

PROJECT TITLE WARKWORTH INSTITUTION, CAMBELLFORD, ON
STORES BUILDING PARKING LOT PAVING AND
SANITARY AND STORM LINES REPLACEMENT

PROJECT NUMBER R.074850.001

PROJECT DATE 2016-03-04

Consultant for Building Code Review:
WSP Canada Inc.
73 Water Street North, Suite 605
Cambridge, Ontario N1R 7L6
T +1 226-765-0800
F +1 519-740-6104

CIVIL



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Part 1 GENERAL

1.1 SECTION
INCLUDES

- .1 Title and description of Work.
- .2 Contract Method.
- .3 Work by others.
- .4 Work sequence.
- .5 Contractor use of premises.
- .6 Owner occupancy.
- .7 Alterations to existing building.

1.2 PRECEDENCE

- .1 Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 WORK COVERED
BY CONTRACT
DOCUMENTS

- .1 Work of this Contract comprises the upgrades to the sanitary and storm conveyance system, full depth reconstruction of the asphalt paving, and general site work at building WA05 (Stores Building) at Warkworth Institution located in Campbellford, Ontario.

1.4 CONTRACT
METHOD

- .1 Construct Work under lump sum price contract.

1.5 COST BREAKDOWN

- .1 Within 10 working days of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract amount.
 - .2 Show separately cost of equipment purchased exempt from Ontario Retail Sales Tax under your Ontario Sales Tax licence number.
 - .3 Within 10 working days of acceptance of bid submit a list of subcontractors.
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- 1.6 WORK BY OTHERS .1 The Contractor shall for the purpose of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects, and for the duration of the Work of the Contract:
.1 Assume the role of Constructor in accordance with the Authority Having Jurisdictions.
- 1.7 WORK SEQUENCE .1 Construct Work to accommodate Owner's continued use of the existing building and site during construction. This requires all work be completed on one side of the building before commencing work on the other.
.2 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.
.3 Required stages:
.1 Stage 1: All work, including servicing, paving, etc. in the south parking lot.
.2 Stage 2: All work, including servicing, paving, etc. in the north parking lot.
.3 Stage 3: General site reinstatement and other works.
.4 Maintain fire access/control.
- 1.8 CONTRACTOR USE OF PREMISES .1 Contractor shall limit use of premises for Work to allow:
.1 Owner occupancy.
.2 Co-ordinate use of premises under direction of Departmental Representative.
.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
.4 Refer to Section 01 14 00 and Section 01 35 13 for security requirements for access to the Work site.
- 1.9 OWNER OCCUPANCY .1 Owner will occupy the premises during entire construction period for execution of normal operations.
.2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.
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1.10 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING FACILITIES .1 Execute work with least possible interference or disturbance to building operations occupants and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.11 DOCUMENTS REQUIRED .1 Maintain at job site, one copy each document as follows:
.1 Contract Drawings.
.2 Specifications.
.3 Addenda and amendments.
.4 Reviewed Shop Drawings.
.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to Contract.
.8 Field Test Reports.
.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Information.
.11 Other documents as specified.

Part 2 Products

2.1 NOT USED .1 Not used.

Part 3 Execution

3.1 NOT USED .1 Not used.

Part 1 General

1.1 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.

1.2 USE OF SITE AND
FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative 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 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS,
ADDITIONS OR
REPAIRS TO EXISTING
FACILITIES

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

1.4 EXISTING
SERVICES

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
 - .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
 - .3 Provide alternative routes for pedestrian and vehicular traffic.
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- .4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services to maintain critical building and tenant systems, as required.
- .7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .8 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .10 Record locations of maintained, re-routed and abandoned service lines.
- .11 Construct barriers in accordance with Section 01 56 00.

1.5 SPECIAL

- .1 Submit schedule in accordance with Section 01 32 16.
- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .3 Keep within limits of work and avenues of ingress and egress.
- .4 Deliver materials outside of peak traffic hours unless otherwise approved by Departmental Representative .

1.6 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
-

- .2 Security clearances:
 - .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
 - .2 Obtain requisite clearance, as instructed, for each individual required to enter premises.
- .3 Site Access: Normal working hours 8:00am to 4:00pm.
 - .1 Contractor superintendent shall be present at all times during construction. All contractor employees shall sign-in and out daily at security desk.
 - .2 Contractor may work after hours only with pre-arrangement with Departmental Representative. Owner site representative will be required and security deployed for all after hours work.

1.7 BUILDING/SITE
SMOKING ENVIRONMENT

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

Part 1 General

1.1 RELATED
REQUIREMENTS

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified within the technical specification sections.

1.2 APPOINTMENT AND
PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S
RESPONSIBILITIES

- .1 Provide labour, equipment and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
 - .2 Notify Departmental Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
 - .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
 - .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental.
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Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 General

1.1 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance and Departmental Representative.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 Within 15 days after award of Contract, request meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
 - .2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
 - .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
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- .2 Schedule of Work: in accordance with Section 01 32 16.
- .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00.
- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00.
- .5 Delivery schedule of specified equipment.

- .6 Site security in accordance with Section 01 56 00 and Section 01 35 13.

- .7 Health and safety in accordance with Section 01 35 29.

- .8 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

- .9 Record drawings and specifications in accordance with Section 01 33 00.

- .10 Maintenance manuals in accordance with Section 01 78 00.

- .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00.

- .12 Monthly progress claims, administrative procedures, photographs, hold backs.

- .13 Appointment of inspection and testing agencies or firms.

- .14 Insurances, transcript of policies.

1.3 PROGRESS
MEETINGS

- .1 During course of Work schedule progress meetings bi-weekly.

 - .2 Contractor, major Subcontractors involved in Work, Departmental Representative are to be in attendance.

 - .3 Notify parties minimum five days prior to meetings.

 - .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.

 - .5 Agenda to include the following:
-

- .1 Review, approval of minutes of previous meeting.
- .2 Review of Work progress since previous meeting.
- .3 Field observations, problems, conflicts.
- .4 Problems which impede construction schedule.
- .5 Review of off-site fabrication delivery schedules.

- .6 Corrective measures and procedures to regain projected schedule.

- .7 Revision to construction schedule.

- .8 Progress schedule, during succeeding work period.

- .9 Review submittal schedules: expedite as required.

- .10 Maintenance of quality standards.

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

- .12 Other business.

Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 - GENERAL

- 1.1 ELECTRONIC COPY
- .1 Submit electronic, colour, digital photography in jpg format, minimum 12.20 Megapixels (4272 x 2848) resolution.
 - .2 Identification: name and number of project and date of exposure indicated.
 - .3 Number of viewpoints: minimum 12. Locations of viewpoints determined by Departmental Representative.
 - .4 Frequency: monthly with progress statement, framing and services before concealment and as directed by Departmental Representative.

- 1.2 VIDEO
- .1 Submit colour, digital, HD format.
 - .2 Frequency: as directed by Departmental Representative.

Part 2 - PRODUCTS

- 2.1 NOT USED
- .1 Not Used.

Part 3 EXECUTION

- 3.1 NOT USED
- .1 Not Used.

Part 1 GENERAL

1.1 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
 - .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
 - .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
 - .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
 - .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
 - .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
 - .7 Milestone: significant event in project, usually completion of major deliverable.
 - .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
 - .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.
-

1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Submit to Departmental Representative within 5 working days of Award of Contract, Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
- .2 Certificate of Substantial Completion Target: August 19, 2016.

1.5 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
 - .2 Departmental Representative will review and return revised schedules within 5 working days.
 - .3 Revise impractical schedule and resubmit within 5 working days.
 - .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.
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- 1.6 PROJECT SCHEDULE
- .1 Develop detailed Project Schedule derived from Master Plan.
 - .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Hazardous substances abatement.
 - .6 Demolition.
 - .7 Parking lot.
 - .8 Sewer Replacement.
 - .9 Site Grading.
 - .10 Stormwater Conveyance Upgrades.

- 1.7 PROJECT SCHEDULE REPORTING
- .1 Update Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.
 - .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

- 1.8 PROJECT MEETINGS
- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
 - .2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

- 2.1 NOT USED
- .1 Not used.

Part 3 Execution

- 3.1 NOT USED
- .1 Not used.

Part 1 General

1.1 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
 - .2 Do not proceed with Work affected by submittal until review is complete.
 - .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
 - .4 Where items or information is not produced in SI Metric units converted values are acceptable.
 - .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated 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 Departmental Representative, 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 co-ordinated.
 - .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
 - .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
 - .10 Keep one reviewed copy of each submission on site.
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- .11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format. Forward PDF, MS Word, MS Excel, MS Project and Autocad dwg files on USB drive compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.2 SHOP DRAWINGS

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
 - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
 - .3 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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
 - .4 Allow 5 days for Departmental Representative's review of each submission.
 - .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental in writing of revisions other than those requested.
 - .7 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.

 - .8 Submissions 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.
 - .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 Relationship to adjacent work.

 - .9 After Departmental Representative's review, distribute copies.

 - .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

 - .11 Submit 3 hard copies and one electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.

 - .12 Submit 3 hard copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

 - .13 Delete information not applicable to project.

 - .14 Supplement standard information to provide details applicable to project.
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- .15 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, electronic copy 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.
- .16 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for the sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that PWGSC 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.

1.3 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic photographs and videos in accordance with section 01 32 00.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

PART 1 - GENERAL

1.1 PURPOSE

- .1 To ensure that both the construction project and the institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.

