Public Services and Procurement Canada

Requisition No. EZ899-181746/A

Buy & Sell I.D. No. _____

SPECIFICATIONS
for
Pacific Highway Port of Entry
Loading Dock Concrete Apron Regrading
(Project No. R.078170.001)
Surrey, B.C

September 2017

APPROVED BY:

_____ 2017-10-20
Regional Manager, AES — Date

_____ 2017-10-06
Construction Safety Coordinator — Date

TENDER:

_____ 2017-10-20
Project Manager — Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
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APPENDIX A - PRELIMINARY HAZARD ASSESSMENT FORM

1. CODES

.1 Perform work to CURRENT Codes, Construction Standards and Bylaws, including Amendments up to the TENDER closing date

2. DESCRIPTION OF WORK

.1 Work under this Contract comprises of construction at the Commercial Operation Building B Warehouse, at the at the Pacific Highway Port of Entry in Surrey, British Columbia. Work includes removal of existing asphalt and concrete, removal of the existing granular base and sub-base, preparation of the sub-grade, installation of granular base and subbase, installation of new reinforced concrete slabs in the loading bays, line painting and final restoration of approaches to bays 1, 2, 3, 4, 5.

.2 Work to be performed under this Contract includes, but is not limited to, the following items covered further in the Contract documents:

.1 Remove existing asphalt and reinforced concrete including base gravels in two phases in order to maintain continuous operation of the existing Commercial building loading dock. Provide continuous smooth driving surfaces for ongoing Port of Entry operations.

.2 Prepare, re-grade, and test the sub-grade in two phases.

.3 Prepare, re-grade, and test the subbase and base gravels in two phases.

.4 Install reinforced concrete slabs in two phases. Complete all testing of concrete.

.5 Phase 1 shall be Bays 1 to 3 and Phase 2 shall be Bays 4 and 5

.6 Complete site restorations to match existing or better conditions as determined by the Department Representative.

.7 Provide the Department Representative with all test reports and final documentation.

.8 Correct all deficiencies and warranty items

3. CONTRACT DOCUMENTS

.1 The Contract documents, drawings and specifications are intended to complement each other, and to provide for and include everything necessary for the completion of the work.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

4. OTHER CONTRACTS

.1 Cooperate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.

.2 Coordinate work with that of other Contractors (if applicable). If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of this Work.

5. DIVISION OF SPECIFICATIONS

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

6. TIME OF COMPLETION

.1 Total completion of the site work, including all deficiencies, shall be no later than 12 weeks from contract award date.

7. HOURS OF WORK

.1 Normal permitted working hours are 7am to 5pm, Monday to Friday. Weekend work may be performed with 72 hour written notice to the Departmental Representative and subject to CBSA approval.

8. WORK SCHEDULE

.1 Carry on work as follows:

.1 Within 10 working days after Contract award, provide a schedule showing anticipated progress stages and final completion of the work within the time period required by the Contract documents. Indicate the following:

.1 Submission of shop drawings, product data, MSDS sheets and samples.

.2 Commencement and completion of work of each section of the specifications or trade for each phase as outlined.

.3 Final completion date within the time period required by the Contract documents.

.2 Do not change approved Schedule without notifying Departmental Representative.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by

Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

9. COST BREAKDOWN

.1 Before submitting the first progress claim, submit a breakdown of the Contract lump sum prices in detail as directed by the Departmental Representative and aggregating Contract price.

10. CODES, BYLAWS, STANDARDS

.1 Perform work in accordance with the National Building Code of Canada, and other indicated Codes, Construction Standards and/or any other Code or Bylaw of local application.

.2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.

.3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.

.4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

11. DOCUMENTS REQUIRED

.1 Maintain 1 copy each of the following at the job site:

.1 Contract drawings.
.2 Contract specifications.
.3 Addenda to Contract documents.
.4 Copy of approved work schedule.
.5 Reviewed/approved shop drawings.
.6 Change orders.
.7 Other modifications to Contract.
.8 Field test reports.
.9 Reviewed/approved samples.
.10 Manufacturers' installation and application instructions.
.11 One set of record drawings and specifications for "as-built" purposes.
.12 National Building Code of Canada.
.13 Current construction standards of workmanship listed in technical Sections.

12. REGULATORY REQUIREMENTS

.1 Obtain and pay for - Building Permit, Certificates, Licenses and other permits required by regulatory municipal, provincial or federal authorities to complete the work.

.2 Provide inspection authorities with plans and information required for issue of acceptance certificates.

.3 Furnish inspection certificates in evidence that the work installed conforms with the requirements of the authority having jurisdiction.

13. CONTRACTOR'S USE OF SITE .1 Site located on Canada Border Services Agency (CBSA) property at the Pacific Highway Port of Entry.

.2 Use of site:

.1 Assume responsibilities for work areas for performance of this work.

.2 Be responsible for coordination of all work activities on site, including the work of other contractors engaged by the Departmental Representative.

.3 Perform work in accordance with Contract documents. Ensure work is carried out in accordance with indicated phasing.

.4 Do not unreasonably encumber site with material or equipment. All equipment shall be stored with the Contractor's work zone unless approved in advance by the Department Representative.

.5 Accept liability for damage, safety of equipment and overloading of existing equipment.

.6 Provide portable toilet for use by crew during construction. Toilet placement shall be approved by the Departmental Representative.

