1.01 ACCESS AND EGRESS

.1 Contractor shall be responsible for roof access. Scaffold may be erected at the fort street loading dock. Scaffold cannot impede access to the facility.

.2 Access to the loading dock is limited and shall be coordinated with the Contract Administrator. No parking in the loading bay is permitted.

.3 No material storage on neighboring roofs is permitted.

.4 Design, construct and maintain temporary ‘access to’ and ‘egress from’ work areas, including scaffolding, stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.02 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of adjacent premises. Make arrangements with Contract Administrator to facilitate work as stated.

.5 Closures: Protect work temporarily until permanent enclosures are completed.

.6 Facility access shall be provided 24 hours a day, seven days a week.

.7 Secure facilities at end of each workday.

1.03 SITE SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

END OF SECTION

1.01 RELATED REQUIREMENTS

.1 City of Winnipeg Request For Information (RFI) v1.0, as appended to this Section.

1.02 REQUESTS FOR INFORMATION

.1 General: Immediately upon discovery of the need for interpretation of the Contract Documents, prepare and submit a Request for Information (RFI) to the Contract Administrator in the form specified herein.

.1 Coordinate and submit RFIs in a prompt manner to avoid delays in the Work.

.2 Keep each RFI to one specific item only. Do not combine several items requiring interpretation into one RFI.

.3 For RFIs submitted by email include project name, RFI reference number and RFI subject in the email heading.

.2 Contract Administrator will only consider RFIs submitted by the Contractor. Contract Administrator will not accept, review, or reply to RFIs submitted by Subcontractors, Suppliers or other entities under Contract with the Contractor.

.3 Content of the RFI: Follow input requirements as illustrated the City's Request for Information (RFI) Submittal form.

.1 Attachments:

.1 Include detail drawings, sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to describe items requiring interpretation.

.2 Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached drawings and sketches.

1.03 RFI SUBMITTAL FORM

.1 Complete the City's Request for Information (RFI) Submittal form, as appended to this Section.

.2 Submit RFI form and attachments as electronic files in Adobe Acrobat PDF format.

1.04 NUISANCE OR REDUNDANT RFI

.1 Contract Administrator will not respond to nor reply to the following Contractor-generated nuisance or redundant RFI's.

.1 Requests for approval of submittals.

.2 Requests for approval of substitutions.

.3 Requests for approval of Contractor's means and methods.

.4 Requests for approval of corrective actions for deficient Work.

.5 Requests for coordination information already indicated in the Contract Documents.

.6 Requests for adjustments in the Contract Time or the Contract Price.

.7 Requests for interpretation of Contract Administrator's response on submittals.

.8 Incomplete or inaccurately prepared RFIs.

.2 Do no list nuisance and redundant RFI's in the RFI log.

Request for Information (RFI)

Date Submitted:	Click here to select a date.	**RFI No.:**	Enter RFI#
Project Name:	Click here to enter project name.	**Date Response Required by:**	Select date.

Submitted To:

Contract Administrator (CA):	Click here to enter name of Contact Administrator.
Department/Firm:	Click here to enter CA's Dept/Firm.

Consultant Ref. No.	Click here to enter Reference No.
Bid Opportunity No.	Click here to enter Bid Opp. No.

Requested By:

Name:	Click here to enter name.
Title:	Click here to enter Title.
Firm:	Click here to enter Firm name.
Email/Tel:	Click here to enter email/tel.

For City Office use		
	City File No.:	Click here to enter City File No.
	Project ID:	Click here to enter Project ID.
	Project Record Index No.:	Click here to enter PRI No.
	Purchase Order No.:	Click here to enter PO No.

For details and instructions on how to complete this document, click the [¶] icon under the Home tab to display the hidden text.

Request/Question: (to be completed by Contractor)

Click here to enter Question/Request.

Answer/Response: (to be completed by Contract Administrator)

Click here to enter Answer/Response.

Attachment(s): ☐

RFI Response Distribution: (to be completed by Contract Administrator)

- ☐ Contract Administrator
- ☐ Contractor
- ☐ City Project Manager
- ☐ Consultant
- ☐ Other: Click here to enter text.

1.05 CONTRACT ADMINISTRATOR'S RESPONSE

.1 Contract Administrator will review each RFI, determine action (or no action) required, and submit his reply to the Contractor.

.2 Allow five working days for Contract Administrator's response time for each RFI. RFI's that are received by the Contract Administrator after [1:00 pm] on working days will be considered as have been received on the next working day.

.3 Contract Administrator's failure to reply to any RFI within the time period specified above or within a reasonable time period, as determine by the Contract Administrator, will not be considered a reason for a delay claim by the Contractor.

.4 The Contract Administrator may extend the response time for any RFI at his discretion. Reasons may include, but not necessarily be limited to, the following:

.1 Too many RFIs submitted on the same day or within a short time period.

.2 RFI's which require extensive review and research by the Contract Administrator, which may include requests for additional information from other sources, the timing of which the Contract Administrator has no control.

.3 RFIs which, in the Contract Administrator's opinion, will have no significant impact on the construction progress schedule and therefore may be deferred for a reasonable period of time.

.5 Contract Administrator's action may include a request for additional information, in which case Contract Administrator's response time will be re-adjusted to the date when the additional information is received by the Contract Administrator.

.6 If Contractor believes the Contract Administrator's RFI response warrants a change in the Contract Time or the Contract Price, notify the Contract Administrator in writing within [five] days of receipt of the Contract Administrator's RFI response.

1.06 CONTRACTOR'S RESPONSE

.1 On receipt of Contract Administrator's response to an RFI:

.1 Update RFI log as specified herein.

.2 Review response and, submit a reply to the Contract Administrator, within [five] working days of receipt of Contract Administrator response, stating whether the Contract Administrator's response is either acceptable or not acceptable.

.2 If Contract Administrator's response is acceptable:

.1 Distribute the response to affected parties and proceed accordingly.

.3 If Contract Administrator's response is considered not acceptable:

.1 Resubmit the RFI and include reason(s) for disagreement.

.2 Contract Administrator will review and submit a reply to the Contractor within 5 working days of receipt of resubmittal, notwithstanding the Contract Administrators extension of response time as specified herein.

END OF SECTION

1.01 RELATED DOCUMENTS

.1 Builders' Liens Act (Manitoba).

1.02 SCHEDULE OF VALUES

.2 Submit to Contract Administrator, Schedule of Values, at least 15 days prior to submitting first Application for Payment.

.3 Use Schedule of Values as basis for Contractor's Progress Claim.

.4 Form of Submittal:

.1 Submit typewritten Schedule of Values on letter size white paper.

.2 Use Table of Contents of this Tender as basis for format for listing costs of work for Sections under all Divisions.

.3 Identify each line item with number and title as listed in Table of Contents of this Tender.

.5 Itemize separate line item cost for work required by each Section of this Tender.

.6 After review by Contract Administrator, revise and resubmit Schedule as directed.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Start-up meeting, progress meetings and reports.

1.02 MEETING LOCATION

.1 Project meetings shall be held in site office provided by Contractor as specified in Section 01 52 00 - Construction Facilities.

1.03 CONSTRUCTION START-UP MEETING

.1 After award of Contract, but before start of Work, Contract Administrator shall convene a start-up meeting to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of the Contract Administrator, Contractor, and major Subcontractors are to attend.

.3 Contract Administrator shall establish time and location of meeting and notify all concerned parties within five working days of meeting.

.4 Contract Administrator shall chair meeting, record minutes, and distribute minutes to all attending parties within four working days after meeting.

.5 Agenda:

.1 Appointment of official representatives of participants in the work.

.2 Lines of communication.

.3 Schedule of work, progress scheduling.

.4 Critical work sequencing and long-lead items.

.5 Deliveries

.6 Access

.7 Procedures for RFIs.

.8 Submittal procedures

.9 Schedule of submission of shop drawings, product data, samples, test reports,

.10 Schedule for provision of mock-ups and field samples.

.11 Preconstruction photographs

.12 Procedures for changes, field decisions, change orders, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.

.13 City-furnished products

.14 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.15 Safety

.16 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.17 Requirements for temporary utilities, temporary barriers and controls, construction facilities, site sign and other temporary construction.

.18 Record drawings in accordance with Section 01 78 00 - Project Closeout.

.19 Maintenance Manuals in accordance with Section 01 78 00 - Project Closeout.

.20 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Project Closeout.

.21 Monthly progress claims, administrative procedures, photographs, and holdbacks.

.22 Appointment of inspection and testing agencies or firms in accordance with Section 01 40 00 - Quality Requirements.

.23 Insurances and transcript of policies.

.24 Commissioning

1.04 JOB PROGRESS MEETINGS

.1 After award of Contract and signing of Agreement, Contractor will convene job progress meetings at regularly scheduled intervals to ensure proper coordination of the Work.

.2 Designate times and locations of meetings, and notify all parties concerned, including Subcontractors, a minimum five days prior to meetings.

.3 Chair meetings, record minutes, and distribute minutes to all attending parties within four working days after meetings.

.4 Agenda to generally include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule and comparison to initial Gantt-Chart Schedule.

.8 Review schedule progress, during succeeding work period and comparison to initial Gantt-Chart Schedule.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for effect on construction schedule and on completion date.

.12 Health and Safety.

.13 Other business.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

.1 Startup construction schedule.

.2 Contractor's Construction Schedule.

.3 Construction schedule updating reports.

.4 Daily construction reports.

.5 Material location reports.

.6 Site condition reports.

.7 Unusual event reports.

1.02 DEFINITIONS

.1 Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

.1 Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.

.2 Predecessor Activity: An activity that precedes another activity in the network.

.3 Successor Activity: An activity that follows another activity in the network.

.2 Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

.3 CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

.4 Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

.5 Event: The starting or ending point of an activity.

.6 Float: The measure of leeway in starting and completing an activity.

.1 Float time is not for the exclusive use or benefit of either City or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

.2 Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

.3 Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

.7 Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

.1 Format for Submittals: Submit required submittals in the following format:

.1 Working electronic copy of schedule file, where indicated.

.2 Startup construction schedule.

.1 Submittal of cost-loaded, start-up construction schedule will not constitute approval of schedule of values for cost-loaded activities.

.3 Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

.4 Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

.1 Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

.5 CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

.1 Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.

.2 Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.

.3 Total Float Report: List of activities sorted in ascending order of total float.

.4 Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

.6 Construction Schedule Updating Reports: Submit with Applications for Payment.

.7 Daily Construction Reports: Submit at weekly intervals.

.8 Material Location Reports: Submit at weekly or monthly intervals.

.9 Site Condition Reports: Submit at time of discovery of differing conditions.

.10 Unusual Event Reports: Submit at time of unusual event.

.11 Qualification Data: For scheduling consultant.

1.04 QUALITY ASSURANCE

.1 Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 19 - Project Meetings. Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:

.1 Review software limitations and content and format for reports.

.2 Verify availability of qualified personnel needed to develop and update schedule.

.3 Discuss constraints, including phasing, work stages, area separations, interim milestones and partial City occupancy.

.4 Review delivery dates for City-furnished products.

.5 Review schedule for work of City separate contracts.

.6 Review submittal requirements and procedures.

.7 Review time required for review of submittals and resubmittals.

.8 Review requirements for tests and inspections by independent testing and inspecting agencies.

.9 Review time required for Project closeout and City start-up procedures, including commissioning activities.

.10 Review and finalize list of construction activities to be included in schedule.

.11 Review procedures for updating schedule.

1.05 COORDINATION

.1 Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

.1 Secure time commitments for performing critical elements of the Work from entities involved.

.2 Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.06 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

.1 Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

.1 Use Microsoft Project, Primavera, Meridian Prolog for current Windows operating system.

.2 Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.

.1 Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

.3 Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

.1 Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Consultant.

.2 Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

.3 Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 - Submittal Procedures in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.

.4 Startup and Testing Time: Include no fewer than 30 days for startup and testing.

.5 Commissioning Time: Include no fewer than 30 days for commissioning.

.6 Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Consultant's administrative procedures necessary for certification of Substantial Completion.

.7 Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

.4 Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.

.1 Phasing: Arrange list of activities on schedule by phase.

.2 Work under More Than One Contract: Include a separate activity for each contract.

.3 Work by City: Include a separate activity for each portion of the Work performed by City.

.4 City-Furnished Products: Include a separate activity for each product. Include delivery date Delivery dates to stipulate the earliest possible delivery date.

.5 Work Restrictions: Show the effect of the following items on the schedule:

.1 Coordination with City site activities.

.2 Limitations of continued occupancies.

.3 Uninterruptible services.

.4 Partial occupancy before Substantial Completion.

.5 Use-of-premises restrictions.

.6 Seasonal variations.

.7 Environmental control.

.6 Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

.1 Subcontract awards.

.2 Submittals.

.3 Purchases.

.4 Fabrication.

.5 Sample testing.

.6 Deliveries.

.7 Installation.

.8 Tests and inspections.

.9 Adjusting.

.10 Curing.

.11 Startup and placement into final use and operation.

.12 Commissioning.

.7 Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

.1 Structural completion.

.2 Temporary enclosure and space conditioning.

.3 Completion of mechanical installation.

.4 Completion of electrical installation.

.5 Substantial Completion.

.8 Other Constraints: Community material resources.

.5 Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, piling, Substantial Completion, and final completion.

.6 Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.

.7 Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

.1 Unresolved issues.

.2 Unanswered Requests for Information.

.3 Rejected or unreturned submittals.

.4 Notations on returned submittals.

.5 Pending modifications affecting the Work and the Contract Time.

.8 Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

.1 Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

.2 Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

.3 As the Work progresses, indicate final completion percentage for each activity.

.9 Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

.10 Distribution: Distribute copies of approved schedule to Consultant, City, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

.1 Post copies in Project meeting rooms and temporary field offices.

.2 When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.07 STARTUP CONSTRUCTION SCHEDULE

.1 Gantt-Chart Schedule: Submit startup, horizontal, Gantt-chart-type construction schedule within seven days of date established for the Notice to Proceed.

.2 Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

.3 Gantt-Chart Schedule to be consistent with the schedule submitted by the Contractor in their Bid.

1.08 CPM SCHEDULE REQUIREMENTS

.1 General: Prepare network diagrams using AON (activity-on-node) format.

.2 Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

.3 CPM Schedule: Prepare Contractor's Construction Schedule using a time-scaled CPM network analysis diagram for the Work.

.1 Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.

.1 Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.

.2 Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.

.3 Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

.4 Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.

.4 CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.

.1 Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

.1 Preparation and processing of submittals.

.2 Mobilization and demobilization.

.3 Purchase of materials.

.4 Delivery

.5 Fabrication

.6 Utility interruptions

.7 Installation

.8 Work by City that may affect or be affected by Contractor's activities.

.9 Testing and inspection

.10 Commissioning

.11 Punch list and final completion.

.12 Activities occurring following final completion.

.2 Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

.3 Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

.4 Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

.1 Subnetworks on separate sheets are permissible for activities clearly off the critical path.

.5 Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Consultant's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, sustainable design documentation, and demonstration and training (if applicable), in the amount of five percent of the Contract Sum.

.1 Each activity cost shall reflect an appropriate value subject to approval by Consultant.

.2 Total cost assigned to activities shall equal the total Contract Sum.

.5 Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.

.6 Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:

.1 Contractor or subcontractor and the Work or activity.

.2 Description of activity.

.3 Main events of activity.

.4 Immediately preceding and succeeding activities.

.5 Early and late start dates.

.6 Early and late finish dates.

.7 Activity duration in workdays.

.8 Total float or slack time.

.9 Average size of workforce.

.10 Dollar value of activity (coordinated with the schedule of values).

.7 Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

.1 Identification of activities that have changed.

.2 Changes in early and late start dates.

.3 Changes in early and late finish dates.

.4 Changes in activity durations in workdays.

.5 Changes in the critical path.

.6 Changes in total float or slack time.

.7 Changes in the Contract Time.

.8 Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

.1 In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.

.2 In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.

.3 In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.

.4 Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

.1 In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.

.2 Submit value summary printouts one week before each regularly scheduled progress meeting.

1.09 REPORTS

.1 Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

.1 List of subcontractors at Project site.