1.2 DEFINITIONS

- .1 "Contraband" means:
 - .1 An intoxicant, including alcoholic beverages, drugs and narcotics.
 - .2 Tobacco or associated tobacco products.
 - .3 An igniting device, lighter or matches.
 - .4 A weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization.
 - .5 An explosive or a bomb or a component thereof.
 - .6 Currency over any applicable prescribed limit, \$25 when possessed by an inmate without prior authorization.
 - .7 Any item not described in paragraphs 1.2.1.1 to 1.2.1.6 that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.
 - .2 "Unauthorized Smoking and related Items" means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing tobacco, cigarette making machines, matches and lighters.
 - .3 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.
 - .4 "CSC" means Correctional Service Canada.
 - .5 "Director" means Director, Warden or Superintendent of the Institution as applicable.
 - .6 "Construction Employees" means persons working for the General Contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.
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- .7 "Departmental Representative" means the project manager from Public Works and Government Services Canada.
- .8 "Perimeter" means the fenced or walled area of the Institution that restrains the movement of the inmates.
- .9 "Construction Limits" means the area as shown on the contract drawings that the Contractor will be allowed to work. This area may or may not be isolated from the security area of the Institution.
 - .1 For this Project, the limits of construction are generally bound by the paved area surrounding the Stores Building. This is not located within the security areas of the institution.

1.3 PRELIMINARY
PROCEEDINGS

- .1 Prior to the commencement of work, the Contractor shall meet with the Director or his/her representative to:
 - .1 Discuss the nature and extent of all activities involved in the Project.
 - .2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.
- .2 Contractor shall:
 - .1 Ensure that all Construction Employees are aware of the security requirements.
 - .2 Ensure that a copy of the security requirements is always prominently on display at the job site.
 - .3 Co-operate with institutional personnel in ensuring that security requirements are observed by all Construction Employees.

1.4 CONSTRUCTION
EMPLOYEES

- .1 Submit to the Director a list of the names with date of birth of all Construction Employees to be employed on the construction site and a security clearance form for each employee.
 - .2 Allow two (2) weeks for processing of security clearances. Employees will not be admitted to the Institution without a valid security clearance in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC Institutions are not valid at this Institution.
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- .3 The Director may require that facial photographs may be taken of Construction Employees and these photographs may be displayed at appropriate locations in the Institution or in an electronic database for identification purposes. The Director may require that Photo ID cards be provided for all Construction Employees. ID cards will then be left at the designated entrance to be picked upon arrival at the institution and shall be displayed prominently on the Construction Employees' clothing at all time while Construction Employees are in the institution.
- .4 Entry to Institutional Property will be refused to any person there may be reason to believe may be a security risk.
- .5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
 - .1 Appear to be under the influence of alcohol, drugs or narcotics.
 - .2 Behave in an unusual or disorderly manner.
 - .3 Are in possession of contraband.
- .6 Smoking is prohibited anywhere on CSC property.

1.5 VEHICLES

- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the owner or an employee of the company that owns the vehicle.
 - .2 The Director may limit at any time the number and type of vehicles allowed within the Institution.
 - .3 Drivers of delivery vehicles for material required by the project will not require security clearances but must remain with their vehicle the entire time that the vehicle is in the Institution. The Director may require that these vehicles be escorted by Institutional Staff or Commissionaires while in the Institution.
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- .4 If the Director permits trailers to be left inside the secure perimeter of the Institution, these trailer doors will be locked at all times. All windows will be securely locked when left unoccupied. All trailer windows shall be covered with expanded metal mesh. All storage trailers inside and outside the perimeter shall be locked when not in use.

1.6 PARKING

- .1 Parking area(s) to be used by Construction Employees will be designated by the Director. Parking in other locations will be prohibited and vehicles may be subject to removal.

1.7 SHIPMENTS

- .1 All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the Institution's own shipments. The Contractor must have his/her own employees on site to receive any deliveries or shipments. CSC staff will NOT accept receipt of deliveries or shipments of any material, equipment or tools.

1.8 TELEPHONES

- .1 There will be no installation of telephones, Facsimile machines and computers with Internet connections permitted within the perimeter of the Institution unless prior approval of the Director is received.
 - .2 The Director will ensure that approved telephones, facsimile machine and computers with internet connections are located where they are not accessible to inmates. All computers will have an approved password protection that will stop an internet connection to unauthorized personnel.
 - .3 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, BlackBerries, telephone used as 2-way radios, are not permitted within the Institution unless approved by the Director. If wireless cellular telephones are permitted, the user will not permit their use by any inmate.
 - .4 The Director may approve but limit the use of two way radios.
-

1.9 WORK HOURS

- .1 Work hours within the Institution are: Monday to Friday 08:00am to 04:00pm
- .2 Work will not be permitted during weekends and statutory holidays without the permission of the Director. A minimum of seven days advance notice will be required to obtain the required permission. In case of emergencies or other special circumstances, this advance notice may be waived by the Director.

1.10 OVERTIME WORK

- .1 No overtime work will be allowed without permission of the Director. Give a minimum forty-eight (48) hours advance notice when overtime work on the construction project is necessary and approved. If overtime work is required because of an emergency such as the completion of a concrete pour or work to make the construction safe and secure, the Contractor shall advise the Director as soon as this condition is known and follow the directions given by the Director. Costs to the Crown for such events may be attributed to the Contractor.
- .2 When overtime work, weekend, or statutory holiday work is required and approved by the Director, extra staff members may be posted by the Director or his/her designate, to maintain the security surveillance. The Departmental Representative may post extra staff for inspection of construction activities. The actual cost of this extra staff may be subject to reclamation by the Crown.

1.11 TOOLS AND EQUIPMENT

- .1 Maintain a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required.
 - .2 Throughout the construction project maintain up-to-date the list of tools and equipment specified above.
 - .3 Keep all tools and equipment under constant supervision, particularly power-driven and cartridge-driven tools, cartridges, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device.
 - .4 Store all tools and equipment in approved secure locations.
-

- .5 Lock all tool boxes when not in use. Keys to remain in the possession of the employees of the Contractor. Scaffolding shall be secured and locked when not erected and when erected, will be secured in a manner agreed upon with the Institutional designate.
- .6 All missing or lost tools or equipment shall be reported immediately to the Director.
- .7 The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks may be carried out at the following intervals:
 - .1 At the beginning and conclusion of every construction project.
 - .2 Weekly, when the construction project extends longer than a one week period.
 - .3 The Contractor may be subject to random checks by security staff to ensure proper storage and security of tools throughout the project.
- .8 Certain tools/equipment such as cartridges and hacksaw blades are highly controlled items. The Contractor will be given at the beginning of the day, a quantity that will permit one day's work. Used blades/cartridges will be returned to the Director's representative at the end of each day.
- .9 If propane or natural gas is used for heating the construction, the Institution will require that an employee of the Contractor supervise the construction site during non-working hours.
- .10 If torches or grinders are required tools to perform Work, Contractor must complete a Hot Work Permit as supplied by CSC. Completed original form(s) are copied and posted on the work site in a conspicuous location. Original documents are to remain with the Institutional Fire Chief.

1.12 KEYS

- .1 Security Hardware Keys:
 - .1 The Contractor shall arrange with the security hardware supplier/installer to have the keys for the security hardware to be delivered directly to Institution, specifically the Security Maintenance Officer (SMO).
 - .2 The Security Maintenance Officer (SMO) will provide a receipt to the Contractor for security hardware keys.
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.3 The Contractor will provide a copy of the above-mentioned receipt to the Departmental Representative.

.2 Other Keys:

.1 The Contractor will use standard construction cylinders for locks for his/her use during the construction period.

.2 The Contractor will issue instructions to his/her employees and sub-trades, as necessary, to ensure safe custody of the construction set of keys.

.3 Upon completion of each phase of the construction, the CSC representative will, in conjunction with the lock manufacturer:

.1 Prepare an operational keying schedule.

.2 Accept the operational keys and cylinders directly from the lock manufacturer

.3 Arrange for removal and return of the construction cores and install the operational core in all locks.

.3 Upon putting operational security keys into use, the CSC construction escort shall obtain these keys as they are required from the Security Maintenance Officer (SMO) and open doors as required by the Contractor. The Contractor shall issue instructions to his/her employees advising them that all security keys shall always remain with the CSC construction escort.

1.13 SECURITY
HARDWARE

.1 Turn over all removed security hardware to the Director of the Institution for disposal or for safekeeping until required for re-installation.

1.14 PRESCRIPTION
DRUGS

.1 Employees of the Contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one day supply only into the Institution.

1.15 SMOKING
RESTRICTIONS

.1 Contractors and construction employees are not permitted to smoke inside correctional facilities or outdoors within the perimeter of a correctional facility and must not possess unauthorized smoking items within the perimeter of a correctional facility.

- .2 Contractors and construction employees who are in violation of this policy will be requested to immediately cease smoking or dispose of any unauthorized smoking items and, if they persist, will be directed to leave the institution.
- .3 Smoking is only permitted outside the perimeter of a correctional facility in an area to be designated by the Director.

1.16 CONTRABAND

- .1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on Institutional Property.
- .2 Discovery of Contraband on the construction site and the identification of the person(s) responsible for the Contraband shall be reported immediately to the Director.
- .3 Contractors shall be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of Contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.
- .4 Presence of arms and ammunition in vehicles of Contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.

1.17 SEARCHES

- .1 All vehicles and persons entering Institutional property may be subject to search.
 - .2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of Contraband or unauthorized items, he/she may order that person to be searched.
 - .3 All employees entering the Institution may be subject to screening of personal effects for traces of Contraband drug residue.
-

1.18 ACCESS TO AND
REMOVAL FROM
INSTITUTION
PROPERTY

- .1 Construction personnel and commercial vehicles will not be admitted to the Institution after normal working hours, unless approved by the Director.

