



**EW GYM FLOOR AND DRAINAGE IMPROVEMENTS
ECOLE SECONDAIRE NORVAL-MORRISSEAU**

51 Wright Street, Richmond Hill, Ontario

“REQUEST FOR PROPOSAL”

Project 23034

DATE June 25, 2025



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End of Section

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Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
ARCHITECTURAL				
000	Location Plan, Drawing List & OBC Matrix	7	-	June 12, 2025
A101	Site Demolition Plan	2	-	June 12, 2025
A102	Site Plan	2	-	June 12, 2025
A201	First Floor Key Plan	7	-	June 12, 2025
A202	Part First Floor Demolition Plan	7	-	June 12, 2025
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STRUCTURAL				
S101	Notes & Typical Details	7	-	June 12, 2025
S201	Part Foundation Plan	7	-	June 12, 2025
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S501	Sections	7	-	June 12, 2025
CIVIL				
C01	Site Grading Plan	5	-	June 12, 2025
C02	Site Servicing Plan	5	-	June 12, 2025

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Work covered by contract documents
- .2 Owner
- .3 Location of the site
- .4 Scheduling requirements
- .5 Site access
- .6 Work sequence
- .7 Contractor use of premises
- .8 Work by others
- .9 Engineer design
- .10 Designated substances: ACM and others
- .11 Building smoking environment
- .12 Special conditions
- .13 Site security
- .14 "By Others"
- .15 Protection of Drawings

1.2 Work Covered by Contract Documents

- .1 Work of this Contract comprises the construction of the new Gymnasium Floor and Drainage Improvements, at Ecole Secondaire Norval-Morrisseau as indicated on the Contract Drawings and specifications.

1.3 Owner

- .1 Conseil Scolair Viamonde, 116 Cornelius Parkway, Toronto, Ontario M6L 2K5

1.4 Place of the Work

- .1 The Work of this Contract is located at 51 Wright Street, Richmond Hill, Ontario

1.5 Scheduling Requirements

- .1 RFP Issued: June 24, 2025.
- .2 Mandatory site visit: July 2, 2025
- .3 RFP closing: July 15, 2025
- .4 Site work complete: August 31, 2025
- .5 Substantial Performance: October 31, 2025.

1.6 Metric Project

- .1 This project is to be based on The International System of Units (SI). Measurements are expressed in metric (SI) units.
- .2 All dimensions are to be shown in meters and millimeters.

1.7 Site Access

- .1 Access to the site to be arranged by the Owner.

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

.3 Provide secure construction fencing as specified and where directed by the Owner.

1.8 Work Sequence

.1 Construct Work continuously.

1.9 Contractors Use of Premises

.1 Contractor has restricted use of site until Substantial Performance.

1.10 Engineer Design

.1 Where specifications require work to be designed by an engineer, engage an engineer licensed in the Province of Ontario to design such work. Refer to Section 01 78 00.

1.11 Verification

.1 All dimensions shall be verified on site, and all necessary modifications and adjustments shall be made as necessary to suit.

1.12 Building Smoking Environment

.1 Smoking and vaping are prohibited in all work places within the Owner's buildings and on the Owner's property.

1.13 Special Conditions

.1 The following general and special conditions apply:
.1 All existing surfaces and finishes are to be repaired wherever damaged during the course of the Work.

1.14 Site Security

.1 Daily Inspection: Provide inspection of the work areas daily while the work is in progress and take whatever measures are necessary to secure the construction zones from theft, vandalism and unauthorized entry.

1.15 "By Others"

.1 The term "by others" where it is used in the contract documents means that work shown or described in the contract documents and labeled with this designation is not included in the specific sub-trade's scope of work but will be required to be done within the General Contractor's contract.

1.16 Use of Drawings

.1 Copies of architectural and structural "issued for construction" drawings in digital format will be made available for the contractors use under the following conditions.
.1 Copyright remains with BBA.

- .2 The drawings will only be used for shop drawings for this project and not be put to any other use.
 - .3 BBA assumes no liability for errors or omissions in the drawings. The Contractor assumes all risk and expenses associated with the use of drawings in the production of his work.
 - .4 References to BBA and other Consultants must be deleted from the title block.
 - .5 The Contractor signs a release available from BBA that addresses the above items in more detail.
- .2 Arrangements for use of Sub-Consultant drawings must be made with the Appropriate Sub-Consultant.

1.17 Protection of Drawings

- .1 Copyright of electronic document belongs to the Consultant. Electronic documents may not be forwarded to others, transmitted, downloaded or reproduced in any format, whether print or electronic, without the express, written permission of the copyright owner.
- .2 Drawings, specifications and other contract related documents which are posted on Contractor controlled websites for access by sub-trades and suppliers, shall be posted only on password expressed interest in the Project.
- .3 Provide Consultant and Owner with access to such websites as noted above.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Consultants

.1 ARCHITECT:

Barry Bryan Associates
201 - 250 Water Street
Whitby, Ontario L1N 0G5
Tel: (905) 666-5252
Fax: (905) 666-5256
Attention: Mr. Nick Swerdfeger, OAA, M.Arch, MRAIC, B.Arch Sci

.2 STRUCTURAL ENGINEER:

Barry Bryan Associates
201 - 250 Water Street
Whitby, Ontario L1N 0G5
Tel: (905) 666-5252
Fax: (905) 666-5256
Attention: Mr. David Bovill, P.E., P. Eng.

.3 CIVIL ENGINEER

WPE Engineering Ltd.
7250 Keele St Unit 222
Vaughn, Ontario L4K 1Z8
Tel: (416) 578-8682
Attention: Mr. Mike Du

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Access and Egress
- .2 Use of Site and Facilities
- .3 Alterations, Additions or Repairs to Existing Buildings
- .4 Existing Services
- .5 Special Requirements
- .6 Security
- .7 Building Smoking Environment

1.2 Access and Egress

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

1.3 Use of Site and Facilities

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Owner will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
- .5 Use only elevators, existing in building for moving workers and material.
- .6 Protect walls of passenger elevators, to approval of Owner prior to use.
- .7 Accept liability for damage, safety of equipment and overloading of existing equipment.
- .8 Closures: protect work temporarily until permanent enclosures are completed.

1.4 Alterations, Additions or Repairs to Existing Buildings

- .1 Execute work with least possible interference or disturbance to [building operations, occupants, public and normal use of premises. Arrange with Owner to facilitate execution of work.

1.5 Existing Services

- .1 Notify, Owner, utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Owner 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for personnel, pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00.

1.6 Special Requirements

- .1 Submit schedule in accordance with Section 01 32 00 - Construction Progress Documentation.
- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .3 Prior to cutting or drilling horizontal or vertical surfaces including concrete, concrete block or other structural substrate, determine location of reinforcing, service lines, pipes, conduits or other items by x-ray, ground penetrating radar or other appropriate method. Submit findings to Owner prior to cutting or drilling.

1.7 Building Smoking Environment

- .1 Comply with smoking restrictions. Smoking and vaping is not permitted.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Cash Allowances

1.2 References

- .1 Canadian Construction Documents Committee CCDC2-2020 Stipulated Price Contract including the Supplementary Conditions.

1.3 Cash Allowances

- .1 Refer to General Conditions, GC4.1.
- .2 Unless otherwise specified, Cash Allowances shall cover the cost of the materials and equipment delivered F.O.B. job site, and all applicable taxes, except Harmonized Sales Tax. The Contractor's handling costs on the site, labour, installation costs, overhead and profit and other expenses shall be included separately in the Stipulated Price and not in the Cash Allowance.
- .3 Where it is specified that a Cash Allowances is to include both supply and installation costs, such allowances shall cover the cost of the materials and equipment delivered and unloaded at the site, all applicable taxes and the contractor's handling costs on the site, labour and installation costs and other expenses, except overhead and profit which shall be included separately in the Stipulated Price.
- .4 If the cost of the Work covered by Cash Allowances, when determined, is more or less than the allowance, the Contract Sum shall be adjusted accordingly.
- .5 In the event that the cost of the work covered by Cash Allowances should exceed the cash allowance, while the Contract Sum will be adjusted in conformity therewith, there shall be no adjustment to the Contractor's fee or other expenses such as overhead or profit, it being understood and agreed that the contract sum includes the Contractor's expenses and profit for all Cash Allowances whether or not they are exceeded.
- .6 Progress payments on accounts of work authorized under Cash Allowances shall be included in monthly certificate for payment.
- .7 Expenditures from Cash Allowances shall be authorized by Site Instruction, Change Directive or Change Order.
- .8 Cash Allowance for independent inspection and testing shall cover the cost of such services as provided by independent testing agency only. The Contractor's cost for labour, overhead and other expenses related to independent inspection and testing shall be included separately in the Stipulated Price and not in the Cash Allowance.
- .9 Cause the work covered by Cash Allowances to be performed for such amounts and by such persons as the Consultant may select and direct or as required by the project drawings and specifications.
- .10 Amount of each allowance, for Work specified in respective specification Sections is as follows:
.1 Independent Inspection and Testing: Will be confirmed via addendum.

Project: 23034
Description: NEW GYM FLOOR AND DRAINAGE IMPROVEMENTS
ECOLE SECONDAIRE NORVAL-MORRISSEAU
51 WRIGHT STREET, RICHMOND HILL

ALLOWANCES
Section 01 21 00

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Alternatives

1.2 References

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 23-2018 A Guide to Calling Bids and Awarding Contracts.

1.3 Requirements

- .1 Referenced specification Sections stipulate pertinent requirements for products and methods to achieve Work stipulated under each Alternative.
- .2 Co-ordinate affected related Work and modify surrounding Work to integrate Work under each Alternative.

1.4 Substitution of Materials Prior to Bid Closing

- .1 Where products or systems have been specified by trade name, no substitution will be allowed except where alternatives have been approved by the Consultant prior to bid closing.
- .2 Where a specified product or system is not available at the time of bid, the bidder must inform the Consultant in writing so that they may advise all bidders of proposed changes. In the event that the Bidder fails to do so, the Consultant will choose a substitute product suitable for the application at the time of construction.

1.5 Request for Approval of Alternates

- .1 Contractors and suppliers of products or systems that have not been specified may apply for approval of their product or system as an "alternative".
- .2 Requests for approval must reach the Consultant at least five working days prior to the bid closing. The Consultant will advise applicants of the status of their request two working days prior to bid closing.
- .3 Request for approval shall include sufficient information for the Consultant to satisfactorily review the alternative. This may include the following:
 - .1 Project name and number.
 - .2 Specification sections to which the product or system applies.
 - .3 Description of proposed substitution, including manufacturer's material specifications, manufacturer's preparation and application requirements and manufacturer's warranties.
 - .4 Sample of product indicating surface finish and material thickness to be applied under this Contract.
 - .5 Installation history of proposed alternative including:
 - .1 projects and locations
 - .2 approximate value of contract
 - .3 approximate size of projects
 - .4 number of years in use
 - .5 type of usage

- .6 name of owner and consultant involved.
- .4 When submitting alternatives to specified materials or equipment, Bidders shall include in their Bid any changes in the Work required to accommodate the alternatives. A later claim for an addition to the Contract Price due to changes in the Work that are necessitated by the use of the alternatives will not be considered.

1.6 Approval of Alternates

- .1 An addendum will be issued prior to bid closing if an alternative is approved. No alternative materials or equipment will be considered after bid closing.
- .2 Products or systems that have been approved as alternatives may be substituted for specified products and systems as outlined in the addendum.
- .3 When substitution of any proposed alternative into the work, either in whole or in part, affects other parts of the work, the Contractor shall assume full responsibility and bear the associated costs. The Contractor will also be responsible for paying for any drawing changes required as a result of the substitution.
- .4 Cost savings arising from approved alternative products or systems are to be credited to the Contract and the Contract Price will be adjusted accordingly.
- .5 The Consultant reserves the right to reject any or all requests for approval.
- .6 No substitutions will be permitted without the approval of the Consultant in the form of an addendum.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Requests for Substitution (RFS) prior to execution of Contract.
- .2 Requests for Substitution (RFS) after execution of Contract.

1.2 Definitions

- .1 Products Not Available: When all listed manufacturers products in the specification section are no longer manufactured.
- .2 Proprietary Specification: a specification which includes one or more proprietary names of products or manufacturers, or both, and may also include descriptive, reference standard, or performance requirements, or any combination thereof.
- .3 Non-proprietary Specification: a specification which includes descriptive, reference standard or performance requirements, or any combination thereof, but does not include proprietary names of products or manufacturers.
- .4 Substitution: a product or manufacturer not specified by proprietary name, which may be acceptable in place of a product or manufacturer which, is specified by proprietary name.

1.3 Procedures

- .1 Product Options:
 - .1 For products specified by non-proprietary specification:
 - .1 Select any product by any manufacturer, which meets requirements of Contract Documents.
 - .2 For products specified by proprietary specification:
 - .1 Select any product or manufacturer named, or
 - .2 Substitute an unnamed product or manufacturer in accordance with Substitutions – Manufacturers article of this Section.
 - .3 For products specified by proprietary specification and accompanied by words indicating that substitutions will not be accepted:
 - .1 Select any product or manufacturer named; substitutions are not permitted.
 - .2 Substitution Requests Prior to Execution of Contract: Submit substitutions requests to Consultant no later than the time stated in the Instructions to Bidders.

1.4 Substitutions – Products

- .1 Substitute Products: Where substitute products are permitted, unnamed products may be accepted by the Consultant, subject to the following:
 - .1 Substitute products shall be the same type as, be capable of performing the same functions as, and meet or exceed the standards of quality and performance of the specified products.
 - .2 Substitutions for Cause: Changes proposed by Subcontractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - .3 Substitutions for Convenience: Changes proposed by Subcontractor or Contractor that are not required in order to meet other Project requirements but may offer advantage to Contractor or Subcontractor.

1.5 Substitutions – Manufacturers

- .1 Substitute Manufacturers: Where substitute manufacturers are permitted, unnamed manufacturers will be accepted by the Consultant, subject to the following:
 - .1 Substitute manufacturers shall have capabilities comparable to those of the named manufacturers.
 - .2 In making a substitution Contractor and the Subcontractor represents that they have:
 - .1 Investigated substitute product or manufacturer, or both, and determined it meets or exceeds the criteria of the specified product, and;
 - .2 Will provide the same warranty for the Substitution as for the specified product.
 - .3 Will make any changes to the Work necessitated by substitution as required for Work to be complete in all respects, and;
 - .4 Waives claims for additional costs and time caused by substitution which may subsequently become apparent.
 - .5 Will reimburse Consultant's services for review or redesign, additional studies, investigations, review of submittals, and associated contract administration.
 - .6 Received necessary approvals of authorities having jurisdiction.
 - .7 Investigated the proposed substitute to determine if license fees and royalties are pending.
 - .8 If accepted, the substitution will not adversely affect the Construction Schedule.
 - .3 Do not install requested Substitutions without Consultant's acceptance.
 - .4 If, in the Consultant's opinion, a substitution does not meet requirements of Contract Documents, Contractor shall, at no extra cost to Owner, provide a product which, in the Consultant's opinion, does meet requirements of Contract Documents.

1.6 Proprietary Specifications

- .1 Notwithstanding specified proprietary names of either or both products or manufacturers, products provided shall meet other applicable requirements of Contract Documents. Modify products if necessary, to ensure compliance with all requirements of Contract Documents.

1.7 Changes to Accepted Products and Manufacturers

- .1 Products and manufacturers accepted by the Consultant for use in performance of Work of Contract shall not be changed without Consultant's written consent. .
- .2 Submit requests to change accepted products and manufacturers to Consultant in writing, including product data indicated in Product Data article.

1.8 Product Data

- .1 When requested by the Consultant, submit complete data substantiating compliance of a product with requirements of Contract Documents. Include the following:
 - .1 Product identification, including manufacturer's name and address.
 - .2 Manufacturer's literature providing product descriptions, applicable reference standards, performance and test data, in form consistent with the Contract Documents and readily comparable with product being substituted and can provide the specified and indicated requirements.
 - .3 Samples, as applicable.
 - .4 Name and address of projects on which product has been used and date of each installation.
 - .5 Itemized comparison of substitution with named product(s). List significant variations.
 - .6 Designation of availability of maintenance services and sources of replacement materials
 - .7 Completed Substitutions Request Form. Incomplete forms will be rejected.

1.9 Consultant Procedure

- .1 In reviewing the supporting data submitted for substitutions, Consultant will use, for purposes of comparison, all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications.
- .2 Consultant will review supporting data and will determine that the substitution in the Consultant's opinion is or is not able to meet or exceed the standards of quality, appearance and performance to the material specified.
- .3 Consultant will sign, date and issue the RFS indicating acceptance or refusal, with applicable pre-contract or contract documentation, to affected participants.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Requests for Information.
- .2 Submittal Procedures.
- .3 Screening of RFI's.
- .4 Response to RFI's.
- .5 Response Timing.

1.2 Related Sections

- .1 Section 01 31 00 Project Management and Coordination
- .2 Section 01 33 00 Submittal Procedures

1.3 Request for Information (RFI)

- .1 A request for information (RFI) is a formal process used during the Work to obtain an interpretation of the Contract Documents or to obtain additional information.
- .2 An RFI shall not constitute notice of claim for a delay.

1.4 Submittal Procedures

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Number RFI's consecutively in one sequence in order submitted, in numbering system as established by the Contractor.
- .3 Submit one distinct subject per RFI form. Do not combine unrelated items on one form.
- .4 RFI Form:
 - .1 Submit a draft "Request for Information" form to be approved by the Owner and Consultant.
 - .2 Submit RFI's to the Consultant on approved "Request for Information" form. The Consultant shall not respond to an RFI except as submitted on this form.
 - .3 Where RFI form does not have sufficient space to provide complete information thereon, attach additional sheets as required.
 - .4 Submit with RFI form all necessary supporting documentation.
- .5 RFI Log:
 - .1 Maintain log of RFI's sent to and responses received from the Consultant, complete with corresponding dates.
 - .2 Submit updated log of RFI's at each construction meeting.
- .6 Submit RFI's sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do so will not be paid by the Owner.
- .7 Only the Contractor shall submit RFI's to the Consultant.
- .8 RFI's submitted by Subcontractors or Suppliers directly to the Consultant will not be accepted.

1.5 Screening of RFI's

- .1 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the Interpretation of the Contract Documents cannot be resolved

by direct reference to the Contract Documents. Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected.

1.6 Response to RFI's

- .1 Consultant shall review RFI's from the Contractor submitted in accordance with this section with the following understandings:
 - .1 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.
 - .2 Only the Consultant shall respond to RFI's. Responses to RFI's received from entities other than the Consultant shall not be considered.

1.7 Response Timing

- .1 Allow 5 Working Days for review of each RFI by the Consultant.
- .2 Consultant's review of RFI commences on date of receipt of RFI submission by the Consultant from Contractor and extends to date RFI returned by Consultant.
- .3 When the RFI submission is received by Consultant before noon, review period commences that day. When RFI submittal is received by Consultant after noon, review period begins on the next Working Day.
- .4 If, at any time, the Contractor submits a large enough number of RFI's or the Consultant considers the RFI to be of such complexity that the Consultant cannot process these RFI's within 5 Working Days, the Consultant will confer with the Contractor within 3 Working Days of receipt of such RFI's, and the Consultant and the Contractor will jointly prepare an estimate of the time necessary for processing same as well as an order of priority among the RFI's submitted. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Preconstruction Conference
- .2 Project Meetings
- .3 On Site Documents
- .4 Cost Breakdown

1.2 Preconstruction Conference

- .1 The Consultant will call for and administer a Preconstruction Conference at time and place to be announced.
- .2 Contractor, all major Subcontractors, and major suppliers shall attend the Preconstruction Conference.
- .3 Agenda will include, but not be limited to, the following items.
 - .1 Lines of communication and contact information
 - .2 Submittal and RFI procedures
 - .3 Schedules
 - .4 Personnel and vehicle permit procedures
 - .5 Use of premises
 - .6 Location of any Contractor on-site facilities
 - .7 Security
 - .8 Housekeeping
 - .9 Inspection and testing procedures, on-Site and off-Site
 - .10 Control and reference point survey procedures
 - .11 Health and safety
 - .12 Contractor's Schedule of Values
 - .13 Contractor's Schedule of Submittals
- .4 The Consultant will distribute copies of minutes to attendees. Attendees shall have seven days to submit comments or additions to minutes. Minutes will constitute final documentation of results of Preconstruction Conference.

1.3 Project Meetings

- .1 The Consultant will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.
- .2 Meetings will be held minimum bi-weekly.

1.4 On-Site Documents

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 Requests for Information (RFI's)
 - .6 Change orders.
 - .7 Other modifications to Contract.

- .8 Field test reports.
- .9 Geotechnical reports
- .10 DSS reports
- .11 Approved Work schedule.
- .12 Manufacturers' installation and application instructions.
- .13 Safety Data Sheets (SDS).
- .14 Health and Safety Plan and other safety related documents.
- .15 Other documents as specified.

1.5 Cost Breakdown

- .1 Submit a detailed cost breakdown to Consultant at least ten working days prior to the submission of the first progress claim. After approval by Consultant the cost breakdown will be used as basis for progress payment.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Submittals.
- .2 Schedules.
- .3 Format.
- .4 Submission.
- .5 Critical Path Scheduling.
- .6 Submittals Schedule.

1.2 Submittals

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

1.3 Schedules Required

- .1 Submit schedules as follows:
 - .1 Construction Progress Schedule.
 - .2 Submittal Schedule for Shop Drawings and Product Data.
 - .3 Submittal Schedule for Samples.
 - .4 Product Delivery Schedule.
 - .5 Cash Allowance Schedule for purchasing Products or Services.
 - .6 Shutdown or closure activity.

1.4 Format

- .1 Prepare schedule in form of a horizontal bar chart using Microsoft Project 2016 or later.
- .2 Provide a separate bar for each major item of work, trade or operation.
- .3 Split horizontally for projected and actual performance.
- .4 Provide horizontal time scale identifying first work day of each week.
- .5 Format for listings: chronological order of start of each item of work.
- .6 Identification of listings: By Systems description.

1.5 Submission

- .1 Submit initial format of schedules within 10 working days after award of Contract.
- .2 Submit schedules in electronic format, by email as PDF files.
- .3 Consultant will review schedule and return reviewed copy within 10 days after receipt.
- .4 Resubmit finalized schedule within 7 days after return of reviewed copy.
- .5 During progress of Work revise and resubmit schedule as directed by Consultant.
- .6 Submit revised progress schedule with each application for payment.

- .7 Distribute copies of revised schedule to:
 - .1 Job site office.
 - .2 Subcontractors.
 - .3 Other concerned parties.
 - .4 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.
- .8 Table current and up to date schedule at each regular site meeting.

1.6 Critical Path Scheduling

- .1 Include complete sequence of construction activities.
- .2 Schedules shall represent a practical plan to complete the work within the Contract period, and shall convey the plan to execute the work. Schedules as developed shall show the sequence and interdependencies of activities required for complete performance of the work.
- .3 The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the work will be executed in the sequence and duration indicated in the schedule.
- .4 Failure to include any element of work required for performance of the Contract or failure to properly sequence the work shall not excuse the Contractor from completing all work within the Contract Time.
- .5 All schedules shall be developed utilizing industry standard 'best practices' including, but not limited to:
 - .1 No open-ended activities.
 - .2 No use of constraints other than those defined in the Contract Documents without the prior approval of the Consultant.
 - .3 No negative leads or lags.
 - .4 No excessive leads or lags without prior justification and approval from the Consultant.
 - .5 For individual schedule construction activities, do not exceed 14 days in duration without prior approval of the Consultant. Subdivide activities exceeding 14 days in duration to an appropriate level.
 - .6 Sufficiently describe schedule activities to include what is to be accomplished in each work area. Express activity durations in whole days. Clearly define work that is to be performed by subcontract.
 - .7 Create the schedule in conformance with the work-hours and constraints set forth in these Contract Documents.
- .6 Include dates for commencement and completion of each major element of construction.
- .7 Show projected percentage of completion of each item as of first day of month.
- .8 Indicate progress of each activity to date of submission schedule.
- .9 Show 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.

.10 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.

1.7 Submittals Schedule

- .1 Include schedule for submitting shop drawings, product data, and samples. Indicate manufacture and delivery lead times into the shop drawing submittal schedule.
- .2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Administrative
- .2 Requests for Information
- .3 Shop Drawings and Product Data
- .4 Interference Drawings
- .5 Progress Photographs
- .6 Samples
- .7 Mock-Ups
- .8 Certificates and Transcripts

1.2 Related Sections

- .1 Section 01 26 15 Requests for Information
- .2 Section 01 31 00 Project Management and Coordination

1.3 Administrative

- .1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in metric units.
- .4 Where items or information is not produced in metric units converted values are acceptable.
- .5 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. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Consultant in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.
- .10 Keep one reviewed copy of each submission on site.

1.4 Requests for Information (RFI's)

- .1 Refer to Section 01 26 15 – Requests for Information

1.5 Shop Drawings and Product Data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, product data and other data which the Contractor provides to illustrate details of a portion of Work.
- .2 Coordinate each submission with requirements of Work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .3 Submit shop drawings bearing stamp and signature of qualified professional Engineer registered or licensed in the Province of Ontario where required by the individual specification sections. Each submittal and each resubmittal must bear the stamp of the Engineer.
- .4 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 design drawings and specifications.
- .5 Prior to submission to Consultant, review all submitted drawings. By this review, Contractor represents to have determined and verified field measurements, site conditions, materials, catalogue number and similar data and to have checked and coordinated each drawing with the requirements of Work and of Contract Documents. Contractor's review of each drawing shall be indicated by stamp, date and signature of a responsible person.
- .6 At time of submission, notify Consultant in writing of any deviations in drawings from the requirements of the Contract Documents.
- .7 Allow ten days for Consultant's review of each submission.
- .8 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .9 Make any changes in submitted drawings which Consultant may require, consistent with Contract Documents and resubmit unless otherwise directed by Consultant. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.
- .10 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 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 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 Submit one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

 - .14 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

 - .15 Delete information not applicable to project.

 - .16 Supplement standard information to provide details applicable to project.

 - .17 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

 - .18 The review of shop drawings by the Consultant is for sole purpose of ascertaining conformance with general concept.
 - .1 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 responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, 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 sub-trades.
- 1.6 Interference Drawings
- .1 Prepare interference drawings to coordinate the installation of the work of all sections, within available space. Conflicts between trades which could be determined beforehand, by the careful coordination and preparation of interference drawings, shall be corrected at no expense to the Owner.

 - .2 Prepare interference drawings of all buried services as necessary to avoid conflicts with new or existing structures, foundations or services.

 - .3 Submit interference and equipment placing drawings as specified in Section 01 71 00, when

requested by the Consultant.

1.7 Progress Photographs

- .1 Progress photograph to be electronically formatted and labelled as to location and view.

1.8 Samples

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin, manufacturer, product information, applicable specification section, and intended use.
- .2 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .3 Where colour, pattern or texture is criterion, submit full range of manufacturer's samples.
- .4 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .5 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.9 Mock-Ups

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Administrative
- .2 Fires
- .3 Disposal of Wastes
- .4 Drainage
- .5 Site Clearing and Plant Protection
- .6 Pollution Control
- .7 Unanticipated Soil Contamination

1.2 Related Sections

- .1 Section 01 41 00 Regulatory Requirements
- .2 Section 01 51 Temporary Utilities
- .3 Section 01 56 00 Temporary Barriers and Enclosures

1.3 References

- .1 Statutes of Canada 1999 Chapter 33.
 - .1 Canadian Environmental Protection Act 1999.
 - .2 SOR/2003-289. Federal Halocarbon Regulations, 2003.
 - .3 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)
- .2 OPSS 805 "Construction Specification for Temporary Erosion and Sediment Control Measures".
- .3 Province of Ontario Environmental Protection Act, R.S.O. 1990, c. E.19
- .4 Ontario Regulation O Reg 406/19 On-Site and Excess Soil Management

1.4 Administrative

- .1 Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation, including those referenced above.
- .2 Failure to comply with environmental requirements may result in a stop work order or assessment of damages commensurate with repair of damage.
- .3 It is the Contractor's responsibility to be aware of environmental requirements and the best management practices and pollution control measures necessary to meet them.
- .4 It is the Contractor's responsibility to obtain and abide by permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction.
- .5 All hazardous materials are to be stored with secondary containment

1.5 Fires

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

1.6 Disposal of Wastes

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.7 Drainage

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing deleterious substances into waterways, sewer or drainage systems.
- .3 Protect storm drains against entry by sediment, debris, oil, or chemicals.
- .4 Control disposal or runoff of water containing deleterious substances or other harmful substances in accordance with local authority requirements.