.3 The border crossing will remain open during entire construction period and the contractor is expected work with CBSA to minimize any disruptions.

.4 Co-operate with Department Representative in scheduling operations to minimize conflict with CBSA or public.

.6 Execute work with least possible interference or disturbance to the operations and normal use of premises. Arrange with Departmental Representative to facilitate execution of work. Contractor shall mitigate noise generated during the work. Contractor shall schedule any high-noise level activities with the Departmental Representative in order to minimize disruption to CBSA staff.

.7 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.

.8 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

.9 Attend progress, safety and site security orientation meetings.

14. EXAMINATION .1 Examine site and be familiar and conversant with existing conditions likely to affect work.

.2 Provide photographs of existing conditions, objects and structures prior to the start of the project.

.3 Photographs shall not capture any CBSA employee, vehicle, or traveler.

.4 Photographs shall be taken throughout the project and forwarded to the Departmental Representative

15. 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 the Departmental Representative 48 hours notice for necessary interruption throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian, vehicular traffic and tenant operations.

.3 Provide alternative routes for personnel and pedestrian and vehicular traffic as applicable.

.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 when directed by Departmental Representative to maintain critical buildings and tenant systems.

.7 Provide adequate bridging over trenches which traveled areas 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.

16. LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space, and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain his approval for actual location.

.4 Submit field drawings or shop drawings to indicate the relative position of various services and equipment when required by the Departmental Representative and/or as specified.

17. SETTING OUT OF WORK

.1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Provide devices needed to lay out and construct work.

.3 Supply such devices as templates required to facilitate Departmental Representative's inspection of work.

18. QUALITY OF WORK

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

19. WORKS COORDINATION

.1 Coordinate work of subtrades:
- .1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.
- .2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.

.2 Provide each subcontractor with complete plans and specifications for Contract, to assist them in planning and carrying out their respective work.

.3 Develop coordination drawings when required, illustrating potential interference between work of various trades and distribute to affected parties.
- .1 Pay particularly close attention to overhead work above ceilings and within or near to building structural elements.
- .2 Identify on coordination drawings, building elements, services lines, rough-in points and

indicate location services entrance to site.
.3 Facilitate meeting and review coordination drawings. Ensure subcontractors agree and sign off on drawings.
.4 Publish minutes of each meeting.
.5 Plan and coordinate work in such a way to minimize quantity of service line offsets.
.6 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.

.4 Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

.5 Work cooperation:
.1 Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.
.2 Ensure that each trade provides all other trades reasonable opportunity for completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed work.
.3 Ensure disputes between subcontractors are resolved.

.6 The Departmental Representative is not responsible for, or accountable for extra costs incurred as a result of Contractor's failure to coordinate Work.

.7 Maintain efficient and continuous supervision.

20. APPROVAL OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

.1 In accordance with Section 013300, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.

.2 Allow sufficient time for the following:
.1 Review of product data.
.2 Approval of shop drawings.
.3 Review of re-submission.

21. PROJECT MEETINGS

.1 Administrative Requirements
.1 Schedule and administer site meetings throughout the progress of the work on a regular basis or at the call of Departmental Representative.
.2 Prepare and distribute agenda at least three (3) days prior to the meetings.
.3 Distribute written notice of each meeting seven (7) days in advance of meeting date to Departmental Representative.
.4 Meeting space can be held in the meeting room in CBSA. Book meeting or room in advance through Departmental Representative.

.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 five (5) days after meetings and transmit to meeting participants and affected parties not in attendance, Departmental Representative and Consultants.

.8 Representative of Contractor, Sub-contractor, and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

.2 Pre-Construction Meeting

.1 Within 15 days after award of Contract: Departmental Representative will request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Attendance will include, but is not limited to, the Departmental Representative. Departmental Representative to establish time and location of pre-construction meeting, Contractor to notify parties concerned a minimum of four (4) working days before meeting.

.3 Departmental Representative will chair the meeting, record minutes, and issue minutes.

.4 Agenda to include:

.1 Introduction of official representative of participants in the Work.

.2 Construction schedule including start and finish dates.

.3 Communication Protocol for submission of shop drawings, Environmental Protection Plan, and Erosion and Sediment Control Plan. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences

.5 Security requirements.

.6 Site safety

.7 Communication Protocol for proposed changes, change orders, procedures, approvals required.

.8 Owner's Work.

.9 Record drawings in accordance with Section 01 78 00 - Closeout Submittals.

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

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

.13 Appointment of inspection and testing

agencies or firms.

.3 Progress Meetings

.1 During course of Work and two weeks prior to Project Completion, schedule progress meetings bi-weekly.

.2 Attendance to include, but is not limited to, Departmental Representative, and Contractor.

.3 Contractor responsible to record minutes of meetings and circulate to attending parties and affected parties not in attendance within five (5) days after meeting.

.4 Record next meeting dates in the meeting minutes or notify parties a minimum of seven (7) days in advance for other ad-hoc meetings.

.5 Agenda to include, at a minimum, the following:

.1 Review, approval of minutes of previous meeting;

.2 Review of Health and Safety including any incidents, near misses, and WorkSafe BC visits;

.3 Review of Work progress since previous meeting;

.4 Construction schedule review;

.5 Corrective measures and procedures to regain projected schedule;

.6 Request for Information (RFI) log review;

.7 Change order log review;

.8 Review submittal schedule;

.9 Review updated as-builts;

.10 Review and resolve site issues;

.11 New business.