.2 List of separate contractors at Project site.

.3 Approximate count of personnel at Project site.

.4 Equipment at Project site.

.5 Material deliveries.

.6 High and low temperatures and general weather conditions, including presence of rain or snow.

.7 Testing and inspection.

.8 Accidents.

.9 Meetings and significant decisions.

.10 Unusual events.

.11 Stoppages, delays, shortages, and losses.

.12 Meter readings and similar recordings.

.13 Emergency procedures.

.14 Orders and requests of authorities having jurisdiction.

.15 Change Orders received and implemented.

.16 Change Directives received and implemented.

.17 Services connected and disconnected.

.18 Equipment or system tests and startups.

.19 Partial completions and occupancies.

.20 Substantial Completions authorized.

.2 Material Location Reports: At weekly or monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

.1 Material stored prior to previous report and remaining in storage.

.2 Material stored prior to previous report and since removed from storage and installed.

.3 Material stored following previous report and remaining in storage.

.3 Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

.4 Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise City in advance when these events are known or predictable.

.1 Submit unusual event reports directly to Consultant and City within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Shop drawings

.2 Product data, test reports, certificates.

.3 Manufacturer's instructions and field reports

.4 Samples

1.02 DEFINITIONS

.1 Action Submittals: Written and graphic information and physical samples that require Contract Administrator's responsive action. Unless specifically noted otherwise in individual section, the following are considered Action Submittals:

.1 Product Data

.2 Shop Drawings

.3 Reports

.4 Closeout Submittals

.2 Informational Submittals: Written and graphic information and physical samples that do not require Contract Administrator's responsive action. Submittals may be rejected for not complying with requirements. Unless specifically noted otherwise in individual section, the following are considered Informational Submittals:

.1 Certificates

.2 Maintenance Data

.3 Material Safety Data Sheets (MSDS)

.4 Inspection Reports

.5 Manufacturer's Instructions

1.03 ADMINISTRATIVE

.1 Submit to Contract Administrator submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

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

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator ‘s review.

.10 Keep one reviewed copy of each submission on site.

.11 Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Contract Administrator’s receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

.1 Submittals that are received by the Contract Administrator after 1:00 pm on working days will be considered as have been received on the next working day.

.2 Initial Review: Allow five working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Contract Administrator will advise Contractor when a submittal being processed must be delayed for coordination.

.3 Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

.4 Resubmittal Review: Allow five working days for review of each resubmittal.

1.04 SUBMITTAL SCHEDULE

.1 Submittal Schedule: Submit, as an Action Submittal, a list of submittals, arranged in chronological order by dates required by demolition schedule. Include time required for review when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Contract Administrator and additional time for handling and reviewing submittals required by those corrections.

.2 Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction progress schedule.

.1 Initial Submittal: Submit for review concurrently with the Construction Progress Schedule utilizing the Critical Path Method (CPM).

.1 Allow five working days for Consultant review of submittal schedule.

.2 Format: Arrange the following information in a tabular format:

.1 Scheduled date for first submittal.

.2 Specification Section number and title.

.3 Submittal Category: Action; Informational.

.4 Name of Subcontractor.

.5 Description of the Work covered.

.6 Scheduled date for Contract Administrator’s final release or approval scheduled dates.

.2 Final (Revised) Submittal: Submit within 14 days of initial submittal.

.1 Submit revised submittal schedule to reflect Consultant review comments and changes in current status and timing for submittals.

.3 Progress Submittals: Submit updated Submittal Schedule at monthly intervals to coincide with project meetings.

1.05 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings for Contract Administrator’s review.

.2 This review by the Contract Administrator is for the sole purpose of ascertaining conformance with the general concept of the scope of work. This review shall not mean

that the Contract Administrator approves the content inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of their responsibilities for errors or omissions in the shop drawings or of their responsibility for meeting all requirements of the contract documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

.3 The term “shop drawings” means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.4 Shop drawings that do not include the stamp, date, and signature of the person responsible for reviewing the shop drawings before submittal to the Contract Administrator, will be rejected and returned without being examined.

.5 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or registered in Province of Manitoba, Canada and who holds a “certificate of authorization” from the EGM, where specifically requested in the specifications. Shop drawings not bearing the required Engineer’s seal will be rejected and returned without being examined.

.6 Indicate materials, methods of construction and explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.7 Adjustments made on shop drawings by the Contract Administrator are not intended to change the Contract Price. If it is deemed that such adjustments affect the value of Work, state such in writing to the Contract Administrator prior to proceeding with fabrication or the Work.

.8 Make changes in shop drawings that the Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify the Contract Administrator in writing of any revisions other than those requested.

.9 Accompany submissions with transmittal letter, containing:

- .1 date,
- .2 project title and number,
- .3 contractor’s name and address,
- .4 identification and quantity of each shop drawing, product data, and samples, and
- .5 other pertinent data.

.10 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and Address of:
  - .1 Subcontractor,
  - .2 Supplier, and
  - .3 Manufacturer.
- .4 Contractor’s stamp, signed by Contractor’s authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:

.1 Layout, showing dimensions, including identified field dimensions, and clearances.

.2 Setting details

.3 Capacities

.4 Performance characteristics

.5 Standards

.6 Operating weight

.7 Relationship to adjacent work.

.8 Other

.12 Submit one digital file in Adobe PDF file format of the following submittals:

.1 Shop drawings for each requirement requested in specification sections and as the Contract Administrator may reasonably request.

.2 Product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.

.3 Test reports for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Report signed by authorized official of testing laboratory

.2 Testing must have been within three years of date of contract award for project.

.4 Certificates for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract, complete with project name.

.5 Manufacturers' instructions for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Pre-printed material describing installation of product, system or material, including special notices and material safety data sheets concerning impedances, hazards and safety precautions.

.6 Manufacturer's field reports for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.11 Delete information not applicable to project.

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

.13 If upon review by the Contract Administrator, no errors or omissions in compliance with the Contract Documents are discovered or if only minor corrections are made, copies will be returned, and Work may proceed. If, however, shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through the same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.14 No extension of Contract Time will be allowed for delays in the Work which may be caused for Contract Administrator‘s rejection of shop drawings.

.15 Shop drawings, which contain deviations from the Contract Documents which are not presented to the Contract Administrator in writing will be rejected and returned without being examined.

1.06 TESTING

.1 Keep one set of photographs on site.

.2 Provide one set of photographs to Contract Administrator.

1.07 CERTIFICATES AND TRANSCRIPTS

.1 Prior to commencement of the Work, provide evidence of compliance with worker's compensation legislation at the place of the Work, including payments due thereunder.

.2 Submit transcription of insurance immediately after award of Contract.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Requirements and limitations for cutting and patching the Work.

.2 Selective demolition and removal of existing materials, equipment and finishes; cutting openings in walls, ceiling, floors and roof decks as required to accommodate the new work and finishes.

.3 Patching and making good existing work and finishes affected by alteration and renovation work.

.4 Salvage of existing materials and equipment where indicated.

1.02 RELATED WORK

.1 Patching and making good existing construction and finishes as part of the work of the respective Subcontractors whose work is affected.

.2 Removal, relocation, of existing mechanical and/or electrical services and equipment.

1.03 COORDINATION MEETING

.1 Prior to start of alteration and renovation work convene a coordination meeting to review construction procedures for alteration and renovation work. Agenda to include:

.1 Construction progress schedule.

.2 Site security, temporary enclosures, emergency exits.

.3 Site access and storage.

.4 Start-up and shut down of mechanical and electrical services.

.5 Waste management and disposal.

.6 Work procedures in occupied spaces.

.2 Senior representatives of the Contract Administrator, City, Contractor and major Subcontractors are to be in attendance.

.3 Establish time and location of meeting and notify all concerned parties within [five] working days of meeting.

.4 Chair meeting and record minutes. Distribute minutes to all attending parties within [four] working days after meeting.

1.04 GENERAL PROCEDURES

.1 The existing building(s) are to remain occupied and functional during the work of this project. Execute work with least possible interference or disturbance to building occupants and the general public and the normal use of the premises.

.2 Prior to start of any alteration work, arrange with the City and Contract Administrator a work schedule satisfactory to operational requirements of the existing facility.

.3 The City shall vacate only those areas designated for alteration work.

.4 Confine construction activities to designated work areas. Do not store materials, tools or equipment outside of designated work areas.

.5 Prevent migration of dust and debris into occupied areas.

.6 Establish access routes to and from the work areas. Use only designated access routes for movement of workers, tools, equipment, materials, and construction debris.

.7 Where work must proceed in occupied areas clean up at the end of each workday. Place tools, equipment, and materials into secure lock-up.

.8 Provide temporary protection to cut and partially finished surfaces to building occupants and general public from possible injury.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with [Section 01 74 19 - Construction/Demolition Waste Management and Disposal][, and Waste Reduction Work Plan].

.2 Except for items indicated for salvage, construction waste, abandoned or demolished materials and equipment are the Contractor's responsibility and shall be promptly removed from site.

.3 Dispose of construction debris, abandoned equipment and materials off site via designated access routes.

.4 Do not allow demolition debris to accumulate within the building or on site. Remove debris on a regular basis.

.5 Do not allow waste and debris to block access routes to and from exits, fire lanes, or impede access to the building.

.6 Do not burn rubbish or debris on site.

.7 Do not use City's waste containers for waste removal.

.8 Provide suitable waste containers. Locate large waste containers on City's property only in areas acceptable to the City.

1.06 TEMPORARY ENCLOSURES

.1 Construct temporary partitions to isolate work areas from occupied areas of the building(s). Erect partitions to contain construction debris and prevent unauthorized entry to work areas.

.2 Prior to erection confirm exact location(s) with Contract Administrator.

.3 Provide doors to prevent unauthorized access.

.4 Where temporary partitions restrict access to emergency exits review security requirements with Contract Administrator prior to erection.

.5 Construct partitions of steel studs spaced at maximum 600 mm on centre. Cover finished side with gypsum board.

.6 Provide continuous dust barrier on inside of 6 mil polyethylene sheet. Seal holes and joints to prevent migration of dust to occupied areas.

.7 Where overhead structures are more than 2 400 mm above floor provide continuous polyethylene dust barriers at top of partition to seal off space above partition and structure.

1.07 PROTECTIVE COVERS

.1 Where furniture, furnishings, cabinet work or other finished work is adjacent to or in areas where alteration work is in progress provide covers to protect against construction debris and dust.

.2 Remove covers and clean up after each work stage as instructed by Contract Administrator.

1.08 EXISTING MECHANICAL AND ELECTRICAL SERVICES

.1 Prior to start of Work identify and confirm the location of all mechanical and electrical services within or passing through construction areas. Confirm their origin and destination.

.2 Where services are concealed within walls, floors, or ceilings and cannot be visually identified use electronic scanning devices or other acceptable means to locate and identify concealed services.

.3 Do not shut off, disconnect, or remove existing mechanical and electrical services without prior notification of Contract Administrator.

.4 Where existing service must be shut-down or disconnected, notify City in advance of shut-down or disconnection. Provide schedule indicating which services are affected and duration of shut-down.

.5 Some services within construction areas may serve other areas of the building not affected by construction work and must remain in service during construction period. Take special precautions to protect and maintain continuance of services that are to remain active to service adjacent areas.

.6 Include for required connections, temporary or permanent, for continuance of existing services.

1.09 EXISTING FIXTURES AND EQUIPMENT

.1 Where new flooring and finishes are to be installed, remove and replace existing plumbing fixtures and other equipment to allow for installation of new flooring and finishing products under or behind such item. Example: lift water closets to allow installation of finish flooring base.

.2 In rooms with floor drains, remove and replace clamp rings to allow for installation of finish flooring under clamp ring.

1.10 SALVAGE MATERIAL

.1 Remove as salvage items as indicated.

.2 Remove items carefully to prevent damage. Dismantle large items to fit through openings and ease of transport.

.3 For items indicated for reinstallation store on site until required.

.4 For items to be turned over to City transport to storage areas [on site] as directed by City.

1.11 EQUIPMENT

.1 Provide equipment, tools and machinery for proper execution of the Work.

1.12 PREPARATION

.1 Structural and load-bearing elements:

.1 Obtain Contract Administrator’s written approval before cutting, boring or sleeving structural or load-bearing members including roof decks, floor assemblies or load bearing walls and columns.

.2 Electronically scan structural elements to confirm location of structural steel and reinforcing before starting work. Record locations on record drawings.

.3 Mark out exact locations and dimensions prior to inspection.

.4 Do not proceed with the work until the Contract Administrator has reviewed and confirmed proposed work.

.2 Prevent movement, settlement or damage of structures, services, parts of existing building to remain.

.1 Provide bracing, shoring and underpinning as required.

.2 Repair damage caused by demolition as directed by Contract Administrator.

.3 Support affected structures and, if safety of structure being demolished appears to be endangered, take preventative measures, stop Work and immediately notify Contract Administrator.

1.13 SELECTIVE DEMOLITION FOR ALTERATION WORK

.1 Specialists familiar with the materials affected shall perform selective demolition work.

.2 Perform in a manner to neither damage nor endanger any part of the existing building or work in progress.

.3 Demolition work indicated on drawings is schematic only. Verify all dimensions and conditions on site.

.4 Do not damage or deface existing construction, equipment or finishes indicated to remain or items indicated for salvage.

.5 Keep cutting to no more than 10% larger than outside dimensions of item penetrating another material.

.6 Make cuts with clean, true, smooth edges to minimize patchwork and to provide suitable surface for integration of new materials.

.7 Use concrete saw for cutting concrete.

.8 Use diamond core drill for cutting small diameter openings in concrete.

.9 Use of pneumatic driven jackhammers inside buildings is not permitted without Contract Administrator approval.

.10 Marking:

.1 Each Subcontractor is responsible for marking out locations of all cutting, boring, and demolition required for installation of their respective work.

.2 Extra costs for additional cutting and patching required because of errors in marking out of locations of cutting and demolition work shall be paid by the Subcontractor responsible for the error in marking.

.11 Openings and Recesses:

.1 Cut openings and recesses in foundation walls and floors as required for installation of new work and finishes.

.2 Coordinate with Mechanical, Electrical and other Subcontractors.

.3 Contractor is responsible for cutting openings larger than 150 x 150 mm or 150 mm in diameter. Openings smaller than these shall be the responsibility of the Subcontractor requiring the opening.

.4 Contractor is responsible for cutting recesses larger than 800 x 800 mm in size. Recesses smaller than these sizes shall be the responsibility of the Subcontractor requiring the recess.

1.14 PATCHING AND MAKING GOOD

.1 Patching and making good of existing materials and finishes is the responsibility of the Subcontractor whose work is affected.

.2 Patch and make good all damage to existing materials and finishes resulting from work of this Contract.

.3 Patching, unless otherwise noted, shall match existing adjacent surfaces in all respects. Make patchwork inconspicuous in final assembly.

.4 Patch and repair to standard of construction of surrounding materials, except where indicated otherwise.

.5 Fit work air tight to pipes, sleeves, ducts, conduit and other penetrations. Seal all penetrations tight with acceptable materials.

.6 Patch openings, holes, cuts and around pipes, ductwork, conduit and other work passing through fire separations and fire rated assemblies. Use materials and methods to maintain integrity of fire ratings. Use materials meeting Underwriters' Laboratories Canada (ULC) requirements and authorities having jurisdiction.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Health and safety requirements and adherence.

1.02 RELATED REQUIREMENTS

.1 Section 02 81 01 - Hazardous Materials

.2 Section 02 82 00.01 - Asbestos Abatement Requirements Type 1 Work Procedures

.3 Section 02 82 00.02 - Asbestos Abatement Requirements Type 2 Work Procedures

.4 E2 – Excavation Assessment

.5 E3 - Hazardous Materials Assessment

1.03 REFERENCE STANDARDS

.1 Government of Canada

.1 Canadian Construction Safety Code, 1997

.2 Canada Labour Code, R.S.C., 1985, c. L-2, Part II, Occupational Health and Safety

.3 Workplace Hazardous Materials Information System 2015 (WHMIS)

.2 National Research Council

.1 National Building Code of Canada 2015 (NBC)

.2 National Fire Code of Canada 2015 (NFC)

.3 Province of Manitoba

.1 Manitoba Building Code 2011 (MBC) including Manitoba amendments

.2 The Workplace Safety and Health Act, C.C.S.M. c. W210

.3 The Workers Compensation Act RSM 1987, c. W200

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Meetings:

.1 Schedule and administer health and safety meeting with Contract Administrator prior to commencement of Work.

