, or backing board, and applied at right angles to framing members. Secure base layer with screws spaced 300 mm (12") oc to each member. Ensure perimeter screws are not more than 13 mm (1/2") from edges and ends are opposite screws on adjacent boards. Ensure surface of erected base layer is straight, plumb or level and without protrusions before face layer is applied.

3.3.1.11.3. Face Layer: Apply face layer at right angles to base layer with screws.

3.3.1.11.4. Joints: Finish joints in face layers only, unless otherwise required to achieve fire resistant ratings indicated, as hereinafter specified. Ensure setting compound for fire rated construction conforms to requirements of authorities having jurisdiction to obtain fire rating shown on Drawings.

3.3.2. Cement Board Application:

3.3.2.1. Provide cement board in accordance with manufacturer's written installation instructions.

3.3.2.2. Provide finished work plumb, level and true, free from perceptible waves or ridges, square with adjoining parts of Work.

3.3.2.3. Cut and fit as required to accommodate or fit around work of other Sections. Provide work of this Section accurately and neatly. Butt sheets together to moderate contact. Do not force cement boards into place.

3.3.2.4. Where possible apply boards perpendicular to framing and in lengths that will span ceilings and walls. Accurately fit exposed butt joints together and make edges smooth.

3.3.2.5. Support ends and edges on framing.

3.3.2.6. Secure cement board to metal furring and steel studs with special screws recommended by cement board manufacturers.

3.3.2.7. Provide rendering coating to cement board exposed in finished Work and feather coating if applicable to be inconspicuous.

3.3.3. Interior Ceilings:

3.3.3.1. Comply with recommendations of CGC Drywall Steel-Framed Systems Folder 09250-SA 923.

3.3.3.2. Provide hanger wires spaced at maximum 1200 mm (4') oc along carrying channels and within 150 mm (6") of ends of carrying channel runs. Secure hanger wires to inserts in structure above.

3.3.3.3. Provide carrying channels maximum 1200 mm (4') oc and within 150 mm (6") of walls. Secure with hanger wire saddle-tied along channels. Provide 25 mm (1") clearance between runners and walls. Provide splicers behind joints. Level channels to a maximum tolerance of 3 mm (1/8") over 3600 mm (12').

3.3.3.4. Provide metal furring channels at right angles to carrying channels at maximum 600 mm (24") oc and within 150 mm (6") of walls. Provide 25 mm (1") clearance between furring ends and abutting walls. Attach furring channels to carrying channels with saddle-tie of double strand tie wire.

3.3.3.5. Provide additional cross-reinforcing at bulkheads and other openings.

3.3.3.6. Provide ceiling gypsum board, smooth and level. In areas with a high humidity content (ie. Washrooms, janitor closets, etc.) install MRGB.

3.3.4. Metal Trim and Accessories:

3.3.4.1. Provide metal trim casing beads at reveals; at ceiling-wall intersections and partition perimeters; and at intersection of dissimilar constructions such as gypsum board to concrete.

3.3.4.2. Provide metal trim casing beads where gypsum board abutts against a surface having no trim concealing junction.

3.3.4.3. Provide a 13 mm (1/2") separation gasket between metal trim casing beads and window frames or other cold surfaces or provide sponge tape between gypsum board partition or furring framing, where such framing abuts exterior door or window frame, sponge tape between floor and gypsum board partition track. Ensure tape is either full width or 1 strip 9 mm (3/8") wide on each side of framing member.

3.3.4.4. Provide casing bead and sponge tape where gypsum board abuts materials other than itself and acoustic tile ceilings including at exterior door and window frames, where juncture is not concealed with trim; or elsewhere where indicated on Drawings. Unless indicated otherwise, use tape 3 mm (1/8") narrower than casing bead to provide recess at exposed side. Compress tape by 25%.

3.3.4.5. Provide metal trim casing beads where indicated on Drawings.

3.3.4.6. Access Doors and Panels: Install access doors and panels supplied as part of work of Divisions 22, 23 and 26 and where required as part of work of this Section in walls, bulkheads, ceilings and soffits.

3.3.5. Control Joints:

3.3.5.1. Provide either manufactured control joint devices or field fabricated control joints from suitable materials to suit site conditions in accordance with manufacturer's instructions and/or ASTM C840.

3.3.5.2. Set in gypsum facing board, supporting control joints with studs or furring channels on both sides of joint. Ensure double studs with discontinuous tracks and double suspended ceiling furring channels have been installed prior to commencing board and bead application at control joints. Provide control joints as required to prevent cracks at following locations:

3.3.5.2.1. where a partition, wall or ceiling traverses a construction joint (expansion, seismic or building control element) in base building structure

3.3.5.2.2. where a wall or partition runs in an uninterrupted straight plane exceeding 9.1 m (30') (Note: A full height door frame may be considered a control joint).

3.3.5.2.3. interior ceilings with perimeter relief: installed so linear dimensions between control joints do not exceed 15 m (50') and total area between control joints does not exceed 230 m^2 (2,500 sq ft).

3.3.5.2.4. interior ceilings without perimeter relief: installed so linear dimensions between control joints do not exceed 9.1 m (30') and total area between control joints does not exceed 84 m^2 (900 sq ft).

3.3.5.2.5. exterior ceilings and soffits: installed so linear dimensions between control joints do not exceed 15 m (50') and total area between control joints does not exceed 230 m^2 (2,500 sq ft).

3.3.5.2.6. at stress points (ie corners of openings or changes in direction of surfaces).

3.3.5.3. Provide additional control joints at long and narrow surfaces.

3.3.5.4. Provide control joints full height floor to ceiling or door header to ceiling in partitions and furring runs.

3.3.5.5. Provide control joints from wall to wall in ceiling areas.

3.3.5.6. Provide continuous polyethylene dust barrier behind and across control joints.

3.3.5.7. Ensure Consultant reviews exact locations of control joints.

3.3.6. Sound Control:

3.3.6.1. Where indicated on Drawings, provide sound rated partitions and ceiling in locations indicated to meet required minimum STC rating. Apply gypsum board on both sides of sound-proofed partitions. Follow manufacturer's details and recommendations.

3.3.6.2. Provide sound attenuation insulation to completely fill height of stud cavities. Tightly butt ends and sides of blankets within cavities. Cut blankets to fit small spaces. Carefully fit blankets behind electrical outlets, bracing, fixture attachments and mechanical and electrical services.

3.3.6.3. Mechanically fasten blankets to back of gypsum board as recommended by gypsum board manufacturer.

3.3.6.4. At sound attenuating suspended ceiling and enclosures having spring isolator hangers, terminate ceiling or enclosure at adjacent construction by providing continuous isolator strip and sealed joint.

3.3.7. Joint Treatment - Gypsum Board:

3.3.7.1. Verify board is firm against framing members and screw heads are properly depressed.

3.3.7.2. Mix joint compound or ready-to-use compounds according to manufacturer's directions. Use pure, unadulterated, clean water for mixing. Permit mixed material to stand 30 minutes before using. Do not mix more material than can be used within 1 hour. Do not use set or hardened compound. Clean tools and equipment after mixing each batch.

3.3.7.3. Tape and fill joints and corners in accordance with gypsum board manufacturer's printed instructions. Fill either manually, using hand tools of trade, or by a mechanical taping and filling machine of proven efficiency.

3.3.7.4. Remove plastic tape from control joints after finishing with joint compound.

3.3.7.5. After final coats of filler have dried at least 24 hours, sand surface lightly with No. 00 sandpaper to leave it smooth, ready for decoration.

3.3.7.6. Provide finished work smooth, seamless, plumb and true, flush and with square plumb neat corners.

3.3.7.7. Levels of Finish: Provide following levels of finish in accordance with ASTM C840:

3.3.7.7.1. Level 0: No taping, finishing or accessories required for temporary construction or areas where final decoration is not required.

3.3.7.7.2. Level 1: Use this level in plenum areas above ceilings, attics, areas where assembly would generally be concealed or in building service corridors and other areas.

3.3.7.7.3. Level 2: Use this level where water resistant gypsum backing board is used as substrate for tile; may be used in garages, warehouse storage, or other similar areas where surface appearance is not of primary concern.

3.3.7.7.4. Level 3: Use this level in appearance areas which are to receive heavy or medium texture spray or hand applied finishes before final painting or where heavy grade wall coverings are to be applied as final decoration.

3.3.7.7.5. Level 4: Use this level where flat paints, light textures or wall coverings are to be applied.

3.3.7.7.6. Level 5: Use this level to provide a uniform surface and minimize possibility of joint photographing and of fasteners showing through final decoration.

3.3.7.7.7. Exposed Moisture Resistant Gypsum Board Finish: Ensure joints and interior angles have tape embedded in joint compound and 2 separate coats of joint compound applied over all flat joints and 1 separate coat of joint compound applied over interior angles. Cover fasteners heads and accessories with 3 separate coats of joint compound. Ensure surface is smooth and free of tool marks and ridges.

3.3.8. Fire Rated Partitions:

3.3.8.1. Ensure materials for fire rated construction conform to requirements of authorities having jurisdiction to obtain fire rating shown on Drawings. Where dissimilar components are built into fire rated assemblies ensure continuity of fire separation by boxing in elements with

gypsum board and framing to suit authorities having jurisdiction. Work in cooperation with Section providing firestopping work.

3.3.8.2. Provide fire rated enclosures, separations and assemblies as indicated on Drawings conforming to requirements of authorities having jurisdiction.

3.3.8.3. Where required, secure sound attenuation blanket insulation between studs as specified in Article on Sound Control Partitions.

3.3.9. Cutting and Patching: Cooperate and coordinate with other Sections to obtain satisfactory gypsum board finish work. Do cutting, patching and Make Good as required by installation of work of other Sections.

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.5. CLEANING

3.5.1. Clean off beads, casings, joint cement droppings and similar items and remove surplus materials and rubbish on completion and as directed.

3.6. PROTECTION

3.6.1. Provide protection of materials and work of this Section from damage by weather and other causes. Perform work in areas closed and protected from damage due to weather. Protect work of other trades from damage resulting from work of this Section. Make Good such damage immediately.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2008, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide acoustical panel ceilings including but not limited to following:

1.2.1.1. Ceiling suspension systems.

1.2.1.2. Lay-in acoustical ceiling panels.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of “Maintenance Material Form” for receiving extra/spare material for Owner’s future use: Section 00 65 37, Maintenance Material Form (Specimen).

1.2.2.2. Provision of suspended gypsum board ceilings: Section 09 22 16 Non-Structural Metal Framing.

1.2.2.3. Ceiling mounted equipment, patients lights, ceiling brackets for TV and monitor: Division 11, Equipment

1.2.2.4. Provision of mechanical fixtures: Division 21, Fire Suppression, Division 22, Plumbing and Division 23, Heating, Ventilating and Air Conditioning.

1.2.2.5. Provision of electrical, communication and security fixtures: Division 26, Electrical, Division 27, Communications, Division 28, Electronic Safety and Security.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. CAC: Ceiling Attenuation Class.

1.3.1.2. LR: Light Reflectance.

1.3.1.3. NRC: Noise Reduction Co-efficient.

1.3.1.4. OBC: Ontario Building Code.

1.3.1.5. ULC: Underwriters Laboratories of Canada; www.ulc.ca.

1.3.1.6. cUL: Underwriters Laboratories Inc.; www.ul.com.

1.3.2. Reference Standards:

1.3.2.1. ASTM C423-2022 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

1.3.2.2. ASTM C635/C635M-17 - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

1.3.2.3. ASTM C636/C636M-19 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels

1.3.2.4. ASTM E1414/E1414M-2021A - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum

1.3.2.5. CAN/CGSB-92.1-M89 - Sound Absorptive Prefabricated Acoustical Units

1.3.2.6. CAN/ULC-S101-14 REV1 - Standard Methods of Fire Endurance Tests of Building Construction and Materials

1.3.2.7. CAN/ULC-S102-18 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.2.8. CAN/ULC-S702-14 - Standard for Mineral Fibre Thermal Insulation for Buildings

1.4. SUBMITTALS

1.4.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.4.2. Product Data: Submit Product data on ceiling grid system, acoustical panels; clearly indicate specific items proposed for use if manufacturer's catalogues are submitted.

1.4.3. Shop Drawings: Submit Shop Drawings for work of this Section. In addition to minimum requirements indicate following:

1.4.3.1. Reflected plans of ceilings, joint pattern, position of suspension grids, seismic requirements, methods of suspension and termination at walls, partitions, bulkheads, lighting fixtures and mechanical fixtures.

1.4.3.2. Submit reflected ceiling plans detailed in measurement system (e.g. imperial or metric) to match Drawings.

1.4.3.3. Ensure a licensed engineer specified herein is responsible for:

1.4.3.3.1. Production and review of Shop Drawings.

1.4.3.3.2. Sealing and signing each Shop Drawing and any associated calculations performed.

1.4.4. Samples: Submit samples in accordance with Section 01 33 00. Submit following samples in sizes indicated:

1.4.4.1. Submit 300 mm (12") long samples of suspension system parts, including trim and seismic items.

1.4.4.2. Submit 300 mm x 300 mm (12" x 12") samples of acoustical panels.

1.4.5. Certificates:

1.4.5.1. Submit certificate attesting installed acoustical ceiling systems meet fire-resistance ratings required for this Project.

1.4.5.2. Submit independent test data and certificate confirming system meets or exceeds specified NRC rating in accordance with ASTM C423 and CAC rating in accordance with ASTM E1414/E1414M.

1.4.5.3. Submit independent test data and design tables for each type of insert to be employed on this Project for hanger supports.

1.5. CLOSEOUT SUBMITTALS

1.5.1. Operational and Maintenance Data: Submit maintenance instructions to Owner for recommended cleaning materials and methods for panels and trim. Include precautions for use of and composition of cleaning materials detrimental to acoustic materials and trim.

1.6. MAINTENANCE MATERIAL SUBMITTALS

1.6.1. Spare Parts: Leave 2 unopened sealed cartons of each type of ceiling panel specified for Owner's future maintenance use. Supply spare panels from same production run as installed panels.

1.6.2. Execute Section 00 65 37.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7.1.2. Licensed Professionals: Employ a licensed engineer carrying minimum $2,000,000.00 professional liability insurance and is registered in the Province of Ontario.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Delivery and Acceptance Requirements: Deliver materials in original packages, containers and bundles, bearing brand and manufacturer's name and ULC or cUL labels.

1.8.2. Storage and Handling Requirements:

1.8.2.1. Store materials in a covered area, off ground, on flat, smooth, dry surfaces. Protect from moisture. Remove damaged or deteriorated materials from site.

1.8.2.2. Comply with ceiling panel manufacturer's recommendations regarding temperature and humidity conditions before, during and after ceiling installation.

1.9. SITE CONDITIONS

1.9.1. Ambient Conditions: Continuously maintain rooms or areas scheduled to receive acoustical treatment at not less than 21 deg C (70 deg F) and at occupancy humidity, at least 3 Days prior to installation and 3 Days after work is completed. Schedule work to eliminate risk of damage to these materials due to adverse environmental conditions in rooms or areas when and after work is installed.

1.10. WARRANTY

1.10.1. Manufacturer Warranty: Warrant work of this Section for period of 3 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Armstrong World Industries Canada Ltd.; www.armstrongceilings.com

2.1.1.2. Bailey Metal Products Ltd.: www.bmp-group.com

2.1.1.3. CertainTeed Ceilings; www.certainteed.com

2.1.1.4. CGC Inc.; www.cgcinc.com

2.1.1.5. Rockfon; www.rockfon.com

2.1.2. Substitution Limitations: Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification.

2.2. MATERIALS

2.2.1. Description:

2.2.1.1. Regulatory Requirements: Ensure complete ceiling assemblies including panel and suspension system are fire rated and labelled in accordance with ULC Design number noted on Drawings.

2.2.2. Performance/Design Criteria:

2.2.2.1. Design suspension system to support safely and without distortion, superimposed loads of:

2.2.2.1.1. Lighting fixtures.

2.2.2.1.2. Air supply diffusers, boots, fire alarm grilles and exhaust and return air grilles.

2.2.2.1.3. Curtain tracks and window blinds.

2.2.2.1.4. Power grid system, where indicated.

2.2.2.1.5. Suspended Hospital equipment where indicated.

2.2.2.2. Design suspension system to support lighting fixtures according to Ontario Hydro regulations and submit certification in accordance with Rule 30-302 (1).

2.2.2.3. Prepare panels for sprinkler head penetrations and suspension members of curtain tracks.

2.2.2.4. Coordinate installation and cooperate with Mechanical and Electrical Subcontractors, to accommodate mechanical and electrical items, or any other Work required to be incorporated in or coordinated with the ceiling system.

2.2.2.5. Structural Design: Employ a licensed engineer specified herein to:

2.2.2.5.1. design components for work of this Section requiring structural performance.

2.2.2.5.2. be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations.

2.2.2.5.3. design acoustical ceiling system in compliance with seismic requirements for the Place of the Work as determined by authorities having jurisdiction and verified by an independent third party.

2.2.3. Unless otherwise indicated, manufacture ceiling suspension Products to minimum requirements of ASTM C635/C635M, for Medium Duty, modified as required to suit grid design shown.

2.2.4. Exposed Grid System:

2.2.4.1. Factory finished satin white on Z90 (G30) hot dipped galvanized cold rolled steel. Ensure system provides lock joint intersections of cross and main tees

2.2.4.2. 15/16” exposed face

2.2.4.3. Acceptable products: "DONN DX/DXL® Suspension System" by CGC Inc., "Prelude® XL” Exposed Tee System" by Armstrong World Industries, “Chicago Metallic 1200 Seismic” by Rockfon or “15/16” Classic Stab Systems” by CertainTeed Ceilings.

2.2.5. Fire-Rated Exposed Grid System:

2.2.5.1. Acceptable products: “DONN DXL™ Fire-Rated Suspension System" by CGC Inc., “Prelude® XL Fire Guard” by Armstrong World Industries, “Chicago Metallic 1250 Seismic Fire-Front Exposed” by Rockfon or “Protectone® classic Fire-Rated Stab System” by CertainTeed Ceilings, with double web tees, rated to achieve fire rating required for Project.

2.2.6. Basic Steel Material and Finish: Commercial quality cold rolled steel 0.455 mm (26 ga) minimum thickness, galvanized to zinc coating designation Z90 (G30) for normal interior spaces, Z180 (G60) for high humidity spaces and Z275 (G90) for exterior spaces. Ensure exposed surfaces of metal products are factory finished in non-yellowing, low sheen satin white enamel to Consultant’s acceptance to match whiteness in panels. Provide paint formulation of grid system to lighting fixture, speaker grille, sprinkler and diffuser manufacturers to ensure consistency of colour, sheen and texture of all exposed metal components in the ceiling assemblies. Provide slip-on trim mouldings or metal mouldings with baked enamel finish, as standard with grid manufacturer, to trim around light fixtures.

2.2.7. Accessories for Suspension System: Complete with splices, clips and perimeter moulding of manufacturer's standard and aluminum types to suit the applicable conditions unless special conditions and access areas are shown or specified. In high humidity areas provide galvanized suspension system.

2.2.8. Hangers: Minimum 2.642 mm (12 ga) overall thickness galvanized steel wire to zinc coating designation Z275 (G90), meeting "Heavy-duty" classification of ASTM C635/C635M.

2.2.9. Main Tees: 3.66 m (12') long, 23.8 mm (15/16") face width double web design, rectangular bulb at top of web, 38 mm (1-1/2") web height. Expansion cut-outs in main tees controlling buckling caused by heat expansion.

2.2.10. Main Tee Splices: Designed to lock lengths of main tees together so joined lengths of tee function structurally as single unit with tee faces at joint perfectly aligned and presenting tight seam.

2.2.11. Cross Tees: 1220 mm (4') long, 25 mm (1") web height structural cross-section, design same as main tees, designed to connect at main tees forming positive lock without play, loss or gain in grid dimensions with offset over-ride of face flange over main tee flange to provide flush joint. Provide 38 mm (1-1/2") web height of cross-tee for fire rated assemblies.

2.2.12. Edge Moulding Around Ceiling Perimeters: Materials and finish to match tees.

2.2.13. Panel Hold-Down Clips: As recommended by lay-in panel manufacturer.

2.2.14. Inserts for Concrete Slabs: Certified type for setting in concrete or self drilling expansion inserts for placing afterwards. Tie wire anchors, Red Head TW-1614 by ITW Canada, Inc., or Parabolt Wire Anchor by Acrow Richmond, or T-14 Eyebolt by Ramset Ltd., or Tire Wire Drive TW-932 by Isometric Ltd.

2.2.15. Fasteners: Galvanized and of size suited to loading conditions.

2.2.16. Metal Closures and Trim: Bonderized and with factory-applied white baked enamel finish. Provide anchors as standard with manufacturer.

2.2.17. Supplementary Steel Supports: Steel conforming to Section 05 50 00.

2.2.18. Sound Attenuation Batts (Acoustical Ceiling Insulation): CAN/ULC-S702, mineral (glass and stone wool) fibre, flame spread and smoke developed in conformance with OBC requirements and other authorities having jurisdiction in accordance with CAN/ULC-S102. Non-combustible in accordance with requirements of CAN/ULC-S114. Acceptable Products: “EcoTouch™ QuietZone® PINK™ FIBERGLAS® Acoustic Insulation” by Owens Corning Canada LP or “Rockwool AFB - Acoustical Fire Batts” by Rockwool Inc., thickness; 64 mm (2-1/2") except as otherwise noted.