22. TESTING AND INSPECTIONS .1 See Section 01 45 00 - QUALITY CONTROL

.2 The contractor shall engage and pay for the services of an approved independent testing agency of test laboratory to complete all testing at indicated in Section 01 45 00.

.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 re-testing and re-inspection.

23. AS-BUILT DOCUMENTS .1 The Departmental Representative will provide 2 sets of drawings, 2 sets of specifications, and 2 copies of the original AutoCAD files for "as-built" purposes.

.2 As work progresses, maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings and shop drawings as changes occur.

.3 Closeout submittals in accordance with Section 01 78 00.

24. CLEANING

.1 Daily conduct cleaning and disposal operations. Comply with local ordinances and anti-pollution laws.

.2 Ensure cleanup of the work areas each day after completion of work.

25. ENVIRONMENTAL PROTECTION

.1 Complete all works in accordance with Section 01 35 43 - ENVIRONMENTAL PROCEDURES

.2 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.

.3 Ensure proper disposal procedures in accordance with all applicable territorial regulations.

26. ADDITIONAL DRAWINGS

.1 The Departmental Representative may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in the Contract documents.

.2 Upon request, Departmental Representative may furnish up to a maximum of 10 sets of Contract documents for use by the Contractor at no additional cost. Should more than 10 sets of documents be required the Departmental Representative will provide them at additional cost.

27. SYSTEM OF MEASUREMENT

.1 The metric system of measurement (SI) will be employed on this Contract.

28. SUBMISSION OF TENDER

.1 Submission of a tender is deemed to be confirmation of the fact that the Tenderer has analyzed the Contract documents and is fully conversant with all conditions.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Submit to the 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 coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify the 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 coordinated.

.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.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.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 Indicate materials, methods of construction and

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

.3 Allow 10 working days for Departmental Representative's review of each submission.

.4 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.

.5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.6 Accompany submissions with transmittal letter, in duplicate, 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.

.7 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.
.5 Details of appropriate portions of Work as applicable:
.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.

.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.8 After Departmental Representative's review, distribute copies.

.9 Submit one PDF of shop drawings for each requirement requested in specification sections and as Departmental Representative may reasonably request.

.10 Delete information not applicable to project.

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

.12 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, transparency 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.

.13 The review of shop drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that the Departmental Representative 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 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Worksafe BC status.

1.4 APPROVALS

.1 Approval of shop drawings: refer to Section 01 11 55, clause 20.0.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 32 11 23-Aggregate Base Courses.

.2 Section 32 11 16.01-Granular Sub-Base.

1.2 REFERENCES

.1 Manual of Uniform Traffic Control Devices for Streets and Highways for Canada, Transportation Association of Canada.

.2 Traffic Control Manual for Work on Roadways, BC Ministry of Transportation

1.3 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 Comply with most recent editions of the Traffic Control Manual for Work on Roadways published by the BC Ministry of Transportation and the Manual of Uniform Traffic Control Devices for Streets and Highways for Canada published by the Transportation Association of Canada.

.3 During progress of the Work, make adequate provision to accommodate normal traffic along roads and highways immediately adjacent to or crossing the works so as to cause minimum inconvenience to the general public.

.4 When working on travelled way:

.1 Place equipment in position to present minimum of interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.5 Do not close any lanes of road without prior approval of Departmental Representative. Before re-routing traffic erect suitable signs and devices in accordance with instructions reference manuals.

.6 Keep travelled way graded, free of pot holes and of sufficient width for required number of lanes of traffic.

.1 Provide minimum 7 m wide temporary roadway for traffic in two-way sections through Work and on detours.

.2 Provide minimum 5 m wide temporary roadway

for traffic in one-way sections through Work and on detours.

.7 As directed by Departmental Representative, provide graveled detours or temporary roads to facilitate passage of traffic around restricted construction area:

.1 Place and compact granular sub-base in accordance with Section 32 11 16.01 - Granular Sub-base course.

.2 Place and compact granular base in accordance with Section 32 11 23 - Aggregate Base Courses.

.8 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of Departmental Representative.

1.4 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified reference manuals.

.3 Place signs and other devices in locations recommended in the reference manuals.

.4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.5 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag persons, trained in accordance with, and properly equipped as specified in the reference manuals in following situations:

.1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are

heavy, approach speeds are high and traffic signal system is not in use.

.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

.7 At each end of restricted sections where pilot cars are required.

.8 Delays to public traffic due to contractor's operators: maximum 15 minutes.

.9 Submit a traffic management plan for each phase of work if requested by the Departmental Representative.

.2 Where roadway, carrying two-way traffic, is restricted to one lane, for 24 hours each day, provide portable traffic signal system. Adjust, as necessary, and regularly maintain system during period of restriction. Signal system to meet requirements of the reference manuals.

1.6 OPERATIONAL REQUIREMENTS

.1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by Departmental Representative to protect and control public traffic.

.2 Maintain existing conditions for traffic crossing right-of-way.

----------END OF SECTION----------

1. REFERENCES

.1 Government of Canada.
- .1 Canada Labour Code - Part II
- .2 Canada Occupational Health and Safety Regulations.