.2 Coordination:

.1 Review and coordinate hot work safety requirements as indicated in other Sections.

1.05 REGULATORY REQUIREMENTS

.1 Observe and enforce construction safety measures with construction safety measures of the following:

.1 Canadian Construction Safety Code

.2 Canada Labour Code, Part II, Occupational Health and Safety.

.3 NBC, Part 8 Safety Measures at Construction and Demolition Sites.

.4 NFC, Sections 5.2., and 5.6

.5 The Workers Compensation Act RSM 1987, c. W200

.6 The Workplace Safety and Health Act, c. W210.

.7 Municipal statutes, and authorities having jurisdiction.

.2 In event of conflict between any provisions of above authorities, the more stringent requirements to apply.

1.06 SAFETY PLAN

.1 Develop written site-specific health and safety plan, and fire safety plan, based on hazard assessment prior to commencing any site work and continue to implement, maintain, and enforce plan until final demobilization from site.

1.07 RESPONSIBILITY

.1 The "Prime Contractor" according applicable jurisdiction, is responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific health and safety plan, and fire safety plan.

1.08 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Informational Submittals:

.1 Provide a valid certificate of recognition (COR) as issued by the provincial construction safety association or other certifying organization authorized the province.

.2 Submit Contractor’s site-specific safety plan and fire safety plan at least five Business Days prior to the commencement of any Work on the Site.

.3 Submit two copies of Contractor's authorized representative's work site health and safety inspection reports to Contract Administrator.

.4 Submit copies of incident and accident reports.

1.09 WORK SITE SAFETY

.1 Comply with and enforce the construction health and safety measures required by provincial legislation applicable to the Place of the Work, and applicable provisions of Federal, and municipal safety laws and ordinances.

.2 Assume full responsibility for the safety and organization of the Work until Final Certificate of Payment.

.3 Follow any directives from the Worker's Compensation Board and provide any safeguards required.

.4 Comply with all of the City of Winnipeg’s safety requirements.

.5 Post all necessary danger signs.

.6 Maintain on site five sets of CSA approved construction safety hats, safety vests and safety glasses for use of authorized visitors to site. Visitors are responsible for their own CSA approved footwear.

1.10 SITE CONDITIONS

.1 An Excavation Assessment of the building site has been conducted, refer to E2.

.2 A hazardous materials assessment of the building site has been conducted, refer to E3.

.3 Work at site will involve contact with:

.1 Residual petroleum hydrocarbon (PHC) in the soils.

.2 Asbestos containing cementitious drainpipes.

1.11 UNFORSEEN HAZARDS

.1 Should unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance o the Work, stop work and immediately advise Contract Administrator verbally and in writing.

1.12 CERTIFICATE OF RECOGNITION PROGRAM

.1 Contractor to possess safety program for an accredited occupational health and safety program applicable to the requirements listed in the bid opportunity document.

.2 Subcontractors with employees doing construction work on this site must show safety program registration verified by either the Heavy Construction Association or the Construction Safety Association as applicable to the Place of the Work.

1.13 FIRE SAFETY REQUIREMENTS

.1 Conform to requirements of NFC, Section 5.2. Hot Works, Section 5.6. Construction and Demolition Sites, and as follows.

.2 Hot Works Including, Cutting, Grinding, Torch Work, and Welding:

.1 Make application for a hot works permit.

.2 If possible, hot works shall be performed in a safe area, absent of combustibles. If not possible, remove combustibles from the area of hot works.

.3 Provide and maintain at least one portable fire extinguisher in the hot work area.

.4 Ventilate area of hot work by use of approved portable supply and exhaust fans.

.5 Ventilate hot works in enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.6 Provide a continuous fire watch during the hot work and for a period of not less than one hour after its completion and four hours after completion of the work.

.3 Burning rubbish and construction waste materials is not permitted on site.

1.14 OVERLOADING

.1 Do not load any part of the structure during the construction with a load greater than it is calculated to bear safely when complete. Ensure every temporary support is as strong as the permanent support. Do note place loads on concrete floors until they have obtained their permanent set.

1.15 HAZARDOUS WORK

.1 Blasting or other use of explosives is not permitted.

.2 Use powder actuated devices only after receipt of written permission from Contract Administrator.

1.16 SMOKING PRECAUTIONS

.1 Observe smoking regulations.

END OF SECTION

1.01 DEFINITIONS

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

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

1.02 SUBMITTALS

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

.2 Two weeks prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Contract Administrator. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

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

.4 Environmental Protection Plan: Include:

- .1 Name(s) of person(s) responsible for ensuring adherence to Environmental Protection Plan.
- .2 Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from site.
- .3 Name(s) and qualifications of person(s) responsible for training site personnel.
- .4 Descriptions of environmental protection personnel training program.
- .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
- .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
- .9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

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

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

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

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan: to be included and updated, as required.

1.03 FIRES

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

.2 Where fires or burning permitted, prevent staining or smoke damage to structures, materials, or vegetation that is to be preserved. Restore, clean and return to new condition stained or damaged work.

.3 Provide supervision, attendance and fire protection measures as directed.

1.04 DISPOSAL OF WASTES

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

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

1.05 DRAINAGE

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

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

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

1.06 POLLUTION CONTROL

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

.2 Control emissions from equipment and plant to local authority’s emission requirements.

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

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

1.07 NOTIFICATION

.1 Contract Administrator will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: After receipt of such notice, inform Contract Administrator of proposed corrective action and take such action for approval by Contract Administrator.

.3 Contract Administrator will issue stop order of work until satisfactory corrective action has been taken.

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

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Inspection and testing, administrative, and enforcement requirements.

.2 Tests.

1.02 RELATED REQUIREMENTS

.1 Submission of tests to confirm product quality, Section 01 33 00 - Submittal Procedures.

.2 Material and workmanship quality, reference standards, Section 01 61 00 - Common Product Requirements.

1.03 REVIEW OF THE WORK

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

.3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Contract Administrator instructions, or law of Place of Work.

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

.5 Contract Administrator will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, the City shall pay cost of examination and replacement.

1.04 ACCESS TO WORK

.1 Allow inspection/testing agencies access to the Work, offsite manufacturing, and fabrication plants.

.2 Cooperate to provide reasonable facilities for such access.

1.05 PROCEDURES

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

.2 Submit test reports requested in Specification sections or as may be requested by Contract Administrator. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.

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

1.06 DAMAGED OR DEFECTIVE WORK

.1 Promptly make good the City's property damaged by removals made under this Contract.

.2 If in opinion of Contract Administrator, it is not expedient to make good damage to property attributable to the course of the Work, the City will deduct from Contract price the difference in value between Work performed and that called for by repair or remediation to damaged buildings or property, amount of which will be determined by Contract Administrator.

1.07 REPORTS

.1 Submit four copies of inspection and test reports promptly to the Contract Administrator.

.2 Provide copies to Subcontractor of work being inspected/tested and manufacturer/ fabricator of Material being inspected/tested.

1.08 TESTS

.1 Furnish test results as may be requested.

.2 The cost of tests and mix designs beyond those called for in the Drawings and Specifications or beyond those required by the Law of the Place of Work shall be appraised by the Contract Administrator.

END OF SECTION

1.01 INSTALLATION AND REMOVAL

.1 Provide temporary utilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.02 WATER SUPPLY

.1 A limited amount of water from the existing building supply will be made available for construction use.

.2 Provide, install and maintain temporary lines and connections at own expense.

.3 The City will pay utility charges.

1.03 TEMPORARY HEATING AND VENTILATION

.1 Maintain temperatures of minimum 10°C in areas in which construction is in progress.

1.04 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power required during construction for temporary lighting and the operating of power tools.

.2 Arrange for connection with Manitoba Hydro. Pay all costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of the supply required for temporary lighting and power tools is the responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.05 TEMPORARY COMMUNICATIONS FACILITIES

.1 Provide and pay for temporary telephone fax and internet hook up, lines and equipment necessary for own use and use of Contract Administrator.

1.06 FIRE PROTECTION

.1 Provide and maintain adequate temporary fire protection equipment during performance of Work, as required by insurance companies having jurisdiction and governing Codes, regulations and By-Laws.

.2 Burning rubbish and construction waste materials is not permitted on site.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Construction aids.

.2 Office and sheds.

1.02 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA)

.1 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.

.2 CAN/CSA-S269.2-16, Access Scaffolding for Construction Purposes.

1.03 INSTALLATION AND REMOVAL

.1 For review and approval of the Contract Administrator, prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Indicate use of supplemental or other staging area.

.3 Provide construction facilities in order to execute work expeditiously.

.4 Remove from site all such work after use.

1.04 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2 and authority having jurisdiction approval.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms temporary stairs.

.3 The contractor is responsible for access and egress to the roof.

1.05 HOISTING

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists and cranes shall be operated by qualified operator.

1.06 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Drawings and Specifications. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.07 CONSTRUCTION PARKING

.1 Parking will be provided on Site subject to the approval of the Contract Administrator and provided it does not disrupt performance of Work. Parking in the area is limited.

.2 Provide and maintain adequate access to project site.

1.08 CONSTRUCTOR'S SITE OFFICE

.1 Site office location subject to the approval of the Contract Administrator.

.2 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay-down table.

.3 Provide marked and fully stocked first-aid case in a readily available location.

.4 Subcontractors to provide their own offices as necessary, subject to the approval of the Contract Administrator. Direct location of these offices.

1.09 EQUIPMENT, TOOL AND MATERIAL STORAGE

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

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.10 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Location subject to approval of the Contract Administrator.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 Existing facilities not to be used.

1.11 CONSTRUCTION SIGNAGE

.1 No signs or advertisements, other than warning signs, are permitted on site.

.2 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.3 Maintain approved signs and notices in good condition for duration of project and dispose of offsite on completion of project or earlier if directed by Contract Administrator.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Contract Administrator.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from Site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.8 Dust control: Adequate to ensure safe operation at all times.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.02 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA)

.1 CSA-O121, Douglas Fir Plywood

.2 CAN/CSA O141 - Softwood Lumber

.3 CSA O151 - Canadian Softwood Plywood

1.03 INSTALLATION AND REMOVAL

.1 Provide temporary controls to execute Work expeditiously.

.2 Remove from site all such work after use and make good to adjacent surfaces and finishes.

1.04 HOARDING AND SITE FENCING

.1 Erect temporary site fence around construction laydown and trailer area to prohibit unauthorized access.

.2 Use minimum 2 100 mm high chain link or wire mesh fencing with posts at no more than 3 000 mm on centre. Provide lockable truck entrance gate(s) and equip gates with locks and keys.

1.05 GUARD RAILS AND BARRICADES

.1 Provide as recommended by local governing authorities.

1.06 DUST TIGHT SCREENS

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Erect temporary dust tight screens using 38 x 89 mm steel studs at maximum 610 mm centres, polyethylene sheet, and 1 219 x 2 438 x 13 mm exterior grade plywood (CSP or DFP) or 13 mm gypsum wall board. Extend to underside of existing roof and make air tight.

.3 Provide access to hoarding areas with temporary hollow metal doors and knock down metal frames and hardware.

.4 Polyethylene Sheet: Reinforced, fire-resistive sheet, 0.25-mm (10-mil) minimum thickness, with flame-spread rating of 15 or less per ASTM E84 and passing NFPA 701 Test Method.

.5 Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 914 by 1 524 mm (36 by 60 inches).

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

.7 Confirm locations and installation with Contract Administrator at least three days prior to installation.

.8 Where screens restrict access to emergency exits review security requirements with Contract Administrator prior to erection.

1.07 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.08 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.09 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect adjacent private and public property from damage during the performance of work.

.2 Be responsible for all damage incurred.

.3 Provide necessary screens, covers and hoardings.

.4 Confirm locations and installation with Contract Administrator at least five days prior to installation.

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

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Substitution procedures.

.4 Quality of Work, coordination and fastenings.

.5 Prevention of dust and mould contamination of products and materials during delivery, storage and handling.

1.02 REFERENCE STANDARDS

.1 Within text of each Specification section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in Specifications.

.3 If there is question as to whether any product or system is in conformance with applicable standards, Contract Administrator reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be borne by the City in event of conformance with Drawings and Specifications or by Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.03 QUALITY ASSURANCE

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

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Drawings and Specifications.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout buildings.

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

1.04 AVAILABILITY

.1 Immediately upon receiving Letter of Intent, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of materials, equipment or articles are foreseeable, notify Contract Administrator within two days discovery of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In the event of failure to notify the Contract Administrator at commencement of Work, and should it subsequently appear that Work may be delayed for such reason, the Contract Administrator reserves the right to substitute more readily available products of similar character, at no increase in Contract Price or contract time.

1.05 SUBSTITUTIONS

.1 The Work is based on the materials and methods specified in the Specifications.

.2 Substitutions are permitted during Bid period only, make application in accordance with B6 Substitutes.

1.06 STORAGE HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.5 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

.6 Touch-up damaged factory finished surfaces to Contract Administrator's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.07 TRANSPORTATION

.1 Pay the costs of transportation of products required in the performance of Work.

.2 Transportation costs of products supplied by the City will be paid for by the City unless specified otherwise. Unload, handle and store such products, unless otherwise specified.

1.08 MANUFACTURERS' INSTRUCTIONS

.1 Unless otherwise indicated in the specifications, install or erect all products in accordance with manufacturer's recommendations. Do not rely on labels or enclosures that are provided with products. Obtain instructions directly from manufacturers.

.2 Notify Contract Administrator in writing of any conflicts between the Specifications and manufacturer's instructions so that the Contract Administrator may establish the course of action to follow.

.3 Improper installation or erection of products due to failure in complying with these requirements authorizes the Contract Administrator to require any removal and re-installation that may be considered necessary, at no increases in Contract price or Contract time.

1.09 QUALITY OF WORK

.1 Ensure quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Contract Administrator if required Work is such as to make it impractical to produce required results.

.2 Enforce discipline and good order among workers.

.3 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from site, workers deemed incompetent or careless.

.4 Decisions as to standard or fitness of quality of Work in cases of dispute rest solely with Contract Administrator, whose decision is final.

1.10 COORDINATION

.1 Ensure cooperation of workers during the Work. Maintain efficient and continuous supervision.

.2 Ensure Work of various Subcontractors does not conflict or create interference.

.3 Be responsible for the proper coordination and placement of openings, sleeves, and accessories.

.4 Supply all items required to be built in as and when required, together with templates, measurements and shop drawings.

.5 Ensure all workers examine the drawings and specifications covering the Work of others that may affect the performance of their own Work. Examine the Work of others and report to the Contract Administrator, in writing, any defects, or deficiencies that may affect the Work. In the absence of any report, the Contractor shall be held to have waived all claims for damage to or defects in such Work.

.6 Ensure that components openings that are required for the installation of Work is coordinated. Furnish the necessary information to the sections concerned in ample time to permit allowance for such items. Failure to comply with this requirement does not relieve the party at fault of the cost of cutting or drilling at a later date and subsequent patching.

1.11 CONCEALMENT

.1 In finished areas, conceal pipes, ducts, and wiring in floors, walls, and ceilings, except where indicated otherwise.

.2 Before installation, inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

1.12 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 PROTECTION OF WORK IN PROGRESS

.1 Protect Work completed or in progress.

.2 Prevent overloading of any part of the building. Do not cut, drill, or otherwise sleeve any load bearing structural member unless specifically indicated on drawings or in Specifications without written approval of the Contract Administrator.