1.8 Site Clearing and Plant Protection

- .1 Protect trees and plants on site and adjacent properties.
- .2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
- .4 Restrict tree removal to areas indicated.
- .5 Prevent unnecessary disturbance of topsoil and underlying soil from vehicles and heavy equipment.
- .6 Minimize stripping of topsoil and vegetation.
- .7 Comply with the requirements of Ontario Regulation O. REG 406/19, "On-Site and Excess Soil Management", for the importation of new soils and fill materials and the exportation, removal and disposal off-site, of excavated materials. Complete testing of imported and exported materials as required. Unless noted elsewhere, costs for such testing is the responsibility of the contractor and is not included in any allowances. Maintain and submit to authorities having jurisdiction all required test reports, certificates and documentation.

1.9 Pollution Control

- .1 Maintain, inspect, and repair temporary erosion and pollution control features installed under this contract on a weekly basis. Submit inspection logs to the Owner when requested.
- .2 Control emissions from equipment and plant to conform to federal, provincial, and municipal requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Take all measures necessary to prevent material and mud tracking on adjacent roads and streets.
- .5 Use mechanical sweepers as often as necessary to keep adjacent roads and streets clean of material and mud that is deposited from this project.
- .6 On site disposal or clean out of concrete trucks is not permitted. Any spillage of concrete onto

asphalt or other surfaces must be cleaned up before spillage sets.

1.10 Unanticipated Soil Contamination

- .1 Should unanticipated soil contamination be discovered:
 - .1 Stop work and assess the situation for safety.
 - .2 If situation does not appear to be safe, evacuate workers from area.
 - .3 If safe to do so, take immediate steps to control any spread of contamination, in accordance with Contractor's spill prevention and response plan.
 - .4 Immediately contact the Consultant.
- .2 Removal and disposal off site of contaminated materials shall comply with the requirements of Ontario Regulation O Reg 406/19 On-Site and Excess Soil Management.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 References
- .2 Owner's Regulations
- .3 Standards and Definitions
- .4 Designated Substances
- .5 Hazardous Materials
- .6 Spills Reporting
- .7 Protection of Water Quality
- .8 Potable Water Systems
- .9 Soils Management
- .10 Access for Inspection and Testing
- .11 Other Regulatory Requirements

1.2 Related Work

- .1 Section 01 70 03 Safety Requirements

1.3 References

- .1 Perform Work in accordance with Ontario Building Code (OBC), National Fire Code of Canada (NFC), the Canadian Electrical Code CSA C22.1:21, including all Supplements and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Where a material is designated in the Contract Documents for a certain application, unless otherwise specified, that material shall conform to standards designated in the Code. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards invoked by the aforementioned Code.
- .3 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
 - .3 Manufacturer's instructions.
- .4 Where requirements of Contract Documents exceed Code requirements provide such additional requirements.
- .5 Where the Building Code or the Contract Documents do not provide all information necessary for complete installation of an item, then the manufacturer's instructions for first quality workmanship shall be strictly complied with.

1.4 Owner's Regulations

- .1 Conform to requirements, regulations and procedures of the Owner.

1.5 Standards and Definitions

- .1 Where a reference is made to specification standards produced by various organizations and agencies, conform to latest edition of standards, as amended and revised to date of Contract.
- .2 Have a copy of each specified standard which relates to your work available on the site to be produced immediately on Consultant's request.

1.6 Designated Substances

- .1 Stop work immediately when material resembling asbestos, mould or any other designated substance which is not identified in the Designated Substance Report is encountered during the course of the work. Notify Owner and Consultant immediately.
- .2 The Owner will arrange for independent testing of suspected designated substances and removal of such substances encountered on the site during the course of the work.

1.7 Hazardous Materials

- .1 Definition: "Hazardous Material" is material, in any form, which by its nature, may be flammable, explosive, irritating, corrosive, poisonous, or may react violently with other materials, if used, handled or stored improperly. Included are substances prohibited, restricted, designated or otherwise controlled by law.
- .2 Provide SDS for all materials brought to the Place of Work.
- .3 Hazardous Materials will not be introduced for experimental or any other use prior to being evaluated for hazards.
- .4 Make known to the Consultant those hazardous materials or designated substances intended to be used in the workplace and receive permission to use before introducing to the Owner's property.
- .5 Many common construction materials such as asbestos pipe and various insulations are designated substances and shall not be used under any circumstances.

1.8 Spills Reporting

- .1 Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the Consultant. Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1999.
- .2 All spills or discharges of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Consultant.
- .3 This reporting will not relieve the Contractor of his legislated responsibilities regarding such spills or discharges.

1.9 Protection of Water Quality

- .1 No waste or surplus organic material including topsoil is to be stored or disposed of within 30 metres of any watercourses. Run-off from excavation piles will not be permitted to drain directly into watercourses. Where this measure is not sufficient or feasible to control sediment entering the watercourses, sedimentation traps or geo-textile coverage will be required.

- .2 If de-watering is required, the water shall be pumped into a sedimentation pond or diffused onto vegetated areas a minimum of 30 metres from any watercourses and not pumped directly into the watercourses.
- .3 Provide all de-watering and sedimentation control required to properly complete the work of this contract.
- .4 Supply, install and maintain silt/sediment control fencing along the edge of the site to intercept construction runoff silt, to the satisfaction of the Owner.

1.10 Potable Water Systems

- .1 Potable water systems in completed buildings must meet criteria and guidelines established by Provincial and Municipal authorities, prior to occupancy by the Owner.
- .2 Upon completion, submit testing certificates verifying water quality and water systems meets all applicable Provincial and Legislated Standards

1.11 Soils Management

- .1 Comply with the requirements of Ontario Regulation O. REG 406/19, "On-Site and Excess Soil Management", for the importation of new soils and fill materials and the exportation, removal and disposal off-site, of excavated materials. Complete testing of imported and exported materials as required. Unless noted elsewhere, costs for such testing is the responsibility of the contractor and is not included in any allowances. Maintain and submit to authorities having jurisdiction all required test reports, certificates and documentation.

1.12 Access for Inspection and Testing

- .1 Cooperate fully with and provide assistance to, all outside authorities including Building Inspectors, utilities, testing agencies and consultants, with the inspection of the Work.

1.13 Other Regulatory Requirements

- .1 Conform to the requirements of the Ontario Ministry of Transportation, Regional and Local authorities regarding transportation of materials.
- .2 Obtain required road occupancy permits.
- .3 Pay any required roadway damage deposits required by the local municipality.
- .4 Conform to the requirements of the Ontario Ministry of the Environment.
- .5 Conform to the requirements of the Ontario Ministry of Labour.
- .6 Conform to the requirements of the local Conservation Authority.
- .7 Conform to all applicable local by-laws, regulations and ordinances.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

Project: 23034
Description: NEW GYM FLOOR AND DRAINAGE IMPROVEMENTS
ECOLE SECONDAIRE NORVAL-MORRISSEAU
51 WRIGHT STREET, RICHMOND HILL

REGULATORY REQUIREMENTS
Section 01 41 00

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Inspection
- .2 Independent Inspection Agencies.
- .3 Access to Work
- .4 Procedures
- .5 Rejected Work
- .6 Reports
- .7 Contractors Responsibilities
- .8 Tests and Mix Designs
- .9 Mock-Ups
- .10 Equipment and Systems.

1.2 Related Sections

- .1 Section 01 21 00 Cash Allowances

1.3 Inspection

- .1 Contractor is responsible for Quality Control (QC).
- .2 Allow Owner and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

1.4 Independent Inspection Agencies

- .1 Independent Inspection and Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor and paid from the cash allowances specified in Section 01 21 13.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Pay costs for retesting and re-inspection.

1.5 Access to Work

- .1 Allow inspection and testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.6 Procedures

- .1 Notify Owner and Consultant 48 hours in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples

1.7 Rejected Work

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other work damaged by such removals or replacements promptly.
- .3 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Consultant will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.8 Reports

- .1 Submit electronic .pdf format inspection and test reports to Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.9 Contractors Responsibilities

- .1 Be responsible for the execution of the Construction Quality Plan and is to pay all costs for the execution of the Construction Quality Plan. Designate an experienced site representative for carrying out the Construction Quality Plan.
- .2 Provide the Owner with a completed quality product for the Work. Contractor shall be responsible for any costs associated with re-testing and reperforming the Work as a result of the Contractor's poor performance or workmanship or other failure to comply with the Contract Documents.
- .3 All Work shall be done by persons qualified in their respective trades, and the workmanship shall be first-class in every respect. Contractor is responsible for ensuring employees are appropriately trained. All materials and equipment furnished shall be the best of their respective kinds for the intended use and unless otherwise specified, same shall be new and of the latest design.
- .4 The Consultant will have the authority to reject Work that does not conform to the Contract Documents or may require special inspection or testing, whether or not such Work is to be then

fabricated, installed or completed.

- .5 Failure by a Contractor to conduct its operations, means and methods and coordinate proper sequencing of the Work may cause the Owner to withhold payment or any other means deemed necessary to correct non-conforming Work.
- .6 The Owner shall engage a testing firm to perform such engineering laboratory services and on-site inspection as deemed necessary by the Owner. The testing firm will determine compliance with the requirements of the Contract Documents. This Work will not be a service to the Contractors for the performing of tests and checking of materials required of the Contractors.
- .7 Copies of test and inspection reports will be furnished to the Contractor. The laboratory and its representatives will be instructed to promptly call to the attention of the Contractor, any instance of non-compliance with the requirements of the Contract Documents. Failure to so notify the Contractor shall not relieve the Contractor of any of its responsibilities for compliance or making good workmanship or materials which are not in compliance with the requirements of the Contract Documents. The agency shall notify the Consultant and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services
- .8 Contractor's construction materials, procedures and work shall be subject to specified testing procedures and shall be in conformance with the Contract Documents as verified by Testing Agency.
- .9 Cooperate with the testing firm and provide labor to assist with sample preparations where applicable.
- .10 Except where specifically indicated to be provided by another entity as identified, inspections, tests, and similar quality control services including those specified to be performed by independent agency are the Contractor's responsibility, and costs thereof are not to be included in contract sum.
- .11 Cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to Work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at Project site.
- .12 Coordination: Contractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of Work and without the need of removal/replacement of work to accommodate inspections and tests. Scheduling of times for inspections, tests, taking of samples, and similar activities is Contractor's responsibility.
- .13 Where sampling and testing is required for Sections of Work listed in the Contract Documents, the tests shall be performed by an independent testing lab and paid for by the Contractor.
- .14 Test procedures to be used shall be submitted for approval of the Consultant where other than those specified are recommended by the testing agency.
- .15 Testing Agency Duties: The independent Testing Agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Owner, the Consultant and Contractors in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
- .16 Contractor is responsible for scheduling times for inspections, tests, taking samples and similar

activities.

1.10 Tests and Mix Designs

- .1 Furnish test results and mix designs as requested.

1.11 Mockups

- .1 Prepare mockups for Work specifically requested in specifications.
- .2 Construct in locations acceptable to Consultant.
- .3 Prepare mockups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mockups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Mock-ups may remain as part of Work unless indicated otherwise.

1.12 Equipment and Systems

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Appointment and payment.
- .2 Manufacturer's field review.

1.2 Related Sections

- .1 Particular requirements for testing and inspection to be carried out by testing laboratory designated by the Consultant are specified under various sections of the specifications.
- .2 Balancing and testing of systems under Divisions 21 through 28.

1.3 Appointment and Payment

- .1 From time to time during the progress of the Work, the Owner will require that testing and inspection be performed to determine that materials provided in the Work meet the requirements of the Contract Documents.
 - .1 Subcontractors shall verify with Contractor, in writing, portions of the Work that will require testing and/or inspection prior to commencing such affected work.
- .2 The Owner will appoint testing and inspection companies, representing, reporting and responsible to the Owner. Cost of testing and inspection will be authorized as a disbursement of the Cash Allowances as specified in Section 01 21 13 unless otherwise indicated or specified and except for the following:
 - .1 Testing and inspection required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Testing and inspection performed exclusively for Contractor's convenience.
 - .3 Testing, adjusting and balancing of conveying systems, mechanical and electrical equipment and systems. Refer to mechanical specifications for in-contract air-balancing.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under supervision of the Consultant.
 - .6 Where tests or inspections by designated testing laboratory reveal work not in accordance with the Contract requirements, Contractor shall pay costs for additional tests or inspections as Consultant may require to verify acceptability of corrected work.
 - .7 Additional testing required because of changes in materials, proportions of mixes, requested by the Contractor or Subcontractors as well as any extra testing of materials occasioned by lack of identification or failure of such materials being replaced to meet requirements of the Contract Documents or testing of structure or elements including load testing, shall be carried out at no additional cost to the Owner.
 - .8 Where evidence exists that defective workmanship has occurred or that the Work has been carried out incorporating defective materials, the Consultant reserves the right to have tests, inspections or surveys performed, analytical calculation of structural strength made and the like in order to help determine the extent of defect and whether such work must be replaced. Tests, inspections or surveys carried out under these circumstances will be made at the Contractor's expense and will not be paid for by the Owner.
 - .9 Testing and compliance letters specified in other Sections.
- .3 Inspection and testing company shall submit monthly invoice original to the Contractor for review, relating invoices to tests and inspection reports. Provide original receipts for disbursements. Invoices will be forwarded by Contractor to the Consultant for inclusion in progress payment application.

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- .4 The Consultant will work with the Owner's representative and the Contactor's commissioning team to review the work of the Contract during closeout procedures. The Contractor shall be responsible to correct all deficiencies as reported by the Consultant and Owner's representative, and in accordance with the Contract documents. Refer to Sections 01 77 00 for additional closeout and commissioning requirements.
 - .5 Testing and Inspection shall be performed by qualified and/or certified personnel under professional supervision or performed directly by a professional engineer qualified in conformance with applicable codes and certification programs.
 - .6 Requirements of regulatory agencies:
 - .1 Testing shall be conducted in accordance with the requirements of the Building Code.
 - .2 Obtain certification where required by the building code and standards.
 - .7 Cooperation with testing and inspection company.
 - .1 Provide inspection company with materials and installation information as required or as requested.
 - .2 Provide access to the work for representatives of the inspection and testing companies.
 - .3 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
 - .4 Cooperate with testing and inspection companies and give adequate notification of any changes in source of supply, additional work shifts or other proposed changes.
 - .5 No Product nor part of the Work shall be installed before it is tested when a test is specified or required, nor shall work be executed where a test or inspection is required and the inspector cannot attend. Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by the Consultant.
 - .6 Cooperate in permitting access to the Work for testing and inspection company wherever Work is in progress, or wherever Products, materials or equipment are stored prior to shipping.
 - .7 Supply labour required to assist testing and inspection company in sampling and making tests.
 - .8 Repair work damaged as a result of testing and inspection work.
 - .9 Costs of above labour and material shall be borne by applicable Subcontractors.
 - .10 The testing and inspection service does not relieve the Contractor of responsibility for normal shop and site inspection, and quality control of production.
 - .11 Pay costs for removal and replacement of Work, or for remedial measures necessitated by faulty workmanship and materials which fail to meet requirement specified.
 - .8 Prepare schedule for testing and inspection in accordance with Section 01 33 00 and as follows:
 - .1 Establishing Schedule:
 - .1 By advance discussion with the selected testing laboratory, determine the time required by the laboratory to perform its tests and issue each of its findings.
 - .2 Allow required time within Construction Schedule
 - .2 Adherence to Schedule:
 - .1 Contractor shall advise testing and inspection laboratory in advance when testing of the Work is required.
 - .2 When testing and inspection laboratory is ready to test according to predetermined schedule, but is prevented from testing or taking specimens due to incompleteness of the parts of the Work scheduled for testing and inspection, extra costs for testing attributable to the delay may be back-charged to the Contractor at no increase in the Contract Price.
 - .3 Notify Contractor and inspection company at least 3 Working Days before work required to be inspected commences, and arrange for a meeting at the Place of the Work, to be held one Working day before the work starts with the following present:

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- .1 Contractor, a principal of the Sub-contractor whose work is to be inspected or tested, testing and inspection company, manufacturer's representative and Consultant.
 - .4 Give 2 Working Days prior notice to inspection company of the commencement of each phase of the Work requiring inspection and provide inspection company with materials and installation information.
- .9 Reports and Documents:
- .1 Testing and Inspection companies shall submit shop inspection and site inspection reports within 5 Working days of each inspection.
 - .2 Distribute reports as follows:
 - .1 Owner.
 - .2 Consultant.
 - .3 Contractor.
 - .4 Consulting engineers as applicable.
 - .3 Inspectors shall submit a written report on each inspection or test, including pertinent data such as conditions at the Place of the Work, dates, test references, locations of tested materials, actual product identification, procedures and descriptions, site instructions given, recommendations and/or any other information required by standard applicable reporting of tests and inspections.
 - .4 Clearly indicate in report failure of Product or procedures to meet applicable standards, give recommendations for retesting or correction. Contact Consultant immediately when Product or procedure fails to meet applicable standards.
 - .5 Upon completion of those parts of the Work subject to independent testing and inspection, submit to the Consultant duplicate certificates of acceptance of the installation issued by independent testing and inspection company.
- .10 Inspection and Test Specimens:
- .1 Testing and inspection will generally consist of procedures listed in the following paragraphs, but additional tests may be performed as required to verify conformance to Contract Documents.
 - .2 Specimens and samples for testing, unless otherwise specified in the Contract Documents, will be taken by the testing laboratory; sampling equipment and personnel will be provided by the testing laboratory; and deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.
 - .3 Testing and inspection company shall take samples necessary to verify quality as specified by applicable standards or as specified herein. Taking of samples shall not endanger the structure or life and shall be taken so as to best represent the Work as a whole.
 - .4 Samples shall be handled, packaged, stored and delivered so as to best ensure the validity of tests that will be performed on them. Sample handling where required shall duplicate conditions at the Place of the Work (such as site cured concrete cylinders).
- 1.4 Manufacturer's Field Review
- .1 Where manufacturer's field review is specified, manufacturer's representative shall review the relevant parts of work at the Place of Work, or wherever such affected work is in progress, to ensure that work is being executed in accordance with manufacturer's written recommendations.
 - .2 Manufacturer's field review is to ensure that the Products specified are being used in the Work and are being applied on surfaces prepared in accordance with their recommendations and the requirements of the Contract Documents.
 - .3 Manufacturer's representative shall undertake such review weekly, or additionally as necessary, to determine that the work is in accordance with manufacturer's written recommendations.

- .4 Manufacturer's representative shall submit a type written report on manufacturer's letterhead within 2 Working Days after each field review. Report shall document manufacturer's representative's field observations and recommendations.
- .5 Manufacturer's field review reports to be prepared and distributed following the procedures specified for pe reparation and submittal of testing and inspection reports given above.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Temporary utilities

1.2 Related Sections

- .1 Section 01 52 00 Construction Facilities
- .2 Section 01 56 00 Temporary Barriers and Enclosures

1.3 Installation and Removal

- .1 Provide temporary utilities and controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.4 Dewatering

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.5 Water Supply

USE WHERE WATER IS AVAILABLE (EXISTING BUILDINGS)

- .1 Existing sources of water can be made available to the Contractor at no charge, subject to operational requirements. Arrange for connection and pay all costs for installation, maintenance and removal. Conversions or alterations to existing sources of water to meet construction requirements are the responsibility of the Contractor.
- .2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.

1.6 Temporary Heating and Ventilation

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted, unless prior approval is given by the Consultant.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10° C in areas where construction is in progress.
- .5 Ventilating:

- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building may not be used when available, unless there are savings to the Contract Price and Consultant's written permission is obtained stating conditions of use, provisions relating to guarantees on equipment and operation and maintenance of system. Be responsible for damage to heating system if use is permitted.
 - .7 On completion of Work for which permanent heating system is used, replace filters.
 - .8 Ensure Date of Substantial Performance and warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.
 - .9 Pay costs for maintaining temporary heat, when using permanent heating system. Owner will pay utility charges when temporary heat source is existing building equipment.
 - .10 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform to applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct fired combustion units to outside.
 - .11 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.7 Temporary Power and Light

- .1 Existing sources of electric power can be made available to the Contractor. Conversions or alterations to existing sources of electric power to meet construction requirements are the responsibility of the Contractor.
- .2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.
- .3 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected.
- .4 Provide and pay for all temporary power during construction.
- .5 Arrange for connection with utility company. Pay all costs for installation, maintenance and removal.
- .6 Provide and maintain temporary lighting throughout project. Lighting levels shall be sufficient to complete work including inspections. Provide minimum lighting levels of 400 lux at work areas. Lighting levels at floors and stairs not within work areas shall be not less than 160 lux at all times

during construction activity.

.7 All equipment used shall be CSA approved.

.8 Wiring and method of installation shall conform to local power requirements and shall be reviewed by a licensed inspector prior to use.

1.8 Temporary Communication Facilities

.1 Provide and pay for temporary telephone, fax, cellular data, lines and all equipment necessary for Contractor's own use.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Construction aids.
- .2 Site storage.
- .3 Construction parking
- .4 Offices
- .5 Equipment, tool and material storage.
- .6 Sanitary facilities.
- .7 Signage.
- .8 Shoring

1.2 References

- .1 CSA Group (CSA)
 - .1 CAN/CSA Z321-96 (R2006) Signs and Symbols for the Workplace

1.3 Installation and Removal

- .1 Provide construction facilities in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.4 Scaffolding

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

1.5 Hoisting

- .1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment.
- .2 Hoists and cranes shall be operated by qualified operator.

1.6 Site Storage/Loading

- .1 Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.7 Construction Parking

- .1 Parking will be permitted on site at areas designated by the Owner provided it does not disrupt performance of Work or ongoing Owners operations.
- .2 Provide and maintain adequate access to project site.
- .3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

1.8 Offices

- .1 General Contractor and Subcontractors may provide their own offices as necessary and subject to site constraints. Direct location of these offices.

1.9 Equipment, Tool and Material Storage

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.10 Sanitary Facilities

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.11 Construction Signage

- .1 Direct requests for approval to erect a Contractor signboard to Consultant.
- .2 Signs and notices for safety and instruction shall be in English. Graphic symbols shall conform to CAN/CSA Z321.
- .3 Post "Construction Zone" signage outside barrier and entrance to all work areas.
- .4 Maintain approved signs and notices in good condition for duration of project and dispose of off-site on completion of project.
- .5 Install signage to direct site traffic and deliveries to the Construction work areas.

1.12 Shoring

- .1 Examine the site to determine the conditions under which work will be performed.
- .2 Contractor shall formulate his own conclusions as to the extent of the existing conditions and shoring required.
- .3 The method of shoring shall be according to the Contractor's and his Engineer's directions.
- .4 All existing loads must be shored prior to commencement of demolition and removal of load bearing elements.
- .5 All shoring and frame braces must be supplied with a safe load rating which must not be exceeded. Install in accordance with manufacturer's recommended procedures and safety guidelines. Ensure that the safe load conditions of the shoring are not exceeded by dead, live or construction loads.
- .6 All shoring shall be subject to the Consultant's review and approval prior to commencing demolition work.

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- .7 Completely remove all shoring after new structure is installed and all concrete is set.
 - .8 Submit shoring drawings and a proposed installation procedure stamped by a professional engineer registered in the Province of Ontario. Procedures shall follow the information provided on these drawings. The shoring design engineer shall be retained and paid for by the Contractor. The shoring engineer shall review all existing conditions on site prior to completing shoring design.
 - .9 Removal of existing materials without proper engineered shoring is a safety hazard and will not be permitted.
 - .10 Make good all damage to the existing structure and adjoining structures and bear full responsibility for failure to provide adequate shoring.
 - .11 The failure or refusal of the Consultant to suggest the use of shoring, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of the work or of any of their obligations under the Contract, nor impose any liability on the Owner or their agents; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or their agents, or employees, relieve the Contractor from necessity of properly and adequately protecting the existing structure from collapse or damage, nor from and of his obligations under the Contract relating to injury to persons or property, nor entitle him to any claims for extra compensation or an extension in schedule.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Barriers.
- .2 Environmental Controls.
- .3 Traffic Controls.
- .4 Fire Routes.

1.2 Installation and Removal

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

1.3 Site Fencing

- .1 Contractor's lay-down area designated by the Owner must be secure and there must be no access by unauthorized persons. Provide temporary fencing around whole work site. Use modular free-standing fencing: galvanized, minimum 1.8m high, chain link or welded steel mesh, pipe rail. Provide one lockable truck entrance gate and at least one pedestrian door as directed. Equip all gates with locks and keys. Maintain fence in good repair.

1.4 Guard Rails and Barricades

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs and wherever else necessary to prevent accidental falls.
- .2 Provide as required by governing authorities.

1.5 Traffic Barriers

- .1 Where indicated, provide precast concrete barriers conforming to ASTM C825 - 19 Standard Specification for Precast Concrete Barriers.
- .2 Provide sufficient barriers as necessary to protect the public and Owner from construction traffic.
- .3 Remove barriers on completion.

1.6 Weather Enclosures

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure and snow loading.

1.7 Dust Tight Screens

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

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

1.8 Protection for Off Site and Public Property

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.9 Protection of Building Finishes

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 3 days prior to installation.

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

1.10 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.

1.11 Public Traffic Flow

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

1.12 Fire Routes

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

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 This Section specifies administrative and procedural requirements for the following:
 - .1 implementation of an erosion and sedimentation control plan (ESC).

1.2 Related Work

- .1 Section 01 31 00 Project Management and Coordination.

1.3 Reference Standards

- .1 United States Environmental Protection Agency (EPA).
 - .1 2012 US EPA Construction General Permit (CGP).
- .2 EPA 832/R-92-005 - Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices, September 1992.
- .3 Local erosion and sediment control by-laws, regulations, and guidelines

1.4 Definitions

- .1 Erosion: Deterioration, displacement, or transportation of land surface by wind or water, intensified by land-clearing practices related to construction activities.
- .2 Rain or Rainstorm: An event defined causing the pooling of water on road or other impervious surfaces.
- .3 Sediment: Soil and other particulate matter that has been eroded and transported by storm or well production run-off water.
- .4 Snow Melt: An event in snow conditions when the temperature is above 0 degrees C or when environmental conditions causing snow on the ground to melt.

1.5 System Description

- .1 Prevent loss of soil during construction by storm water runoff and wind erosion.
- .2 Protect stockpiled topsoil.
- .3 Prevent sedimentation of storm water and receiving streams with storm drain inlet protection.
- .4 Prevent pollution of the air with dust and particulate matter.
- .5 Protect construction site access points to prevent the deposit of excavated materials on adjacent public property. Remove construction materials from public property promptly.
- .6 Prevent discharge of pollutants on site.

1.6 Regulatory Requirements

- .1 Provide environmental controls as required by applicable code and authority having jurisdiction.

- .2 Conform to municipal requirements for sediment control from excavation.

1.7 Performance Requirements

- .1 The Owner, with the design team, has established that this Project is to reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust.
- .2 Meet the requirements outlined in EPA CGP Section 2.
- .3 Identify and manage construction related pollution in compliance with all municipal, provincial, and federal Acts and regulations.

1.8 Administrative Requirements

- .1 Comply with Section 01 31 00 for project management and coordination procedures.
- .2 Coordination: Contractor to coordinate with other work having a direct bearing on work of this section.

1.9 Submittals

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

1.10 Closeout Submittals

- .1 Comply with Section 01 77 00 for closeout submittal requirements.
- .2 Contractor's Erosion and Sedimentation Control Plan Narrative including:
 - .1 A description of how the ESC plan was implemented,
 - .2 Erosion and sedimentation control measures implemented on site,
 - .3 Timing of the implementation of the plan, and
 - .4 Maintenance protocols used to ensure the proper function of control measures.
- .3 Contractor's Erosion and Sedimentation Control Trade Contractor Declaration
 - .1 Written declaration from the Contractor who implemented the plan, confirming that the ESC plan was carried out appropriately.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Preparation

- .1 Planning and coordination of the construction shall minimize sediment pollution.
- .2 Water courses to be protected at all times. Piling of soil in drainage-ways is not allowed.