.2 National Building Code of Canada (NBC):
- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 The Canadian Electric Code (as amended)

.4 Canadian Standards Association (CSA) as amended:
- .1 CSA Z797-2009 Code of Practice for Access Scaffold
- .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes
- .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures
- .4 CSA Z1006-10 Management of Work in Confined Spaces.
- .5 CSA Z462- Workplace Electrical Safety Standard

.5 National Fire Code of Canada 2010 (as amended)
- .1 Part 5 - Hazardous Processes and Operations and Division B as applicable and required.

.6 American National Standards Institute (ANSI):
- .1 ANSI A10.3, Operations - Safety Requirements for Powder-Actuated Fastening Systems.

.7 Province of British Columbia:
- .1 Workers Compensation Act Part 3- Occupational Health and Safety.
- .2 Occupational Health and Safety Regulations
- .3 B.C. Ministry of Transportation and Infrastructure Traffic Control Manual for Work on Roadways (as amended)

2. RELATED SECTIONS

.1 Refer to the following current sections as required:

- .1 Submittals procedures: Section 01 33 00
- .2 Special Procedures for Traffic Control: Section 01 35 00.06

3. WORKERS' COMPENSATION BOARD COVERAGE

.1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

4. COMPLIANCE WITH REGULATIONS

.1 PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

5. SUBMITTALS

.1 Submit to Departmental Representative submittals listed for review.

.2 Work effected by submittal shall not proceed until review is complete.

.3 Submit the following:

- .1 Site Specific Health and Safety Plan.
- .2 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .3 Copies of incident and accident reports.
- .4 Complete set of current Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.4 The Departmental Representative will review the Contractor's Site Specific Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.

.5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.

.6 Submission of the Site Specific Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:

- .1 Be construed to imply approval by the Departmental Representative.
- .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.

.3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

6. RESPONSIBILITY

.1 Assume responsibility as the Prime Contractor for work under this contract.

.2 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.

.3 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

7. HEALTH AND SAFETY COORDINATOR

.1 The Health and Safety Coordinator:

.1 Be responsible for completing all health and safety training and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.

.2 Be responsible for implementing, revising, daily enforcing, and monitoring the Site Specific Health and Safety Plan.

.3 Be on site during execution of work.

8. GENERAL CONDITIONS

.1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

.2 Secure site at night time [or provide security guard] as deemed necessary to protect site against entry.

9. PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Multi-employer work site.
.2 Federal employees and general public.
.3 Energized electrical services.
.4 Working from heights
.5 Working in the open exposed to unpredictable weather.
.6 High volumes of vehicular and pedestrian traffic

10. UTILITY CLEARANCES

.1 The Contractor is solely responsible for all utility detection and clearances prior to starting the work

.2 The Contractor will not rely solely upon the Reference Drawings or other information provided for utility locations.

11. REGULATORY REQUIREMENTS

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

.2 In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

11. WORK PERMITS

.1 Obtain specialty permit[s] related to project before start of work.

12. FILING OF NOTICE

.1 The General Contractor is to complete and submit a Notice of Project as required by Provincial authorities.

.2 Provide copies of all notices to the Departmental Representative.

13. HEALTH AND SAFETY PLAN

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

.1 Primary requirements:

- .1 Contractor's safety policy.
- .2 Identification of applicable compliance obligations.
- .3 Definition of responsibilities for project safety/organization chart for project.
- .4 General safety rules for project.
- .5 Job-specific safe work procedures.
- .6 Inspection policy and procedures.
- .7 Incident reporting and investigation policy and Procedures.
- .8 Occupational Health and Safety Committee/Representative procedures.
- .9 Occupational Health and Safety meetings.

.10 Occupational Health and Safety communications and record keeping procedures.

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
.3 List hazardous materials to be brought on site as required by work.
.4 Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
.5 Identify personal protective equipment (PPE) to be used by workers.
.6 Identify personnel and alternates responsible for site safety and health.
.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of Site Specific Health and Safety Plan by Public Service and Procurement Canada (PSPC) shall not relieve the Contractor of responsibility for errors or omissions in final Site Specific Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

14. EMERGENCY PROCEDURES

.1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:
.1 Designated personnel from own company.
.2 Regulatory agencies applicable to work and as per legislated regulations.
.3 Local emergency resources.
.4 Departmental Representative [site staff].

.2 Include the following provisions in the emergency procedures:
.1 Notify workers and the first-aid attendant, of the nature and location of the emergency.

.2 Evacuate all workers safely.
.3 Check and confirm the safe evacuation of all workers.
.4 Notify the fire department or other emergency responders.
.5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
.6 Notify Departmental Representative [site staff].

.3 Provide written rescue/evacuation procedures as required for, but not limited to:
.1 Work at high angles.
.2 Work in confined spaces or where there is a risk of entrapment.
.3 Work with hazardous substances.
.4 Underground work.
.5 Work on, over, under and adjacent to water.
.6 Workplaces where there are persons who require physical assistance to be moved.

.4 Design and mark emergency exit routes to provide quick and unimpeded exit.

15. HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:
.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per [Section 013300].
.2 In conjunction with Departmental Representative, schedule to carry out work during "off hours" when tenants have left the building.
.3 Provide adequate means of ventilation in accordance with Section 01 51 00.
.4 The contractor shall ensure that the product is applied as per manufacturers recommendations.
.5 The contractor shall ensure that only pre-approved products are brought onto the work site in an adequate quantity to complete the work.