1.14 EXISTING UTILITIES

.1 When connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and building occupants and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

1.01 MATERIALS

.1 Required for original installation.

.2 Change in materials or products not permitted unless previously approved by Contract Administrator during Bid period.

1.02 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work.

1.03 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing.

.6 Restore damaged work with new products in accordance with requirements of Drawings and Specifications.

.7 Refinish damaged surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

1.04 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse, recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

1.01 REFERENCE STANDARDS

.1 Canadian Standards Association:

.1 CAN/CSA-Z317.2, Special Requirements for Heating, Ventilation and Air Conditioning (HVAC) Systems in Health Care Facilities.

.2 CAN/CSA-Z317.10, Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities.

.3 CAN/CSA-Z317.13, Infection Control during Construction, Renovation, and Maintenance of Health Care Facilities.

1.02 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

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

.3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.4 Remove waste materials and debris from the site at regularly scheduled times or dispose of as otherwise directed by the Contract Administrator. Do not burn or bury waste materials or debris on site.

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

1.03 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.04 CLEANING DURATION DEMOLITION

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

.2 Dispose of waste materials and debris off site at regularly scheduled intervals.

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

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

1.05 FINAL CLEANING

.1 Refer to General Conditions.

.2 When the Work is complete, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris and leave the Work clean and suitable for occupancy by the City.

.3 Leave the work 'broom clean' before the inspection process commences.

.4 Remove debris and surplus materials from site.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 Requirements for waste management goals, waste management plan and waste management plan implementation.

1.02 DEFINITIONS

.1 Construction Waste: Solid wastes such as building materials, packaging and rubble resulting from construction, paving and infrastructure.

.2 Dangerous Goods: Product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.3 Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

.4 Hazardous Material: Product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.5 Hazardous Waste: Hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.6 Recyclable Waste: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

.7 Recycling Facility: A business that specializes in collecting, handling, processing, distributing, or remanufacturing waste materials generated by new construction projects, into products or materials that can be used for this project or by others.

.8 Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

.9 Salvage and Reuse: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.03 SUSTAINABILITY OBJECTIVES

.1 The Contractor shall use all means available to divert the greatest extent practical and economically feasible, construction waste from landfills and incinerators. Develop and implement a demolition waste management plan.

1.04 ACTION SUBMITTALS

.1 Submit draft waste management plan to the Contract Administrator prior to project start up meeting.

1.05 INFORMATIONAL SUBMITTALS

.1 Waste Reduction Progress Reports: Submit a monthly report to the Contract Coordinator and include the following information:

.1 Material category.

.2 Generation point of waste.

.3 Total quantity of waste in tons (tonnes)

.4 Quantity of waste salvaged, both estimated and actual in tons (tonnes).

.5 Quantity of waste recycled, both estimated and actual in tons (tonnes).

.6 Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).

.7 Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

.2 Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

.3 Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

.4 Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.06 WASTE MANAGEMENT PLAN

.1 General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.

.2 Goals: Establish waste diversion goals for the project by identifying at least five materials targeted for diversion.

.3 Waste: Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work.

.4 Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

.1 Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

.2 Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

.3 Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

.5 Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1.07 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Contract Administrator.

.2 Unless specified otherwise, materials for removal do not become Contractor's property.

.3 Use the following paragraph if material is to be turned over to Consultant.

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

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

.6 Use the following paragraph for demolition projects.

.7 Protect structural components not removed for demolition from movement or damage.

.8 Use the following paragraph for demolition projects.

.9 Support affected structures. If safety of building is endangered, cease operations and immediately notify Contract Administrator.

.10 Protect surface drainage, storm sewers, sanitary sewers, and utility services from damage and blockage.

1.08 SCHEDULING

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

1.09 PREPARATION

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

1.10 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of adjacent property owners and public roadways.

.2 Maintain security measures established by the City.

.3 Provide temporary security measures as approved by Contract Administrator.

1.11 WASTE MANAGEMENT PLAN IMPLEMENTATION

.1 Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

.2 Minimize waste disposal to landfills, employ processes that ensure the generation of as little waste as possible, including the prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors, as well as minimizing over packaging and poor quantity estimating.

.3 Of the inevitable waste that is generated, as many of the waste materials as economically feasible are to be salvaged for reuse and or recycled. However, the Contractor is to abide by any direction from Contract Administrator regarding recyclable waste. Use of waste disposal in landfills or incinerators is to be minimized.

.4 Provide and pay for the proper disposal and salvage of construction materials and waste.

.5 Provide completely enclosed garbage containers.

.6 Use only brokerage, storage, transfer and disposal facilities licensed by authorities having jurisdiction for the recycling and disposal of waste material.

.7 Material Handling Procedures: Prevent contamination of material to be recycled and salvaged, and handle material consistent with requirements for acceptance by designated facilitates; where space permits, source separation is recommended; where material must be co-mingled, they must be taken to a processing facility for separation off site.

.8 Manager: Designate an on-site party responsible for instructing workers and overseeing and documenting results of the waste management plan for Project.

.9 Distribution: Distribute copies of the waste management plan to the Job Site Foreman, each Subcontractor, and the Contract Administrator.

.10 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by parties at appropriate stages of Project.

.11 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.

.12 Hazardous Wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.

.13 Application for Progress Payments: Submit with each Application for Progress Payment a Summary of Waste Generated by the Project:

.1 Failure to submit information shall render Application for Payment incomplete and delay Progress Payment.

.2 Submit summary on a form acceptable to City containing the following information:

.1 Amount in tonnes or cubic metres (tons or cubic yards) of material land filled from the Project.

.2 Identity of the landfill.

.3 Total disposal cost. Include manifests, weight tickets, receipt, and invoices.

.4 Each material recycled, reused, or salvaged from the Project.

.5 Amount tonnes or cubic metres (tons or cubic yards).

.6 Date removed from the job site, the receiving party, and the transportation cost.

.7 Amount of any money paid or received for the recycled or salvaged material.

.8 Net total cost or savings of salvage or recycling each material.

.3 Attach manifests, weight tickets, receipts, and invoices.

.4 The City will pay all tipping fees for non-recyclable material disposal at City owned landfill.

1.12 DISPOSAL OF WASTE

.1 Burying of rubbish and waste materials is prohibited unless approved by the Contract Administrator.

.2 Disposal of waste volatile materials, mineral spirits, oil, paint thinner, into waterways, storm, or sanitary sewers is prohibited.

1.13 CLEANING

.1 Remove tools and waste materials on completion of work, leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

1.14 SPECIAL PROGRAMS

.1 Be responsible for final implementation of programs involving tax credits or rebates or similar incentives related to recycling, if applicable to the Project.

.2 A current listing of recyclers specializing in specific categories of materials may be obtained from applicable government agencies. Most provinces have an Internet web site which offers information and suggested recycling sites.

.3 Obtain information packets relevant to all the above listed programs prior to starting work on the Project and confirm facility's ability to accept waste from Project.

.4 Document work methods, recycled materials, alternate disposal methods that qualify for tax credits, rebates, and other savings under programs listed by authority having jurisdiction.

END OF SECTION

1.01 SUMMARY

.1 Section Includes:

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials, and related information.

.4 Operation and maintenance data.

.5 Warranties and bonds.

.6 Warranty Management Plan.

1.02 SUBMISSION

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

1.03 FORMAT

.1 Three hard copy (binders), one electronic format (PDF). Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf, letter size format with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, process flow, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.04 CONTENTS – EACH VOLUME

.1 Table of Contents: provide title of project;

.1 Date of submission; names.

.2 Addresses and telephone numbers of Contract Administrator and Contractor with name of responsible parties.

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

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

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

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.05 AS-BUILTS AND SAMPLES

.1 Conform to D17 - As-Built Drawings and as follows.

.2 Maintain at the site for Contract Administrator one record copy of:

.1 Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.3 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.4 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.5 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.6 Keep record documents and samples available for review by Contract Administrator.

1.06 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on three (3) sets of black line opaque drawings, and within copy of Specifications. Make arrangements of black line opaque copies.

.2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:

.1 Measured locations of utilities and appurtenances referenced to visible and accessible features of construction.

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 References to related shop drawings and modifications.

.5 Specifications: Legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.07 WARRANTIES AND BONDS

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principals.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with the City's permission, leave date of beginning of time of warranty until the Date of Total Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

1.08 WARRANTY MANAGEMENT PLAN

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Contract Administrator for review.

.3 Warranty management plan to include required actions and documents to assure that the City receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Contract Administrator for review prior to each monthly pay estimate.

.6 Assemble approved information in binder and submit upon acceptance of work.

.7 Except for items put into use with The City's permission, leave date of beginning of time of warranty until Date of Total Performance is determined.

.8 Conduct joint four-month and nine-month warranty inspection, measured from time of acceptance, by Contract Administrator.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractor, Subcontractors, manufacturers or suppliers involved.

.2 Contractor's plans for attendance at four and nine-month post-construction warranty inspections.

.3 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.10 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.11 Written verification will follow oral instructions. Failure to respond will be cause for the Contract Administrator to proceed with action against Contractor.

1.09 PRE-WARRANTY CONFERENCE

.1 Meet with Contract Administrator, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Contract Administrator.

.2 Contract Administrator will establish communication procedures for:

.1 Notification of construction warranty defects.

.2 Determine priorities for type of defect.

.3 Determine reasonable time for response.

.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

END OF SECTION

Part 1 General

1.01 SUMMARY

.1 Section Includes:

.1 Roof assembly demolition.

1.02 DEFINITIONS

.1 Demolition: Rapid destruction of building or parts of building, following removal of hazardous materials.

1.03 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)

.1 ANSI/ASSP A10.6-2006 (R2016), Safety and Health Program Requirements for Demolition Operations

.2 Canadian Standards Association (CSA International)

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures

.3 Government of Canada

.1 Canadian Environmental Protection Act, 1999 (CEPA)

.2 Canadian Environmental Assessment Act, 2012 (CEAA)

.3 Transportation of Dangerous Goods Act, 1992 (TDGA)

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

.1 Material Safety Data Sheets (MSDS).

.5 National Fire Protection Association (NFPA)

.1 NFPA 241 (2019), Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.04 MATERIALS OWNERSHIP

.1 Unless otherwise indicated, demolition waste becomes property of Contractor.

1.05 ADMINISTRATIVE REQUIREMENTS

.1 Site Meetings:

.1 Convene pre-demolition meeting two weeks prior to beginning work of this Section in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify project requirements.

.2 Review site conditions, including requirements for photographic documentation of existing conditions.

.3 Coordination with other Subcontractors.

.2 Arrange for site visit with Contract Administrator to examine existing site conditions adjacent to demolition work, prior to start of Work.

.3 Ensure site demolition is on the meeting agenda of regularly scheduled job meetings specified in Section 01 31 19 - Project Meetings.

.4 Ensure key personnel attend.

.5 Provide written report on status of waste diversion activity at each project meeting.

.2 Scheduling: Meet project timelines without compromising specified minimum rates of material diversion.

.1 Notify Contract Administrator in writing when unforeseen delays occur.

1.06 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Certificates:

.1 Written authorization from Contract Administrator is required to deviate from haulers, facilities, receiving organizations.

1.07 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, applicable Provincial/Territorial regulations.

1.08 DELIVERY, STORAGE, AND HANDLING

.1 Store and manage hazardous materials in accordance with Section 01 35 43 - Environmental Procedures.

.2 Storage and Protection:

.1 Protect in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Contract Administrator and at no cost to Contract.

.3 Remove and store materials to be salvaged, in manner to prevent damage.

.4 Store and protect in accordance with requirements for maximum preservation of material.

.5 Handle salvaged materials as new materials.

1.09 SITE CONDITIONS

.1 On-site storage removed items or materials is not permitted.

.2 Notify Contract Administrator before disrupting building access or services.

Part 2 Products

2.01 PERFORMANCE REQUIREMENTS

.1 Regulatory Requirements:

.1 Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

.2 Comply with ANSI/ASSE A10.6, CSA S350, and NFPA 241.

2.02 EQUIPMENT

.1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.01 PREPARATION

.1 Inspect site with Contract Administrator and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage, and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of Contract Administrator two days before starting demolition.

3.02 PREPARATION

.1 Inspect site with Contract Administrator and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage, and items to remain. Record an inventory of items and provide a copy to Contract Administrator.

.2 Disconnect, cap, plug or divert, as required, existing utilities within the building where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services in the building and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.

.1 Immediately notify Contract Administrator of damage to any utility or service, designated to remain in place.

.2 Immediately notify the Contract Administrator should uncharted utility or service be encountered and await instruction in writing regarding remedial action.

3.03 PROTECTION

.1 Prevent movement, settlement, or damage to parts of building to remain in place. Provide bracing and shoring required.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Protect building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

3.04 EXISTING EQUIPMENT

.1 Existing roof top equipment to remain in place unless indicated otherwise.

3.05 SALVAGE

.1 Refer to demolition drawings and specifications for items to be salvaged for reuse and items to be turned over to the City.

.2 Provide all labour and transportation equipment such as carts, dollies, and hand trucks to complete the work.

.3 Remove items carefully to prevent damage. Transport items to temporary storage areas as directed by Contract Administrator.

3.06 REMOVAL OPERATIONS

.1 Remove elements of existing roof assembly to permit new construction.

.2 Perform demolition work in a manner to neither damage nor endanger any part of the existing building or work in progress.

.3 Demolition work indicated on drawings is schematic only. Verify all dimensions and conditions on site.

.4 Do not damage or deface existing construction, equipment or finishes indicated to remain or items indicated for salvage.

.5 Keep cutting to no more than 10% larger than outside dimensions of item penetrating another material.

.6 Trim edges of partially demolished building elements to tolerances as defined by Contract Administrator to suit future use.

.7 Make cuts with clean, true, smooth edges to minimize patchwork and to provide suitable surface for integration of new materials.

.8 Use concrete saw for cutting concrete and masonry.

.9 Use diamond core drill for cutting small diameter openings in concrete and masonry.

.10 Use of pneumatic driven jackhammers inside buildings with approval of Contract Administrator.

3.07 RESTORATION

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

3.08 CLEANING

.1 Progress Cleaning: Clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Remove debris, trim surfaces and leave work site clean, upon completion of Work

.3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

.2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

.3 Waste Management: Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.09 PROTECTION

.1 Repair damage to adjacent materials or property caused by selective demolition.

END OF SECTION

Part 1 General

1.01 SUMMARY

.1 Section Includes:

.1 Epoxy crack-injection.

1.02 REFERENCE STANDARDS

.1 ASTM

.1 ASTM C-39 - Compressive Strength
.2 ASTM C-496 - Splitting Tensile Strength
.3 ASTM C-882 Modified - Slant Shear Bond Strength
.4 ASTM C-469 - Modulus of Elasticity
.5 ASTM C-157 Modified- Shrinkage
.6 ASTM C-293 - Flexural Strength

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate the Work of this Section with the installation of substrate.

.2 Preinstallation Conference:

.1 Conduct a pre-installation conference at Project site.
.2 Convene pre-installation conference prior to beginning work of this Section on-site with Subcontractor's Representative and construction administrator in accordance with Section 01 31 19 - Project Meetings to review methods and procedures related to concrete maintenance including, but not limited to, the following:

.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review manufacturer's written installation instructions and warranty requirements.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 Submittals Procedures.

.2 Product Data: For each type of product.

.1 Include construction details, material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

.3 Samples: Cured Samples for each exposed product and for each colour and texture specified, in manufacturer's standard size appropriate for each type of work.

.4 Samples for Initial Selection: Cured Samples for each exposed product and for each colour and texture.

.1 Include sets of Samples for epoxy crack-injection adhesive and capping adhesive in the form of injection-treated, whole, dense concrete block or brick units representative of the range of required adhesive colours.

.5 Samples for Verification: Cured Samples for each exposed product and for each colour and texture specified.

.1 Include Samples of epoxy crack-injection in the form of injection-treated, whole, dense concrete block or brick units representative of the range of required adhesive colours.

.6 Product Test Reports: For each cementitious patching mortar, joint-filler, crack-injection adhesive, for tests performed by manufacturer and witnessed by a qualified testing agency.