2.2.19. Acoustical Lay-in Panels: CAN/CGSB-92.1-M, acoustical units, prefabricated, with white painted textured and/or smooth face, qualified for use in fire rated ceiling assembly; ULC or cUL labelled and meeting following performance criteria as determined by CAN/ULC-S101 and as specified:

2.2.19.1. Flame Spread Rating: 25 or under to CAN/ULC S102.

2.2.19.2. Smoke Developed:50 or under to CAN/ULC S102.

2.2.19.3. Fire Rating: Class A

2.2.19.4. Acoustical Lay-In Panels (ACT-1):

2.2.19.4.1. Basis of Design: “MARS 80/40 Healthcare”, by CGC:

2.2.19.4.1.1. Item no. 86115

2.2.19.4.1.2. Size: 24” x 24” x 1” th

2.2.19.4.1.3. Edge: Square

2.2.19.4.1.4. Suspension grid: 15/16 in

2.2.19.4.1.5. Colour: 050 Flat White

2.2.19.4.1.6. Light Reflectance: 0.90

2.2.19.4.1.7. Ceiling Attenuation Class (CAC): 40

2.2.19.4.1.8. Noise Reduction Coefficient (NRC): Noise Absorption 0.80

2.2.19.5. Acoustical Lay-In Panels (ACT-2):.

2.2.19.5.1. Basis of Design: “MARS 80/40 Healthcare”, by CGC:

2.2.19.5.1.1. Item no. 88115

2.2.19.5.1.2. Size: 24” x 48” x 1” th

2.2.19.5.1.3. Edge: Square

2.2.19.5.1.4. Suspension grid: 15/16 in

2.2.19.5.1.5. Colour: 050 Flat White

2.2.19.5.1.6. Light Reflectance: 0.90

2.2.19.5.1.7. Ceiling Attenuation Class (CAC): 40

2.2.19.5.1.8. Noise Reduction Coefficient (NRC): Noise Absorption 0.80

2.2.19.6. Acoustical Lay-In Panels (ACT-3):

2.2.19.6.1. Basis of Design: “Clean Room Unperforated”, by CGC:

2.2.19.6.2. Acoustical Lay-In Panels (ACT-3):

2.2.19.6.2.1. Item no. 56099

2.2.19.6.2.2. Size: 24” x 24” x 5/8” th

2.2.19.6.2.3. Edge: Square

2.2.19.6.2.4. Suspension grid: 15/16 in

2.2.19.6.2.5. Colour: 050 Flat White

2.2.19.6.2.6. Light Reflectance: 0.79

2.2.19.6.2.7. Ceiling Attenuation Class (CAC): 35

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Do not start installation until exterior glazing has been completed and exterior openings are closed in. Ensure wet work is completed and dried out to a degree acceptable to panel manufacturer before installation is commenced. Maintain uniform temperatures of at least 21 deg C (72 deg F) for 72 hours prior to commencement of work and maintain temperature until 72 hours after completion.

3.2.2. Install ceiling panels and metal suspension system in accordance with applicable requirements of ASTM C636/C636M, seismic design and manufacturer's directions. Where manufacturer's directions are at variance with Contract Documents, notify Consultant before proceeding with work.

3.2.3. Do not commence installation until all work above suspended ceiling has been completed, inspected and accepted.

3.2.4. Install supporting inserts for hangers of suspended ceiling system into concrete slab above.

3.2.5. Install acoustical ceilings using tradesmen skilled in this class of work, in accordance with manufacturer's instructions and as specified herein.

3.2.6. Neatly and symmetrically install suspended ceiling to true lines, evenly balanced to pattern indicated on Drawings or as directed.

3.2.7. Centre ceiling system on room axis unless otherwise thereon or directed leaving equal border panels not less than 1/2 a full width.

3.2.8. Recessed items shall replace or be centred on acoustical panels, except where shown otherwise. Consult with Mechanical and Electrical to co-ordinate work. Provide additional supports where required.

3.2.9. Space hangers for suspended ceilings to support grillage independent of walls, columns, pipes and ducts at maximum 1220 mm (4') centres along support grillage and not more than 150 mm (6") from ends. Provide additional hangers at light fixtures and diffusers.

3.2.10. Attach hangers to inserts in overhead concrete slab. Bend top of hangers at right angles, turn down and securely fasten. Turn bottom of hangers upwards and securely wrap 3 times.

3.2.11. Suspension to Metal Deck: Punch lower part of metal deck with special puncher at required distances. Put hanger wire through holes, turn down, make a loop and securely wrap 3 times.

3.2.12. Provide written confirmations to Divisions 21, 22, 23, 26, 27 and 28 when requested by Consultant, that suspended ceiling is capable of supporting additional weight of mechanical and electrical fixtures specified in Divisions 21, 22, 23, 26, 27 and 28.

3.2.13. Run main tees at right angles to length of light fixtures.

3.2.14. Space main tees 1220 mm (4') oc in 1 direction and securely tie to hangers.

3.2.15. Space cross tees 610 mm (2') oc at right angles to main tees and properly lock at intersections.

3.2.16. Level suspended systems with a maximum tolerance of 3 mm (1/8") over 3.66 m (12').

3.2.17. Use longest practical lengths of tees, furring and running channels to minimize joints. Make joints square, tight, flush and reinforced with concealed splines. Assemble framework to form a rigid and interlocking system.

3.2.18. Design suspension system to accommodate movement caused by thermal expansion or contraction.

3.2.19. Design and space hangers and carrying members to support entire ceiling system, including lighting fixtures, diffusers and equipment openings in locations indicated on Drawings.

3.2.20. Use edge moulding where ceiling abutts vertical surface.

3.2.21. Use corner moulding along external edges at ceiling steps.

3.2.22. Exposed Grid Lay-in Panel Ceilings:

3.2.22.1. Install direct-hung exposed grid lay-in acoustical panel ceilings where shown. Install main tees, cross tees and wall mouldings so bottom flanges are in flat, level plane at finish ceiling elevations. Arrange grid so opposite wall edge panels are of equal width but not less than 1/2 panel width and lay out and erect grid system to provide following panel pattern as shown:

3.2.22.1.1. Pattern of 610 mm x 1220 mm (24" x 48"), with main beam tees spaced 1220 mm (48") oc and cross tees 610 mm (24") oc unless reviewed otherwise.

3.2.22.2. Install exposed ceiling grid per ASTM C636/C636M, reviewed Shop Drawings and specified herein.

3.2.22.3. Erect main beams parallel to main wall and to each other; space uniformly at centres specified. Stop ends of main beams 13 mm (1/2") from walls allowing for expansion. Supply main beams in as long lengths as possible to minimize number of joints in a run. Join lengths of main beams together at hangers only; use special splice pieces. In ceilings having recessed lighting fixtures, modify grid framing to provide main beams along and parallel to both long sides of lighting fixtures; at each 300 mm (12") wide fixture, provide an additional main beam along the long side of fixture. At other items recessed in ceiling and designed to be framed by main beams, provide additional main beams necessary. Rest ends of main beams on horizontal leg of wall mouldings.

3.2.22.4. Support main beams with hangers along each run, spaced at not more than 1220 mm (48") centres; except in areas of steel framing, provide hangers at each intersection of main beam and framing. If ductwork or equipment located in ceiling plenum area interferes with hanger spacing, provide a trapeze or other arrangement reviewed by Consultant to support main beams at proper spacing. Do not secure hangers to metal roof deck, ductwork, conduit, piping, equipment or support system for any of these. Provide an additional hanger at each corner of each opening to receive a recessed lighting fixture and each opening that has been framed by main beam members. Provide additional hangers at each diffuser, grille and other points of extra loading. Secure hangers to main beams to develop full strength of hangers and per manufacturer's published directions. Secure hangers to construction above per ASTM C636/C636M and following requirements:

3.2.22.4.1. Exposed Concrete Slab: Use anchors, cast-in hanger wires or inserts, specifically designed for hanger use.

3.2.22.4.2. Steel Beams: Use beam clips.

3.2.22.4.3. Steel Joists: Wrap hanger wire around lower chord member.

3.2.22.4.4. Permanent Metal Forms and Cellular Floor Deck: Tabs, holes or slots specifically provided for hanger attachment. Prevent hanger twisting or turning by cross tying.

3.2.22.5. Install primary cross tees at right angles to main beam tees and space uniformly at centres specified. Join ends of cross tees to web of main beams with a positive interlock; except at light fixtures, secure members together with concealed steel clips and bolts. Install tees to produce fine-line joints between flanges of abutting members.

3.2.22.6. Install secondary cross tees at right angles to primary tees and space uniformly at centres specified, and secure in a manner similar to primary tees.

3.2.22.7. At locations where ceilings abut walls, columns and other vertical surfaces, install continuous wall moulding to trim ceiling edges. Install moulding with bottom horizontal leg at elevation required to support acoustical panel and to be flush with bottom flange of grid members, and with vertical leg concealed. Bolt mouldings to supporting construction at 610 mm (24") on centres and within 150 mm (6") of end of each moulding piece. Provide tight, inconspicuous butt joints in moulding if several pieces are required in any 1 run.

3.2.22.8. Install acoustical panels in grid system openings supported by bottom flanges of members. Provide special shapes and sized to provide a complete installation by cutting panels to fit into less than full size openings. Fit panels moderately tight between upright legs of members. Cut panels neatly and accurately to fit closely around items piercing the finish ceiling plane ensuring no “light bleeding” is occurring at light fixtures. Secure each panel into grid opening with concealed hold-down clips.

3.2.23. Fire-Resistance Rated Ceilings: Provide fire-resistance rated ceilings where required, including proper construction of framing and furring and proper thickness of acoustical units, to produce hourly fire-resistance ratings called for. Requirements for materials, methods of erection and application specified under appropriate headings of this Section apply, except where more stringent requirements are defined for particular fire-resistance rating by ULC.

3.3. SITE QUALITY CONTROL

3.3.1. Site Test and Inspection:

3.3.1.1. After interior finishing work has been substantially completed, or when directed by Consultant, inspect acoustical treatment work.

3.3.1.2. Structural Inspection: Ensure a licensed engineer specified herein inspects work of this Section during erection/installation and submits sealed and signed Field Review Report within 5 Days of site visit.

3.3.2. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. CLEANING

3.4.1. Clean exposed surfaces of acoustical panel ceilings, including trim and edge mouldings. Comply with manufacturer's written instructions for cleaning and touch-up of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned or repaired to permanently eliminate evidence of damage.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2008, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide resilient sheet vinyl flooring including but not limited to following:

1.2.1.1. Testing and preparation of substrate.

1.2.1.2. Resilient sheet vinyl flooring complete with coved base.

1.2.1.2.1. Safety Sheet Flooring (SFS)

1.2.1.2.2. Vinyl Sheet Flooring (VF)

1.2.1.3. Reducing strips and thresholds at junction with adjacent architectural finishes.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Filling of major holes, chases and trenches in concrete substrate Flatness and levelness requirements for floor to receive resilient sheet flooring: Section 03 30 00, Cast- In-Place Concrete.

1.2.2.2. Sealant between sheet flooring and penetrating components: Section 07 92 00, Joint Sealants.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. MSDS: Material Safety Data Sheets.

1.3.1.2. RH: Relative Humidity.

1.3.1.3. SCOF: Static Coefficient of Friction.

1.3.2. Reference Standards:

1.3.2.1. ASTM D2047-17 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine

1.3.2.2. ASTM E648-19ae1 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

1.3.2.3. ASTM E662-17a - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

1.3.2.4. ASTM F710-21 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

1.3.2.5. ASTM F970-22 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading

1.3.2.6. ASTM F1869-16a - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

1.3.2.7. ASTM F2170-19a - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs in situ Probes

1.3.2.8. ASTM F3010-18 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings

1.3.2.9. CAN/ULC-S102.2-18 - Standard Test Method for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination: Coordinate installation of resilient sheet vinyl flooring with installation of adjacent materials.

1.4.2. Preinstallation Meeting:

1.4.2.1. Prior to start of work, arrange for Project site meeting of all parties associated with work of this Section, including Contractor, resilient sheet vinyl flooring installer, trade of substrates to which flooring is applied and manufacturer's representative.

1.4.2.2. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of resilient sheet vinyl flooring installation and other matters affecting construction, to permit compliance with intent of this Section. Ensure Division 03 requirements for concrete are compatible with requirements of this Section; floor flatness and floor levelness requirements for various floor finishes and their acceptability by flooring manufacturer; surface texture of finished floor required for various floor finishes; acceptable approaches to remediation of high moisture and high pH floors; adhesive application and floor covering installation.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Shop Drawings: Submit Shop Drawings for all areas showing all seam locations, roll direction, coving details, treatment at walls, floor drains, treatment where flooring meets dissimilar materials and other special conditions.

1.5.3. Samples:

1.5.3.1. Submit samples in accordance with Section 01 33 00.

1.5.3.2. Submit 229 mm x 300 mm (9" x 12") sample pieces of sheet material. Where applicable nosing, feature strips, treads, edge strips and applicable accessories.

1.5.3.3. Submit 152 mm (6") long cove former.

1.5.3.4. Submit 300 mm (12”) samples for welding rod, each type of seam specified, to indicate quality of joint treatment and each type of flooring accessory.

1.5.4. Test and Evaluation Reports: If requested, submit test reports from recognized approved independent testing laboratory for following requirements:

1.5.4.1. Submit calcium chloride test results in accordance with requirements specified herein.

1.5.4.2. Submit pH test results and verify their acceptability to resilient sheet flooring manufacturer in accordance with requirements specified herein.

1.5.4.3. Critical Radian Flux of 0.45 watts per cm^2 or greater, Class I in accordance with ASTM E648.

1.5.4.4. Smoke Generation, Maximum Specific Optical Density of 450 or less in accordance with ASTM E662.

1.5.4.5. SCOF of minimum 0.6 on level surface and 0.8 on ramps in accordance with ASTM D2047.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operating and Maintenance Data: Provide maintenance data for resilient flooring for incorporation into maintenance manual specified in Section 01 77 00. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

1.7. MAINTENANCE MATERIAL SUBMITTALS

1.7.1. Extra Stock Materials:

1.7.1.1. Supply to Owner at completion of job, 1 unopened roll as spare flooring of each colour, packaged in original cartons. Ensure maintenance materials are from same production run as installed materials.

1.7.1.2. Execute “Section 00 65 37, Maintenance Material Form (Specimen)”.

1.8. QUALITY ASSURANCE

1.8.1. Qualifications:

1.8.1.1. Installers: Provide work of this Section executed by competent installers with minimum of 5 years experience in application of Products, systems and assemblies specified, including 2 years in heat welding of seams and with approval and training of the Product manufacturers. Upon request, provide proof of manufacturer’s certificate to Consultant prior to commencement of installation.

1.8.2. Mock-Ups:

1.8.2.1. In coordination with Consultant, Owner, Contractor, Subcontractor, flooring manufacturer and adhesive manufacturer, meet to select and block-off a floor area of approximately 9 m² (100 sq ft). Clean and properly prepare for building a mock-up of resilient sheet vinyl flooring using specified adhesive and floor finish materials in accordance with Specifications, Product instructions and discussions at the meeting. During mock-up area installation, ensure participants are present to observe substrate preparation, installation and cleaning procedures.

1.8.2.2. Ensure pertinent remarks, observations and recommendations are discussed in presence of participants and recorded in minutes of meeting. Contractor shall ensure adequate and complete distribution of minutes.

1.8.2.3. Mock-up floor area, once accepted, including recorded remarks and recommendations of meeting becomes a permanent part of Project and is the standard of workmanship against which balance of resilient sheet flooring work will be judged. Protect mock-up area from dirt, dust, damage and abuse until Substantial Completion of the Work ready for takeover by Owner.

1.8.3. Bond Test:

1.8.3.1. Install multiple bond tests using 900 mm x 900 mm (3’ x 3’) pieces of material adhered with the appropriate adhesive to verify quality of adhesion. Remove half of each piece after 24 hours, then the other half after 48 hours.

1.8.4. Test Reports:

1.8.5. Provide slip resistant sheet vinyl safety flooring in compliance with the following:

1.8.5.1. Americans with Disabilities Act Architectural Guidelines (ADAAG)

1.8.5.2. Occupational Safety and Health Administration (OSHA)

1.9. DELIVERY, STORAGE AND HANDLING

1.9.1. Delivery and Acceptance Requirements:

1.9.1.1. Deliver materials in good condition to site in manufacturer's original unopened containers that bears name and brand of manufacturer, Project identification, shipping and handling instructions.

1.9.1.2. Deliver flooring material in a manner to avoid deterioration, staining or any other damage.

1.9.1.3. Deliver packaged floor preparation and adhesive materials in their original bags or containers clearly identified; keep containers sealed and labels intact until time of use. Prevent damage or contamination to materials by water, moisture, freezing, excessive heat, foreign matter or other causes.

1.9.2. Storage and Handling Requirements:

1.9.2.1. Store and handle flooring material in a manner to avoid deterioration, staining or any other damage.

1.9.2.2. Store packaged floor preparation and adhesive materials in their original bags or containers clearly identified; keep containers sealed and labels intact until time of use. Prevent damage or contamination to materials by water, moisture, freezing, excessive heat, foreign matter or other causes. If materials are frozen, do not stir any such liquids or adhesives until they are completely thawed.

1.9.2.3. Provide secure heated and dry storage facilities on site. Maintain temperature in storage area between 18 deg C (65 deg F) and 38 deg C (100 deg F).

1.9.2.4. Stand rolls on end. Protect and secure rolls from falling.

1.9.2.5. Store materials on site at least 24 hours before work begins.

1.10. SITE CONDITIONS

1.10.1. Ambient Conditions:

1.10.1.1. Maintain appropriate environmental conditions and protect work during and after installation. Comply with trade standards and manufacturer's Product instructions. Follow Product MSDS and label instructions concerning safety, health and other related precautionary and environmental protection. Comply with applicable federal, provincial, local and statutory regulations.

1.10.1.2. Close doors and windows. Turn off radiant floor heating systems and protect work area from direct draft, sun and heat exposure during installation and for at least 72 hours after completion.

1.10.1.3. When necessary, build a temporary shelter and use indirect auxiliary heaters to maintain an adequate temperature level in work environment.

1.10.1.4. Maintain relative humidity in accordance with manufacturer's instructions.

1.10.1.5. Exhaust temporary heaters to building exterior to prevent health hazards and damage to work from toxic fumes and emanations.

1.10.1.6. Maintain temperature of floor covering areas at not less than 18 deg C (65 deg F) or more than 38 deg C (100 deg F) 48 hours before, during installation and for 48 hours after application unless otherwise required in Product instructions.

1.11. WARRANTY

1.11.1. Manufacturer Warranty: Warrant work of this Section against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner

1.11.1.1. Safety Sheet Flooring: 10 years.

1.11.1.2. Vinyl Sheet Flooring:

PART 2 - PRODUCTS

2.1. MATERIALS

2.1.1. Safety Sheet Vinyl Flooring (SFS):

2.1.1.1. Slip Resistance ASTM D2047 0.88 Dry, 1.03 Wet.

2.1.1.2. Thickness 2 mm (0.08”).

2.1.1.3. Roll Width: 2 m (6' 7").

2.1.1.4. Roll Length: 20 m (66').

2.1.1.5. Basis of Design: “Aquarius” by Altro; www.altro.com

2.1.1.6. Colour:

2.1.1.6.1. SFS-1: “Terrapin” AQ12009

2.1.1.6.2. SFS-2: “Abalone” AQ12028

2.1.2. Vinyl Sheet Flooring (VF)

2.1.2.1. Homogenous, sheet vinyl floor covering without backing, comprised of pigments, polymers, and plasticizers that is free from ortho-phthalates, heavy metals, and pesticides. Product shall have a monochromatic or contrast colour chip, or travertine pattern visual. Product will contain a polyurethane, clear specialty performance top layer.

2.1.2.2. Thickness 2 mm (0.08”).

2.1.2.3. Roll Width: 2 m (6' 7").

2.1.2.4. Product shall have the ability to be dry buffed using a single disc, high speed, rotary machine at 1500 RPM and with no additional liquids, pastes or waxes as part of the maintenance or appearance retention process.

2.1.2.5. Basis of Design:

2.1.2.5.1. VF-1: “iQ Eminent” by Tarkett; www.tarkettna.com colour: White 0904

2.1.2.5.2. VF-2: “iQ Eminent Unisense” by Tarkett, colour: Dusty Sand 0928

2.1.3. Accessories:

2.1.3.1. Adhesive:

2.1.3.1.1. Water-resistant reactive adhesives or of types recommended by resilient homogenous flooring manufacturer for specific material on applicable substrate, above, on or below grade.

2.1.3.1.1.1. For resilient sheet flooring: Johnsonite no. 925 Adhesive.

2.1.3.1.2. High Moisture Tolerant Adhesive: “Flextech 720” by Flextile Ltd. or “S-543 Commercial Sheet Flooring & LVT Adhesive” by Armstrong World Industries Canada Ltd. or “Planiseal™ VS” by Mapei Corporation.