16. ASBESTOS HAZARD

.1 Carry out any activities involving asbestos in accordance with applicable Provincial Regulations.

.2 Removal and handling of asbestos will be performed as indicated.

17. PCB REMOVALS

.1 Mercury-containing fluorescent tubes and ballasts which contain polychlorinated biphenyls (PCBs) are classified as hazardous waste.

.2 Remove, handle, transport and dispose of as indicated.

18. REMOVAL OF LEAD-CONTAINING PAINTS

.1 All paints containing TCLP lead concentrations above 5 ppm are classified as hazardous.

.2 Carry out demolition activities involving lead-containing paints in accordance with applicable Provincial Regulations.

19. ELECTRICAL SAFETY REQUIREMENTS

1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.1 Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.

.2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

20. ELECTRICAL LOCKOUT

1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

.2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have procedures available for review upon request by the Departmental Representative.

.3 Keep the documents and lockout tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

21. OVERLOADING

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

22. FALSEWORK	.1	Design and construct falsework in accordance with CSA S269.1-1975 (R2003).
23. SCAFFOLDING	.1	Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 and B.C. Occupational Health and Safety Regulations.
24. CONFINED SPACES	.1	Carry out work in confined spaces in compliance with Provincial Regulations
25. POWDER-ACTUATED DEVICES	.1	Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.
26. FIRE SAFETY AND HOT WORK	.1	Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
	.2	Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.
27. FIRE SAFETY REQUIREMENTS	.1	Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
	.2	Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
	.3	Portable gas and diesel fuel tanks are not permitted on most federal work sites. Approval from the DR is required prior to any gas or diesel tank being brought onto the work site
28. FIRE PROTECTION AND ALARM SYSTEM	.1	Fire protection and alarm systems shall not be: .1 Obstructed. .2 Shut off. .3 Left inactive at the end of a working day or shift.
	.2	Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
	.3	Be responsible/liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.
29. UNFORESEEN HAZARDS	.1	Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

30. POSTED DOCUMENTS

.1 Post legible versions of the following documents on site:

- .1 Site Specific Health and Safety Plan.
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
- .5 Notice of Project.
- .6 Floor plans or site plans.
- .7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
- .8 Workplace Hazardous Materials Information System (WHMIS) documents.
- .9 Material Safety Data Sheets (MSDS).
- .10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

31. MEETINGS

.1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

32. CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

.3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

----------END OF SECTION----------

PART 1 - GENERAL

1.1 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 humankind; or degrade environment aesthetically, culturally and/or historically.

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

1.2 FIRES

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

1.2 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.

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

.3 Safely dispose of wet concrete and pipe grout off-site in accordance with Municipal, Provincial and Federal authorities' requirements.

1.3 ENVIRONMENTAL PROTECTION PLAN / EROSION AND SEDIMENT CONTROL PLAN

.1 Contractor to prepare an Environmental Protection Plan and Erosion and Sediment Control Plan. The plan shall be submitted to the Departmental Representative a minimum of 7 days in advance of the start of construction.

1.4 EROSION AND SEDIMENT CONTROL / DRAINAGE

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust that complies with the most stringent requirements of the authorities having jurisdiction.

.2 The contractor shall inspect, repair, and maintain erosion and sedimentation control measures during construction until construction is complete and all materials have been removed from site.

.3 All work shall be undertaken and completed in such a manner as to prevent the release of sediment, silt, or sediment laden water, concrete or concrete leachate or any other deleterious substance into

any ditch or water course.

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

.5 The contractor shall keep all portions of the work drained during construction until completion. Where necessary, catch water ditch shall be constructed along the tops of excavations or fill slopes to prevent water flowing into or over the excavated or filled area. The contractor will be responsible for the repair for the damage, directly resulting for their operations and for the removal or dirt or debris from existing system, which may be caused by or which may result from water backing up or overflowing through, from, or along any part of the work or adjacent properties. The contractor shall bear all costs associated with these repairs until works are complete and accepted by the Department Representative.

.6 The contractor shall modify and/or provide additional silt control measures as necessary to accommodate construction activities and satisfy the requirements or the governing agencies.

.7 The contractor shall maintain all silt control facilities on an as-needed basis

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

.9 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

1.5 POLLUTION CONTROL

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

.2 Control emissions from equipment and plant to local authorities' emission requirements.

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

1.6 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.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective

action and take such action for 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.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 INSPECTION

.1 The Contractor shall as part of the work perform, or cause to be performed, all tests, inspections and approvals of the work as required by the Contract Documents, and if a test, inspection or approval requires a representative sample of materials or workmanship the Contractor shall at the Contractor's own cost supply the labour and materials necessary to provide the sample.

.2 If any portion of the work is designated for special tests, inspections or approvals (either as a requirement in the Contract Documents, or by the Department Representative's instructions, or by the laws or regulations applicable at the place of the work), then:

.1 if the Department Representative is to perform or arrange for the test, inspection or approval the Contractor shall give the Department Representative timely notice requesting such test, inspection or approval; and

.2 if other authorities are to perform the test, inspection or approval the Contractor shall arrange for such test, inspection or approval and shall give the Department Representative timely notice of the date and time for such test, inspection or approval.

.3 Department 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, Department Representative shall pay cost of examination and replacement.