3.2 Erosion and Sedimentation Control Requirements

- .1 Meet the requirements of the EPA CGP Section 2 covering effluent limitations applicable to all discharges from construction sites.
- .2 Erosion and Sedimentation Control Requirements (EPA CGP Section 2.1): Installation and maintenance of erosion and sediment controls to minimize the discharge of pollutants from earth-disturbing construction activities.
 - .1 Provide natural buffers or equivalent sediment controls when surface water is located within 15.25 metres of project earthwork.
 - .2 Install sediment controls along site perimeter that will receive stormwater.
 - .3 Minimize sediment track-out. Refer to work site entrance requirements.
 - .4 Control discharges from stockpiled sediment or soil. Refer to stockpiling requirements.
 - .5 Provide dust control measures to avoid pollutant discharge into surface waters.
 - .6 Minimize the disturbance of steep slopes.
 - .7 Preserve native topsoil on site, unless infeasible.
 - .8 In areas to receive landscaping or where water infiltration practices will be installed, minimize soil compaction by restricting vehicle and equipment use or use soil conditioning techniques prior to planting.
 - .9 Protect storm drain inlets.
 - .10 Maintain control measures.
- .3 Stabilization Requirements (EPA CGP Section 2.2): Stabilize stockpiled soils and other exposed portions of the site
 - .1 Meet the deadlines for initiating and completing stabilization when earth-disturbing construction activities stop, temporarily or permanently.
 - .2 Meet the criteria for stabilization, whether using vegetative or non-vegetative cover.
- .4 Pollution Prevention Requirements (EPA CGP Section 2.3): Install and maintain effective pollution prevention measures to prevent the discharge of pollutants.
 - .1 Prohibited discharges.
 - .2 General maintenance requirements.
 - .3 Pollution prevention standards.
 - .4 Emergency spill notification.
 - .5 Fertilizer discharge restrictions.

3.3 Stockpiling

- .1 Material removed from the excavation to be selectively stockpiled in areas, approved by the Consultant, where a minimum of sediment will be generated, and other damage will not result.
- .2 Prevent cleared topsoil and excavated earth stockpiled on site from being eroded by rainstorm, snow melt or wind.

3.4 Municipal Storm Water

- .1 Protect catch basins, drains, culverts, and other points of entry into municipal storm water collection systems.

3.5 Sediment Control

- .1 Limit operation of vehicles on site to paved surfaces or temporary gravel surfaces in order to avoid disturbing the soil.
- .2 Clean concrete trucks, placing and finishing tools and equipment in areas where sediment can be collected and not pollute the storm water collection system, both on and adjacent site.

3.6 Work Site Entrances

- .1 Locate gravel pads at all site access points to reduce the amount of sediment carried off the construction site by vehicles, and to collect sediment from vehicle washing.
- .2 Gravel pads to be 19 mm crushed gravel on geotextile fabric, 300 mm thick, 15 meters long by 4.5 meters wide to accommodate vehicles accessing the site.
- .3 Provide temporary water supply to wash soil from vehicle undercarriages and wheels prior to exiting the construction site.

3.7 Dewatering

- .1 Ensure dewatering pumps are directed to a silt management system, in a location approved by the Consultant, prior to entering the storm water collection system.

3.8 Field Quality Control

- .1 Inspect erosion and sediment control measures, to ensure proper functions are not damaged, each week and after storm events with more than 40 mm rainfall over a 24-hour period.
- .2 Remove sediment accumulations as required, and after each storm event.
- .3 Maintain and repair damaged, clogged and weathered materials.

3.9 Cleaning

- .1 Remove temporary erosion and sediment control devices when need for their service has ended.

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Manufacturer's instructions.
- .3 Quality of Work, coordination and fastenings.
- .4 Dielectric Separation
- .5 Tolerances for Execution of Work.
- .6 Protection of Work in progress.
- .7 Existing Utilities

1.2 Quality

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 Availability

- .1 Review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Storage, Handling and Protection

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.

- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Consultant.
- .9 Touch up damaged factory finished surfaces to Consultant's satisfaction. Use touch up materials to match original. Do not paint over name plates.

1.5 Transportation

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Owner. Contractor shall be responsible for the unloading, handling and storage of such products.

1.6 Manufacturer's Instructions

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re installation at no increase in Contract Price or Contract Time.

1.7 Quality of Work

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .3 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .4 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.8 Coordination

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 Concealment

- .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.10 Remedial Work

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 Location of Fixtures

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Consultant of conflicting installation. Install as directed.

1.12 Fastenings

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 Fastenings – Equipment

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 Dielectric Separation

- .1 Ensure that a dielectric separator is provided in a permanent manner over entire contact surfaces to prevent electrolytic action (galvanic corrosion) between dissimilar materials. Similarly, prevent

corrosion to aluminum in contact with alkaline materials such as contained in cementitious materials.

1.15 Tolerances for Execution of Work

- .1 Unless specifically indicated otherwise, Work shall be installed plumb, level, square and straight.
- .2 Unless acceptable tolerances are otherwise specified in specification sections, or are otherwise required for proper functioning of equipment, site services and mechanical and electrical systems:
 - .1 "Plumb and level" shall mean plumb or level within 1 mm in 1m.
 - .2 "Square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
 - .3 "Straight" shall mean within 1 mm under a 1 m long straight edge.
 - .4 "Flush" shall mean within:
 - .1 6 mm for exterior concrete, masonry and paving materials.
 - .2 1 mm for interior concrete, masonry, tile and similar surfaces.
 - .3 0.5 mm for other interior surfaces.
- .3 Allowable tolerances shall not be cumulative

1.16 Protection of Work in Progress

- .1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by Consultant, at no increase in Contract Price or Contract Time.
- .2 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of the Consultant.

1.17 Existing Utilities

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

1.18 Hazardous Materials

- .1 Report any found or suspected hazardous materials to the Owner.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Safety Requirements
- .2 Fire Protection
- .3 Accident Reporting
- .4 Records on Site

1.2 References

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Fire Commissioners of Canada, FC 301, Standard for Construction Operations.
- .3 National Fire Protection Agency (NFPA)
 - .1 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .4 Occupational Health and Safety Act.
 - .1 R.R.O. 1990, Reg. 860: Workplace Hazardous Materials Information System (WHMIS)
 - .2 O. Reg. 632/05: Confined Spaces
- .5 Ontario Building Code.

1.3 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit to Owner and Consultant copies of the following documents, including updates issued:
 - .1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work
 - .2 Site-specific Health and Safety Plan prior to commencement of work on the work site. Plan shall include but not be limited to the following:
 - .1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.
 - .2 Phone numbers of local fire, police, and ambulance outside of 911 services.
 - .3 Location of nearest medical facility and level of injury that each can service.
 - .3 Submit to the Owner, Consultant and Municipal Fire Department, for review, a "Fire Safety Plan" conforming to Section 2.14 of the National Fire Code of Canada. Maintain a copy of the "Fire Safety Plan" on site.
 - .4 Copies of certification for all employees on site of applicable safety training including, but not limited to:
 - .1 WHMIS.
 - .2 Fall arrest and protection.
 - .3 Suspended Access Equipment.
 - .4 Erection of Scaffolding.
 - .5 License for powder actuated devices.
 - .5 On-site Contingency and Emergency Response Plan addressing:
 - .1 Standard procedures to be implemented during emergency situations.
 - .2 Preventative planning and protocols to address possible emergency situations.
- .3 Guidelines for handling, storing, and disposing of hazardous materials that maybe encountered on site, including measures to prevent damage or injury in case of an accidental spill.
- .4 Incident and accident reports, promptly if and upon occurrence
 - .1 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
 - .2 Accident or Incident Reports, within 24 hours of occurrence.

- .5 Submit other data, information and documentation upon request by the Consultant as stipulated elsewhere in this section.

1.4 Compliance Requirements

- .1 Comply with the latest edition of the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

1.5 Constructor

- .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 OHS Act 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".
- .2 The "Constructor" will be solely responsible for the safety of all persons on the Site.

1.6 Safety Requirements

- .1 Observe and enforce all construction safety measures and comply with the latest edition and amending regulations of the following documents and in the event of any differences among those provisions, the most stringent shall apply:
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, August 1997, Ontario Regulation 213/91 including amendments.
 - .2 Hazardous Products Act and Canada Labour Code.
 - .3 The Workplace Safety and Insurance Board, O. Reg 454.
 - .4 Ontario Building Code Act, Ontario Regulation 332/12 including amendments.
 - .5 National Building Code of Canada, Part 8: Safety Measures on Construction and Demolition Sites.
 - .6 National Fire Code of Canada.
 - .7 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition
 - .8 Environmental Protection Act.
 - .9 The Power Commission Act.
 - .10 The Boiler and Pressure Vessels Act.
 - .11 The Elevators and Lifts Act.
 - .12 The Operating Engineer's Act.
 - .13 Municipal statutes.
- .2 Obey all Federal, Provincial and Municipal Laws, Acts, Statutes, Regulations, Ordinances and By-laws which could in any way, pertain to the work outlined in the Contract, or to any employees of the Contractor. Satisfy all statutory requirements imposed by the Occupational Health and Safety Act and Regulations made thereunder, on a Contractor, and Constructor and/or Employer with respect to or arising out of the performance of the Contractors obligations under this Contract.
- .3 Working at Heights: The supervisor of the project, will be responsible to ensure that his employees and subcontractors/suppliers have current Working at Heights and Fall Protection certification.
- .4 The supervisor of the project will be responsible for his employees and subcontractors/suppliers maintaining standard safety practices, as well as the specific safety rules listed below, while working on the Owner's property.

- .5 The Owner reserves the right to order individuals to leave the site if the individual is in violation of any safety requirement or any Act. Any expense incurred will be the responsibility of the Contractor.
- .6 Notify the Owner should any hazardous condition become apparent.
- .7 Enforce the use of CSA approved hard hats, reflective vests and safety boots for all persons entering or working at the construction site. Refuse admission to those refusing to conform to this requirement.
- .8 Provide safeguard and protection against accident, injury or damage to any person on the site, adjacent work areas and adjacent property.

1.7 Confined Space

- .1 Confined Space: Where applicable, provide the Consultant and all Regulatory Authorities with a copy of the Contractors' Confined Space Entry Procedure. In the event that defined procedures are not available, abide by the applicable requirements of the Occupational Health and Safety Act and all regulations made thereunder.
- .2 Persons intended to work in confined spaces, as defined by the Owner, must have formal training in performing work in confined spaces.
- .3 Provide proof of valid certificates of such training for all workers prior to entry of such workers into confined spaces.
- .4 Provide all necessary safety equipment for entry into confined spaces.
- .5 Where workers are required to enter a confined space, as defined by the OHSA, O. Reg. 632/05 Section 221.2, ensure that workers of the Contractor and all Subcontractors follow the requirements of the above legislation, including but not limited to:
 - .1 Having a method for recognizing each confined space to which the program applies
 - .2 Having a method for assessing the hazards to which workers may be exposed
 - .3 Having a method for the development of confined space entry plans (which include on-site rescue procedures)
 - .4 Having a method for training workers
 - .5 Having an entry-permit system.
 - .6 Supply the necessary tools and equipment to perform the confined space entry. These items include, but are not limited to, required documentation, gas detectors, breathing equipment, fall protection and rescue equipment.

1.8 Safety Meetings

- .1 Site toolbox safety meetings will be held weekly for all Contractor employees and all sub trade contractors.
- .2 Where a Joint Health and Safety Committee is required on a project, workers and supervisors, selected, as members of the committee must attend.

1.9 Workplace Hazardous Materials Information System (WHMIS)

- .1 Be familiar with WHMIS regulations and be responsible for compliance.

- .2 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.
- .3 Be responsible for all other requirements of regulations as applicable to Employers.
- .4 All controlled products to be properly labelled and stored.
- .5 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

1.10 Fire Protection

- .1 Provide and maintain safeguard and protection against fire in accordance with current fire codes and regulations.
- .2 Provide temporary fire protection throughout the course of construction. Particular attention shall be paid to the elimination of fire hazards.
- .3 Comply with the requirements of FCC No. 301 Standards for Construction Operations issued by the Fire Commissioner of Canada and the National Building Code.
- .4 Provide and maintain portable fire extinguishers during construction, in accordance with Part 6 of the National Fire Code of Canada 2015 and NFPA 241.
- .5 Maintain unobstructed access for firefighting at all areas in accordance with the National Building Code of Canada.

1.11 First Aid

- .1 Provide such equipment and medical facility as required by WSI Act to supply first aid services to anyone who may be injured at the place of Work. Report all accidents or injuries to the proper authorities and to the Owner and Consultant.

1.12 Accident Reporting

- .1 Investigate and report incidents and accidents as required by Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

1.13 Records on Site

- .1 Maintain on site a copy of the safety documentation as specified in this Section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.
- .2 Upon request, make copies available to the Consultant.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

Project: 23034
Description: NEW GYM FLOOR AND DRAINAGE IMPROVEMENTS
ECOLE SECONDAIRE NORVAL-MORRISSEAU
51 WRIGHT STREET, RICHMOND HILL

SAFETY REQUIREMENTS
Section 01 70 03

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Field Engineering survey services.
- .2 Survey services to establish and confirm inverts for Work.
- .3 Recording of subsurface conditions found.

1.2 References

- .1 Owner's identification of existing survey control points and property limits.

1.3 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit name and address of Surveyor to Consultant.
- .3 On request of Consultant, submit documentation to verify accuracy of field engineering work.
- .4 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform to Contract Documents.

1.4 Examination of Work and Site

- .1 Examine the site and existing building to be fully informed of their particulars as related to the Work.
- .2 Verify dimensions of completed Work in place before fabrication of Work to be incorporated with it. Ensure that all necessary job dimensions are taken for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions.
- .3 No claims for extra payment will be paid for extra work made necessary or for difficulties encountered due to conditions of the site which were visible or reasonably inferable from an examination of the site at the time prior to RFP closing date and furthermore, failure of the Contractor to visit and examine the site shall be deemed a waiver of all claims for extra payment due to any condition of the site existing prior to RFP closing date.
- .4 As-found damage: Record by photography and submit evidence to Consultant before commencing work, any found damaged surfaces or materials adjacent to new work, and not included under scope of this new work. Remedial work to any damage, not so recorded, shall be the responsibility of the Contractor.

1.5 Qualifications of Surveyor

- .1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Consultant.

1.6 Survey Reference Points

- .1 Existing control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Consultant.

- .4 Report to Consultant when reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.7 Survey Requirements

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill and topsoil placement and landscaping features.
- .4 Stake slopes and berms.
- .5 Establish pipe invert elevations.
- .6 Stake batter boards for foundations.
- .7 Establish foundation and floor elevations.
- .8 Establish lines and levels for mechanical and electrical work.

1.8 Existing Services

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings. The Contractor is responsible for coordination of all utility locates.
- .2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut off points as directed by Consultant.
- .3 Where Work involves breaking into or connecting to existing services, carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to building occupants, pedestrian and vehicular traffic.
- .4 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
- .5 Install temporary drain plugs to prevent construction debris from blocking pipes downstream of the work.
- .6 All existing concrete floor slabs shall be scanned prior to any cutting or breaking of concrete. Employ a qualified concrete scanning company or inspection and testing agency to scan and map floor slabs for reinforcing, plastic and metal conduit, piping, grounding cables, embedment and the like. Map all slabs and provide copies to the Owner and Consultant.

1.9 Location of Services, Equipment and Fixtures

- .1 Location of services, equipment, fixtures and outlets indicated on drawings or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance. Include existing equipment which affects or will be affected by the work.

- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Location of site services where required, is approximate and is based on information provided by the Owner. Undertake all locates to determine exact locations of existing services and lay out new services to avoid any conflicts with new building elements, including site improvements, building foundations and other new or existing services.
- .5 Submit field drawings and interference drawings to indicate relative position of various services and equipment. Refer to requirements for interference drawings specified elsewhere.
- .6 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.
- .7 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus and connections are coordinated.
- .8 Ensure that clearances required by jurisdictional authorities and clearances for proper maintenance and access are indicated and maintained.
- .9 Submit interference drawings to Owner and Consultant in accordance with Section 01 33 00.

1.10 Records

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.

1.11 Subsurface Conditions

- .1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Layout and Survey

1.2 Layout and Survey

- .1 Existing grades, lines, and site conditions shown on drawings were taken from survey information established by persons engaged directly by the Owner. The accuracy of survey information is not the Owner's responsibility. Establish location of property lines.
- .2 Be responsible for setting out the Work. Prior to setting out the Work, verify dimensions and elevations shown on the Contract Documents and report to the Consultant any unsatisfactory conditions that may adversely affect the proper completion of the Work.
- .3 Set up and maintain permanent reference points and be responsible for the accuracy of such reference points. Establish lines and levels required for the performance of the Work.
- .4 Accurately set out the Work from levels and lines. Where Work of this Contract is dependent upon grades and elevations of existing structures or facilities, such grades or elevations shall take precedence over those determined by reference to established elevations. Advise the Consultant of any discrepancies.
- .5 During any activity of the Work, employ a Land Surveyor licensed to practice in the place of Work to layout and check all features, including but not limited to the following:
 - .1 Lay out building on the Site.
 - .2 Establish a permanent benchmark, or markers as widely separated as possible
 - .3 Establish and maintain temporary benchmarks set in suitable locations.
 - .4 Provide general dimensions, lines and elevations required by Subcontractors.
 - .5 Verify elevations of floor and roof levels as construction proceeds and relate to benchmark datum.
 - .6 Verify that present or known future restrictions are not violated by construction on the site or lines of traverse to all public utilities.
 - .7 Correlate geodetic elevation of benchmark datum with elevations in use by public utilities adjacent to Project.
 - .8 Verify accuracy of site dimensions shown on Drawings.
 - .9 Provide a survey to verify location of footings immediately adjacent to property lines, before construction of footings proceeds.
 - .10 Provide a survey to verify location of building related to property lines when foundation walls are completed to grade level.
 - .11 Provide a survey prior to placement of asphalt and concrete paving to confirm that grades conform to grades indicated on drawings.
 - .12 Provide a survey to verify location of completed building on Site.
- .6 Examine, preserve and protect established benchmarks. Re-establish a lost or displaced benchmark by a Land Surveyor licensed to practice in the place of Work at no cost to the Owner. Accept responsibility for setting out the Work.
- .7 In the event of a discrepancy between the Owner and the Contractor regarding horizontal and/or vertical alignment conditions, that are beyond allowable specified tolerance, the Owner may engage the services of an independent Land Surveyor. The surveyor shall investigate the disputed condition and the results of the independent investigation shall determine the bearer of costs for this service, being either the Owner or the Contractor.

- .8 If the Contractor is found to be in error, all costs incurred to correct the condition shall be assumed by the Contractor.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Surrounding site condition survey
- .2 Protection of existing structures and utilities
- .3 Adjacent building air intakes

1.2 Surrounding Site Condition Survey

- .1 Prior to commencing the Work, tour the Project site with Owner and Consultant to examine and record damage to existing adjacent buildings, streets, sidewalks, bicycle paths, and all other improvements. This record shall serve as a basis for determination of subsequent damage due to Contractor's operations and shall be signed by all parties making the tour. Any cracks, sags, or damage to the adjacent buildings and improvements not noted in the original survey, but subsequently discovered, shall be reported to the Consultant.

1.3 Protection of Existing Structures and Utilities

- .1 The Drawings show, if applicable, existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, steam and steam condensate return lines, chilled water, landscape irrigation, site lighting and other utilities that are known to the Owner in their approximate location. Exercise care in avoiding damage to these facilities. The Contractor will be held responsible for the repair if damaged. The Owner or Consultant does not guarantee that all utilities or obstructions are shown or that the locations indicated are accurate.
- .2 Locate and surface mark all known existing underground structures and utilities before proceeding with construction operations that may damage them. Stake and flag utility valve boxes and other surface structures. Prior to commencing excavation and trenching, obtain field verification and marking of utilities within limits of Project site. Coordinate with Consultant and Owner well in advance to schedule the Pre-Dig Conference for each excavation activity, in accordance with Section 01 31 00 Project Management and Coordination. Existing underground structures and utilities shall be kept in service unless approval to interrupt or shutdown service is obtained from Owner. If damaged, the utility shall be repaired at no additional cost to the Owner.
- .3 Uncover, prior to any earthwork for new construction, all existing piping where crossings, interferences, close proximity (1.5 metres or less) or connections are shown on the Drawings, from 300 mm below proposed construction limit to the existing ground surface. Any variation in the actual elevations and the indicated elevations shall be brought to the Consultant's attention. If the Contractor does not expose all existing utilities, Contractor shall not be entitled to additional compensation for Work necessary to avoid interferences.
- .4 If interferences occur at locations other than the general locations shown on the Drawings, and such utilities are damaged before their locations have been established, or create an interference, notify the Consultant and a method for repairing the damage or correcting the interference shall be supplied by the Consultant. Payment for additional Work due to interferences not shown on the Drawings shall be in accordance with the General Conditions.
- .5 Care shall be exercised to prevent damage to adjacent facilities including walks, streets, curbs, and gutters from settlement, lateral movement, undermining, and washout and other hazards; where equipment will pass over these obstructions suitable planking shall be placed. Damaged facilities, due to the Contractor operations, shall be removed and replaced at no additional cost to the Owner.

- .6 If any other structures or utilities are encountered, request Consultant to provide direction on how to proceed with the Work.
- .7 If any structure or utility is damaged, take immediate action to ensure the safety of persons and property. Correct damage immediately. Contractor shall bear all costs of correction, replacement, repair, restoration, including related damages additional testing, inspection, and compensation for Consultants services and expenses. Compensation to the Owner shall be made by deductive Change Order.
- .8 No Work is to be performed on energized electrical equipment unless scheduled with the Consultant. The Owner reserves the right to specify specific conditions for all Work involving energized high-voltage electrical equipment.

1.4 Adjacent Building Air Intakes

- .1 For existing building air intakes located within 30 metres of the construction site boundary, provide and maintain prefilters on the exterior of the louvers.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

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

1.2 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit written request and obtain Consultant's approval in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather exposed or moisture resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight exposed elements.
 - .5 Work by Owner or other contractor.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 .Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Date and time work will be executed.

1.3 Materials

- .1 As specified and required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 25 00 - Substitution Procedures.
- .3 Requests for change in materials shall include documentation indicating conformance to project requirements and intent.

1.4 Definitions

- .1 Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- .2 Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

PART 2 PRODUCTS

2.1 Materials

- .1 General: Comply with requirements specified in other Sections.
- .2 In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

- .3 If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Consultant for the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.1 Preparation

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

3.2 General

- .1 Carry out all cutting, fitting and patching required for the work of the Contract.
- .2 Repair all wall and floor surfaces where items have been removed.
- .3 Make good all finishes as required.
- .4 Repaint damaged wall surfaces.
- .5 Fit several parts together, to integrate with other Work.
- .6 Uncover Work to install ill-timed Work.
- .7 Remove and replace defective and non-conforming Work.
- .8 Provide cutting and patching of all openings in non-structural elements of Work as necessary to complete installation of mechanical and electrical Work. Include complete removal and replacement of such elements as necessary to provide construction access.
- .9 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .10 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .11 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.
- .12 Restore work with new products in accordance with requirements of Contract Documents.
- .13 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

- .14 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with "ULC approved firestopping material, full thickness of the construction element. Include any openings in existing building elements created by removal of existing services or equipment.
- .15 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

3.3 Cutting and Patching

- .1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
- .2 Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- .3 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- .4 Temporary Support: Provide temporary support of work to be cut.
- .5 Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- .6 Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 - Summary of Work.
- .7 Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- .8 Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - .1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - .2 Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - .3 Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - .4 Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - .5 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - .6 Proceed with patching after construction operations requiring cutting are complete.
- .9 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where

applicable.

- .1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - .2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - .1 Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - .2 Restore damaged pipe covering to its original condition.
 - .3 Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, colour, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.
 - .1 Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - .4 Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - .5 Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- .10 Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.4 Subfloor Levelling

- .1 Where existing flooring is to be removed from floor slabs to remain, including ceramic tile flooring, carefully remove all flooring, grout, adhesives, waterproofing membranes and the like down to the base slab. Clean, patch and repair slab where damaged with concrete or acceptable leveling compound in accordance with new flooring manufacturer's instructions and ASTM F710. Refer to original building drawings and remove and replace existing concrete floor toppings as necessary and where required.
- .2 Where new flooring is to be installed on new concrete slab or on framed floors, subfloor shall be levelled in accordance with flooring manufacturer's specifications and tolerances and with ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

3.5 Fire Barrier Seals

- .1 Ensure fire separations are maintained as indicated on the drawings. patch and firestop all penetrations accordingly.

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Progressive Cleaning
- .2 Final Cleaning

1.2 References

- .1 National Fire Protection Association (NFPA)
 - .1 NFPA 241-22 Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.3 Project Cleanliness

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use clearly marked separate bins for recycling.
- .7 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

PART 2 PRODUCTS

2.1 Products

- .1 All cleaning materials and products shall be low VOC type. Submit list of cleaning products including SDS for approval prior to commencement of cleaning operations.
- .2 Use only cleaning materials recommended by manufacturer of surface to be cleaned and recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 Final Cleaning

- .1 When Work is Substantially Performed 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 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.
- .6 Clean lighting reflectors, lenses, and other lighting surfaces. Clean and/or replace lamps, light fixtures, grilles and lenses.
- .7 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .8 Thoroughly vacuum clean interior of electrical equipment.
- .9 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .10 Clean and seal concrete floor surfaces with non-skid matte sealer.
- .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .12 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
- .13 Broom clean and wash exterior paved areas, walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs. Clear all drains, scuppers, gutters and downspouts.
- .16 Remove debris and surplus materials from crawl spaces and other accessible concealed spaces.
- .17 Remove snow and ice from access to building.
- .18 Under direction of Consultant, aim adjustable luminaires.

3.2 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 References.
- .2 Submittals.
- .3 Definitions.
- .4 Waste Management Goals for the Project.
- .5 Documents.
- .6 Waste Management Plan.
- .7 Materials Source Separation Program.
- .8 Disposal of Wastes.
- .9 Scheduling.
- .10 Storage, Handling and Protection.
- .11 Application.
- .12 Diversion of Materials.

1.2 Related Sections

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 35 00 Environmental Procedures
- .3 Section 01 74 11 Cleaning

1.3 References

- .1 O. Reg. 102/94 Waste Audits and Waste Reduction Work Plans.
- .2 O. Reg. 278/05 Occupational Health and Safety Act

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit a completed Waste Management Plan (WMP) prior to project start-up.

1.5 Definitions

- .1 Waste Management Plan (WMP): Contractor's approved overall strategy for waste management including waste reduction workplan and materials source separation program.
- .2 Materials Source Separation Program (MSSP): Consists of a series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .3 Separate Condition: Refers to waste sorted into individual types.

1.6 Waste Management Goals for the Project

- .1 The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing over packaging and poor quantity estimating.

- .2 Of the waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling. Waste disposal in landfills or incinerators shall be minimized.

1.7 Waste Management Plan

- .1 Waste Management Plan: Submit a Waste Management Plan within 10 calendar days after receipt of Notice of Award of Contract, or prior to any waste removal, whichever occurs sooner. The Plan shall contain the following:
 - .1 Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project should also be prepared
 - .2 Alternatives to Land Filling: Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the course of the Project.
- .2 Post WMP or summary where workers at site are able to review its content.

1.8 Materials Source Separation Program

- .1 The Waste Management Plan shall include a Source Separation Program for recyclable waste and shall be in accordance with the established policies currently in place at the local Municipality, and the requirements of O. Reg. 102/94.
- .2 Prepare MSSP and have ready for use prior to project start-up.
- .3 Implement MSSP for waste generated on project in compliance with approved methods and as approved by Consultant.
- .4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.
- .5 Provide containers to deposit reusable and/or recyclable materials.
- .6 Locate containers to facilitate deposit of materials without hindering daily operations.
- .7 Locate separated materials in areas which minimize material damage.
- .8 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

1.9 Disposal of Wastes

- .1 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .2 Provide appropriate on-site containers for collection of waste materials and debris. Containers for volatile wastes shall be closed containers and shall be removed from site daily.
- .3 Provide and use clearly marked separate bins for recycling.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.

- .5 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .6 Do not permit waste to accumulate onsite.
- .7 Burying of rubbish and waste materials is prohibited.
- .8 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

1.10 Scheduling

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

1.11 Storage, Handling and Protection

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Owner.
- .2 Materials from building demolition to be salvaged or re-used are to be removed and salvaged.
- .3 Unless specified otherwise, materials for removal become Contractor's property.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Application

- .1 Do work in compliance with Waste Management Plan.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.
- .3 Source separate materials to be reused/recycled into specified sort areas.