2.1.3.1.3. Vinyl Sheet Flooring: “Rollsmart” by Tarkett.

2.1.3.1.4. Safety Sheet Flooring: 2-part polyurethane adhesive, Altroflex 30 by Altro.

2.1.3.2. Weld Rod:

2.1.3.2.1. Solid color vinyl weld rod for heat welding of seams. Color shall be compatible with field color of flooring as selected by Consultant.

2.1.3.2.2. Weld rods shall be able to retain their appearance without any additional weld rod specific maintenance such as seam treatments, seam coatings, or floor finish localized to the seams only.

2.1.3.3. Cove former:

2.1.3.3.1. Semi-rigid PVC cove former - 24 mm (1") radius supplied by the flooring manufacturer, “Cove Former 901” by Altro, or “CFS-000-A Cove Filler Strip” by Johnsonite.

2.1.3.4. Subfloor Filler and Leveler:

2.1.3.4.1. Fast setting, polymer-modified Portland cement based patching compound mixed with either a latex additive or water only depending on substrate conditions and Product instructions. “Self-Leveler Plus” by Mapei.

2.1.3.5. Cap Stip:

2.1.3.5.1. Stainless steel.

2.1.3.6. Metal edge strips:

2.1.3.6.1. Aluminum extruded, smooth, mill finish and polished with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

2.1.3.7. Concrete Moisture Emission Reducer: Provide 1 of following:

2.1.3.7.1. “Flextech™ 4020 Moisture Barrier” by Flextile Ltd.

2.1.3.7.2. “Planiseal™ VS” by Mapei Corporation.

2.1.3.7.3. “Sikafloor® 81 EpoCemCA” by Sika Canada Inc.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions for New Concrete:

3.1.1.1. Ensure new concrete slab has been properly cured and dry for minimum of 28 Days and has reached minimum compressive strength of 25 MPa (3625 psi) and a minimum of 1.5 MPa (218 psi) in tension.

3.1.1.2. Ensure no curing and sealing compounds, hardeners or other chemical additives have been used on concrete.

3.1.1.3. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Preinstallation Testing for all Concrete Floors:

3.1.2.1. Relative Humidity (RH) Testing:

3.1.2.1.1. Perform calcium chloride test no earlier than 28 Days after concrete has been placed in accordance with requirements of ASTM F1869 for existing concrete floors, and in-situ probe RH testing in accordance with ASTM F2170 for new concrete prior to installation of flooring material.

3.1.2.1.2. Conduct 3 tests for each of the RH test methods for first 93 m2 (1000 sq ft) and 1 additional test for every 93 m² (1000 sq ft) of flooring. Ensure moisture emission from concrete floor does not exceed 2.27 kg/93 m² (5 lbs/1000 sq ft) in 24 hours or has a maximum RH of 80%.

3.1.2.1.3. Provide results to Consultant prior to commencement of installation including diagram of area tested showing location of each moisture test.

3.1.2.1.4. When concrete moisture emission rate is between 2.27 kg/93 m² (5 lbs/1000 sq ft) and 6.79 kg/93 m² (15 lbs/1000 sq ft) and in 24 hours use a concrete moisture emission reducer.

3.1.2.1.5. Do not proceed with installation until moisture problem has been corrected.

3.1.2.2. Alkalinity Testing (pH):

3.1.2.2.1. Perform pH test no earlier than 28 Days after concrete has been placed to ensure alkali salt residue is within limitation acceptable to manufacturer and to avoid adhesive failure, discoloration, shrinkage and softening of floor covering. If pH results are higher than 9.0, report to Consultant, Contractor or Owner for investigation and remedial work.

3.1.2.2.2. Perform at least three pH tests must be performed for the first 93 m² (1,000 square feet) of space. One additional test should be performed for each additional 93 m² (1,000 square feet 0 thereafter.

3.1.2.2.3. Refer to manufacturer for ways to neutralize floor prior to beginning of installation. Neutralize by sanding, vacuuming and/or by water plus mild sulfuric or sulfamic acid application as recommended by manufacturer.

3.1.2.2.4. Retest to assure pH has been neutralized.

3.1.2.3. Capillary Moisture Testing:

3.1.2.3.1. Moisture content of concrete substrate must be ≤ 4 % by mass (pbw – part by weight) as measured with a Tramex®CME / CMExpert type concrete moisture meter.

3.1.2.3.2. Before proceeding with application, test surfaces for moisture content in accordance with ASTM D4263 and in consultation with manufacturer to ensure they are suitable for application.

3.1.2.3.3. Provide all test results to Consultant prior to commencement of installation including diagram of area tested showing location of each moisture test, alkalinity test and capillary moisture test.

3.1.2.4. Evaluation and Assessment:

3.1.2.4.1. Report all testing results to manufacturer's representative and submit written acceptance of these results approval before proceeding.

3.1.2.4.2. Commencement of work implies acceptance of previously completed work.

3.1.2.5. If moisture levels exceed acceptable limit, apply moisture emission reducer in accordance with ASTM F710 and ASTM F3010.

3.2. PREPARATION

3.2.1. Surface Preparation:

3.2.1.1. Prepare concrete floors to receive resilient sheet flooring in accordance with requirements of ASTM F710. Consult individual manufacturer for their specific recommendations and follow them as required.

3.2.1.2. Clean subfloor free of residual adhesives, sealer, dust and other foreign matter detrimental to resilient flooring application.

3.2.1.3. Prepare existing and new concrete floors over entire area with steel shot blasting or other method recommended by manufacturer. Remove uneven joints, rough areas, foreign and projection off surfaces. Surface to be hard, sound and roughened to irregular surface with weak concrete removed and surface holes and voids exposed. Equip dry blasting machine with vacuum to minimize dust.

3.2.1.4. Shot blast floor to remove soft material and to achieve a profile equivalent to ICRI / CSP 3 – 4.

3.2.1.5. Shot blast to expose cracks in concrete surface. For cracks lesser than 1.5 mm (1/16") employ crack reinforcing tape in accordance manufacturer's recommendations. Repair cracks, holes or other deficiencies in accordance with manufacturer's recommendations.

3.2.1.6. Blow clean control joints, sawcuts and cracks with compressed air.

3.2.1.7. Apply self-leveler to achieve smooth and flat floor to within 3 mm (1/8") in 3 m (10').

3.2.1.8. Ensure gypsum board backing surfaces for cove bases are free of voids and irregularities. Fill recessed joints with recommended epoxy plaster.

3.3. INSTALLATION

3.3.1. Coved Formed Base Installation:

3.3.1.1. Provide cove former wall base where shown on Drawings, using contact tape in accordance with manufacturer's instructions.

3.3.1.2. Use lengths as long as practicable and not less than 500 mm (20") long.

3.3.1.3. Install straight, level, and tight to face of wall. Scribe and fit to door frames and other obstructions.

3.3.1.4. Taper cove former at door frames to ensure cove radius does not protrude beyond the face of door frame.

3.3.1.5. Mitre external and internal corners to suit site conditions.

3.3.1.6. Roll the cove former using proper small sized hand roller.

3.3.2. Sheet Vinyl Installation:

3.3.2.1. Scribe glue line on walls:

3.3.2.1.1. Where wall protection to be installed, sheet vinyl to extend 50 mm (2") up wall behind the wall protection sheet.

3.3.2.1.2. Where wall protection is not to be installed, install cap strip 150 mm (6") above the floor.

3.3.3. Install resilient sheet vinyl flooring in accordance with manufacturer's written installation procedures and as specified herein. Mix and apply adhesives to manufacturer's written installation procedures.

3.3.4. Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

3.3.5. Install rolls in sequential order following roll numbers on the labels.

3.3.6. Reverse sheets unless instructed otherwise in manufacturer's Instructions.

3.3.7. Lay resilient sheet vinyl flooring using heat seam and welding rod process. Prepare heat welded seams with special tool for this purpose and heat weld with vinyl welding rod in seams. Use method and sequence of work in conformance with approved Shop Drawings and in conformance with manufacturer's recommendations. Finish seams flush and free from voids, recesses and raised areas. Lay flooring (with seams parallel to building lines) to produce a minimum number of seams.

3.3.8. Use "Butterfly Cut" technique at corners.

3.3.9. Border widths minimum 1/3 width of full material. Lay resilient sheet vinyl flooring true, level and with even tight joints. Fit borders accurately as required.

3.3.10. Run sheets parallel to length or width of room as accepted. Double cut sheet joints and continuously seal.

3.3.11. As installation progresses, roll flooring with 45 kg (100 lb) roller or per flooring manufacturer's written recommendations to ensure full adhesion. Keep edges of sheet flooring at seams devoid of extra adhesive.

3.3.12. Where resilient sheet vinyl flooring terminates at exterior doors with thresholds or transition trim, feather flooring as required to achieve maximum allowable distance of 13 mm (1/2") between flooring and top of threshold or transition trim. Extend sheet flooring a minimum of 13 mm (1/2") under threshold and apply sealant to perimeter of threshold.

3.3.13. Cut flooring neatly around fixed objects. Provide borders around permanent fixtures.

3.3.14. Install floor markings where indicated. Fit joints tightly.

3.3.15. Install flooring in pan type floor access covers with recommended adhesive suitable for this specific application. Maintain floor pattern.

3.3.16. Continue flooring over areas which will be under built-in furniture.

3.3.17. Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

3.3.18. Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

3.3.19. Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4.2. Manufacturer Services:

3.4.2.1. To ensure proprietary materials are used in accordance with manufacturer's instructions, ensure manufacturers and/or suppliers furnishing appropriate directions make regular site visits prior to and during construction.

3.4.2.2. Determine number and frequency of such visits through prior agreement between Consultant, Contractor, Subcontractor, resilient sheet vinyl flooring and adhesive manufacturers.

3.4.2.3. Ensure easy access to site by above representatives at all times.

3.4.2.4. Ensure after each visit, manufacturer reports in writing current observations concerning work conditions and progress to Contractor for inclusion into minutes of construction work.

3.4.2.5. Following these observations, ensure any condition or work reported as unacceptable or in non-conformity to trade standard requirements is rectified or removed and replaced at Subcontractor's sole expense and responsibility.

3.5. CLEANING

3.5.1. Remove excess adhesive from floor, base and wall surfaces without damage.

3.5.2. Clean floor and base surface to flooring manufacturer's instructions.

3.6. PROTECTION

3.6.1. Protect installed flooring as recommended by flooring manufacturer against damage from rolling loads, other trades or placement of fixtures and equipment.

3.6.2. Prohibit foot traffic on floor for 24 hours after installation. Prohibit heavy traffic, rolling loads and furniture or appliance placement for a minimum of 72 hours after installation.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide resinous flooring including but not limited to following:

1.2.1.1. Testing and preparation of substrate.

1.2.1.2. Joint fillers

1.2.1.3. Trowel down pigmented high performance chemical resistant resinous flooring systems

1.2.1.4. Urethane topcoat

1.2.1.5. Reducing strips and thresholds at junction with adjacent architectural finishes.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Filling of major holes, chases and trenches in concrete substrate Flatness and levelness requirements for floor to receive resinous flooring: Section 03 30 00, Cast- In-Place Concrete.

1.2.2.2. Concrete curing and finishing: Section 03 35 00 Concrete Finishing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. ACI: American Concrete Institute; https://www.concrete.org

1.3.1.2. ANSI ; American National Standards Institute

1.3.1.3. CSP: Concrete Surface Profile

1.3.1.4. DFT: dry film thickness

1.3.1.5. IRCI: .International Concrete Repair Institute

1.3.1.6. MSDS: Material Safety Data Sheets.

1.3.1.7. RH: Relative Humidity.

1.3.1.8. SCOF: Static Coefficient of Friction.

1.3.1.9. VOC: Volatile Organic Compound.

1.3.1.10. WFT: wet film thickness.

1.3.2. Reference Standards:

1.3.2.1. ANSI A326.3-2021 - American National Standard Test Method For Measuring Dynamic Coefficient Of Friction Of Hard Surface Flooring Materials

1.3.2.2. ASTM C307-18 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing's.

1.3.2.3. ASTM C413-18 - Standard Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

1.3.2.4. ASTM C579-18 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.

1.3.2.5. ASTM C580-02 (2012) - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing's, and Polymer Concretes.

1.3.2.6. ASTM C920-18 - Standard Specification for Elastomeric Joint Sealants

1.3.2.7. ASTM D4263-83(2018) - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

1.3.2.8. ASTM E303-22 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester

1.3.2.9. ASTM F1869-16a - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

1.3.2.10. ASTM F2170-19a - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs in situ Probes

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Ensure that substrate treatments for moisture, repair, or levelling are compatible with the manufacturer of work in this Section.

1.4.2. Preinstallation Meeting:

1.4.2.1. Prior to start of work, arrange for site meeting of parties associated with work of this Section. Presided over by Contractor, include Consultant, Subcontractor, and manufacturer's representative.

1.4.2.2. Review work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials to be used, installation, methods and procedures, quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of this Section. Also discuss following items:

1.4.2.2.1. Surface preparation.

1.4.2.2.2. Priming.

1.4.2.2.3. Application.

1.4.2.2.4. Curing and protection.

1.4.2.2.5. Coordination with other Work.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data:

1.5.2.1. Material List: An inclusive list of required coating materials. Identify each material by manufacturer's catalog number and general classification.

1.5.2.2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.

1.5.2.3. MSDS: Submit Manufacturer's Safety Data Sheet for each Product being used.

1.5.3. Samples: For each type of exposed finish required.:

1.5.3.1. Include samples for review of sheen, color, and texture only.

1.5.3.2. Include a list of materials and application for each coat of each finish sample.

1.5.4. Certificates:

1.5.4.1. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

1.5.4.2. Material Certificates: For each resinous floor coating component, signed by manufacturer.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operating and Maintenance Data: Provide maintenance data for resinous flooring for incorporation into maintenance manual specified in Section 01 77 00. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

1.7. QUALITY ASSURANCE

1.7.1. Applicator Qualifications:

1.7.1.1. Applicators: Use experienced applicators having a record of successful in-service resinous flooring system applications similar in material and extent to those specified in this Section and as follows:

1.7.1.1.1. Applicators must have completed flooring manufacturer’s training program for Products specified.

1.7.1.1.2. Applicators must be licensed, certified or approved in writing by the flooring manufacturer for the Products specified.

1.7.1.2. Applicator Experience: Minimum 5 years’ experience in the application of the type of system specified. Applicator shall submit a list of five (5) projects of similar size, scope and complexity.

1.7.2. Mock-Up:

1.7.2.1. Construct one 10 sq.m. (100 sq.ft.) mock-up of each type and colour of resinous flooring in location acceptable to Consultant to demonstrate quality of finished system, complying with manufacturer's installation instructions and requirements of this Section and in accordance with Division 01 General Requirements.

1.7.2.2. Arrange for Consultant’s review and acceptance, obtain written acceptance before proceeding with Work.

1.7.2.3. Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the Work of this Section. Mock-up shall be left in place for the duration of the Work.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Delivery:

1.8.1.1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number and date of manufacture.

1.8.1.2. Material should be delivered to job site and checked for completeness and shipping damage prior to job start.

1.8.2. Storage:

1.8.2.1. Store materials in accordance with manufacturer’s written instructions.

1.8.2.2. Keep containers sealed until ready for use. Material should be stored in a dry, enclosed, well-ventilated, protected area from the elements.

1.8.2.3. Do not subject material to excessive heat or freezing.

1.8.2.4. Shelf life: Established based on manufacturer's written recommendation for each material being used.

1.8.3. Handling:

1.8.3.1. Protect materials during handling and application to prevent damage or contamination.

1.8.3.2. Condition materials for use accordingly to manufacturer's written instructions prior to application.

1.8.3.3. Record material lot numbers and quantities delivered to jobsite/storage.

1.8.3.4. All materials used shall be pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.9. SITE CONDITIONS

1.9.1. Ambient Conditions:

1.9.1.1. Maintain appropriate environmental conditions and protect work during and after installation. Comply with trade standards and manufacturer's Product instructions. Follow Product MSDS and label instructions concerning safety, health and other related precautionary and environmental protection. Comply with applicable federal, provincial, local and statutory regulations.

1.9.1.2. Close doors and windows. Turn off radiant floor heating systems and protect work area from direct draft, sun and heat exposure during installation and for at least 72 hours after completion.

1.9.1.3. When necessary, build a temporary shelter and use indirect auxiliary heaters to maintain an adequate temperature level in work environment.

1.9.1.4. Maintain relative humidity in accordance with manufacturer's instructions.

1.9.1.5. Exhaust temporary heaters to building exterior to prevent health hazards and damage to work from toxic fumes and emanations.

1.9.1.6. Maintain temperature of floor covering areas at not less than 18 deg C (65 deg F) or more than 38 deg C (100 deg F) 48 hours before, during installation and for 48 hours after application unless otherwise required in Product instructions.

1.10. WARRANTY

1.10.1. Submit Warranty information in accordance with Division 01 General Requirements

1.10.1.1. Submit Applicator's written warranty, signed and issued in the name of Owner warranting the Work of this Section against defects in materials and workmanship for a period of two (2) years from the date of Substantial Performance of the Work.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. BASF; www.master-builders-solutions.basf.com

2.1.1.2. Dur-A-Flex; www.dur-a-flex.com

2.1.1.3. Neogard; www.neogard.com

2.1.1.4. Niagara Protective Coatings; www.niacoat.com

2.1.1.5. R & D Technical Solutions Ltd.; www.kelmar.com

2.1.1.6. Sika Canada Inc.; www.sikacanada.com

2.1.1.7. Tnemec Inc.; www.tnemec.com

2.1.2. Products from manufacturers listed will be considered provided they meet the performance requirements.

2.1.3. Products from manufacturers not listed will not be considered.

2.1.4. Source Limitations: Obtain primary resinous floor coatings through one source from a single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

2.2. DESIGN/PERFORMANCE REQUIREMENTS

2.2.1. Slip Resistance for level surfaces: 0.42 Dynamic Coefficient of Friction (DCOF) rating or greater to ANSI A326.3 or Pendulum Test Value (PTV) of 36 to ASTM E303.

2.2.2. Material Compatibility: Provide primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.2.3. Technical Requirements: Provide resinous flooring system that when cured, produces following physical properties when tested in accordance with standards specified herein:

2.2.3.1. Compressive Strength: Minimum 41 MPa (6,000 psi) when tested to ASTM C579.

2.2.3.2. Tensile Strength: Minimum 10 MPa (1,500 psi) when tested to ASTM C307.

2.2.3.3. Flexural Strength: Minimum 15 MPa (2,200 psi) when tested to ASTM C580.

2.2.3.4. Water Absorption: Maximum 1% when tested to ASTM C413.

2.3. RESINOUS FLOORING MATERIALS

2.3.1. Multi-Coloured Epoxy Resinous Flooring (EF-1): 100% solids, no VOC, no odour; multi-coat trowel system, minimum 6 mm (1/4") total thickness consisting of following:

2.3.1.1. Primer: 2-component epoxy primer.

2.3.1.2. Basecoat: 2-component trowel applied epoxy matrix (clear epoxy resin, coloured quartz silica aggregates).

2.3.1.3. Epoxy Grout Coat: 2 coats epoxy grout.

2.3.1.4. Topcoat: Gloss Satin anti-slip finish; colour: 100.

2.3.1.5. Basis of Design:

2.3.1.5.1. “Sikafloor® Quartzite® Trowel System” by Sika Canada Inc. consisting of:

2.3.1.5.1.1. Primer: “Sikafloor® 156CA Epoxy Primer”.

2.3.1.5.1.2. Basecoat: “Sikafloor® Duochem 9200”.

2.3.1.5.1.3. Epoxy Grout Coat: “Sikafloor® 2002”.

2.3.1.5.1.4. Topcoat: “Sikafloor® 2002 with Sikafloor® Duochem 5206 Epoxy Clear Satin Top Coat with Anti-Slip Aggregate”.

2.3.2. Joint Backing: Preformed, compressible strips of closed cell polyethylene or urethane foam, rubber tubing or non-migrating plasticized vinyl with shore 'A' hardness of 20 and tensile strength between 140 kPa and 200 kPa. Sizes and shapes to suit various conditions, diameter 25% greater than joint width. Compatible with sealant, primer, resinous flooring and substrate.

2.3.3. Joint Sealant: Pour grade, multi-component, polyurethane sealant conforming to ASTM C920, Type M, Grade P, Class 25, Use T, M, A, I and O. Supply 1 of following:

2.3.3.1. “MasterSeal® SL 2™" by BASF.

2.3.3.2. “Sikaflex® 2c SL” by Sika Canada Inc.

2.3.3.3. “THC-900/901 or Vulkem® 245" by Tremco Canada.

2.4. ACCESSORY MATERIALS

2.4.1. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

2.4.2. Crack Reinforcing Tape: Elastic 100% nylon double weave tape that only stretches in 1 direction - sideways. Ensure tape is capable of imparting dimensional strength with elasticity. Ensure tape allows for crack movement. “Crack Reinforcing Tape (CRT)” by R & D Technical Solutions Ltd.

2.4.3. Divider Strips: 'L' shape to required floor thickness, white alloy zinc.

2.4.4. Concrete Moisture Emission Reducer: Provide 1 of following:

2.4.4.1. “Flextech 4010 Moisture Barrier” by Flextile Ltd.