.4 If the Contractor disagrees with Department Representative's determination of the Work not meeting the Specifications based on the results of inspection or testing required in the Contract Documents or ordered by the Department Representative, the Contractor may elect to carry out such further inspection or testing which the Department Representative agrees is acceptable for the purpose of determining whether the work complies with the requirements of the Contract Documents If such further inspection or testing determines that the Work is not in accordance with the requirements of the Contract Documents, then the Contractor shall correct such Work and pay the

costs of the inspection and testing including all costs of the correction and further testing. If such further inspection or testing determines that the Work is in accordance with the requirements of the Contract Documents, then then Department shall pay all costs of the inspection and testing.

.5 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 at the Contractor's own expense, and Contractor shall comply with such direction.

.6 The Contractor shall promptly provide the Department Representative with 4 copies of all certificates, inspection and testing reports required by the Contract Documents or ordered by the Department Representative.

.7 The Contractor shall not undertake any Work outside the working hours, as specified in the Contract Documents, which under the Contract Documents requires tests, inspection, or approval by the Department Representative unless the Contractor obtains the Department Representative's prior approval. The Contractor shall reimburse the Department for any additional costs incurred to provide tests, inspections or approvals outside such specified working hours.

.8 Independent Inspection / Testing Agencies will be engaged by the Contractor for purpose of inspecting and/or testing portions of the Work. Cost of such services will be borne by the Contractor.

.9 Submit for approval by Departmental Representative proposed Independent Inspection / Testing Agencies.

.10 Employment of inspection / testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.11 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 re-testing and re-inspection.

1.2. ACCESS TO WORK

.1 Allow Department Representative 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.

1.3 TESTING FREQUENCY

.1 Departmental Representative will appoint and pay for services of testing laboratory for quality assurance (QA).

.2 Contractor will furnish labour, equipment, and facilities to provide Quality Control (QC) testing by an approved testing laboratory in accordance with the following specification section and with the following minimum frequency of testing.

Base and Sub-base Material (Layer)

Test	Frequency
Gradation	1
Crush Count	1
Atterberg Limits	1
Moisture-Density Relationship	1
Field in Place density	12/layer

Portland Cement Concrete

Test	Frequency
Mix Production Gradation	1
Crush count	1
Concrete Testing (Includes slump, air, temperature and casting cylinders and beams)	1/20 cu.m. and 1 day per minimum
Compression Strength	3 per test
Flexure Strength	2 per test
Placing Straight edge	5

.3 Provide equipment required for executing inspection and testing by appointed agencies. Provide and ship appropriate samples for QA testing.

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.5 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 re-inspection.

1.4 REPORTS

.1 Submit 4 copies of inspection and test reports to Departmental Representative. The inspection and certification report are to submitted in PDF format during the construction stage with hard copies included in the Close Out documentation. All test reports shall be provided within 24 hours of completion of each test.

1.5 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.

----------END OF SECTION----------

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 Departmental Representative or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times. Do not burn waste materials on site, unless approved by Departmental Representative.

.3 Clear snow and ice from site to provide a safe working areas.

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

.5 Provide on-site containers for collection of waste materials and debris. Dispose of waste materials and debris off site. On-site containers are to be stored within the Contractor's fenced/barricaded construction area.

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

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

.5 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds. Remove dirt and other disfiguration from exterior surfaces. Sweep and wash clean paved areas.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00-Submittal Procedures.

.2 Section 01 45 00-Quality Control

1.2 SUBMITTALS

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

.2 Copy will be returned after final inspection with Departmental Representative comments.

.3 Revise content of documents as required prior to final submittal.

.4 Furnish evidence, for type, source and quality of products provided.

.5 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.6 Pay costs of transportation.

.7 Submit to Department Representative, 4 final copies of all test reports completed for this project including compaction tests, granular material gradations, concrete test reports a minimum 2 weeks prior to Substantial Performance of the Work.

.8 Submit as-builts to the Department Representative prior to a claim for substantial performance. Include a digital copy of the as-builts with the submission.

1.3 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 216 x 279mm 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 process flow, under Section numbers and sequence of Table of Contents.

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

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

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

1.4 CONTENTS - EACH VOLUME .1 Table of Contents: provide title of project;

.1 Date of submission; names.
.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:
.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

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

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

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

1.5 AS-BUILTS .1 Maintain, in addition to requirements in General Conditions, one record copy of:
.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Change Orders and other modifications to Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.

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

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

.4 Maintain record documents in clean, dry and legible

condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Departmental Representative.

1.6 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of blue 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: mark each item to record actual construction, including:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections to provide certification that all works have been completed as specified and that works are ready for tie-in.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00-Submittal Procedures.

.2 Section 03 30 00-Cast-In-Place Concrete.

1.2 REFERENCES

.1 American Concrete Institute (ACI)
- .1 SP-66, ACI Detailing Manual 2004.
  - .1 ACI 315, Details and Detailing of Concrete Reinforcement.
  - .2 ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.

.2 American Society for Testing and Materials International (ASTM)
- .1 ASTM A 143/A 143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
- .2 ASTM A 185/A 185M, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .3 ASTM A 497/A 497M, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
- .4 ASTM A 775/A 775M, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .5 ASTM A 325-06, Standard Specification for structural bolts, steel, heat treated 120/105 ksi minimum tensile strength.

