



**Request for Quotation # Q-303-2020-A-
007-DCAM
For
Repairs to the Sediment tank wall at
Oshawa Water Supply Plant**

Appendix D, D-1 and D-2

The Deliverables and Material Disclosures

Tender Document 4 of 4

Electronic submission required



The Regional Municipality of Durham
Works Department
605 Rossland Road East, Whitby ON, L1N 6A3

Repairs to the sediment tank walls at Oshawa Water Supply Plant
1540 Ritson Road South
Oshawa, ON
L1J 3M3

AECOM Engineering Ltd.
300 Water Street
Whitby, ON
L1N 9J2

These specifications (Divisions 00-07) were prepared under the supervision of the following registered coordinating professionals:

Written by: **Abdulah Al-Jalaad**_____

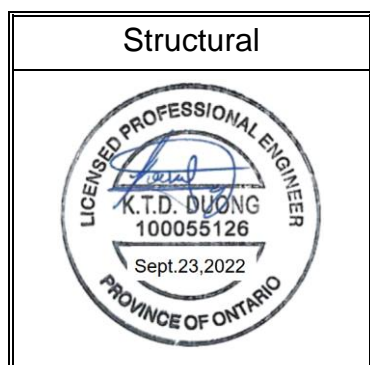
Date: **Sept. 23, 2022**_____

Checked by: _____

A blue ink signature of K.T.D. Duong, written over a horizontal line.

(Consultant Project Manager)

Date: **Sept 23, 2022**_____



Division 00 Procurement and Contracting Requirements

Not used

Division 01 General Requirements

01 11 00	Summary of Work
01 14 00	Work Restrictions
01 29 00	Payment Procedures
01 31 00	Project Management and Coordination
01 31 19	Project Meetings
01 32 00	Construction Progress Documentation
01 33 00	Submittal Procedures
01 35 29	Health and Safety Procedures
01 41 00	Regulatory Requirements
01 45 00	Quality Control
01 50 00	Temporary Facilities and Controls
01 51 00	Temporary Utilities
01 53 00	Temporary Construction
01 55 00	Vehicular Access and Parking
01 62 00	Product Options
01 65 00	Product Delivery Requirements
01 74 00	Cleaning and Waste Management
01 78 00	Closeout Submittals

Division 02 Existing Conditions

02 22 50	Demolition and Removals
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Division 03 Concrete

03 30 00	Cast-in Place Concrete
03 93 00	Epoxy Crack Injection

Division 04 to 05

Not used

Division 07 Thermal and Moisture Protection

07 10 00	Waterproofing
07 27 13	Self-adhered Air and Vapour Barrier Membrane

Division 08 to 48

Not Used

End of Table of Contents

1 General

1.1 Section includes

- .1 Documents and terminology.
- .2 Associated requirements.
- .3 Work expectations.
- .4 Work by other parties.
- .5 Premises usage.

1.2 Complementary documents

- .1 Drawings, Specifications, and schedules are complementary each to the other and what is called for by one to be binding as if called for by all. Should any discrepancy appear between documents which leave doubt as to the intent or meaning, abide by Precedence of Documents article below or obtain direction from the Consultant.
- .2 Install components to physically conserve headroom, to minimize furring spaces, or obstructions.
- .3 Locate devices with primary regard for convenience of operation and usage.
- .4 Examine all discipline Drawings, Specifications, and schedules and related Work to ensure that Work can be satisfactorily executed. Conflicts or additional work beyond work described to be brought to attention of Consultant.

1.3 Location

- .1 The Place of the Work is located at 1540 Ritson Road South, Oshawa.
- .2 The materials and/or services shall be delivered FOB Destination(s), Prepaid.

1.4 Description of the Work

- .1 Work of this Contract comprises remediation of concrete deterioration along the exterior sediment tank wall.

- .2 Division of the Work among Subcontractors, suppliers and vendors is solely the Contractor's responsibility. Neither the Owner nor Consultant assumes any responsibility to act as an arbiter to establish subcontract terms between sectors or disciplines of work.
- .3 Refer to the Drawings and Specifications for the required Work.
- .4 Division 01 General Requirements, of the Specifications generally specify work and coordination of the work that is the direct responsibility of the Contractor but shall not be interpreted to define absolutely the limits of responsibility that must be established between the Contractor and their Subcontractors by their separate agreements.
- .5 Ensure that Subcontractors understand that the General Conditions of the Contract as amended by the Supplementary Conditions, and Division 01 General Requirements, apply to Sections of the Specification governing their work.
- .6 Ensure that the work includes all labour, equipment and products required, necessary or normally recognized as necessary for the proper and complete execution of the work of each trade.
- .7 The Work also includes the examination of the site, submission of samples, scheduling and coordination, project meetings, protection of the existing facility, repair and preparation of surfaces, quality control, inspection reports, project cleanliness, maintenance of data, preparation of as-built drawings, final cleaning and warranty.

1.5 Contract method

- .1 Construct Work under a single, lump Sum price contract.
- .2 Assume responsibility for assigned contracts as Subcontracts forming part of the Work.
- .3 Quotation Documents were prepared by the Consultant for the Region of Durham. Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them, are the responsibility of such third parties. The Consultant and Region accept no responsibility for damages, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

1.6 Documents provided

- .1 The Region will not supply hard copies of contract documents to the contractor for construction purposes.

1.7 Performance of the Work

- .1 Commence the Work within 7 calendar days of receipt of the Order to Commence Work letter issued by the Project Manager and, subject to adjustment in Contract Time as provided for in the Contract Documents, attain Substantial Performance of the Work, within twelve (12) weeks after issuance by the Project Manager of an Order to Commence Work and complete the Work in its entirety within fourteen (14) weeks after issuance by the Project Manager of an Order to Commence Work. No work is to be started until the Project Manager has issued an Order to Commence Work letter.

1.8 Discrepancies and clarifications

- .1 Advise Consultant of discrepancies discovered in requirements of the Contract Documents and request clarification from Consultant in written form.
- .2 Advise Consultant when clarifications are required pertaining to meaning or intent of requirements of Contract Documents and request clarification from Consultant in written form.
- .3 Do not proceed with related work until written clarification is provided by Consultant.
- .4 Failure to notify Consultant shall result in Contractor incurring responsibility for resulting deficiencies and expense at no additional cost to the Owner.
- .5 Written instructions issued by Consultant for clarification, implicitly supersede applicable and relevant aspects of the Contract Documents irrespective of whether these documents are explicitly or specifically cited in clarification requests or clarification instructions.

1.9 Work by Owner

- .1 Permit the Owner and/or their other contractors to inspect the work at any reasonable time, and to perform such work and install such equipment as the Owner may require.

1.10 Basis of payment

- .1 **There shall be no payment for this Section as no actual Work is specified herein.**

1.11 Qualifications of Contractor

- .1 The General Contractor for this Contract, or its Subcontractor executing the portion of work shall have the following experience:
 - .1 Substantially performed at least five (5) projects of similar and related scope in the past three (3) years.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Owner access.
- .2 Contractor's use of site.
- .3 Connecting to existing services.
- .4 Site access.
- .5 Continuity of existing service.
- .6 Working hours.
- .7 Special scheduling requirements.

1.2 Owner access

- .1 The building and parking areas, which are not immediately affected by the Work, will remain occupied by the Owner during the Work.
- .2 Ensure adequate access to areas not occupied for the Work.

1.3 Contractor's use of site

- .1 Accept full responsibility of assigned work and storage areas from the time of Contract award until completion of the Work.
- .2 Do not unreasonably encumber site with materials or equipment.
- .3 Contractor shall not have access to existing facility utilities (power, water, etc.). Contractor shall provide power generators and water as required at no additional cost to the owner.
- .4 Contractor will not have access to existing facilities washrooms. Contractor to provide their own washroom for contractor use at no additional cost to the owner.
- .5 Do not obstruct entrances, stairs or fire exits.
- .6 Maintain free access route for emergency vehicles, waste disposal trucks and delivery vehicles.
- .7 Provide for all vehicular and pedestrian traffic.

- .8 The placement of a refuse bin will be allowed in an area agreed by the Owner.
- .9 Repair all damage to paving, grass, walkways, curbs, trees, planting beds, and any other areas, caused by the Contractor's operations.

1.4 Existing services

- .1 Operation of existing facility shall take precedence over Contractor's operations. Keep existing buildings in operation at all times.
- .2 Notify Owner of intended interruption of services and obtain required permission.
- .3 Where Work involves breaking into or connecting to existing services, give Consultant and Owner minimum seven (7) Calendar Days of notice for necessary interruption of electrical or communications services throughout course of work. This lead time is required so the Owner can adequately prepare and test backup power and communications systems prior to interruption.
- .4 Keep duration of interruptions minimum.
- .5 Perform utility interruptions only during business days between the hours of 7:00am and 3:00pm to allow the Owner to monitor the status of backup power systems in operation.
- .6 Construct barriers in accordance with Section 01 53 00.

1.5 Site access by Contractor

- .1 Unless stated otherwise, the Contractor will be permitted access to the site from start of construction until Substantial Performance of the Contract.
- .2 Access Roads and Walks:
 - .1 All construction vehicles and personnel required for construction shall use existing access roads and walks as determined at later date by Owner. When no longer required, or at completion of Work, make good all disturbed surfaces. Maintain roads and walks, removing dirt, mud, debris, ice, snow and other obstructions during use.
 - .2 Provide for access of emergency vehicles at all times.

- .3 After Substantial Performance of the Contract, the Contractor shall not enter the facility without prior written authorization from the Owner and the Contractor's activities shall be restricted to the work duly authorized by the Owner, including modifications and rectification of deficiencies. If the Contractor proposes to perform additional work other than the authorized work, further written approval must be obtained by the Contractor from the Owner prior to proceeding with such additional work.
- .4 Workers employed on the site shall sign a "Daily Register" provided showing "IN" and "OUT" times and number of hours worked on each shift. Times shall be recorded in 24-hour time (i.e. 00:00 to 23:59).

1.6 Working hours

- .1 Carry out Work between the hours of 7:00 a.m. and 3:30 p.m. local time, Monday through Friday except statutory holidays.
- .2 If the Contractor wishes to complete any work outside of these regular hours, obtain permission from the facility operator through the Owner at least forty-eight (48) hours prior.
- .3 The Owner will not be responsible for additional costs associated with working after regular hours unless such after-hours work is ordered by the Owner and not specified as a requirement in the Contract Documents.
- .4 The Owner will not be responsible for additional costs associated with working after regular hours if such after-hours work is required for the Contractor to return to the agreed upon construction schedule.

2 Products – not used

3 Execution – not used

End of section

1.1 General

1.2 Section includes

- .1 Special procedures for progress payments on Region of Durham Tenders.

1.3 Related requirements

- .1 Section 01 33 00 Submittals
- .2 Construction Act

1.4 Construction Act Holdback

- .1 In accordance with the Construction Act, a 10% holdback will be deducted from each progress payment.
- .2 The Owner shall have the right to withhold the 10% Construction Act regular and finishing holdbacks until the Owner is in receipt of the submissions specified in Section 01 33 00, Articles 3.1.1.3 (submissions at Substantial Performance) and 3.1.1.4 (submissions at Completion) as applicable.

1.5 Submission of Proper Invoices for payment

- .1 Applications for payment shall be preceded by a payment review meeting to be held no less than five (5) calendar days before the end of the monthly payment period.
- .2 Email draft invoices to the Consultant and Owner at least one (1) business day prior to the scheduled payment review meeting.
- .3 At the payment review meeting, review with Owner and Consultant the Contractor's draft invoice, status of Change Orders and Change Directives, holdbacks and net amount due for that billing period.
- .4 Consultant and Owner will provide a marked-up copy of the Contractor's draft invoice within five (5) business days of the payment review meeting.
- .5 **Submit Proper Invoice by email to the Consultant and the Owner's Project Manager, Mr. Mark McLester, P.Eng. and Contract Services Coordinator, Ms. Sally Arnott** for processing no earlier than seven (7) calendar days after the end of the billing period. **Do not mail a hardcopy.** Ensure Proper Invoice complies with all requirements detailed in Appendix

B – Supplementary Conditions. Email title shall include “**URGENT – PROGRESS PAYMENT REQUEST for Contract Q-303-2020-A-007**” and be marked as High Priority.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 This Section includes administrative provisions for coordinating construction operations including, but not limited to, the following:
 - .1 General project coordination procedures
 - .2 Administrative and supervisory personnel
- .2 Each Subcontractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to specific Subcontractors by Contractor.