3.2 Diversion of Materials

- .1 Separate materials from general waste stream and stockpile in separate piles or containers, to approval of Owner, and consistent with applicable fire regulations. Mark containers or stockpile areas.
- .2 On-site sale of materials is not permitted.

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 Administrative procedures preceding preliminary and final inspections of Work.

1.2 References

- .1 Canadian Construction Documents Committee
 - .1 CCDC 2-2020 Stipulated Price Contract including Supplementary Conditions.
 - .2 OAA/OGCA Document 100 - Recommended Procedures Regarding Substantial Performance of Construction Contracts and Completion Takeover of Projects.
 - .3 The Construction Act.

1.3 Inspection and Declaration

- .1 Contractor's Inspection: The Contractor shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents. Submit duplicate copies of the deficiency list to the Owner and Consultant.
 - .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Consultant's review.
- .2 Consultant's Review: Consultant and Contractor will perform review of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.
- .3 Completion: submit written certificate that following have 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 Equipment and systems have been tested, adjusted and balanced and are fully operational.
 - .4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies, TSSA, ESA and other regulatory agencies have been submitted.
 - .5 Operation of systems have been demonstrated to Owner's personnel.
 - .6 Work is complete and ready for Final Review by the Consultant.
- .4 Final Inspection: when items noted above are completed, request final review of Work by Consultant, and Contractor. If Work is deemed incomplete by the Consultant, complete outstanding items and request re-review.
- .5 Declaration of Substantial Performance: when Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC 5.4 - Substantial Performance of Work and Payment of Holdback for specifics to application.
- .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment: When Consultant considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2, General Conditions Article GC 5.5 – Final Payment for specifics to application.

- .8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2, General Conditions Article 5.4 - Substantial Performance of Work and Payment of Holdback.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 As built, samples, and specifications.
- .2 Equipment and systems.
- .3 Product data, materials and finishes, and related information.
- .4 Operation and maintenance data.
- .5 Spare parts, special tools and maintenance materials.
- .6 Warranties and bonds.
- .7 Final site survey.

1.2 Submittals

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

1.3 Submission

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 At least 2 weeks prior to commencement of scheduled commissioning activities, submit 2 copies of the DRAFT Operating and Maintenance Manuals, for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor 1 DRAFT copy, with review comments, for revision. Submit 1 copy of the revised Operating and Maintenance for approval prior to the production of FINAL copies. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the FINAL Operating and Maintenance Manuals.
- .3 Building will not be deemed ready for use unless the draft copies of the Operating and Maintenance Manuals and the "As-built" Record Documents have been submitted and reviewed by the Consultant.
- .4 Building will not be deemed ready for use unless the completed and submitted Operating and Maintenance Manuals and "As-built" Record Documents have been accepted by the Consultant.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.

1.4 Format

- .1 Organize data in the form as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.

- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in .dwg format. Provide duplicate copies on memory stick.

1.5 Contents Each Volume

- .1 Table of Contents: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.6 As-Builts and Samples

- .1 In addition to requirements in General Conditions, maintain at the site for Consultant one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.

Provide files, racks, and secure storage.

- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Consultant.

1.7 Recording Actual Site Conditions

- .1 Record information on set of drawings, provided by Consultant.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: 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.
- .4 Submit following drawings:
 - .1 Record changes in red. Mark on one set of prints and at completion of project prior to final inspection, produce electronic "as-built" records on disk using latest version of AutoCad. Annotate "AS-BUILT RECORD" in each drawing title block.
 - .2 All changes shall be shown on a separate drawing layer named "as-built".
 - .3 At least 2 weeks prior to commencement of scheduled commissioning activities, submit one copy of the draft "As-built" Project Record Documents for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor the draft copy, with review comments, for revision. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the final "As-built" Project Record Documents and disk of "as-built" record drawings.
- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 Final Survey

- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or

non-conformance with Contract Documents.

1.9 Equipment and Systems

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with Engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.
- .15 Additional requirements: as specified in individual specification sections.

1.10 Materials and Finishes

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .2 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 Additional Requirements: as specified in individual specifications sections.

1.11 Spare Parts

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Spare parts as identified in individual sections are to be delivered to the Owner prior to the Contractor's application for Substantial Performance.
- .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.12 Maintenance Materials

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Maintenance materials are to be delivered to the Owner prior to the Contractor's application for Substantial Performance.
- .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.13 Special Tools

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Special tools are to be delivered to the Owner prior to the application for Substantial Performance.
- .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.14 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.

1.15 Warranties and Guarantees

- .1 Separate each warranty or guarantee with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and guarantees, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co-execute submittals when required.
- .7 Retain warranties and guarantees until time specified for submittal.

1.16 Independent Specialty Engineers Sign-Off

- .1 Prior to Substantial Performance, provide copies of signed and stamped engineers review and sign-off letters stating that the work has been built in accordance with their drawings and designs. Conditional or vague letters of sign-off will not be accepted. All specialty design engineers for all sub-contractors and suppliers will be required to review the work in progress at appropriate intervals to ensure compliance with their designs and drawings and shall provide final sign-off letters. Provide copies of all field reports issued by specialty engineers. Carry all costs associated with full compliance with this requirement.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 02 41 14 Asphalt Paving Removal
- .2 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 The National Building Code of Canada, Part 8, Safety Measures on Construction and Demolition Sites.
- .2 Ontario Provincial Regulations
 - .1 Ontario Regulation 102/94 Waste Audits and Waste Reduction Work Plans.
 - .2 Ontario Regulation 103/94 Environmental Protection Act.
 - .3 Ontario Regulation 213/07 The Fire Code.
 - .4 Ontario Regulation 232/98 Landfilling Sites.
 - .5 Ontario Regulation 347 Environmental Protection Act, General - Waste Management.
- .3 The Workplace Health and Safety Act, and Regulations for Construction Projects.
- .4 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37
 - .2 Canadian Environmental Protection Act 1999 (CEPA), c. 33
- .5 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005 Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .3 Submit plan indicating: Descriptions of and anticipated quantities of materials to be salvaged, reused, recycled and landfilled.
- .4 Submit copies of certified weigh bills, bills of lading or receipts from authorized disposal sites and reuse and recycling facilities for material removed from upon request from Consultant.

1.5 Quality Assurance

- .1 Preconstruction Meeting: Arrange a reconstruction Meeting: Arrange a preconstruction meeting attended by Contractor's key personnel to discuss the following:
 - .1 Verify project requirements
 - .2 Review site conditions
 - .3 Coordination with other Subcontractors affected by work of this Section
 - .4 Examine existing site conditions adjacent to demolition work, prior to start of Work
 - .5 Waste reporting requirements
- .2 Arrange for site visit with Consultant to examine existing site conditions adjacent to demolition work prior to start of Work.

- .3 Coordination: Coordinate requirements for Waste Management and Disposal for materials being re used or recycled in accordance with Section 01 74 19.
 - .1 Divert excess materials from landfill
 - .2 Separate materials identified for recycling place in identified areas in accordance with Waste Management Plan
 - .3 Label location of salvaged material's storage areas and provide barriers and security devices
 - .4 Remove materials that cannot be salvaged for re use or recycling and dispose of in accordance with applicable codes at licensed facilities
- .4 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA and applicable Provincial regulations.
- .5 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
- 1.6 Shipping, Handling and Storage
 - .1 Refer to Section 01 61 00 – Common Product Requirements.
 - .2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Consultant and at no cost to Owner.
 - .3 Remove and store materials to be salvaged, in manner to prevent damage.
- 1.7 Project Conditions
 - .1 Protect existing site features to remain or identified for salvage or re use; make repairs and restore to a similar condition to existing where damage to these items occurs as directed by the Consultant and at no cost to Owner:
 - .1 Remove and store salvaged materials to prevent contamination.
 - .2 Store and protect salvaged materials as required for maximum preservation of material.
 - .3 Handle salvaged materials the same as new materials.
 - .2 Protect trees, plants and foliage on site and adjacent properties where indicated.
 - .3 Protect existing site features and structures, trees, plants and foliage on site and adjacent properties.
 - .4 Provide erosion and sedimentation control as specified in Section 31 23 10 and on site development drawings.
 - .5 Ensure that demolition work does not adversely affect adjacent water courses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .6 Do not dispose, of waste or volatile materials such as mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
 - .7 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- 1.8 Waste Management and Disposal
 - .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Preparation

- .1 Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities, preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Separate work areas from areas occupied by the Owner and the public, as specified in Section 01 56 00.

3.2 Removal of Hazardous Wastes

- .1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.3 Removal Operations

- .1 Remove items as indicated.
- .2 Salvage for res use existing signage, where indicated. Existing concrete sign bases shall be removed entirely.
- .3 Do not disturb items designated to remain in place.
- .4 Removal of pavement, curbs and gutters: refer to Section 02 41 14
- .5 When removing pipes under existing or future pavement area, excavate at least 300mm below pipe invert.
- .6 Decommission monitoring wells in accordance with Provincial guidelines and regulations.
- .7 Removal from site: Interim removal of stockpiled material will be required by Consultant, if it is deemed to interfere with operations of Owner.
- .8 Sealing: Seal pipe ends and walls of manholes or catch basins as indicated. Securely plug to form watertight seal. Refer to site development drawings.
- .9 Backfill: refer to Section 31 23 10.

3.4 Restoration

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

- .2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.
- .3 Restore areas within public roadways and road allowances in accordance with municipal standards.

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon completion of work, remove debris, trim surfaces and leave work site clean.
- .3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 02 41 13 Selective Site Demolition
- .2 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 Ontario Provincial Regulations
 - .1 Ontario Regulation 102/94 Waste Audits and Waste Reduction Work Plans.
 - .2 Ontario Regulation 103/94 Environmental Protection Act.
 - .3 Ontario Regulation 213/07 The Fire Code.
 - .4 Ontario Regulation 232/98 Landfilling Sites.
 - .5 Ontario Regulation 347 Environmental Protection Act, General - Waste Management.
- .2 The Workplace Health and Safety Act, and Regulations for Construction Projects.
- .3 Department of Justice Canada (Jus):
 - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37
 - .2 Canadian Environmental Protection Act, 1999 (CEPA), c. 33

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .3 Submit plan indicating:
 - .1 Descriptions of and anticipated quantities of materials to be salvaged, reused, recycled and landfilled.
 - .2 Schedule of selective demolition.
 - .3 Submit copies of certified weigh bills, bills of landing from authorized disposal sites and reuse and recycling facilities for material removed from upon request from Consultant.
- .4 Informational Submittals: Provide the following submittals during the course of the work:
 - .1 Certificates: Submit copies of certified weigh bills, bills of lading or receipts from authorized disposal sites and re use and recycling facilities for material removed from site.

1.5 Quality Assurance

- .1 Preconstruction Meeting: Arrange a preconstruction meeting attended by Contractor's key personnel to discuss the following:
 - .1 Verify project requirements
 - .2 Review site conditions
 - .3 Coordination with other Subcontractors affected by work of this Section
 - .4 Examine existing site conditions adjacent to demolition work, prior to start of Work
 - .5 Waste reporting requirements

- .2 Arrange for site visit with Consultant to examine existing site conditions adjacent to demolition work prior to start of Work.
 - .3 Coordination: Coordinate requirements for Waste Management and Disposal for materials being re used or recycled in accordance with Section 01 74 19.
 - .1 Divert excess materials from landfill
 - .2 Separate materials identified for recycling place in identified areas in accordance with Waste Management Plan
 - .3 Label location of salvaged material's storage areas and provide barriers and security devices
 - .4 Remove materials that cannot be salvaged for re use or recycling and dispose of in accordance with applicable codes at licensed facilities
 - .4 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA and applicable Provincial regulations.
 - .5 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
- 1.6 Project Conditions
- .1 Protect existing site features to remain or identified for salvage or re use; make repairs and restore to a similar condition to existing where damage to these items occurs as directed by the Consultant and at no cost to Owner:
 - .1 Remove and store salvaged materials to prevent contamination.
 - .2 Store and protect salvaged materials as required for maximum preservation of material.
 - .3 Handle salvaged materials the same as new materials.
 - .2 Protect trees, plants and foliage on site and adjacent properties where indicated.
 - .3 Perform pavement removal work to prevent adverse effects to adjacent watercourses, groundwater and wildlife, and to prevent excess air and noise pollution:
 - .1 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
 - .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authorities Having Jurisdiction.
 - .4 Protect existing site features and structures, trees, plants and foliage on site and adjacent properties.
 - .5 Provide erosion and sedimentation control as specified in Section 31 23 10 and on site development drawings.
 - .6 Ensure that demolition work does not adversely affect adjacent water courses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .7 Do not dispose, of waste or volatile materials such as mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
 - .8 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Equipment

- .1 Use cold milling, planning or grinding equipment with automatic grade controls capable of operating from string line, and capable of removing part of pavement surface to depths or grades indicated.

PART 3 EXECUTION

3.1 Preparation

- .1 Verify extent and location of asphalt identified for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities, preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Temporary Erosion and Sedimentation Control:
- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal
- .5 Prior to beginning removal operation, inspect and verify with Consultant areas, depths and lines of asphalt pavement to be removed.
- .6 Protection: protect existing pavement not designated for removal, lighting fixtures, signage and structures from damage. In event of damage, immediately replace or make repairs to approval of Consultant at no additional cost.
- .7 Separate work areas from areas occupied by the Owner and the public, as specified in Section 01 56 00.

3.2 Removal

- .1 Remove existing asphalt pavement to lines and grades as indicated.
- .2 Demolition of pavements, curbs and gutters:
- .1 Square up adjacent surfaces to remain in place by saw cutting or other method acceptable to the Consultant.
- .2 Protect adjacent joints and load transfer devices.
- .3 Protect underlying and adjacent granular materials where they are exposed and identified to remain.

- .3 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement.
- .4 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .5 Suppress dust generated by removal process.

3.3 Finish Tolerances

- .1 Finished surfaces in areas where asphalt pavement has been removed to be within 5 mm of grade specified but not uniformly high or low.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Sweep remaining asphalt pavement surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooming as required.
- .4 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .5 Removed asphalt pavement which is to be recycled in hot mix asphalt concrete under this Contract may be stockpiled at designated asphalt plant site.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 CSA Group (CSA)
 - .1 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures
- .2 ASTM International (ASTM)
 - .1 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 2012
 - .2 Canadian Environmental Protection Act (CEPA), 2012
 - .1 SOR/2003-2 On-Road Vehicle and Engine Emission Regulations.
 - .2 SOR/2006-268 Regulations Amending the On-Road Vehicle and Engine Emission Regulations
 - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
 - .4 Motor Vehicle Safety Act (MVSA), 1995
 - .5 Hazardous Materials Information Review Act, 1985
- .4 National Fire Protection Association (NFPA)
 - .1 NFPA 241 – 2022 Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S660-08 Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids
 - .2 ULC/ORD-C58.15-1992 Overfill Protection Devices for Flammable Liquid Storage Tanks
 - .3 ULC/ORD-C58.19-1992 Spill Containment Devices for Underground Flammable Liquid Storage Tanks
- .6 U.S. Environmental Protection Agency (EPA)
 - .1 EPA CFR 86.098-10 Emission standards for 1998 and later model year Otto-cycle heavy-duty engines and vehicles
 - .2 EPA CFR 86.098-11 Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles
 - .3 EPA 832/R-92-005 Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- .7 Laws, rules and regulations of other authorities having jurisdiction.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario as follows:

- .3 Informational Submittals: Provide the following submittals when requested by the Consultant:
 - .1 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Consultants and Owner for work of similar complexity and extent.

1.5 Definitions

- .1 Demolition: rapid destruction of building following removal of hazardous materials, if required.
- .2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly.

1.6 Administrative Requirements

- .1 Coordination: Coordinate with Owner for the material ownership including but not limited to:
 - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.
 - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during demolition remain Owner's property.
- .2 Scheduling:
 - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
 - .2 In event of unforeseen delay notify Consultant in writing.

1.7 Quality Assurance

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial/Territorial and Municipal regulations.
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
- .3 Standards: Comply with Provincial regulations and NFPA 241

1.8 Site Conditions

- .1 If material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Consultant immediately.
 - .1 Proceed only after receipt of written instructions have been received from Consultant.
- .2 Notify Consultant before disrupting building access or services.
- .3 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

1.9 Existing Conditions

- .1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

PART 2 PRODUCTS

2.1 Equipment

- .1 Equipment and heavy machinery:
 - .1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
 - .2 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.
 - .3 Machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 EXECUTION

3.1 Examination

- .1 Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.
- .2 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.
- .3 Promptly submit a written report to Consultant.

3.2 Preparation

- .1 Temporary Erosion and Sedimentation Control:
Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: requirements of authorities having jurisdiction.
- .2 Protection of In-Place Conditions:
 - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .3 Demolition/Removal:
 - .1 Demolish parts of structure as indicated.
 - .2 Removal of Pavements, Curbs and Gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Consultant.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
 - .3 Remove parts of existing concrete slab on grade to permit new construction.
 - .4 Trim edges of partially demolished building elements to tolerances as defined by Consultant to suit future use.
 - .5 At end of each day's work, leave Work in safe and stable condition.
 - .6 Protect interiors of parts not to be demolished from exterior elements at all times.
 - .7 Demolish to minimize dusting. Keep materials wetted as directed by Consultant.

3.3 Site Restoration and Repairs

- .1 Below Grade Areas: Rough grade below grade areas ready for further excavation or new construction.
- .2 Below Grade Areas: Completely fill below grade areas and voids resulting from structure demolition operations with satisfactory soil materials according to backfill requirements in Section 31 23 10.
- .3 Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes.
- .4 Provide a smooth transition between adjacent existing grades and new grades.
- .5 General: Promptly repair damage to adjacent construction caused by demolition operations.
- .6 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- .7 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4 Refer to demolition drawings and specifications for items to be salvaged for reuse or protected for the duration of construction.
- .5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction Waste Management and Disposal:
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 20 00 Concrete Reinforcing
- .2 Section 03 30 00 Cast-in-Place Concrete
- .3 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 American Concrete Institute (ACI)
 - .1 ACI 117-10 Specifications for Tolerances for Concrete Construction and Materials.
 - .2 ACI 347R-14 Guide to Formwork for Concrete
 - .3 ACI SP-4-14 Formwork for Concrete
- .2 CSA Group (CSA)
 - .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete
 - .2 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples
 - .3 CSA O86:19 Engineering Design in Wood
 - .4 CSA O121-2017 (R2022) Douglas Fir Plywood
 - .5 CSA O141:23 Canadian Standard Lumber
 - .6 CSA S269.1-16 (R2021) Falsework and Formwork

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings showing type, extent and locations of items to be built into concrete.
 - .2 Sleeving Drawings: Submit drawings showing sleeves required through floors, roof and other structural members.
 - .3 Submit drawings showing size and spacing of conduits and piping.
 - .4 Coordinate with other Divisions prior to submittal.
 - .5 Prior to submission to Consultant, review all submitted drawings. By this review, Contractor represents to have determined and verified field measurements, site conditions, materials, catalogue number and similar data and to have checked and coordinated each drawing with the requirements of Work and of Contract Documents. Contractor's review of each drawing shall be indicated by stamp, date and signature of a responsible person.
 - .6 At time of submission, notify Consultant in writing of any deviations in drawings from the requirements of the Contract Documents.
 - .7 Consultant will review and return submitted drawings in accordance with an agreed schedule. Consultant's review will be for conformity to design concept and for general arrangement and shall not relieve Contractor of responsibility for errors or omissions in submitted drawings or of responsibility for meeting requirements of Contract Documents.
 - .8 Make any changes in submitted drawings which Consultant may require, consistent with Contract Documents and resubmit unless otherwise directed by Consultant. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.

- .9 Do not commence placing sleeves, conduits, or piping before drawings have been reviewed and Consultant's comments incorporated on drawings issued to site.
- .10 Assume responsibility for accuracy of Work. Review of submitted shop drawings does not relieve Contractor from compliance with requirements of Contract Documents.

1.5 Quality Assurance

- .1 Obtain a copy of CSA A23.1/A23.2 and maintain on site
- .2 Design of Formwork: Assume full responsibility for complete structural design and construction of formwork in accordance with CSA S269.1 and CSA O86, as applicable.
 - .1 The design and engineering of the formwork, as well as its' construction, shall be the responsibility of the Contractor.
- .3 Formwork shall be designed for the loads and lateral pressures outlined in the ACI publication "SP-4 Formwork for Concrete" and wind pressures and allowable stresses as set down in the National Building Code and in accordance with CSA A23.1 and A23.2. Formwork shall be of sufficient strength and rigidity to support all concrete and construction loads, taking into account proposed rate and method of pouring concrete so that the resultant finished concrete shall conform to the shapes, lines and dimensions of the members shown on the drawings.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Protect formwork to prevent functional damage and damage to faces affecting appearance of concrete surfaces exposed to view.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 All materials shall be new, in accordance with referenced standards.
- .2 Plywood: Douglas Fir, conforming to CSA O121. Sound undamaged sheets finished one side, fabricated especially for use as concrete form panels, with sealed edges. Minimum 17mm thickness.
- .3 Lumber: Conforming to CSA O141, with grade stamp clearly visible.
- .4 Chamfers: Cut from 19mm x 19mm wood, smooth with no open defects.
- .5 Form Ties: snap ties, with spreader washer and 25mm break back.
- .6 Joint Tape: non-staining, water impermeable, self-release.
- .7 Nails, Spikes and Staples: Galvanized, conforming to CSA B111.
- .8 Dovetail Anchor Slots: As specified in Section 04 05 19.

- .9 Form Release Agent: Colourless mineral oil which will not stain concrete.
- .10 For concrete surfaces exposed to view, provide panels smooth and free of defects which would be reproduced as concrete blemishes.

PART 3 EXECUTION

3.1 Examination

- .1 Before starting this work, examine work done by others which affects this work.
- .2 Notify the Consultant of any conditions which would prevent proper completion of this work.
- .3 Commencement of work implies acceptance of existing conditions.

3.2 Erection

- .1 Verify lines, levels and centres before proceeding with formwork. Ensure dimensions agree with drawings.
- .2 Align joints and make watertight, to prevent leakage of cement paste and disfiguration of concrete.
- .3 Construct formwork to produce concrete with dimensions, lines and levels within tolerances specified in ACI 347R-14.
- .4 Provide formed openings where required for pipes, conduits, sleeves and other work to be embedded in and passing through concrete members.
- .5 Install chamfers at all external corners exposed to view.
- .6 Adequately brace and shore formwork to sustain loads (both concrete and working loads) applied during construction.
- .7 Be responsible for safety of the structure both before and after the removal of forms, until the concrete has reached its specified 28 day strength.

3.3 Built-In Work

- .1 Form openings and build in anchors, inserts, sub-frames, key-ways, sleeves, miscellaneous metal items, reglets and similar items furnished under Work of other Sections, which are indicated on Drawings and on shop drawings of other trades, and as required for proper completion of Work.
- .2 Do not embed wood in concrete.
- .3 Anchor Bolts: Tie anchor bolts securely in position to prevent movement during concrete placing. Use template to locate bolts. Verify that bolts have specified projection above concrete.
- .4 Openings or Sleeves Not Shown on Structural Drawings:
 - .1 Obtain Consultant's written approval before forming openings of sleeves through columns and beams, or through slabs within 1800 mm of their supports.
 - .2 Obtain Consultant's written approval before forming openings or sleeves larger than 200 mm square in any location.

- .5 Embedded Pipe or Conduit Not Shown or Detailed on Structural Drawings:
 - .1 Obtain Consultant's written approval before placing conduit or pipe which would be embedded in finished structure.
- .6 Confirm that built-in items that penetrate surface waterproofing are installed to meet requirements of waterproofing trade.

3.4 Construction Joints

- .1 Form construction and expansion joints with bulkheads to ensure straight lines. Immediately before subsequent pour at construction joint, remove bulkhead and tighten forms so that concrete surfaces will be on same plane with no overlapping of concrete.
- .2 Review with Consultant proposed location and details of construction joints in walls, columns, beams and slabs.
 - .1 Construction joints shall present appearance of normal form panel joint.
 - .2 Install continuous shear key in construction joints in walls and framed floors which are 152mm or more thick.
 - .3 Provide vertical construction joints in walls at not more than 20 metres centre to centre.
 - .4 Provide waterstops in accordance with manufacturer's instructions at construction joints in walls which retain earth. Waterstops shall be continuous.

3.5 Treatment of Formwork Surfaces

- .1 Form Release Agent:
 - .1 Coat formwork with form release agent before reinforcement, anchors, accessories, and other built in items are installed.
 - .2 Do not coat plywood forms pre-treated with release agent.
 - .3 On surfaces to receive finish materials, adhesives, sealers, paint or other coatings or materials, use a compatible release agent.

3.6 Stripping of Formwork

- .1 Strip formwork on vertical surfaces when concrete has hardened sufficiently that no damage will result from stripping operations.
- .2 Do not remove plywood formwork by jerking loose or by metal pinch bars. Use wood wedges and gradually force panels loose. Leave plywood forms in place as long as possible to permit maximum shrinkage away from concrete.
- .3 Take particular care not to damage external corners when stripping formwork.
- .4 When forms are stripped during curing period, cure and protect exposed concrete in accordance with Section 03 30 00 - Cast-in-Place Concrete.

3.7 Defective Work

- .1 Movement and displacement of formwork during construction, variations in excess of specified tolerances, marked and disfigured surfaces, and failure of materials or workmanship to meet requirements of this specification, and which cannot be repaired by approved methods, will be considered defective work.
- .2 Replace defective work, as directed by Consultant.

- .3 Pay for additional inspection and testing, redesign, corrective measures, and related expenses, if work has proven to be deficient.
- .4 Reconstruct defective formwork and replace concrete and reinforcement placed in defective formwork at no additional cost.

3.8 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 10 00 Concrete Forming and Accessories
- .2 Section 03 30 00 Cast-in-Place Concrete
- .3 Section 32 16 23 Sidewalks

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM A143/A143M-07(2020) Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
 - .2 ASTM A1064/A1064M-22 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- .2 American Concrete Institute (ACI)
 - .1 ACI SP-66 (04) ACI Detailing Manual
- .3 CSA Group (CSA)
 - .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete
 - .2 CSA A23.3:19 Design of Concrete Structures
 - .3 CSA G30.18:21 Carbon Steel Bars for Concrete Reinforcement
 - .4 CSA G40.20-13/G40.21-13 (R2018) General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
 - .5 CSA W186:21 Welding of Reinforcing Bars in Reinforced Concrete Construction
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC Reinforcing Steel Manual of Standard Practice

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings, including placing drawings and bar lists.
 - .2 Prepare placing drawings and bar lists in accordance with the American Concrete Institute (ACI) Detailing Manual, and the Reinforcing Steel Institute of Canada (RSIC) Reinforcing Steel Manual of Standard Practice and the typical details included with Contract Documents.
 - .3 Prepare placing drawings to minimum scale of 1:50.
 - .4 Submit placing drawings and bar lists sufficiently detailed and dimensioned to permit correct placement of reinforcement and accessories without reference to architectural or structural Drawings.
 - .5 Show reinforcement, including dowels, in elevation on placing drawings for wall reinforcement.
 - .6 Show concrete cover to reinforcement.
 - .7 Show location of construction joints.
- .3 Inspection Reports: Inspection and Testing Company shall:
 - .1 Submit written reports of inspection and tests.
 - .2 Distribute reports as follows:
 - .1 Consultant.
 - .2 Contractor.

- .4 Quality Assurance Submittals:
 - .1 Mill Test Report: provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Submit in writing proposed source of reinforcement material to be supplied.

1.5 Quality Assurance

- .1 Obtain a copy of CSA A23.1/A23.2 and maintain on site.
- .2 Qualifications: Welding: Undertake welding of reinforcement only by a fabricator or Subcontractor approved by Canadian Welding Bureau to requirements of CSA W186.
- .3 Source Quality Control: Source Quality Control may be performed by an Inspection and Testing Company appointed by Consultant.
- .4 Review provided by Inspection and Testing Company does not relieve Contractor of his sole responsibility for quality control over Work. Performance or non-performance of Inspection and Testing Company shall not limit, reduce, or relieve Contractor of his responsibilities in complying with the requirements of the Specification.
- .5 Identify and correlate reinforcing steel from Canadian mills with test reports for compliance with requirements specified.
- .6 Test unidentified reinforcing steel at expense of Contractor. Perform testing for each 1 tonne or part thereof supplied for incorporation in Work.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 In accordance with reference standards.
- .2 Substitute different size bars only if permitted in writing by Consultant.
- .3 Bar Reinforcing Steel:
 - .1 Bars which are to be welded by arc-welding process: to CSA G30.18, Grade 400W.
 - .2 Other bars: to CSA G30.18, Grade 400R.
- .4 Plain round bars: to CSA G40.20-04/G40.21.
- .5 Cold-drawn annealed steel wire ties: to ASTM A497.
- .6 Chairs, bolsters, bar supports, spacers: to CSA A23.1.