2.4.4.2. “Sikafloor® 81 EpoCemCA” by Sika Canada Inc.

2.4.5. Cove Strips: As recommended by flooring manufacturer.

2.4.6. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated.

2.4.7. Aggregate: Applied per manufacturer’s recommendation rate to meet non-slip requirements in wet areas.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions for New Concrete:

3.1.1.1. Ensure new concrete slab has been properly cured and dry for minimum of 28 Days and has reached minimum compressive strength of 25 MPa (3625 psi) and a minimum of 1.5 MPa (218 psi) in tension.

3.1.1.2. Ensure no curing and sealing compounds, hardeners or other chemical additives have been used on concrete.

3.1.1.3. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Preinstallation Testing for all Concrete Floors:

3.1.2.1. Relative Humidity (RH) Testing:

3.1.2.1.1. Perform calcium chloride test no earlier than 28 Days after concrete has been placed in accordance with requirements of ASTM F1869 for existing concrete floors, and in-situ probe RH testing in accordance with ASTM F2170 for new concrete prior to installation of flooring material.

3.1.2.1.2. Conduct 3 tests for each of the RH test methods for first 93 m2 (1000 sq ft) and 1 additional test for every 93 m² (1000 sq ft) of flooring. Ensure moisture emission from concrete floor does not exceed 2.27 kg/93 m² (5 lbs/1000 sq ft) in 24 hours or has a maximum RH of 80%.

3.1.2.1.3. Provide results to Consultant prior to commencement of installation including diagram of area tested showing location of each moisture test.

3.1.2.1.4. When concrete moisture emission rate is between 2.27 kg/93 m² (5 lbs/1000 sq ft) and 6.79 kg/93 m² (15 lbs/1000 sq ft) and in 24 hours use a concrete moisture emission reducer.

3.1.2.1.5. Do not proceed with installation until moisture problem has been corrected.

3.1.2.2. Alkalinity Testing (pH):

3.1.2.2.1. Perform pH test no earlier than 28 Days after concrete has been placed to ensure alkali salt residue is within limitation acceptable to manufacturer and to avoid adhesive failure, discoloration, shrinkage and softening of floor covering. If pH results are higher than 9.0, report to Consultant, Contractor or Owner for investigation and remedial work.

3.1.2.2.2. Perform at least three pH tests must be performed for the first 93 m² (1,000 square feet) of space. One additional test should be performed for each additional 93 m² (1,000 square feet 0 thereafter.

3.1.2.2.3. Refer to manufacturer for ways to neutralize floor prior to beginning of installation. Neutralize by sanding, vacuuming and/or by water plus mild sulfuric or sulfamic acid application as recommended by manufacturer.

3.1.2.2.4. Retest to assure pH has been neutralized.

3.1.2.3. Capillary Moisture Testing:

3.1.2.3.1. Moisture content of concrete substrate must be ≤ 4 % by mass (pbw – part by weight) as measured with a Tramex®CME / CMExpert type concrete moisture meter.

3.1.2.3.2. Before proceeding with application, test surfaces for moisture content in accordance with ASTM D4263 and in consultation with manufacturer to ensure they are suitable for application.

3.1.2.3.3. Provide all test results to Consultant prior to commencement of installation including diagram of area tested showing location of each moisture test, alkalinity test and capillary moisture test.

3.1.2.4. Evaluation and Assessment:

3.1.2.4.1. Report all testing results to manufacturer's representative and submit written acceptance of these results approval before proceeding.

3.1.2.4.2. Commencement of work implies acceptance of previously completed work.

3.1.2.5. If moisture levels exceed acceptable limit, apply moisture emission reducer in accordance with ASTM F710 and ASTM F3010.

3.2. PREPARATION

3.2.1. Surface Preparation:

3.2.1.1. Prepare concrete floors to receive resinous flooring in accordance with requirements of ASTM F710. Consult individual manufacturer for their specific recommendations and follow them as required.

3.2.1.2. Clean subfloor free of residual adhesives, sealer, dust and other foreign matter detrimental to resinous application.

3.2.1.3. Prepare existing and new concrete floors over entire area with steel shot blasting or other method recommended by manufacturer. Remove uneven joints, rough areas, foreign and projection off surfaces. Surface to be hard, sound and roughened to irregular surface with weak concrete removed and surface holes and voids exposed. Equip dry blasting machine with vacuum to minimize dust.

3.2.1.4. Shot blast floor to remove soft material and to achieve a profile equivalent to ICRI / CSP 3 – 4.

3.2.1.5. Shot blast to expose cracks in concrete surface. For cracks lesser than 1.5 mm (1/16") employ crack reinforcing tape in accordance manufacturer's recommendations. Repair cracks, holes or other deficiencies in accordance with manufacturer's recommendations.

3.2.1.6. Blow clean control joints, sawcuts and cracks with compressed air.

3.2.1.7. Apply self-leveler to achieve smooth and flat floor to within 3 mm (1/8") in 3 m (10').

3.2.1.8. Ensure gypsum board backing surfaces for cove bases are free of voids and irregularities. Fill recessed joints with recommended epoxy plaster.

3.3. INSTALLATION

3.3.1. General:

3.3.1.1. Prepare, mix materials and apply each component of resinous flooring system in accordance with manufacturer's printed directions to produce uniform monolithic wearing surface of thickness indicated for each system, with integral cove bases, uninterrupted except at divider strips, sawn joints or other types of joints required.

3.3.1.2. Apply flooring with care to ensure no laps, pin holes, voids, crawls, skips or other marks or irregularities are visible and to provide uniform appearance.

3.3.1.3. Work coating into corners and other restricted areas, up and over equipment bases and into recesses in floors to ensure full coverage.

3.3.1.4. Make clean true junctions with no visible overlap between adjoining applications of coatings.

3.3.1.5. Match approved sample for colour, sheen, texture and slip resistance.

3.3.1.6. For large areas, stop each Day's production at metal dividing strip at lines reviewed by Consultant.

3.3.2. Trowel Applied Resinous Flooring:

3.3.2.1. Primer: Apply primer over prepared substrate, at manufacturer's recommended spreading rate with timing of application coordinated with subsequent application of basecoat mix to ensure optimum adhesion between resinous flooring materials and substrate.

3.3.2.2. Trowel Applied Epoxy Matrix Basecoat: Combine aggregate to blended epoxy resin to form trowelable mortar. Trowel apply mix over tacky primer in number of coats and at spreading rates required to produce minimum thickness specified. Allow topping to harden minimum time recommended by resinous flooring manufacturer before applying epoxy grout coats.

3.3.2.3. Epoxy Grout Coats: When basecoat has hardened, remove imperfections by lightly abrading surface and vacuum clean. Apply 2 finish coats at spreading rate and following method recommended by manufacturer to achieve 0.254 mm (10 mils) minimum DFT and to obtain specified finish to match reviewed samples. Allow minimum recommended drying time between coats.

3.3.2.4. Topcoat: Apply topcoat in accordance with manufacturer's recommendations to achieve satin anti-slip finish.

3.3.3. Chemical Resistant Resinous Flooring:

3.3.3.1. Primer: Apply primer over prepared substrate, at manufacturer's recommended spreading rate with timing of application coordinated with subsequent application of basecoat mix to ensure optimum adhesion between chemical resistant epoxy resinous flooring materials and substrate.

3.3.3.2. Trowel Applied Epoxy Matrix Basecoat: Combine aggregate to blended epoxy resin to form trowelable mortar. Trowel apply mix over tacky primer in number of coats and at spreading rates required to produce minimum thickness specified. Allow topping to harden minimum time recommended by resinous flooring manufacturer before applying top coat.

3.3.3.3. Topcoat: When basecoat has hardened, remove imperfections by lightly abrading surface and vacuum clean. Apply topcoat at spreading rate and following method recommended by manufacturer to achieve 0.254 mm (10 mils) minimum DFT and to obtain specified finish to match reviewed samples. Allow minimum recommended drying time between coats.

3.3.4. Cove Bases:

3.3.4.1. Terminate base 150 mm (6") high, feather out and trim evenly along wall to provide smooth transition with adjacent wall finish. Ensure top coat is compatible with wall coating prior to application.

3.3.4.2. Round interior and exterior corners.

3.3.5. Thresholds:

3.3.5.1. Where resinous flooring terminates at doorways and difference in height occurs between resinous flooring and other finishes, install tapered aluminum thresholds not less than 25 mm (1") wide and full thickness of difference in level.

3.3.5.2. Where flooring terminates at doorways and difference in height occurs between resinous flooring and other floor finishes, cut back slab for 32 mm (1-1/4") width to allow full thickness of resinous flooring to be flush with adjacent floor finish (chasing).

3.3.5.3. Where resinous flooring terminates at doorways and floor finishes are of same thickness, provide metal divider strips flush with surfaces.

3.3.6. Floor Drains:

3.3.6.1. Slope resinous flooring to drains minimum of 3 mm in 300 mm (1/8" in 12") from furthest surface point.

3.3.6.2. Grind concrete around perimeter to provide 6 mm (1/4") thickness of resinous flooring material which is flush with top of drain and slopes as indicated on Drawings.

3.3.7. Ramps, Stairs and Landings: Provide textured anti-slip finish to surfaces of ramps stairs and landings. Finish stair nosings in accordance with manufacturer's recommendations. Match reviewed sample.

3.3.8. Chasing: Provide chase where resinous flooring does not abut against vertical surface by chiseling out 38 mm (1-1/2") wide chase to straight saw-cut 13 mm (1/2") depth.

3.3.9. Joints: Where substrate is interrupted by isolation, control or expansion joints, provide saw-cut joint in resinous flooring after floor installation. Install backer rod and fill with manufacturer's recommended sealant.

3.3.10. Site Tolerances: Finish resinous flooring surfaces to produce plumb and level floor, or straight where sloped to drains, within tolerance of 3 mm in 3 m (1/8" in 10').

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4.2. Manufacturer Services:

3.4.2.1. Ensure resinous flooring manufacturer representative's presence at pre-construction site meeting and on site Day resinous flooring application is commenced and periodically thereafter, to ensure work is properly performed.

3.4.2.2. Submit field inspection reports.

3.5. CLEANING

3.5.1. Remove promptly as work progresses spilled or splattered resinous flooring materials from adjacent surfaces. Clean resinous floors on completion of Work. Do not mar surfaces while removing splatters.

3.6. PROTECTION

3.6.1. Protect adjacent surfaces from damage resulting from work of this Section. If necessary, cover or mask adjacent surfaces to those receiving flooring including fixtures and equipment.

3.6.2. Erect barriers to prevent entry and presence of workers not performing work of this Section during application of resinous flooring and for 48 hours following completion of application.

3.6.3. Post "No Smoking" signs while work is in progress and curing. Ensure sparkproof electrical equipment is used in areas where inflammable materials are being applied. Prevent use of open flames or equipment that may cause sparks during this phase of work.

3.6.4. Protect completed work from traffic for at least 1 week to allow proper curing of resinous floor finish. Protect work from any trades using area after completion of installation.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide painting including but not limited to following:

1.2.1.1. Surface preparation of substrate: cleaning and preparation of surfaces for application of paint systems.

1.2.1.2. Interior priming and painting of:

1.2.1.2.1. Exposed building surfaces indicated on Room Finish Schedule.

1.2.1.2.2. Metal doors, frames and transom panels.

1.2.1.2.3. Edges of plastic laminated wood doors and trim of lites in same doors.

1.2.1.2.4. Exposed miscellaneous metal and steel items for work of other trades, including hangers, screws, etc., for mechanical and electrical works.

1.2.1.2.5. Gypsum board walls, ceilings, bulkheads and other enclosures.

1.2.1.2.6. Telephone closet backboards.

1.2.1.2.7. Pipe bumpers.

1.2.1.2.8. Access panels and doors.

1.2.1.2.9. Exposed vanity supports.

1.2.1.2.10. Conduit, piping, ductwork, light panels, etc. Exposed to view in areas listed in Room Finish Schedule.

1.2.1.2.11. Natural gas piping in all locations.

1.2.1.2.12. Finish painting of prime painted diffusers, registers and grilles in exposed locations.

1.2.1.2.13. Shop primed materials of other Sections.

1.2.1.2.14. Exposed surfaces of open ceilings including, structure, ducts, mechanical and electrical items, hangers, screws, miscellaneous metals, etc.

1.2.1.2.15. Exposed surfaces behind mechanical louvres and grilles.

1.2.1.2.16. Pipes, conduits, ducts and thermal insulation covers on ducts in rooms where walls and/or exposed ceilings are painted except mechanical/ electrical plant rooms.

1.2.1.3. Provision of materials, labour and equipment required to complete painting work and ancillary work described and implied herein to full intent of Drawings and Schedules.

1.2.1.4. Waste management and disposal of paint, stain and wood preservatives and other related hazardous materials.

1.2.2. Section Excludes: Painting of:

1.2.2.1. Pre-finished metal flashing and similar components. Refer to other sections for special finishes and their effects work of this section.

1.2.2.2. Chrome, stainless steel, vinyl, plastic laminate and aluminum surfaces throughout unless specified otherwise.

1.2.2.3. Wallcoverings unless otherwise noted.

1.2.2.4. Primed and finish painted equipment furnished by manufacturer unless required to be field painted in 1 common corporate colour as identified in room finish schedule.

1.2.2.5. Areas indicated as “unfinished” or “exposed” on room finish schedule.

1.2.2.6. Special finishes for cast-in-place concrete.

1.2.2.7. Sealers over concrete.

1.2.2.8. Shop priming of steel including structural steel, joists and steel decking.

1.2.2.9. Shop priming of metal fabrications and custom metal work.

1.2.2.10. Shop priming and finishing of finish woodwork.

1.2.2.11. Pre-finishing of wood doors and frames.

1.2.2.12. Electrostatic painting (powder coating).

1.2.2.13. Fluoropolymer thermal setting enamels or other organic coatings.

1.2.3. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.3.1. Surface preparation and shop priming of miscellaneous metal work: Section 05 50 00, Metal Fabrications.

1.2.3.2. Priming and/or back painting of wood: Section 06 10 00, Rough Carpentry.

1.2.3.3. Shop priming of steel doors, frames and screens: Section 08 11 13, Steel Doors and Frames.

1.2.3.4. Instructions on painting, stenciling and banding of mechanical and electrical work: Mechanical and Electrical.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. DFT: Dry Film Thickness.

1.3.1.2. MSDS: Material Safety Data Sheets.

1.3.2. Definitions:

1.3.2.1. Exposed: Visible in completed work. In case of closets, cabinets and drawers, it includes their interiors. Exposed surfaces in underground parking areas are considered “Exterior” for purpose of this Specification. Exposed surfaces in aboveground parking areas are considered “Interior” for the purpose of this Specification.

1.3.2.2. Gloss or Sheen: Capacity of a finish on a surface to reflect light at specific angles as tested in accordance with ASTM D523.

1.3.2.3. Hazardous Waste: Construction and demolition materials that are regulated for disposal by local, city, county, province or federal authorities having jurisdiction.

1.3.2.4. Painting: In this Section refers to application of various types of paint, stain, varnishes and lacquers, etc.

1.3.2.5. Surface Preparation: Cleaning or treating of surface to be painted to ensure best possible bond between surface and painting to be applied to surface; remove surface contaminants that will affect performance of painting, without limitations such as oil, grease, salts, dust, dirt, rust, rust scale, mill scale and old coatings where applicable; remove surface imperfections

without limitation including but not limited to such as weld spatter, sharp edges, burrs, slivers, laminations, pits, porosities and crevices; prepare surfaces to provide anchor profile or surface profile which improve mechanical bonding of coating to prepared surface by increasing surface area.

1.3.3. Reference Standards:

1.3.3.1. ASTM D523-14(2018) - Standard Test Method for Specular Gloss

1.3.3.2. CAN/CGSB-85.100-93 – Painting

1.3.3.3. CAN/CGSB-1.500-75 - Methods of Test for Toxic Trace Elements in Protective Coatings

1.3.3.4. SSPC-08 - Systems and Specifications - Steel Structures Painting Manual, Volume 1 & 2

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Preinstallation Meetings:

1.4.1.1. Review Drawings, details and Schedules, determine intent, extent, materials, types of surfaces, locations and be fully cognizant of intent of Work. Review Product literature, MSDS, related safety data, proper disposal requirements and inform those involved in work of this Section.

1.4.1.2. Review Specifications and Drawings for work of other Sections regarding provisions for prime and finish coats and ensure compatibility with each other and substrate prior to application.

1.4.1.3. Prior to start of work, arrange for Project site meeting of parties associated with Work of this Section. Presided over by Contractor include SHN Project Manager, Consultant, Subcontractor, manufacturer’s representative, any sub-trades whose work will be painted (including Mechanical and Electrical trades) or whose work is adjacent to, or whose work or schedule may be affected by work of this Section.

1.4.1.4. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas requiring painting and other matters affecting construction, to permit compliance with intent of this Section.

1.4.2. Scheduling:

1.4.2.1. Schedule painting operations to prevent disruption of and by other trades. Ensure painting is completed for locations requiring application of finishes by other trades in a timely fashion to prevent delays.

1.4.2.2. Carry out painting in accordance with Hospital’s operation requirements. Schedule work so painted surfaces will be dry before occupants are affected. Obtain written authorization from Consultant and SHN Project Manager for changes in work schedule.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data:

1.5.2.1. Submit Product data and a Schedule of Finishes listing manufacturer's Product name, colour, textures, MSDS and test reports requested for each paint system. Submit test reports for odourless, low or zero VOC Products when requested.

1.5.2.2. Painting Subcontractor to receive written confirmation of specific surface preparation procedures and primers used for fabricated steel items from fabricator/supplier to ensure appropriate and manufacturer compatible finish coat materials prior to commencement of painting.

1.5.2.3. Submit Product data for concrete and concrete block primers.

1.5.3. Samples: Submit samples 30 Days before materials are required.

1.5.3.1. Submit following samples in sizes indicated:

1.5.3.1.1. 2 copies of brushouts minimum 200 mm x 250 mm (8" x 10") of each finish including colour, sheen and texture. Identify each sample with job, finish, colour name, number, sheen and gloss values, substrate to be applied to, date and name of Subcontractor.

1.5.3.1.2. sample panels of stain, varnish, lacquer or other wood finish on each species of wood specified, minimum 300 mm (12") square and of specified thickness.

1.5.4. Certificates:

1.5.4.1. Surface Preparation: Submit manufacturer's representative's written approval of surface preparation methods and any specific recommendations for alternative methods.

1.5.5. Site Quality Control Submittals:

1.5.5.1. Submit site instruction reports in accordance with Section 01 30 00 containing information required by this Section.

1.5.5.2. Progress Reports: Arrange to have paint manufacturer's representative inspect work of this Section on a regular basis and prepare weekly job progress reports. Submit copy of reports to Consultant.

1.6. CLOSEOUT SUBMITTALS

1.6.1.1. Operation and Maintenance Data:

1.6.1.1.1. Upon completion of Project, submit a coating maintenance manual, such as Dulux "Project Colour and Product Information" report or equal.

1.6.1.1.2. Ensure manual includes an 'Area Summary' with finish schedule.

1.6.1.1.3. 'Area Detail' designating where each Product/colour/finish was used.

1.6.1.1.4. Product data pages.

1.6.1.1.5. MSDS.

1.6.1.1.6. Care and cleaning instructions, touch-up procedures and colour samples of each colour and finish used.

1.7. MAINTENANCE MATERIAL SUBMITTALS

1.7.1. Extra Stock Materials: Submit to Owner 1 - unopened 4 litre (1 gal) can of each different type and colour and degree of gloss of paint used (batch mix) on this Project for touch-ups. Ensure paint is boxed and in sealed, unopened cans in undamaged condition, with name of manufacturer, contents, type and colour clearly indicated on a label securely adhered to can.

1.7.2. Label each can with locations where product was used.

1.7.3. If paint colour was a mix or custom blend, include complete formulae to achieve the same colour in the future.

1.8. Execute Section 00 65 37.

1.9. QUALITY ASSURANCE

1.9.1. Qualifications:

1.9.1.1. Applicators:

1.9.1.1.1. Execute work of this Section by a firm which has adequate plant, equipment and skilled workers to perform work expeditiously and which is known to have been responsible, during immediate past 5 years, for installations similar to work contained herein. Ensure firm is fully conversant with applicable laws, bylaws, codes, fire, health and safety regulations and other regulations which govern.

1.9.1.2. Mock-Ups:

1.9.1.2.1. Provide mock-up at location established by Consultant, complete with required lighting. Mock-up to establish standard of workmanship, texture, gloss and coverage.

1.9.1.2.2. Apply minimum 300 mm x 300 mm (12" x 12"), or where required, full size mock-up of each finish on each type of surface to be coated with correct material, number of coats, colour, texture and degree of gloss required.

1.9.1.2.3. Provide additional mock-ups of each finish in modified colour, texture or degree of gloss when required, to obtain acceptance.

1.9.1.2.4. Prepare surfaces and apply treatment to galvanized or other components as required for Consultant's review. Do no painting until mock-ups have been accepted.

1.9.1.2.5. Accepted mock-up to become standard of comparison for painting work on site. Correct and refinish work which does not compare with accepted finishes at no expense to Owner.