.7 Field quality-control reports.

.8 Quality-Control Program: Submit before work begins.

1.05 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Each repair product manufacturer shall employ factory-authorized service representatives who are available for consultation and Project-site inspection and on-site assistance.

.2 Concrete-Maintenance Specialist Qualifications: Engage an experienced concrete-maintenance firm that employs installers and supervisors who are trained and approved by manufacturer to apply concrete repair products to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing or patching new concrete is insufficient experience for concrete-maintenance work.

.1 Field Supervision: Concrete-maintenance specialist firm shall maintain experienced full-time supervisors on Project site during times that concrete-maintenance work is in progress.

.3 Quality-Control Program: Prepare a written plan for concrete maintenance to systematically demonstrate the ability of personnel to properly perform maintenance work, including each phase or process, protection of surrounding materials during operations, and control of debris and runoff during the Work. Describe in detail materials, methods, equipment, and sequence of operations to be used for each phase of the Work.

.4 Mock-ups: Build mock-ups to demonstrate aesthetic effects and to set quality standards for materials and execution.

.1 Epoxy Crack Injection: Perform epoxy crack injection in two separate areas, each approximately 1 200 mm (48 inches) long.

1.06 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

.3 Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

.4 Condition the specified product as recommended by the manufacturer.

1.07 SITE CONDITIONS

.1 Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components

before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.

.1 Use only Class A epoxies when substrate temperatures are below or are expected to go below 40 deg F (5 deg C) within eight hours.

.2 Use only Class A or B epoxies when substrate temperatures are below or are expected to go below 60 deg F (16 deg C) within eight hours.

.3 Use only Class C epoxies when substrate temperatures are above and are expected to stay above 60 deg F (16 deg C) for eight hours.

.2 Cold-Weather Requirements for Cementitious Materials: Do not apply unless concrete-surface and air temperatures are above 40 deg F (5 deg C) and will remain so for at least 48 hours after completion of Work.

.3 Cold-Weather Requirements for Cementitious Materials: Comply with the following procedures:

.1 When air temperature is below 40 deg F (5 deg C), heat patching-material ingredients and existing concrete to produce temperatures between 40 and 90 deg F (5 and 32 deg C).

.2 When mean daily air temperature is between 25 and 40 deg F (minus 4 and plus 5 deg C), cover completed Work with weather-resistant insulating blankets for 48 hours after repair or provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 48 hours after repair.

.3 When mean daily air temperature is below 25 deg F (minus 4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 48 hours after repair.

.4 Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F (32 deg C) and above.

Part 2 Part 2 - Products

2.01 MANUFACTURER

.1 Source Limitations: For repair products, obtain each colour, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.

2.02 SYSTEM DESCRIPTION

.1 This specification describes the patching or overlay of interior and exterior horizontal surfaces and formed vertical and overhead surfaces with Portland Cement Concrete.

2.3 EPOXY CRACK-INJECTION MATERIALS

.1 Epoxy Crack-Injection Adhesive: ASTM C881/C881M, bonding system [Type I,] [Type IV,] [Type IV at structural locations and where indicated, Type I at other locations;] free of VOCs.

.1 Acceptable Products:

.1 Epojet LV.

.2 Capping Adhesive:

.1 Acceptable Products:

.1 Planibond AE or Planibond AE Fast manufactured for use with crack-injection adhesive by same manufacturer.

.3 Product manufactured for use with crack-injection adhesive by same manufacturer.

.4 Colour: Provide epoxy crack-injection adhesive and capping adhesive as indicated by manufacturer's designations that blend with existing, adjacent concrete and do not stain concrete surface.

.2 Epoxy Crack Adhesive: ASTM C881/C881M, bonding system. Free of VOCs.

.1 Acceptable Product:

.1 Planibond AE.

.2 Type I or Type II: Non-load-bearing applications.

.3 Epoxy Crack Adhesive: ASTM C881/C881M, bonding system. Free of VOCs.

.1 Product: Subject to compliance with requirements, provide MAPEI Corporation; Planibond AE Fast.

.2 Type I or Type II: Non-load-bearing applications.

.4 Epoxy Crack Adhesive: ASTM C 881/C 881M, bonding system. Free of VOCs.

.1 Product: Subject to compliance with requirements, provide MAPEI Corporation; Planibond EBA .

.2 Type I or Type II: Non-load-bearing applications.

.5 Epoxy Crack Adhesive: ASTM C 881/C 881M, bonding system. Free of VOCs.

.1 Product: Subject to compliance with requirements, provide MAPEI Corporation; Epojet.

.2 Type I or Type II: Non-load-bearing applications

2.04 MISCELLANEOUS MATERIALS

.1 Portland Cement: ASTM C150/C150M, Type I, II, or III unless otherwise indicated.

.2 Water: Potable.

Part 3 Execution

3.01 CONCRETE-MAINTENANCE SPECIALIST

.1 Concrete-Maintenance Specialist Firms: Subject to compliance with requirements, have concrete maintenance performed by a qualified and experienced contractor

3.02 CONCRETE MAINTENANCE

.1 Have concrete-maintenance work performed only by qualified concrete-maintenance specialist.

.2 Comply with manufacturers' written instructions for surface preparation and product application.

3.03 EXAMINATION

.1 Notify Consultant seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.

.2 Locate areas of deteriorated or delaminated concrete using hammer or chain-drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off

boundaries. At columns and walls make boundaries level and plumb unless otherwise indicated.

.3 Pachometer Testing: Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover. Calibrate pachometer using depth of cover measurements, and verify depth of cover in removal areas using pachometer.

.4 Perform surveys as the Work progresses to detect hazards resulting from concrete-maintenance work.

3.04 PREPARATION

.1 Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and during its progress.

.2 Protect persons, motor vehicles, surrounding surfaces of building being repaired, building site, plants, and surrounding buildings from harm resulting from concrete maintenance work.

.1 Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

.2 Use only proven protection methods appropriate to each area and surface being protected.

.3 Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete maintenance work is being performed.

.4 Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of concrete maintenance work.

.5 Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.

.6 Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.

.7 Protect floors and other surfaces along haul routes from damage, wear, and staining.

.8 Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.

.9 Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape [or a liquid strippable masking agent]. If practical, remove items, store, and reinstall after potentially damaging operations are complete.

.10 Neutralize and collect alkaline and acid wastes for disposal off the City of Winnipeg's property.

.11 Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

3.5 EPOXY CRACK INJECTION

.1 Clean cracks with oil-free compressed air or low-pressure water to remove loose particles.

.2 Clean areas to receive capping adhesive of oil, dirt, and other substances that would interfere with bond.

.3 Place injection ports as recommended by epoxy manufacturer, spacing no farther apart than thickness of member being injected. Seal injection ports in place with capping adhesive.

.4 Seal cracks at exposed surfaces with a ribbon of capping adhesive at least 1/4 inch (6 mm) thick by 1 inch (25 mm) wider than crack.

.5 Inject cracks wider than 0.003 inch (0.075 mm) to a depth of 8 inches (200 mm).

.6 Inject epoxy adhesive, beginning at widest part of crack and working toward narrower parts. Inject adhesive into ports to refusal, capping adjacent ports when they extrude epoxy. Cap injected ports and inject through adjacent ports until crack is filled.

.7 After epoxy adhesive has set, remove injection ports and grind surfaces smooth.

3.06 FIELD QUALITY CONTROL

.1 Testing Agency: Engage a qualified testing agency to perform tests and inspections.

.2 Perform the following tests and inspections:

.1 Epoxy Crack Injection: Core-drilled samples to verify proper installation.

.1 Testing Frequency: Three samples from mockup and one sample for each 100 feet (30 m) of crack injected.

.2 Where samples are taken, refill holes with epoxy mortar.

.3 Product will be considered defective if it does not pass tests and inspections.

.4 Prepare test and inspection reports.

.5 Manufacturers Field Service: Engage manufacturers' factory-authorized service representatives for consultation and Project-site inspection and to provide on-site assistance when requested by Consultant.

Have manufacturers' factory-authorized service representatives perform Project-site inspections to observe progress and quality of the Work.

END OF SECTION

Part 1 General

1.01 SUMMARY

.1 Section Includes:

.1 Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.

.2 Vapour retarder

.3 Roof insulation

.4 Walkways

.5 Base flashings roofing membrane expansion joints and counter flashings.

.6 Inspection and testing protocols.

1.02 RELATED REQUIREMENTS

.1 Section 07 62 00 - Sheet Metal Flashing and Trim: For metal flashings.

.2 Section 07 92 00 – Joint Sealing

1.03 ABBREVIATIONS

.1 Abbreviations and Acronyms used in this Section:

1. XPS - Extruded Polystyrene Board Insulation
2. EPS - Expanded Polystyrene Board Insulation
3. ISO - Rigid Cellular Polyisocyanurate Board Insulation
4. MFB - Mineral Fibre Board Insulation

1.04 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)

.1 ANSI/SPRI/RCI NT-1 (2017), Detection and Location of Latent Moisture in Building Roofing Systems by Nuclear Radioisotopic Thermalization

.2 ASTM

.1 ASTM C1177/C1177M, Specification for Glass Mat Gypsum Substrate for Use as a Sheathing

.2 ASTM D3617 – 83 (1994), Standard Practice for Sampling and Analysis of New Built-Up Roof Membranes

.3 ASTM D7954. Electrical Capacitance/Impedance Testing:

.4 ASTM E96/E96M, Standard Test Methods for Water Vapor Transmission of Materials

.5 ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.6 ASTM E783 - 02(2018), Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors

.7 ASTM C1153 - 10(2015), Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging

.8 ASTM E1186 - 17, Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems

.9 ASTM E2357 - 18, Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies

.10 ASTM D3617 / D3617M - 17, Standard Practice for Sampling and Analysis of Built-Up Roof Systems During Application

.11 ASTM D4541 -17, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

.12 ASTM D4586, Standard Specification for Asphalt Roof Cement, Asbestos-Free.

.13 ASTM D5957 - 98(2013), Standard Guide for Flood Testing Horizontal Waterproofing Installations

.14 ASTM D7954 / D7954M - 15a, Standard Practice for Moisture Surveying of Roofing and Waterproofing Systems Using Non-Destructive Electrical Impedance Scanners

.3 Canadian General Standards Board (CGSB)

.1 CGSB 37-GP-9Ma, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing

.2 CGSB 37-GP-56, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing

.3 CAN/CGSB-51.33, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction

.4 Canadian Standards Association (CSA)

.1 CSA A123.3, Asphalt or Tar Saturated Roofing Felt

.2 CSA A123.4, Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems

.3 CSA A123.21:20, Standard test method for the dynamic wind uplift resistance of membrane-roofing systems

.4 CSA A231.1, Precast Concrete Paving Slabs

.5 CAN/CSA-A247, Insulating Fibreboard

.6 CSA A284, Mineral Aggregate Thermal Roof Insulation

.7 CSA B35.3, Tapping and Drive Screws (Slotted and Recessed Head, Thread)

.8 CSA O121, Douglas Fir Plywood

.9 CSA O151, Canadian Softwood Plywood

.5 CRCA (Canadian Roofing Contractors' Association)

.1 CRCA Roofing Specifications Manual

.6 National Roofing Contractors Association (NRCA)

.1 Quality Control and Quality-Assurance Guidelines for the Application of Membrane Roof Systems (Electronic)

.7 Underwriters Laboratories Canada (ULC)

.1 CAN/ULC-S701, Thermal Insulation, Polystyrene, Boards and Pipe Coverings.

.2 CAN/ULC-S702, Thermal Insulation, Mineral Fibre, for Buildings.

.3 CAN/ULC-S704, Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced

.4 CAN/ULC-S706, Insulated Fiberboard

.8 Factory Mutual (FM Global)

.1 FM Approvals - Roofing Products

1.05 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning roofing Work, with roofing contractor's representative, Contract Administrator and Consultant to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

.5 Review hot work safety requirement.

.2 Coordination:

.1 Coordinate the work of this Section with the commissioning requirements specified in article 3.12.

1.06 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section [01 33 00 - Submittal Procedures].

.2 Product Data: Provide manufacturer's product data sheets for roofing materials installed on project.

.3 Shop Drawings: Indicate flashing details. Indicate layout for tapered insulation.

.4 Qualification Data: For Subcontractor and installer.

.5 Product Test Reports: For each roof system membrane, for tests performed by an independent testing agency.

.6 Field quality-control reports.

1.07 QUALITY ASSURANCE

.1 Qualifications:

.1 Roofing Subcontractor: Must be a member in good standing of the Roofing Contractors Association of Manitoba and the Canadian Roofing Contractors' Association.

.2 Installer Qualifications: Company or person specializing in application of modified bituminous roofing systems with five years documented experience approved by manufacturer.

.3 Workers: Workers performing roofing work must be skilled and employed by a company recognized and trained as an approved applicator by the roofing materials manufacturer, and must have in their possession proof of their participation in the training course run by the roofing manufacturer for the specified products.

.2 Compatibility: Ensure compatibility between components of roofing system is essential. Provide written declaration to [Contract Administrator] stating that materials and components, as assembled in system, meet this requirement. Refer to article FIELD QUALITY CONTROL.

.3 Source Quality Control:

.1 Submit laboratory test reports in accordance with Section 01 40 00 - Quality Requirements.

.2 Submit laboratory test reports certifying compliance of bitumens and roofing sheets and membranes with specification requirements.

.4 Manufacturer's representative to provide on-site inspection, technical assistance and application instructions to ensure proper installation of vapour retarder and roof membrane systems. The Contractor to include all costs for manufacturer's inspection in his bid price.

.1 Manufacturer's representative field services are described in article FIELD QUALITY CONTROL.

1.08 STORAGE AND HANDLING

.1 Provide and maintain dry, off-ground weatherproof storage.

.2 Store rolls of felt in upright position. Store membrane rolls with selvage edge up.

.3 Remove only in quantities required for same day use.

.4 Place plywood runways over work to enable movement of material and other traffic.

.5 Store caulking at +5°C minimum.

.6 Store insulation protected from daylight and weather and deleterious materials.

1.09 SITE CONDITIONS

.1 Do not install roofing when temperature remains below manufacturers' recommendations. Minimum temperature for solvent-based adhesive is -5°C.

.2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.10 PROTECTION

.1 Conform to requirements of Section 01 35 29 - Health and Safety Requirements, article 1.08 Fire Safety and subparagraph 3.02.7 Fire Protection in this section.

.2 Fire Extinguishers: Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle, ULC labeled for A, B and C class protection. Size 9 kg (20 lbs) on roof per torch applicator, within 10 m of torch applicator.

.3 Maintain fire watch for roofing operations for one hour after each days roofing operations cease. Use an electronic thermometer to check for hot spots.

1.11 WARRANTY

.1 For Work of this Section, twelve-month warranty period is extended to five years.

.2 Modified Bituminous Membrane Manufacturer's Guarantee: Provide manufacturer's written non-pro-rated warranty against failure of roofing system, leakage for a period of 15 years from the date of Substantial Completion of Work as agreed upon by Contract Administrator, Contractor, roofing Subcontractor and membrane manufacturer. Guarantee shall cover but not be limited to:

.1 Labour and material for repair, replacement of roofing components from the structural deck up.

.2 Leakage, failure of roofing system due to natural causes.

.3 Non-prorated warranty.

1.12 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction/Demolition Waste Management and Disposal, and Waste Reduction Work Plan.

Part 2 Products

2.01 PERFORMANCE AND DESIGN CRITERIA

.1 Compatibility between components of roofing system is essential. Provide written declaration to Contract Administrator stating that materials and components, as assembled in system, meet this requirement.

.2 Roofing System: CSA A123.21 for wind uplift resistance

2.02 DECK PRIMER

.1 Primer: Type recommended by membrane manufacturer, applicable for substrate and application.

2.03 VAPOUR RETARDER

.1 Self-Adhesive Vapour Retarder: Self-adhesive SBS modified bitumen sheet, selvage edge, top surface sanded; bottom surface silicone release paper.