1.2 Administrative requirements

- .1 General Coordination: Coordination that generally applies to all components of the Contract Documents as follows:
 - .1 Subcontractor shall coordinate construction activities as required with Contractor's Schedule to ensure efficient and orderly installation of each part of Work.
 - .2 Subcontractors shall notify Contractor where the Subcontractor's installation of one part of Work is dependent on installation of other components.
 - .3 Schedule and coordinate construction activities of other Subcontractors in sequence required to obtain best results. Where availability of space is limited, Subcontractor shall coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - .4 Subcontractors shall make adequate provisions to accommodate items scheduled for later installation by other Subcontractors, under separate contract or by Contractor's own forces.

1.3 Quality assurance

- .1 Designate an on-site party responsible for instructing workers and overseeing the environmental goals for the project.
- .2 Review environmental procedures and status of Waste Management Plan and Environmental Protection Plan at each construction meeting.

1.4 Existing site conditions

- .1 Existing construction shown has been taken from available information. When specific details are unavailable, assumptions have been made regarding probable construction. Any variance from construction, as shown on the Drawings shall be immediately brought to the attention to the Owner.
- .2 Make careful examination of the site and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken.
- .3 Check all site dimensions prior to fabrication of materials and construction.
- .4 Report any inconsistencies, discrepancies, omissions and errors between site conditions and Contract Documents to the Consultant prior to the commencement of Work.
- .5 Ensure that each Subcontractor performing work related to the site conditions has examined the site so that all are fully informed on anything which may affect their Work thereon in order that construction proceeds competently and expeditiously.

1.5 Coordination

- .1 Cooperate with the Owner's representatives at the Place of the Work to minimize disruptions to the building operation and services.
- .2 Coordinate with the Owner's representative regarding access and use of site.
- .3 Coordinate performance and sequencing of the Work with the Owner.

1.6 Submittals

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

1.7 Dimensions

- .1 Do not scale directly from Drawings. Obtain clarification from the Consultant if there is ambiguity or lack of information.
- .2 Details and measurements of any Work which is to fit or to conform with Work installed shall be taken at the Place of the Work.

- .3 Verify dimensions at the Place of the Work before commencing Shop Drawings or other submittals. Before fabrication commences report discrepancies to the Consultant in writing. Incorporate accepted variances on Shop Drawings and as-built records.
- .4 Verify that the Work is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent Work, as set out in accordance with the requirements of the Contract Documents and ensure that Work installed in error is rectified at Contractor's expense before construction continues.
- .5 Owner will accept no claims for extra expense on the part of the Contractor for non-compliance.

1.8 Supervision of the Work

- .1 Provide all superintendence, labour, equipment, and materials necessary to complete the project in an orderly, competent, and expeditious manner.
- .2 While work is in progress, maintain site superintendence capable of acting competently on site instructions given by the Owner.
- .3 Maintain good order and discipline among workers engaged on the project.

1.9 Maintenance of documents on site

- .1 Maintain at the job site, one copy of each of following:
 - .1 Drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Change Orders and Change Directives
 - .5 Shop Drawings and samples
 - .6 Other modifications to the Contract
 - .7 Site instructions
 - .8 Copy of approved work schedule
 - .9 Copy of manufacturer's installation instructions
 - .10 SDS sheets
 - .11 Contractor's health and safety policy

- .12 Ministry of Labour Notice of Project
- .13 Building permit for sewage disposal system
- .2 Maintain documents in a clean, dry, legible condition and make documents available at all times for inspection by the Owner

1.10 Security and protection of construction site and equipment

- .1 Protect the construction site and equipment from damage. Repair any damage to the construction site or equipment to the satisfaction of the Owner.
- .2 Take precautions to protect the site and equipment until Completion.
- .3 The Owner shall not be responsible for damaged, lost or stolen materials and equipment. Contractor is responsible for all materials and equipment left on site until the work is complete. Provide for proper security or storage of any material or equipment left on site.
- .4 When not at the Place of the Work, ensure that the work area is secured, and that all tools and materials are locked up.

1.11 Existing utilities

- .1 Protect all utilities at the Place of the Work for the duration of the work.
- .2 Maintain all existing services including power and data to the entire building and occupied areas of the suites used by the Region. Any and all shutdowns or disruptions in service are to be approved by the Owner or building Owner.
- .3 Have all utilities located and staked out and provide the Owner with all cable locations supplied by the utilities prior to commencing any excavation or demolition.
- .4 Contact the local municipality, utilities or any other agencies for further information regarding the exact location of all existing utilities, to exercise the necessary care in excavation and demolition operations, and to take such precautions necessary to safeguard the utilities from damage.
- .5 All utilities located within the limits of proposed excavations shall be exposed by hand excavation and carefully supported and protected by the Contractor.

- .6 Removal, relocation, or supporting of existing utilities shall be carried out in consultation with the respective authorities:
 - .1 Bell Canada
 - .2 Hydro One Connections
 - .3 any other utility/contractor as required.
- .7 Be responsible for paying charges by the Utilities or Agencies for locating cables and the Contractor shall pay any charges for repairs and lost revenue if utility equipment, cables, pipes or other assets are damaged and is responsible to make good any ground and surface damages as well.
- .8 Prior to the commencement of demolition, provide a sign-off sheet from the existing water, gas, electrical, telephone, and sewer service providers.
- .9 Verify that services are cut off, capped, diverted and/or removed as required by local regulating authorities. Ensure all services are in the proper state prior to commencing work.
- .10 Ensure all utilities are capped off at the property line and identify the termination locations on reference drawings.
- .11 No claims will be considered which are based on delays or inconvenience resulting from the removal or relocation of services not being completed before the start of this Contract.

1.12 Contact for after-hours or emergency services

- .1 When after-hours work is permitted by the Owner, provide an after-hours phone or pager number to respond to emergencies or requirements that arise when offices are closed.

2 Products – not used

3 Execution

3.1 Coordination

- .1 Coordinate all construction operations to verify efficient and orderly installation of each part of Work.

- .2 Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation with Subcontractors.
- .3 Schedule construction operations in sequence required where installation of one part of Work depends on installation of other components, before or after its own installation.
- .4 Coordinate installation of different components with Subcontractors to verify maximum accessibility for required maintenance, service, and repair.
- .5 Make adequate provisions to accommodate items scheduled for later installation.
- .6 Prepare memoranda where necessary, for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
- .7 Prepare similar memoranda for Owner where coordination of Owner-installed Work is required.
- .8 Ensure all Subcontractors coordinate scheduling and timing of required administrative procedures with other construction activities, and activities of other contractors and Subcontractors, if any, to avoid conflicts and to verify orderly progress of Work.

3.2 General installation provisions

- .1 Ensure that installer of each major component inspects both substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- .2 Comply with manufacturer's installation instructions and recommendations, to extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.
- .3 Inspect Materials immediately upon delivery and again prior to installation. Reject damaged and defective items and arrange for replacement.

- .4 Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- .5 Supervise all Subcontractor work.
- .6 Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect.
- .7 Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.
- .8 Coordinate temporary enclosures with required inspections and tests, to minimize necessity of uncovering completed construction for that purpose.
- .9 Install individual components at standard mounting heights recognized within the industry for the applications indicated where mounting heights are not indicated. Confirm non-standard specified mounting heights with Consultant prior to installation.
- .10 Coordinate construction activities to ensure that no part of Work completed or in progress is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

3.3 Layout of Work

- .1 Be responsible for laying out the work in compliance with the Drawings, Shop Drawings and schedules.
- .2 Rectify all errors resulting from failure to follow or verify Products, Drawings or the proper layout of any element of the installation.

3.4 Protection of existing facility and personnel

- .1 Do not endanger in any way the personnel, equipment, offices and existing structures of the Owner. Exercise caution to keep the existing facilities free from damage due to the Contractor's work. If the measures observed by the Contractor are not considered sufficient, the Owner may order additional precautions to be taken.
- .2 Take all necessary precautions to adequately protect the building and property from damage. Make good all damage at no extra cost.

- .3 Erect suitable safety barriers as required for security and to make the site safe for pedestrians.
- .4 Supply and erect temporary barricades where required.
- .5 Remove the barriers from the site at the completion of the work or when directed by the Owner.
- .6 Adequately protect the Work at all stages and maintain the protection until the Work is completed. Remove and replace any work and materials damaged that cannot be satisfactorily repaired at no extra cost.

3.5 Restoration of disturbed areas

- .1 Fill all holes left from mechanical and electrical services removed or relocated to maintain the required fire separations and to maintain the intended finished appearance of the surface.
- .2 Patch and make good all existing floor, wall and ceiling materials and finishes disturbed by construction work.

3.6 Restoration work for uncovered site hazards

- .1 Make restorations to uncovered or disrupted mechanical or electrical services where such services pose a potential health or safety risk.
- .2 Restorations shall be an extra to the Contract only where such work could not have been reasonably foreseen by examination at the time of bidding in the sole opinion of the Owner.

End of section

1 General

1.1 Section includes

- .1 Pre-construction meeting.
- .2 Regular progress meetings.

1.2 Pre-construction meeting

- .1 Owner will arrange for a pre-construction meeting to discuss and resolve administrative procedures and responsibilities prior to the commencement of the Work. Owner's project team, the Consultant and a representative from the facility user department will participate in the pre-construction meeting.
- .2 Coordinate and organize attendance at the pre-construction meeting by representatives of major Subcontractors and other parties in contract with the Contractor.
- .3 Owner will arrange attendance of other interested parties not responsible to the Contractor.
- .4 Agenda will include, but not be limited to, the following topics as are pertinent to the Contract:
 - .1 Introduction of key personnel participating in the project
 - .2 Project communications procedures
 - .3 Restrictions on working hours, access, movements on site, etc.
 - .4 Reviewing the approved project schedule
 - .5 Contract administration requirements including submittals, payment procedures, and Change Order procedures
 - .6 Identify any product availability problems and substitution requests and procedures
 - .7 Review Consultant's inspection requirements
 - .8 Schedule for project meetings
 - .9 Temporary services to be provided by the Contractor
 - .10 Emergency contact numbers
 - .11 Site-specific safety training
 - .12 Site security requirements

1.3 Progress meetings

- .1 Consultant will schedule and administer project meetings as required throughout progress of Work.
- .2 Consultant will distribute written notice of each progress meeting four (4) days in advance of meeting date to the Owner, the Contractor and other affected parties.
- .3 Consultant will prepare agenda for meetings.
- .4 Agenda will include, but not be limited to, the following topics as are pertinent to the Contract.
 - .1 Review, approval of minutes of previous meeting.
 - .2 Construction safety
 - .3 Coordination
 - .4 Review of Work progress since previous meeting.
 - .5 Field observations, problems, conflicts.
 - .6 Problems which impede construction schedule.
 - .7 Review of off-site fabrication delivery schedules.
 - .8 Revision to construction schedule.
 - .9 Progress schedule, up to next scheduled meeting.
 - .10 Review submittal schedules: expedite as required.
 - .11 Maintenance of quality standards.
 - .12 Review proposed changes for effect on construction schedule and on completion date.
 - .13 Review site safety and security issues.
 - .14 Requests for information/clarification
 - .15 Contemplated changes
 - .16 Other business.
- .5 Inform the Consultant three (3) days in advance of meetings regarding any other items the Contractor wishes to be added to the agenda.
- .6 Ensure key project personnel attend regularly scheduled progress meetings to be held on site at times and dates that are mutually agreed to by the Owner and Contractor.

- .7 Coordinate and organize attendance of individual Subcontractors and material suppliers when requested. Relationships and discussions between Subcontractor participants are not the responsibility of the Consultant and do not form part of the meetings content.
- .8 Ensure that Contractor representatives in attendance at meetings have required authority to commit Contractor to actions agreed upon. Assign same persons to attend such meetings throughout the contract period.
- .9 Consultant will preside at meetings.
- .10 Consultant will record minutes.
- .11 Consultant will reproduce and distribute copies of minutes within three (3) business days after each meeting and transmit to meeting participants and affected parties not in attendance.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Construction schedule.
- .2 Schedule of submittals.

1.2 General requirements

- .1 Be responsible for planning and scheduling of the Work.
- .2 Be responsible for ensuring that Subcontractors plan and schedule their respective portions of the Work within the overall project schedule.