1.9.1.2.6. Accepted full size mock-up may become integral part of finished work if permitted by Consultant.

1.10. DELIVERY, STORAGE AND HANDLING

1.10.1. Delivery and Acceptance Requirements:

1.10.1.1. Deliver to site, materials manufacturer's original, sealed and labeled containers bearing manufacturer's name, brand name, type of paint or coating and colour designation, degree of gloss, batch number, standard compliance, materials content as well as mixing, reducing and application requirements.

1.10.1.2. Manufacturer to certify, materials delivered to site conform to approved list.

1.10.2. Storage and Handling Requirements:

1.10.2.1. Store on site, materials in manufacturer's sealed and labeled containers.

1.10.2.2. Comply with applicable local fire and building code requirements during storage and application.

1.10.2.3. Store containers of paint, thinner and other volatile materials in secure, well ventilated location, heated to minimum 10 deg C (50 deg F), where they will not be exposed to excessive heat or direct solar radiation. Keep tightly closed when not in actual use.

1.10.2.4. Presence of any unauthorized materials or containers on site is sufficient cause for rejection of paint materials on site at that time.

1.10.2.5. Protect floor and wall surfaces in storage areas from paint drips and splatters.

1.10.2.6. Be totally responsible for prevention of fire or explosion caused by improper storage of paints, solvents, rags and similar items. Store fire hazardous materials in location and in manner approved by local fire authority. Post "No Smoking" signs in areas of storage and mixing and strictly enforce this requirement. Provide and maintain CO_2 fire extinguishers of minimum 9 kg (20 lb) capacity. Repair damage to storage area or surrounding area at no cost to Owner.

1.10.2.7. Where toxic, volatile, explosive, flammable materials are used, provide adequate fireproof storage lockers and take necessary precautions and post adequate warnings (eg “No Smoking” signs) as required.

1.11. SITE CONDITIONS

1.11.1. Ambient Conditions:

1.11.1.1. Paint and finish in clean, dust-free, properly ventilated and adequately lit areas minimum 323 Lx (30 ft candles) on surfaces to be painted or decorated.

1.11.1.2. Provide each paint materials in accordance with manufacturer's recommended tolerances for:

1.11.1.2.1. Substrate Moisture Content: Perform tests with a properly calibrated electronic moisture meter to ensure compliance with manufacturer’s recommendations. Without limitation, maximum moisture content as follows:

1.11.1.2.1.1. Concrete and Concrete Unit Masonry: Maximum 12 - 14% for solvent coatings and as recommended by manufacturer for each water based system.

1.11.1.2.1.2. Gypsum Based Board and Plaster: Maximum 12 - 14%.

1.11.1.2.1.3. Wood: Maximum 15%.

1.11.1.3. Temperature and Ventilation:

1.11.1.3.1. Do not provide paint under ambient and surface temperatures less those required below in any instance for 24 hours before, during and 7 Days after installation.

1.11.1.3.2. Provide ventilation to remove odours, evaporating solvents and moisture. Maintain adequate ventilation at all times to control excessive humidity.

1.11.1.3.3. Interior Paint:

1.11.1.3.3.1. Water Based Paints: Maintain minimum interior surface and ambient air temperature of between 18 deg C (65 deg F) and 32 deg C (90 deg F) during application and drying of paint and maintain until building occupancy occurs.

1.11.1.3.3.2. Solvent Based Paints: Maintain minimum interior surface and ambient air temperature of between 7 deg C (45 deg F) and 35 deg C (95 deg F) during application and drying of paint and maintain until building occupancy occurs.

1.11.1.3.3.3. Do not undertake interior painting on surfaces where condensation has or will form due to presence of high humidity and lack of proper ventilation.

1.12. WARRANTY

1.12.1. Manufacturer Warranty: Warrant work of this Section for a period of 2 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to material and workmanship defects such as: improper cleaning and preparation of surfaces, entrapped dust and dirt, material shrinkage, cracking, splitting and defective workmanship including but are not limited to failure in bubbling, drips, runs, blistering, uneven coverage, misses, poor cutting in and delamination.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer: Dulux Paints mailto:duluxpaints@archway.com products only. No exceptions.

2.2. MATERIALS

2.2.1. Description:

2.2.1.1. Regulatory Requirements:

2.2.1.1.1. Conform to latest edition of Industrial Health and Safety Regulations issued by applicable authorities having jurisdiction in regard to site safety (ladders, scaffolding, ventilation, etc.).

2.2.1.1.2. Comply with more stringent of applicable laws, bylaws, codes, fire regulations, health and safety regulations of authorities having jurisdiction or requirements of this Specification. Ensure standards used for work of this Section are considered a minimum.

2.2.1.1.3. Where required, ensure paints and coatings meet flame spread and smoke developed ratings designated by local code requirements and/or authorities having jurisdiction.

2.2.1.1.4. Comply with toxic trace limitations stipulated by authorities having jurisdiction as tested in accordance with CAN/CGSB-1.500.

2.2.1.1.5. Conform to requirements of local authorities having jurisdiction in regard to storage, mixing, application and disposal of paint and related waste materials.

2.2.2. Performance/Design Criteria:

2.2.2.1. Provide best practices specified or recommended in CAN/CGSB-85.100.

2.2.2.2. Consultant reserves right to refuse any paint or finishing material if in its opinion it is not suitable or adequate for proposed use.

2.2.2.3. Provide paint and finishing materials of highest grade, top quality line of Products from manufacturer. Paint material containers not displaying manufacturer's Product identification will not be acceptable. Ensure paint is not diluted.

2.2.2.4. Use brand of paint chosen throughout work of this Section, except where specified otherwise. As far as practical, factory mix paint for immediate application without thinning or alteration at site.

2.2.2.5. Provide primers in recommended DFT/coat.

2.2.2.6. Only materials (primers, paints, coatings, varnishes, stains, lacquers, etc.) recommended by manufacturer are acceptable for use on this Project.

2.2.2.7. Ensure materials used are lead and mercury free and have low VOC content where possible.

2.2.2.8. Provide paint materials with good flowing and brushing properties and dry or cure free of blemishes, sags, air entrapment, etc.

2.2.2.9. Paint materials which from time to time will become hot, such as convector covers and similar item, a paint type approved by paint manufacturer for particular condition.

2.2.3. Finishes:

2.2.3.1. Colours:

2.2.3.1.1. PT-1: to match Benjamin Moore OC-65 Chantilly Lace.

2.2.3.1.2. PT-2: to match Benjamin Moore 1542 Himalayan Trek.

2.2.3.1.3. PT-3: to match Benjamin Moore CC-630 Backwoods.

2.2.3.1.4. PT-4: to match Benjamin Moore OC-64 Pure White.

2.2.3.2. Gloss Values:

2.2.3.2.1.	Walls:	Satin (G4) or Semi-gloss (G5)
2.2.3.2.2.	Floors:	Semi-gloss (G5) or Gloss (G6)
2.2.3.2.3.	Ceilings:	Flat or Matte (G1)
2.2.3.2.4.	Trim and Doors:	Semi-gloss (G5) or Gloss (G6)
2.2.3.2.5.	Signage:	Flat or Matte (G1)

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Do work only when surfaces and conditions are satisfactory for production of quality work. Report to Consultant in writing any surfaces which are found to be unsatisfactory.

3.1.1.2. Ensure temperature of surfaces to be finished are as required for application of finish. Refer to “Temperature and Ventilation” article specified herein. Ensure surfaces are dry and free of dirt, grease or other contaminants that may affect applied finish.

3.1.1.3. Verify moisture content of surfaces with electronic moisture meter. Do not proceed without written directions if moisture reading is higher than as required for application. Refer to “Ambient Conditions” article specified herein for substrate moisture content requirements.

3.1.1.4. If substrate is steel, do not apply coatings over moisture or when surface temperature is within 3 deg C (5 deg F) of dew point.

3.1.1.5. If substrate is wood, do not stain or paint if moisture reading is higher than 15%. Inspect work to assure surfaces are smooth, free from machine marks and nail heads have been countersunk.

3.1.1.6. If substrate is cast-in-place concrete, allow to cure for 60 to 90 Days before proceeding with priming.

3.1.1.7. If substrate is precast prestressed concrete, inspect and accept or reject filled-in surface blow holes.

3.1.1.8. If substrate is new plaster or masonry, allow to cure for 30 to 90 Days. Ensure moisture content is between 12% and 14% and test for alkalinity and neutralize (pH 6.5 - 7.5) before proceeding with priming.

3.1.1.9. If substrate is gypsum board, inspect to ensure joints are completely filled and sanded smooth. Inspect surfaces for "nail popping", screw heads not recessed and taped, breaks in surface or other imperfections and have repaired as required.

3.1.1.10. Verify each substrate is dry and not frozen and free from tool and sandpaper marks, dust, rust, insects, grease and other foreign matter liable to impair finished work.

3.1.2. Evaluation and Assessment:

3.1.2.1. Prior to commencement of work of this Section, thoroughly examine (and test as required) conditions and surfaces scheduled to be painted and report in writing to Contractor and Consultant any conditions or surfaces that will adversely affect work of this Section.

3.1.2.2. Do not commence painting work until adverse conditions and defects have been corrected and surfaces and conditions are acceptable to this Subcontractor.

3.1.2.3. Commencement of work does not imply acceptance of surfaces except as qualified herein. Surfaces such as concrete, masonry, structural steel and miscellaneous metal, wood,

gypsum board and plaster, is not responsibility of this Subcontractor. Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions:

3.2.1.1. Provide scaffolding, staging, platforms and ladders, as required for execution of work. Erect scaffolding to avoid interference with work of other trades. Comply with Occupational Health and Safety Act.

3.2.1.2. During work of this Section, provide drop cloths, plastic, plywood or metal sheets to protect floors in areas assigned for storage and mixing of paints. Cover finished floors, walls, ceilings and other work in vicinity and protect from paint and damage.

3.2.1.3. Protect work of other trades against paint splattering and Make Good at own expense any such damage.

3.2.1.4. Remove and securely store miscellaneous and finish hardware and surface fittings, electrical switch and outlet covers, receptacle plates, louvres, fittings and fastenings, to protect from paint splatter. Mask items not removable. Use sufficient drop cloths and protective coverings for full protection of floors, furnishings, mechanical, electrical and special equipment, other components of building which do not require painting or to be removed, from paint spotting and other soiling. Carefully clean and re-install items when paint is dry. Clean any components that are paint spotted or soiled. Do not use solvent or reactive cleaning agents on items that will mar or remove finishes (e.g. lacquer finishes).

3.2.1.5. Prohibit traffic, where possible, from areas where painting is being carried out and until paint is cured. Post “wet paint” or other warning signage during and on completion of work. Provide also warning signs at points of entry to areas where painting is applied and drying.

3.2.2. Surface Preparation:

3.2.2.1. Prepare defective surfaces to obtain a satisfactory substrate and in accordance with paint manufacturer's instructions.

3.2.2.2. Prior to painting, wipe down wall surfaces, vacuum clean floors, ensure all surfaces are dust-free.

3.2.2.3. Clean soiled surfaces to be painted.

3.2.2.4. Remove efflorescence, chalk, dust, dirt, oil, grease, rust, form oil, release agents, loose mill scale and other extraneous matter from surfaces.

3.2.2.5. Remove mildew by scrubbing affected area with solution of 150 g (5.3 oz) TSP and 125 g (4.4 oz) bleach in 3.5 ℓ (0.92 gal) water. Rinse well with clean water and allow to dry. If condition is serious, source out finishes with extra mildew resistance.

3.2.2.6. Be responsible for surface preparation to suit surface condition and conform to level of cleaning based on SSPC, recommended metal cleaning procedures most commonly used to suit site conditions.

3.2.2.7. Concrete and Masonry:

3.2.2.7.1. Form Oil Removal: Remove with Xylol or TSP.

3.2.2.7.2. Efflorescence Removal: Remove by dry brushing or washing with 1 part commercial muriatic acid to 20 parts water by volume and thoroughly rince with clean water.

3.2.2.7.3. Mildew Removal: Remove by scrubbing affected area with 1 part sodium hypochlorite to 3 parts water. Where dirt is also evident, add 1.36 kg (3 lbs) TSP to 6.8 ℓ (1.5 gal) of above solution.

3.2.2.7.4. Concrete Vertical Surfaces: Use sand blasting, high pressure water blasting, high pressure water blasting with abrasives, vacuum blasting with abrasives or alternatively, needle guns or power grinders equipped with suitable grinding stone, to remove concrete, loose mortar, fins, projections and surface contaminants. Vacuum or blow down and remove dust and loose particles from surface. Fill large cracks and/or voids in consultation with design engineer using either polyester, epoxy or acrylic resin, block filler or cement sand mixture in accordance with design engineer's written instructions. Fill only flush to surface and allow to set.

3.2.2.7.5. Concrete Block Masonry: Fill voids and cracks in masonry block wall to provide uniform surface for subsequent coats.

3.2.2.8. Metals:

3.2.2.8.1. Ensure application of paint and coatings occurs within appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or manufacturer's paint specifications require earlier applications.

3.2.2.8.2. SSPC-SP 3 (Power Tool Cleaning): Use of power sanders and wire brushes, impact tools, grinders and power chipping hammers to remove loose mill scale, loose rust, paint or other foreign matter. Do not employ power tool cleaning excessively causing burnished mill scale preventing primers to adhere properly.

3.2.2.8.3. Ferrous Metal: Clean to SSPC-SP 1/2/3, to suit site conditions. Remove loose rust and prime bare metal with rust inhibitive steel primer. Touch-up damaged shop applied primer using compatible Product. Provide full coat primer only if damage is extensive. Treat weld areas with phosphoric acid (5% solution).

3.2.2.8.4. Structural Steel/Miscellaneous Steel (previously painted and exposed by alterations work): Remove oil, grease, dirt, rust scale, loose mill scale, loose paint or coating by brush-off blast cleaning to SSPC-SP 7.

3.2.2.8.5. Hot Dipped Galvanized Steel (Unweathered): Allow to weather minimum of 26 weeks and Xylene clean to SSPC-SP 1 specified herein prior to coating to remove dust, dirt, grease, oxides and other foreign material. Remove silicates or similar surface treatments or any deposits of white rust by sanding or similar abrasive methods (bronze wool). Use of acetic acid to prepare galvanized surfaces is not acceptable.

3.2.2.8.6. Galvanized Steel (Weathered): Remove dust, dirt, grease, oxides and other foreign material and clean to SSPC-SP 1 specified herein prior to coating.

3.2.2.8.7. Galvanized Steel (Pre-Treated)(Non-Crystal Appearance): Follow manufacturer's recommendations for preparation, priming and coating of pre-treated galvanized steel.

3.2.2.8.8. Light Zinc Coated or Satin Coated Products (ZF075) mostly found in environmentally controlled areas. Follow manufacturer's recommendations for preparation, priming and coating.

3.2.2.8.9. Heavy Coated Zinc Z275 (G90) for high humidity areas and as specified. Follow manufacturer's recommendations for preparation, priming and coating.

3.2.2.8.10. Metal Doors: Remove doors before painting to paint bottom and top edges and re-hang once dry. Do not paint stainless steel or bronze door butts.

Paint or finish top and bottom edges of doors. Touch-up or refinish tops and edges after fitting.

3.2.2.9. Previously Finished Surfaces:

3.2.2.9.1. Clean existing interior and exterior surfaces to be repainted or varnished to provide bond. Remove rust, scale, oil, grease, mildew, chemicals and other foreign matter. Remove loose paint and fill flush with suitable patching material. Clean off bubbled, cracked, peeling or otherwise defective paint by stripping with suitable environmental strippers or by burning. Do not burn off paints suspected of having lead content. Treat residue from stripping as Hazardous Waste.

3.2.2.9.2. Flatten gloss paint and varnish with sandpaper and wipe off dust. If previous coatings have failed so as to affect proper performance or appearance of coatings to be applied, remove previous coatings completely and prepare substrates properly and refinish as specified for new work.

3.2.2.9.3. Leave entire surface suitable to receive designated finishes and in accordance with finish manufacturer's instructions.

3.2.2.10. Plastics (PVC): Solvent clean to SSPC-SP 1. Sand lightly with No. 120 grit sandpaper and remove dust.

3.2.2.11. Gypsum Board:

3.2.2.11.1. Examine and ensure gypsum board surfaces are without defects or deficiencies and suit able to receive painting applications. Commencement implies acceptance of gypsum board work. Examine surfaces after for imperfections showing through and fill small nicks or holes with patching compound and sand smooth. Examine surfaces after priming for imperfections showing through.

3.2.2.11.2. Clean surfaces dry, free of dust, dirt, powdery residue, grease, oil, wax or any other contaminants.

3.3. APPLICATION

3.3.1. Safety Precautions: When handling solvent coating materials, wear approved vapour/particulate respirator as protection from vapours. Dust respirators do not provide protection from vapours.

3.3.2. Material Compatibility: Provide primers and finish coat materials compatible with each other and substrate including fillers.

3.3.3. Mixing and Tinting:

3.3.3.1. Unless otherwise specified herein or pre-approved, paint to be ready and factory tinted. Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment and colour and gloss uniformity.

3.3.3.2. Mix and prepare paint materials including paste, powder or catalyzed paint mixes in accordance with manufacturer’s directions for particular material and coat to be applied to produce a mixture of uniform density. If reducing is required, do so in accordance with recommendations of manufacturer for particular material and coat.

3.3.3.3. Where thinner is used, addition is not to exceed manufacturer’s recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.

3.3.3.4. Mix primer-sealer with a certain amount of colour coat in proportions recommended by manufacturer of material actually used. Tint undercoats and each finish coat with correct type colours, for identification of each succeeding coat.

3.3.3.5. Thoroughly mix materials before application. Apply materials evenly, under adequate illumination, free from sags, runs and other defects. Do cutting-in neatly.

3.3.3.6. Thin paint for spraying in accordance with manufacturer's instructions. Obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

3.3.4. Obtain colour chart giving colour schemes and gloss value for various areas from Consultant. Ensure colour chart gives final selection of colours and surface textures of finishes and whether finishes are transparent (natural) or opaque (paint).

3.3.5. Provide finish uniform in sheen, colour and texture, free from streaks, shiners and brush or roller marks or other defects.

3.3.6. Apply materials in accordance with manufacturer's directions and specifications paying particular attention to appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or manufacturer's paint specifications require earlier applications. Do not use adulterants. Do any reduction of coating's viscosity in accordance with manufacturer's directions.

3.3.7. Use up paints within period of shelf life recommended by paint manufacturer.

3.3.8. Ensure successive coatings are harmonious chemical compositions and materials of same manufacturer.

3.3.9. Sand and dust between each coat to provide an anchor for next coat and to remove defects visible from a distance up to 1 m (39").

3.3.10. Ensure each coat is dry and hard before a following coat is applied.

3.3.11. Continue through paint finish behind wall-mounted items (e.g. chalk and tack boards).

3.3.12. Finish listed surfaces indicated on Room Finish Schedule(s) and/or noted on Drawing(s) and as specified. Refer to Finish Room Schedule for type, location and extent of finishes required and include touch-ups and field painting necessary to complete work shown, scheduled or specified.

3.3.13. Finishes and number of coats specified in Room Finish Schedule are intended as minimum requirements guide only. Refer to manufacturer's recommendations for exact instructions for thickness of coating to obtain optimum coverage and appearance. Some materials and colours may require additional coats and deeper colours may require use of manufacturers' special tinted primers.

3.3.14. Paint entire plane of areas exhibiting incomplete or unsatisfactory coverage and of areas which have been cut and patched. Patching is not acceptable. Vary each coat slightly in successively darker tones to permit supervision identity.

3.3.15. Do not paint baked paint surface, chrome plated, stainless steel, aluminum or other surfaces finished with final finish in factory. Finish paint primed surfaces.

3.3.16. Advise Consultant when each applied paint coat can be inspected. Do not recoat without inspection. Tint each coat slightly to differentiate between applied coats.

3.3.17. Apply additional paint coats, beyond number of coats specified for any surface, to completely cover and hide substrate and to produce a solid, uniform appearance.

3.3.18. Apply primer coat soon after surface preparation is completed to prevent contamination of substrate.

3.3.19. Primer/Sealers: Apply primer-sealer coats by brush or roller. Permit to dry in accordance with manufacturer's recommendations before applying succeeding coats. Touch up suction spots and sand between coats with No. 120 sandpaper.

3.3.20. Metals:

3.3.20.1. Apply primer coat to unprimed ferrous metal surfaces. Where sandblast preparation is specified, apply specified primer immediately after blast cleaning.

3.3.21. Woodwork:

3.3.21.1. Fill open grain woods with filler tinted to match wood and work well into grain. Wipe excess from surface before filler sets.

3.3.21.2. Sand smooth paint and varnish undercoats prior to recoating.

3.3.21.3. Prime woodwork designated for painting as soon as possible after delivery to site and before installation. Prime cut surfaces, whether exposed or not, i.e. 6 edges of wood doors, before installation. Prime cut surfaces of woodwork to receive transparent finish with 1 coat of transparent finish reduced 25% or as directed by manufacturer.

3.3.21.4. Apply final coats on smooth surfaces by roller or brush. Hand brush wood trim surfaces.

3.3.22. Allow each coat of paint to cure and become dry and hard before application of succeeding coats (unless manufacturer's directions require otherwise).