.7 Mechanical splices: subject to approval of Consultant.

2.2 Fabrication

.1 Fabricate reinforcing steel only in permanent fabricating shop.

.2 Fabricate reinforcing steel in accordance with shop drawings.

.3 Tag reinforcing bars to indicate placement as designated on shop drawings.

.4 Splices:

.1 Provide splices only where specifically indicated on Drawings.

.2 Stagger alternate mechanical splices 750 mm apart.

.3 Stagger alternate end bearing splices 750 mm apart.

.4 Install on threaded splices, plastic internal coupler thread protector and plastic bar end thread protector.

PART 3 EXECUTION

3.1 Examination

.1 Before starting this work, examine work done by others which affects this work.

.2 Examine formwork to verify that it has been completed, and adequately braced in place.

.3 Notify the Consultant of any conditions which would prejudice proper completion of this work.

.4 Commencement of work implies acceptance of existing conditions.

3.2 Installation

.1 Place reinforcing steel in accordance with reviewed placing drawings, typical details, and CSA A23.3.

.2 Adequately support reinforcing and secure against displacement within tolerances permitted.

.3 Place reinforcing steel to provide minimum spacing and proper concrete cover as noted on drawings.

.4 Do not cut reinforcement to incorporate other Work.

.5 Relocate or rebend bars only on written instructions of Consultant.

.6 Tie reinforcement in place. Do not weld.

3.3 Adjusting

.1 Adjust and secure reinforcement in correct position immediately before concrete is placed.

.2 Remove contaminants which lessen bond between concrete and reinforcement.

3.4 Field Quality Control

.1 Provide competent supervisor, with at least three years of experience in reinforcement placement,

to direct placement of reinforcement.

- .2 Inspect placement of reinforcement for conformance with Drawings and Specifications, before each concrete placement, and correct as necessary.
- .3 Consultant's periodic review of selected areas of reinforcement are for verification of conformity to design concept and general arrangement only and shall not relieve Contractor of responsibility for quality control, errors, or omissions, or conformance with requirements of Contract Documents.

3.5 Defective Work

- .1 Incorrectly fabricated, misplaced or omitted reinforcement will be considered defective Work.
- .2 Replace or adjust defective reinforcement before concrete is placed as directed by Consultant.
- .3 Replace or strengthen concrete work which is deficient as a result of incorrectly fabricated, misplaced, or omitted reinforcement, which was not corrected before concrete was placed.
- .4 Pay for additional inspection and testing, redesign, corrective measures, and related expenses, if Work has proven to be deficient.

3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 10 00 Concrete Forming and Accessories
- .2 Section 03 20 00 Concrete Reinforcing
- .3 Section 07 92 00 Joint Sealants
- .4 Section 10 80 00 Miscellaneous Specialties
- .5 Section 32 16 23 Sidewalks

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM C260/C260M-10a (2016) Standard Specification for Air Entraining Admixtures for Concrete
 - .2 ASTM C295/C295M-19 Standard Guide for Petrographic Examination of Aggregates for Concrete
 - .3 ASTM C309-19 Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete
 - .4 ASTM C330/C330M-17a Standard Specification for Lightweight Aggregates for Structural Concrete
 - .5 ASTM C494/C494M-19 Standard Specification for Chemical Admixtures for Concrete
 - .6 ASTM C881/C881M-20a Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
 - .7 ASTM C1017/C1017M-13e1 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .8 ASTM C1107/C1107M-20 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
 - .9 ASTM D412-16 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
 - .10 ASTM D570-98(2018) Standard Test Method for Water Absorption of Plastics
 - .11 ASTM D624-00(2020) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - .12 ASTM D638-14 Standard Test Method for Tensile Properties of Plastics
 - .13 ASTM D1259-06(2018) Standard Test Methods for Nonvolatile Content of Resin Solutions
 - .14 ASTM D1751-18 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
 - .15 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness
 - .16 ASTM D5329-20 Standard Test Methods for Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphalt Pavements and Portland Cement Concrete Pavements
- .2 American Concrete Institute (ACI)
 - .1 ACI 117-10 Specifications for Tolerances for Concrete Construction and Materials.
 - .2 ACI 232.1R-12 Report on the Use of Raw or Processed Natural Pozzolans in Concrete
- .3 CSA Group (CSA)
 - .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete.
 - .2 CSA A283:19 Qualification Code for Concrete Testing Laboratories.
 - .3 CSA A3000-18 Cementitious Materials Compendium

- .4 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 1010 Material Specification for Aggregates - Granular A, B, M and Select Subgrade Material.
 - .2 OPSS 1212 Material Specification for Hot-Poured Rubberized Asphalt Joint Sealing Compound.
- .5 Government of Canada Treasury Board Secretariat (TBS)
 - .1 Standard on Embodied Carbon in Construction

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Samples: Submit for inspection, material samples of specified mix designs.
- .3 Concrete Mix Designs:
 - .1 Submit concrete mix designs for review. Specify intended use for each mix design.
 - .2 Review of mix design does not relieve Contractor from responsibility for compliance with Contract Documents.
 - .3 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CSA A23.1. Mix design shall be adjusted to prevent alkali aggregate reactivity problems.
 - .4 Provide certification that plant, equipment, and all materials to be used in concrete comply with the requirements of CSA A23.1.
 - .5 Submit written requests for use of admixtures not specified, for site mixing of concrete, and for use of bonding agents.
 - .6 Submit in writing, proposed method of in-situ strength testing.
- .4 Inspection Reports: Inspection and Testing Company shall:
 - .1 Submit written reports of inspection and tests.
 - .2 Distribute reports as follows:
 - .1 Consultant;
 - .2 Contractor.
 - .3 On concrete cylinder test reports, include:
 - .1 Specific location of concrete represented by sample
 - .2 Design strength.
 - .3 Unit weight of sample
 - .4 Class of exposure
 - .5 Aggregate size and mixtures incorporated
 - .6 Date, hour and temperature at time sample taken
 - .7 Percentage air content
 - .8 Test strength of cylinder
 - .9 Type of failure if test fails to meet specification.

1.5 Quality Assurance

- .1 Obtain a copy of CSA A23.1/A23.2 and maintain on site.
- .2 Pre-Construction Conference:
 - .1 At least 35 days prior to the start of concrete construction schedule, conduct a meeting to review proposed mix designs and to discuss detailed requirements of the proposed concrete operations. Review requirements for submittals, coordination, and availability of materials. Establish work progress and sequencing schedules and procedures for material testing, inspection and certifications.

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- .3 Source Quality Control:
- .1 Both source quality control, and field quality control specified in Article 1.5.4, may be performed by an Inspection and Testing Company appointed by Consultant.
 - .2 Review provided by Inspection and Testing Company does not relieve the Contractor of his sole responsibility for quality control over Work. Performance or non- performance of Inspection and Testing Company shall not limit, reduce, or relieve Contractor of his responsibilities in complying with the requirements of the Specification.
 - .3 Inspection and Testing Company shall be certified under CSA A283, Qualification Code for Concrete Testing Laboratories, for Category 1 Certification.
 - .4 Payment for specified Work performed by Inspection and Testing Company will be made from Cash Allowance.
 - .5 Payment for additional tests (including testing of structure and its performance and load testing) required by changes of materials or mix design requested by Contractor, and failure of completed Work to meet specified requirements, shall be made at Contractor's expense.
 - .6 Perform Work of source quality control in accordance with CSA A23.2 and to include:
 - .1 Verification that ready-mix supplier is qualified to supply concrete in accordance with Specification.
 - .2 Review of proposed concrete mix designs.
 - .3 Sampling, inspection, and testing of materials as may be required.
- .4 Field Quality Control:
- .1 Inspection and Testing Company, when appointed as specified for Source Quality Control, shall perform sampling, inspection and testing of concrete work at site.
 - .2 Perform sampling, inspection and testing in accordance with CSA A23.2, and to include:
 - .1 Making of standard slump tests.
 - .2 Obtaining of three standard specimens for strength tests from each 100 m of concrete, or fraction thereof, of each mix design of concrete placed in any one day. In addition, for slabs-on-grade, obtain beam specimens for determination of modulus of rupture.
 - .3 Verification that test specimens are stored within an enclosure, maintained at specified temperatures.
 - .4 Making compression tests of each set of three specimens, one at 7 days and two at 28 days; modulus of rupture tests at 90 days.
 - .5 Verification of air content of air-entrained concrete.
 - .1 For Class of exposure F-1, and C-2, test at frequency in accordance with CSA A23.1.
 - .2 Make first test before placing any concrete.
 - .3 After stable air content has been established, frequency of tests will be determined by Consultant.
 - .4 For other Classes of exposure, test at time of obtaining strength test specimens.
 - .3 Inspection for Tolerances:
 - .1 Confirm that concrete work meets specified tolerance requirements.
 - .2 Use the elevation survey records of elevations of finished concrete surfaces specified in Section 03 10 00 and this section as basis for judging compliance.
 - .3 Use approved aluminum straightedge to judge compliance with specified slab tolerances, except use dipstick equipment where F-number tolerance is specified.
 - .4 Slabs-on-Grade:
 - .1 Observe application of curing compound to sample slab, recording rate of application.
 - .2 Monitor on a random basis acceptable to the Consultant, that slab is being saw cut before slab temperature starts to fall.
 - .3 Qualifications: Floor finishing shall be undertaken only by contractors with at least 10 years of experience.
 - .4 Sample of Finish Flooring:

- .1 Finish an area of floor slab where directed by Consultant to provide sample of finish for approval.
- .2 Protect new sample area until finish is approved.
- .3 If liquid membrane curing compound is to be used on Project, determine and apply correct quantity required to meet rate of coverage recommended by manufacturer for measured test area.
- .4 Approved sample will provide standard by which subsequent finishing will be judged and will be incorporated into Work.

1.6 Tolerances

- .1 In accordance with ACI 117 and CSA A23.1.
- .2 Difference between elevation of high point and low point in specified area not to exceed:
 - .1 In any bay up to 100 m²: 12 mm.
 - .2 In any bay up to 400 m²: 25 mm.
- .3 Straightedge method: Finish floor slabs to meet following tolerances when measured at 72 +/- 12 hours after completion of floor finishing, before shores are removed from formed slabs, by placing a freestanding unlevelled straight edge anywhere on slab and allowing it to rest on two high points. Gap between straightedge placed on two high points and slab not to exceed:
 - .1 3 metre straightedge: 8 mm (Class A).
 - .2 2 metre straightedge: 4 mm.

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.

1.8 Job Conditions

- .1 Protect floor slabs, and concrete surfaces exposed to view or on which finishes are to be applied, from grease, oil, and other soil which will affect the appearance of the concrete, or impair the bond of finish material.
- .2 Environmental Conditions: In addition to Cold Weather and Hot Weather Requirements of CSA A23.1, the following shall apply to Work of this Section:
 - .1 Provide protection or heat, or both, so that temperature of concrete at surfaces is maintained at not less than 21 ° C for three days after placing, not less than 10 ° C for the next two days and above freezing for the next two days.
 - .2 Do not permit alternate freezing and thawing for fourteen days after placing.
 - .3 Vent exhaust gases from combustion type heaters to atmosphere outside protection enclosures.
 - .4 Provide protection to maintain concrete continuously moist during curing period.
 - .5 For field cured cylinders representing strength development of in-situ concrete, provide same specified hot and cold weather protection for storage of each concrete compression specimen as for concrete from which it was taken, until it is sent to testing laboratory.
 - .6 Do not place concrete during rain. Should rain commence during placing, cover freshly placed concrete.
 - .7 Do not place bonded toppings on rough slabs that are less than 15 °C.
 - .8 Do not grout at ambient air temperatures or concrete surface temperatures less than 5 ° C, or when temperature is forecast to fall to less than 5 ° C within 24 hours of grouting.

- .9 Do not apply sealants at ambient air temperatures or concrete surface temperatures less than 5 ° C.

1.9 Project Records

- .1 Maintain record of all concrete pour related to time, date, delivery slip serial number and location of each concrete pour and identify related test cylinders. Keep records on site until project is completed.
- .2 Delivery Records: File duplicate copies of concrete delivery slips on which shall be recorded: supplier, serial number of slip, date, truck number, contractor, Project, Class of exposure, cementing materials content, air content, volume in load, and time of first mixing of aggregate, cementing materials and water.
- .3 Record Drawings:
 - .1 Record on a set of Drawings:
 - .1 founding elevations of all footings
 - .2 variations of foundation Work from that indicated on Drawings.
 - .2 Make record drawings available for Consultant's inspection at all times.

1.10 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 To meet specified requirements of referenced Standards.
- .2 Cement:
 - .1 Portland Cement: to CSA A3000.
 - .2 Cementitious Hydraulic Slag: to ACI 232.1R
- .3 Fine Aggregate: For slabs-on-grade, fineness modulus of fine aggregate to be between 2.7 and 3.1.
- .4 Coarse Aggregates:
 - .1 20 mm to 5 mm (No. 4 sieve) except as specified below.
 - .2 For slabs-on-grade 125 mm and thicker: 40 mm to 5 mm (No. 4 sieve); combine at least two of the single sizes specified in Table 5 Group II of CSA A23.1, one of which is to be 40 mm, to obtain maximum bulk density (unit weight) and optimum grading, in accordance with an approved procedure.
 - .3 For slabs-on-grade: Abrasion loss not to exceed 35%. Petrographic number of aggregate not to exceed 125 when tested in accordance with ASTM C295.
 - .4 For toppings 50 mm thick and less and for slabs over open web steel joists: 12 mm to 5 mm (No. 4 sieve).
- .5 Admixtures:
 - .1 Conform to Reference Standards for chemical and air-entraining admixtures.
 - .2 Provide only admixtures that are free of chlorides.
 - .3 When requested, provide evidence acceptable to Consultant that superplasticizer does not increase shrinkage of concrete.

- .6 Curing-Sealing Compound: Membrane curing-sealing compound formulated from chlorinated rubber resins, or acrylic emulsion, solvent free for use in occupied buildings, to ASTM C309, type 1.
 - .1 Basis-of-Design Product: Euclid Chemical Company; Diamond Clear 350 or a comparable product by one of the following:
 - .1 BASF Corporation - Construction Systems.
 - .2 Sika Corporation
 - .3 W.R. Meadows
- .7 Bonding Agent: To ASTM C881, 100% reactive, 2 component, low viscosity, high modulus bonding adhesive.
- .8 Non-Metallic Hardener: Natural and synthetic materials with Mohs hardness 7 minimum, premixed with Portland cement.
 - .1 Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company; Surfex. or a comparable product by one of the following:
 - .1 BASF Corporation - Construction Systems.
 - .2 Sika Corporation
- .9 Non-Oxidizing Metallic Dry-Shake Floor Hardener: Unpigmented, factory-packaged, dry combination of Portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.
 - .1 Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company; EUCCO-PLATE H.D. or a comparable product by one of the following:
 - .1 BASF Corporation - Construction Systems.
 - .2 Sika Corporation
- .10 Saw Cut Filler: Semi-rigid epoxy or polyurea in accordance with ACI 302.1R for joint fillers used in control and construction joints.
 - .1 Basis of Design Euco 700 or Euco QWIKjoint UVR by Euclid Chemical.
- .11 Premoulded Joint Fillers: Bituminous impregnated fiber board: to ASTM D1751.
- .12 Sealant: Refer to Section 07 92 00 – Joint Sealants
- .13 Mechanical Anchors: 'Kwik' Bolts, 'Cinch' Anchors or Parabolts.
- .14 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

2.2 Concrete Mixes

- .1 Ready Mix, with 28 day compressive strength as indicated on Drawings.
- .2 Design concrete mix in conformance with CSA A23.1, Tables 1, 2, 5 (Alternative 1) and 17, and as follows. Provide concrete meeting water/cementing materials ratio and air content of Table 14 in accordance with Class of exposure specified in following sub-paragraphs, and minimum strength specified on Drawings. Note that concrete designed in accordance with water/cementing materials ratio of Table 14 may yield strength exceeding minimum strength specified on Drawings.
 - .1 Class of exposure C-2 with 25 percent Portland cement replaced with cementitious hydraulic slag: for pavements, sidewalks, curbs and gutters.
 - .2 Class of exposure F-2 with 25 percent Portland cement replaced with cementitious hydraulic slag: for grade beams, and for exposed exterior beams, columns, walls and slabs.
 - .3 Slabs-on-Grade:

- .1 Use type 20 Portland cement, or replace 35 percent Portland cement with cementitious hydraulic slag.
 - .2 When mean daily temperature exceeds 25 ° C at time of placement, replace 25 percent of type 20 cement, or 50 percent of type 10 cement, with cementitious hydraulic slag.
 - .3 Use water/cementing materials ratio 0.45 maximum.
 - .4 Use aggregates specified in paragraphs 2.1.3.
 - .5 Cementing materials content 325 kg/m.
 - .6 Modulus of rupture 3.5 MPa average, 3.0 MPa minimum.
 - .7 Slump at delivery, before addition of superplasticizer, 50 mm; add superplasticizer, not water, to bring slump to level acceptable to floor finisher for placement.
- 4 Interior Concrete, other than specified above, and not exposed to freezing and thawing or the application of deicing chemicals: select water/cementing materials ratio and cementing materials content on basis of strength, workability, and finishing requirements.
- 3 Submit evidence, and material samples, if requested, acceptable to the Inspection and Testing Company, to verify that the proposed concrete mix design will produce specified quality of concrete.
- 4 List all proposed admixtures in mix design submission. Do not change or add admixtures to approved design mixes without Consultants approval.
- 5 Concrete Weight: Air dry unit weight: minimum 2,300 kg/m; adjusted proportionally for maximum air content listed in CSA A23.1, Clause 15, Table 10.
- 6 Concrete supplier to provide documentation indicating the requirements of TBS Standard on Embodied Carbon in Construction have been met.

2.3 Admixtures

- .1 Chemical Admixture: To ASTM C494. Incorporate water-reducing admixture, type WN, in all concrete.
- .2 Air Entraining Agent: To ASTM C260. Incorporate air-entraining agent in addition to chemical admixture in concrete of relevant Class of exposure, in accordance with CSA A23.1, Clause 15, Table 10.
- .3 Chloride: Do not use calcium chloride or admixtures containing chloride in concrete.

2.4 Premixed Grout

- .1 Non-Shrink Metallic: Non-catalyzed metallic grout to ASTM C1107, Compressive strength at 28 days: 48 MPa.
- .2 Non-Shrink, Non Stain, Non-Metallic: to ASTM C1107. Compressive strength at 28 days: 59 MPa.
- .3 Flowable Grout: High-tolerance Non-shrink, Non-metallic shrinkage compensating grout to ASTM C1107. Compressive strength at 28 days: 59 MPa.

PART 3 EXECUTION

3.1 Examination

- .1 Before starting this work, examine work done by others which effects this work.
- .2 Notify Consultant of any condition which would prejudice proper completion of this work.
- .3 Confirm that surfaces on which concrete is to be placed are free of frost and water before placing.
- .4 Confirm that reinforcement, dowels, control joints, inserts and all other built in work are in place and secured.
- .5 Commencement of work implies acceptance of existing conditions.

3.2 Treatment of Formed Surfaces

- .1 Conform to the requirements of CSA A23.1, and as additionally specified herein.
- .2 Treat concrete surfaces which will be exposed or painted in the completed building to provide a "Smooth Rubbed Finish" in accordance with CSA A23.1, uniform in colour and texture.
- .3 Plugs at Recessed Ties:
 - .1 Clean tie holes to remove all foreign matter.
 - .2 Coat plugs by dipping in adhesive and insert in hole.
 - .3 Remove excess adhesive immediately with thinner which will not stain concrete, as recommended by manufacturer.
- .4 Obtain Consultant's approval of finished exposed concrete and grind or otherwise correct to the satisfaction of the Consultant.

3.3 Placing Concrete

- .1 Place concrete in accordance with requirements CSA A23.1/A23.2.
- .2 Notify Consultant and inspection and testing firm at least 24 hours prior to commencement of concrete placing operation and 24 hours before wall forms are closed in.
- .3 Obtain Geotechnical Engineer's confirmation that thickness, elevation and compaction of sub-grade meets specifications before placing concrete.
- .4 Do not place concrete in water or open frozen surfaces.
- .5 Remove contaminants which lessen concrete bond to reinforcement before concrete is placed.
- .6 Maintain accurate records of cast in place concrete items. Record date, location of pour, quantity, air temperature and test samples taken.
- .7 Ensure that reinforcement, inserts, embedded items, formed expansion joints and the like, are not disturbed during concrete placement.

- .8 Joint fillers:
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant.
 - .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
 - .3 Locate and form isolation, construction and expansion joints as indicated.
 - .4 Install joint filler.
 - .5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.
- .9 Provide construction joint as indicated on the drawings. Ensure dowels are adequately anchored and placed at right angles to the joint before placing concrete.
- .10 Place floor slabs to depth indicated on the drawings with 25 MPa minimum concrete unless otherwise noted on drawings but consistent with minimum cement content specified for exposed floors in this specification.
- .11 Sloping Surfaces and Slabs: commence concrete placement at bottom of sloping surfaces.

3.4 Finishing Concrete

- .1 Perform finishing operations on plastic concrete surfaces in accordance with CSA A23.1, and as specified herein.
- .2 Refer to the drawings for floor finishes and coverings.
- .3 Scream the top of rough floor slabs to an even level or sloping surface at the proper elevation to receive the finish or topping specified on the drawings and in finish schedule.
- .4 Provide a smooth steel trowel finish on all areas scheduled to receive a covering, or painted finish.
- .5 Exposed Floor Surfaces: Provide hard, smooth, dense, steel troweled surface, free from blemishes, and of uniform appearance.
- .6 Non-slip Surfaces: Provide swirl trowel or broom finish of texture acceptable to Consultant.
- .7 Curb Edging: Finish external corners of curbs rounded and smooth.
- .8 Hardened Floor Finish:
 - .1 Apply premixed material to total of 7.5 kg/m² of floor surface.
 - .2 Apply in two shakes, of half total specified amount in each shake; the second shake at right angles to the first.
 - .3 Follow manufacturer's special finishing instructions if concrete is air entrained.

3.5 Curing

- .1 Cure concrete in accordance with CSA A23.1 and as specified herein.
- .2 Curing Compound Method:
 - .1 Use curing and sealing compound specified except:
 - .1 On surfaces to receive epoxy or similar paint finish.

- .2 On surfaces to which architectural finishes will be adhered, the adhesives for which are incompatible with the curing compound.
- .3 Air-entrained concrete for exterior slabs and sidewalks placed between October 1st and March 31st.
- .3 Select acrylic water compound except that if ambient conditions extend drying time unduly and if area is well ventilated and unoccupied by other workers, solvent based compound may be used.
- .4 Apply curing compound in accordance with manufacturer's instructions, increasing application rate as necessary to cover surface completely.
- .5 Curing Blanket or Wet Burlap Method: For exterior sidewalks and other finished concrete surfaces that will be exposed to freezing and thawing or deicing chemicals:
 - .1 Cover with curing blanket or wet burlap overlaid with 0.102 mm thick polyethylene and maintain in place for the additional curing for durability period in accordance with CSA A23.1 but in no case for less than 7 days.
 - .2 Wet blanket or burlap regularly to maintain in moist condition. Do not allow to dry out.
- .6 Cure finished concrete surface with an approved curing and sealing compound which will leave the surface with a uniform appearance and with a minimum of discolouration after drying. Ensure that the curing compound will be compatible with the architectural finishes or adhesives for finishes to be applied later. Apply the compound in strict accordance with the manufacturer's instructions.
- .7 Protect surface which will be exposed to direct sunlight during the curing period, with a light coloured, laminated waterproof paper immediately after the curing and sealing compound has hardened sufficiently for the paper to be placed without damage to the sealed surface. Lap the paper a minimum of 100 mm and seal the laps. Leave the paper in place for at least seven days.

3.6 Grouting

- .1 Mix prepackaged grout with water in accordance with manufacturer's printed instructions.
- .2 Dampen concrete surfaces immediately before installing grout.
- .3 Use non-shrink and shrinkage-compensating grouts only when grout will be contained against expansion and self-disintegration.
- .4 Slope grout beyond edge of plate at 45 degrees.
- .5 Provide same environmental protection and curing as specified for concrete.

3.7 Joint Sealant

- .1 Apply sealant specified in Section 07 92 00 to thoroughly dry surfaces only, at ambient air temperatures above 5 ° C.
- .2 Provide sealant on top of joint filler with a polyethylene bond breaker between joint filler and joint sealant applied in accordance with manufacturer's direction.
- .3 Confirm that preformed joint filler and backer rod are compatible with sealant.
- .4 Caulk joints in accordance with the following:

- .1 Do not commence joint preparation until concrete is at least 28 days old.
- .2 Thoroughly clean sides of joints with mason's router, or power saw, equipped with double blade where necessary to suit joint width.
- .3 Blow clean with compressed air with oil trap on line, or vacuum clean.
- .4 Install backer rod of diameter 25 percent greater than joint width, and type recommended by sealant manufacturer to be compatible with sealant. Locate backer rod to provide for sealant depth of one-half joint width, but not less than 12 mm.
- .5 Prime joint if required, as recommended by sealant manufacturer.

3.8 Defective Work

- .1 Variations in excess of specified tolerances and marked and disfigured surfaces that cannot be repaired by approved methods will be considered defective work.
- .2 Replace or modify concrete that is out of place or does not conform to lines, detail or grade as directed by the Consultant.
- .3 Replace or repair defectively placed or finished concrete as directed by the Consultant.
- .4 Testing and Replacement of Deficient Concrete in Place:
 - .1 Pay for additional testing and related expenses if concrete has proven to be deficient.
 - .2 Replace or strengthen deficient concrete work as directed by the Consultant, and pay for all testing and related expenses for replaced work until approved by the Consultant.

3.9 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Clear away from the building site excess and waste materials and debris resulting from Work of this Section.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 10 00 Concrete Forming and Accessories
- .2 Section 03 30 00 Cast-In-Place Concrete
- .3 Section 07 26 00 Vapour Retarders

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM A123/A123M-17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - .2 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .3 ASTM D2559 - 12a(2018) Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions
 - .4 ASTM F1667-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
- .2 CSA Group (CSA)
 - .1 CSA A247- M86 (R1996) Insulating Fiberboard.
 - .2 CSA B111-1974(R2003) Wire Nails, Spikes and Staples.
 - .3 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CSA O80 SERIES-15 Wood Preservation
 - .5 CSA O121-17 Douglas Fir Plywood.
 - .6 CSA O141:23 Canadian Standard Lumber.
 - .7 CSA O151-17 Canadian Softwood Plywood
 - .8 CSA Z809-08 Sustainable Forest Management
- .3 Underwriters Laboratories Canada (ULC)
 - .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .4 National Lumber Grading Authority (NGLA)
 - .1 Standard Grading Rules for Canadian Lumber, Latest Edition.
- .5 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004 FSC Principle and Criteria for Forest Stewardship.
 - .2 FSC-STD-20-002-2004 Structure and Content of Forest Stewardship Standards V2-1
 - .3 FSC Accredited Certified Bodies.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Certified Wood: Submit listing of wood products and materials used, produced from wood obtained from forests certified by FSC Accredited Certification Body in accordance with FSC-STD-01-001.

1.5 Quality Assurance

- .1 Sawn lumber shall be identified by the grade stamp of an association or independent grading agency certified by the Canadian Lumber Standards Accreditation Board.