1.3 Construction schedule

- .1 Submit a construction schedule, in PDF format, within thirty (30) calendar days after the date of the Order to Commence Work.
- .2 Consultant will review schedule and return review copy within five (5) Working Days after receipt.
- .3 Revise and resubmit construction schedule within seven (7) calendar days.
- .4 Indicate submittal dates, and all critical Product delivery dates, including those furnished by Owner and required by allowances.
- .5 Include dates for commencement and completion of each major element of the contract including, but not limited to, the following:
 - .1 Submittals.
 - .2 Site preparation.
 - .3 Final completion.
- .6 Submit updated construction schedule with each application for payment and whenever requested by the Consultant, identifying changes since the previous version.
- .7 Construction schedule updates:
 - .1 Indicate projected percentage of completion of each item as of first day of month.
 - .2 Indicate progress of each activity to date of submission schedule.

- .3 Indicate changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised projections of progress and completion.
 - .4 Other identifiable changes.
- .4 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.
 - .2 Corrective action recommended and its effect.
 - .3 Effect of changes on schedules of other prime contractors.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Shop Drawings and Product data.
- .2 Certificates and transcripts.

1.2 Administrative requirements

- .1 Submit to Consultant all submittals listed for review.
- .2 Work affected by a submittal shall not proceed until review is complete.
- .3 Present Shop Drawings, samples and mock-ups in SI (metric) units unless Imperial measurements are used on the Drawings.
- .4 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents.
- .5 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.
- .6 Time required by the Consultant and Owner to review the fourth and subsequent re-submittals to correct errors and address previous comments will be charged back to the Contractor.
- .7 Notify Consultant in writing at time of submission identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Verify field measurements and affected adjacent Work are coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .11 Keep one (1) reviewed copy of each submission on site.

1.3 Shop Drawings, Product data and engineered submissions

- .1 The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures Product data and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, 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 Drawings and Specifications.
- .3 Shop Drawings shall carefully consider architectural intent and shall be coordinated to ensure items to be exposed in finished work are located to provide best aesthetics as directed or required by the Consultant. Show orientation and relationships between materials where deemed necessary by the Consultant.
- .4 Include in every shop drawing submission, a copy of the relevant specification section, with addendum updates included where applicable, and all referenced and applicable sections, with addendum updates included where applicable. Check-mark each paragraph to indicate compliance with the specification or mark otherwise to indicate requested deviations from specified requirements. Check marks denote full compliance with a paragraph in its entirety. If deviations from the specifications are indicated, underline each point of deviation and denote by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance with the specified requirements. Provide in the submittal a detailed, written justification for each deviation.
- .5 Failure to include a copy of the marked-up specification sections, along with justifications for any requested deviations to specified requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

- .6 Submit all Shop Drawings electronically. Each submittal shall be a single PDF file complete with transmittal letter, check marked specifications, and Shop Drawings. The Owner reserves the right to require that a submittal be submitted in hard copy.
- .7 Allow five (5) Working Days for Consultant's review of each submission.
- .8 Adjustments made on Shop Drawings by the Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior, and obtain Consultant's approval prior to proceeding with Work.
- .9 Make changes in Shop Drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.
- .10 Accompany submissions with transmittal letter, containing:
 - .1 Date
 - .2 Make
 - .3 Company
 - .4 Region's project title and tender number.
 - .5 Contractor's name and address.
 - .6 Identification and quantity of each Shop Drawing, Product data and sample.
 - .7 Other pertinent data
- .11 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

- .5 Details of appropriate portions of the Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .12 After Consultant's review, distribute copies.
- .13 Delete information not applicable to project.
- .14 Supplement standard information to provide details applicable to project.
- .15 If upon review by the Consultant, no errors or omissions are discovered or if only minor corrections are made, the electronic shop drawing submission will be stamped "reviewed" or "reviewed as modified" and returned and fabrication and installation of Work may proceed. If Shop Drawings are returned stamped "not reviewed", noted copy will be returned and re-submission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

- .16 The review of Shop Drawings by the Consultant is for sole purpose of ascertaining conformance with general design concept. This review shall not mean that the Consultant approves detail design inherent in Shop Drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in Shop Drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.
- .17 Whenever there is a requirement for the Contractor to submit drawings with the seal of a Professional Engineer, such submissions shall be within the timelines of the project.

2 Products – not used

3 Execution

3.1 Submissions

- .1 Submit the following to the Owner:
 - .1 Upon notification of award of this project, and prior to commencing work:
 - .1 Certificate(s) of Insurance using the Owner's Certificate of Insurance form.
 - .2 Clearance Certificate from Workplace Safety & Insurance Board (WSIB)
 - .2 During Construction
 - .1 Progress Reports
 - .2 Update of any Insurance Certificates about to expire
 - .3 Current valid WSIB Clearance Certificate
 - .4 Shop Drawings, Product data and samples
 - .5 Minutes of Meetings

- .6 Inspection Reports
- .7 Change Orders and Change Directives
- .8 Requests for Information (RFI)
- .9 Updated construction drawings
- .10 Updated construction schedule
- .3 At Substantial Performance, provide originals of:
 - .1 Statutory Declaration
 - .2 Occupancy Permit
 - .3 Substantial Performance Release of Claims Letter
 - .4 Update of any Insurance Certificates about to expire
 - .5 Current Valid WSIB Certificate of Clearance
 - .6 Extended Warranties, if applicable
 - .7 Closeout Submittals. Refer to Section 01 78 00.
- .4 At Completion
 - .1 Approved ESA Electrical Inspection report
 - .2 Update of any Insurance Certificates about to Expire
 - .3 Current Valid WSIB Certificate of Clearance
 - .4 Completion Release of Claims Letter
 - .5 Region of Durham Standard Form for Property Owner's Release of Land used by the Contractor
- .5 At end of Warranty Period
 - .1 Final Release of Claims Letter

End of section

1 General

1.1 Section includes

- .1 Health and safety administrative requirements for contractors performing work for the Region of Durham.

1.2 References

- .1 Province of Ontario website
 - .1 Construction site health and safety during COVID-19
 - .1 <https://www.ontario.ca/page/construction-site-health-and-safety-during-covid-19>
 - .2 Resources to prevent COVID-19 in the workplace
 - .1 <https://www.ontario.ca/page/resources-prevent-covid-19-workplace#construction>
- .2 Canadian Construction Association
 - .1 [COVID-19 - Standardized Protocols for All Canadian Construction Sites](#)

1.3 Health and safety policy

- .1 Obtain copies of all Subcontractors' Health and Safety Policies and Programs prior to such Subcontractor commencing work on the site if and when requested.
- .2 Provide a copy of Contractor's current Health and Safety Policies and Program, to implement that policy prior to the commencement of construction.

1.4 Health and safety legislation and requirements

- .1 Comply with all Federal and Provincial laws relating to Health and Safety including Acts and Regulations as well as Lower Tier Municipality By-Laws.
- .2 Comply with all applicable industry safety standards.

- .3 Comply with 213/91 (Construction Projects) made under the Occupational Health and Safety Act (OHSA) and all amendments thereto. Copies of the Regulations may be obtained from the Ministry of Labour at their Scarborough office, Publications Ontario at 880 Bay Street, Toronto, Ontario M7A 1N8 (Tel. 416-326-5300).
- .4 Comply with legislative requirements for work performed including, but not limited to, qualifications of workers, training, supervision and use of onsite equipment.
- .5 Provide any and all personal protective equipment for Contractor's own workers where prescribed by legislation.

1.5 COVID-19 Health and Safety

- .1 Ensure that all workers comply with the Government of Ontario's guidelines for [Construction Site Health and Safety During COVID-19](#) including but not limited to:
 - .1 washing hands often with soap and water or alcohol-based hand sanitizer
 - .2 sneeze and cough into sleeve
 - .3 avoid touching eyes, nose or mouth
 - .4 avoid contact with people who are sick
 - .5 stay home if you are sick
 - .6 avoid close contact with other people. Close contact includes being within two (2) metres of another person.
- .2 The Contractor shall monitor the latest recommendations from public health officials related to protecting workers from COVID-19 and adjust work procedures and provide personal protective equipment as per those recommendations.
- .3 **All workers attending the Place of the Work shall complete an online COVID-19 pre-screening checklist each day prior to arriving on site. The online pre-screening checklist can be accessed using the following link: this URL:**
[Region of Durham Wellness Screening](#)

- .4 The Contractor is encouraged to follow the latest edition of the Canadian Construction Association's document "[COVID-19 - Standardized Protocols for All Canadian Construction Sites](#)."

1.6 Safety data sheets (SDS)

- .1 Provide to the Consultant a list of Designated Substances that will be brought to the site prior to commencing work. Safety Data Sheets (SDS) and the hazardous material inventory for each substance listed must be kept on the Project.
- .2 Maintain copies of current SDS at the Place of the Work at a location accessible to all workers, the Consultant, and the Owner.

1.7 List of designated substances at the site

- .1 In accordance with the requirements of Section 30(1) of the Occupational Health and Safety Act, the Bidder is hereby advised that the designated substances as listed hereunder are or may be present on the site and within the limits of this Contract:

Designated Substance	Identified on this Site?	Location
Acrylonitrile	No	
Arsenic	No	
Asbestos	Yes	See Survey
Benzene	No	
Coke Oven Emissions	No	
Ethylene Oxide	No	
Isocyanate	No	
Lead	No	
Mercury	No	
Silica	No	
Vinyl Chloride	No	

- .2 Comply with the governing Ministry of Labour regulations respecting protection of workers, removal, handling and disposition of any Designated Substances encountered in carrying out the Work proposed on this contract.
- .3 Comply with the governing environmental and disposal regulations respecting handling and disposition of designated substances.
- .4 Should a Designated Substance not herein identified be encountered, immediately notify the Consultant and the Owner of the Contractor's findings. Management of such substance shall be treated as extra work.

1.8 Health and safety warnings

- .1 The Consultant and the Owner shall have the right to document all Contractors for all health and safety warnings and/or to stop any Contractor's work if the Contractor fails to comply with any requirements under this Section.
- .2 Similarly, the Consultant and the Owner shall have the right to issue warnings and/or to stop work for any Contractor violations of the contract including Regional health and safety policy and programs and/or if the Contractor creates a health or safety hazard.
- .3 Written warnings and/or stop work orders shall be given to the Contractor using the Owner's Contractor Health and Safety Warning / Stop Work Order Form.
- .4 If the Contractor fails to adequately respond to the Consultant's or the Owner's order to correct a hazard, the Owner reserves the right to have the hazard corrected by a third party at the Contractor's expense. The Consultant's or the Owner's decision, as the case may be, as to the urgency for such correction shall be final.

1.9 Notice of project

- .1 Notify all regulatory bodies required for construction activities, (i.e., Notice of Project, employer notification, etc.). Notifications shall include, but not be limited to, the notification requirements laid out in OHSA Sec 51-53 and the requirements of Ontario Regulation 213/91 for Construction Projects, Sections 5, 6 and 7. For the purpose of this contract the Contractor shall be the "Constructor".

1.10 Fire safety requirements

- .1 Protect persons and properties.
- .2 Maintain operable fire protection equipment.
- .3 Maintain fire fighters' access.
- .4 Provide temporary fire extinguishing equipment.
- .5 Maintain existing and temporary fire exit.
- .6 Where the work requires the Contractor to shut down fire and life safety systems, provide a fire watch for the duration of the shutdown.
- .7 In occupied buildings, schedule the use of flame, such as torches and volatile substances well in advance with the approval of the Owner and the Consultant.
- .8 Maintain a fire watch after all welding operations for a period of not less than seven (7) hours.

2 Products – not used

3 Execution

End of section

1 General

1.1 Section includes

- .1 Laws, notices, permits and fees.
- .2 Discovery of hazardous materials.
- .3 Codes and standards.
- .4 Regulations.
- .5 Permits.