1.19 MOVEMENT OF
VEHICLES

- .1 Escorted commercial vehicles will be allowed to enter or leave the Institution through the vehicle access gate during the following hours:
.1 08:00 am to 04:00pm.
- .2 Construction vehicles shall not leave the Institution until an inmate count is completed.
- .3 The Contractor shall advise the Director twenty four (24) hours in advance to the arrival on the site of heavy equipment such as concrete trucks, cranes, etc.
- .4 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC Staff or Commissionaires working under the authority of the Director.
- .5 Commercial Vehicles will only be allowed access to Institutional Property when their contents are certified by the Contractor or his/her representative as being strictly necessary to the execution of the construction project.
- .6 Vehicles shall be refused access to Institutional Property if, in the opinion of the Director, they contain any article which may jeopardize the security of the Institution.
- .7 Private vehicles of Construction Employees will not be allowed within the security wall or fence of medium or maximum security Institutions without the permission of the Director.
- .8 With prior approval of the Director, a vehicle may be used in the morning and evening to transport a group of employees to the work site. This vehicle will not remain within the Institution the remainder of the day.
- .9 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked, with the battery removed. The Director may require that the equipment be secured with a chain and padlock to another solid object.
-

1.20 MOVEMENT OF
CONSTRUCTION
EMPLOYEES ON
INSTITUTIONAL
PROPERTY

- .1 Subject to the requirements of good security, the Director will permit the Contractor and his/her employees as much freedom of action and movement as is possible.
- .2 However, notwithstanding paragraph above, the Director may:
 - .1 Prohibit or restrict access to any part of the Institution.
 - .2 Require that in certain areas of the Institution, either during the entire construction project or at certain intervals, Construction Employees only be allowed access when accompanied by a member of the CSC security staff.
- .3 During the lunch and coffee/health breaks, all employees will remain within the construction site. Employees are not permitted to eat in the officer's lounge and dining room.

1.21 SURVEILLANCE
AND INSPECTION

- .1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.
- .2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among Construction Employees and maintained throughout the construction project.

1.22 STOPPAGE OF
WORK

- .1 The Director may request at any time that the Contractor, his/her employees, sub-contractors and their employees not enter or leave the work site immediately due to a security situation occurring within the Institution. The Contractor's site supervisor shall note the name of the staff member making the request and the time of the request and obey the order as quickly as possible.
 - .2 The Contractor shall advise the Departmental Representative within 24 hours of this delay to the progress of the work.
-

1.23 CONTACT WITH
INMATES

- .1 Unless specifically authorized, it is forbidden to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any employee doing any of the above will be removed from the site and his/her security clearance revoked.
- .2 It is forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this Contract.

1.24 COMPLETION OF
CONSTRUCTION
PROJECT

- .1 Upon completion of the construction project or, when applicable, the takeover of a facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the Institution as part of the construction contract.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA): Canada
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .2 National Building Code 2010 (NBC):
 - .1 NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
- .3 National Fire Code 2010 (NFC):
 - .1 NFC 2010, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
- .4 Province of Ontario:
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended - Updated 2005
 - .2 O. Reg. 490/09, Designated Substances.
 - .3 Workplace Safety and Insurance Act, 1997.
 - .4 Municipal statutes and authorities.
- .5 Treasury Board of Canada Secretariat (TBS):
 - .1 Treasury Board, Fire Protection Standard April 1, 2010.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
 - .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
 - .1 Emergency and Fire Evacuation Route: The Contractor shall obtain training on procedures of evacuating the site under emergency and/or fire situations. Contractor training and sign-off is required prior to initiating site work.
 - .2 Sample attached as Annex
 - .4 Contractor's and Sub-contractors' Safety Communication Plan.
-

.5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Emergency Response requirements and procedures provided by Departmental Representative.

.3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.

.4 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.5 Submit names of personnel and alternates responsible for site safety and health.

.6 Submit records of Contractor's Health and Safety meetings when requested.

.7 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, bi-weekly.

.8 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.

.9 Submit copies of incident and accident reports.

.10 Submit Material Safety Data Sheets (MSDS).

.11 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.

1.3 FILING OF
NOTICE

.1 File Notice of Project with Provincial authorities prior to commencement of Work.

1.4 SAFETY
ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

- 1.5 MEETINGS .1 Schedule and administer Health and Safety meeting with Departmental Representative.
- 1.6 REGULATORY REQUIREMENTS .1 Comply with the Acts and regulations of the Province of Ontario.
.2 Comply with specified standards and regulations to ensure safe operations at site.
- 1.7 PROJECT/SITE CONDITIONS .1 Work at site will involve contact with:
.1 Silica in concrete.
.2 Asbestos in AC sanitary sewer pipes.
- 1.8 GENERAL REQUIREMENTS .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
.2 Departmental Representative will respond in writing, where deficiencies or concerns are noted and will request re-submission with correction of deficiencies or concerns.
.3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.
- 1.9 COMPLIANCE REQUIREMENTS .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.
- 1.10 RESPONSIBILITY .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
-

- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.

1.11 UNFORSEEN
HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.12 POSTING OF
DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.
 - .1 Contractor's Safety Policy.
 - .2 Constructor's Name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety
 - .5 Ministry of Labour Orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour office
 - .8 Material Safety Data Sheets.
 - .9 Written Emergency Response Plan.
 - .10 Site Specific Safety Plan.
 - .11 Valid certificate of first aider on duty.
 - .12 WSIB "In Case of Injury At Work" poster.
 - .13 Location of toilet and cleanup facilities.

1.13 CORRECTION OF
NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
-

- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 BLASTING

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

1.15 POWER ACTUATED
DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.
- .2 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .3 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

PART 1 - GENERAL

1.1 RELATED
REQUIREMENTS

- .1 Section 02 82 00.01 - Asbestos Abatement - Minimum Precautions.

1.2 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.3 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Product Data:
 - .1 Submit 2 copies of WHMIS MSDS.

1.4 FIRES

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

1.5 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .2 Provide temporary drainage and pumping required to keep excavations and site free from water.
 - .3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
 - .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
-

1.6 SITE CLEARING
AND PLANT
PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect 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 minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.7 POLLUTION
CONTROL

- .1 Maintain temporary erosion control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
 - .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
-

- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 CLEANING
- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .1 Leave Work area clean at end of each day.
 - .2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
 - .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.
 - .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

Part 1 General

- 1.1 REFERENCES AND CODES
- .1 Perform Work in accordance with National Building Code of Canada (NBC) 2010, National Fire Code of Canada (NFC) 2010 and Ontario Building Code (OBC) 2012, including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply as directed by the Departmental Representative..
 - .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
- 1.2 HAZARDOUS MATERIAL DISCOVERY
- .1 Stop work immediately and notify Departmental Representative if materials which may contain designated substances or PCB's, other than those identified in Section 01 35 29 are discovered in course of work.
- 1.3 BUILDING/SITE SMOKING ENVIRONMENT
- .1 Comply with smoking restrictions and municipal by-laws.
- 1.4 TAXES
- .1 Pay applicable Federal, Provincial and Municipal taxes.

Part 2 Products

- 2.1 NOT USED
- .1 Not Used.

Part 3 EXECUTION

- 3.1 NOT USED
- .1 Not Used.

Part 1 General

1.1 SECTION
INCLUDES

- .1 Inspection and testing, administrative and enforcement requirements of soil compaction, concrete, asphalt and other tests as directed by Departmental Representative.
- .2 Tests and mix designs.

1.2 RELATED
SECTIONS

- .1 Section 01 29 83 - Payment Procedures For Laboratory Testig Services.

1.3 INSPECTION

- .1 Allow Departmental Representative and Correction Services Canada Representatives 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.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 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.
- .4 Departmental Representative 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, Departmental Representative shall pay cost of examination and replacement.

1.4 INDEPENDENT
INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work above and beyond those required of the Contractor. Cost of such services will be borne by Departmental Representative.
-

- .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 Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.5 ACCESS TO WORK

- .1 Allow inspection/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 appropriate agency and 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 Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
 - .2 Make good other Contractor's work damaged by such removals or replacements promptly.
-

- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative 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 Departmental Representative.

1.8 REPORTS

- .1 Refer to section 01 33 00.
- .2 Submit copies of inspection and test reports to Departmental Representative.
- .3 Provide copies to subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

Part 1 General

1.1 INSTALLATION
AND REMOVAL .1 Provide temporary utilities controls in order
to execute work expeditiously.

.2 Remove from site all such work after use.

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

1.3 WATER SUPPLY .1 Contractor to provide own water supply.

1.4 FIRE PROTECTION .1 Provide and maintain temporary fire protection
equipment during performance of Work required
by governing codes, regulations and bylaws.

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

Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-09 (R2014), Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

1.4 HOISTING

- .1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists and cranes to be operated by qualified operator.

1.5 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
-

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

1.6 CONSTRUCTION
PARKING

- .1 Limited parking will be permitted on site provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.

1.7 SECURITY

- .1 Pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.8 OFFICES

- .1 Subcontractors to provide their own offices as necessary.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Allow Departmental Representative temporary use of drawing laydown table when required.

1.9 EQUIPMENT, TOOL
AND MATERIALS
STORAGE

- .1 Provide and maintain, in 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 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 precautions as required by local health authorities. Keep area and premises in sanitary condition.
-

1.11 PROTECTION AND
MAINTENANCE OF
TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .8 Dust control: adequate to ensure safe operation at all times.

1.12 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 General

- 1.1 RELATED REQUIREMENTS
- .1 Section 01 51 00 - Temporary Utilities.
 - .2 Section 01 52 00 - Construction Facilities.
- 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 HOARDING
- .1 Provide temporary site enclosure when performing site work.
 - .2 Erect temporary site enclosure using modular freestanding fencing: galvanized, minimum 1.8 m high, chain link or welded steel mesh, pipe rail.
- 1.4 ACCESS TO SITE
- .1 Provide and maintain access roads and sidewalk crossings as may be required for access to Work.
- 1.5 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 public.
- 1.6 FIRE ROUTES
- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
- 1.7 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.
-

1.8 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 Departmental Representative locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

1.9 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

Part 1 General

1.1 RELATED
REQUIREMENTS

- .1 Section 01 45 00 - Quality Control.

1.2 REFERENCES

- .1 Within text of specifications, reference may be made to reference standards.
- .2 Conform to these standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
.1 The cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .4 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.
- .5 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online.

1.3 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality 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 disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Departmental Representative 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 Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Amount or Contract Time.

1.5 METRIC SIZED
MATERIALS

- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.
 - .2 The Contractor is required to provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.
 - .3 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative.
-

- .4 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided.
- .5 Claims for additional costs due to provision of specified modular metric sized products will not be considered.