.3 Canadian Standards Association (CSA International)
- .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-A23.3, Design of Concrete Structures.
- .3 CAN/CSA- G30.18-M92 (R2002), Billet Steel Bars for Concrete Reinforcement, Grade 400W.
- .4 CAN/CSA- G30.114-M1983 (R1998), Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
- .5 CAN/CSA- S16-01 (R2005), Limit State Design of Steel Structures.
- .6 CAN/CSA- W186-M1990 (R2002), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .7 CSA- W59-03, Welded Steel Construction (Metal Arc Welding).
- .8 CSA-G40.20-04/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .9 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.

.4 Reinforcing Steel Institute of Canada (RSIC)
.1 RSIC, Reinforcing Steel Manual of Standard Practice.

.5 National Building Code of Canada 2015.

1.3 SUBMITTALS

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

.2 Prepare reinforcement drawings in accordance with ACI 315.

.3 Submit shop drawings including placing of reinforcement and indicate:
.1 Bar bending details.
.2 Lists.
.3 Quantities of reinforcement.
.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.

.4 Detail lap lengths and bar development lengths to CSA-A23.3.

.5 When Chromate solution is used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by Departmental Representative prior to its use.

.6 Quality Assurance: in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
.1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel.
.2 Upon request submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:
.1 Place materials defined as hazardous or toxic in designated containers.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: billet steel, grade as specified on contract drawings deformed bars to CAN/CSA-G30.18 grade 400W, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.16.

.4 Cold-drawn annealed steel wire ties: to CSA G30.3.

.5 Deformed steel wire for concrete reinforcement: to CSA G30.14.

.6 Welded deformed steel wire fabric: to CSA G30.15.
.1 Provide in flat sheets only.

.7 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m².
.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
.2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
.1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.
.3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
.1 In this case, no restriction applies to temperature of solution.
.4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.
.1 Provide product description as described in PART 1 - SUBMITTALS

.8 Chairs, bolsters, bar supports, spacers: to CSA-A23.1.

.9 Mechanical splices: subject to approval of Departmental Representative.

.10 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1 and ACI 315.
.1 ACI 315R unless indicated otherwise.

.2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

.2 Upon request inform Departmental Representative of proposed source of material to be supplied.

2.4 STRUCTURAL STEEL WORK

.1 Unless noted otherwise on drawings:
- .1 All structural steel shall conform to CAN/CSA-G40.20/G40.21-13 grade 300W.
- .2 Welding shall be carried out in accordance with CSA W59-1989.
- .3 All steel plates, threaded rods, washers and nuts shall be galvanized in accordance with CAN/CSA G164-M92.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Galvanizing to include chromate treatment.
- .1 Duration of treatment to be 1 hour per 25 mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A 143/A 143M.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

.2 Use plain round bars as slip dowels in concrete.
- .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
- .2 When paint is dry, apply thick even film of mineral lubricating grease.

.3 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.4 Minimum concrete cover to reinforcing steel, unless shown otherwise in the drawings:
- .1 faces cast and permanently exposed against earth = 100mm
- .2 all others = 75mm

.5 Ensure cover to reinforcement is maintained during concrete pour.

.6 Protect coated portions of bars with covering during transportation and handling.

.7 Development length as follows:

	Uncoated Vertical Bars	Uncoated Horizontal Bars
10M	300mm	350mm
15M	400mm	500mm
20M	550mm	700mm

.8 Lap splices shall be staggered with minimum lap length as follows:

	Uncoated	Uncoated Top Bars
10M	350mm	450mm
15M	500mm	650mm
20M	700mm	900mm

.9 Splices shall be staggered so that no more than 50% of the reinforcing is spliced at any one location, unless shown otherwise on the drawings.

.10 All exposed edges of concrete to be chamfered 19mm.

3.4 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

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

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C 260, Standard Specification for Air-Entraining Admixtures for Concrete.
- .2 ASTM C 309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .3 ASTM C 494/C 494M, Standard Specification for Chemical Admixtures for Concrete.
- .4 ASTM D 1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- .5 ASTM D 1752, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 Canadian Standards Association (CSA International)
- .1 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-A23.2-14, Methods of Test and Standard Practice for Concrete.
- .3 CAN/CSA-A23.3-14, Design of Concrete Structures.
- .4 CSA A283, Qualification Code for Concrete Testing Laboratories.
- .5 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .1 CSA-A3001, Cementitious Materials for Use in Concrete.

.3 National Building Code of Canada 2015.

1.3 CERTIFICATION

.1 Minimum 2 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 Portland cement.
- .2 Blended hydraulic cement.
- .3 Supplementary cementing materials.
- .4 Grout.
- .5 Admixtures.
- .6 Aggregates.
- .7 Water
- .8 Waterstops.
- .9 Waterstop joints.
- .10 Joint filler

.2 Provide certification from Materials Representative that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1

.3 Provide certification from Materials Representative that mix proportions selected will produce concrete of specified quality, durability and yield and that strength will comply with CAN/CSA-A23.1.

1.4 CONSTRUCTION QUALITY CONTROL

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

.2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

.3 Submit proposed quality control procedures for DEPARTMENTAL Representative's approval. Submit in accordance to 01 33 00 - Submittal Procedures.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Portland Cement: to CAN/CSA A30001.

.2 Supplementary Cementing Materials: to CSA-A23.5.

.3 Water: to CSA-A23.1.

.4 Aggregates: to CAN/CSA-A23.1.