1.2 Laws, notices, permits and fees

- .1 The laws of the Place of the Work shall govern the Work.
- .2 The Contractor shall be responsible for obtaining all permits (including Building Permit for Sewage Disposal System from the Durham Region Health Department), licenses and certificates necessary for the performance of the Work which were in force at the date of executing the Agreement.
- .3 Provide the required notices and comply with the laws, ordinances, rules, regulations or codes which are or become in force during the performance of the Work and which relate to the Work, to the preservation of the public health and to construction safety.
- .4 Construction of the Work is subject to the approval, inspection, by-laws, and regulations of municipal, provincial and federal authorities and organizations concerned with roads, streets, railways, telephones, electrical supplies, gas supplies and other public services having jurisdiction in respect to any matter in the Contract.
- .5 If the Contractor knowingly performs or allows work to be performed that is contrary to any laws, ordinances, rules, regulations or codes, the Contractor shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations or codes.
- .6 Determine detailed requirements of authorities having jurisdiction.

- .7 Pay all fees associated with applications, permits and inspections required by authorities having jurisdiction.
- .8 Pay construction damage deposits levied by municipality in connection with the issuance of a building permit.
- .9 Keep a copy of all permits on site.

1.3 Hazardous material discovery

- .1 Asbestos: If material resembling asbestos is encountered which has not been identified in the Contract Documents, immediately stop work and notify the Consultant.

1.4 Codes and standards

- .1 Perform the Work in accordance with the requirements of the latest editions of the following statutes and codes in force at the time of the Agreement:
 - .1 Ontario Building Code
 - .2 Municipal by-laws
 - .3 Electrical Safety Authority
 - .4 Ontario Electrical Safety Code
 - .5 Ontario Construction Safety Act
 - .6 WHIMS
- .2 Comply with any applicable revisions to codes and regulations after the date of the agreement. Costs of such revisions shall be compensated for through a Change Order.
- .3 Review Contract Drawings and Specifications for any conflicts with the above regulations and where there are apparent discrepancies, notify the Owner in writing and obtain clarification before proceeding with the Work.

1.5 Precedence of standards

- .1 Where applicable, ensure that all materials and equipment conform to the applicable standards listed.
- .2 Canadian standards take precedence over American standards in the case of duplication or conflict.

1.6 Permits

- .1 Obtain all necessary permits and approvals required for this project.
- .1 Provide a copy of all permits to the Consultant immediately upon receipt.
- .2 Keep a copy of all permits on site.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

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

1.2 Reference standards

- .1 ISO/IEC 17025-2005 - General Requirements for the Competence of Testing and Calibration Laboratories.
- .2 SCC (Standards Council of Canada).
- .3 Electrical tests and inspections will comply with NETA, International Electrical Testing Association.

1.3 Review by Consultant

- .1 Consultant may order any part of the Work to be reviewed or inspected if Work is suspected to be not in accordance with Contract Documents.
- .2 If, upon review such work is found not in accordance with Contract Documents, correct such Work and pay cost of additional review and correction.
- .3 If such Work is found in accordance with Contract Documents, Owner will pay cost of review and replacement.

1.4 Quality of Products and materials

- .1 All materials, fixtures, fittings, appliances and apparatus supplied and installed by the Contractor shall be new, the best of their kind for the application and free from any defects.

1.5 Quality control inspection and testing

- .1 At reasonable times and giving reasonable notice of at least twenty-four (24) hours, the Owner may inspect the work site and/or those areas of the Contractor's place of business that are related to the performance of the Contract. If the Owner requires an inspection, the Contractor must provide reasonable assistance and arrangements for the inspection to take place.

- .2 Where required by the Consultant, the Contractor shall supply certified copies of all tests upon, all materials to be used in the construction of the works, indicating that materials comply with the Specifications. Such tests shall be made by a testing company which has been approved by the Consultant and shall be at the Contractor's expense.
- .3 Any and all materials or manufactured products, including pipe, may be tested by the Owner. The Contractor shall, at their own expense, supply samples for quality assurance (QA) testing as directed of any and all materials or manufactured products which he is using or proposes to use in the work, and he shall not be entitled to any extra remuneration nor any extension of the time allowed to complete the work, as a result of any delays which may be caused or occasioned as a result of compliance with these Specifications.
- .4 Materials whose test specimens fail to meet specified requirements and those materials which are rejected upon inspection shall not be permitted to remain on the site of the work and shall be immediately removed from the site of the work by the Contractor at their own expense.
- .5 In addition to the above items, the Contractor shall arrange and pay for the following:
 - .1 Inspection and testing required by law, ordinances, rules, regulations or Authorities having jurisdiction.
 - .2 Inspection and testing performed exclusively for the Contractor's convenience.
 - .3 Tests specified to be carried out by the Contractor under the supervision of the Consultant.

1.6 Receipt and acceptance of materials

- .1 During the process of unloading any equipment and materials, inspect equipment and materials in the presence of the Consultant for loss or damage in transit. Notify the agent of the carrier of any loss or damage to the shipment.

- .2 All equipment and materials supplied by the Contractor and found faulty or defective upon delivery will be rejected by the Consultant and shall be replaced by the Contractor at their own expense, but failure to discover same shall not relieve the Contractor of responsibility for removing all faulty materials supplied by him and replacing same with good materials which he shall supply all at his own cost and expense.
- .3 The unloading of all equipment shall be carefully performed in an approved manner to avoid damage to such equipment. Ample facilities shall be provided by the Contractor for handling the equipment.

1.7 Metric vs. Imperial equipment

- .1 Notwithstanding the requirements set out in the preceding paragraphs, because not all trades have adopted metric material or in cases of adapting to existing, where metric and Imperial types of equipment are to be installed under the same contract, the Contractor shall ensure that mating of metric and non-metric equipment is possible.
- .2 Supply shop drawings of proposed transition couplings, etc., to the Consultant prior to assembly. The supply and installation of such couplings, adapters, etc., shall be at no additional cost to the Owner.

1.8 Quality assurance testing by the Owner

- .1 The Owner may request any required samples at any reasonable time.
- .2 The Owner will perform quality assurance testing using its own forces which are CSA certified. Alternatively, the Owner may appoint a CSA-certified agency to conduct quality assurance testing on its behalf. Quality assurance testing will be at a frequency determined by the Owner.
- .3 All costs of quality assurance testing, except as noted otherwise, shall be borne by the Owner.
- .4 The Contractor may request that the Owner's, or their agent's, quality assurance equipment be tested for CSA compliance. All costs for such tests shall be at the Contractor's expense where such equipment is found to be in compliance.

- .5 Provide clear access to work areas to be inspected and assist as required by providing safety equipment, ladders, materials, etc., for these inspections, including but not necessarily limited to, welding x-ray inspections, concrete testing, painting inspections and compaction tests.
- .6 Additional testing required to prove the adequacy of construction shall be at the Contractor's expense, where the routine test shows the construction to be inadequate, or where the Contractor's materials and procedures have not been as specified, or when work has proceeded without approval or inspection.
- .7 Where the Owner's quality assurance testing differs from the Contractor's quality control results, the Owner's results shall govern and all additional quality assurance testing shall be billed to the Contractor at a rate of not less than \$250 per re-test except where such re-tests are carried out by the Owner's agency in which case such re-tests shall be billed at a rate of 110% of the invoiced amount.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Storage of Products and materials.
- .2 Temporary sanitary facilities Owner and Consultant.
- .3 Temporary sanitary facilities and shelter for Contractor's workers.
- .4 First aid
- .5 Security of construction site

2 Products

3 Execution

3.1 General

- .1 Facility operations take priority over Contractor operations. When Contractor operations necessarily impact facility operations and use, review impacts with the Consultant, the Owner and the facility operator and provide temporary facilities to the satisfaction of the Consultant.
- .2 All schedules must indicate contingency and alternate date and times in the event of postponement for any reason, or breakdown of temporary by-pass equipment during the shutdown.
- .3 Comply with local Police, Fire Department and Paramedic requirements regarding notification of all interested parties concerning the construction work and provisions for traffic movement.

3.2 Storage of Products, materials and equipment

- .1 Storage areas are designated by the Owner.
- .2 Store materials to ensure the preservation of their quality and fitness for the work. Store materials on wooden platforms or other hard, clean surface off the ground. Locate stored materials to facilitate prompt inspection.

- .3 Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
- .4 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 the work.
- .5 Store products subject to damage from weather in weatherproof enclosures.
- .6 Store cementitious products clear of earth or concrete floors, and away from walls.
- .7 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .8 Store sheet materials, lumber, etc. on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .9 Remove and replace damaged products to the satisfaction of the Consultant.
- .10 Do not use private property for storage purposes without the written permission of the property owner. Pay rental charges and damages associated with occupying private lands.

3.3 Temporary sanitary facilities for Owner and Consultant

- .1 Provide suitable sanitary facilities for Owner and Consultant in accordance with governing regulations and ordinances. Such facilities shall be for the exclusive use of the Owner and Consultant; Contractor's workers shall use separate facilities in accordance with 3.4 below.
- .2 Keep sanitary facilities clean, properly maintained and fully stocked with the necessary supplies at all times.
- .3 Install and confirm operation of temporary sanitary facilities prior to decommissioning existing sewage holding tank. Leave temporary sanitary facilities in place and fully operational until Substantial Performance.

3.4 Temporary shelter and sanitary facilities for Contractor's workers

- .1 Provide suitable sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Keep sanitary facilities clean, properly maintained and fully stocked with the necessary supplies at all times.
- .3 Provide and maintain drinking water and washing facilities in accordance with governing regulations and ordinances.
- .4 Post notices and take such precautions as required by local health authorities.
- .5 Periodically remove wastes from Site.
- .6 Existing permanent facilities may not be used.
- .7 Provide shelter for workers.

3.5 Location of temporary facilities

- .1 Coordinate the location of temporary facilities with the Owner.

3.6 Installation and removal of temporary facilities

- .1 Provide temporary facilities and controls to execute the work expeditiously.
- .2 Remove temporary facilities and controls at the conclusion of the Work, unless otherwise directed by Consultant.
- .3 Site to be left in tidy and clean condition after removal of all temporary facilities.

3.7 Temporary first aid facilities

- .1 Provide and maintain the necessary first aid items and equipment as required.
- .2 Designate employees who are properly instructed to be in charge of first aid. Ensure that at least one such employee is always available on the site while work is being conducted.

3.8 Drainage ditches and storm sewers

- .1 All ditches, drainage channels and/or storm sewer systems, which may be affected by construction shall have their flows maintained at all times during construction, unless permission to the contrary has been obtained from the Consultant. No extra cost shall be incurred by the Owner for this work.
- .2 Make allowance in prices for any problems that may be encountered because of ditch flows or storm sewer flows. Drainage shall not be impeded, nor shall blockages or water backups be permitted. Any damage because of water or flooding shall be the responsibility of the Contractor.

3.9 Security for construction site

- .1 Be responsible for the security of construction site materials, tools, equipment, temporary facilities and storage and all construction.

3.10 Removal and restoration of temporary facilities and controls

- .1 Remove temporary facilities and controls from the site on completion of the works, or as otherwise ordered in writing by the Consultant. Unless specifically stated otherwise in the Contract Documents, maintain ownership over the temporary facilities including furnishings.
- .2 As each portion of the work is completed, as determined by the Consultant, restore disturbed areas, roadways, fences, building, etc. equal to or better than the initial condition and clean up the construction area as instructed by the Consultant.
- .3 Leave clean and in good order, roads, parking areas, walks, grassed areas and other areas disturbed by the construction and Contractor's activities. Failure to make satisfactory progress in the execution of this work within 48 hours of receipt of written notice from the Consultant may result in the Consultant having the surplus material removed, or re-grading any area or performing any work necessary to leave the site in a satisfactory condition and having the costs deducted from payments due under the Contract.

End of section

1 General

1.1 Section includes

- .1 Temporary utilities.

1.2 Temporary utilities

- .1 Make arrangements for the supply of water, electrical power, gas, sanitary facilities, heat, and any other temporary services as may be required during construction.
- .2 Be responsible for all fees, permits and charges, including arrangements for all necessary applications, incurred throughout the construction period until the date of Substantial Performance.
- .3 Provide power generators as required to maintain construction activities and all temporary facilities at no extra cost to the Owner.
- .4 Permanent utilities installed as part of the Work may not be used for construction requirements.
- .5 Operate equipment according to the requirements of the Ontario Ministry of Labour under the Occupational Health and Safety Act and Regulations for Construction Projects.

1.3 Installation and removal

- .1 Provide temporary utilities and controls to execute work expeditiously.
- .2 Salvage and assist in recycling products for potential reuse.
- .3 Remove from site all such work after use.

1.4 Temporary water supply

- .1 Provide all water required for construction activities and Contractor's workers at Contractor's expense. Existing water service may not be used.
- .2 Supply all hoses and water containers as may be required.
- .3 Use of hydrants or fire hoses is not permitted without written consent from the Owner.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Protection of surrounding Work.