.1 Thickness: 3 mm.

.2 Water Vapour Transmission: < 2.5 ng/Pa•s•m² (< 0.04 perm) tested to ASTM E96.

.3 Acceptable Products: Sopraply Stick Duo as manufactured by Soprema.

2.04 MEMBRANE

.1 Base Sheet: CGSB 37-GP-56, Styrene-Butadiene-Styrene (SBS) elastomeric polymer, prefabricated sheet, composite reinforcement, weighing 3.3 kg/m2 (0.7 lb/ft^2).

.1 Top and Bottom Surfaces:

.1 Thermofusible plastic film.

.2 Acceptable Products: Sopraply Base 520 as manufactured by Soprema.

.2 Cap Sheet: CGSB 37-GP-56, Styrene-Butadiene-Styrene (SBS) elastomeric polymer, prefabricated sheet, [glass] [polyester] reinforcement, weighing [180] [250] g/m².

.1 Top and Bottom Surfaces:

.1 Granules / polyethylene film for torch on application.

.2 Acceptable Products: Sopraply Traffic 560 FR cap as manufactured by Soprema.

.3 Base Sheet Flashing Membrane (Stripping): Same as base sheet.

.4 Cap Sheet Flashing Membrane (Stripping): Same as cap sheet.

.5 Roof Tape: Fire tape to prevent penetration of open flame into open joints, voids, gaps in combustible substrates. SBS modified bitumen membrane with non-woven glass reinforcing, sanded on top surface, self-adhesive backing with removable silicone film.

.1 Acceptable Product: Soprema Sopraguard Tape.

2.05 BITUMEN

.1 Asphalt: CSA A123.4, Types 2 or 3 for application.

2.06 ROOFING INSULATION

.1 Mineral fibreboard panel with rigid surface. Surface of saturated with a coat of bitumen compatible with SBS membranes installed with hot bitumen.

.1 Acceptable Products: Toprock DD Plus as manufactured by Rockwool.

.2 Rigid Cellular Polyisocyanurate Insulation (ISO): CAN/ULC-S704, Type 2, compressive strength 138 kPa (20 psi), polymer coated facers both sides, board size 1 219 by 1 219 mm, thickness indicated. Flame spread classification: less than 500.

.1 Acceptable Products: Sopra-ISO PLUS

.3 Sloped Insulation:

.1 Expanded polystyrene insulation (EPS) to CAN/ULC-S701, Type 2 cut to tapered shapes for slopes indicated.

2.07 PRIMERS, SEALERS, ADHESIVES

.1 Waterproofing Mastic multi-purpose mastic composed of SBS modified bitumen, fibres, [aluminium pigments,] mineral fillers and solvents. Where exposed in final assembly use product with aluminum pigment or cover with colour matched granules.

.1 Acceptable Product: Soprema Sopramastic or Sopramastic ALU.

.2 Pitch Pocket Filler: Aluminum coloured, solvent and SBS modified bitumen based mastic.

.3 Roofing Adhesive: One component polyurethane adhesive for bonding insulation boards, deck covering. Complete with manufacturer's recommended multi-bead applicator:

.1 Acceptable Product: Insta-Stik Quik Set Commercial Roofing Adhesive.

.4 Adhesive for Bonding Base Sheet Membrane to Overlay Board: Type recommended by roof membrane manufacturer.

2.08 WALKWAYS

.1 SBS modified bitumen cap sheet of same type use on roofing assembly for heat welded application. Granular surface in contrasting colour. Full roll width with selvedge edge removed.

Part 3 Execution

3.01 WORKMANSHIP

.1 Do roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual

.2 Do priming for asphalt roofing in accordance with CGSB 37-GP-15.

.3 Prepare surfaces and complete waterproofing work in conformance with roofing manufacturer’s instructions.

.4 Install roofing elements on clean and dry surfaces, in conformance with manufacturer's instructions and recommendations.

.5 Roofing work must be completed in a continuous fashion as surfaces are readied and weather conditions permit.

.6 Seal all seams not covered by cap sheet membrane in the same day. Do not install cap sheet if any moisture is present at/in the base sheet seams.

.7 Whenever Membranes are Torch-Applied:

.1 Ensure a continuous and even bead of molten bitumen is visible as the membrane is unrolled and torched.

.2 Use only torch equipment recommended by the roofing manufacturer.

.3 During application, simultaneously melt both designated contact surfaces so a bead of bitumen is apparent as cap sheet unrolls.

.4 Avoid overheating. Avoid excessive bitumen bleed-out at joints.

.5 Make sure joints between the two layers are staggered by at least 300 mm.

.6 De-granulate overlap surfaces.

.7 Complete perfect welds between two membranes. Leave no zone un-welded. In cold weather, adjust welding time to obtain homogenous seam.

.8 Inspect seams and overlapped joints and repair defective work.

3.02 PREPARATION

.1 Cover walls and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of work.

.3 Clean off drips and smears of bituminous material immediately.

.4 Dispose of rainwater off roof and away from face of building until roof drains or hoppers installed and connected.

.5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Contract Administrator.

.6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.

.7 Fire Protection:

.1 Conform to requirements of NFCC, Section 5.2 Hot Works, and as follows.

.2 Prior to the start of work, conduct a site inspection to establish safe working practices. Respect all safety measures outlined by the membrane manufacturer as well as local roofing association recommendations. Provide a written hot work permit to the Contract Administrator prior to any work commencing.

.3 Throughout roofing installation, maintain a clean site and have one approved ABC fire extinguisher within 6 metres of each roofing torch. Respect all safety measures described in technical data sheets. Torches must never be placed near combustible or flammable products. Torches should never be used where the flame is not visible or cannot be easily controlled.

.4 Provide a continuous fire watch during the hot work and for a period of not less than 60 minutes after its completion.

.5 At the end of each workday, conduct a fire watch by using a heat detector gun to spot any smouldering or concealed fire. Ensure the fire watch is in effect for a minimum of four hours after any hot work is performed.

.6 Never apply the torch directly to old and wood surfaces.

.7 Make application for a hot works permit.

3.03 EXAMINATION ROOF DECKS

.1 Examine roof decks and immediately inform of Contract Administrator in writing of defects.

.2 Prior to commencement of work ensure:

.1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.

.2 Curbs have been built.

.3 Roof drains have been installed at proper elevations relative to finished roof surface.

.4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.

3.04 VAPOUR RETARDER

.1 Modified Bituminous Sheet Vapour Retarder: Self-adhered to deck covering in accordance with manufacturer's instructions.

.2 Ensure membrane is fully bonded to substrates and is free of air pockets, wrinkles, tears, and fishmouths. Overlap adjacent membranes by 75 mm, and end laps by 150 mm. Stagger end laps by at least 300 mm.

3.05 EXPOSED MEMBRANE ROOFING APPLICATION

.1 Insulation: Fully adhered, hot bitumen application.

.1 Embed insulation in 1 to 1.5 kg/m² mopping of bitumen.

.2 Place boards in parallel rows with ends staggered, and in firm contact with one another. Stagger joints between layers.

.3 Cut end pieces to suit.

.2 Tapered Insulation Application:

.1 Mop insulation to vapour retarder and top layer of insulation to bottom layer with hot asphalt at rate of 1 kg/m²

.2 Install tapered insulation as first insulation layer in accordance with shop drawings. Stagger joints between layers 150 mm minimum.

.3 Base Sheet Membrane: Fully adhered, torch-on application.

.1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and attach one end with fasteners.

.2 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement.

.3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps. Stagger end laps.

.4 Application to be free of blisters, wrinkles and fishmouths.

.5 Do membrane application in accordance with manufacturer's recommendations.

.4 Cap Sheet Membrane: Fully adhered, torch-on application.

.1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.

.2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.

.3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Stagger end laps. Offset joints in cap sheet 300 mm minimum from those in base sheet.

.4 Stagger joints between cap sheet and base sheet.

.5 Application to be free of blisters, fishmouths and wrinkles.

.6 Do membrane application in accordance with manufacturer's recommendations.

.5 Flashings:

.1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.

.2 Torch base and cap sheet onto substrate in 1 metre wide strips.

.3 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.

.4 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.

.5 Provide 75 mm minimum side lap and seal.

.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

.7 Do work in accordance with manufacturer's recommendations.

.6 Roof Penetrations:

.1 Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.

.7 Fire Tape:

.1 Fire tape combustible substrates to prevent penetration of open flames into voids, holes or gaps in substrates prior to application of torch-applied membranes.

3.06 WALKWAYS: MODIFIED BITUMEN MEMBRANE

.1 Install SBS modified bituminous membrane as roof walkway over roofing cap sheet, torch-on application.

.2 Application to be free of blisters, wrinkles and fishmouths.

.3 Use full length pieces wherever possible. Butt joints and ensure corners and edges are fully bonded without raised edges.

3.07 FIELD QUALITY CONTROL

.1 Refer to Section 01 40 00 - Quality Requirements.

.2 Vapour Retarder and Roof Membrane Manufacturer's Field Services:

.1 Manufacturer’s representative to attend site at regular intervals including not less than one visit at each of the following construction stages: 5%, 75% and 100%.

.1 Notify Contract Administrator 48 hours in advance of date and time of visits.

.2 Report in writing to Contractor, and Contract Administrator:

.1 Prior to Installation: Vapour retarder and roof membranes are designed in accordance with specified performance requirements, and that materials and components are compatible.

.2 Following Completion of Vapour Retarder and Roof Membrane: Vapour retarder and roof membranes are installed in compliance with manufacturer’s instructions in compliance with all conditions of warranty.

.3 Manufacturer's Field Reports: Prepare and submit manufacturer's written reports within five days of review, verifying compliance of Work, as described in Article ACTION AND INFORMATIONAL SUBMITTALS and FIELD QUALITY CONTROL.

.4 Provide written inspection report to Contract Administrator.

3.08 INDEPENDENT INSPECTION AND TESTING

.1 Comply with Section 01 40 00 - Quality Requirements.

.2 Engage an independent inspection agency to test and inspect and roofing system installation.

.1 Cost for inspection and testing to be paid by Contractor.

.2 Acceptable Independent Inspection Agencies:

.1 D. K. Bennett & Associates Ltd.: 1118 Lorette Avenue, Winnipeg, Manitoba; Tel.: 204-452-6795; URL: http://dkbennett.com.

.2 Intertek Group; 356 Saulteaux Crescent, Winnipeg, Manitoba R3J 3T2; Tel:. 204 885 9300; URL: http://www.intertek.com.

.3 Pinchen Ltd.; 54 Terracon Place, Winnipeg, Manitoba R2J 4G7; Tel.: 204-452-0983; URL: https://www.pinchin.com.

.3 QCA Building Envelope Ltd.; Box 23119, 1925 Pembina Hwy, Winnipeg, Manitoba R3T 2B3; Tel:. 204-371-0996; URL: https://buildingenvelope.biz.

.3 Notify Contract Administrator 48 hours in advance of date and time of tests and inspections.

.3 Vapour Retarders - Inspection and Testing:

.1 Inspections: Vapour retarder materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:

.1 Continuity of vapour retarder system has been achieved throughout the building envelope with no gaps or holes.

.2 Continuous structural support of vapour retarder system has been provided.

.3 Site conditions for application temperature and dryness of substrates have been maintained.

.4 Maximum exposure time of materials to UV deterioration has not been exceeded.

.5 Surfaces have been primed.

.6 Laps in sheet materials have complied with the minimum requirements and have been shingled in the correct direction (or mastic applied on exposed edges), with no fishmouths.

.7 Termination mastic has been applied on cut edges.

.8 Vapour retarder has been firmly adhered to substrate.

.9 Compatible materials have been used.

.10 Transitions at changes in direction and structural support at gaps have been provided.

.11 Connections between assemblies (vapour retarder and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.

.12 All penetrations have been sealed.

.2 Tests: As determined by testing agency from among the following tests.

.1 Membrane-to-substrate tensile adhesion testing conducted in general accordance with ASTM D4541 for each 56 sq. m (600 sq. ft.) of installed air barrier or part thereof.

.1 When the product manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report to indicate whether this requirement has been met.

.2 Where the material manufacturer has not declared a minimum adhesion value for their product/substrate combination, the value shall simply be recorded.

.3 Vapour Retarders will be considered defective if they do not pass inspections and testing.

.1 Apply additional vapour retarder material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.

.2 Remove and replace deficient vapour retarder components for retesting as specified above.

.4 Repair damage to vapour retarder caused by testing; follow manufacturer's written instructions.

.4 Roofing - Inspection and Testing:

.1 Low-Voltage Electrical Conductance Testing: Testing agency shall survey entire roof area and flashings to locate discontinuity in the roof membrane using an exposed metal electrical loop to create an electrical field tested with hand-held probes or a scanning platform having integral perimeter electrical loops creating a complete electrical field.

.1 Perform tests before overlying construction is placed.

.2 After testing, repair areas of discontinuities, repeat tests, and make further repairs until roofing and flashing installations are contiguous.

.1 Cost of retesting is Contractor's responsibility.

.3 Testing agency shall prepare survey report indicating locations of initial discontinuities, if any.

.2 Test Cuts: Remove test specimens to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:

.1 Determine approximate quantities of components within roofing membrane according to ASTM D3617.

.2 Examine test specimens for interply voids according to ASTM D3617 and to comply with criteria established in Appendix 3 of NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."

.3 Repair areas where test cuts were made according to roofing system manufacturer's written instructions.

.5 Frequency and timing of testing and inspections as determined by the independent inspection agency.

.1 Repair or remove and replace components of vapour retarder and roofing system where inspections indicate that they do not comply with specified requirements.

.2 Vapour retarder and roofing systems will be considered defective if they do not pass tests and inspections.

.1 Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

.3 Prepare test and inspection reports.

3.09 CLEANING

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

.4 Check drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.

END OF SECTION

Part 1 General

1.01 RELATED REQUIREMENTS

.1 Section 07 52 00 - Modified Bituminous Membrane Roofing: For installation of transition strips.

1.02 REFERENCE STANDARDS

.1 Aluminum Association

.1 Aluminum Design Manual 2020

.2 Designation System for Aluminum Finishes

.2 ASTM

.1 ASTM A653/A653 M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM A792/A792M, Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

.3 ASTM B32, Specification for Solder Metal

.3 Canadian Standards Association (CSA)

.1 CSA A123.3, Asphalt or Tar Saturated Roofing Felt

.2 CAN/CSA-S136, North American Specification for the Design of Cold-Formed Steel Structural Members

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type

.5 Canadian Roofing Contractors Association (CRCA).

.1 Roofing Specifications Manual 2011

.6 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI Sheet Steel Facts No. 10, Table 1 - MSG Sheet Steel Gauge Numbers and Thicknesses

.7 Sheet Metal and Air Conditioning National Contractors Association (SMACNA)

.1 Architectural Sheet Manual, Seventh Edition – January 2012

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Samples: Submit duplicate colour samples of prefinished sheet metal for colour selection by Contract Administrator. Submit duplicate 50 x 50 mm samples of each type of sheet metal material, colour and finish.

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Coordinate the work of this Section with the commissioning requirements specified in NIBS Guideline 3-2006, Annex M.10: Flashing and Sheet Metal Flashing and Trim Checklist 07 62 00, as indicated in Article

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.01 PERFORMANCE REQUIREMENTS

.1 General: Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim will not rattle, leak, or loosen, and will remain watertight.

.2 Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

.1 Temperature Change: 230 deg F (110 deg C), ambient; 212 deg F (100 deg C), material surfaces.

.4 Base Steel Thicknesses of Sheet Steel:

.1 Base metal thicknesses of sheet steel specified herein are based on the Manufacturers Standard Gauge (MSG) system. The minimum thickness shall be the design thickness (nominal base steel thickness) minus the maximum allowable under-tolerance as specified by CSA-S136. Thicknesses (gauge) specified are for uncoated steel.

.2 Design thicknesses are in accordance with CSSBI Sheet Steel Facts No. 10, Table 1 - MSG Sheet Steel Gauge Numbers and Thicknesses

.5 Base Metal Thickness of Sheet Aluminum:

.1 Base metal thickness of uncoated sheet aluminum specified in this section is based on the Aluminum Association designation system for thickness.