1.6 Shipping, Handling and Storage

- .1 Protect materials, under cover, both in transit and on the site.
- .2 Store materials to prevent deterioration or the loss or impairment of their structural and other essential properties. Do not store materials in areas subject to high humidity and areas where masonry and concrete work are not completely dried out.
- .3 Store sheathing materials level and flat, in a dry location. Protect panel edges from moisture at all times.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Timber Material shall be 'Grade Stamped'.
- .2 CSA Z809 or FSC Certified.
- .3 Construction Lumber: To CSA O141 Softwood Lumber graded to NLGA Standard Grading Rules for Canadian Lumber, published by the National Lumber Grades Authority. All lumber shall bear grade stamps. Moisture content of softwood lumber not to exceed 19% at time of installation.
 - .1 Framing lumber, plates, furring, blocking, No. 1 SPF.
 - .2 Nailing strips, furring and strapping: No. 4 S-P-F.
 - .3 Fitment framing: No. 1 S-P-F.
- .4 Canadian Softwood Plywood: to CSA O151-M, standard construction, good one or both sides as required, thickness as shown or specified.
 - .1 Douglas Fir Plywood: To CSA O121-M, standard construction, good one side, thickness as shown on the drawings.
- .5 Nails, Spikes and Staples: To ASTM F1667.
- .6 Bolts: 12.5 mm diameter, galvanized, complete with nuts and washers.
- .7 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

PART 3 EXECUTION

3.1 Installation

- .1 Workmanship
 - .1 Execute work using skilled mechanics according to best practice, as specified here.
 - .2 Lay out work carefully and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions; align, level, square, plumb, adequately brace, and secure permanently in place. Join work only over solid backing.

- .2 Rough Hardware: Include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, strap iron, and operating hardware for temporary enclosures.
- .3 Provide treated wood nailers, blocking, cants, grounds, furring and similar members where shown and where required for screeding or attachment of other work and surface applied items. Attach to substrate as required to support applied loading.

3.2 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 07 26 00 Vapour Retarders
- .3 Section 07 92 00 Joint Sealants
- .4 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM C423-23 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - .2 ASTM C518-21 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 - .3 ASTM C578-22 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
 - .4 ASTM D1621-16(2023) Standard Test Method for Compressive Properties of Rigid Cellular Plastics
 - .5 ASTM D1623-17(2023) Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
- .2 Underwriters Laboratories Canada (ULC)
 - .1 ULC 701.1 Standard for Thermal Insulation, Polystyrene Boards
 - .2 ULC 704 Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
- .3 Canadian General Services Board (CGSB)
 - .1 CGSB 71-GP-24M Adhesive, Flexible, for Bonding to Cellular Polystyrene Insulation.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit insulation manufacturer's product literature including specified physical properties for each type of insulation specified.
- .3 Submit installation instructions.
- .4 Submit certification that product complies with specification requirements and is suitable for the use indicated.

1.5 Environmental Requirements

- .1 Insulation shall not be produced with, or contain, any of the regulated CFC compounds listed in the Montreal Protocol of the United Nations Environmental Program.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.

- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Deliver material to the site in the original unbroken packages bearing the name of manufacturer.
- .4 Store materials in an approved manner at the site preceding application and protect from damage at all times.
- .5 Remove damaged or deteriorated materials from site.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.8 Warranty

- .1 Provide written warranty that the actual thermal resistance of the extruded polystyrene foam insulation will not vary by more than 10% from its published thermal resistance.
- .2 Warranty period is 15 years after date of Substantial Performance.

PART 2 PRODUCTS

2.1 Board Insulation

- .1 Rigid insulation at perimeter of ground floor slab and below grade: extruded expanded polystyrene to ULC S701.1 TYPE 4. HFO blowing agents. Thickness as detailed, 400 x 2440 mm boards with butt edges. Material shall have the following characteristics when tested to the reference standards:
 - .1 Compressive Strength: ASTM D1621: 210 kPa.
 - .2 Water Absorption: ASTM D2842: maximum 0.7% by volume.
 - .3 Water Absorption: ASTM C272: maximum 0.1% by volume.
 - .4 Water Vapour Permeance, ASTM E96: 52 ng/Pa•s•m²
 - .5 Thermal resistance RSI: ASTM C518: 0.88/25 mm
- .1 Basis of Design: Soprema XPS-30

2.2 Accessories

- .1 Adhesives: As recommended by material manufacturer, compatible with insulation and substrate membrane, waterproof,
- .2 Vapour Retarder: As specified in Section 07 26 00.

PART 3 EXECUTION

3.1 Installation – General

- .1 Install insulation of types indicated, or, where not indicated, as appropriate, to provide a continuously un-interrupted building envelope in accordance with the requirements of the reference standards.
- .2 Install insulation after building substrate materials are dry.

- .3 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .4 Fit insulation tightly around all structural angles, penetrations and other protrusions.
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly; offset vertical joints.
- .6 Insulation board materials shall be free from chipped or broken edges.
- .7 Sizes of materials shall be consistent with the module of the system.
- .8 Do not enclose or conceal insulation until it has been inspected by the Consultant.

3.2 Perimeter Insulation

- .1 Do not proceed with installation until concrete surfaces are dry and cured, and water proofing membranes have been inspected and approved.
- .2 Install perimeter insulation vertically just prior to backfilling.
- .3 Prime porous concrete surfaces.
- .4 Apply adhesive in gobs or pads to the back of the insulation board in accordance with manufacturer's instructions. Joints shall be left dry with joints brought into tight contact. Apply insulation to the wall with a slight sliding motion to ensure good contact.
- .5 Protect insulation from damage until time for backfilling.
- .6 Following backfilling and prior to placement of underslab vapour barriers, install horizontal insulation. Install rigid insulation at perimeter of all exterior walls and for extent as indicated. Tightly butt joints.

3.3 Underslab Insulation

- .1 Under slab application: Following backfilling and prior to placement of underslab vapour barriers, install horizontal insulation. Install rigid insulation for extent as indicated. Lay boards on level compacted fill. Tightly butt joints. Stagger joints in multiple layers as indicated.
- .2 Extend boards as indicated on Drawings, and as follows:
 - .1 Lay boards on level compacted fill.
 - .2 Protect top surface of horizontal insulation from damage during concrete work.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 07 92 00 Joint Sealants
- .3 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM E96/E96M-22ae1 Standard Test Methods for Water Vapor Transmission of Materials
 - .2 ASTM E154/E154M-08a(2019) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
 - .3 ASTM E1643-18a Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
 - .4 ASTM E1745-17(2023) Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
 - .5 ASTM F1249-20 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor
- .2 American Concrete Institute (ACI)
 - .1 ACI 302.1R Guide for Concrete Floor and Slab Construction

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit manufacturer's product data including certification that materials meet the requirements of the reference standards, and application instructions.

1.5 Project Conditions

- .1 Products specified are not intended for uses subject to abuse or permanent exposure to the elements.
- .2 Do not apply membranes on frozen ground.

1.6 Quality Assurance

- .1 Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the application of the vapor retarder.
- .2 Obtain vapour retarder materials from a single manufacturer regularly engaged in manufacturing the product.
- .3 Provide products which comply with all federal, provincial and local regulations controlling use of volatile organic compounds (VOCs).

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- .4 Store materials in a clean dry area in accordance with manufacturer's instructions. Stack membrane on smooth ground or wood platform to eliminate warping.
- .5 Protect materials during handling and application to prevent damage or contamination.
- .6 Ensure membrane is stamped with manufacturer's name, product name, and membrane thickness at intervals of no more than 220 cm.

1.8 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Sheet Vapour Barrier for Below Concrete Slabs on Grade

- .1 Vapour retarder membrane below slabs on grade shall be manufactured from virgin polyolefin resins and shall meet or exceed all requirements of ASTM E1745, Class A.
 - .1 Maximum Water Vapour Permeance (ASTM E154 Sections 7, 8, 11, 12, 13, by ASTM E96, Method B or ASTM F1249)
 - .1 As received: 0.0063 perms.
 - .2 After Wetting and Drying: 0.0052 perms.
 - .3 Resistance to Plastic Flow and Temperature: 0.0057 perms.
 - .4 Effect Low Temperature and Flexibility: 0.0052 perms
 - .5 Resistance to Deterioration from Organisms and Substances in Contacting Soil: 0.0052 perms.
 - .6 Puncture Resistance (ASTM D1709): >3,200 grams.
 - .7 Tensile Strength ASTM E154, Section 9: 72 Lb. Force/Inch
 - .2 Thickness of Retarder (plastic), ACI 302.1R-96, not less than 15 mils.
 - .3 Acceptable product: Sealtight Perminator HP, as manufactured by W.R. Meadows or Stego Wrap Vapor Barrier by Stego Industries LLC or approved equivalent.
- .2 Seam Tape: High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 100 mm. Perminator Tape by W.R. Meadows or Stego Tape by Stego Industries LLC or approved equivalent..
- .3 Pipe Collars: Construct pipe collars from vapor barrier material and pressure sensitive tape per manufacturer's instructions.

PART 3 EXECUTION

3.1 Vapour Retarders Below Slabs

- .1 Install sheet vapour retarder below all concrete slabs on grade.
- .2 Prepare surfaces in accordance with manufacturers recommendations.
- .3 Level, tamp, or roll earth or granular material beneath the slab base.
- .4 Install vapour retarder below floor slab immediately prior to concrete reinforcement placement and in accordance with ASTM E1643
- .5 Unroll vapour retarder with the longest dimension parallel with the direction of the pour.
- .6 Lap vapour retarder over footings and seal to foundation walls.
- .7 Overlap joints 150 mm and seal with manufacturer's tape.
- .8 Seal all penetrations (including pipes and conduits) with manufacturer's pipe boot.
- .9 No penetration of the vapour retarder is allowed except for reinforcing steel and permanent utilities.
- .10 Repair damaged areas by cutting patches of vapour retarder, overlapping damaged area 150 mm and taping all four sides with tape.
- .11 Restrict traffic over vapour retarder.
- .12 Prior to placing concrete inspect vapour retarder and repair all tears and punctures.

3.2 Inspection

- .1 Arrange for inspection of vapour retarders immediately prior to covering, by local building department and Consultant.
- .2 Make all required repairs identified during inspection.

3.3 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 06 10 00 Rough Carpentry
.3 Section 32 16 23 Sidewalks

1.3 References

- .1 ASTM International (ASTM)
- .1 ASTM C510-16(2022) Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants
 - .2 ASTM C661-15(2022) Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
 - .3 ASTM C679-15(2022) Standard Test Method for Tack-Free Time of Elastomeric Sealants
 - .4 ASTM C719-22 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
 - .5 ASTM C793-05(2017) Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants
 - .6 ASTM C794-18(2022) Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
 - .7 ASTM C834-17 Standard Specification for Latex Sealants
 - .8 ASTM C919-22 Standard Practice for Use of Sealants in Acoustical Applications
 - .9 ASTM C920-18 Standard Specification for Elastomeric Joint Sealants
 - .10 ASTM C1183/C1183M-13(2018) Standard Test Method for Extrusion Rate of Elastomeric Sealants
 - .11 ASTM C1193-16 Standard Guide for Use of Joint Sealants
 - .12 ASTM C1246-17(2022) Standard Test Method for Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants After Cure
 - .13 ASTM C1247-20 Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids
 - .14 ASTM C1248-22 Standard Test Method for Staining of Porous Substrate by Joint Sealants
 - .15 ASTM C1311-22 Standard Specification for Solvent Release Sealants
 - .16 ASTM C1330-23 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
 - .17 ASTM D412-16(2021) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
 - .18 ASTM D2203-01(2023) Standard Test Method for Staining from Sealants
 - .19 ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
 - .20 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- .2 Department of Justice Canada (Jus)
- .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 U. S. Environmental Protection Agency (EPA)
- .1 EPA 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.

- .4 South Coast Air Quality Management District (SCAQMD) California State
- .1 SCAQMD Rule 1168-03: Adhesives and Sealants.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit product data for all sealant materials and accessories including:
- .3 Submit MSDS Data Sheets for review and acceptance by the Owner prior to delivery to the project site. Obtain written approval from the Owner and do not deliver any materials to the Owner's property, prior to receipt of such approval.

1.5 Quality Assurance

- .1 Installer Qualifications: Company with minimum of three years of experience specializing in work of this section, employing applicators trained for application of joint sealants required for this project, with record of successful completion of projects of similar scope, and approved by manufacturer.
- .2 Caulking work shall be carried out in strict accordance with manufacturer's printed directions.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.7 Project Conditions

- .1 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Ventilate area of work by use of approved portable supply and exhaust fans.

1.8 Scheduling

- .1 Ensure sealants are cured before covering with other materials.

1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Manufacturer

- .1 Basis-of-Design Products: Provide joint sealant products manufactured by Tremco, Inc., Commercial Sealants and Waterproofing, 220 Wicksteed Avenue, Toronto, www.tremcosealants.com, or comparable products of other manufacturer approved by Consultant.

2.2 Materials, General

- .1 VOC Content for Interior Applications: Provide sealants and sealant primers complying with the

following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):

- .1 Architectural Sealants: 250 g/L.
 - .2 Sealant Primers for Nonporous Substrates: 250 g/L.
 - .3 Sealant Primers for Porous Substrates: 775 g/L.
- .2 Low-Emitting Sealants for Interior Applications: Provide sealants and sealant primers complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 - .3 Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer using ASTM C1087 testing and related experience.
 - .4 Joint Sealant Standard: Comply with ASTM C920 and other specified requirements for each joint sealant.
 - .5 Stain Test Characteristics: Where sealants are required to be non-staining, provide sealants tested per ASTM C1248 as non-staining on porous joint substrates specified.

2.3 Joint Sealant Accessories

- .1 Cylindrical Sealant Backing: ASTM C1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.
- .2 Bond Breaker Tape: Polymer tape compatible with joint sealant and adjacent materials and recommended by sealant manufacturer.
- .3 Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.
- .4 Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.
- .5 Masking tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

PART 3 EXECUTION

3.1 Examination

- .1 Examine joint profiles and surfaces to determine if work is ready to receive joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Verify joint surfaces are clean, dry, and adequately cured. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

3.2 Preparation

- .1 Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C1193.
 - .1 Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
 - .2 Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.

- .3 Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

3.3 Application

- .1 Sealant and Primer Installation Standard: Comply with ASTM C1193 and manufacturer's written instructions.
- .2 Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.
 - .1 Install joint backing to maintain the following joint ratios:
 - .1 Joints up to 13 mm wide: 1:1 width to depth ratio.
 - .2 Joints greater than 13 mm wide: 2:1 width to depth ratio; maximum 13 mm joint depth.
 - .2 Install bond breaker tape over substrates when sealant backings are not used.
- .3 Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.
- .4 Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.
- .5 Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.
 - .1 Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
 - .2 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
 - .3 Tool exposed joint surface concave using tooling agents approved by sealant manufacturer for application.
- .6 Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.
 - .1 Remove masking tape immediately after tooling joint without disturbing seal.
 - .2 Remove excess sealant from surfaces while still uncured.
- .7 Installation of Acoustical Sealant: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations on both sides of assemblies with a continuous bead of acoustical sealant. Comply with ASTM C919 and with manufacturer's written recommendations.

3.4 Field Quality Control

- .1 Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer's instructions and with ASTM C1193, Method A.
 - .1 Perform 5 tests for the first 300 m of joint length for each kind of sealant and joint substrate, and one test for each 300 m of joint length thereafter or 1 test per each floor per building elevation, minimum.
 - .2 For sealant applied between dissimilar materials, test both sides of joint.

- .2 Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.
- .3 Submit report of field adhesion testing to Consultant indicating tests, locations, dates, results, and remedial actions taken.

3.5 Schedule

- .1 Provide sealants at the following locations
 - .1 Where required to protect interior from exterior air and water infiltration.
 - .2 Joints between all dissimilar materials.
 - .3 Construction and control joints.
 - .4 Joints in metal frames.
 - .5 Base of metal frames at resilient flooring
 - .6 Other locations where caulking or sealant is required to provide a neat clean junction.

3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM D543-21 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
 - .2 ASTM D2240-15(2021) Standard Test Method for Rubber Property—Durometer Hardness
 - .3 ASTM E648-19ae1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
 - .4 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - .5 ASTM F970-22 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading
 - .6 ASTM F1303-04(2021) Standard Specification for Sheet Vinyl Floor Covering with Backing
 - .7 ASTM F1869-22 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
 - .8 ASTM F2170-19a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes
 - .9 ASTM F2772-11(2019) Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems.
- .2 American Concrete Institute (ACI)
 - .1 ACI 302.2R-06 Guideline for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Manufacturer's promotional brochures, specifications and installation instructions.
- .3 Samples:
 - .1 Submit for selection and approval three (3) sets of the indoor athletic flooring, manufacturer's brochures, samples or sample boards of all of the available colours, textures and styles.
 - .2 Submit colour samples of all the available game line paint colors for selection and approval.
- .4 Manufacturer Certifications:
 - .1 Provide certification that accurately identifies the Original Equipment Manufacturer (OEM) of flooring furnished for this project including manufacturer's name, address and factory location.
 - .2 Suppliers of private label flooring for this project must identify themselves as such and fully disclose the OEM information listed above.

- .3 All “manufacturer” requirements in these specifications must be complied with by the OEM, including warranties, certifications, qualifications, product data, test results, environmental requirements, performance data, etc.
 - .5 Submit maintenance instructions for Indoor Athletic Surfacing, for inclusion in the Operation and Maintenance Manuals specified in Section 01 78 00-Closeout Submittals.
- 1.5 Quality Assurance
- .1 Qualifications:
 - .1 The indoor resilient multipurpose surfacing shall have been actively marketed for a minimum of ten (10) years.
 - .2 The indoor resilient multipurpose surfacing shall be manufactured in an ISO 9001 certified plant.
 - .3 The indoor resilient multipurpose surfacing supplier shall be an established firm, experienced in the field, and appointed as a distributor by the manufacturer of the indoor resilient multipurpose surfacing.
 - .4 The installer of the indoor resilient multipurpose surfacing shall have a minimum of five (5) years of experience in the field installing indoor resilient multipurpose surfacing and have worked on at least five (5) projects of similar size, type and complexity.
 - .2 Certifications:
 - .1 Installer to submit the indoor resilient athletic surfacing manufacturer’s certification attesting that they are an approved installer of the indoor resilient multipurpose surfacing.
 - .2 The indoor resilient multipurpose surfacing manufacturer to submit official ISO 9001 certification for the facility in which the indoor resilient multipurpose surfacing is manufactured.
 - .3 Testing: Tests shall be relative for multi-purpose use with certificates from independent testing resources to be made available upon request. Test results shall be performed according to ASTM standard testing procedures including ASTM F2772 “Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems”.
- 1.6 Shipping, Handling and Storage
- .1 Refer to Section 01 61 00 – Common Product Requirements.
 - .2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.
 - .3 Delivery:
 - .1 Material shall not be delivered until all related work is in place and finished and/or proper storage facilities and conditions can be provided and guaranteed stable according to FieldTurf USA, Inc. recommendations.
 - .4 Storage:
 - .1 Store the material in a secure, clean and dry location.
 - .2 Maintain temperature between 55° and 85° Fahrenheit.
 - .3 Store the indoor resilient athletic surfacing rolls in an upright position on a smooth flat surface immediately upon delivery to jobsite.
 - .4 Rolls shipped in rigid protective cardboard containers can be laid horizontally prior to unpacking and installation.

1.7 Project Site Conditions

- .1 Maintain project/site conditions acceptable for the installation of the indoor resilient multipurpose flooring.
- .2 The area in which the indoor resilient multipurpose surfacing will be installed shall be dry and weather tight. Permanent heat, light and ventilation shall be installed and operable.
- .3 All other trades shall have completed their work prior to the installation of the resilient athletic flooring.
- .4 Maintain a stable room temperature of at least 18°C for a minimum of one (1) week prior to, during and thereafter installation.
- .5 Concrete subfloor surface pH level within the 7 to 10 range dependent upon installation type.
- .6 Concrete subfloor should be no greater than 3.0 mm within a 3.0 m diameter. This tolerance shall be measured in accordance with ASTM E1155. A specified (FF) of 50 and an (FL) of 30 should reach this degree of floor flatness and floor level. There is no numerical correlation between F numbers and the deviation from the straight edge, however the above specified numbers should achieve a flat floor with minimal deviation in the slab. Reference ACI 117 and ACI 302.1R. The general contractor should provide a certificate of compliance with the above recommendations.
- .7 Concrete subfloor must be clean and free of all foreign materials or objects including, but not limited to, curing compounds and sealers.
- .8 Fill cracks, grooves, voids, depressions, and other minor imperfections. Follow the manufacturer's directions. Moveable joints must be treated utilizing specific transitioning joint devices depending upon the Consultant's recommendations. Follow current ASTM F710 guidelines for the preparation of concrete slabs to receive resilient flooring.
- .9 Refer to ACI 302.2R "Guidelines for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials" for concrete design and construction.

1.8 Additional Materials

- .1 Furnish to the owner additional materials containing a total of at least 2% of each different colour or design of the indoor resilient athletic surfacing used on the project.

1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

- .1 Special Limited Warranty:
 - .1 Manufacturer's standard form in which manufacturer agrees to repair or replace sports flooring including labor that fails within specified warranty period.
- .2 Material warranty must be direct from the product manufacturer.

- .1 Material warranties must come from original manufacturer or division thereof. Private label warranties from distributors or brokers are not valid. Supply original point of manufacturing upon request.
- .3 Failures include, but are not limited to, the following:
 - .1 Material manufacturing defects.
 - .2 Surface wear and deterioration to the point of wear-through of wear layer per ASTM F410/ASTM F1303.
 - .3 Failure due to substrate moisture exposure exceeding 98 percent relative humidity when tested according to ASTM F2170.
- .4 Warranty Period:
 - .1 For material defects and surface wear-through: 25 years from date of Substantial Performance.
 - .2 For moisture vapor tolerance: 25 years from date of Substantial Performance.
- .5 Installer's Limited Warranty:
 - .1 Installer's standard form in which installer agrees to repair or replace sports flooring that fails due to poor workmanship or faulty installation within the specified warranty period.
 - .2 Warranty Period: 2 years from date of Substantial Performance.

PART 2 PRODUCTS

2.1 Manufacturer

- .1 The basis of the design for the indoor resilient multipurpose surfacing is Omnisports Active+ as manufactured by Tarkett.
- .2 All other installation accessories and related components must be either made or approved by the indoor resilient athletic surfacing manufacturer.
- .3 Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions.
- .4 Test reports confirming compliance from an independent sports laboratory must be provided along with samples, technical data, installation, maintenance, and warranty prior to acceptance as an alternative product.

2.2 Materials

- .1 Omnisports Active+ - Prefabricated sport surface 8.1 mm with wood flooring design, single surface embossing and Extreme Three (3) Layers technology (X3LT) as supplied by Tarkett.
 - .1 Embossing of wood design and solid colors must be the same; varying embossing or surface textures will not be allowed.
 - .2 Printing of wood design shall closely resemble standard wood strip flooring in size, colour, board length, and grain appearance.
 - .3 Surface embossing combined with TopClean XP must offer proper balance of surface friction per ASTM F2772.
 - .4 Surface embossing combined with TopClean XP must provide resistance to stains and scratches. Surface profile must not incorporate linear embossing.
 - .5 The wood design shall be protected by a clear layer of pure PVC (Polyvinyl Chloride) and TopClean XP, a factory-applied UV cured urethane treatment.

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- .6 Extreme Three (3) Layers technology (X3LT) includes Omnisports XCS cushion, glass veil and calendared sheet must offer improved shock absorbing comfort while providing better indentation recovery
 - .7 The XCS cushion force reduction layer shall be high-density closed cell PVC foam with honeycomb embossing, and is applied in one continuous manufacturing process.
 - .8 Laminated or adhered foam layers will not be allowed.
 - .9 Field constructed products will not be accepted.
- .2 Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:
 - .1 Width — 2 m
 - .2 Length — 25.9m approx.
 - .3 Wear Layer — 2 mm
 - .4 Total Thickness — 8.1 mm
 - .5 Wear Layer Type 1– Grade 1 ASTM F1303/F410
 - .6 Vertical Deformation PASSED ASTM F2772
 - .7 Rolling Load PASSED 0.30 (EN 1569 {11/1999})
 - .8 Surface Finish Effect PASSED ASTM F2772 (80 – 110)
 - .9 Chemical Resistance Excellent ASTM F925
 - .10 Impact Resistance PASSED EN 1717
 - .11 Abrasion Resistance PASSED 0.10 (EN ISO 5470-1 {06/1999})
 - .12 Static Load Limit PASSED ASTM F970- Load 175 Lbs
 - .13 Sound Insulation Excellent +/- 19 dB (ISO 717/2)
 - .14 In-Room Sound Insulation Excellent 61dB (NF S31-074)
 - .15 Ball Rebound PASSED ASTM F2772 > 90%
 - .16 Force Reduction PASSED ASTM F2772 Class 3
 - .17 Fire Rating PASSED ASTM E648 Class 1
 - .18 Microbial Assays Test No Growth G21 ASTM - Backing
 - .19 Asthma and Allergy Friendly™ ASP: 05-01/101 Certified Compliant
 - .20 Phthalate-free technology — YES
 - .21 REACH Compliant — YES
 - .22 Heavy Metals — NO
 - .23 ISO 9001 — YES
 - .24 ISO 14001 — YES
 - .3 Colour: As available from the indoor resilient athletic surfacing manufacturer's standard range.
 - .4 Hardwood Design Series: A wood look design as available from the indoor resilient athletic surfacing manufacturer's standard range.
 - .5 Texture: Texture to remain consistent between solid colors and wood design when blending colours.
 - .6 Welding Rod: As supplied by the indoor resilient athletic surfacing manufacturer or supplier.
 - .1 Colour to blend with the indoor resilient athletic surfacing color or design.
 - .2 All seams shall be welded to create a monolithic and impermeable surface.
 - .7 Adhesive: As approved by the indoor resilient athletic surfacing manufacturer.
 - .8 Game Line Paint and Primer: As approved by the indoor resilient athletic surfacing manufacturer.

PART 3 EXECUTION

3.1 Examination

- .1 Ensure that project/site conditions are acceptable for the installation of the indoor resilient athletic flooring.
- .2 Verify that the area in which the indoor resilient athletic surfacing will be installed is dry and weather tight. Verify that permanent heat, light and ventilation is installed and operable.
- .3 Verify that all other work that could cause damage, dirt and dust or interrupt the normal pace of the indoor resilient athletic flooring installation is completed or suspended.
- .4 Verify that there is a stable room temperature of at least 18°C.
- .5 Verify that there are no foreign materials or objects on the subfloor and that the subfloor is clean and ready for installation.
- .6 Direct Full Spread Adhering to Concrete Subfloor Multi-Set : moisture content less than 83% RH when tested per ASTM F2170.
- .7 Follow Fieldturf USA, Inc installation recommendations.
- .8 Moisture content less than 92% RH when tested per ASTM F2170.
- .9 Do not average the results of the tests. Report all field test results in writing to the Consultant, and Owner prior to installation.
- .10 Verify that the concrete subfloor surface pH level is within the 7 - 10 range.
- .11 Document the results indicating the slab is within manufacturer's tolerances for slab deviation.

3.2 Preparation

- .1 Clean existing floor slab of all materials and adhesives.
- .2 Sand the entire surface of the concrete slab. Provide surface treatment including filler and levelling compounds as required and in accordance with manufacturer's recommendations.
- .3 Sweep the concrete slab so as to remove all dirt and dust. If a sweeping compound is to be used it must be a sweeping compound that does not contain oil or other items that may inhibit the adhesive bond.
- .4 Slab must be dust free. In the event that dust impairs adhesive bond, priming the slab prior to application of adhesive may be necessary. Follow installation guidelines.

3.3 Installation

- .1 The installation area shall be closed to all traffic and activity for a period to be set by the indoor resilient athletic surfacing installer. The indoor resilient athletic surfacing installation shall not begin until the installer is familiar with the existing conditions.

- .2 All necessary precautions should be taken to minimize noise, smell, dust, the use of hazardous materials and any other items that may inconvenience others.
- .3 Install the indoor resilient athletic surfacing in strict accordance with the indoor resilient athletic surfacing manufacturer's written instructions.
- .4 Indoor athletic surfacing shall be installed in a full bed of adhesive. Perimeter adhesive only is not permitted and will not be accepted.
- .5 Install the indoor resilient athletic surfacing minimizing cross seams. Provide a seam diagram during the submittal process for approval prior to installation. Vinyl Sheet Flooring Seams: Comply with ASTM F 1516. Rout joints and heat weld to permanently and seamlessly fuse sections together. Apply transitions at doorways as needed.
- .6 Paint game lines using approved game line paint primer and game line paint in strict accordance with the game line paint manufacturer's instructions.
- .7 Install appropriate threshold plates or transition strips where necessary.

3.4 Protection

- .1 Protect the indoor resilient athletic surfacing from damage using coverings approved by the manufacturer until Substantial Performance.