1.2 Installation and removal

- .1 Provide temporary controls to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 Protection of surrounding work

- .1 Provide protection for finished and partially finished Work from damage.
- .2 Provide necessary cover and protection.
- .3 Be responsible for damage incurred due to lack of or improper or inappropriate protection.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Access to site.
- .2 Temporary parking.
- .3 Fire routes.

1.2 Access to site

- .1 Do not obstruct entrances, stairs or fire exits.
- .2 Provide for mud and snow removal and dust suppression, as required during the construction period.
- .3 Maintain vehicular access to all properties within and adjacent to the Place of the Work at all times except when Contractor's operations reasonably necessitate a temporary restriction. Such restrictions shall be kept to a minimum and shall be coordinated with the affected property owner or occupant.
- .4 All traffic arrangements shall be subject to the approval of the Consultant and the authority having jurisdiction.
- .5 Plan and schedule the routes of vehicles transporting all materials to, from or within the Place of the Work, so that vehicular movements are accomplished with minimum interference and interruptions to traffic.
- .6 The Owner reserves the right to alter or reject proposed delivery and trucking routes as considered necessary. The Contractor shall notify suppliers of materials and equipment of the above requirements.

1.3 Parking for construction personnel

- .1 Parking for Contractor's, Subcontractors, suppliers and/or their employee's vehicles shall be limited to restricted area as designated by the Owner.
- .2 Parking for will be permitted on site provided it does not disrupt performance of Work and continuing operation of the facility.
- .3 The Owner and their employees will not be responsible for parking fines incurred by the Contractor, Subcontractors, suppliers and/or their employees.

- .4 Provide and maintain adequate access to project site.

1.4 Fire routes

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

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section Includes

- .1 Product options.
- .2 Procedures for substitution requests submitted after award of the Contract.

1.2 General Product requirements

- .1 All Products and materials supplied shall have a low V.O.C. rating.

1.3 Specified product options

- .1 Performance or prescriptive standards:
 - .1 Select any product, assembly or component material that meets or exceeds the specified standards for products specified only by referenced standards and performance criteria.
- .2 Acceptable products:
 - .1 Products specified by component material name, manufacturer, catalogue number, model number, or similar reference establishing the standard of acceptance that the Consultant will consider appropriate for the Work. Select any named Product, assembly or component material contained in the listing of Acceptable Products.
- .3 Acceptable manufacturers:
 - .1 Select any product, assembly or component material manufactured by the listed Manufacturers that meets or exceeds the specified standards and performance criteria.
 - .2 Submit required Shop Drawing and Product data submissions before starting any work of the relevant Specification Section for review by Consultant.

1.4 Product substitutions

- .1 Owner is under no obligation to accept proposed substitute Products unless the Contractor can provide evidence satisfactory to the Consultant that such proposed substitute Product meets or exceeds the specified performance and other criteria.

1.5 Incorporation of specified Products

- .1 Coordinate the installation of the selected Products into the Work:
 - .1 Make any changes in the Work as may be required to accommodate the selected Products.
 - .2 Notify Consultant where a selected Product is inconsistent with the layouts and configurations indicated on Drawings and Schedules.
 - .3 Bear costs and waive claims for additional compensation for costs that are implicit in the use of the selected Products.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Product delivery requirements and conditions.

1.2 Delivery requirements and conditions

- .1 Fully indemnify the Owner for all damages to persons or property resulting from the services and operations performed by employees of the Contractor and all Subcontractors and suppliers, and all contracted agents or carriers, including the delivery and unloading of goods or equipment at (and transfer and unloading of bulk chemicals or fuels to) Regional facilities.
- .2 Employ delivery vehicles that are suitably licensed, insured, operated and maintained in accordance with the Contract requirements, the Contractor's (and its agent's or carrier's) applicable policies and procedures, and all applicable federal, provincial and municipal legislation, statutes and by-laws.
- .3 Ensure that the Contractor's forces receive and sign off on all deliveries and shipments required for the Work. The Owner will not be responsible for the sign off on any deliveries for the Contractor.
- .4 Equip all delivery vehicles with any other material handling equipment required for the delivery person to safely unload the shipment at the receiving location(s) at the Place of the Work and move the Products to the designated receiving area(s) identified in the Contract.
- .5 Equip delivery vehicles, where required, with a hydraulic tailgate for unloading heavy equipment, packages, drums, pallets and similar large, heavy items at receiving locations which are not equipped with a truck loading dock.

2 Products – not used

3 Execution – not used

End of section

1 General

1.1 Section includes

- .1 Progressive cleaning.
- .2 Cleaning prior to application for Substantial Performance.
- .3 Cleaning prior to Completion.

2 Products

2.1 Cleaning materials

- .1 Cleaning agents and materials: Low VOC content.

3 Execution

3.1 Progressive cleaning

- .1 Maintain site in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other contractors.
- .2 Remove waste materials from site or dispose of waste materials as directed by Consultant. Do not burn waste materials on site.
- .3 Clear snow and ice from area of construction, bank or pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Remove waste material and debris from site, or deposit in waste container(s), at end of each working day.
- .6 Waste containers, if allowed:
 - .1 Provide on-site steel framed, hinged lid containers for collection of waste materials and debris.
 - .2 Provide and use clearly marked, separate bins for recycling.
 - .3 Place waste containers in an area directed by the Owner. Pay for all associated costs and permits. Do not locate bins on a structural slab.

- .4 Remove and replace waste containers promptly when full and upon completion of the work.
- .7 Storage of waste material and debris outside of the waste containers is not permitted.
- .8 Clean interior areas at the end of each work day and keep interior walkways clear for Owner's staff to continue normal operation of the well house.
- .9 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of enclosure ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .13 Collect and separate recyclable materials in accordance with Region of Durham sorting requirements and transport to a Regional recycling location.
- .14 Divert unused aggregate materials from landfill to facility for reuse as approved by Consultant and Owner.
- .15 Dispose of unused paint and paint thinner materials at official hazardous material collections site as approved by Consultant and Owner. Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.
- .16 Divert unused asphalt from landfill to facility capable of recycling materials.

3.2 Cleaning prior to application for Substantial Performance

- .1 Prior to applying for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

- .2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Remove stains, spots, marks and dirt from electrical fixtures.
- .8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .9 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .10 Remove dirt and other disfiguration from exterior surfaces.
- .11 Sweep and wash clean paved areas.
- .12 Remove snow and ice from access to facilities.

3.3 Cleaning prior to Completion

- .1 Execute final cleaning prior to Completion acceptance review.
- .2 Clean site; sweep paved areas, rake clean landscaped surfaces.
- .3 Remove waste and surplus materials, rubbish, and construction facilities from the site.

End of section

1 General

1.1 Section includes

- .1 Inspections and declarations.
- .2 Spare parts, maintenance materials and special tools.
- .3 Operation and maintenance manual
- .4 Recording actual site conditions.
- .5 Record (as-built) documents and samples.
- .6 Record documents.
- .7 Final survey.
- .8 Extended Warranties.

1.2 Inspections and declarations

- .1 **Contractor's inspection:** Contractor and all Subcontractors shall conduct an inspection of the Work, identify deficiencies and defects, issue list of deficiencies and repair as required to conform to the Contract Documents.
- .2 Notify the Consultant in writing of satisfactory completion of the Contractor's Inspection and that corrections have been made.
- .3 Request the Consultant's Inspection.
- .4 **Consultant's inspection:** Consultant and Contractor will perform an inspection of the Work to identify obvious defects or deficiencies. Consultant will generate a list of deficiencies. Correct defective and deficient Work accordingly.
- .5 Consultant will identify in inspection report all items deemed to affect issuance of Substantial Performance.
- .6 **Substantial Performance:** Contractor shall submit a written certificate that the following has been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.

- .3 Certificates required by authorities having jurisdiction have been submitted.
- .4 All required documentation has been submitted.
- .5 Work is complete and ready for Substantial Performance Inspection.
- .7 **Substantial Performance inspection:** When items noted in 1.3.6 above are completed, request Substantial Performance Inspection of the Work by the Consultant and the Owner. If Work is deemed incomplete by Consultant or Owner, complete all such outstanding items and request re-inspection.
- .8 **Declaration of Substantial Performance:** When the Owner considers deficiencies and defects have been corrected and it appears requirements of the Construction Act with respect to Substantial Performance, as amended by the Supplementary Conditions, have been met, make application for Substantial Performance of the Work.
- .9 **Commencement of warranty period:** The date of Substantial Performance of the Work, as certified by the Owner, shall be the date for commencement of the warranty period.
- .10 **Commencement of lien period:** The date of publication of the certificate of Substantial Performance of the Work shall be the date for commencement of the lien period.
- .11 **Release of basic (statutory) holdback:** After issuance of certificate of Substantial Performance of the Work, submit an application for payment of the basic holdback retained by the Owner under the Construction Act.
- .12 **Payment of finishing holdback:** After issuance of Certificate of Completion, submit an application for payment of finishing holdback retained by the Owner under the Construction Act.
- .13 **Final inspection:** Consultant and Owner will conduct a Final Inspection within three (3) months of the end of the warranty period. If deficient or defective Work is identified by Owner, correct deficient or defective Work and request re-inspection.

- .14 **Final payment:** When the Owner considers that all deficiencies and defects have been corrected and it appears all Contractor obligations under the Contract have been fulfilled, the Owner will issue a Final Acceptance Certificate and issue final payment.

1.3 Operation and maintenance manual

- .1 Prepare an operation and maintenance manual during the course of construction for all equipment installed.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described Products and systems.
- .3 At least two (2) weeks prior to Substantial Performance of the Work, submit to the Consultant, one (1) electronic copy in PDF format of the draft Operation and Maintenance Manual in Canadian English.
- .4 Operation and Maintenance Manual shall include copies of the manufacturer's Product data sheets and operating and maintenance manuals for all equipment installed. PDF file shall not have any security protection applied (i.e. no passwords).
- .5 Consultant will return a copy after the Substantial Performance inspection with Consultant's and Owner's comments.
- .6 Revise content of documents of the Operation and Maintenance Manual as required prior to final submittal.
- .7 Provide **a single PDF file** of the complete, final Operation and Maintenance Manual after acceptance by the Owner. The PDF file shall not have any security protection applied (i.e. no passwords).
- .8 **Substantial Performance will not be granted until an acceptable Operation and Maintenance Manual has been submitted.**

1.4 Operation and maintenance manual format

- .1 Electronic files:
 - .1 Single file in PDF format.
 - .2 Organize data in the form of an instructional manual.
 - .3 Arrange content by systems under Section numbers and sequence of Table of Contents.

- .4 Text: Manufacturer's printed data, or typewritten data.
- .5 Drawings: As-Built.
- .6 Use PDFs from original electronic files, combined into a single file.
Avoid scanning hard copy documents to PDF files.

1.5 Operation and maintenance manual contents

- .1 Each volume of the operation and maintenance manual shall include each item specified in this article.
- .2 Provide table of contents including:
 - .1 Title of project.
 - .2 Date of submission.
 - .3 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .4 Schedule of products and systems, indexed to content of volume.
 - .5 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data
 - .1 Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.
- .4 Drawings
 - .1 Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Certificates of Acceptance
 - .1 Provide relevant certificates issued by Authorities Having Jurisdiction, including Durham Region Health Department and Electrical Safety Authority.

1.6 Recording actual site conditions

- .1 Record information on set of black line drawings, and within the project manual, provided by Owner.
- .2 Annotate with red coloured felt tip marking pen, for recording changed information. As requested by the Consultant, use multiple colored marking pens to differentiate between systems.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is accurately recorded.
- .4 Drawings and Shop Drawings
 - .1 Legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications
 - .1 Legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents
 - .1 Maintain inspection certifications required by individual specifications sections.