1.6 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, 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 Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 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 Departmental Representative. Unload, handle and store such products.

1.8 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 Departmental in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Amount or Contract Time.

1.9 QUALITY OF WORK

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

1.10 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, 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.

Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3

2.2 NOT USED .1 Not Used.

Part 1 General

1.1 SURVEY
REFERENCE POINTS

- .1 Existing base horizontal and vertical 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 Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

1.2 SURVEY
REQUIREMENTS

- .1 Establish lines and levels, locate and lay out, by instrumentation.
- .2 Stake for grading, fill and asphalt.
- .3 Establish lines and levels for utilities and electrical work.

1.3 EXISTING
SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.4 LOCATION OF
SERVICES

- .1 Inform Departmental Representative of impending installation and obtain approval for actual location.
- .2 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.5 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
-

Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 General

1.1 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Submit written request in advance of alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Efficiency, maintenance, or safety of operational elements.
 - .3 Visual qualities of sight-exposed elements.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Effect on Work of Owner or separate contractor.
- .6 Written permission of affected separate contractor.
- .7 Date and time work will be executed.

1.2 MATERIALS

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00.

1.3 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during alteration.
 - .2 After uncovering, inspect conditions affecting performance of Work.
 - .3 Beginning of alteration means acceptance of existing conditions.
-

- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Uncover Work to install ill-timed Work.
- .3 Remove and replace defective and non-conforming Work.
- .4 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .5 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .6 Restore work with new products in accordance with requirements of Contract Documents.
- .7 Submit proposed materials, finishes and installation method to Departmental Representative for approval.

1.5 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.
-

Part 1 General

1.1 PROJECT
CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 20.
- .6 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .8 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 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 Remove waste products and debris.
-

- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Broom clean and wash exterior walks, steps and surfaces used during construction.
- .8 Remove dirt and other disfiguration from exterior surfaces.
- .9 Sweep and wash clean paved areas.
- .10 Clean equipment and fixtures to sanitary condition; clean or

1.3 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

Part 1 General

1.1 CONSTRUCTION &
DEMOLITION WASTE

- .1 Carefully deconstruct and source separate materials/equipment and divert, waste destined for landfill to maximum extent possible. Target for this project is 60% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.
- .2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
 - .1 Provide facilities for collection, handling and storage of source separated wastes.
 - .2 Source separate the following waste:
 - .1 Concrete block and portland cement concrete.
 - .2 Corrugated cardboard.
 - .3 Wood, not including painted or treated wood or laminated wood.
 - .4 Steel.
- .3 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.
- .4 Indicate how material being removed from the site will be reused, recycled, composted or anaerobically digested.
- .5 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

1.2 WASTE
PROCESSING SITES

- .1 Province of: Ontario.
 - .1 Ministry of Environment and Energy: 135 St. Clair Avenue West, Toronto, ON, M4V 1P5.
 - .2 Telephone: 800-565-4923 or 416-323-4321.
 - .3 Fax: 416-323-4682.
 - .4 Telephone: 416-657-2797.
 - .5 Fax: 416-960-8053.
 - .2 Email: rco@rco.on.ca.
-

.3 Internet: <http://www.rco.on.ca/>.

Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3 Execution

3.1 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT .1 Schedule C - Government Chief Responsibility for the Environment:
.1 Ministry of Environment Address: St. Clair Avenue West, Toronto, ON, M4V 1P5.
.2 Telephone: 800-565-4923 or 416-323-4321.
.3 Fax: 416-323-4682.
.4 Telephone: 416-657-2797.
.5 Fax: 416-960-8053.

Part 1 General

1.1 INSPECTION AND
DECLARATION

- .1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Departmental Representative's Inspection.
- .2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to 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 Certificates required by Authorities having jurisdiction have been submitted.
 - .4 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

1.2 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.

Part 2 Products

2.1 NOT USED

- .1 Not Used.
-

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 General

1.1 SECTION
INCLUDES

- .1 As-built, samples, and specifications.
- .2 Product data, materials and finishes, and related information.
- .3 Operation and maintenance data.
- .4 Warranties and bonds.

1.2 SUBMISSION

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned with Departmental Representative's comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of maintenance manuals and commissioning documentation in English.
- .5 If requested, furnish evidence as to type, source and quality of products provided.
- .6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

1.3 FORMAT

- .1 Organize data in the form of an 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 systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: Manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide CAD drawings files in 1:1 scaled dwg format. Provide text files in MS Word or PDF, MS Excel and MS Project formats. Forward files on USB flash drive compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.4 CONTENTS - EACH VOLUME

- .1 Table of Contents: provide title of project;
 - .1 Date of submission; names,
 - .2 Addresses, and telephone numbers of Contractor with name of responsible parties;
 - .3 Schedule of products, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

1.5 AS -BUILTS AND SAMPLES

- .1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Amendments and addenda.
 - .4 Change Orders and other modifications to the Contract.
-

- .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office, as applicable.
 - .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 Departmental Representative.
 - .6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of work. Submit files on USB flash drive compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.
 - .7 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.6 RECORDING
ACTUAL SITE
CONDITIONS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
 - .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
 - .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
 - .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
-

- .1 Measured horizontal and vertical of locations underground utilireferenced to permanent surface improvements.
- .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .3 Field changes of dimension and detail.
- .4 Changes made by change orders.
- .5 Details not on original Contract Drawings.
- .6 References to related shop drawings and modifications.

- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Amendments and change orders.
- .6 Other Documents: Provide construction progress digital photos and videos.

1.7 WARRANTIES AND BONDS

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
 - .4 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until the Date of Certificate 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 bonds until time specified for submittal.
-

Part 2 Products

2.1 NOT USED .1 Not Used.

Part 3 Execution

3.1 NOT USED .1 Not Used.

Part 1 General

1.1 RELATED
REQUIREMENTS

- .1 Section 01 35 29 - Health and Safety Requirements
- .2 Section 02 82 00.01 - Asbestos Abatement - Minimum Precautions.

1.2 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit erosion and sedimentation control drawing/plan.

1.3 QUALITY
ASSURANCE

- .1 Selective demolition work shall be performed by workers familiar with the materials affected. Perform in a manner to neither damage nor endanger any portion of the Work.

1.4 SITE CONDITIONS

- .1 Existing conditions:
 - .1 Take precautions to protect environment. Refer to specification section 01 35 29.
 - .2 Hazardous or contaminated materials or substances will be encountered during demolition/alternation work.
 - .3 Proceed with work following directions of this specification and all referenced materials.
- .2 Protection:
 - .1 Prevent movement, or damage of adjacent construction. Provide bracing as required. Repair damage caused by demolition as directed by Departmental Representative.

Part 2 Products

2.1 NOT USED

- .1 Not used.
-

Part 3 Execution

3.1 EXAMINATION

- .1 Inspect building and site and verify extent and location of items designated for removal, 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, as required before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
- .5 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.
- .6 Immediately notify the Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PROTECTION

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, 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.
-

3.3 PREPARATION

- .1 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, walkways and waterways according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

3.4 SELECTIVE
DEMOLITION WORK

- .1 Remove items for disposal and salvage as indicated on drawings.
- .2 Do not damage or deface existing construction, equipment or finishes indicated to remain or items indicated for salvage.
- .3 Dispose of rubble, debris, and removed materials off site. Dispose of materials in accordance with authority having jurisdiction.
- .4 Refer to section 01 14 00 for further requirements of work to existing building.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.
- .3 Refer to removals drawings and specifications for items to be salvaged for reuse.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

PART 1 GENERAL

1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following work:
 - .1 Removing or handling asbestos cement sewer pipes.

1.2 SECTION INCLUDES

- .1 Requirements and procedures for asbestos abatement of asbestos cement sewer pipes.

1.3 REFERENCES

- .1 Department of Justice Canada (JUS)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .3 O. Reg. 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
- .4 O. Reg. 490/09, Designated Substances.
- .5 A Guide to the Regulations respecting Asbestos on Construction Projects and in Buildings and Repair Operations released in November 2007, <http://www.labour.gov.on.ca/english/hs/asbestos/index.html>.

1.4 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
 - .2 Amended Water: water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
 - .3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
 - .4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.
-

- .5 Authorized Visitors: Engineers, Consultants or designated representatives, and representatives of regulatory agencies.
- .6 Competent worker person: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: means material that:
 - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
 - .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.
- .10 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

1.5 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 and in addition refer to 00 11 00.
 - .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
 - .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
 - .4 Submit proof of Contractor's Asbestos Liability Insurance.
-

- .5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY
ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 29.
 - .2 Safety Requirements: worker protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.7 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.

- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm thick (6 mil) bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING
CONDITIONS

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project have been included in the tender package.
- .2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.9 OWNER'S
INSTRUCTIONS

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop Sheets:
 - .1 Polyethylene: 0.15 mm thick.

- .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

PART 3 EXECUTION

3.1 PROCEDURES

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.
- .2 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.
 - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
 - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
 - .3 Do not use compressed air to clean up or remove dust from any surface.

- .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
- .4 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity fine - mist sprayer.
 - .2 Perform Work to reduce dust creation to lowest levels practicable.
 - .3 Work will be subject to visual inspection and air monitoring.
 - .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .5 Frequently and at regular intervals during Work and immediately on completion of work:
 - .1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and
 - .2 Drop sheets to be wetted and placed in a waste container as soon as practicable.
- .6 Cleanup:
 - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
 - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
 - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
 - .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

PART 1 - GENERAL

1.2 REFERENCES

- .1 Reference Standards:
 - .1 ASTM International(Latest editions)
 - .1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2 ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3 ASTM C494/C494M-15a, Standard Specification for Chemical Admixtures for Concrete.
 - .5 ASTM D412-15a, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - .6 ASTM D624-00(2012), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
 - .7 ASTM D1751-04(2013)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - .2 CSA International
 - .1 CSA A23.1-09/A23.2-09 (R2014), Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A283-06(R2011), Qualification Code for Concrete Testing Laboratories.
 - .3 CAN/CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .4 CAN/CSA A3001-13, Cementitious Materials for use in Concrete

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Certificates
 - .1 Minimum two weeks prior to starting concrete work submit to Departmental Representative manufacturer's test data, and certification by qualified independent inspection and testing laboratory that following

materials will meet specified requirements.