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Remove all unused materials, tools, and equipment and dispose of any debris properly. Clean the indoor resilient athletic surfacing in accordance with the manufacturer's instructions.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 09 65 66 Indoor Athletic Surfacing

1.3 Reference Standards

- .1 ASTM International (ASTM)
 - .1 ASTM A312/A312M-21 Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit manufacturer's preprinted technical literature for pre-manufactured products.
- .3 Submit operating and maintenance instructions for all manufactured products and specialties, for inclusion in the Operations and Maintenance Manuals specified in Section 01 78 00-Closeout Submittals.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Protect finished surfaces during shipment and installation.

1.6 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Items specified herein shall be standard manufactured items, modified if required and as specified to suit conditions of this project.
- .2 Fabricate work true to dimensions, square and plumb, to suit site conditions.
- .3 Thickness of metals shall be adequate for the various conditions with requirements specified as a minimum.
- .4 Finished work shall be free from warping, open seams, weld marks, rattles and other defects. Drilling shall be reamed and exposed edges finished smooth.

- .5 Provide all fastenings, anchorage and accessories as required to complete the work and as recommended by the manufacturer.
- .6 Fastenings shall be concealed or theft-proof type where possible. Exposed fastenings shall be neatly executed and shall be of the same material and finish as the base metal on which they occur.

2.2 Products

- .1 **Gymnasium Floor Sockets:** Floor sockets for badminton and volleyball shall be solid cast bronze sockets with steel sleeves and removable caps or installation in concrete floor slabs. Sockets shall be as manufactured by S/A Sport Spieth Anderson, Orillia Ontario. 705-325 2274:
 - .1 Badminton Floor Sockets: Model 170, 48 mm I.D. x 168 mm depth; and
 - .2 Volleyball Sockets: Model 209, 77 mm I.D. x 241 mm depth with hinged cap.

PART 3 EXECUTION

3.1 Installation - General

- .1 Install manufactured items in accordance with manufacturer's printed instructions and recommendations.

3.2 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 Ontario Provincial Standards (OPS)
.1 OPSD 219.130 Heavy Duty Silt Fence Barrier (November 2006)
.2 OPSS 805 Temporary Erosion and Sediment Control Measures (November 2015)

PART 2 PRODUCTS

2.1 Materials

- .1 Silt fence shall be prefabricated heavy duty geotextile, Mirafi Envirofence or equivalent with the following physical properties:

Property	Test Method	Units	Minimum Average Roll Values
Grab Tensile Strength (machine direction)	ASTM D4632	N (lbs)	550
Grab Tensile Strength (cross-machine direction)	ASTM D4632	N (lbs)	550
Grab Tensile Elongation	ASTM D4632	%	15/15
Mullen Burst Strength	ASTM D3786	kPa	2060
Trapezoid Tear Strength	ASTM D4533	N	290
Permittivity	ASTM D4491	sec	0.10
Water Flow Rate	ASTM D4491	l/min/m ²	405
Ultraviolet Stability	ASTM D4355	%	70

- .2 Fence shall be prefabricated with 1.2 cm nominal square hardwood posts at 2.5 metre spacing.

PART 3 EXECUTION

3.1 Examination

- .1 Prior to commencement of Work, meet with Owner and Consultant on site for review of layout and items to be retained and protected on site.
.2 Examine drawings including reference drawings and investigate fully site conditions. Report any adverse conditions to the Consultant.

3.2 Preparation and Protection

- .1 Maintain control devices throughout the duration of construction in good repair and to the satisfaction of the Owner, Consultant, Ministry of the Environment and Local Conservation Authority.

- .2 Environmental protection measures are to be installed in advance of any work performed. Environmental protection measures are to be constructed and maintained to the satisfaction of the Owner and the Local Conservation Authority.
- .3 Install and maintain new construction fencing in location determined by Contractor and approved by Owner. Refer to Section 01 56 00 – Temporary Barriers and Enclosures.
- .4 Prepare all required temporary access routes and driveways. Ensure entrances are designed to safely support all imposed loads.
- .5 Protect trees and vegetation to remain during construction against flooding and sediment deposit. Tree protection barriers shall be in accordance with OPSD 220.010.
- .6 Obtain locates of all underground services prior to commencement of any work on site.
- .7 Locate and stake all buried services. Be responsible for protection of services including sub-drainage systems.
- .8 Ensure that all pedestrian access and exit routes from site are in place and protected from construction operations.
- .9 Maintain and protect existing fire access routes. Provide access to municipal fire hydrants at all times.
- .10 Provide and maintain temporary drainage structures as required.

3.3 Sedimentation Control

- .1 Ensure that sedimentation control as specified and as indicated on the drawings and required by authorities are in place and are in proper repair prior to commencement of the Work.
- .2 Sedimentation control shall be in accordance with OPSS 805, and local authorities.
- .3 Maintain and/or repair sedimentation control at all watercourses and catch basins to prevent contamination by excavated fill.
- .4 Refer to details and notes on site development drawings.
- .5 Install additional sedimentation control as required and obtain Consultant's approval prior to commencement of site works.

3.4 Clearing and Grubbing

- .1 Remove and dispose of trees, snags, stumps, shrubs, brush, limbs, and other vegetative growth. Remove all evidence of their presence from the surface including sticks and branches greater than 25 mm in diameter or thickness. Remove and dispose of trash piles and rubbish.
- .2 After clearing, remove and dispose of wood or root matter including stumps, trunks, roots, or root systems greater than 25 mm in diameter.

3.5 Stripping Topsoil

- .1 Remove topsoil down to full depth where it contacts non-organic soil from locations of new structures and where adjustment to grades is necessary.
- .2 Do not handle wet or frozen topsoil.
- .3 Stockpile clean non-contaminated topsoil approved by the Geotechnical Engineer, on site, for reuse if space permits. Piles shall not exceed 2000 mm in height.
- .4 Protect stockpiled material from contamination and erosion.
- .5 On completion of work, remove all unused stockpiled material from the site, and dispose of in accordance with applicable legislation.

3.6 Removal

- .1 Remove all items as indicated on site plans and dispose of in a legal manner.
- .2 Sawcut and remove existing asphalt pavement at limits shown and as necessary.
- .3 Break out and remove existing concrete sidewalk and asphalt where indicated and required.
- .4 Remove and dispose of all signage, sign posts, barriers, and the like within work area limits.
- .5 Remove and dispose of fences, gates, posts and their foundations completely, as indicated or as required by the Consultant.

3.7 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 31 23 10 Excavating, Trenching and Backfilling
- .2 Section 32 92 23 Sodding

1.3 References

- .1 Agriculture and Agri-Food Canada (AAFC)
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN 1340-2005 Guidelines for Compost Quality.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 Definitions

- .1 Compost:
 - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
 - .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss on Ignition (LOI) test.
 - .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25) and contain no toxic or growth inhibiting contaminants.
 - .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.

1.6 Quality Assurance

- .1 Topsoil from each source, native and imported shall be tested for N.P.K., atrazine, minor elements as well as clay and organic matter contents and acidity (PH) range. Topsoil shall be tested, and written test report received and approved by Consultant prior to delivery to site. Contractor to allow minimum three-weeks lead time for Consultant to submit samples and await laboratory test results prior to installation date.

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.

1.8 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Owner.

- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Topsoil in Seeded and Sodded Area

- .1 Topsoil for seeded areas planting beds: mixture of particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Topsoil shall be fertile, friable natural loam containing not less than 4% of organic matter for clay loams and not less than 2% of organic matter for sandy loams to a maximum of 10% by volume. Topsoil to have an acidity value ranging from a Ph of 6.0 to a Ph of 7.5.
 - .2 Topsoil to be capable of sustaining vigorous plant growth and to be free from subsoil, roots, vegetation, debris, toxic materials, invasive species seeds and weeds and stone over 50mm diameter.
 - .3 Topsoil to be screened prior to delivery to site.
- .2 Fertilizer: Complete commercial synthetic fertilizer as required by soil tests.
- .3 Limestone: Ground agricultural limestone containing minimum 85% of total carbonates.
 - .1 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .4 Elemental Sulphur: Sulphur comprised of 90% sulphur and 10% percent Bentonite Clay.
 - .1 Consistence: friable when moist.

2.2 Topsoil for Tree and Ornamental Grass/Perennial Plantings

- .1 Imported topsoil: friable , neither heavy clay nor of very light sandy nature, containing a minimum of 4% organic matter for clay loam and 2% sandy loams to a maximum of 10% by volume. Free from subsoil, roots, grass, weeds, invasive species seeds, toxic materials, stones, foreign objects and with an acidity range (ph) of 6.0 to 7.5. Topsoil containing crabgrass, couch grass or noxious weeds is not acceptable.

2.3 Soil Amendments

- .1 All soil amendments where specified shall be thoroughly and evenly blended to provide uniform consistency of final soil mixture.
- .2 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
 - .5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .6 Ph value: 6.0 to 7.5.
- .3 Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle minimum size: 5 mm.

- .4 Sand: washed coarse silica sand, medium to coarse textured.
- .5 Aggregate: Pea gravel 12mm dia. Round Clear.
- .6 Organic matter: compost Category A, in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .7 Limestone: Ground agricultural limestone.
 - .1 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .8 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.4 Source Quality Control

- .1 Advise Consultant of sources of topsoil to be utilized with sufficient lead time for testing.
- .2 Contractor is responsible for amendments to supply topsoil as specified.
- .3 Soil testing by recognized testing facility for PH, P and K, and organic matter.
- .4 Contractor to bare all costs for testing required for initially non-conforming laboratory results requiring further soil amendments.
- .5 Testing of topsoil will be carried out by a testing laboratory approved by Consultant.
 - .1 Soil sampling, testing and analysis to be in accordance with Provincial Standards

PART 3 EXECUTION

3.1 Stockpiling of Topsoil Prior to Use

- .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .2 Stockpile in off-site location unless otherwise agreed to at pre-construction meeting.
 - .1 Stockpile height not to exceed 2 m if stockpile location on site is identified.
- .3 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed by Consultant and at the expense of the Contractor.
- .4 Protect stockpiles from contamination and compaction.

3.2 Preparation of Existing Grade

- .1 Verify that grades are correct. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches and stones in excess of 25 mm diameter and other deleterious materials.

- .1 Remove debris which protrudes more than 25 mm above surface.
- .2 Dispose of removed material off site.

- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100mm.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 Placing and Spreading of Topsoil/Planting Soil

- .1 Place topsoil after Consultant has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For seeded areas keep topsoil at finished grade.
- .4 Spread topsoil as indicated to following minimum depths after settlement.
 - .1 600mm minimum for ornamental grass and perennial beds and planters.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.4 Finish Grading

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
 - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Consultant.
 - .1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.5 Acceptance

- .1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 Surplus material

- .1 Dispose of materials not required off-site.

3.7 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .3 Leave all adjacent hard surfaces swept and washed clean of topsoil.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- | | | |
|----|------------------|------------------------|
| .1 | Section 02 41 14 | Asphalt Paving Removal |
| .2 | Section 03 30 00 | Cast-In-Place Concrete |
| .3 | Section 31 10 00 | Site Clearing |
| .4 | Section 32 12 16 | Asphalt Paving |
| .5 | Section 32 16 13 | Concrete Curbs |
| .6 | Section 32 16 23 | Sidewalks |
| .7 | Section 32 92 23 | Sodding |
| .8 | Section 33 46 00 | Subdrainage |
| .9 | Section 33 46 13 | Foundation Drainage |

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM D698-12(2021) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))
 - .2 ASTM D1557-12(2021) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
- .2 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 805 Construction Specification for Temporary Erosion and Sediment Control Measures
 - .2 OPSS 180 General Specification for the Management of Excess Materials
 - .3 OPSS 206 Construction Specification for Grading
 - .4 OPSS 1010 Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material
- .3 Ontario Provincial Standard Details (OPSD)
 - .1 OPSD 219.130 Heavy Duty Silt Fence Barrier
 - .2 OPSD 805 Temporary Erosion and Sediment Control Measures
- .4 The Occupational Health and Safety Act.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit shop drawings of shoring and bracing required in connection with excavation. Drawings to show clearly procedural sequence to be followed.

1.5 Definitions

- .1 Earth: Site excavated material, including shale, rubble rock, building debris, shrub and tree roots and soil.
- .2 Soil: Site excavated material, free from shale, rubble rock, building debris, shrub and tree roots.
- .3 Fill: Approved materials, other than earth, clay and unapproved soil. Approved soil may be used only with approval of the Consultant in writing.

- .4 Rock: All solid rock in ledges, stratified deposits, unstratified masses, and all conglomerate deposits or any other material so firmly cemented by process of nature as to present all the characteristics of solid rock, being so hard or firmly cemented that it cannot be excavated and removed with a power shovel except after thorough and continuous drilling and blasting.
- .5 Backfilling: The operation of supplying and installing fill and approved soil materials.
- .6 Engineered Fill: Approved material used to build-up to design elevations.

1.6 Examination

- .1 Examine the building site and determine the nature and extent of the materials to be removed or the additional fill required to provide depths and levels indicated on drawings. Field check the site to review existing conditions. Verify locations of all existing utilities and services that will affect the work.
- .2 Refer to drawings for all building and site development details.

1.7 Geotechnical Report

- .1 Refer to "Geotechnical Investigation Report No. 6381W-23-GA" dated July 28, 2023 and prepared by Toronto Inspection Limited.
- .2 Information provided in this report is based on field records and is therefore subject to the usual limitations and reservations associated with such work (stated in the conclusion of the report).
- .3 The use of this information is entirely at the risk of the Contractor.
- .4 During examination of the site, carry out such investigations as necessary to determine subsurface conditions to be encountered in constructing the Works.
- .5 Notify the structural engineer and the inspection and testing company when excavation work commences for inspection and verification of soil conditions.

1.8 Setting Out Work

- .1 The drawings indicate the building components location and proposed and final grades. Be responsible to construct the work according to levels and locations shown on the drawings. Report any errors or discrepancies to the Consultant before commencing work.
- .2 Commencement of any part of the work shall constitute acceptance of drawings as being correct.
- .3 Employ a competent instrument man and provide all lines and levels, limit lines and boundary stakes for the execution of the work as required. All benchmarks shall be carefully protected.
- .4 Provide and be responsible for, all lines, levels and dimensions which trades require to relate their work to the work of other trades. All trades shall be notified that all such levels and dimensions must be obtained from the Contractor.

1.9 Existing Underground Utilities

- .1 Arrange underground locates of all utility assets prior to excavating. Do not commence excavation in a location prior to utility members marking the location of their utilities or indicating that none exist within the outlined excavation limits. Where necessary, employ the services of a private utility locator to ensure that all utilities are located in a timely manner.
- .2 Verify the location and elevation of all existing utilities within the limits of the Work. Observe the locations of the stake outs, prior to commencing the Work. In the event there is a discrepancy between the locations of the stake outs and the locations shown on the Contract Documents, that may affect the Work, immediately notify the Consultant and the affected utility companies, in order to resolve the conflict.
- .3 All existing buried utilities located within the excavation zone and any other facilities adjacent to the excavation shall be carefully supported and protected from damage as a result of the Contractor's operations. Be responsible for repairing any damaged underground utilities, as a result of actions during the course of the work at no extra cost to the Owner.
- .4 All costs associated with this work shall be considered incidental to all related items of work in the Contract. No separate payment will be made for costs incurred in obtaining utility locates.

1.10 Protection of Existing Services

- .1 Notify the Owner, Public Utility or Municipal authorities in advance of planned excavations adjacent to their services.
- .2 Take care not to damage or displace encountered known and unknown services.
- .3 When such services are encountered during the execution of work, immediately notify the Consultant and protect, brace and support active services. Where repairs to these services become necessary use the following procedure:
 - .1 Known services, repair at no expense to the Owner.
 - .2 Unknown services, forward to the Consultant a complete breakdown of the estimated cost of such work. Proceed only upon written authorization.
- .4 In the case of damage to, or cutting off of an essential service, notify Consultant, the Owner, and Public Utility or Municipal authorities immediately and repair the service under the Consultant's direction.

1.11 Inspection and Testing

- .1 Provide proper and sufficient samples, ample opportunity and access at all times for the Consultant or Testing Agency to inspect materials, operations and completed works carried out under this Section.
- .2 Sample and test excavated material prior to shipping to landfill off the site. Samples shall be tested for compliance of acceptable material for landfill. Furnish to the Owner the results of all testing and location of landfill site used. This testing will not be undertaken by the Owner's Inspection and Testing Agency.

- .3 Provide 24 hours notice to inspection laboratory and request tests as follows:
 - .1 Sieve Analysis: Proposed fill materials will be tested to confirm stability for intended use and conformity with specifications.
 - .2 Density Test: Tests will be conducted on compacted fill, to ASTM D698.
 - .3 Frequency Test: Excavated Surfaces: When existing compacted fill surface is being prepared, make a series of three tests of surface for each 500 m² area.
 - .4 Fills under Pavement or Slabs on Grade: Make three tests for every two lifts of compacted fill for each 500 m² area.
 - .5 Backfill Structural Walls: Test each different material for approximately each 30 metres of wall being backfilled at depth increments of 610 mm.

1.12 Standards

- .1 Carry out all work in accordance with the applicable OPSS, OPSD and site drawings. The applicable Ontario Provincial Standard Specifications are listed hereafter.
- .2 The following shall apply:
 - .1 OPS 180 Management and Disposal of Excess Material
 - .2 OPS 206 Grading, Nov. 2005
 - .3 OPS 314 Untreated Granular Subbase, Base, Surface, Shoulder and Stockpiling
 - .4 OPS 805 Temporary Erosion and Sediment Control Measures

1.13 Shoring and Bracing

- .1 Shoring and trench timbering, in addition to requirements of local authorities, shall be carried out in accordance with the requirements of The Occupational Health and Safety Act, "November 1992 Ontario Regulation 213/91" and Regulations for Construction Projects by Ontario Ministry of Labour and to Construction Safety Association brochure "Trenching Safety April 1994".
- .2 Erect necessary shoring for excavations in such a manner that:
 - .1 Whenever a trench or excavated face is necessary, shore and brace to prevent failure. Engage a registered Professional Engineer fully qualified in this line of work to design, stamp shop drawings and assume responsibility for the shoring and bracing. Submit shop drawings to the Consultant.
 - .2 It will properly retain the banks of the excavations and prevent caving-in or displacement or damage to surrounding or adjacent buildings or other property.
 - .3 All other work in connection with this Contract, including the Mechanical and Electrical Trades, may be carried out while it is still in place if necessary.
 - .4 It will be entirely free of footings, foundation walls or other such work so that it may be removed entirely or in sections when it is no longer required or when directed, without causing any damage or injury to the structural work that has been completed.

1.14 Sedimentation Control

- .1 Maintain and/or repair sedimentation control at all watercourses and catch basins to prevent contamination by excavated fill.
- .2 Sedimentation control shall be in accordance with the Ontario Provincial Standard Specifications, OPSS 805 and local authorities.
- .3 Refer to details and notes on site development drawings.

- .4 Install additional sedimentation control as required and obtain Consultant's approval prior to commencement of site works.

1.15 Dewatering

- .1 Keep excavations and backfill dry at all times.

PART 2 PRODUCTS

2.1 Materials

- .1 Type A Fill: Class "A" material conforming to OPSS1010, latest edition.
- .2 Type B Fill: Class "B" material conforming to OPSS 1010, latest edition.
- .3 Sand Fill: Clean, well graded compactable sand to OPSS 1010, Granular "M" fill.
- .4 Crushed Stone: Crushed stone shall be composed of clean, hard, durable course gravel, or crushed rock fragments such that 100% of the particles pass the 18 mm sieve and not more than 10% of the particles pass the No. 4 sieve. No clay or other objectionable materials shall be present.
- .5 Pea Gravel: 10 mm diameter washed stone.
- .6 Engineered Fill: fill placed below Type A and Type B fill to bring excavation to the design elevations. To be Type B fill or approved fill, approved in writing by the Consultant.
- .7 Topsoil: Clean topsoil, imported material approved by the Consultant, and free from admixtures of subsoil, clay lumps, stones or roots over 25 mm diameter, free of toxic substances or any other foreign matter which would inhibit growth. Minimum 150 mm thickness and 500 mm at all planting beds.
- .8 Silt fence: heavy duty geotextile, Mirafi Envirofence or equivalent.

PART 3 EXECUTION

3.1 Preparation

- .1 Clearing: Refer to Section 31 10 00 - Site Clearing.
- .2 Lines and Levels: Refer to Section 01 71 00 - Examination and Preparation.
- .3 Stock Piles: Where permitted, stockpile materials in a manner to prevent segregation and contamination. Piles not to exceed 2000 mm in height. Stockpile materials in a location and manner not interfering with ongoing operation and use of the site and building by the Owner.
- .4 Install silt fencing as detailed and in accordance with reference standards.

3.2 Excavation Work

- .1 Excavate to elevations and dimensions indicated or required by the work, plus sufficient space to permit erection of forms, shoring and inspection. Excavation shall be made to clean lines to minimize quantity of fill material required.

- .2 Remove large rocks, stumps and other obstructions of whatever nature encountered in the course of excavation and haul away off the site. Remove all concrete, masonry, rubble or other construction debris encountered during the work.
- .3 Unauthorized Excavation - Excavation to greater than required depth shall be corrected by the Contractor at his own expense in a manner as directed by the Consultant. Fill over-excavated areas under structure bearing surfaces and footings with concrete as specified for foundations.
- .4 Keep excavation free of water by bailing, pumping or a system of drainage as required and provide pumps, suction and discharge lines or well points of sufficient capacity and maintain until such time as the permanent drainage system is installed or until the Consultant's approval of removal of equipment is obtained. Take all necessary measures to prevent flow of water into the excavation.
- .5 Protect the bottom and sides of excavated pits and trenches from freezing. Protect also from exposure to the sun and wet weather to prevent cave-ins and softening of the bed upon which concrete or drains rest.
- .6 Excavations must not interfere with the normal 45 degree plane of bearing from the bottom of any footing.
- .7 Keep bottoms of excavations clean and clear of loose materials levelled and stepped at changes of levels with exception of excavations made for drainage purposes and those to slope as required.
- .8 If the excavations reveal seepage zones, springs or other unexpected sub-surface conditions which may necessitate revisions or additions to any drainage system, inform the Consultant immediately so that remedial action can be taken.
- .9 If removal of earth causes displacement of adjacent earth, the earth so disturbed shall be removed at no additional cost to the Owner.
- .10 Conditions of Excavated Surfaces
 - .1 Excavate to a depth sufficient to expose firm undisturbed subsoil, free of organic matter and to the Testing Agency's approval.
 - .2 Remove soft, wet or unconsolidated ground and organic material encountered in excavating.
 - .3 Should the nature of the sub-soil at the depths shown prove to be unsatisfactory to the Consultant for the placing of the concrete work, then upon the Consultant's written order, the Contractor shall excavate to greater depth until a satisfactory bottom is reached.
- .11 Tolerances: General excavation shall be to the elevations shown on the drawings, plus or minus 25 mm.

3.3 Hydro Excavation

- .1 Utilize hydro excavation services when working near and around known utilities to avoid damage.

3.4 Backfilling

- .1 Proceed promptly with backfilling as the building progresses, and as work to be backfilled has been inspected and approved by the Consultant. The backfill in areas where settlement cannot be tolerated, e.g. service and footing trenches under the floor slab, should be compacted to at least 100 per cent of its Standard Proctor Maximum Dry Density. The backfill should be placed in lifts not

greater than 200 mm thick in the loose state, each lift being compacted with a suitable compactor to the specified density.

- .2 Do not commence backfilling operations until mechanical and electrical services, site drainage systems, perimeter and insulation has been inspected and approved by Consultant and authorities having jurisdiction. Existing floor subgrade must be proof rolled before backfilling.
- .3 Withdraw shoring material during backfill. Lumber left in place without the Consultant's approval will not be paid for by the Owner.
- .4 Backfill evenly on both sides of foundation walls to avoid unequal fill pressures on walls.
- .5 Place fill around foundation walls and footings so that footings will have a minimum of 1200 mm coverage, measured at an angle of 45 degrees from bottom of footing to protect against frost until final grading is complete.
- .6 Where fill is placed adjacent to structures or vulnerable building components or in restricted areas, the fill shall be compacted to the same degree as specified by suitable equipment approved by the Consultant. Avoid damage to or displacement of walls, columns, piers, underground services, and process/ production equipment.
- .7 Add water in amounts required only to achieve the optimum moisture content, in accordance with ASTM D1557.
- .8 Backfill shall be free of snow and ice, topsoil, construction debris and oversized boulders greater than 150 mm.

3.5 Rough Grading

- .1 Preparation and Layout
 - .1 Establish extent of grading by area and elevation.
 - .2 Prior to commencement of grading work, establish location and extent of all underground utilities occurring in work areas. Maintain, reroute or extend as required. Pay all costs for this work, except costs borne by utilities companies.
 - .3 Slope grade away from building as indicated on drawings.
 - .4 Cut temporary drainage swales and create containment ponds and structures for temporary surface run-offs, until storm sewer system is installed.
 - .5 Regrade all areas that retain or pond water.
 - .6 Rough grade all areas to tolerance of plus or minus 50 mm.

3.6 Fills Under Concrete Slab

- .1 The fill shall be deposited in layers of such thickness that the equipment being used for compacting can produce the specified density but in no cases, more than 200 mm thickness. If lumps are present in the material each layer shall be continuously disced in order to ensure proper compaction.
- .2 The exposed subgrade shall be proof rolled to ensure its integrity. If the subgrade consists of engineered fill, the fill shall be compacted to at least 98% of its maximum Standard Proctor Dry Density for native materials or 100% compaction for Granular "A" and "B" materials, using equipment approved by the Consultant. Any loose, wet or deleterious material shall be sub-excavated and replaced by the Contractor with Type B Engineered fill which must be compacted to 98% Standard Proctor Maximum Density.

- .3 Immediately after levelling, each layer of fill shall be thoroughly compacted by the use of approved mechanical equipment.

3.7 Compaction Density

- .1 Use approved equipment for compaction. Maintain materials at optimum moisture content to obtain required compaction. Special care shall be taken to prevent disturbance of the existing subgrade and adjacent structures and equipment.
- .2 Be responsible for damage to the subgrade and installed materials due to improper compaction methods. Make good to approval of the Consultant.
- .3 The minimum density of fill in place shall be the following values of Standard proctor densities for corresponding locations in accordance with ASTM D698.
 - .1 Type A Fill: To 100% Standard Proctor Maximum Density.
 - .2 Type B Fill: To 100% Standard Proctor Maximum Density.
 - .3 Engineered Fill: To 98% Standard Proctor Maximum Density.
- .4 If during progress of work, tests indicate that compacted materials do not meet specified requirements, remove defective work, replace and retest at own expense.
- .5 Ensure compacted fills are tested and approved before proceeding with placement of surface materials.

3.8 Fill Locations

- .1 Type A Fill:
 - .1 Under all interior and exterior concrete slabs 150 mm minimum thickness.
 - .2 Below all mechanical or electrical services, from 150 mm below invert, to springline.
- .2 Type B Fill:
 - .1 Around all footings, foundations, grade beams and walls up to the underside of Type A fill.
 - .2 From top of approved compacted subgrade to underside of concrete slabs (interior or exterior) but not less than 200 mm thickness.
 - .3 At all areas on the site indicated to be paved with asphalt.
- .3 Sand Fill:
 - .1 In accordance with geotechnical report.
- .4 Crushed Stone: around all subdrainage piping.
- .5 Engineered Fill: All fill locations up to the underside of Type B fill and where required to fill up to design elevations.
- .6 Topsoil: at all areas to receive sod. Minimum 100 mm thickness unless noted otherwise.
- .7 Site excavated material: as backfill to exterior side of foundation walls only when permitted and approved by the Geotechnical engineer and below all sodded or seeded areas up to underside of topsoil, but not within 600 mm of foundation walls or structures.

3.9 Water on Prepared Surfaces

- .1 Promptly remove, by approved methods, water rising from seeping of the soil or resulting from rainfall wherever such water is on the surface of sub-grade soil and compacted fill.
- .2 Where proper drainage and pumping is not carried out as specified herein, and any prepared sub-grade soil for under structural work, and any compacted fill for under concrete slabs, is softened or disturbed by water due to improper drainage and pumping, the Contractor shall remove the unsatisfactory soil and fill, and bear all incidental costs in connection with additional excavation and placing and compacting of granular fill under floor slabs.