1.7 As-built documents and samples

- .1 In addition to requirements in Section 01 31 00, maintain at the site one record copy of:
 - .1 Reviewed shop drawings, product data, and samples.
 - .2 Field test records.
 - .3 Inspection certificates.
 - .4 Manufacturer's certificates.
- .2 Store as-built documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label as-built documents and file in accordance with technical specification section number. Label each document "As-Built Documents" in neat, large, printed letters.
- .4 Maintain as-built documents in clean, dry and legible condition. Do not use as-built documents for construction purposes.
- .5 Keep as-built documents and samples available for inspection by Consultant.
- .6 Prior to Substantial Performance of the Work, provide final draft redline mark-up As-Built Drawings to Consultant with as-built dimensions and spatial arrangements.
- .7 Consultant will review the As-Built Drawings and provide comments to the Contractor with a copy to the Owner.
- .8 Revise As-Built Drawings taking the comments from the Consultant into account.
- .9 Submit final As-Built Drawings to the Consultant prior to requesting Substantial Performance.
- .10 **Substantial Performance will not be granted until final, acceptable As-Built Drawings have been submitted.**

2 Products

2.1 Materials and finishes

- .1 Building Products, Applied Materials, and Finishes: Provide product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
- .2 Provide instructions for cleaning agents and methods; precautions against detrimental agents and methods; and recommended schedule for cleaning and maintenance.
- .3 Moisture-Protection and Weather-Exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Building Envelope: Include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .5 Additional Requirements: as specified in individual specifications sections.

3 Execution

3.1 Deliver to site

- .1 Deliver spare parts, maintenance materials, and special tools to location as directed; place and store.

3.2 Storage, handling and protection

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

End of section

1 General

1.1 Summary

- .1 This Section specifies the requirements for the supply of all labour, materials and equipment to complete the partial demolition and removal work as indicated on the Contract Drawings, as specified herein, and as required in order to complete the Work.

1.2 References

- .1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

1.3 Submittals

- .1 Submit for review plan showing impacts, interruptions and delays to Owner's operations.
- .2 Submit removal procedures and equipment list required for the partial demolition work.
- .3 Submit hoarding/dust protection plans and drawing for the Contract Administrator's review.

1.4 Site Conditions

- .1 Interruptions to operation of storage facility patron will not be permitted.
- .2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and site access and egress.
- .3 Take over structures to be partially demolished based on condition on date that Tenders close.

2 Products – Not used

3 Execution

3.1 General

- .1 Products/debris generated during partial demolition become Contractor's property. Remove Products from Site daily, unless such Products are otherwise specified or shown on Contract Drawings to be reused or turned over to Owner's Representative.
- .2 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.
- .3 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Owner's Representative. Be responsible for all costs of loading and off-loading, and for transportation to the storage area. Perform Work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Owner's Representative. Owner's Representative will determine extent of damage and accept or refuse Products.
- .4 For items to be removed and stored or reused, refer to Drawings.
- .5 Clean up rubble and debris, resulting from Work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.

3.2 Examination

- .1 Examine adjacent structures and other installations prior to commencement of demolition and removals Work.

3.3 Protection

- .1 Prevent movement of, or damage to, adjacent services and all Region of Durham property not included in the Contract. Make good damage caused by partial demolition to acceptance of Owner's Representative.

- .2 Protect adjacent structures and property against damage which might occur from removal debris or other causes. Repair or replace damage caused from Work of this Section to acceptance of Owner's Representative.
- .3 Do not interfere with use of adjacent areas and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.
- .4 Take precautions to support affected structures. If safety of structure being partially demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Owner's Representative. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.
- .5 Prevent debris from blocking surface drainage system which are required to remain in operation.
- .6 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.
- .7 Supply and install adequate protection for materials to be re-used. Set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.
- .8 Close off access to areas where demolition is proceeding.
- .9 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.

3.4 Selective Demolition

- .1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.
- .2 Perform Work and prevent inconvenience to persons outside those parts which are to be demolished.
- .3 Carry out partial demolition/concrete removal in accordance with the requirements of CSA S350-M.

- .4 Partially demolish structures as indicated on Contract Drawings.
- .5 Do not sell or burn materials on Site.
- .6 At end of day's Work, leave Work in safe condition with no part in danger of toppling or falling.

3.5 Partial Depth Concrete Removal

- .1 Vertical surface removal shall include the removal of all delaminated and spalled concrete from the vertical surfaces of the walls as designated by the Contract Administrator.
- .2 Chipping hammers, nominal 7 kg class shall be used for the removal of concrete within the remaining 150 mm of the limits of removal, and behind and within 25 mm of reinforcing steel that is to remain in place.
- .3 The perimeters of the areas to be repaired or modified shall be sawcut to give a neat edge of 25 mm depth or to the first layer of rebar, whichever is less.
- .4 Where the bond between concrete and reinforcing steel is broken, or where more than half of the perimeter of the bar is exposed, the concrete surrounding the bars shall be removed to a depth of 25 mm below the bar.
- .5 In areas of concrete removal, where bars are completely exposed or do not have enough cover, bars shall be retied at each intersection point and painted with two coats of zinc rich paint. In areas of concrete removals where the cover to the bars is lost, the new concrete patch shall restore the concrete cover to its original thickness.
- .6 Chipping shall extend along all reinforcing bars to the point where the exposed bars are free from heavy rust. Concrete at edges of spalls shall then be sounded by the Contract Administrator for local delamination before chipping is completed.
- .7 Extreme care must be taken not to overbreak the concrete beyond the limits of removal. Any overbreak shall be made good by the Contractor at his own expense, to the satisfaction of the Contract Administrator.

- .8 Not more than 24 hours before placement of the repair concrete, the repair area shall be abrasive blast cleaned including any reinforcing steel that is uncovered, until the area is free of loose concrete, dirt and/or corrosion deposits. The sandblasting shall remove all scale and corrosion deposits from the exposed reinforcing steel. "Low free silica" sand shall be used for sandblasting.
- .9 There will be no separate payment for loading, hauling and disposal of removed concrete and debris, all of which are deemed to be included in the work.
- .10 Measurement for the removal of deteriorated concrete will be in cubic metres of concrete removed as measured on site by the Contract Administrator. In the case when vertical and horizontal removals or vertical and overhead removals overlapped at the same location, the overlapped volume shall only be included once, and shall be measured as follows:
 - .1 Overlaps in horizontal and vertical removals shall be measured as horizontal removal.
 - .2 Overlaps in vertical and overhead removals shall be measured as vertical removal.
- .11 Payment for concrete removal under these items at the unit price bid for each item shall be payment in full for all labour, equipment and materials necessary to complete the work.

3.6 Restoration

- .1 Where demolition removed a structure or installation, restore area as shown on the Drawings.

End of section

1 General

1.1 Summary

- .1 This Section specifies the requirements for the supply of all labour, materials and equipment to complete the concrete Work as indicated on the Contract Drawings, as specified herein, and as required in order to complete the Work.
- .2 Comply with the requirements of CSA 23.1 and CSA 23.2 except where noted otherwise in the Contract Documents. Do not use materials that are toxic in their installed condition.

1.1 Measurement and Payment

- .1 Concrete removal and replacement work shall be measured and pay for as indicated in the bid form.

1.2 References

- .1 Canadian Standards Association (CSA)
 - .1 CSA A23.1 04, Concrete Materials and Methods of Concrete Construction.
 - .2 CSA A23.2 04, Methods of Test for Concrete.
 - .3 CSA A3001 -03 Cementitious Materials for Use in Concrete
 - .4 CSA A3002 -03 Masonry and Mortar Cement

1.3 Performance Requirements

- .1 28 Day Compressive strength.
- .2 35 Mpa for structural concrete.
- .3 Low Shrinkage concrete with 28 Days of drying not greater than 0.04% for concrete made with 40 mm aggregate and 0.055% for concrete made with 20 mm aggregate when tested in accordance with modified ASTM C157 as accepted by the Ready Mix Concrete Association of Ontario.
- .4 Normal density concrete unless specified otherwise in the Contract Documents.
- .5 Bond strength of 1.2 MPa for toppings or concrete benching.

- .6 Construction tolerances: Comply with Clause 6.4 of CSA A23.1- 4 unless noted otherwise in the Contract Documents.

1.4 Submittals

- .1 A minimum of 15 Working Days prior to commencing the Work, inform the Consultant of the proposed source of aggregates and provide access for sampling.
- .2 Concrete mix design for concrete horizontal surface repairs, vertical repairs, and soffit/overhead repairs.

1.5 Certificates

- .1 A minimum of 15 Working Days prior to starting any concrete Work, submit, to the Consultant, the manufacturer's test data and certification by a qualified independent inspection and testing laboratory acceptable to the Region, that the following materials will meet the specified requirements:
 - .1 Portland cement.
 - .2 Blended hydraulic cement.
 - .3 Grout
 - .4 Aggregates are not subject to deleterious expansion.
- .2 Provide certification that the mix proportions selected will produce concrete of a quality, yield and strength as specified in the concrete mixes and shall comply with the requirements of CSA A23.1.
- .3 Submit design mixes to the Consultant for review a minimum of twenty-eight (28) Days prior to starting any concrete Work. Tabulate concrete mixes indicating the size of aggregates, water cementing material ratio, admixtures, air content, and location of use for each mix.
- .4 Chemical admixtures used in the production of concrete for potable water structures shall be certified as safe Products from recognized approving authorities.
- .5 Provide certification that crack injection materials are suitable for continuous submersion and that they will not release toxic material into the water.

- .6 Submit a detailed plan for cold weather concrete curing and protection of concrete placed and cured in weather below temperature of 5° Celsius.
- .7 Submit a detailed plan for hot weather placements including curing and protection for concrete placed in ambient temperature over 27°C.

1.6 Quality Assurance

- .1 A minimum of 15 Working Days prior to starting any concrete Work, submit to the Consultant the proposed quality control procedures for the following items:
 - .1 Falsework erection.
 - .2 Hot weather concrete.
 - .3 Cold weather concrete.
 - .4 Curing.
 - .5 Finishes.
 - .6 Formwork removal.
- .2 Concrete Testing
 - .1 Testing of concrete for materials and compression will be done by agencies paid for by the Owner.
 - .2 The Contractor shall pay for additional testing required because of changes in material or the mix proportions, as well as any extra testing of the concrete or materials occasioned by the Contractor's failure to meet the Specification requirements.
 - .3 The use of testing services does not relieve the Contractor of its responsibility to provide materials and construction in compliance with the Contract Documents.
 - .4 Three (3) concrete bond tests to test the bond strength between repaired concrete to the existing concrete substrate. A minimum 3 MPa bond strength will be required at the test area.
- .3 Cold Weather Requirements. The following requirements are in addition to the requirements of CSA A23.1-04, Clause 7.4.2.5 - Cold Weather.

- .1 Provide temperature-controlled enclosures for areas where concrete is to be placed whenever the ambient air temperature is 5 degrees Celsius or lower.
 - .2 Protect concrete from the adverse effects of space-heated enclosures including local overheating and combustion products.
 - .3 Heat mix water and, if necessary, aggregates when the air temperature is at or below, or predicted to go below, 5 degrees Celsius at any time during the next 24 hours.
 - .4 Maintain the temperature of reinforcing bars and forms above 10 degrees Celsius prior to placing the concrete.
 - .5 Maintain the temperature of concrete, when deposited in forms, between a minimum of 15 degrees Celsius and a maximum of 25 degrees Celsius.
 - .6 Maintain the temperature of concrete at surfaces at a minimum of 10 degrees Celsius for a minimum period of 7 Days after placing and achieving a minimum of 75 percent of the specified strength. The concrete temperature may then be lowered to ambient air temperature at a rate of 0.5 degrees Celsius per hour or 10 degrees Celsius per Day
 - .7 Use additional protection if full 28 Day compressive strength is required at an early age.
 - .8 Keep concrete continuously moist during the curing period.
- .4 High Temperature Control Requirements
- .1 The following requirements are in addition to the requirements of CSA A23.1 04, Clause 7.4.2.4 - Hot Weather.
 - .2 Limit the peak temperature during the curing period to a maximum of 40 degrees Celsius. The placing temperature that will satisfy this requirement depends on the ambient temperature, humidity at the time of placing, thickness of the concrete, and curing methods employed.

- .3 Consider the use of retarders, low heat cement, slag replacement, ice in mixing water, pre-cooling of aggregates, cooling of concrete through continuous wet curing, and similar methods in order to prevent concrete temperatures from exceeding 40 degrees Celsius at any time.
- .4 Notwithstanding the requirements of the subsections above, do not place concrete with a temperature higher than 25 degrees Celsius. Concrete with a temperature in excess of 25 degrees Celsius upon arrival at the Site will be rejected. Remove all rejected concrete from the Site.
- .5 Protection
 - .1 Protect freshly placed concrete from damage due to construction operations and from cold, heat, rain, snow, running water, drying winds, and any other factors which would likely cause deterioration of concrete quality.
 - .2 Use waterproof insulated covers or other suitable materials to enclose freshly placed concrete under these conditions.
- .6 Backfilling and Service Loads Restrictions
 - .1 Verify that backfill is not higher than the finished grades indicated on the Contract Drawings.
 - .2 Verify that the leakage test is successfully completed before backfilling.