3.3.23. Before finishing paint coats are applied, inspect and touch-up shop coats of primers previously applied by other trades or fabricators.

3.3.24. Provide paint coating thicknesses indicated, measured as minimum DFT.

3.3.25. Apply a minimum of 4 coats of paint where deep or bright colours are used to achieve satisfactory results.

3.3.26. Ledges: Finish projecting ledges, both above and below sight lines, as specified for adjacent surfaces.

3.3.27. Light Coves: Paint light coves white whether a light lens is installed or not, unless otherwise indicated.

3.3.28. Interior Columns: Finish interior columns same as walls of room unless otherwise indicated.

3.3.29. Existing Spaces:

3.3.29.1. Refinish existing surfaces of rooms or areas which have been damaged, altered or otherwise affected by work. Also finish "new" work occurring thereon unless otherwise specified. Use same procedure as for new work but primer (or filler, stain and sealer in case of varnish finish) may be omitted. Prepare existing surfaces as specified herein. Ensure finish matches previous finish.

3.3.29.2. Paint or repaint rooms or areas where noted on Room Finish Schedule and/or as indicated on Drawings.

3.3.29.3. Repaint surfaces entirely between changes of plane.

3.3.29.4. Use finish coat of respective new surface paint system for minor repair of existing finishes. Use system primer where existing finishes are damaged down to bare surface.

3.3.29.5. Extend painting to a suitable boundary to avoid a “patched” effect. Sand, wire-brush, or scrape such existing finished surfaces to remove loose paint and to reduce gloss. Also clean existing films of dirt, grease or wax. If metallic surfaces are rusted, remove loose scale to provide a firm surface. Patch and sand cracks and other imperfections.

3.3.29.6. Provide paint to interior existing spaces effected by alterations in accordance with following:

3.3.29.6.1. Paint walls to nearest inside and outside corners for full wall height.

3.3.29.6.2. Paint columns floor to ceiling.

3.3.29.6.3. Paint full ceilings to nearest wall or bulkhead.

3.3.29.6.4. Unless indicated otherwise match existing colour.

3.3.29.6.5. Where Room Finish Schedule indicates existing and/or new wall finishes to be painted, existing surfaces such as, existing door and frames, mechanical supply and return air grilles (both on walls and ceilings), access doors and electrical panels which have been previously painted to be painted for a complete finish room. If Room Finish Schedule indicates “-” it denotes entire room need not be painted, paint only patched area.

3.3.29.7. Example Locations:

3.3.29.7.1. Pressed steel frames.

3.3.29.7.2. Hollow metal doors.

3.3.29.7.3. Access doors and frames.

3.3.29.7.4. Hose cabinets.

3.3.29.7.5. Miscellaneous exposed interior metal work.

3.3.30. Mechanical and Electrical Services:

3.3.30.1. Co-ordinate painting of mechanical and electrical equipment, piping, conduit, system Identification with appropriate Mechanical and Electrical Specification Sections. Unless otherwise specified or noted, paint “unfinished” conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and texture to match adjacent surfaces, in following areas:

3.3.30.1.1. Where exposed-to-view in exterior and interior areas.

3.3.30.1.2. In interior high humidity interior areas.

3.3.30.1.3. In mechanical and electrical rooms.

3.3.30.2. Read Divisions 21, 22, 23, 26, 27 and 28 for their requirements and further instruction on painting Mechanical and Electrical work and perform such work under supervision of respective Mechanical and Electrical Divisions.

3.3.30.3. Finish paint primed mechanical equipment: heaters, convectors, radiators, wall fin perimeter induction units, fan coil units and similar items. Ensure use of heat resistant paint on surfaces where operating surface temperature will exceed 65 deg C (150 deg F).

3.3.30.4. Prime and paint exposed, unfinished electrical raceways, fittings, outlet boxes, junction boxes, pull boxes and similar items.

3.3.30.5. Take steps to protect gauges, identification plates and similar items from being painted over or paint splattered.

3.3.30.6. Remove grilles, covers, access panels for mechanical and electrical systems from installed location and paint separately, if these items are not factory finished. Paint adjacent surfaces after removal and reinstall when surfaces are dry.

3.3.30.7. Paint work to match surfaces they are seen against unless directed otherwise.

3.3.30.8. Paint interior surfaces of air ducts visible through grilles and louvres, with 1 coat of flat black metal paint to limit of sight line.

3.3.30.9. In unfinished areas leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

3.3.30.10. Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

3.3.30.11. Do not paint over nameplates.

3.3.30.12. Paint behind louvres grilles and diffusers for minimum of 460 mm (18”) or beyond sight line, whichever is greater, to be painted with primer and 1 coat of matt black (non-reflecting) paint.

3.3.30.13. Paint each surface inside of light valances.

3.3.30.14. Paint disconnect switches for fire alarm system and exit light systems in red enamel.

3.3.30.15. Paint or band fire protection piping and sprinkler lines in accordance with mechanical requirements. Keep sprinkler heads free of paint.

3.3.30.16. Paint yellow or band natural gas piping in accordance with mechanical requirements.

3.3.30.17. Back prime and paint face and edges of plywood service panels for telephone and electrical equipment before installation to match adjacent wall surface. Leave equipment in original finish except for touch-up as required and paint conduits, mounting accessories and other unfinished items.

3.4. SITE QUALITY CONTROL

3.4.1. Site Tests and Inspections:

3.4.1.1. Provide and coordinate site inspection service by manufacturer's representative in advance of work commencing and during progress of work to ensure correct use and application of each specified material. Manufacturer's representative to review and submit approval of surface preparation methods in Specifications or obtain specific recommendations for alternative methods. Report such conditions to Consultant.

3.4.1.2. As work progresses and upon completion of work, submit written reports and manufacturers' confirmation that materials and application methods conform to manufacturers' requirements.

3.4.1.3. Inspect surfaces, preparation and paint applications.

3.4.2. Non-Conforming Work:

3.4.2.1. Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction to Consultant at no cost to Owner. Touch up small affected areas, repaint large affected areas or areas without sufficient DFT of paint. Remove runs, sags of damaged paint by scraper or by sanding prior to application of paint.

3.4.2.2. Following are considered non-conforming qualities:

3.4.2.2.1. Lack of Uniformity:

3.4.2.2.1.1. Brush/roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas and foreign materials in paint coatings.

3.4.2.2.1.2. Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.

3.4.2.2.1.3. Damage due to touching before paint is sufficiently dry or any other contributory cause.

3.4.2.2.1.4. Damage due to application on moist surfaces or caused by inadequate protection from weather.

3.4.2.2.1.5. Damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).

3.4.2.2.2. Aesthetic Problems: If following are evident under final lighting source (including daylight) for interior surfaces:

3.4.2.2.2.1. Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 1 m (39").

3.4.2.2.2.2. Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 1 m (39").

3.4.2.2.2.3. Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.

3.4.2.2.2.4. When final coat on any surface exhibits a lack of uniformity of colour, sheen, texture and hiding across full surface area.

3.5. CLEANING

3.5.1. Keep waste rags in covered metal drums containing water and remove from building at end of each Day. Remove other combustible rubbish materials and empty paint cans each Day from site and safely dispose of same in accordance with requirements of authorities having jurisdiction.

3.5.2. Clean equipment and dispose of wash water/solvents as well as other cleaning and protective materials (e.g. rags, drop cloths, masking papers, etc.), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction.

3.5.3. Clean containers used for storage, mixing and application of materials free of foreign materials and residue.

3.5.4. Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

3.5.5. Clean adjacent surfaces which have been painted, soiled or otherwise marred. Remove spilled, splashed, splattered or sprayed paint as work progresses using means and materials that are not detrimental to affected surfaces.

3.5.6. Remove masking and other protection provided under this Section.

3.5.7. Remove temporary protective wrappings provided by others for protection of work after completion of painting operations unless instructed otherwise.

3.5.8. Painting work will not be considered complete until spatters, drippings, smears and overspray have been cleaned and removed to satisfaction of Consultant.

3.5.9. Make Good any damage to structure building surfaces or furnishings resulting from painting operations at no cost to Owner.

3.5.10. Waste Management:

3.5.10.1. Dispose paint waste in accordance with local regulations.

3.5.10.2. Set aside and protect surplus and uncontaminated finish materials not required by Owner and deliver or arrange collection for verifiable re-use or re-manufacturing.

3.6. ATTACHMENTS

3.6.1. INTERIOR FINISH SCHEDULE:

3.6.1.1. Concrete Vertical Surfaces:

3.6.1.1.1.1. 1 coat primer alkali resistant water based: Dulux Gripper Universal Acrylic Primer/ Sealer code 60000A

3.6.1.1.1.2. 2 coats latex: Dulux Lifemaster code 59311

3.6.1.1.1.3. Finish: Eggshell.

3.6.1.2. Concrete Masonry Units (CMU's): (concrete block and concrete brick):

3.6.1.2.1.1. 1 coat latex block filler: Dulux X-Pert Acrylic

3.6.1.2.1.2. 2 coats latex: Dulux Lifemaster code 59311

3.6.1.2.1.3. Finish: Eggshell.

3.6.1.3. Structural Steel and Metal Fabrications: (columns, beams, joists, etc.):

3.6.1.3.1. Steel and Metal Fabrications (with existing shop coat primer) - Unexposed: No further finishing required except for touch-up of damaged surfaces.

3.6.1.3.1.1. 1 coat quick dry metal primer: PPG Pitt-Tech Plus EP WB Acrylic Primer

3.6.1.3.1.2. 2 coats quick dry enamel: PPG HPC Alkyd Industrial Semi-Gloss Enamel code 4336H

3.6.1.3.1.3. Finish: Semi-Gloss.

3.6.1.4. Galvanized Metal (Not Chromate Passivated): (High contact/high traffic areas (doors, frames, railings, pipes, etc.) low contact/low traffic areas (overhead decking, pipes, ducts, etc.):

3.6.1.4.1.1. 1 coat waterborne primer: PPG Pitt-Tech Plus EP WB Acrylic Primer

3.6.1.4.1.2. 2 coats latex: Dulux acrylic eggshell code 14220

3.6.1.4.1.3. Finish: Eggshell

3.6.1.5. Structural Steel, : (underside roof deck, OWSJ, beams):

3.6.1.5.1.1. 2 coats latex dry fall: Spraymaster Latex Dryfall code 10113 or PPG Speedhide Super Tech WB Interior Flat Latex Dry-Fog code 6-723XI

3.6.1.5.1.2. Finish: Flat

3.6.1.6. Gypsum Board:

3.6.1.6.1. 1 coat latex primer sealer: Dulux X-Pert code 11000

3.6.1.6.2. 2 coats latex:

3.6.1.6.2.1. Walls: Dulux Lifemaster code 59311

3.6.1.6.2.1.1. Finish: Eggshell

3.6.1.6.2.2. Ceilings: Dulux Lifemaster code 59111

3.6.1.6.2.2.1. Finish: Flat.

3.6.1.7. Plywood Backer Panels:

3.6.1.7.1. 2 coats Albi Cote FRL-X

3.6.1.7.2. Finish: Flat

3.6.1.8. Epoxy paint (PT-5) in Tech Rooms and Water Treatment Rooms and where shown on drawings:

3.6.1.8.1. For gypsum board substrate: 1 coat latex primer sealer: Dulux X-Pert code 11000

3.6.1.8.2. For concrete block substrate: 1 coat latex block filler: Dulux X-Pert Acrylic

3.6.1.8.3. 2 coats PPG Pitt-Glaze WB1

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide miscellaneous specialties including but not limited to following:

1.2.1.1. Stainless steel corner guards (CG).

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of wall protection, handrails, and bumpers: Section 10 26 23, Protective Wall Covering.

1.3. SUBMITTALS

1.3.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.3.2. If requested by Consultant submit samples of Products.

1.3.3. Product data: each system component and installation accessory required, including installation methods for each type of substrate

1.3.4. Shop drawings showing locations, extent and installation details of corner guards. Show methods of attachment to adjoining construction. Show locations of any exposed fastenings where necessary.

1.4. CLOSEOUT SUBMITTALS

1.4.1. Operational and Maintenance Data: Submit maintenance instructions in accordance with Section 01 70 00.

1.5. QUALITY ASSURANCE

1.5.1. Installer qualifications: Engage an installer who has no less than 3 years experience in installation of systems similar in complexity to those required for this project.

1.5.2. Manufacturer's qualifications: Not less than 5 years experience in the production of specified products and a record of successful in-service performance.

1.5.3. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.

1.6.2. Material must be stored flat.

1.7. WARRANTY

1.7.1. Provide lifetime warranty against defects in material and manufacturing.

PART 2 - PRODUCTS

2.1. MANUFACTURED UNITS

2.1.1. Stainless Steel Adhesive Type Corner Guards (CG-1):

2.1.1.1. Surface mounted, 16 ga. stainless steel: type 304 alloy with #4 satin finish.

2.1.1.2. Size; 89 mm (3 ½") legs, 1235 mm (46 5/8") long.

2.1.1.3. Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.4. Basis of Design: "CO-8" by Construction Specialties www.c-sgroup.com. Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.4.1. IPC Door Wall Protection Systems; www.inprocorp.com

2.1.1.4.2. Koroseal Wall Protection Systems; www.korogard.com

2.1.1.4.3. Pawling Corporation; www.pawling.com

2.1.1.5. Adhesive: PL Premium heavy-duty adhesive as recommended by manufacturer.

2.1.2. Fabrication:

2.1.2.1. Accurately fit joints and intersecting members in true planes with adequate fastening.

2.1.2.2. Fit and assemble work of this Section in shop where possible. Where shop fabrication is not possible, execute trial assembly in shop.

2.1.2.3. Fabricate finished work free from distortion, weld splatter and defects detrimental to appearance and performance.

2.1.2.4. Provide exposed metal fastenings and accessories of the same material, texture, colour and finish as the base metal to which they are applied or fastened, unless otherwise specified.

2.1.2.5. Do not expose trademarks or labels on finished surfaces.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Surface preparation: clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.

3.3. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.4. INSTALLATION

3.4.1. Conform to manufacturer's printed instructions for accurate, secure installation. Ensure proper operation.

3.4.2. Apply adhesive in a zigzag pattern over the back of each wing of the corner guard. Position corner guard on the wall and apply pressure until a tight fit is achieved.

3.4.3. Provide work of this Section true to dimensions, square, plumb, level and free from distortion or defects detrimental to appearance and performance.

3.5. SITE QUALITY CONTROL

3.5.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.6. CLEANING

3.6.1. Immediately upon completion of installation, clean material in accordance with manufacturer's recommended cleaning method.

3.6.2. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.7. PROTECTION

3.7.1. Cover finished surfaces and protect exposed corners and areas vulnerable to damage by persons or by movement of materials, tools or equipment.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide protective wall covering including but not limited to following:

1.2.1.1. Vinyl protective wall covering (WP).

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Finish painting: Section 09 91 00, Painting.

1.2.2.2. Corner guards: Section 10 26 13, Corner Guards

1.2.2.3. Handrails: Section 10 26 26, Handrails

1.3. REFERENCES

1.3.1. Reference Standards:

1.3.1.1. ASTM E84-21a - Standard Test Method for Surface Burning Characteristics of Building Materials

1.3.1.2. ASTM D4263-83(2018) - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

1.3.1.3. ASTM D5420-21 - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes.

1.3.1.4. CAN/ULC S102-18, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3.1.5. NAAMM/AMP 500 Metal Finishes Manual, 2006

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Pre-installation Meeting:

1.4.1.1. Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5. SUBMITTALS

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

1.5.2. Product Data: Submit manufacturer's current printed product literature, specifications, and installation instructions.

1.5.3. Shop Drawings:

1.5.3.1. Indicate, by large scale details, all materials, finishes, dimensions, anchorage and assembly.

1.5.3.2. Submit a layout diagram indicating the location of each panel and joining method.

1.5.4. Test Reports: Submit certified test reports showing compliance with specified performance characteristics and physical properties.

1.5.5. Manufacturer’s Instructions: Submit current published manufacturer’s installation and maintenance instructions.

1.5.6. Submit two copies of WHMIS MSDS - Material Safety Data Sheets Indicate VOC's:

1.5.6.1. For caulking materials during application and curing.

1.5.6.2. For adhesives.

1.5.7. Samples: Submit following samples in sizes indicated:

1.5.7.1. Protective sheet wall covering material 300 mm (12") square.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operational and Maintenance Data: Submit maintenance instructions in accordance with Section 01 70 00.

1.6.2. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

1.6.3. Submit manufacturer's field reports.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide work of this Section, executed by competent installers with minimum of 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7.2. Mock-ups:

1.7.2.1. Install in designated area a job mock-up using acceptable products and manufacturer approved installation methods.

1.7.2.2. Obtain Owner’s and Consultant’s acceptance of finish color, texture and pattern, and workmanship standards.

1.7.2.3. Mock-Up Size: 3 m x 1220 mm. Mock-up to also include inside and outside corner, base, opening and termination details.

1.7.2.4. Accepted Mock-up may be incorporated into final construction.

1.8. DELIVERY STORAGE AND HANDLING

1.8.1. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

1.8.2. Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.

1.8.3. Store panels in temperature controlled environments. Leave protective blue film on panel until ready to use.

1.8.4. Panels should be stored flat and be pre-conditioned minimum of 24 hours in ambient temperatures similar to the prevailing operational conditions.

1.9. SITE CONDITIONS

1.9.1. Ambient Conditions: Maintain temperature between 21 deg C to 27 deg C (70 deg F to 80 deg F) and humidity below 80% 48 hours before, during and 48 hours after installation.

1.10. WARRANTY

1.10.1. Manufacturer's Warranty: Submit warranty covering failure of materials for a period of 20 years. Failure shall include discolouration,

1.10.2. Installation Warranty: Submit installation warranty covering defects in workmanship for a period of 2 years. Failure shall include loss of adhesion, debonding of sheet from substrate, opening of seams.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Altro, www.altro.com

2.1.1.2. Construction Specialties; www.c-sgroup.com

2.1.1.3. Gerflo, www.gerflorcanada.com

2.1.1.4. IPC Wall Protection Systems; www.inprocorp.com

2.1.1.5. Koroseal Wall Protection Systems; www.korogard.com

2.1.2. Basis of Design:

2.1.2.1. Vinyl Wallcovering: "Whiterock Matte" Wall Cladding by Altro.

2.1.2.2. Stainless Steel wallcovering: CS "Acrovyn Stainless Steel Sheet".

2.1.3. Substitution Limitations:

2.1.3.1. Proposed substitutions are only considered after the contract is awarded.

2.1.3.2. Proposed substitutions to be made in accordance with Section 01 25 00 – Substitution Procedures.

2.1.3.3. Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification after full review by Consultant, and acceptance by the Owner.

2.2. MATERIALS

2.2.1. Wall Covering (WP):

2.2.1.1. 100% pure vinyl, extruded, homogenous, semi-rigid, unplasticized PVCu sheet:

2.2.1.2. Fire and smoke: Class A to ASTM E84

2.2.1.3. Impact Resistance: 198 in lb tested to ASTM D5420

2.2.1.4. Smoke Developed: 300 to CAN/ULC S102

2.2.1.5. Flame Spread Rating: 10 to CAN/ULC S102

2.2.1.6. Thickness: 2.5 mm (0.10")

2.2.1.7. Size of sheet: 2500 mm or 3000 mm (8 ft or 10 ft) to suit ceiling height x 1220 mm (48") width.

2.2.1.8. Basis of Design: Whiterock by Altro, Model: "Satins".

2.2.1.9. Colour:

2.2.1.9.1. WP-1: Linen (WSR 41) (W136/41)

2.2.1.9.2. WP-2: Linen (WSR 41) (W136/41)

2.2.1.9.3. WP-3: Linen (WSR 41) (W136/41)

2.2.1.9.4. WP-5: Linen (WSR 41) (W136/41)

2.2.1.9.5. WP-6: Linen (WSR 41) (W136/41)

2.2.1.9.6. WP-7: Mocha/Fawn (W6FR/206)

2.2.1.10. Adhesive: two-part resin-based polyurethane adhesive 'AltroFix W39', or as recommended by manufacturer.

2.2.1.11. Vinyl welding rod: weld rod, colour to match panel.

2.2.1.12. Sealant around panel penetrations: Sanitary sealant, mould resistant 'Altro Sanitary Sealant A802'.

2.2.2. Wall Protection WP-4:

2.2.2.1. Stainless steel sheet: 16 ga, type 304 alloy, 1.59 mm (0.0625") th.

2.2.2.2. Sheet sizes and joint locations as shown in drawings.

2.2.2.3. Smooth face, polished to no.4 finish. Maximum surface roughness Ra 25 micro-inches.

2.2.2.4. Finish to comply with NAAMM/AMP 500 Metal Finishes Manual.

2.2.2.5. Adhesive: "Fastbond 30" by Construction Specialties or as recommended by manufacturer.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Ensure that walls to receive wall covering are smooth and straight to 3 mm in 3 m (1/8 inch in 10 feet), and free of any dust, debris or irregularities.

3.1.3. Ensure that gypsum board is prime painted before application of wall protection adhesive.

3.1.4. Ensure concrete walls including patching or levelling have cured for minimum 28 days, Ensure that concrete is free of sealer, curing compounds, oil, grease and other agents.