- .1 Cement and cementitious materials.
- .2 Grout
- .3 Admixtures
- .4 Aggregates
- .5 Water
- .6 Joint Filler

.2 Provide certification that mix proportions selected will produce concrete of quality, durability, yield and strength as specified in concrete mixes, and will comply with CSA A23.1/A23.2.

.3 Provide two copies of WHMIS MSDS.

1.4 QUALITY
ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00.

.2 Provide Departmental Representative, minimum 2 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:

- .1 Hot weather concrete.
- .3 Cold weather concrete.
- .4 Curing.
- .5 Finishes.
- .6 Joints.

.4 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.5 DELIVERY,
STORAGE AND
HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

- .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
- .2 Deviations to be submitted for review by Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .3 Waste Management and Disposal
 - 1. Divert unused concrete materials from landfill to local facility approved by Departmental Representative.
 - 2. Provide appropriate area on the job site where concrete trucks can be safely washed.
 - 3. Divert unused admixtures, additive materials from landfill to officials hazardous materials collection sites as approved by the Departmental Representative.
 - 4. Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
 - 5. Prevent admixtures and additive materials from entering into drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial and National Regulations.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described

in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

- .1 Portland Cement: to CAN/CSA-A3001, Exposure Class C-2.
- .2 The cementitious material selection is left to the Concrete Mix designer to meet the stated strength, durability and other parameters.
- .3 Supplementary cementing materials: Concrete Mix designer to determine to meet the project requirements. While complying the codes.
- .4 Water: to CSA A23.1/A23.2.
- .5 Aggregates: to CSA A23.1/A23.2.
- .6 Admixtures:
 - .1 Air entraining admixture: to ASTM A23.1/A23.2.
 - .2 Chemical admixture: to ASTM C494/C494M. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .7 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.
 - .1 Compressive strength: 35 MPa at 28 days.
 - .2 Net shrinkage at 28 days :As specified in the selected premixed compound.
- .8 Curing compound: to CSA A23.1/A23.2
- .9 Premoulded joint fillers:
 - .1 Bituminous impregnated fiber board: to ASTM D1751.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
 - .1 Provide 24 hours minimum notice prior to placing of concrete.

- .2 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .3 Pumping of concrete is permitted only after approval of equipment and mix.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application for concrete finishes.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature, concrete temperature at discharge and test samples taken.
- .9 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place steel dowels of deformed steel reinforcing bars or threaded bars as shown on the drawings and install as per the specified anchoring system.
- .10 Do not place load upon new concrete until authorized by Departmental Representative.

3.2
INSTALLATION/
APPLICATION

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Finishing and curing:
 - .1 Finish concrete to CSA A23.1/A23.2.
 - .2 Use procedures as reviewed by Departmental Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
 - .3 Wet cure using polyethylene sheets placed over sufficiently hardened concrete to prevent damage. Overlap adjacent edges 150mm and tightly seal with sand or wood planks. Weigh sheets down

to maintain close contact with concrete during the entire curing period.

.4 Finish concrete to CSA A23.1/A23.2.

.5 Provide swirl-trowelled finish for exterior walks, ramps and pads.

.6 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.3 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.

.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 25mm joint filler to separate slab on grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless otherwise indicated.

3.3 SURFACE
TOLERANCE

- .1 Concrete tolerance to CSA A23.1/A23.2 Thickness slab shall not be less than the specified value. Levels shall not vary more than plus/minus 5mm from that indicated on drawings where mild slope is indicated. On flat slabs, tolerance shall be in accordance with CSA A23.1/A23.2, F-number method, $I_f = 25$, $F_1 = 20$.

3.4 FIELD QUALITY
CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days for concrete with Type C-2 exposure.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
- .1 Ensure testing laboratory is certified to

CSA A283.

- .3 Ensure test results are provided to Departmental Representative.
- .4 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .7 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .1 Divert unused concrete materials from landfill to local facility after receipt of written approval from Departmental Representative.
 - .2 Provide appropriate area on job site where concrete trucks and be safely washed.
 - .3 Divert unused admixtures and additive materials from landfill to official hazardous material collections site as approved by Departmental Representative.
 - .4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
 - .5 Prevent admixtures and additive materials from entering drinking water supplies or streams.
 - .6 Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal.
 - .7 Dispose of waste in accordance with applicable local, Provincial and National regulations.

PART 1 GENERAL

1.1 RELATED
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 31 23 33 - Excavating, Trenching and Backfilling.
- .3 Section 32 11 20 - Granular Base.
- .4 Section 32 12 16 - Asphalt Paving.

1.2 REFERENCES

- .1 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS.PROV 1010, November 2013, Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.
 - .2 OPSS.PROV 1004, November 2012, Aggregates Miscellaneous.

1.3 SAMPLES

- .1 Allow continual sampling by Departmental Representative during production.
- .2 Provide Departmental Representative with access to source and processed material for sampling.
- .3 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Granular 'A' to OPSS.PROV 1010.
 - .2 Granular 'B' Type I to OPSS.PROV 1010.
 - .3 19mm clear stone to OPSS.PROV 1004.
 - .4 Rip Rap to OPSS.PROV 1004.
-

- 2.2 SOURCE QUALITY CONTROL
- .1 If, in opinion of Departmental Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
 - .2 Advise Departmental Representative 4 weeks in advance of proposed change of material source.
 - .3 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

part 3 execution

- 3.1 NOT USED
- .1 Not Used.

PART 1 GENERAL

1.1 RELATED
SECTIONS

- .1 Section 31 11 00 - Clearing and Grubbing.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
.1 ASTM D698-12e2, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m³).

1.3 EXISTING
CONDITIONS

- .1 Known underground and surface utility lines and buried objects are as indicated on site plan.

1.4 PROTECTION

- .1 Protect and/or transplant existing fences, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Fill material: In accordance with Section 31 23 33.

PART 3 EXECUTION

3.1 STRIPPING OF
TOPSOIL

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Departmental Representative.
- .2 Commence topsoil stripping of areas as indicated after area has been cleared of brush weeds and grasses and removed from site.
-

- .3 Strip topsoil to depths as indicated. Rototill weeds and grasses and retain as topsoil on site. Avoid mixing topsoil with subsoil.
- .4 Stockpile in locations as directed by Departmental Representative. Stockpile height not to exceed 2 m.
- .5 Dispose of unused topsoil off site.

3.2 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Rough grade to following depths below finish grades:
 - .1 100 mm for grassed areas.
 - .2 As per contract drawings.
- .3 Slope rough grade away from building as indicated.
- .4 Grade swales and ditches to depth as indicated.
- .5 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .6 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:
 - .1 85% under landscaped areas.
 - .2 95% under paved and walk areas.
- .7 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING

- .1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by Departmental Representative. Costs of tests will be paid by Departmental Representative. Refer to Section 01 45 00.

3.4 SURPLUS MATERIAL

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping off site as directed by Departmental Representative.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63(2014), Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D4318-10e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-2013, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-2013, Cementitious Materials for Use in Concrete.
 - .2 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .3 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
 - .1 OPSS.PROV 1004, November 2012, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.
 - .2 OPSS.PROV 1010, November 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.2 DEFINITIONS

- .1 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
 - .2 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
-

- .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .6 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
 - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

- .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.
- .7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 QUALITY
ASSURANCE

- .1 Submit design and supporting data at least 2 weeks prior to beginning Work.
- .2 Design and supporting data submitted to bear stamp and signature of qualified professional Engineer registered or licensed in Province of Ontario, Canada.

- .3 Keep design and supporting data on site.
- .4 Engage services of qualified professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .5 Do not use soil material until written report of soil test results are reviewed by Departmental Representative.
- .6 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.

1.5 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

1.6 EXISTING
CONDITIONS

- .1 Examine geotechnical report appended to this specification.
 - .2 Buried services:
 - .1 Before commencing work verify and establish location of buried services on and adjacent to site.
 - .2 Coordinate with appropriate authority for relocation of buried services.
 - .3 Remove obsolete buried services as indicated in the Contract Drawings.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Confirm locations of buried utilities by careful test excavations and soil hydrovac methods as appropriate.
 - .6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered and as indicated on the Contract Drawings.
 - .7 Record location of maintained, re-routed and abandoned underground lines.
 - .8 Confirm locations of recent excavations adjacent to area of excavation.
 - .3 Existing buildings and surface features:
-

.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Approved Backfill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.
- .2 Granular material: to OPSS.PROV 1010 for:
 - .1 Granular A, maximum size 19.0 mm.
 - .2 Granular B, Type I, maximum size 26.5 mm.
- .3 Sand: clean, washed, minimum 100% passing 4.75 mm sieve, maximum 5% passing 0.075 mm sieve to OPSS.PROV 1004.
- .4 Drainage material: 19 mm crushed stone or 19 to 63 mm clean gravel to OPSS.PROV 1004 and as indicated in the drawings.
- .5 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum cement content of 25 kg/m³ with 40% by volume fly ash replacement: to CAN/CSA-A3001, Type GU.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CAN/CSA-A23.1/A23.2.
 - .5 Cement: Type GU.
 - .6 Slump: 160 to 200 mm.

PART 3 - EXECUTION

3.1 SITE
PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement and sidewalks neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 PREPARATION/
PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.3 STRIPPING OF
TOPSOIL

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of grasses and removed from site.
- .2 Strip topsoil to depths as required.
 - .1 Do not mix topsoil with subsoil.
- .3 Stockpile in locations as directed by Departmental Representative.
 - .1 Stockpile height not to exceed 2 m and should be protected from erosion.
- .4 Dispose of unused topsoil off site.

3.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative.
-

.1 Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

3.5 DEWATERING AND
HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Departmental Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 to approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.6 EXCAVATION

.1 Advise Departmental Representative at least 7 days in advance of excavation operations.