2 Products

2.1 Materials

- .1 Portland cement: in accordance with CSA 23.1 and CSA 23.2.
- .2 Water: in accordance with CSA A23.1.
- .3 Aggregates: in accordance with CSA A23.1. Coarse aggregates are to be rough and angular gravel or crushed stone of normal density.
- .4 Air entraining admixtures: in accordance with ASTM C 260.

- .5 Chemical admixtures: in accordance with ASTM C 494. The Consultant is to approve all accelerating or set retarding admixtures during cold and hot weather placing.
- .6 Concrete retarders: in accordance with ASTM C 494 water based. Do not allow moisture of any kind to come in contact with the retarder film.

2.2 Mixes

- .1 Proportion normal density concrete in accordance with CSA A23.1.
 - .1 Cement:
 - .1 Type GU10 Portland cement.
 - .2 Minimum compressive strength at 28 Days: 35 MPa.
 - .3 Maximum cement content: 300 kg/m³ of concrete.
 - .4 Class of exposure: S-1 with very high sulphate resisting cement.
 - .5 Nominal size of coarse aggregate: 40 and 20 mm.
 - .6 Water/cement ratio: 0.38 for water retaining structures.
 - .7 Air content: 5% to 8%
 - .8 Chemical admixtures: following admixtures in accordance with ASTM C 494 including type, quantity, water reducing, strength increasing, air entraining, super plasticizers, rust inhibitors.
 - .9 Submit the mix design with test results to the Consultant for review a minimum of 28 Days prior to placing concrete.
 - .10 Wall concrete mixes shall include the use of a super plasticizer added at the plant, according to CSA A266.6 such as Rheobuild 1000 by Master Builders, or an approved equivalent. The maximum slump is anticipated to be 25 mm to 40 mm prior to adding the superplasticizer and tests shall be in conformity with CSA Specification A23.2. The slump at the Site should not exceed 200 mm after the plasticizer is added to the concrete.
 - .11 No amount of calcium chloride in any chemical form shall be used in any concrete mix or as a de-icing agent in the forms.

3 Execution

3.1 Preparation

- .1 Obtain the Consultant's approval before placing any concrete. Provide a minimum of 2 Working Days notice prior to the placing of concrete.
- .2 Prior to placing of the concrete, obtain the Consultant's approval of the proposed method for protection of the concrete during placing and curing in adverse weather.
- .3 Maintain accurate records of poured concrete items indicating the date, location of pour, quality, air temperature and test samples taken.
- .4 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in position.
- .5 Do not place loads upon new concrete until authorized by the Consultant.
- .6 Existing concrete surface receiving concrete shall be wet for 24Hrs prior to concrete pour. Surface shall be surface damp with no ponding wet spots.
- .7 Sandblast clean all concrete repair surfaces including all existing reinforcing steel.

3.2 Concreting

- .1 Perform cast in place concrete Work in accordance with CAN/CSA A23.1
- .2 Vibrators
 - .1 The use of mechanical vibrators is required.
 - .2 A sufficient number of vibrators shall be employed to ensure complete compaction.
 - .3 At least one (1) extra gasoline powered vibrator shall be on hand for emergency use.
 - .4 Vibration shall not be continued to the extent that water forms a surface on the concrete.

- .5 Avoid any disturbance to concrete which has become too stiff to regain plasticity when vibrated.
- .6 Vibration shall not be applied directly to steel which extends into partially hardened concrete.
- .3 Finishing:
 - .1 Interior repair areas not exposed to freeze thaw and deicing salt shall receive smooth steel trowel finished or roughness to match adjacent concrete finishes.
 - .2 Exterior repair areas exposed to freeze thaw and deicing salt shall receive smooth finished with magnesium float.
 - .3 Area being waterproofed shall be finished in accordance with waterproofing manufacturer's recommendation.
- .4 Repair of temperature and shrinkage induced cracks.
 - .1 Repair cracks in the completed structure employing a suitable polyurethane injection technique to make such cracks completely water tight after the repair.
 - .2 Remove surface injection material and finish areas to match surrounding concrete.
- .5 Repair of structural concrete cracks.
 - .1 Repair cracks in the completed structure employing a suitable epoxy injection technique to create a structural repair to the crack component.

3.3 Site Tolerance

- .1 Concrete tolerance shall be in accordance with CSA A23.1.

3.4 Field Quality Control

- .1 Inspection and testing of concrete and concrete materials will be carried out by a testing laboratory designated by the Consultant in accordance with CSA A23.1.
- .2 The Region will pay for the cost of the tests.

- .3 The Consultant will take additional test cylinders during any cold weather concreting and shall cure cylinders at the Site under the same conditions as the concrete which they represent.
- .4 Non-destructive methods for testing concrete shall be in accordance with CSA A23.2.
- .5 Inspection or testing by the Consultant will not augment or replace the Contractor's quality control obligations nor will it relieve the Contractor of any of its responsibilities or obligations under the Contract.
- .6 ASTM C 1583 Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)

End of section

1 General

1.1 Summary

- .1 This specification describes the pressure injection of cracks with an epoxy resin adhesive.

1.2 Measurement and Payment

- .1 Epoxy crack inject work shall be measure and pay for in accordance with the bid form.

1.3 Quality Assurance

- .1 Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- .2 Install materials in accordance with all safety and weather conditions required by the manufacturer, or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.4 Delivery, Storage, and Handling

- .1 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.
- .2 Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- .3 Condition the specified product as recommended by the manufacturer.

1.1 Job Conditions

- .1 Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (5°C) and rising.

- .2 Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified product.

1.2 Submittals

- .1 Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).
- .2 Manufacturer's repair procedures.

1.3 Warranty

- .1 Provide a written warranty from the manufacturer against defects of materials for a period of two (2) years beginning with date of substantial completion of the project.

2 Products

2.1 Manufacturers

- .1 Sika System
 - .1 apply cap bead to crack using Injection Gel, Fast Set
 - .2 drill injection ports at 150 mm to 250 mm spacing
 - .3 inject crack with Sika Dur 35, Hi-Mod LV injection resin (NSF-ANSI 61 potable water contact-approved formula)
- .2 Or approved equivalent.

3 Execution

3.1 Mixing and Application

- .1 Mix the components required for the injection work in accordance with the manufacturer's recommended proportion and mixing time.
- .2 Mixing shall be conducted in a well ventilated area with lay downs and containment to prevent and contain spills and drips.

- .3 Placement procedure:
 - .1 Prior to placement of injection porting device, identify structural cracks with the Contract Administrator.
 - .2 Scan area for embedded reinforcing steel, electrical conduits, and piping's.
 - .3 Set the porting devices as required by the equipment manufacturer. Spacing of the porting devices shall be accomplished as required to achieve the travel of the epoxy resin for the pressure injection grouting between ports and fill the cracks to the maximum. On structures open on both sides, provide porting devices on opposite sides at staggered elevations. Apply the mixed epoxy resin adhesive for sealing over cracks and around each porting device to provide an adequate seal to prevent the escape of the epoxy resin adhesive for the injection grouting. Where required by the Contract Administrator, apply the epoxy resin adhesive for sealing in such a manner that minimal defacing or discoloration of the substrate shall result.
 - .4 The epoxy resin adhesive for the pressure injection grouting:
 - .1 **Manual:** Load the mixed epoxy resin adhesive for grouting into a disposable caulking cartridge or bulk-loading caulking gun. Inject the prepared cracks with a constant pressure in order to achieve maximum filling & penetration without the inclusion of air pockets or voids in the epoxy resin adhesive. Begin the pressure injection at the widest part of the crack being injected and continue until there is the appearance of epoxy resin adhesive at an adjacent port, thus indicating travel. When travel is indicated, to discontinue or continue the pressure injection from that port should be made by the contractor based on his experience, with the approval of the Contract Administrator. Continue procedure until pressure injectable cracks has been filled.

- .2 **Automated:** Dispense the epoxy resin adhesive for grouting under constant pressure in accordance with procedures recommended by the equipment manufacturer as required to achieve maximum filling and penetration of the prepared cracks without the inclusion of air pockets or voids in the epoxy resin adhesive. The pressure injection of single or multiple ports, by use of a manifold system, is possible. This decision should be made by the contractor, with the approval of the Contract Administrator. Continue the approved procedure until all pressure injectable cracks have been filled.
- .4 If penetration of any cracks is impossible, consult the Contractor Administrator before discontinuing the injection procedure. If modification of the proposed procedure is required to fill the cracks, submit said modification in writing to the Contract Administrator for acceptance prior to proceeding.
- .5 Adhere to all limitations and cautions for the epoxy resin adhesive in the manufacturers current printed literature.

1.4 Cleaning

- .1 After the epoxy resin adhesive for grouting has cured, the epoxy resin adhesive for sealing cracks and porting devices shall be removed as required by the Contract Administrator. Clean the substrate in a manner to produce a finish appearance acceptable to the Owner.
- .2 The uncured epoxy resin adhesive can be cleaned from tools with approved solvent. The cured epoxy resin adhesive can only be removed mechanically.
- .3 Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas. Patch flush all injection port and repaired areas with the surrounding concrete surface. Prime and paint area to match.

End of section

1 General

1.1 Summary

- .1 This Section specifies the requirements for the supply of all labour, materials and equipment to complete the Work as indicated on the Contract Drawings, as specified herein, and as required in order to complete the Work.

1.1 Applicator

- .1 Ensure that all Work is done by an experienced, competent waterproofing applicator licensed and/or approved by the waterproofing material manufacturer. Submit the manufacturer's certification of this approval along with a list of similar projects and references where the proposed contractor has installed the same waterproofing systems.
- .2 Ensure applicator's installation equipment and methods are approved by waterproofing material manufacturer. Submit proof of this approval.

1.2 Guarantee

- .1 Select the waterproofing system compatible with and suitable for, the given conditions and long-term requirements.
- .2 Provide completely watertight Work with no leakage through or around the waterproofing.
- .3 Furnish a written, single source guarantee covering the waterproofing materials and workmanship for a period of 5 years from the Date of Acceptance of the Work, and be responsible for making good, at no cost to the Owner, any and all defects due to the failure of the waterproofing materials, workmanship or overall performance.

1.3 Schedule of Waterproofing

- .1 Apply waterproofing to protect dry areas, including:
 - .1 The exterior surfaces of the walls.
- .2 Confirm locations and details with the Contract Administrator prior to proceeding with waterproofing.

1.4 Coordination

- .1 Coordinate with the concrete construction and repairs.
- .2 Provide early submittals to allow early applications to skim slabs, repairs, etc.
- .3 Apply complete continuous membranes where structures can be completed prior to waterproofing. At repaired areas, allow 300 mm overlap with existing waterproofing to remain.

1.5 Submittals

- .1 At the early stages of the project, well before any intended waterproofing on site, submit the following information for the Consultant's review:
 - .1 Product manufacturer's written approval of the proposed waterproofing contractor
 - .2 List of reference contacts and similar projects completed by the proposed contractor using the same waterproofing products
 - .3 Product samples and manufacturer's technical literature for materials and application procedures
- .2 Submit details of the proposed waterproofing systems for each area. Include material data sheets, layer sequence and thickness, surface preparation and acceptance criteria, and protection criteria.
- .3 Submit the waterproofing manufacturer's instructions and details for application, membrane thickness, number of layers, cant beads, protection board, expansion joints, cracks, reinforcing sheets, pipe protrusions, etc.
- .4 During the course of the project, immediately prior to commencing work in each area, submit a Letter of Acceptance for the concrete surfaces to be waterproofed, signed by the applicator's authorized representative.
- .5 Product manufacturer's representative to inspect the waterproofing contractor's work on a regular basis and submit inspection reports to the Consultant.

- .6 Upon completion and formal Acceptance of the Work, submit a five year, single source, 100% labour and materials guarantee covering materials, workmanship and long term performance of the overall waterproofing system.