.6 Design sheet metal flashings and trim to accommodate movement between materials and building structure, caused by structural movements, without permanent distortion, damage to components, racking of joints, opening of seams, buckling and oil canning.

2.02 SHEET METAL MATERIALS

.1 Aluminum-zinc Alloy Coated Steel Sheet: ASTM A792/A792M, commercial quality, grade with AZ150 coating, regular spangle surface, minimum base metal thickness specified by item.

2.03 PREFINISHED STEEL SHEET

.1 Aluminum-zinc alloy coated steel sheet with factory applied polyvinylidene fluoride (PVDF) coil coating, minimum base metal thickness specified by item. Colour selected by Contract Administrator from manufacturer's standard range.

.1 Acceptable Products: Baycoat 10000 Series.

2.04 ACCESSORIES

.1 Isolation Coating: Alkali resistant bituminous paint.

.2 Pitch Pocket Filler: Aluminum coloured, solvent and SBS modified bitumen based mastic.

.3 Underlay for Metal Flashing: dry sheathing to CAN/CGSB-51.32.

.4 Sealants: As specified in Section 07 92 00 - Joint Sealing.

.5 Bond Breaker Tape: Polyethylene bond breaker tape that will not bond to sealant.

.6 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

.7 Nails: of same material as sheet metal, to ASTM F1667, ring thread flat head roofing nails of length and thickness suitable for application.

.8 Screws: Of same material as sheet metal, self-tapping sheet metal screws, corrosion resistant, of length and thickness suitable for metal flashing application. Head colour to match sheet metal where exposed.

.9 Washers: Of same material as sheet metal, 1 mm thick with rubber packings.

.12 Touch-up Paint: As recommended by metal flashing and trim manufacture.

2.05 FABRICATION

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series specifications and SMACNA Architectural Sheet Manual and as indicated.

.2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AA Aluminum Sheet Metal Work in Building Construction and as indicated.

.3 Form pieces in 2 400 mm maximum lengths. Make allowance for expansion at joints.

.4 Hem exposed edges on underside 12 mm. Miter and seal corners with sealant.

.5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

.7 Apply isolation coating to metal surfaces to be in contact with pressure-preservative treated wood or use separation sheet.

2.06 METAL FLASHINGS

.1 Form parapet flashings, cap flashings, copings and fascias to profile from zinc coated aluminum-zinc alloy coated prefinished sheet. Minimum base metal thickness 22 MSG.

.2 Form counter flashings, curb flashings to profile from zinc coated aluminum-zinc alloy coated prefinished sheet. Minimum base metal thickness 24 MSG.

.3 Air Barrier transition flashings at wall / roof junctures provide metal transition flashings as specified below.

.1 Form air barrier transition flashing at wall / roof junctures to profile indicated from zinc coated steel sheet. Minimum base metal thickness 22 MSG.,

2.07 PANS

.1 Form plastic pans from minimum 24 MSG zinc coated sheet with minimum 75 mm (3 inches) upstand above finished roof and 100 mm (4 inches) continuous flanges with no open corners.

Solder or rivet joints tight. Make pans minimum 50 mm (2 inches) wider than member passing through roof membrane.

2.08 REGLETS AND CAP FLASHINGS

.1 Form recessed or surface mounted reglets and metal cap flashing of minimum 24 MSG zinc coated sheet to be built-in concrete or masonry work for base flashings as detailed and in accordance with CRCA FL series details.

.2 Provide slotted fixing holes and steel/plastic washer fasteners. Cover face and ends with plastic tape.

2.9 SCUPPERS

.1 Form scuppers from 22 MSG zinc coated prefinished sheet to sizes and profiles indicated.

.2 Provide necessary fastenings.

Part 3 Execution

3.01 INSTALLATION

.1 Install sheet metal flashing and trim to comply with details indicated and recommendations of CRCA Roofing Specifications Manual FL series details, and SMACNA Architectural Sheet Manual that apply to installation characteristics required unless otherwise indicated on Drawings

.2 Install sheet metal work in accordance with CRCA details, SMACNA Architectural Sheet Manual and as indicated.

.3 Use concealed fastenings except where approved before installation.

.4 Provide underlay under sheet metal and secure in place and lap joints minimum 100 mm (4 inches).

.5 Isolate sheet metal work from direct contact with cementitious materials, dissimilar metals, and pressure-preservative treated wood.

.6 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips, as detailed.

.7 Lock end joints and caulk with sealant.

.8 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.9 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm (1 inch). Lead wedge flashing securely into joint.

.10 Insert metal flashing under cap flashing to form weathertight junction. Caulk flashing at cap flashing with sealant. Use bond breaker tape under sealant bead ensuring at least 6 mm of sealant in contact with metal surfaces on both sides of joint.

3.02 TRANSITION FLASHINGS FLASHING AT WALL / ROOF JUNCTION

.1 Install transition flashing at roof / wall junctures as component of building envelope air and vapour barrier system, as specified in Section 07 13 52, Part 3, and Section 07 27 00, Part 3.

3.03 PLASTIC PANS

.1 Install plastic pans, where shown around items projecting through roof membrane. Fill pans with aluminum coloured pitch pocket filler.

3.04 SCUPPERS

.1 Install scuppers as indicated.

END OF SECTION

Part 1 General

1.01 SUMMARY

.1 Section includes:

.1 Caulks and sealants.

1.02 RELATED REQUIREMENTS

.1 Section 07 52 00 - Modified Bituminous Membrane Roofing

.2 Section 07 62 00 - Sheet Metal Flashing and Trim

1.03 REFERENCE STANDARDS

.1 ASTM

.1 ASTM C834-17, Standard Specification for Latex Sealants

.2 ASTM C919-18, Standard Practice for Use of Sealants in Acoustical Applications

.3 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants

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

.1 Material Safety Data Sheets (MSDS)

.3 National Institute of Building Sciences (NIBS)

.1 NIBS Guideline 302006, Exterior Enclosure Requirements for the Commissioning Process, Annex M: Construction Checklists

.4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168, Adhesives and Sealants Applications.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Action Submittals:

.1 Samples:

.1 Submit two colour samples of proposed sealants for colour selection by the Contract Administrator.

.2 Submit two cured colour samples of exposed sealants for each colour where required to match adjacent material.

.3 Informational Submittals:

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's product to describe:

.1 Caulking compound

.2 Primers

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.4 Installation instructions for each product used.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Submit operation and maintenance data for incorporation into manual.

1.06 QUALITY ASSURANCE

.1 Field Sample:

.1 Apply representative sample of sealant and joint filler installation on site as part of the finished work. The Contract Administrator shall examine sample prior to further installation of sealant materials. Field sample, if acceptable, shall become the standard of quality for sealant work for project.

.2 Mock-Up:

.1 Refer to Section 01 40 00 - Quality Requirements.

.2 Apply joint sealant to mock-up(s). Show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant.

1.07 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area. Protect from freezing.

.2 Store and protect joint sealants from damage.

.3 Replace defective or damaged materials with new.

1.08 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction/Demolition Waste Management.

1.09 SITE CONDITIONS

.1 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.2 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.3 Joint substrates are dry.

.4 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.10 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to Labour Canada.

.2 Ventilate area of work as directed by Contract Administrator by use of approved portable supply and exhaust fans.

1.11 WARRANTY

.1 For Work of this Section 07 92 00 - Joint Sealing, twelve months warranty period is extended to 24 months.

.2 Warranty shall include coverage against sealant failure, delamination, discolouration, and other defects detrimental to performance, and shall include for replacement or repair of damaged materials at no cost to the City of Winnipeg.

Part 2 Products

2.01 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 VOC Content: Sealants and sealant primers shall comply with the following:

.1 Architectural sealants shall have a VOC content of 250 g/L or less.

.2 Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.

.3 Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.

.4 Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

.3 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.4 Where sealants are qualified with primers use only these primers.

2.02 SEALANT MATERIAL DESIGNATIONS

.1 Urethane One Part, Non-Sag:

.1 ASTM C920, Type S, Grade NS, Class 25

.2 Joint movement ±25% maximum.

.3 Acceptable Products: Euclid Eucolastic 1NS; Sikaflex 1a; Tremco DyMonic; Chem-Calk 900; Vulkem 931.

.2 Urethanes One Part, Non-Sag, Class 100/50:

.1 ASTM C920, Type S, Grade NS

.2 Joint movement -50% + 100%.

.3 Acceptable Products: Eucolastic 1 NS; Sikaflex 15M; Vulkem 921; W.R. Meadows Pourthane NS., MasterSeal NP-1.

.3 Urethane, One Part, Self-Leveling:

.1 ASTM C920, Type S, Grade P

.2 Joint movement ±25% maximum.

.3 Acceptable Products: Euclid Eucolastic 1 SL; Sikaflex 1C SL, Chem-Calk 950, Vulkem 45; W.R. Meadows Pourthane SL; Sonolastic SL1.

.4 Urethane, One Part, Self-Leveling:

.1 ASTM C920, Type S, Grade P. Joint movement -50% + 100%.

.2 Acceptable Products: Euclid Eucolastic 1 SL; Vulkem 45 SSL.

.5 Urethanes, Two Part, Non-Sag:

.1 ASTM C 920, Type M, Grade NS, Class 25; CAN/CGSB-19.24, Type 2, Class B.

.2 Joint movement: ±25% maximum.

.3 Acceptable Products: Euclid Eucolastic 2 NS; Sikaflex 2C NS, Dymeric, Chem-Calk 500; Sonolastic NP 2.

.6 Urethanes, Two Part, Self-Leveling:

.1 ASTM C 920, Type M, Grade P, Class 25; CAN/CGSB-19.24, Type 1, Class B.

.2 Joint movement: ±50% maximum.

.3 Acceptable Products: Eucolastic 2 SL; Sikaflex 2C SL, THC 900/901, Chem-Calk 550.

.7 Acrylic, One Part:

.1 Acceptable Products: Tremco Mono 555, Chem-Calk 600.

.8 Acrylic Latex, One Part:

.1 ASTM C834.

.2 Acceptable Products: Tremco Tremflex 834, Chem-Calk 600.

.9 Acoustical Sealant:

.1 ASTM C834.

.2 Acceptable Products: Tremco Tremflex 834, Chem-Calk 600; USG Sheetrock Acoustical Sealant; CertainTeed QuietSeal Pro. Ramset Water-Based Sound-Control Sealant.

.10 Silicone, One Part:

.1 ASTM C920, Type S, Grade NS, Class 100/50, Use NT, M, G, A and O..

.2 CAN/CGSB-19.13

.3 Acceptable Products: Tremco Spectrum 1

.11 Silicone, One Part:

.1 ASTM C920, Type S, Grade NS, Class 50, Use NT, G, and O.

.2 CAN/CGSB-19.13.

.3 Acceptable Products: Dowsil 795.

.12 Silicone, One Part, Mildew Resistant:

.1 ASTM C920, Type S, Grade NS, Class 25.

.2 Acceptable Products: Tremsil 200.

.13 Epoxy-urethane or polyurea, two-part, self-levelling:

.1 Load bearing sealant for saw cuts, preformed joints, construction joints, cracks, in interior floor slabs.

.2 Acceptable Products: Sika Loadflex. VersaFlex SL/75.

2.03 ACCESSORIES

.1 Back-up Materials:

.1 Backer Rod: Extruded polyethylene, closed cell foam backer rod, compatible with sealant, recommended by manufacturer, diameter oversize 30 to 50% to suit joint.

.1 Acceptable Products: Dow Chemical “Ethafoam”, Tremco “Sof Rod”.

.2 Bond Breaker Tape: Polyethylene, pressure sensitive bond breaker tape which will not bond to sealant.

.3 Primers: Type recommended by sealant manufacturer, for appropriate sealant and corresponding substrate.

.4 Joint Cleaner: Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

2.04 SEALANT COLOURS

.1 Sealant Colours: Selected by Contract Administrator from manufacturers’ standard colours. Generally matching the predominant material to which sealant is applied.

.2 Allow for custom colours to match existing.

2.05 SEALANT SELECTION

.1 Refer to Table 07 92 00 (1) and Table 07 92 00 (2) in Part 3 of this section for use and sealant types and locations.

Part 3 Execution

3.01 EXAMINATION

.1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of the Contract Administrator.

.2 Inform the Contract Administrator of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

3.02 PRE-INSTALLATION TESTING

.1 Before commencing application of sealants test materials for indications of staining or poor adhesion.

.2 Ascertain that sealers and coatings applied to sealant substrates are compatible with sealant used and that full bond between the sealant and substrate is attained.

.3 Request samples of the sealed or coated substrate from their fabricators for testing of compatibility and bond, if necessary.

3.03 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

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

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

.4 Ensure joint surfaces are dry and frost free.

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

3.04 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.05 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install foam backer rod to achieve correct joint depth and shape, with approximately 30% compression.

3.06 EXPANDING FOAM SEALANTS

.1 Install expanding foam sealants in accordance with manufacturer’s instructions.

.2 Coordinate installation with work of other trades to ensure foam sealants are installed before building joints are covered.

.3 For expansion joints below grade in foundation walls and grade beams install as primary seal.

.4 For expansion joints above grade in foundation walls, grade beams, exterior walls install as secondary seal with wet caulking as primary seal.

.5 Where used as a secondary seal together with field applied wet caulking provide bond breaker tape or backer rod between foam sealant and caulking.

.6 Size preformed foam sealant to suit joint depth and width allowing for proper compression of the material:

.1 Horizontal expansion and control joints below grade: 20%

.2 Vertical and horizontal joints in building façade: 25%

.3 Watertight joints: 20%.

.7 Use adhesives recommended by manufacturer, suitable for substrate and application.

.8 Install in longest possible lengths. Keep number of joints to a minimum. Join individual strips by means of scarfe joint, cut at approximately 30°.

3.07 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.08 APPLICATION

.1 Apply non-paintable sealants after adjacent surfaces have been painted and paint is fully cured and dry.

.2 Apply paintable sealant before adjacent surfaces have been painted.

.3 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.4 Curing.

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

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

3.09 APPLICATION FLOOR JOINT FILLER

.1 Prepare joints in accordance with manufacturer’s written instructions.

.2 Ensure joints are clean, dry and sound. Remove from joints and joint edges all dirt, dust, debris, oil, grease, paint, curing compounds, sealers, residue and other materials that may act as a bond breaker.

.3 Floor Cracks: Rout-out and clean.

.4 Clean joints free of dust and particulates using compressed air with an airline equipped with an oil trap.

.5 Apply joint filler full depth (no backer rod) to control joints, saw cuts, construction joints, cracks in exposed interior concrete floors in accordance with manufacturer’s written instructions.

.6 Shave off excess sealant smooth to top of slab after sealant has cured.

3.10 INDEPENDENT INSPECTION AND TESTING

.1 Comply with Section 01 40 00 - Quality Requirements.

.2 Contractor to engage and pay for an inspection agency to verify the technical requirements for the commissioning of joint sealing in accordance with NIBS Guideline 3-2006, Annex M.1-5: Joint Sealing Checklist 07 92 00, as appended to this Section.

3.11 CLEANING

.1 Progress Cleaning: Clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Clean adjacent surfaces immediately.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape after initial set of sealant.