.2 Excavate to lines, grades, elevations and dimensions as indicated.

.3 Remove concrete, masonry, paving, walks, demolished foundations and rubble, and other obstructions encountered during excavation in accordance with Section 02 41 16.

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open at end of day's operation.

- .6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .7 Restrict vehicle operations directly adjacent to open trenches.
- .8 Dispose of surplus and unsuitable excavated material off site.
- .9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 Notify Departmental Representative when bottom of excavation is reached.
- .11 Obtain Departmental Representative approval of completed excavation.
- .12 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .13 Correct unauthorized over-excavation as follows:
 - .1 Fill under bearing surfaces and footings with concrete specified for footings fill concrete Granular 'A' compacted to not less than 100% Standard Proctor Maximum Dry Density.
 - .2 Fill under other areas with Granular 'A' compacted to not less than 95% of corrected Standard Proctor Maximum Dry Density.
- .14 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
 - .2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

3.7 BEDDING AND
SURROUND OF
UNDERGROUND
SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as indicated in the Contract Drawings.
 - .2 Place bedding and surround material in unfrozen condition.
-

3.8 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
 - .2 Departmental Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of concrete formwork.
 - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
 - .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
 - .3 Do not use backfill material which is frozen or contains ice, snow or debris.
 - .4 Place backfill material in uniform layers not exceeding 200 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
 - .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.2 m.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative or:
 - .2 If approved by Departmental Representative, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative.
 - .6 Place unshrinkable fill in areas as indicated.
 - .7 Consolidate and level unshrinkable fill with internal vibrators.
 - .8 Install drainage filter system in backfill as indicated.
-

3.9 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 20, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Replace topsoil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

PART 1 GENERAL

- 1.1 RELATED SECTIONS
- .1 Section: 32 11 24 - Granular Sub-Base.
 - .2 Section: 32 12 16 - Asphalt Concrete Paving.

PART 2 PRODUCTS

- 2.1 MATERIALS
- .1 Granular A to OPSS.PROV 1010, November 2013.

PART 3 EXECUTION

- 3.1 PLACING
- .1 Place on a clean surface, properly shaped and compacted and free from snow or ice.
 - .2 Place material in layers not exceeding 150 mm when compacted.
 - .3 Spread each layer uniformly using approved grading equipment and methods.

- 3.2 COMPACTING
- .1 Compact each layer to minimum 100% Standard Proctor Maximum Dry Density.
 - .2 Add water as required to maintain material at or near optimum moisture content while compacting.

- 3.3 FINISHING
- .1 Finish compacted surface to within 12 mm of established grade as indicated by a 3 m straightedge placed in any direction
 - .2 Correct irregularities greater than 12 mm by loosening the surface and adding or removing material until surface is within specified tolerance.

- 3.4 FIELD QUALITY CONTROL
- .1 The Departmental Representative may perform field and laboratory tests for control of moisture, density and aggregate gradation. Results will control Contractor's operations.

PART 1 GENERAL

1.1 RELATED
SECTIONS

- .1 Section: 32 11 20 - Granular Base.
- .2 Section: 32 12 16 - Asphalt Paving.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Granular B Type I: to OPSS.PROV 1010, November 2013. Maximum size Granular B Type I, 75.0 mm.

PART 3 EXECUTION

3.1 PLACING

- .1 Place on a clean surface, properly shaped and compacted and free from snow or ice.
- .2 Place material in layers not exceeding 150 mm when compacted.
- .3 Spread each layer uniformly using approved grading equipment and methods.

3.2 COMPACTING

- .1 Compact each layer to minimum 100% Standard Proctor Maximum Dry Density.
- .2 Add water as required to maintain material at or near optimum moisture content while compacting.

3.3 FINISHING

- .1 Finish compacted surface to within 12 mm of established grade as indicated by a 3 m straightedge placed in any direction
 - .2 Correct irregularities greater than 12 mm by loosening the surface and adding or removing material until surface is within specified tolerance.
-

3.4 FIELD QUALITY
CONTROL

- .1 The Departmental Representative may perform field and laboratory tests for control of moisture, Density (compaction) and aggregate gradation. Results will control Contractor's operations.
- .2 Testing shall be carried out by an independent testing agency, acceptable to the Departmental Representative.

PART 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D 698-12E2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.5-M91 (March 1999), Low Flash Petroleum Spirits Thinner (Reaffirmation of December 1991).
 - .2 CAN/CGSB-1.74-2001, Alkyd Traffic Paint.
- .3 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 302, November 2007, Construction Specification for Priming Granular Base.
 - .2 OPSS 310, November 2010, Construction Specification for Hot Mixed Asphalt
 - .3 OPSS 314, November 2013, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.
 - .4 OPSS 1010, November 2013, Material Specification for Base, Subbase, Select Subgrade, and Backfill Material.
 - .5 OPSS 1103, November 2012, Material Specification for Emulsified Asphalt.
 - .6 OPSS 1150, November 2010, Material Specification for Hot Mixed Asphalt

1.2 SAMPLES

- .1 Submit to Department Representative, the asphalt mix design at least 2 weeks before paving work.

1.3 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 20.

PART 2 Products

2.1 MATERIALS

- .1 Aggregates to: OPSS.PROV 1010.
 - .1 Granular A.
 - .2 Granular B Type I.
 - .3 Select subgrade.
-

- .2 Tack coat: SS-1 to OPSS.PROV 1103.
- .3 Asphalt concrete: to OPSS.PROV 1150.
- .4 Traffic paint: Alkyd yellow (505-308) and white (513-301) to CAN/CGSB-1.74 and OPSS.PROV 1712.
- .5 Paint thinner: to CAN/CGSB-1.5.

Part 3 Execution

3.1 PAVEMENT CONSTRUCTION

- .1 Pavement thickness and drainage spillways as per detail drawings.
- .2 Application of tack coat: OPSS.PROV 1103. Apply only on clean and dry surface. Paint contact surfaces of curbs, gutters, manholes and like structures with thin, uniform coat of asphalt tack coat material.
- .3 Construction of asphalt concrete: OPSS.PROV 310.

3.2 TRAFFIC MARKINGS

- .1 Paint stop lines, centre lines and other pavement markings in accordance with manufacturers recommendations and as indicated.
- .2 Review layout with Department Representative prior to application.
- .3 Use paint thinner in accordance with manufacturer's requirements.
- .4 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.
- .5 Air temperature to be above 10°C, wind speed less than 60 km/h and no rain in forecast within next 4 hours.
- .6 Paint lines to be of uniform colour and density with sharp edges.
- .7 Remove incorrect markings as directed by Department Representative.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.
- .2 Section 31 22 13 - Rough Grading.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-13, Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698-12e2, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600 kN-m/m³).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-3.3-2014, Kerosene, Amend. No. 1, National Standard of Canada.
 - .2 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-14/A23.2-14, Concrete materials and methods of concrete construction/Test methods and standard practices for concrete.
- .4 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS 1010, November 2013, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.3 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00.
 - .2 Product Data: submit WHMIS MSDS.
 - .3 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing work.
-

- .4 If materials have been tested by accredited testing laboratory testing laboratory approved by Departmental Representative within previous 2 months and have passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03 30 00.
- .2 Joint filler, Curing Compound: in accordance with Section 03 30 00.
- .3 Granular base: Granular A to OPSS.PROV 1010.
- .4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water-soluble soap.
- .5 Kerosene: to CAN/CGSB-3.3.

PART 3 - EXECUTION

3.1 GRADE
PREPARATION

- .1 Do grade preparation work in accordance with Section 31 22 13.

3.2 GRANULAR BASE

- .1 Obtain Departmental Representative's approval of subgrade before placing granular base.
 - .2 Place granular base material to lines, widths, and depths as indicated.
 - .3 Compact granular base in maximum 200 mm layers to at least 95% of Standard Proctor Maximum Dry Density.
-

3.3 CONCRETE

- .1 Obtain Departmental Representative's approval of granular base prior to placing concrete.
- .2 Do concrete work in accordance with Section 03 30 00.
- .3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.
- .4 Provide edging as indicated with 10 mm radius edging tool.
- .5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Departmental Representative can be demonstrated. Hand finish surfaces when directed by Departmental Representative.

3.4 TOLERANCES

- .1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.

3.5 EXPANSION AND
CONTRACTION JOINTS

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of m.
- .2 Install expansion joints at intervals of 6 m.
- .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.6 ISOLATION
JOINTS

- .1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.
 - .2 Install joint filler in isolation joints in accordance with Section 03 30 00.
 - .3 Seal isolation joints with sealant approved by Departmental Representative.
-

- 3.7 CURING
- .1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1/A23.2 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound as directed by Departmental Representative.
 - .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.
 - .3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

- 3.8 BACKFILL
- .1 Allow concrete to cure for 7 days prior to backfilling.
 - .2 Backfill to designated elevations with material as directed by Departmental Representative.
 - .1 Compact and shape to required contours as indicated.

- 3.9 CLEANING
- .1 Proceed in accordance with Section 01 74 11.
 - .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

PART 1 GENERAL

1.1 RELATED
SECTIONS

- .1 Section 31 22 13 - Rough Grading.
- .2 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.2 DEFINITIONS

- .1 COMPOST: A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth and contain no toxic or growth inhibiting contaminants. Composed bio-solids must meet the requirements of the Guidelines for Compost Quality, Category (A) produced by the Canadian Council of the Ministers of the Environment (CCME), January 1996.

PART 2 PRODUCTS

2.1 TOPSOIL

- .1 Topsoil for seeded areas: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
 - .2 Contain no toxic elements or growth inhibiting materials.
 - .3 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .4 Consistence: friable when moist.
-

PART 3 EXECUTION

3.1 STRIPPING OF
TOPSOIL

- .1 Commence topsoil stripping of areas as indicated or as directed by Departmental Representative after area has been cleared of brush, weeds and grasses and removed from site.
- .2 Strip topsoil to required depths. Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as directed by Departmental Representative.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.
- .5 Protect stockpiles from contamination and compaction.