3.1.5. Locate test sites to cover representative installation areas. Do not proceed with work when concrete does not conform to the specified performance criteria:

3.1.5.1. Moisture vapour transmission: To ASTM D4263 plastic sheet method, no visible condensation or vapour allowed. Do one test for every 500 sq.ft. or fraction thereof.

3.1.5.2. Surface moisture content: Maximum 2.5%, tested by Delhmorst moisture meter. Do one test for every 500 sq.ft. or fraction thereof.

3.1.5.3. Surface temperature: Minimum 18 degrees C.

3.1.5.4. Alkalinity: Acceptable range of 5 to 9 on the pH scale. Test using distilled water and pH paper. Provide 2 tests for every moisture vapour emission test.

3.1.6. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Surface Preparation: Ensure substrate is dry, well sealed and free of dirt, loose paint, wax and grease. Glossy surfaces may require sanding or priming before installation to help promote adhesion.

3.3. APPLICATION

3.3.1. General:

3.3.1.1. Install protective wall panels on prime painted gypsum board walls where indicated. in accordance with the manufacturers instructions

3.3.2. Vinyl Wall Protection Installation:

3.3.2.1. Thermoform all inside and outside corners to pencil round.

3.3.2.2. Dry-fit sheet prior to fixing. Cut sheet neatly to accommodate pipes, and electrical boxes. Provide 3 mm (1/8”) gap at door and window frames, and penetrations.

3.3.2.3. Hot pipes and steam pipes should be insulated and a 3 mm – 6 mm (1/8” to 1/4”) expansion gap should be created when installing panels around these pipes, then sealed with specified sanitary sealant.

3.3.2.4. All pipes, fixing bolts, etc. extending through the panels should have a minimum 3 mm (1/8”) expansion gap and be sealed with specified sanitary sealant.

3.3.2.5. Extend sheets 50 mm (2”) overlapping coved flooring at base. Bevel front and back edges.

3.3.2.6. Bevel leading edges of sheet prior to welding seams or fitting joint, transition, and cap strips.

3.3.2.7. Install edge mouldings as required and as shown on Drawings.

3.3.2.8. Apply double sided adhesive tape to back of sheet as per manufacturers instructions.

3.3.2.9. Apply adhesive to back of sheet using notched trowel. Allow adhesive to dry tacky to the touch. Apply sheet to wall. Tap sheet with white rubber mallet for initial contact with adhesive tape. Roll thoroughly to ensure full adhesion.

3.3.2.10. Take care to ensure protective wall coverings are fully on the wall at inside corners, without coving or subsequently pulling away from the wall. Apply material to outside corners in a manner which will prevent gathering of air beneath the material on each side of the corner. No joints are allowed within 150 mm (6") of any corner.

3.3.2.11. Heat welded joint installation:

3.3.2.11.1. Provide 1.5 mm (1/16”) gap between sheets for welded joints.

3.3.2.11.2. Clean joint and weld rod with cleaner as recommended by the manufacturer.

3.3.2.11.3. Heat weld joints and trim flush.

3.3.2.12. Thoroughly wash off excess adhesive from material and adjoining surfaces as work proceeds.

3.3.2.13. Seal vinyl panel edges with sanitary sealant.

3.3.3. Stainless Steel Sheet Installation:

3.3.3.1. Install sheets plumb and level with butt joints.

3.3.3.2. Provide 1.5 mm (1/16”) gap at door and screen frames and above base.

3.3.3.3. Scribe sheets at inside and outside corners to fit without gaps.

3.3.3.4. Apply contact adhesive to wall surface and sheet in accordance with adhesive manufacturer’s instructions.

3.3.3.5. Pressure roll stainless steel sheets.

3.4. SITE QUALITY CONTROL

3.4.1. Manufacturer’s Field Services: provide manufacturer’s field service:

3.4.1.1. Attend pre-installation site meeting.

3.4.1.2. Periodic site inspections of the installation to verify correct installation procedures.

3.4.1.3. Upon completion of the work.

3.4.2. Submit field inspection reports following each site visit and final report to confirm that installation meets the manufacturer’s installation requirements and procedures.

3.4.3. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant and Owner.

3.5. CLEANING

3.5.1. Perform cleaning after installation to remove construction and accumulated environmental dirt.

3.5.2. Clean surfaces after installation using manufacturer's recommended cleaning procedures. Clean the panels with an anti-static solution.

3.5.3. Clean adjacent surfaces, which have been soiled or otherwise marred, to completely remove evidence of material causing same.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes:

1.2.1.1. Handrails (A99).

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of corner guards: Section 10 26 13, Corner Guards.

1.2.2.2. Provision of vinyl wall protection covering: Section 10 26 23, Protective Wall Covering.

1.3. ADMINISTRATIVE REQUIREMENTS

1.3.1. Coordination:

1.3.1.1. Coordinate requirements for partition blocking and provide mounting locations to Section 09 22 16 before erection of stud framing.

1.3.2. Preinstallation Meeting:

1.3.2.1. Prior to start of work, arrange for site meeting of parties associated with work of this Section. Presided over by Contractor, Subcontractor, and manufacturer's representative.

1.3.2.2. Review work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials to be used, installation, methods and procedures, quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of this Section.

1.4. SUBMITTALS

1.4.1. Submittals in accordance with Division 01 General Requirements.

1.4.2. Product Data:

1.4.2.1. Product data for each system component and installation accessory required

1.4.2.2. Installation methods for each type of substrate

1.4.3. Shop drawings:

1.4.3.1. Showing locations, extent and installation details

1.4.3.2. Show methods of attachment to adjoining construction

1.4.4. Samples:

1.4.4.1. If requested by Consultant submit samples of Products.

1.4.4.2. Submit samples for verification of color, finish and end cap attachment and alignment.

1.4.4.3. 12" (304.8mm) long sample of each model specified including end cap and mounting hardware

1.5. CLOSEOUT SUBMITTALS

1.5.1. Operational and Maintenance Data: Submit maintenance instructions in accordance with Section 01 70 00.

1.6. QUALITY ASSURANCE

1.6.1. Qualifications:

1.6.1.1. Manufacturers: Provide continuous handrailings, bumper railings and crash railing from 1 manufacturer.

1.6.1.2. Installer qualifications: Engage an installer who has no less than 3 years experience in installation of systems similar in complexity to those required for this project

1.7. DELIVERY, STORAGE, AND HANDLING

1.7.1. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer and product.

1.7.2. Storage: Store wall protection products in original packaging. Protect from weather, extreme temperatures, and moisture.

1.7.2.1. Maintain temperature during storage between 4°- 38°C (40°- 100°F).

1.7.2.2. Store materials flat to prevent twisting or sagging of cartons.

1.7.3. Handling: Take adequate measure to prevent damage to materials. Avoid exposure of products to direct sunlight.

1.8. SITE CONDITIONS

1.8.1. Ambient Conditions: Do not install wall protection products until installation areas are enclosed and weatherproof. HVAC system must be operational and maintaining temperature at 18°-24°C (65°-75°F) for at least 72 hours prior to installation.

PART 2 - PRODUCTS

2.1. DESIGN AND PERFORMANCE CRITERIA

2.2. MATERIALS

2.2.1. Stainless Steel Components: type 304 stainless steel with #4 satin finish

2.2.2. Aluminum: Extruded aluminum should be 6063-T6 alloy, nominal 2.29 mm (0.090") thick retainer. Minimum strength and durability properties as specified in ASTM B221.

2.2.3. Molded Accessories: Injection molded thermoplastic.

2.2.4. Impact Cushion: Extruded thermoplastic, 70 durometer Shore A.

2.2.5. Fasteners: All necessary fasteners to be supplied by the manufacturer, appropriate for wall construction.

2.3. MANUFACTURERS

2.3.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.3.1.1. Construction Specialties Ltd.; www.c-sgroup.com

2.3.1.2. IPC Door Wall Protection Systems; www.inprocorp.com

2.3.1.3. Koroseal Wall Protection Systems; www.korogard.com

2.3.1.4. Pawling Corporation; www.pawling.com

2.4. MANUFACTURED UNITS

2.4.1. Continuous Handrailing:

2.4.1.1. Surface mounted assembly consisting of stainless steel handrail, 133mm (5 ¼") high stainless steel rail assembly including stainless steel end caps and brackets.

2.4.1.2. Basis of Design: Model HRS-6C by Construction Specialties

2.4.2. Fabrication:

2.4.2.1. Verify dimensions on site before fabrication.

2.4.2.2. Accurately fit joints and intersecting members in true planes with adequate fastening.

2.4.2.3. Fit and assemble work of this Section in shop where possible. Where shop fabrication is not possible, execute trial assembly in shop.

2.4.2.4. Fabricate finished work free from distortion, weld splatter and defects detrimental to appearance and performance.

2.4.2.5. Provide exposed metal fastenings and accessories of the same material, texture, colour and finish as the base metal to which they are applied or fastened, unless otherwise specified.

2.4.2.6. Do not expose trademarks or labels on finished surfaces.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. PREPARATION

3.2.1. Surface preparation: clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.

3.3. INSTALLATION

3.3.1. Conform to manufacturer’s printed instructions for accurate, secure installation. Ensure proper operation.

3.3.2. Installation Height Above Finished Floor: As directed by Consultant.

3.3.3. Provide work of this Section true to dimensions, square, plumb, level and free from distortion or defects detrimental to appearance and performance.

3.3.4. Provide necessary reinforcing including but not limited to steel stud backup and securely fasten components to suit design requirements. Ensure proper reinforcing has been provided as necessary.

3.4. PROTECTION

3.4.1. Cover finished surfaces and protect exposed corners and areas vulnerable to damage by persons or by movement of materials, tools or equipment.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide washroom accessories including but not limited to following:

1.2.1.1. Coat hook (A-20).

1.2.1.2. Grab bar (A-97, A-98).

1.2.1.3. Mop and broom holder

1.2.1.4. Tilt mirror.

1.2.1.5. Framed mirror.

1.2.1.6. Shelf.

1.2.1.7. Sanitary napkin disposal (RECN-1)

1.2.2. Products supplied by Owner to be installed under this Section:

1.2.2.1. Hand Sanitized Dispenser (A-2)

1.2.2.2. Paper Towel Dispenser (A-1).

1.2.2.3. Soap Dispenser (A-4).

1.2.2.4. Toilet Paper Dispenser (A-3).

1.2.2.5. Eye Wash Bottle (A90).

1.2.3. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.3.1. Reinforcing requirements for wall mounted accessories in gypsum board: Section 09 21 16, Non Structural Metal Framing.

1.2.3.2. Mechanical requirements: Division 21, Fire Suppression, Division 22, Plumbing and Division 23, Heating, Ventilating and Air Conditioning.

1.2.3.3. Provision of electrical service to washroom accessories requiring power: Division 26, Electrical.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. AODA: Accessibility for Ontarians with Disabilities Act; www.aoda.ca.

1.3.2. Reference Standards:

1.3.2.1. ASTM C1503-18 - Standard Specification for Silvered Flat Glass Mirror

1.3.2.2. CSA W59-18 Welded Steel Construction (Metal Arc Welding)

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination: Coordinate location of washroom accessories with other work to prevent interference with clearances required for access, proper installation, adjustment, operation, cleaning and servicing of washroom accessories.

1.5. SUBMITTALS

1.5.1. Submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Shop Drawings:

1.5.2.1. Submit Shop Drawings for work of this Section. Ensure Shop Drawings are in the form of catalogue cuts and fully illustrate specified materials with description of components, surface finishes, hardware and securement devices.

1.5.3. Samples:

1.5.3.1. If requested, submit complete sample of accessory to Consultant for review of construction quality, materials and finish prior to delivery of required quantities of items. Submit sample of each colour where applicable. Remove trademark and/or labels on exposed finishes prior to acceptance.

1.5.3.2. Samples will be returned for installation.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operational and Maintenance Data: Submit maintenance instructions in accordance with Section 01 70 00. Submit an accessories schedule, keys and parts manual as part of Project closeout documents. Submit 2 sets of following items of manufacturer's literature:

1.6.1.1. Technical Data Sheets of each item used for the Project.

1.6.1.2. Service and Parts Manuals.

1.6.1.3. Name of local representative to be contacted in the event of need of field service of consultation.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Delivery and Acceptance Requirements: Deliver materials in sealed cartons and containers with manufacturer’s name and Product description clearly marked thereon.

1.8. WARRANTY

1.8.1. Manufacturer Warranty: Warrant mirrors for a period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; deterioration of mirror’s silvering.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. ASI Group Canada; www.asigroup-canada.com

2.1.1.2. Foundations Worldwide Inc.: www.bbkareinc.com

2.1.1.3. Bobrick Washroom Equipment of Canada Ltd.; www.bobrick.com

2.1.1.4. Bradley Corporation; www.bradleycorp.com

2.1.1.5. Dyson Canada; www.dysoncanada.ca

2.1.1.6. Frost Products Limited; www.frostproductsltd.com

2.1.1.7. Koala Kare Products; www.koalabear.com

2.1.2. Provide Products for work of this Section by 1 manufacturer and keyed alike to extent possible.

2.1.3. Basis of Design: accessories by Bobrick Washroom Equipment. Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification.

2.2. MATERIALS

2.2.1. Ensure washroom accessories are stainless steel Type 304 or Type 302, of 1 type throughout, ANSI No. 4 mechanical brushed finish, of contemporary design, with minimum material thicknesses of components as specified herein. Arrange stainless steel sheet so grain of brushed finish runs vertically in finished installation.

2.2.1.1. Minimum thickness, any location or component: 0.607 mm (24 ga)

2.2.1.2. Hygienic accessory - exposed double pan doors and panels: 0.607 mm (24 ga)

2.2.1.3. Hygienic accessory - exposed single pan doors: 1.214 mm (18 ga)

2.2.1.4. Reinforcement: 1.214 mm (18 ga)

2.2.2. Provide washroom accessories as specified with options indicated. Model numbers may not reflect all options required.

2.2.3. Provide stainless steel collars to accommodate semi-recessed mounting of units whose depth exceeds wall cavity depth.

2.3. MANUFACTURED UNITS

2.3.1. Coat Hook (A-20): satin finished stainless steel, double hook type supplied with backplates and screws:

2.3.1.1. ASI Group Canada, Model No. ASI-7345-S.

2.3.1.2. Bobrick, Model No. B-6727.

2.3.1.3. Bradley, Model No. 9124.

2.3.1.4. Frost, Model No. 1139S.

2.3.2. Grab Bar: Stainless steel, 32 mm (1-1/4") od, 1.519 mm (16 ga) wall thickness with peened finish, positive gripping surface and complete with standard mounting plates, flanges and accessories, 38 mm (1-1/2") standoff from wall. Mount as shown on Drawings:

2.3.2.1. ASI Group Canada, Model No. ASI-3700 Series.

2.3.2.2. Bobrick, Model No. B-5800 Series.

2.3.2.3. Bradley, Model No. 8322 Series.

2.3.2.4. Frost, Model No.1001 DP Series.

2.3.2.5. Grab Bar Types:

2.3.2.5.1. A-97: L-shaped. Refer to drawings for dimensions.

2.3.2.5.2. A-98: 600 mm (24”) long

2.3.3. Mop and Broom Holder: Janitorial Unit: Supply 1115 mm (865 mm (34") long stainless steel utility shelf complete with stainless steel hooks and spring-loaded rubber mop/broom holders:

2.3.3.1. Bobrick, Model No. B-224x36, or equal unit from one of the manufacturers listed in this Section.

2.3.4. Eye Wash Bottle: supplied by Owner for installation under this Section.

2.3.5. Hand Sanitized Dispenser (A-2): supplied by Owner for installation under this Section.

2.3.6. Mirror: Supply 6 mm (1/4") clear float glass conforming to ASTM C1503, float glass with process deposit of 5 silver coats, 3 copper coats and final protective seal. Supply unit in stainless steel angle framing and minimum 0.457 mm thick (26 ga) galvanized sheet steel backing:

2.3.6.1. Framed Mirror: 610 mm x 915 mm (24” x 36”), Bobrick, Model No. B-165 – 2436, ASI Model No. 0620-2436, Bradley, Model No. 780-2436, Frost, Model No. 941-2436.

2.3.6.2. Tilt Mirror (WA-301): 610 mm x 915 mm (24” x 36”), Bobrick, Model No. B-293.

2.3.7. Paper Towel Dispenser Unit (A-1): supplied by Owner for installation under this Section.

2.3.8. Eye Wash Bottle (A-90): supplied by Owner for installation under this Section.

2.3.9. Soap Dispensers (A-4): supplied by Owner for installation under this Section.

2.3.10. Sanitary Napkin Disposal (WA-203): surface mounted, 1.0 gal capacity, Bobrick Model No. B-270.

2.3.11. Toilet Paper Dispenser:

2.3.11.1. Double Roll (WA-207): supplied by Owner for installation under this Section

2.3.11.2. Jumbo Single Tissue Dispenser: supplied by Owner for installation under this Section.

2.3.12. Shelf: surface mounted, 120 mm (4 ¾”) wide x 610 mm (24”) long, Bobrick Model No. B-683.

2.3.13. Fabrication:

2.3.13.1. Fabricate accessories true, square, rigid, free from distortion and from defects detrimental to appearance and performance. Assemble sheet metal accessories by welding in accordance with CSA W59. Conceal welds, or grind smooth such as to be undetectable in finished work. Unless approved by Owner, ensure assembly fastenings, hardware fixings and mounting or installation devices are concealed in finished work.

2.3.13.2. Use non-corrosive metal fasteners of expansion type, toggle type or other approved type of positive, mechanical anchor as required to suit construction to which accessory is to be mounted. Ensure exposed fasteners, where permitted, are finished to match adjacent accessory surface and countersunk. Where accessories are mounted to sheet metal, provide a 3 mm (1/8") thick minimum full-size metal back-up plate drilled and tapped to receive machine screws and finished to match adjacent sheet metal surface.

2.3.13.3. Ensure frameless accessories have 1 piece fronts with 90 degree formed returns at their edges and openings. Ensure returns are continuously welded and ground smooth at corners. Where accessory fronts are framed, ensure frame edges, both inside and outside, have 90 degree formed returns continuously welded and ground smooth at corners. Ensure doors also have 90 degree formed returns.

2.3.13.4. Use concealed stainless steel piano hinges which extend full-length of hinged element. Ensure hinged elements have concealed, mechanically-retained, rubber bumpers for silent closing, and close flush with faces of fronts or frames. Locate hinges to afford easy and unobstructed access to interiors taking into consideration location of accessory relative to surrounding and adjacent items and finishes.

2.3.13.5. Ensure portions of sheet metal accessory interiors visible in completed work are stainless steel. Ensure changes in plane are formed or continuously welded and ground smooth. Ensure sheet metal accessory parts concealed in finished installation are galvanized or stainless sheet steel. Ensure edges of sheet metal accessible by users or maintenance personnel are hemmed for safety with no sharp edges.

2.3.13.6. Ensure lettering or pressure sensitive international symbols on accessories is silk screened with durable paint to withstand wear, or is engraved or embossed. Size, location and type face of lettering is subject to approval. Ensure edges of letters are straight and sharp.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.1.2. Verify gypsum board walls have been reinforced in accordance with Section 09 21 16 for wall mounted accessories.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Provide necessary wall reinforcement for grab bars and towel bars as detailed for 227 kg (500 lbs) downward pull.

3.2.2. Install washroom accessories in accordance with manufacturer's printed installation instructions.

3.2.3. Provide fastenings and mounting kits for washroom accessories.

3.2.4. Verify wall opening for correct dimensions, plumbness of blocking or frames and other preparation that would affect installation of washroom accessories.

3.2.5. Verify spacing of plumbing fixtures and toilet partitions that affect installation of washroom accessories.

3.2.6. Securely fasten accessories, level and plumb using appropriate fastenings as recommended by manufacturer.

3.2.7. Provide corrosion resistant fastenings. Where fasteners are exposed, use tamper-proof fasteners finished to match items secured.

3.2.8. Locate washroom accessories where indicated on Drawings and where directed by Consultant. Obtain Consultant's acceptance of exact locations.

3.2.9. Provide manufacturer's recommended anchoring systems.

3.2.10. Fit flanges of accessories snug to wall surfaces.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. ADJUSTING

3.4.1. Test mechanisms, hinges, locks and latches.

3.4.2. Adjust and lubricate to ensure washroom accessories are in perfect working order.

3.5. CLEANING

3.5.1. Clean and polish mirrors, aluminum and stainless steel surfaces.

3.5.2. Remove protective coatings and paper including adhesives.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide phenolic lockers including but not limited to following:

1.2.1.1. Two-tier, phenolic sloping top lockers, curb mounted.

1.2.1.2. Phenolic trims, end gables, filler panels.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of concrete locker bases: Section 03 33 00, Cast-In-Place Concrete.

1.3. REFERENCES

1.3.1. Reference Standards:

1.3.1.1. ASTM D494-11(2019) - Standard Test Method for Acetone Extraction of Phenolic Molded or Laminated Products

1.3.1.2. ASTM E84-21a, Standard Test Method for Surface Burning Characteristics of Building Materials

1.1. ADMINISTRATIVE REQUIREMENTS

1.1.1. Preinstallation Meetings: Conduct a pre-installation meeting to installation to verify project requirements and conditions.