2 Products

2.1 For Exterior Use Below Grade

- .1 Trem-Proof 201 System by Tremco Ltd
 - .1 Primer - Vulkem 191
 - .2 Membrane - Trem-Proof 201 SL - 1.5 mm thick, on horizontal surfaces. Apply in 2 passes. Trem-Proof 201 T - 1.5 mm thick, on walls. Apply in 2 passes.
 - .3 Protection - use 3 mm thick protection boards on buried structures.
- .2 Hydrotech hot, fluid applied, rubberized asphalt flexible membrane 6125 system as manufactured by Hydrotech.
 - .1 Provide a complete system from one manufacturer, meeting project requirements:
 - .2 Primer - # 56170
 - .3 Membrane – Hydrotech 6125 - 1 layer 4.5 mm thick on vertical surfaces and 2 layers of 4.5mm each on horizontal surfaces.
 - .4 Flashing/reinforcing – 1.5 mm thick neoprene – Hydrotech Flex Flash F – spun bonded polyester fabric – Flex Flash UN
 - .5 Protect with 3 mm thick protection boards on walls and 6 mm thick protection boards on buried roofs. – Hydro flex 20 or Hydroboard.
- .3 Elastoseal 790-11 system as manufactured by Bakor
 - .1 Provide a complete system from one manufacturer, meeting project requirements:
 - .2 Primer – 930 -18 or 910 - 01
 - .3 Membrane – Elastoseal 790 – 11 1 layer 4.5 mm thick on vertical surfaces and 2 layers of 4.5mm each on horizontal surfaces.
 - .4 Reinforcement/flashing – Polyester fabric by Bakor or 990 –25 elastomeric sheet.

- .5 Protect with 3 mm thick protection boards on walls and 6 mm thick protection boards on buried roofs.
- .4 Submit details for equivalents.

3 Execution

3.1 General

- .1 Deliver materials to job site in factory sealed containers with manufacturer's identification of each package.
- .2 Store materials in a manner to prevent damage or deterioration.
- .3 Extend water proofing 300 mm beyond point common to dry areas/existing waterproofing or further based on specific requirements of the manufacturer. Do not extend above grade.

3.2 Surface Preparation, Inspection, and Certification for Concrete Walls and Slabs

- .1 As an initial step, clean all surfaces to be waterproofed of any and all deleterious material.
- .2 Inspect all subject surfaces to identify imperfections including, but not limited to, uneven surfaces, joints, cracks, honeycombing, spalls, delaminated areas, previous waterproofing materials, exposed reinforcing steel, or any other existing conditions that may affect the performance of the new waterproofing system.
- .3 Repair cracks in concrete using polyurethane or epoxy injection. After injection, remove any related coatings or injection nipples and prepare the surfaces affected.
- .4 Repair other surface imperfections and surfaces of cracks by chipping out and filling with repair mortar to the satisfaction of the Consultant and the waterproofing materials manufacturer prior to beginning final surface preparation steps.
- .5 Blast clean all surfaces to a dry, roughened texture using approved equipment, materials and methods; while adhering to the waterproofing manufacturer's requirements and environmental considerations.

- .6 Waterproofing manufacturer's authorized agent to inspect surfaces to be waterproofed with the Engineer and waterproofing contractor. Provide to the Consultant a written certification from the waterproofing manufacturer that the surfaces are acceptable for the application of the waterproofing system, and that the proposed waterproofing system is appropriate for the location and required service. Do not apply any waterproofing until the Consultant receives the written certification from the manufacturer.

3.3 Pre-Treatment and Detailing

- .1 Ensure the surfaces are approved.
- .2 Pre-treat repaired areas with a layer of reinforced coating as recommended by waterproofing manufacturer
- .3 Provide cants, reglets, and edge preparations as per the reviewed submissions.
- .4 Apply primers as recommended by waterproofing manufacturer.

3.4 Application of Waterproofing

- .1 Conform to the waterproofing manufacturer's instructions and details for material preparation, heating and handling, application, membrane thickness, number of layers, cant beads, protection board, expansion joints, cracks, reinforcing sheets, bonding of layers, bonding of wall waterproofing to waterproofing on skim slabs, etc.
- .2 Schedule the Work to allow 28 days curing for new concrete prior to waterproofing.
- .3 Apply waterproofing only when atmospheric conditions are suitable. Do not apply during rain or when temperatures are below 10 degrees Celsius. Maintain material and substrate temperatures within limits recommended by product manufacturer. Provide suitable enclosures of areas to be waterproofed if necessary to satisfy the work condition requirements.
- .4 Lap joints in waterproofing in accordance with manufacturer's instructions.
- .5 Cure membrane in accordance with manufacturer's instructions.

- .6 Use special designed spray machines where recommended by manufacturer.
- .7 Application of Trem-Proof 201 Waterproofing -
 - .1 Apply Trem-Proof 191 primer
 - .2 Apply Trem-Proof 201 SL, 1.5 mm thick, on horizontal surfaces. Apply in 2 passes.
 - .3 Apply Trem-Proof 201 T, 1.5 mm thick, on external walls. Apply in 2 passes.
 - .4 Allow to cure
 - .5 Protect waterproofing with 3 mm thick protection boards on buried structures.

End of section

1 General

1.1 Summary

- .1 This Section includes requirements for supply and installation of self-adhered air and vapour membranes that prevent exfiltration and infiltration between interior and exterior of building through wall and roof transition construction.

1.2 Reference standards

- .1 American Society for Testing of Materials (ASTM):
- .2 ASTM E96/E96M-10, Standard Test Methods for Water Vapour Transmission of Materials
- .3 ASTM E2178-11, Standard Test Method for Air Permeance of Building Materials

1.3 Quality Assurance

- .1 Qualifications: Provide proof of qualifications when requested by Consultant:
 - .1 Manufacturer: Obtain air and vapour membrane materials through one source from a single manufacturer or using materials from a secondary source that are acceptable to the manufacturer.
 - .2 Installer: Use an installation company that is acceptable to the manufacturer, using workers who are trained and approved by the membrane manufacturer having experience with projects of similar complexity and area.

1.4 Delivery, Storage, and Handling

- .1 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.
- .2 Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- .3 Condition the specified product as recommended by the manufacturer.

1.5 Environmental Conditions:

- .1 Air and vapour barrier is not to be applied to surfaces that are either wet, oily, frosted, dirty or contaminated in any way.
- .2 Ambient Conditions: Apply air and vapour membrane to substrate surfaces that are within manufacturer's installation temperature threshold range accounting for wind cooling and apparent temperature when actual temperature is approaching manufacturer's minimum temperature threshold.
- .3 Air and vapour barrier is not to be applied over lightweight cast-in-place concrete containing high moisture or certain curing compounds. Cast-in-place concrete should be cured for a minimum of two weeks prior to application of air barrier membrane.

1.6 Delivery, storage, handling and protection

- .1 Coordinate deliveries with construction schedule and arrange for proper storage areas.
- .2 All materials are to be stored in a clean, dry and protected area in their original containers sealed and undamaged. Manufacturer's labels are to be easily visible and undamaged.
- .3 Care and precaution are to be exercised by the applicator so as not to damage the work of other trades. Applicator is responsible to take all necessary precautions to protect work of other trades during application.
- .4 In addition to the above, store modified bituminous sheet type air and vapour barrier membrane as follows:
 - .1 Store rolls of membrane on end, in vertical position without leaning with selvage end up.
 - .2 Store materials away from direct heat or open flame.
 - .3 For installation in cold weather, store rolls of membrane in heated storage trailer for minimum of 24 hours with the temperature kept at 21 deg C and remove for application with as little exposure as possible to low ambient temperatures.

- .5 Provide portable fire extinguishers within easy access of torching applications.

1.7 Submittals

- .1 Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).
- .2 Manufacturer's repair procedures.

1.8 Warranty

- .1 Provide a written warranty from the manufacturer against defects of materials for a period of two (2) years beginning with date of substantial completion of the project.

2 Products

2.1 Manufacturers

- .1 Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - .1 Henry Company
 - .2 Soprema Inc.
 - .3 Or approved equivalent.

2.2 Materials

- .1 Self adhering SBS modified bitumen reinforced membrane; having low temperature formulation appropriate for installation requirements; tested in accordance with ASTM E96 and ASTM E2178, and having the following nominal properties:
 - .1 Low Temperature Flexibility: Less than -10°C
 - .2 Basis of Design Products:
 - .1 Blueskin SA by Henry Company
 - .2 Sopraseal Stick 1100-T by Soprema Inc.
 - .3 Or approved equivalent.

- .2 Primer: Solvent based, synthetic rubber adhesive type, quick setting, solvent based, roller consistency type primer.
 - .1 Basis of Design Product: Blueskin Primer by Henry Company.
 - .2 Or approved equivalent.
- .3 Air Barrier Sealant: High solids, rubber asphalt caulking and sealing compound.
 - .1 Basis of Design Product: 570-05 Polybitume Sealing Compound by Henry Company.
 - .2 Or approved equivalent.
- .4 Through Wall Flashing Membrane: 40 mils (1mm) thick x width to suit, strips of self-adhering, SBS rubberized asphalt laminated to a cross-laminated, high density polyethylene film with a siliconized release liner.
 - .1 Basis of Design Product: Blueskin TWF by Henry Company
 - .2 Or approved equivalent.
- .5 Packing Insulation: Loose, glass fibre or mineral fibre insulation, 1.0 lbs./cu.ft. density, and conforming to CAN/CGSB-51.11.

3 Execution

3.1 Examination

- .1 Ensure that surfaces to receive air barrier membrane are dry, firm, suitable for bond, and free from dust, dirt, loose material, projections, ice, frost, slick, grease, oil or other matter detrimental to bond of sheet type air barrier membrane.
- .2 Report surfaces left unacceptable by other trades in writing to the Consultant before commencing installation.
- .3 Co-ordinate work of this section with the work of other sections.
- .4 Commencement of work of this section implies acceptance of surfaces and conditions.

3.2 Preparation

- .1 Prepare surfaces in accordance with manufacturer's written requirements for type of substrate; free from voids, spalled areas, loose aggregates or sharp points; clean surfaces to remove contaminants that could affect bond such as grease or wax, dust, dirt and debris.
- .2 Apply primer to substrates when required by manufacturer at rate recommended by manufacturer; cover primed substrates on same day, reapply primer when work cannot be completed on the same day.

3.3 Installation

- .1 Install air and vapour barrier membranes in accordance with manufacturer's written requirements, using appropriate equipment and skilled workers and as follows:
- .2 Transition Membranes: Connect air and vapour membranes to adjacent assemblies having pre-installed transition membranes; install transition membranes where required to maintain continuity of building envelope.
- .3 Through Wall and Flexible Flashings: Install flexible membranes where required to maintain flow direction to divert water away from face of building envelope.
- .4 Separate air and vapour barrier membranes from incompatible materials, and provide manufacturer's recommended transition materials required to maintain continuity of building envelope.
- .5 Cut and tightly seal air and vapour barrier membrane around penetrations and protrusions to provide a continuous air barrier.
- .6 Lap joints in air and vapour barrier membrane minimum of 75mm (3").
- .7 Where masonry anchors and supports pass through air and vapour barrier membrane, ensure continuity of air and vapour barrier membrane by applying air barrier mastic all around/over masonry anchors.

- .8 Prior to exterior façade installation, inspect air and vapour barrier membrane for punctures, misaligned seams and fishmouths. Apply additional layer of air and vapour barrier membrane over damaged/affected areas, extending membrane minimum of 6" beyond damage in all directions.

3.4 Cleaning and protection

- .1 Protection: Protect membrane as recommended by manufacturer from effects of long term exposure where membrane is open to the environment for prolonged time periods using opaque plastic sheets or tarpaulins; protect membrane from penetrations and damage by successive components of the Work; assign payment for repairs to responsible parties; make repairs in accordance with manufacturer's written instructions using original installers.
- .2 Cleaning: Remove masking materials, debris, excess materials and equipment from site at completion of the work; conduct ongoing daily cleaning as directed by the Contractor; clean stains, drips or spills of coatings, sealants, mastic or primers visible on finished surfaces.

End of section

Appendix B, B-2 Material Disclosures

1. Asbestos

Contractors are advised that asbestos, which has been contained, is on the job site. Please review the attached “Qualitative Asbestos” report (**See Q-303-2020-A-007-DCAM - ECOH Asbestos bldg Materials Survey Report**) for detailed information.

2. Drawings

See “**Q-303-2020-A-007-DCAM - RFQ Stamped**” for Drawings.