3.2 PREPARATION OF
EXISTING GRADE

- .1 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. 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 Departmental Representative has accepted subgrade.
 - .2 Spread topsoil in uniform layers not exceeding 150 mm.
-

- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil to 100mm minimum depth (after settlement).
- .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. Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative. Leave surfaces smooth, uniform and firm against deep footprinting.

3.5 ACCEPTANCE

- .1 Departmental Representative 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 surplus material off site.

3.7 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

PART 1 GENERAL

1.1 RELATED
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 32 91 21 - Topsoil Placement and Grading.

1.2 SUBMITTALS

- .1 Product Data.
 - .1 Submit product data in accordance with Section 01 33 00.
 - .2 Provide product data for:
 - .1 Seed.
 - .2 Mulch.
 - .3 Tackifier.
 - .4 Fertilizer.

1.3 SCHEDULING

- .1 Schedule hydraulic seeding to coincide with preparation of soil surface.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
 - .1 Grass mixture: "Certified", "Canada No. 1 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".
 - .2 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
 - .1 Type II mulch:
 - .1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
 - .3 Tackifier: water dilutable, liquid dispersion.
 - .4 Water: free of impurities that would inhibit germination and growth.
 - .5 Fertilizer:
-

- .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
- .2 Commercial Grade (10-10-10)

PART 3 EXECUTION

3.1 WORKMANSHIP

- .1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.
- .2 Clean-up immediately, any material sprayed where not intended, to satisfaction of Departmental Representative.
- .3 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.
- .4 Protect seeded areas from trespass until plants are established.

3.2 PREPARATION OF SURFACES

- .1 Preparation of soil as per Section 32 91 21.

3.3 SLURRY APPLICATION

- .1 Hydraulic seeding equipment:
 - .1 Slurry tank.
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
 - .2 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
 - .1 Using correct nozzle for application.
 - .2 Using hoses for surfaces difficult to reach and to control application.
 - .3 Blend application 500 mm into adjacent grass areas or sodded areas and previous applications to form uniform surfaces.
 - .4 Re-apply where application is not uniform.
 - .5 Remove slurry from items and areas not designated to be sprayed.
 - .6 Protect seeded areas from trespass.
-

- .7 Remove protection devices as directed by Departmental Representative.

3.4 MAINTENANCE
DURING
ESTABLISHMENT
PERIOD

- .1 Perform following operations from time of seed application until acceptance by Departmental Representative.
- .2 Grass Mixture:
 - .1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
 - .2 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
- .3 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

3.5 ACCEPTANCE

- .1 Seeded areas will be accepted by Departmental Representative provided that:
 - .1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.
- .2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.6 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 Materials and installation for constructing new outfall structures, precast maintenance holes.

1.2 RELATED
SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.
- .2 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Section 33 31 13 - Public Sanitary Utility Sewerage Piping.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A48/A48M-03(2012), Standard Specification for Gray Iron Castings.
 - .2 ASTM C139-14, Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - .3 ASTM C478M-15a, Standard Specification for Circular Precast Reinforced Concrete Manhole Sections (Metric).
 - .4 ASTM C618-15, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - .5 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
 - .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .2 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .3 CSA-A165 Series-04(2009), Concrete Masonry Units (Consists of A165.1, A165.2 and 165.3).
 - .4 CAN/CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
-

- .4 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS 407 - Construction Specification for Maintenance Hole, Catch Basin, Ditch Inlet and Valve Chamber Installation - November 2015, Cibs
 - .2 OPSS 1010 - Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material - November 2013.
- .5 Ontario Provincial Standard Drawings (OPSD)
 - .1 OPSD 405.010 - Maintenance Hole Steps, Hallow - November 2013.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00.
- .2 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.

1.5 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Cast-in-place concrete:
 - .1 In accordance with Section 03 30 00.
- .2 Precast maintenance hole units: to ASTM C478M, circular or oval. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation. Monolithic bases to be approved by Departmental Representative and set on concrete slabs cast in place.
- .3 Joints: to be made watertight using rubber rings, bituminous compound, epoxy resin cement or cement mortar.
- .4 Mortar:
 - .1 Masonry Cement: to CAN/CSA-A3001.
- .5 Ladder rungs: to OPSD 405.010.
- .6 Adjusting rings: to ASTM C478M.
- .7 Concrete Brick: to CAN/CSA-A165 Series.

- .8 Steel gratings, I-beams and fasteners: as indicated.
- .9 Frames, gratings, covers to dimensions as indicated and following requirements:
 - .1 Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
 - .2 Gray iron castings: to ASTM A48/A48M, strength class 30B.
 - .3 Castings: coated with two applications of asphalt varnish sand blasted or cleaned and ground to eliminate surface imperfections.
 - .4 Mainhole hole frames and covers: cover cast with without perforations and complete with two 25 mm square lifting holes to OPSS 407.
 - .5 Covers to be embossed with "Sanitary".
- .10 Granular bedding and backfill: in accordance with OPSS.PROV 1010.
 - .1 150 mm Granular 'A' compact to minimum 98% Standard Proctor Maximum Dry Density.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL

- .1 Excavate and backfill in accordance with Section 31 23 33.01 and as indicated.
- .2 Obtain approval of Departmental Representative before installing outfall structures, maintenance holes or catch basins.

3.2 CONCRETE WORK

- .1 Do concrete work in accordance with Section 03 30 00.
- .2 Position metal inserts in accordance with dimensions and details as indicated.

3.3 INSTALLATION

- .1 Construct units in accordance with details indicated, plumb and true to alignment and grade.
 - .2 Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.
-

- .3 Dewater excavation to approval of Departmental Representative and remove soft and foreign material before placing concrete base.
 - .4 Cast bottom slabs directly on undisturbed ground.
 - .5 Set precast concrete base on 150 mm minimum of granular bedding compacted to minimum 98% Standard Proctor Maximum Dry Density.
 - .6 Precast units:
 - .1 Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight with Departmental Representative approved rubber ring gaskets, bituminous compound, cement mortar, epoxy resin cement, or combination thereof.
 - .2 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
 - .3 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
 - .7 For sewers:
 - .1 Place stub outlets and bulkheads at elevations and in positions indicated.
 - .2 Bench to provide a smooth U-shaped channel. Side height of channel to be 0.75 times full diameter of sewer. Slope adjacent floor at 1 in 20. Curve channels smoothly. Slope invert to establish sewer grade. For pipes smaller than mm use standard fittings, breaking out upper half of fitting upon completion of maintenance hole.
 - .8 Compact granular backfill to minimum 98% Standard Proctor Maximum Dry Density.
 - .9 Place unshrinkable backfill in accordance with Section 31 23 33.01.
 - .10 Installing units in existing systems:
 - .1 Where new unit is to be installed in existing run of pipe, ensure full support of existing pipe during installation, and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.
 - .2 Make joints watertight between new unit and existing pipe.
-

- .3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this Project are ready to be put in operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.
- .11 Set frame and cover to required elevation on no more than four courses of brick. Make brick joints and join brick to frame with cement mortar. Parge and make smooth and watertight.
- .12 Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.
- .13 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.
- .14 Install safety platforms in maintenance holes having depth of 5 m or greater, as indicated.
- .15 Remove existing gratings, frames and I beams and store for re-use at locations designated by Departmental Representative.
- .16 Sectional units:
.1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
.2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600 mm use standard maintenance hole brick, modoloc or grade rings.
- .17 Monolithic units:
.1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation with mortared brick course for 150 mm or less alteration. cast-in-place concrete.
.2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
.3 When monolithic units with tapered upper section are to be lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
.4 Install additional maintenance hole ladder rungs in adjusted portion of units as required.
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.5 Re-use existing gratings, frames and I beams.

.6 Re-set gratings and frames to required elevation on not more than 4 courses of brick. Make brick joints and join brick to frame with cement mortar, parge and trowel smooth.

.1 Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

3.4 LEAKAGE TEST

- .1 Install watertight plugs or seals on inlets and outlets of each new sanitary sewer maintenance hole and fill maintenance hole with water. Leakage not to exceed 0.3% per hour of volume of maintenance hole.
- .2 If permissible leakage is exceeded, correct defects. Repeat until approved by Departmental Representative.
- .3 Departmental Representative will issue Test Certificate for each maintenance hole passing test.

PART 1 - GENERAL

1.1 RELATED
REQUIREMENTS

- .1 Section 31 23 33 - Excavating, Trenching and Backfilling.
- .2 Section 33 05 14 - Maintenance Holes and Catch Basin Structures.

1.2 PAYMENT

- .1 Contractor to pay all costs for CCTV inspection of installed pipe, including all costs to re-test defective pipe if a deficiency is found.

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C14M-15, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe (Metric).
 - .2 ASTM C76M-15, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).
 - .3 ASTM C117-13, Standard Test Method for Materials Finer Than 75 (µ) m (No. 200) Sieve in Mineral Aggregates by Washing.
 - .4 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM D698-12e1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft⁴-lbf/ft³ (600 kN-m/m³)).
 - .6 ASTM D2680-01(2014), Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
 - .7 ASTM D3034-08, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - .8 ASTM D3350-10a, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
 - .3 Canadian Standards Association (CSA International)
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.1 CSA B1800-15, Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.8, B182.11 and B182.13).

.1 CSA B182.1(2012), Plastic Drain and Sewer Pipe and Pipe Fittings.

.2 CSA B182.2 (2012), PVC Sewer Pipe and Fittings (PSM Type).

.3 CSA B182.11 (2012), Recommended Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.5 Transport Canada (TC)

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

.6 Ontario Provincial Standard Specification (OPSS)

.1 OPSS 1010, Material Specification for Aggregates - Base, Subbase, Select Subgrade and Backfill Material - November 2013.

1.4 DEFINITIONS

.1 Pipe section is defined as length of pipe between successive manholes and/or between manhole and any other structure which is part of sewer system.

1.5 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Submit samples in accordance with Section 01 33 00.