3.10 Surplus Soil Disposal

- .1 Surplus soil and excavated material shall be promptly removed and disposed of off the site at legal dump sites. Conform to local bylaw requirements for trucking and disposal. Complete testing as described in Part 1 of this specification.

3.11 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 As excavation proceeds, keep roads and aisles clean of dirt and excavated material.
- .3 Clean up and wash down to remove all dirt and excavated materials caused by the work of this section daily.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 31 23 10 Excavating, Trenching and Backfilling
- .3 Section 32 16 13 Concrete Curbs
- .4 Section 32 16 23 Sidewalks
- .5 Section 32 17 23 Pavement Markings

1.3 References

- .1 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS 1003 (2013) Material Specification for Aggregates - Hot Mix Asphalt
 - .2 OPSS 1010 (2013) Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material
 - .3 OPSS 1101 (2014) Material Specification for Performance Graded Asphalt Cement
 - .4 OPSS 1103 (2012) Material Specification for Emulsified Asphalt
 - .5 OPSS 1150 (2008) Material Specification for Hot Mix Asphalt
- .2 Ontario Regulation O Reg 406/19 On-Site and Excess Soil Management

1.4 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 Submittals.
- .2 Submit asphalt mix designs.

1.5 Protection

- .1 Protect work of all trades and adjacent properties from damage from the work of this section.
- .2 Barricade paved areas to prevent vehicle traffic for at least 24 hours after completion.

1.6 Quality Assurance

- .1 All work of this Section shall be completed by a bona fide road building contractor engaged in paving work for a minimum of 5 years and having all equipment necessary to complete the work as specified.

1.7 Inspection and Testing

- .1 The Owner will engage an independent inspection and testing company.
- .2 The inspection and testing company shall perform the following services:
 - .1 Sample proposed sources of fill materials and advise as to acceptability, maximum densities obtainable and compaction procedures.
 - .2 Carry out density tests to ensure that the required density is achieved and report the results of such tests in writing.

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- .3 The cost of employing the inspection and testing company shall be paid for by the Contractor out of the cash allowances specified in Division 00 21 00.

PART 2 PRODUCTS

2.1 Engineered Fill

- .1 Compacted Granular 'B' fill or other suitable fill as approved by the Consultant to thickness required to bring subgrade to level of underside of Granular 'B' base course.

2.2 Granular Base Materials

- .1 Granular 'B' Base Course: Crushed or uncrushed bank or pit gravel or stone obtained from an approved source, conforming to requirements for Granular 'B' aggregate, Ontario Provincial Standard Specifications Form No. 1010.
- .2 Granular 'A' Base Course: Crushed gravel or stone, obtained from an approved source conforming to requirements for Granular 'A' aggregate, Ontario Provincial Standard Specifications Form No. 1010.

2.3 Asphalt Materials

- .1 Asphalt Cement: OPSS 1101
- .2 Aggregates: OPSS 1003 and OPSS 1010
- .3 Filler: OPSS 1003
- .4 Asphalt (H.L.8) conforming to OPSS Form 1150
- .1 Bituminous First Course - shall be dense graded, hot mixed, hot laid.
- .5 Asphalt (H.L.3) conforming to OPSS Form 1150
- .1 Asphalt surface course shall be hot mixed, hot laid.
- .6 Emulsified Asphalt OPSS 1010 or MTO primer.

2.4 Joint Painting Material and Asphaltic Primer

- .1 SS-1 Emulsion to OPSS 1103.

2.5 Cold Patch

- .1 Asphaltic patching materials in accordance with Ontario Provincial Standard Specifications.

2.6 Painted Line Markings

- .1 As specified in Section 32 17 23 – Pavement Markings.

PART 3 EXECUTION

3.1 Surface Conditions

- .1 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- .2 Verify that asphalt pavement may be installed in strict accordance with the original design, all pertinent codes and regulations, and all pertinent portions of the referenced standards.
- .3 Check rough grading, re-grade, re-level and re-compact as required. Soft spots, wet holes, shall be dug out and filled with granular fill placed in not over 150 mm layers and compacted. Remove surplus material from the site.
- .4 Sub-grade shall be fully stabilized, compacted to 100% of standard Proctor Density and levelled to a tolerance of not more than 13 mm measured on a 3.0 m straight edge.
- .5 In the event of discrepancy, immediately notify the Consultant.
- .6 Place and compact engineered fill in sufficient quantities to bring subgrade up to specified level of underside of Granular 'B' base course. Compact engineered fill to 95% Standard Proctor Density.

3.2 Placement of Granular Base

- .1 Granular material shall be placed in layers of such thickness that the equipment being used can produce the specified density.
- .2 Immediately after leveling the material shall be compacted to the specified density.
- .3 Compaction: All granular material shall be compacted to a minimum of 100% Standard Proctor Maximum Density.
- .4 Finished elevation tolerance will be to within 13 mm of the required elevation.

3.3 Placement of Asphaltic Surfacing

- .1 Asphalt driveway surfacing shall be placed in accordance with Ontario Provincial Standard Specification for Hot Mix Hot Laid Asphaltic Concrete. Materials, equipment and construction methods shall be in accordance with the current edition of OPSS 1010 including all amendments thereto.
- .2 Place asphalt driveway paving where indicated on the drawings.
- .3 Pavement structures including asphalt course and fill shall be as noted on the drawings.
- .4 Finished surface shall be smooth of uniform density and texture and true to established finished elevations. Paving shall be of thickness specified and when checked with a 3 m straight edge shall show no irregularity exceeding 6 mm in depth. Surface shall be sloped in order that all surface water will be drained to perimeter of asphalt.

- .5 Paint contact edges of abutting concrete paving with a thick coat of hot asphalt cement before paving mixture is placed against them.
- .6 Joints in asphalt shall be kept to a minimum. Joints in base and top asphalt shall be staggered.
- .7 Base asphalt shall be thoroughly cleaned prior to placing of top course of asphalt.
- .8 Where asphalt does not adjoin concrete paving, edges shall be trimmed and hand tamped to a clean straight line.

3.4 Patching Asphalt Pavement

- .1 Saw cut perimeters of areas to be patched or joined. Remove existing asphalt and base material to depth required.
- .2 Grind top surface of asphalt to depth of 38 mm for width of 300 mm from saw cut. Paint exposed edge of asphaltic joints, edge of maintenance holes and catch basin frames, curbs and similar items with SS-1 emulsified asphalt.

3.5 Asphalt Prime

- .1 Paint contact of curbs and like structures with thin, uniform coat of asphalt prime material.
- .2 Do not apply prime when air temperature is less than 5 ° C or when rain is forecast within 2 hours.
- .3 Where traffic is to be maintained, treat no more than one-half width of surface in one application.
- .4 Prevent overlap at junction of spreads.
- .5 Do not prime surfaces that will be visible when paving is complete.
- .6 Apply additional material to areas not sufficiently covered.
- .7 Keep traffic off primed areas until asphalt prime has cured.
- .8 Permit prime to cure before placing asphalt paving.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 10 00 Concrete Formwork
- .2 Section 03 30 00 Cast-in-Place Concrete
- .3 Section 31 23 10 Excavating, Trenching and Backfilling
- .4 Section 32 16 23 Sidewalks

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM C309-19 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .2 ASTM D698-12(2021) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))
- .2 CSA Group (CSA)
 - .1 CSA-A23.1:19/ CSA-A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete.
- .3 Ontario Provincial Standard Specifications and Details (OPSS and OPSD)
 - .1 OPSS 1010 Material Specification for Aggregates - Granular A, B, M and Select Subgrade Material.
 - .2 OPSS1308 Material Specification for Joint Filler (Concrete).
 - .3 OPSD 600.110 Concrete Barrier Curb.

1.4 Quality Assurance

- .1 Do concrete work in accordance with the requirements of Division 3, except where otherwise specified herein.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 16 00 – Common Product Requirements.

1.6 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Base: Granular "A", OPSS 1010.
- .2 Concrete: CSA-A23.1
- .3 Curing Compound: Chlorinated rubber based, ASTM C309 Type 2, suitable for exterior use.

- .4 Form Work: Steel or wood, capable of producing smooth, flat surfaces.
- .5 Joint Filler: Premoulded, non-extruding and resilient bituminous. OPSS 1308 Type 'A' joint filler. 13 mm thick
- .6 Reinforcing Steel: Deformed billet steel bars to CSA G30.12-M, Grade 400.
- .7 Sealer: A-H anti-spalling compound by Anti-Hydro, or Sealtight CS-309 by W.R. Meadows.

2.2 Concrete Mix

- .1 Concrete Mixes and materials: in accordance with Section 03 30 00.

PART 3 EXECUTION

3.1 Preparation

- .1 Establish lines and levels as required for completion of work.
- .2 Excavate for curbs to lines and grades required.

3.2 Placing Granular Base

- .1 Sub-grade must be dry and compacted to smooth surface and required grade prior to placing granular base material. Compact to minimum of 98% of Standard Proctor density.
- .2 Place Granular Base to a uniform cross-section over required area in layers not exceeding 150 mm un-compacted thickness and to total depth of 300 mm.
- .3 Finish granular base surface true to curb founding elevations and compact to minimum of 98% of Standard Proctor density, ASTM D698.

3.3 Placing Concrete Curbs

- .1 Align concrete curbs and gutters with curves and tangents as shown on Drawings.
- .2 Curbs shall be in accordance with OPSD 600.110
- .3 Pour concrete on prepared sub-base to required levels and dimensions. Execute work to requirements of CSA A23.1 and CSA A23.2.
- .4 Do not pour concrete when air temperature is or may fall below 5 ° C during or within 24 hours of pour, unless precautions are taken to prevent damage to concrete resulting from low temperature.
- .5 Remove and replace any concrete damaged by freezing at no extra cost.
- .6 Finish concrete with a wooden float to produce an even gritty surface.
- .7 Finish edges of concrete curbs and gutters in accordance with OPSD Standard Drawings.
- .8 Provide mountable curb along length of barrier free parking spaces and drop curbs at all pedestrian crossings, as indicated on the drawings.

- .9 Apply membrane forming curing compound as soon as surface is free of bleed water to uniformly cover exposed concrete surfaces at rate of not less than 1.0 litre/5 m². Maintain this protection for minimum 7 days.
- .10 Apply sealer to exposed surfaces of curbs and gutters, in two coats, in accordance with manufacturer's directions. Prevent contamination of adjacent surfaces.

3.4 Joints

- .1 Joints between curb and gutter and any abutting sidewalk, catch basin and manhole frames, gutter outlets, or any structure, shall be formed with 13 mm thick panels of joint filler, except for control joints for extruded or formed curb and gutter, where they may be sawcut or formed with a "Guillotine" knife.

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 10 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 07 92 00 Joint Sealants
- .3 Section 31 23 10 Excavating, Trenching and Backfilling
- .4 Section 32 16 13 Concrete Curbs

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM C171-20 Standard Specification for Sheet Materials for Curing Concrete
 - .2 ASTM C309-19 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3 ASTM D698-12(2021) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))
- .2 CSA Group (CSA)
 - .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete.
 - .2 CSA A3000-18 Cementitious Materials Compendium
- .3 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 351 Construction Specification for Concrete Sidewalk
 - .2 OPSS 1010 Material Specification for Aggregates - Granular A, B, M and Select Subgrade Material
 - .3 OPSS1308 Material Specification for Joint Filler (Concrete)
- .4 Ontario Provincial Standard Details (OPSD)
 - .1 OPSD 310.010 Concrete Sidewalk

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Concrete Mix Designs:
 - .1 Submit concrete mix designs for review. Specify intended use for each mix design.
 - .2 Review of mix design does not relieve Contractor from responsibility for compliance with Contract Documents.
 - .3 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CSA A23.1. Mix design shall be adjusted to prevent alkali aggregate reactivity problems.
 - .4 Provide certification that plant, equipment, and all materials to be used in concrete comply with the requirements of CSA A23.1.
 - .5 Submit written requests for use of admixtures not specified, for site mixing of concrete, and for use of bonding agents.
 - .6 Submit in writing, proposed method of in-situ strength testing.

1.5 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Base: Granular "A", OPSS 1010.
- .2 Concrete: CSA A23.1-M.
- .3 Curing Compound: Chlorinated rubber based, ASTM C309 Type 2, suitable for exterior use.
- .4 Joint Filler: Pre-moulded, non-extruding and resilient bituminous. OPSS 1308 Type A joint filler.
- .5 Form Lumber: No. 2 S.P.F., 28 x 89 mm, free of twist and warp.
- .6 Reinforcing Steel: 152 x 152 mm MW18.7/MW18.7 welded wire mesh, in flat sheets, not rolls.
- .7 Polyethylene Sheeting: 0.100 mm thickness, to CGSB CAN2-53.33.

2.2 Concrete Mixes

- .1 Concrete Mixes and materials: in accordance with Section 03 30 00.

PART 3 EXECUTION

3.1 Preparation

- .1 Establish lines and levels as required for completion of work.
- .2 Check adequacy of preparations for sidewalks done under Section 31 23 10. Ensure that sub-base is compacted to 98% of Standard Proctor density ASTM D698.

3.2 Placing Granular Base

- .1 Sub-grade must be dry and compacted to smooth surface and required grade prior to placing granular base material.
- .2 Place Granular Base to a uniform cross-section over required area in minimum 100 mm thickness.
- .3 Finish granular base surface true to sidewalk founding elevations and compact to minimum of 98% of Standard Proctor density, ASTM D698.

3.3 Installation

- .1 Construct Sidewalks to OPSD 310.010
- .2 Erect formwork for sidewalks to achieve lines and grades shown on the drawings.

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- .3 Cut expansion joint filler to full cross sectional shape of the sidewalk and place at intervals not exceeding 6.0 m. Locate expansion joints at intersections in accordance with OPSD 310.010. Refer to plans for patterns.
 - .4 Place expansion joint filler between sidewalks and curbs, between sidewalks and building foundations and between sidewalk and any poured concrete bases or piers.
 - .5 Pour concrete on prepared sub-base to required levels and dimensions. Execute all concrete work to CSA A23.1, and CSA A23.2.
 - .6 Pour concrete sidewalks with minimum 125 mm depth, and with transverse slope of 2 mm/ 100 mm (2%). Sidewalk thickness adjacent to curbs shall be 150 mm thick.
 - .7 Do not pour concrete when air temperature is or may fall below 5 ° C during or within 24 hours of pour, unless precautions are taken to prevent damage to concrete resulting from low temperature.
 - .8 Remove and replace any concrete damaged by freezing at no extra cost.
 - .9 Finish concrete with light broom finish, transverse to direction of travel.
 - .10 Trowel smooth edges, minimum 75 mm wide.
 - .11 Apply membrane forming curing compound as soon as surface is free of bleed water to uniformly cover exposed concrete surfaces at rate of not less than 1.0 litre/5 m². Maintain this protection for minimum 7 days.
 - .12 Divide sidewalk between expansion joints into lengths not exceeding 1.5 m on centre equally spaced between expansion joints, with power driven carbide tipped blade, or other device approved for use by the Consultant.
 - .13 Tool contraction joints with smooth edges, 75 mm wide.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 32 12 16 Asphalt Paving

1.3 References

- .1 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 710 Construction Specification for Pavement Marking
 - .2 OPSS 1716 Water-Borne Traffic Paint
 - .3 OPSS 1750 Traffic Paint Reflectorizing Glass Beads
- .2 United States Federal Standards
 - .1 Federal Standard 595B, Colors Used in Government Procurement
- .3 The Accessibility for Ontarians with Disabilities Act, 2005 (AODA)

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit manufacturer's product data.
- .3 Submit following material sample at least 4 weeks prior to commencing work.
 - .1 Paint colour selection.
 - .2 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, reference specification number and formulation number and batch number.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Paint:
 - .1 To OPSS 1716.
 - .2 Colour: To match existing
 - .3 Paint shall be non-slip.
- .2 Glass beads: Overlay type: OPSS 1750 Traffic Paint Reflectorizing Glass Beads.

PART 3 EXECUTION

3.1 Equipment

- .1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.
- .2 Distributor to be capable of applying reflective glass beads as an overlay on freshly applied paint.

3.2 Condition of Surfaces

- .1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

3.3 Application

- .1 Lay out pavement markings.
- .2 Unless otherwise approved by Consultant, apply paint only when air temperature is above 10° C, wind speed is less than 60km/h and no rain is forecast within next 4 hours.
- .3 Apply traffic paint evenly at rate of 3m² /L.
- .4 Do not thin paint unless approved by Consultant.
- .5 Symbols and letters to conform to dimensions indicated.
- .6 Paint lines to be of uniform colour and density with sharp edges.
- .7 Thoroughly clean distributor tank before refilling with paint of different colour.
- .8 Apply glass beads at rate of 200g/m² of painted area immediately after application of paint.

3.4 Protection

- .1 Protect pavement markings until dry.

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 31 10 00 Site Clearing
- .2 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 Nursery Sod Growers Association of Ontario (NSGA)

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit grass seed mix.
- .3 Submit name and address of sod farm.

1.5 Quality Assurance

- .1 Topsoil from each source, native and imported, shall be tested for N.P.K., atrazine, minor elements, as well as clay and organic matter contents and acidity (pH) range. Topsoil shall be tested, written test report submitted and approved by Consultant, prior to delivery to site.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Protect sod during transportation, for delivery to the site in a fresh and healthy condition.
- .3 Install sod immediately, no later than 48 hours after arrival on site. Keep moist and fresh until installation.
- .4 Handle sod carefully to prevent breaking or tearing. Immediately remove damaged and dried-out sod from the site.

PART 2 PRODUCTS

2.1 Topsoil

- .1 Clean topsoil imported material approved by the Consultant, and free from admixtures of subsoil, clay lumps, stones or roots over 25 mm diameter, free of toxic substances or any other foreign matter which would inhibit growth. Minimum 150 mm thickness.

2.2 Sod

- .1 Sod shall be a Certified No. 1 sod, grown and sold in accordance with the latest specifications of the Nursery Sod Growers Association of Ontario (NSGA), composition of 50% Kentucky Blue Grass and 50% Merion Blue Grass.
- .2 At the time of delivery, sod shall have a strong, fibrous root system, be free of disease, stones, burned or bare spots, with a healthy green colour and containing not more than 1% twitch grass and other weeds.
- .3 Sod shall be cut and rolled in sections of max. 1.0 m² in area and approximately 30 mm thick as specified by the NSGA.

2.3 Wooden Pegs

- .1 Hardwood pegs, 25 x 25 mm square and at least 250 mm long, or longer as required for satisfactory anchorage of sod.

2.4 Fertilizer

- .1 Commercial type having a 10-10-10 ratio and shall be applied such that actual nitrogen is 9.0 kg/10 m².

PART 3 EXECUTION

3.1 Preparation

- .1 Adjust subgrade to allow the placing of topsoil to minimum depths specified.
- .2 Scarify subgrade to at least 75 mm deep and remove debris and all stones 50 mm in diameter and larger.
- .3 Arrange for inspection of finished subgrade by Consultant.
- .4 Spread and grade topsoil evenly over approved subgrade. Provide minimum 150 mm thick topsoil. No less will be accepted.
- .5 Finished sodded area top surface shall be uniform and evenly graded between elevations indicated, free of bumps, ridges and depressions. Remove all stones and lumps over 25 mm in diameter and foreign materials.
- .6 Unless recommended otherwise on soil analysis report, apply a 10-10-10 fertilizer at the rate of 9.0 kg/10 m².
- .7 Work fertilizer well and uniformly into the topsoil within 48 hours before laying sod.
- .8 Fine grade, rake and roll surface until smooth and firm against foot prints, and free of depressions, lumps and irregularities.

3.2 Installation

- .1 Place sod closely knit together, so that no open joints are visible, and pieces are not overlapping.

- .2 Install sod to blend tightly and uniformly with adjoining grass areas and, unless otherwise detailed, to be flush with paving, top of curbs.
- .3 On slopes of 3:1 and steeper, place sod perpendicularly to the slope and stake every row with wooden pegs at maximum 600 mm intervals. Drive pegs flush with sod.
- .4 Immediately after installation, water with sufficient amount to saturate sod and underlying topsoil.
- .5 As soon as sod has dried sufficiently to prevent damage, roll with roller to ensure a good bond between sod and topsoil and to remove minor depressions and irregularities.

3.3 Maintenance

- .1 Maintain all sodded areas, from date of installation and until one full growing season is complete (minimum 6 months). Obtain Consultant's approval at end of maintenance.
- .2 Maintenance shall include all necessary measures to establish and maintain grass in a healthy, vigorous growing condition, for one full growing season.
- .3 Maintenance shall include, but not be limited to the following work:
 - .1 Mow grass areas at regular intervals as required to maintain grass height between 50 mm and 60 mm. Not more than $\frac{1}{3}$ of grass blade shall be cut during one mowing. Hand clip where necessary and keep edges neatly trimmed. Remove heavy clippings immediately after mowing and trimming.
 - .2 Control weeds by cutting. Use of chemicals is strictly prohibited.
 - .3 Fertilize not less than once per season (Spring, Summer, Fall).
 - .4 Water when necessary, with sufficient quantities of water to prevent sod and underlying soil from drying out.
 - .5 Roll all sodded areas to remove minor depressions and irregularities.
 - .6 Repair all erosion damage resulting from faulty workmanship and/or maintenance.
 - .7 Replace all grass which has deteriorated, or which shows bare spots.
 - .8 Protect all grass areas against damage, including erosion and trespassing, by providing and maintaining proper safeguards. Remove safeguards at end of maintenance period.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Clean up all areas and remove debris.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 31 23 00 Excavating, Trenching and Backfilling
- .2 Section 33 46 13 Foundation Drainage

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM D1248-16 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
 - .2 ASTM D2412-21 Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- .2 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 1840 Material Specification for Non-Pressure Polyethylene (PE) Plastic Pipe Products

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit manufacturer's technical literature and installation instructions.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Perforated plastic pipe and fittings: to OPSS 1840. Nominal pipe size 150 mm as indicated. Manufactured from high density polyethylene resin which meeting or exceeding the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C as per ASTM D1248.
 - .1 Tube Stiffness The tube shall have a minimum stiffness of 210 kPa at 5% deflection. Tests shall be conducted in accordance with ASTM D2412.
 - .2 Joining System: external insert or split coupler.
 - .3 Filter Sock: Woven polyester.
 - .4 Acceptable product: Big 'O' Perforated Corrugated with Polyester Sock Filter as manufactured by Armtec Ltd. or approved equivalent.

- .2 Backwater Valve: Proline Fittings, 152 mm diameter Inline Backwater Valve 79ABW06G or approved equivalent..
- .3 Bedding gravel or crushed stone: hard, durable particles, graded evenly in size from 16 to 18mm. Refer to Site Servicing plans.

PART 3 EXECUTION

3.1 Installation

- .1 Excavation: Excavate area for subdrains. Compact subgrade to 95% S.P.D.
- .2 Bedding: Place 100mm layer of bedding material over entire excavated area and compact to 95% S.P.D.
- .3 Lay drains on prepared bed true to line and grade with inverts smooth and free of sags or high points.
- .4 Ensure barrel of each pipe is in contact with bed throughout full length. Commence laying at outlet and proceed in upstream direction. Lay perforated pipe with perforations downward. Make joints tight in accordance with manufacturer's instructions. Do not allow water to flow through pipes during construction except as approved.
- .5 Make watertight connections to existing drain, new or existing manholes and catch basins where indicated or as directed. Plug open upstream ends of pipe with approved closures. Surround pipe with filter material and backfill with bedding material compacted to 95% S.P.D.

3.2 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM D1248-16 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
- .2 CSA Group (CSA)
 - .1 CSA A23.1:19 Concrete Materials and Methods of Concrete Construction
 - .2 CSA B182.1 Plastic Drain and Sewer Pipe and Pipe Fittings
- .3 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 1840 Material Specification for Non-Pressure Polyethylene (PE) Plastic Pipe Products
- .4 Ontario Building Code 2012, Part 7 - Plumbing

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit manufacturer's technical literature and installation instructions.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Perforated plastic pipe and fittings: to CSA 182.1. Nominal pipe size 100 mm diameter. Manufactured from high density polyethylene resin which meets or exceeds the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C as per ASTM D1248.
- .2 Joining System: snap, insert or split coupler
- .3 Filter Sock: Woven polyester.
- .4 Acceptable product: Big 'O' Perforated Corrugated with Polyester Sock Filter as manufactured by Armtec Ltd. or approved equivalent.

- .5 Coarse filter aggregate: to CSA-A23.1, Table 2, Group 1, 20-5 mm.
- .6 Fine filter aggregate: to CSA-A23.1, Table 1.
- .7 Filter Mat: Non-Woven Polypropylene Geotextile
 - .1 Terrafix 200R by Terrafix Geosynthetics Inc.
 - .2 Mirafi 140N by TC Mirafi.
 - .3 Approved Equivalent.
- .8 Drainage sheet: Terradrain 600 by Terrafix Geosynthetics Inc. or Mirafi Drainage Composite by TC Mirafi or approved equivalent.

PART 3 EXECUTION

3.1 Layout

- .1 Establish grades and inverts from appropriate bench marks. Lay out lines as shown on Drawings.
- .2 Slope drainage pipes at least 1%. Pipe grade shall not vary more than 10% of internal diameter of pipe within a given run. Such deviation shall be gradual and over a distance of not less than 9.0 m.
- .3 Lay pipe in straight lines; turn corners using 45° bends.

3.2 Installation

- .1 Coordinate work of this Section with that of other related Sections.
- .2 Do not place pipe in direct contact with rigid materials such as rock, brick, or wood. Do not use grade stakes, stones, masonry or concrete fragments or any type of shim under pipe.
- .3 Join pipe sections by means of couplings. Provide end plugs on open ends of pipe runs at high points. Provide fittings such as elbows, bends, tees, adapters, reducers, as required to form a complete drainage system. Carefully tap tapered fittings into pipe; do not overdrive.
- .4 Install perforated pipe with holes and coupling slots facing down.
- .5 Aggregate materials shall be damp when placed. If necessary, spray with water using fog nozzle to assist hydraulic consolidation.
- .6 Place aggregate materials by hand around and above pipe in successive 150 mm lifts.
- .7 Consolidate each lift by tamping moderately; prevent damage to pipes.
- .8 Do not cover pipes until inspected and approved by Consultant.
- .9 Supply rigid non-corrosive sleeves for insertion into foundation walls and other building elements where pipe penetrates such elements. Sleeve diameter shall be 50 mm larger than pipe diameter. Pack joint between pipe and sleeve with moisture resistant compressible pre-moulded filler.

3.3 Perimeter Drainage

- .1 Provide perimeter drainage where indicated at base of foundation walls.

- .2 Connect to existing subdrainage system.
- .3 Place filter fabric into prepared excavation. Size filter fabric to completely wrap drainage course, lapping at joints minimum 300 mm.
- .4 Place minimum 150 mm coarse filter aggregate on top of filter fabric and consolidate.
- .5 Lay drainage pipe to layout shown. Unless other size is indicated, provide 100 mm diameter perforated pipe. Connect to existing outfall as directed by Owner's Representative.
- .6 Provide minimum 150 mm thick coarse filter aggregate at sides and top of drainage pipe.
- .7 Close filter fabric over top of drainage course and secure lap in place.
- .8 Cover filter fabric with 300 mm fine filter aggregate.

3.4 Drainage Sheet

- .1 Ensure that waterproof membranes have been inspected and approved prior to placing drainage sheet.
- .2 Place panels with flat side against waterproofed foundation walls and filter fabric facing soil. Secure panels to substrate with two sided tape or adhesive, compatible with substrate material.
- .3 Connect adjacent panels at the longitudinal edge by pulling the filter fabric back to expose the flange. Place flangeless panel edge on top of the flange of the adjacent panel and butt dimple to dimple.
- .4 Complete panel and attachment by pulling the filter fabric back to expose two rows of dimpled core. Place end of the next panel over the two rows of dimples and interlock.
- .5 Complete all connections in single fashion from top to bottom so that moisture will flow with the overlap and not against it.
- .6 Overlap fabric in the direction of water flow. Secure all terminal edges with the filter fabric flap by tucking it behind the core.
- .7 Overlap drain sheet filter fabric over perimeter drain filter fabric.
- .8 Coordinate with Section 31 23 10 to ensure that drainage sheet is covered with backfill within maximum two weeks of its installation.

3.5 Inspection

- .1 Arrange for inspection of foundation drainage systems by Municipal Inspectors and the Consultant prior to placing backfill.

3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section