.2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: Separate waste materials for recycling in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal

3.12 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

3.13 TABLES

Table 07 92 00 (1)
Sealant Types and Locations

Sealant Types (as specified in Article .4)	Location
Urethane One Part, Non-Sag, joint movement -50% + 100%	Expansion and control joints in exterior surfaces of poured-in-place concrete walls, joint movement: -50% + 100%
	Expansion and control joints in exterior surfaces of precast, architectural wall panels, Joint movement: -50% + 100%
	Control and expansion joints in exterior surfaces of unit masonry walls.
	Coping joints and coping-to-facade joints
	Control and expansion joints on the interior of exterior poured-in place concrete walls
	Control and expansion joints on the interior of exterior precast, architectural wall panels.
	Control and expansion joints on the interior of exterior surfaces of unit masonry walls
Urethane One Part, Non-Sag, joint movement ± 25%	Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry)
	Under door thresholds
Urethane One Part, Self-leveling	Expansion joints in interior floor surfaces
	Cornice and wash (or horizontal surface joints)
	Exterior joints in horizontal wearing surfaces (as itemized)
Acrylic Latex One Part (paintable)	Joints of underside of precast beams or planks
	Exposed interior control joints in drywall
	At junction of suspended gypsum board ceilings and adjacent walls
Acrylic One Part	Perimeters of exterior openings on interior of building where frames meet interior finishes
	Perimeters of interior frames
	Interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls)
	Joints at tops of non-load bearing masonry walls at the underside of poured concrete or steel deck or precast planks
Silicone, One Part - Class 50	Air sealing applications.
Silicone Mildew Resistant	Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, water closets, basins, vanities)
	As specified in specification sections
Semi-rigid two-component epoxy or polyuria sealant	Saw cuts, cracks and construction joints in exposed interior floor slabs.
Other types	As specified in specification sections

END OF SECTION

Part 1 General

1.01 SUMMARY

.1 Section Includes:

.1 Section includes the insulated, translucent sandwich panel system and accessories as shown and specified. Work includes providing and installing.

1.02 RELATED REQUIREMENTS

.1 Section 07 52 00 - Modified Bituminous Membrane Roofing: For roof vapour retarder membrane tied into panel assembly frames for continuity of building air and vapour barrier system.

.2 Section 07 92 00 - Joint Sealing: For system perimeter sealant and back-up materials.

1.03 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 DAF 45 - Designation System for Aluminum Finishes.

.2 Architectural Aluminum Manufacturers Association (AAMA)

.1 AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.

.3 American Society for Testing and Materials (ASTM)

.1 ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

.2 ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.5 ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.6 ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.7 ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.8 ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.40 - Anticorrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB 1.181 - Ready-Mixed Organic Zinc-Rich Coating.

.5 Manitoba Workplace Safety and Health Act and Regulation, Chapter W210 The Workplace Safety and Health Act

.1 Workplace Safety and Health Regulation 217.

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meeting: Convene one week before starting work of this section.

.2 Coordination: Coordinate with other work having a direct bearing on work of this section.

.1 Coordinate the Work with installation of air and vapour barrier placement components or materials.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for components, anchorage and fasteners, sandwich panel, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

.2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.4 Submit manufacturer’s color charts showing the full range of colors available for factory finished exposed aluminum:

.1 When requested, submit samples for each exposed finish required, in same thickness and material for the work.

.5 Delegated Design Submittals:

.1 Include framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

.6 Test Reports:

.1 Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.

.1 Reports required (if applicable) are:

.2 Flame Spread and Smoke Developed (UL 723) – Submit UL Card

.3 Burn Extent (ASTM D 635)

.4 Color Difference (ASTM D 2244)

.5 Impact Strength (UL 972)

.6 Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)

.7 Bond Shear Strength (ASTM D 1002)

.8 Beam Bending Strength (ASTM E 72)

.9 Insulation U-Factor (NFRC 100)

.10 NFRC System U-Factor Certification (NFRC 700)

.11 NFRC Visible Light Transmittance (NFRC 202)

.12 Solar Heat Gain Coefficient (NFRC or Calculations)

.13 Condensation Resistance Factor (AAMA 1503) (Thermally Broken, insulated panels only)

.14 Air Leakage (ASTM E 283)

.15 Structural Performance (ASTM E 330)

.16 Water Penetration (ASTM E 331)

.17 Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure (ASTM E2707)

.18 Fall Through Resistance (ASTM E 661)

.19 Class A Roof Covering Burning Brand (UL 790)

.20 UL Listed Class A Roof System (UL 790) (Optional) – Submit UL Card

1.06 CLOSEOUT SUBMITTALS

.1 Submit manufacturer's operation and maintenance data in accordance with Section 01 78 00 – Closeout Submittals. Include:

.1 Manufacturer’s printed instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use conditions and precautions against materials and methods which may be detrimental to finishes and performances.

1.07 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Conform to requirements of the Manitoba Workplace Safety and Health Act, Regulation W210, Workplace Safety and Health Regulation 217/2006, Part 14 Fall Protection.

.2 Perform Work in accordance with AAMA CW-DG-1.

.3 Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by the manufacturer.

.4 Design structural support framing components to CSA S157 under direct supervision of a professional structural engineer experienced in design of this Work and licensed at the place where the Project is located.

.5 Mock-Ups: Build mock-up representative of primary sandwich panel assemblies, as acceptable to Consultant. Mock-up size equal to one complete unit and include the air barrier materials and air barrier accessories proposed for use in the exterior assembly.

.1 Mock-up to be suitable for testing as specified in this Section.

.2 If accepted, the mock-up may become a part of the finished work and will establish the minimum standard of quality and workmanship for remainder of project.

.6 Manufacturer’s Qualifications:

.1 Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope, and location. At least three of the projects shall have been in successful use for ten years or longer.

.2 Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural, and water infiltration testing of sandwich panel systems by an accredited agency.

.3 Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components, and production sandwich panels for conformance with AC177 “Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems” as issued by the ICC-ES.

.7 Perform welding Work in accordance with CSA W59.2

1.08 DELIVERY, STORAGE, AND PROTECTION

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Handle work of this Section in accordance with AAMA CW-10.

.3 Protect prefinished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.09 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.10 SITE CONDITIONS

.1 Do not install sealants when ambient temperature is less than 5 degrees C.

.2 Maintain this minimum temperature during and after installation of sealants.

1.11 WARRANTY

.1 Provide manufacturer's written guarantee that skylight system will remain leakproof including coverage for complete system failure in accordance with GC 12.3, but for five years from date of Total Performance. Failures include, but are not limited to:

.1 Structural failures including, but not limited to, excessive deflection.

.2 Noise or vibration created by wind and thermal and structural movements.

.3 Deterioration of metals, and other materials beyond normal weathering.

.4 Water penetration through fixed panels and framing areas.

Part 2 Products

2.01 MANUFACTURERS

.1 Acceptable Manufacturers:

.1 Kalwall

.2 Kingspan

2.02 SYSTEM DESCRIPTION

.1 Sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.

.2 Assembled system to permit replacement panel units from exterior without requiring removal of structural mullion sections.

.1 Thickness: 2-3/4 inches

.2 Exterior FRP: Crystal / Interior FRP: Crystal

.3 Grid Core Insulation: Fill panel cores with fiberglass batt

.4 Panel U-factor by NFRC certified laboratory: Minimum 2.0 W/m2*k

.5 Light Transmittance: Minimum 25% - preferable 35%.

2.03 PERFORMANCE REQUIREMENTS

.1 System Design: Design and size components, by a Professional Engineer registered in the Province of Manitoba, to withstand dead loads and live loads caused by positive and

negative wind loads acting normal to plane of panels calculated in accordance with National Building Code as measured in accordance with ASTM E330.

.2 Design and size components to:

.1 Conform to requirements of the Manitoba Workplace Safety and Health Act, Regulation W210, Workplace Safety and Health Regulation 217/2006, Part 14 Fall Protection.

.2 Withstand dead loads and live loads caused by positive and negative wind loads acting normal to plane of panels to a design pressure of 0.95 kPa as measured in accordance with ASTM E330, and in accordance with NBC.

.3 Withstand seismic loads and sway displacement as calculated in accordance with NBC.

.3 Size panels and dimensions to limits established in CAN/CGSB-12.20.

.4 Design aluminum components CAN/CSA S157

.5 Thermal Expansion: Ensure skylight system can withstand temperature differential of 95 degrees C over a twelve-hour period and is able to accommodate interior and exterior system expansion and contraction without damage to components or deterioration of seals.

.6 Provide system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Shortening of building concrete structural columns.

.7 Standard panels shall deflect no more than 1.9” at 30 PSF in 10’-0” span without a supporting frame by ASTM E 72.

.8 Panels shall meet the conditions of acceptance according to ASTM E2707 Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure:

.1 Absence of flame penetration through the wall assembly at any time.

.2 Absence of evidence of glowing combustion on the interior surface of the assembly at the end of the 60-min observation period.

.3 Absence of evidence of flame, glow, and smoke if the test is terminated prior to the completion of the 60-min observation period.

.9 Overall Thermal transmittance (U-Factor): Maximum 2.0 W/(m^2•K).

.1 The overall thermal transmittance value of the skylight assembly shall be determined for the reference sizes listed in accordance with:

.1 CSA A440.2/A440.3 Fenestration Energy Performance /User Guide to CSA A440.2 Fenestration Energy Performance, or

.2 NRFC 100, Determining Fenestration Product U-Factors.

.2 Overall thermal transmittance shall be based on geographic location Zone 7 (Winnipeg), in accordance with the National Energy Code, and with Manitoba amendments.

.10 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or route moisture occurring within system, to the exterior by a weep drainage network.

.11 Maintain continuous air barrier and vapour retarder throughout assembly.

.12 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

.13 Air Infiltration: Limit air infiltration through assembly to 0.03 L/s/sq m of sloped panel area, measured at a reference differential pressure across assembly of 300 Pa as measured in accordance with ASTM E283.

.14 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% HR: No failure.

.15 Water Leakage: None, when measured in accordance with ASTM E331.

Limit air infiltration through assembly to 0.0003 $m^3/s/m2$ (0.06 cfm/ft^2) of wall area, measured at a reference differential pressure across assembly of 750 Pa as measured in accordance with ASTM E283.

.16 Design sloped glazing assemblies to rain screen principles.

.1 Ensure horizontal members are sealed to vertical members to form individual compartments in accordance with rain screen principles.

.2 Ventilate and pressure equalize air spaces outside exterior surface of insulation to exterior.

2.04 MATERIALS

.1 Extruded Aluminum: ASTM B221M, 6063-T5, 6063-T6 alloy and temper.

.2 Sheet Aluminum and Plate: ASTM B209. Aluminum Association alloy AA1100, thickness indicated.

.3 Sheet Steel: CSA-S136; galvanized in accordance with Z275 designation zinc coating.

.4 Steel Sections: CAN/CSA-G40.21M, ASTM A36/A36M, shaped to suit mullion sections.

.5 Zinc Coated Steel Sheet: Commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

.6

2.05 ACCESSORIES

.1 Fasteners, Screws and Bolts: Type 304 stainless steel complying with ASTM F593; provide sufficient strength to withstand design pressure indicated.

.1 Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.

.2 Reinforce members as required to receive fastener threads.

.2 Perimeter Sealant and Backing Materials: As specified in Section 07 92 00 - Joint Sealing.

.3 Sealant used within system (not used for glazing): type recommended by manufacturer.

.4 Flashings: 22-gauge aluminum, finish to match mullion sections where exposed, secured with concealed fastening method.

2.06 FABRICATION

.1 Fabricate skylight components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.3 Prepare components to receive anchor devices. Fabricate anchors.

.4 Arrange fasteners and attachments to ensure concealment from view.

.5 Reinforce framing members for external imposed loads.

2.07 FINISHES

.1 Finish Coatings: Conform to AA designations.

.2 Finish exposed surfaces of interior and exterior aluminum components in accordance with DAF-45 - Aluminum Association Designation System for Aluminum Finishes.

.1 Integral Colour Anodic Finish: Designation AA-M10C21A44, Class I, black.

.3 Finish brake formed or cold rolled sheet aluminum after forming to prevent cracking of finishes. Only minor bending and forming to fit pieces on site will be permitted. Replace components that show cracking, peeling or other damage to finished surfaces at no additional cost to the Contract.

.4 Shop and Touch-Up Primer for Steel Components: SSPC 25 Paint red oxide.

.5 Touch-Up Primer for Galvanized Steel Surfaces: SSPC 20 Paint zinc rich.

.6 Concealed Steel Items: Galvanized in accordance with CAN/CSA-G164M to 380 g/m².

.7 Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

Part 3 Execution

3.01 EXAMINATION

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify openings and adjoining air and vapour seal materials are ready to receive work of this Section.

3.02 INSTALLATION

.1 Install skylight system to manufacturer instructions.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Provide alignment attachments and shims to permanently fasten system to building structure.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Provide thermal isolation where components penetrate or disrupt building insulation.

.6 Install flashings.

.7 Coordinate attachment and seal of perimeter air and vapour barrier materials.

.8 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.9 Install skylight panels as required to achieve performance criteria. Finish the surface with a slope for drainage over the cap.

.10 Install perimeter sealant to method required to achieve performance criteria.

.11 Sheet Metal Air Barrier:

.1 Coordinate attachment and seal of perimeter air barrier materials. Maintain continuity of building envelope air barrier.

.2 Install sheet metal air barrier directly into shoulder of frame with stainless steel screws, anti-rotation spacers, and butyl tape to provide air and vapour seal. Secure into glazing pocket with spacer block and pressure plate.

.3 Overlap end joints minimum 75 mm and seal joints with non-hardening sealant.

.12 Shim Spaces:

.1 Shim spaces are defined as joints or spaces between perimeter frames and adjacent construction.

.2 Fill shim spaces with non-expanding spray foam sealant to maintain continuity of building thermal barrier.

.3 Provide foamed-in-place insulation to shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.13 Install perimeter sealant to method required to achieve performance criteria. Sealant, backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealing.

.14 Isolation Coating:

.1 Apply isolation coating to properly prepared concealed unpainted surfaces in contact with dissimilar materials. Coat surfaces with two coats for a minimum of 16 mils dry film thickness (DFT) or as recommended by coating manufacturer. Dipping of aluminum into coating is not permitted. Allow coating to dry prior to installation of aluminum component.

3.03 ERECTION TOLERANCES

.1 Maximum Variation from Plumb: 1 mm/900 mm non-cumulative or 12 mm/30 m, whichever is less.

.2 Maximum Misalignment of Two Adjoining Members Abutting in Plane: 0.793 mm.

.3 Maximum sealant space between panel and adjacent construction: 13 mm.

3.04 FIELD QUALITY CONTROL

.1 Comply with Section 01 40 00 - Quality Requirements.

.2 Manufacturer's Field Services:

.1 Have manufacturer of products, supplied under this Section, review Work involved in the handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of Work with Contract.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, at stages listed:

.1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.

.2 Minimum twice during progress of Work at 25% and 60% complete.

.3 Upon completion of the Work, after cleaning is carried out.

.4 Notify Consultant and the City of Winnipeg 48 hours in advance of date and time of visits.

.5 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit manufacturer's field reports.

.4 Prepare inspection reports.

3.05 INDEPENDENT INSPECTION AND TESTING

.1 Comply with Section 01 40 00 - Quality Requirements.

.2 Engage an independent inspection and testing agency to inspect and test skylight panel assemblies.

.3 Cost for inspection and testing shall be paid by the Contractor.

.4 Test Area: Perform tests on representative areas of sloped skylight panel assemblies and mock-ups as indicated in article 1.07 and as maybe requested by the independent inspection and testing agency.

.5 Field Quality-Control Testing: Perform the following test on representative areas of sloped panel assemblies and mock-ups.

.1 Water-Spray Test: Before installation of interior finishes has begun, areas designated by Consultant to be tested according to AAMA 501.2 and shall not evidence water penetration.

.1 Perform a minimum of two tests in areas as directed by Consultant.

.2 Air Infiltration: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. (0.45 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

.1 Perform a minimum of two tests in areas as directed by Consultant.

.3 Water Penetration: ASTM E1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft. (300 Pa), and shall not evidence water penetration.

.6 Sloped panel assemblies will be considered defective if they do not pass tests and inspections.

.7 Prepare test and inspection reports.

3.06 CLEANING

.1 Perform cleaning of aluminum components in accordance with AAMA 609 & 610.

.2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.3 Remove protective material from prefinished aluminum surfaces.

.4 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.5 Remove traces of primer, caulking, sealants, and filler materials. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.07 PROTECTION OF FINISHED WORK

.1 Protect finished Work from damage.

END OF SECTION