1.2. SUBMITTALS

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

1.2.2. Shop Drawings:

1.2.2.1. Prepare Shop Drawings for fabrication and erection of lockers and accessories. Show fabrication details, including exact sizes and description of anchorage and hardware, trim, nature of component parts and interface conditions with other work.

1.2.2.2. Verify actual field measurements and show actual measurements on shop drawings.

1.2.2.3. Clearly cross-reference components on Shop Drawings to Drawings indicating location, number required and name of unit.

1.2.3. Product Data: Submit manufacturer’s current printed product literature, specifications, and installation instructions.

1.2.4. Samples:

1.2.4.1. Submit samples of edge details, colours, patterns, finishes, and textures.

1.2.4.2. Submit sample of locker hardware, including lock. This hardware will be returned for installation after review.

1.3. CLOSEOUT SUBMITTALS

1.3.1. Operation and Maintenance Data: Submit maintenance instructions in accordance with Section 01 77 00 Closeout Procedures.

1.3.2. Provide electronic key controllers and operating instructions for locks.

1.4. QUALITY ASSURANCE

1.4.1. Qualifications:

1.4.1.1. Installers: Provide work of this Section, executed by competent installers with minimum of 10 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.5. DELIVERY STORAGE AND HANDLING

1.5.1. Delivery and Acceptance Requirements:

1.5.1.1. Deliver materials in the manufacturer's original protective packaging.

1.5.1.2. Deliver materials in sequence to meet installation schedule. Provide protection from marring or other damage.

1.5.1.3. Carefully unload materials in a manner to prevent damage.

1.5.2. Storage and Handling Requirements:

1.5.2.1. Carefully handle and store in a manner to prevent damage.

1.5.2.2. Store materials in an enclosed shelter providing protection from damage, temperature, humidity, and exposure to the elements.

1.6. WARRANTY

1.6.1.1. Submit locker manufacturer's standard 10-year warranty against defects in material and 2 years warranty for installation deficiencies.

1.6.1.2. Submit 5 year warranty for locks.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. ASI Storage Solutions Inc.; www.asigroup-canada.com

2.1.1.2. Spectrum; www.spectrumlockers.com

2.1.2. Basis of Design: "Classic" by Spectrum.

2.1.3. Substitution Limitations: Comparable Products from other manufacturers not listed herein will be considered provided they meet requirements of this Specification after full review by Consultant.

2.2. MATERIALS

2.2.1. Phenolic Sheet: Solid phenolic with colour-thru core, decorative laminate with multiple resin-impregnated kraft and surface sheets fused at high temperature and pressure to ASTM D494. Colour to be selected by Consultant from manufacturer's standard colour range.

2.2.2. Fire Performance: Class B to ASTM E84.

2.2.3. Hooks: Type 304 Stainless steel:

2.2.4. Fasteners: Type 304 Stainless steel in accordance with locker manufacturers written recommendations.

2.2.5. Lock:

2.2.5.1. Programmable, digital, keypad operation.

2.2.5.2. Controlled with electronic keys and mobile device.

2.2.5.3. Metal housing with brushed nickel finish.

2.2.5.4. 12 mm (1/2”) deadbolt.

2.2.5.5. “Axis NLSK-ADS2-619-010U” by Digilock.

2.2.6. Colour:

2.2.6.1. Exposed faces to have Wilsonart finish, to be selected by Consultant.

2.2.6.2. Interior: “354 Designer White” by Wilsonart.

2.2.7. Fabrication:

2.2.7.1. Fabricate lockers to sizes and to profiles required from following:

2.2.7.1.1. Lockers: 2-tier 305 mm wide x 457 mm deep x 1829 mm total height (12” x 18” x 72”), ventilated, sloping top.

2.2.7.2. Doors: 13 mm (1/2”) nominal thickness phenolic sheet, rounded edges.

2.2.7.3. Door Numbers: 38 mm (1 ½”) dia. recessed stainless steel disk with laser engraved numbering.

2.2.7.4. Hang doors on continuous 1 piece full length 16 ga stainless steel piano hinge. Securely fasten hinges to frame and door. Provide hinges of type which maximize security, resistance to abuse and vandalism. Hold doors in closed position with friction catch.

2.2.7.5. Side Panels: 9 mm (3/8”) nominal thickness phenolic sheet.

2.2.7.6. Tops, Bottoms and Shelves: 13 mm (1/2”) nominal thickness phenolic sheet.

2.2.7.7. End Cover Panels: 13 mm (1/2”) nominal thickness phenolic sheet.

2.2.7.8. Back: 6 mm (1/4”) nominal thickness phenolic sheet.

2.2.7.9. Slope Top Kits, Filler Kits and Trim Kits: 13 mm (1/2”) nominal thickness phenolic sheet.

2.2.7.10. Accessories: Top shelf, and 3 single wall hooks fastened to locker sides and back with tamper proof fasteners.

2.2.7.11. Do not put manufacturer’s names on front of lockers.

2.2.7.12. Ventilation: Provide lockers with 10 mm (3/8”) dia. ventilation holes through top, bottom and shelves.

2.2.7.13. Install stainless steel keeper for door lock deadbolt.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Install phenolic lockers and accessories at locations shown in accordance with manufacturer's written recommendations.

3.2.2. Install lockers level and plumb with flush surfaces and rigid attachment to anchoring surfaces.

3.2.3. Anchor lockers to floor and wall at 1220 mm (48”) maximum spacing as recommended by manufacturer’s written instructions.

3.2.4. Bolt adjoining locker units together to ensure rigid installation.

3.2.5. Attached locker number plates as indicated.

3.3. ADJUSTING

3.3.1. Upon completion, test doors and adjust for ease of operation.

3.3.2. Equip locks with new batteries for ready for service operation. Provide 3 sets of electronic keys to control locks.

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work: Remove unsatisfactory materials and replace to Consultant’s satisfaction at no cost to Owner.

3.5. CLEANING

3.5.1. Clean and Make Good surfaces soiled or damages. Polish units before final acceptance by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to:

1.1.1.1. CCDC 2 – 2020, Stipulated Price Contract as amended in the Contract Documents.

1.1.1.2. Division 01 requirements and documents referred to therein.

1.2. SUMMARY

1.2.1. Section Includes: Provide manual roller window shades including but not limited to following:

1.2.1.1. Manually operated roller window sun control shade assemblies.

1.2.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.2.2.1. Provision of gypsum board substrate at bulkhead and accessories: Section 09 22 16 Non-Structural Metal Framing.

1.3. REFERENCES

1.3.1. Abbreviations and Acronyms:

1.3.1.1. AATCC: American Association of Textile Chemists and Colorists

1.3.1.2. ANSI/WCMA: American National Standards Institute/Window Covering Manufacturers Association

1.3.2. Reference Standards:

1.3.2.1. AATCC TM30 2017e - Antifungal Assessment and Mildew Resistance Test

1.3.2.2. ANSI/WCMA A 100.1-2018 - American National Standard For Safety Of Corded Window Covering Products

1.3.2.3. ASTM D3273-2021 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

1.3.2.4. ASTM D6329-98(2015) - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers

1.3.2.5. ASTM E2180-18 - Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials

1.3.2.6. ASTM G21-15 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

1.3.2.7. ASTM G22-76(1996) Standard practice for Determining Resistance of Plastics to Bacteria

1.3.2.8. CAN2-4.162-M80 - Hospital Textiles - Flammability Performance Requirements

1.3.2.9. CAN/ULC-S 109 -14-R2019 - Standard Method for Flame Tests of Flame Resistant Fabrics and Films

1.4. ADMINISTRATIVE REQUIREMENTS

1.4.1. Coordination:

1.4.1.1. Site verify the window dimensions and shade widths before preparing shop drawings.

1.4.2. Preinstallation Meetings:

1.4.2.1. Conduct a pre-installation meeting in accordance with requirements of Division 01 General Requirements supplemented herein.

1.4.2.2. The following minimum items shall be reviewed at the pre-installation meeting:

1.4.2.2.1. Verify project requirements.

1.4.2.2.2. Review installation conditions under which work is to be performed including possible site concerns.

1.4.2.2.3. Inspection of surfaces to receive the work.

1.4.2.2.4. Coordination requirements with other subtrades.

1.4.2.2.5. Review manufacturer's written installation instructions and warranty requirements.

1.4.3. Sequencing:

1.4.3.1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

1.4.3.2. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.5. ACTION SUBMITTALS

1.5.1. Submit submittals in accordance with Section 01 33 00 Submittal Procedures.

1.5.2. Product Data Sheets:

1.5.2.1. Submit manufacturer’s product data sheets for products to be used in the work of this Section. Manufacturer’s product data sheets shall include: styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.

1.5.2.2. Manufacturer's Installation Instructions: Indicate any special preparation of base building conditions, installation and attachment methods.

1.5.3. Shop Drawings:

1.5.3.1. Submit Shop Drawings which clearly indicate shade sizes, locations, operation, methods of attachment, and description of components, indicating for each component, size, shape, material, thickness, gauge, finish, methods of joining, joint locations, and methods of attachment and relationship with adjacent components and construction, fastening devices, anchorage components and adjacent materials.

1.5.3.2. Shop drawings to clearly indicate shade widths and locations for each installation.

1.5.4. Samples for Verification:

1.5.4.1. Complete, full-size operating unit not less than 450 mm (16 inches) wide for each type of roller shade indicated.

1.5.4.2. For following products:

1.5.4.2.1. Shade Material: 300 mm (12-inch) square section of fabric, from dye lot used for Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.

1.5.5. Window Treatment Schedule for roller shades. Use same designations indicated on Drawings.

1.5.6. Product Certificates: Submit written certification that materials, systems and assemblies have been installed in accordance with manufacturer's requirements. Signed by product manufacturer.

1.5.7. Test and Evaluation Reports: Submit test data substantiating proposed shade fabric meets performance criteria specified herein. Submit independent test results showing properties and acceptable fire hazard classification of shade fabric.

1.6. CLOSEOUT SUBMITTALS

1.6.1. Operation and Maintenance Data: Submit maintenance instructions in accordance with Division 01 General Requirements.

1.6.2. Maintenance Data: For roller window shades to include in maintenance manuals. Include following:

1.6.2.1. Methods for maintaining roller window shades and finishes.

1.6.2.2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.

1.6.2.3. Operating hardware.

1.7. QUALITY ASSURANCE

1.7.1. Qualifications:

1.7.1.1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7.2. Mock-Ups: Erect 1 full size site mock-up of roller window shade at designated location for review. Once reviewed with no objections recorded mock-up sets standard for balance of work. Mock-up may be left as work of this Contract.

1.8. DELIVERY, STORAGE AND HANDLING

1.8.1. Delivery and Acceptance Requirements:

1.8.1.1. Deliver materials to site only when work of this Section can be started.

1.8.1.2. Before delivery to site verify each assembly for proper operation. Clean each assembly of marks and smudges prior to providing wrap up protective covering.

1.8.1.3. Provide necessary crating and bundling for shipment of components to site including protection against weather likely to impair adequacy or appearance of material in finished assembly.

1.9. WARRANTY

1.9.1. Manufacturer Warranty: Warrant work of this Section for a period of 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to deformation of members, mechanical failure, failure of system to operate as designed or faulty or poor quality of work.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Altex Inc.; www.altex.ca

2.1.1.2. Legrand Canada; www.legrand.ca

2.1.1.3. Sun Glow Window Covering Products of Canada Ltd.; www.mysunglow.com

2.1.2. Basis of Design: “Newton High-Speed Lite-Lift with Fascia” by Altex inc..

2.2. MATERIALS

2.2.1. Performance/Design Criteria:

2.2.1.1. Design with final determination of limitation on site to meet requirements indicated on Drawings.

2.2.1.2. Design manually operated roller window shade system with wands for easy lifting, finger tip control, with infinite positioning so shade is capable of stopping and holding at any position within window opening. Provide assemblies to suit adjacent ceilings and finishes. Ensure removal does not require disassembly of shade unit. Left or right hand operative option available to suit design requirements.

2.2.1.3. Ensure design indicated on Drawings consists of factory assembled roller window shade units consisting of surface mounted on face of mullions or at ceiling with 2 end brackets, shade roller tube, extruded fascia, hembar, fabric, fastenings, anchorages and accessories specified and required.

2.2.1.4. System must allow for the ability to lower the shade by pulling on the hembar without damage to the clutch or spring.

2.2.1.5. Lifting Force:

2.2.1.5.1. Required lifting force of 2.5 pounds (1.134 kg) to a maximum of 4 pounds (1.814 kg) to raise or lower the shade.

2.2.1.6. Shade system must have an embedded upper limit stop device to ensure a constant upper position and avoid the shade to be over lifted.

2.2.1.7. Roller shade system must be capable of being raised or lowered at a minimum rate of 1 meter per second (1 m/s).

2.2.1.8. Accessibility:

2.2.1.8.1. System must be operable with one hand.

2.2.1.8.2. System must be operable at any height while sitting.

2.2.1.9. Durability:

2.2.1.9.1. System must be tested for a minimum of 5500 cycles (one cycle means shade raised fully up and lowered fully down) without any failure.

2.2.1.10. Safety:

2.2.1.10.1. System must not have any reachable cord in static or dynamic mode for an optimum safety.

2.2.1.11. Dual Wand System: Extruded aluminium wands matching the finish of the window mullions.

2.2.1.12. Front wand: To raise the shade.

2.2.1.13. Back wand: To lower the shade.

2.2.2. Extruded Aluminum: ASTM B209M, Aluminum alloy 6063-XT6 for roll tube; 6060 for horizontal tracks; and 6063-T5 elsewhere.

2.2.3. Custom Trim: Extruded aluminum to shapes and profiles indicated, where adjacent finishes abut shade assembly and to provide attachment for adjacent finish, finished to match fascia/soffit.

2.2.4. Dielectric Separator: Provide best grade, quick drying non-staining alkali resistant bituminous paint or epoxy resin solution or membrane type for Consultant’s review.

2.2.5. Fabrication:

2.2.5.1. Coordinate and verify job site dimensions affecting this work. Submit in writing dimensions or conditions which vary from those on reviewed Shop Drawings or detrimental to installation. Obtain corrective measures from Consultant prior to fabrication. Ensure suitability of adjacent building components in relationship to work of this Section.

2.2.5.2. Submit in writing defects in work prepared under other Sections. Commencement of work implies acceptance of substrates and conditions.

2.2.5.3. Roller Window Shade Assembly:

2.2.5.3.1. Design and fabricate heavy-duty roller window shade assembly to keep maintenance to minimum.

2.2.5.3.2. Ensure clutch, spring and sprocket of the roller window shade assembly operates smoothly having capability to control rate of fall, to adjust stop and hold at an infinite number of positions as required.

2.2.5.3.3. Ensure assembly allows fingertip control with built-in shock absorber system to prevent clutch breakage under normal operating conditions, even when shades are lowered by pulling on the hembar. Factory set for size and travel of shades.

2.2.5.3.4. Ensure assembly mechanism has structural capacity to accommodate specified shades in window sizes required for this Project. Design assembly mechanism to suit size of windows and mass of system.

2.2.5.4. Roller Tube:

2.2.5.4.1. Design extruded aluminum alloy roller tube to suit assembly design with either end of tube to engage drive system through internal or external extruded keyway. Ensure extruded roller tube has wall thickness to suit design requirements with minimum wall thickness of 1.39 mm (0.0547") with reinforcement for fabric to provide anti-deflection support for wide span shades. Formed aluminum tube is unacceptable.

2.2.5.4.2. Design tubes to be removable without removing drive assembly, block resetting, or readjusting the pre-set stops. Ensure shade tube is self-aligning.

2.2.5.4.3. Ensure roller tube is sized and reinforced internally as necessary to prevent excessive deflection in span of tube. Excessive deflection is defined by observation whereby shades in their open position reveal puckering, sagging or billowing, or where tube deflects beyond 4% of roller length.

2.2.5.4.4. Identify each roller tube to its location in accordance with reviewed shop drawings.

2.2.5.5. Fabric Mounting Spline: Fabricate snap-in-place spline of extruded vinyl with asymmetrical insertion locking channels and embossed fabric guide. Ensure spline has sufficient capacity to hold shades when spline is snapped and locked into the tube. Ensure fabric shade is readily removable without removing the tube from the retainer brackets, or removing brackets from the wall.

2.2.5.6. Snap-In-Place Fascia:

2.2.5.6.1. Provide rectangular formed metal fascia where shown of minimum 1.29 mm (0.0507") thick formed aluminum or extruded aluminum of minimum 2 mm (0.078") thick housing.

2.2.5.6.2. Ensure finished fascia returns back at bottom to permit a maximum opening of 50 mm (2"). Furnish in lengths of up to 3000 mm (10' - 0") unsupported without any visible sag or distortion.

2.2.5.6.3. Fascia members are not required for overhead concealed application.

2.2.5.6.4. Where shades are face mounted to faceted window arrangement, provide matching closure section and bridging clips between ends of abutting units.

2.2.5.7. Shade Fabric Hem Tube: Hem tube may be extruded aluminum, rectangular in shape, designed to hang perfectly perpendicular and to totally conceal any heat-set or sewn seams within the tube. Ensure internal spline secures fabric evenly across its full width. Provide a separate port within the tube to allow storage of non-corrosive weight.

2.2.5.8. Shade Fabrication:

2.2.5.8.1. Do necessary cutting and sewing of fabric to produce finished Product having neat, even appearance and meeting performance requirements specified.

2.2.5.8.2. Fabricate shades with no vertical seams, and with a maximum of 2 horizontal seams per shade. Furnish fabric in adequate width to avoid horizontal seams at spacings of less than 1900 mm (75"). Ensure seams are straight, even and offer minimum visual obstruction.

2.2.5.8.3. Ensure fabric tracks perfectly straight in its movement to within +/-1% of its width from fully open to fully closed position and when rolled onto tube, ensure it is stacked in layers to within +/-3 mm (+/-1/8") of edge alignment.

2.2.5.8.4. Hang bottom edge straight and true, with hem weights totally enclosed in extruded hem tube. Heat sealing alone is not acceptable.

2.2.5.8.5. Ensure sewing incorporates heavy denier polyester yarn and machine stitching is straight and neatly finished with no loose threads visible in finished work. Heat seaming is not acceptable in areas in which fabric is exposed.

2.2.6. Finishes

2.2.6.1. Aluminium: exposed aluminum to be clear anodized.

2.2.7. Fabric:

2.2.7.1. Shading Fabric (Openness): Shade cloths shall be 22% Polyester and 78% Vinyl. Tension fabric in finishing range prior to heat setting to keep wrap ends straight and minimize or eliminate weave distortion to keep fabric flat. Ensure fabric is dimensionally stable, moisture and solar heat resistant and non-flammable with colour fastness with following characteristics:

2.2.7.1.1. Shade Fabric: to be selected by Consultant:

2.2.7.1.1.1.	Openness Factor	3%
2.2.7.1.1.2.	Thickness	0.028”.
2.2.7.1.1.3.	Weight per sq yd	13.3 oz.

2.2.8. Fabric Colour: Ensure shade fabric on any 1 floor is from same dye lot.

2.2.9. Fabric Performance: Hang flat shade fabric without buckling or distortion. When trimmed, hang edge straight without raveling. Ensure unguided roller shade cloth rolls true and straight without shifting sideways more than 3 mm (1/8") in either direction due to wrap distortion or weave design.

2.2.10. Flame Retardance: Ensure fabric is certified by an independent laboratory to pass the Small Scale Vertical Burn Requirements of CAN/ULC-S109.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2. INSTALLATION

3.2.1. Coordinate installation and fastenings with trades providing adjacent components. Coordinate location of support framing and blocking for installation of roller window shades.

3.2.2. Provide, as part of work of this Section, custom trim components including gypsum board and tee bar trim items to accommodate adjacent ceiling systems and finishes for Consultant's review.

3.2.3. Install shades in accordance with manufacturer's instructions in accordance with reviewed Shop Drawings and as indicated, in true, flat planes.

3.2.4. Securely attach installation fittings to their mounting surfaces with screws of correct length and type and with compatible plugs or anchors where required.

3.2.5. Hang shades to substrate in a rigid and secure manner using fastener types and arrangements shown on Shop Drawings. Ensure shades have a 16 mm (5/8") air space at sill.

3.2.6. Ensure penetrating fastener do not interrupt continuity of air/vapour barrier integrity.

3.2.7. Ensure shades and their fabrics hang flat at vertical installation without buckling or distortion. Ensure edge when trimmed, hang straight without curling or ravelling.

3.2.8. Ensure unguided roller shade cloth rolls true and straight without shifting sideways more than +/-3 mm (+/-1/8") in either direction due to warp distortions or weave design.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.4. ADJUSTING

3.4.1. Adjust shades for smooth operation and correct alignment. Perform system operation, service and replacements methods in presence of Owner's personnel.

3.5. CLEANING

3.5.1. Remove protective coating. Clean shades and remove finger marks and smudges from shades and adjacent surfaces.

3.5.2. Leave shades in raised position at completion of work of this Section.

3.5.3. Upon completion of work of this Section, remove Products, materials, debris and equipment from site.

3.5.4. Leave site in a neat and tidy condition, acceptable to Consultant.

3.5.5. Do touch-up required to satisfaction of Consultant.

END OF SECTION