.3 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.

.4 Submit to Departmental Representative for testing at least 2 weeks prior to beginning Work, following samples of materials proposed for use:.

.5 Ensure certification is marked on pipe.

.6 Submit manufacturers information data sheets and instructions in accordance with Section 01 33 00.

1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00.

1.7 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20.

1.8 SCHEDULING

- .1 Schedule Work to minimize interruptions to existing services and maintain existing sewage flows during construction.
- .2 Submit schedule of expected interruptions for approval and adhere to approved schedule.
- .3 Notify Departmental Representative and building manager superintendent 24 hours minimum in advance of any interruption in service.

PART 2 - PRODUCTS

2.1 PLASTIC PIPE

- .1 Type PSM Polyvinyl Chloride (PVC): to CSA-B182.2.
 - .1 Standard Dimensional Ratio (SDR): 35.
 - .2 Locked-in Separate gasket and integral bell system.
 - .3 Nominal lengths: 6 m.

2.2 CEMENT MORTAR

- .1 Portland cement: to CAN/CSA-A3001, normal type GU.
- .2 Mix mortar one part by volume of cement to two parts of clean, sharp sand mixed dry.
 - .1 Add only sufficient water after mixing to give optimum consistency for placement.
 - .2 Do not use additives.

2.3 PIPE BEDDING
AND SURROUND
MATERIALS

- .1 Granular material to OPS 1010, Granular 'A' as indicated on the Contract Drawings.

2.4 BACKFILL
MATERIAL

- .1 As indicated.

- .2 Unshrinkable fill: to Section 31 23 33.01.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Clean and dry pipes and fittings before installation.
- .2 Obtain Departmental Representative's approval of pipes and fittings prior to installation.

3.2 TRENCHING

- .1 Do trenching Work in accordance with Section 31 23 33.
- .2 Do not allow contents of any sewer or sewer connection to flow into trench.
- .3 Trench alignment and depth require approval of Departmental Representative prior to placing bedding material and pipe.

3.3 CONCRETE BEDDING AND ENCASEMENT

- .1 Do concrete Work in accordance with Section 03 30 00.
 - .1 Place concrete to details as indicated directed by Departmental Representative.
- .2 Position pipe on concrete blocks to facilitate placing of concrete.
 - .1 When necessary, rigidly anchor or weight pipe to prevent flotation when concrete is placed.
- .3 Do not backfill over concrete within 24 hours after placing.

3.4 GRANULAR BEDDING

- .1 Place bedding in unfrozen condition.
 - .2 Place granular bedding materials in uniform layers not exceeding 150 mm compacted thickness to depth as indicated.
 - .3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe.
 - .1 Do not use blocks when bedding pipe.
 - .4 Shape transverse depressions as required to suit joints.
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- .5 Compact each layer full width of bed to at least 98% Standard Proctor Maximum Dry Density.
- .6 Fill excavation below bottom of specified bedding adjacent to manholes or structures with compacted bedding material common backfill lean mix concrete.

3.5 INSTALLATION

- .1 Lay and join pipes to: ASTM C12.
 - .2 Lay and join pipes in accordance with manufacturer's recommendations and to approval of Departmental Representative.
 - .3 Handle pipe using methods approved by Departmental Representative.
 - .1 Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.
 - .4 Lay pipes on prepared bed, true to line and grade, with pipe invert smooth and free of sags or high points.
 - .1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
 - .5 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
 - .6 Do not exceed maximum joint deflection recommended by pipe manufacturer.
 - .7 Do not allow water to flow through pipe during construction, except as may be permitted by Departmental Representative.
 - .8 Whenever Work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
 - .9 Install plastic pipe and fittings in accordance with CSA B182.11.
 - .10 Pipe jointing:
 - .1 Install gaskets in accordance with manufacturer's recommendations as indicated.
 - .2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
 - .3 Align pipes before joining.
 - .4 Maintain pipe joints free from mud, silt, gravel and other foreign material.
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.5 Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned and lubricated and replaced before joining is attempted.

.6 Complete each joint before laying next length of pipe.

.7 Minimize joint deflection after joint has been made to avoid joint damage.

.8 At rigid structures, install pipe joints not more than 1.2 m from side of structure.

.9 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.

.11 When stoppage of Work occurs, block pipes as directed by Departmental Representative to prevent creep during down time.

.12 Plug lifting holes with pre-fabricated plugs approved by Departmental Representative, set in shrinkage compensating grout.

.13 Cut pipes as required for special inserts, fittings or closure pieces as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

.14 Make watertight connections to manholes and septic tank as indicated on Contract Drawings.

.1 Use shrinkage compensating grout when suitable gaskets are not available.

3.6 PIPE SURROUND

.1 Place surround material in unfrozen condition.

.2 Upon completion of pipe laying, and after Departmental Representative has inspected pipe joints, surround and cover pipes as indicated.
.1 Leave joints and fittings exposed until field testing is completed.

.3 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.

.1 Do not dump material within 2 m of pipe.

.4 Place layers uniformly and simultaneously on each side of pipe.

.5 Compact each layer from pipe invert to mid height of pipe to at least 98% Standard Proctor Maximum Dry Density.

- .6 Compact each layer from mid height of pipe to underside of backfill to at least 98% Standard Proctor Maximum Dry Density.
- .7 When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

3.7 BACKFILL

- .1 Place backfill material in unfrozen condition.
- .2 Place backfill material, above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
- .3 Under paving and walks, compact backfill to at least 98% Standard Proctor Maximum Dry Density.
 - .1 In other areas, compact to at least 98% Standard Proctor Maximum Dry Density.
- .4 Place unshrinkable fill in accordance with Section 31 23 33.

3.8 FIELD TESTING

- .1 Repair or replace pipe, pipe joint or bedding found defective.
 - .2 When directed by Departmental Representative, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.
 - .3 Remove foreign material from sewers and related appurtenances by flushing with water.
 - .4 Perform infiltration and exfiltration testing as soon as practicable after jointing and bedding are complete, and service connections have been installed.
 - .5 Do infiltration and exfiltration test to ASTM C828.
 - .6 Do infiltration and exfiltration testing as specified herein and as directed by Departmental Representative.
 - .1 Perform tests in presence of Departmental Representative.
 - .2 Notify Departmental Representative 24 hours in advance of proposed tests.
 - .7 Carry out tests on each section of sewer between successive manholes including service connections.
-

- .8 Install watertight bulkheads in suitable manner to isolate test section from rest of pipeline.
 - .9 Exfiltration test:
 - .1 Fill test section with water to displace air in line. Maintain under nominal head for 24 hours to ensure absorption in pipe wall is complete before test measurements are begun.
 - .2 Immediately prior to test period add water to pipeline until there is head of 1 m over interior crown of pipe measured at highest point of test section or water in manhole is 1 m above static ground water level, whichever is greater.
 - .3 Duration of exfiltration test: 2 hours.
 - .4 Water loss at end of test period: not to exceed maximum allowable exfiltration over any section of pipe between manholes.
 - .10 Infiltration test:
 - .1 Conduct infiltration test in lieu of exfiltration test where static ground water level is 750 mm or more above top of pipe measured at highest point in line to be used.
 - .2 Do not interpolate a head greater than 750 mm to obtain an increase in allowable infiltration rate.
 - .3 Install watertight plug at upstream end of pipeline test section.
 - .4 Discontinue pumping operations for at least 3 days before test measurements are to begin and during this time, keep thoroughly wet at least one third of pipe invert perimeter.
 - .5 Prevent damage to pipe and bedding material due to flotation and erosion.
 - .6 Place 90 degrees V-notch weir, or other measuring device approved by Departmental Representative in invert of sewer at each manhole.
 - .7 Measure rate of flow over minimum of 1 hour, with recorded flows for each 5 min interval.
 - .11 Leakage: not to exceed following limits in litres per hour per mm of diameter per 100 m of sewer including service connections:
 - .1 Exfiltration, based on 600 mm head: 0.175 L.
 - .2 Infiltration: 0.150 L.
 - .12 Repair and retest sewer line as required, until test results are within limits specified.
 - .13 Repair visible leaks regardless of test results.
 - .14 Television and photographic inspections:
-

- .1 Carry out inspection of installed sewers by television camera, photographic camera or by other related means.
- .2 Provide means of access to permit Departmental Representative to do inspections.
- .3 Payment for inspection services in accordance with Payment Procedures in PART 1.

PART 1 - GENERAL

1.1 RELATED
REQUIREMENTS

- .1 Section 35 05 16 - Aggregate Materials.
- .2 Section 31 23 33 - Excavating, Trenching and Backfilling.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C 117-13, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D 698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .4 ASTM D 1248-12, Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 CSA International
 - .1 CAN/CSA G401-12, Corrugated Steel Pipe Products.
- .4 Ontario Provincial Standard Specification (OPSS)
 - .1 OPSS.PROV 1010, November 2013, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Mateiral.
 - .2 OPSS.PROV 1860, April 2012, Material Specification for Geotextiles.

1.3 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for pipes and include product characteristics, performance criteria, physical size, finish and limitations.
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1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Store and protect pipes from damage.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 CORRUGATED
STEEL PIPE

- .1 Corrugated steel pipe: to CAN/CSA-G401.

2.2 POLYETHYLENE
PIPE

- .1 100 mm D1248-05 complete with Type II non-woven geotextiles to OPSS.PROV 1860.

2.3 GRANULAR
BEDDING AND
BACKFILL

- .1 Granular bedding and backfill material to Section 31 05 16 and following requirements:
 - .1 Granular A to OPSS.PROV 1010.

PART 3 - EXECUTION

3.1 TRENCHING

- .1 Do trenching Work in accordance with Section 31 23 33.

3.2 BEDDING

- .1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
 - .2 Place 200 mm minimum thickness of approved granular material on bottom of excavation and compact to 98% SPMDD.
 - .3 Place bedding in unfrozen condition.
-

3.3 BACKFILLING

- .1 Place granular backfill material, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .2 Compact each layer to 98% SPMDD.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 20.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.