.5 Air entraining admixture: to CAN/CSA-A266.1.

.6 Chemical admixtures: to CAN/CSA-A266.2. Departmental Representative to approve acceleration or set retarding admixtures during cold and hot weather placing.

.7 Grout:
.1 Provide grout certification prior to use.
.2 To be as specified in Contract Documents. Alternative to be approved by Departmental Representative.
.3 Use in accordance with manufacturer's recommendations.

.8 Curing Compound:
.1 To be spray applied, liquid type conforming to ASTM C309 containing a fugitive dye.
.2 To be applied in accordance with manufacturer's recommendations.
.3 Other curing methods such as sheet material and burlap mats, subject to Departmental Representative's approval.

.9 Premoulded Joint Fillers (expansion joint): Bituminous impregnated fibre board: to ASTM D1751.

2.2 CONCRETE MIXES

.1 Proportion concrete in accordance BCMOTI Standard Specifications for Highway Construction Section 211, BCMOTI Bridge Construction Special Provisions and to specific design criteria specified on Contract Drawings.

.2 Concrete shall have a minimum compressive strength of 35MPa at 28 days

.3 Concrete mix to have 5% +- 1% air content, 50mm +- 20mm slump and 0.38 maximum water to cement ratio by mass.

2.3 FORMS

.1 Forms to CAN/CSA-A23.1.11.

.2 Free from surface defects for all concrete faces exposed to view.

.3 Form ties to be metal and of type such that no metal left within 25mm of concrete surface when forms removed.

2.4 FORM RELEASE AGENT

.1 Non-staining material type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.

PART 3 - EXECUTION

3.1 GENERAL

.1 Do cast-in-place concrete work, including surface tolerances, finishing and field quality control, in accordance with CAN/CSA-A23.1 except where specifically stated otherwise.

3.2 FORMWORK

.1 Formwork to conform to shape, lines and dimensions shown on Contract Drawings.

.2 Formwork to be substantial, sufficiently tight to prevent leakage of mortar and braced and tied to maintain position and shape.

.3 Formwork to be unlined unless specified otherwise.

3.3 CONSTRUCTION

.1 Obtain Departmental Representative's approval before placing concrete. Providing minimum 24h notice prior to placing of concrete.

.2 Pumping of concrete is permitted only after Departmental Representative's approval of equipment and mix.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.

.5 Ensure placement and compaction procedures to CAN/CSA-A23.1 and to approval of Departmental Representative.

.6 Sawcut control joints 8 - 12 hours after concrete placement.

.7 Protect exposed surfaces from weather and vandalism during initial set period.

.8 Strip forms ensuring no damage to concrete.

.9 Ensure curing procedures consistent with weather and temperature conditions.

.10 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.11 Do not place load upon new concrete until authorized by Departmental Representative.

3.4 JOINT FILLERS

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless authorized otherwise by Departmental Representative. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.2 Locate and form all joints as shown on Contract Drawings or as otherwise require. Install joint filler where applicable.

.3 Use 13mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to finished slab surface unless indicated at bottom.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. Section 01 33 00-Submittal Procedures.
2. Section 32 11 23-Aggregate Base Courses.

1.2 REFERENCES

1. ASTM; AWWA; CAN - As specified in the contract document

1.3 SOURCE QUALITY CONTROL

1. Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
2. Inform Department Representative of proposed source and provide samples or access for sampling at least 2 weeks prior to commencing production.
3. If, in opinion of Department 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.
4. Should a change of material source be proposed during work, advise Department Representative 2 weeks in advance of proposed change to allow sampling and testing.
5. Acceptance of material does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified.
6. Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 WASTE MANAGEMENT AND DISPOSAL

1. Divert unused granular materials from landfill to local facility as approved by Department Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Gravel to be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrated particles. In absence of satisfactory performance records over a five year period for particular source of material, soundness to be tested according to ASTM test procedure C-88 or latest revised issue. Maximum weight average losses for course and fine aggregates to be 30% when magnesium sulphate is used after five cycles.
2. All crushed gravel when tested according to ASTM C-136 and ASTM C-117, or latest revised issue, to have a generally uniform gradation and conform to following gradation limits and 60% of the material passing each sieve must have one or more fractured faces.

Determination of the amount of fractured material shall be in accordance with the Ministry of Transportation and Highways' Specification I-11, Fracture Count for Coarse Aggregate, Method "A", which determines fractured faces by count. The Plasticity Index for crushed gravel to not exceed 6.0.

2.2 NATIVE MATERIAL

1. To be any workable soil free of organic or foreign matter; any material obtained within limits of Contract may be approved by the Department Representative. Native material content or compact to specified density.

2.3 PIT RUN GRAVEL

.1 To be well graded granular material, substantially free from clay lumps, organic matter and other extraneous material, screened to remove all stones in excess of maximum diameter specified in material description (300 mm Pit Run Gravel, 200 mm Pit Run Gravel, 100 mm Pit Run Gravel). Material to compact to specified density and conform to following gradations:

Sieve Designation	Percent Passing
(300mm dia)	(100)
(200mm dia)	(100)
(100mm dia)	(100)
75mm	100
50mm	70-100
25mm	50-100
4.75mm	22-100
2.36mm	10-85
0.075mm	2-8

Recycled concrete free from contaminated and other extraneous material, conforming to the specified gradations may be used as pit run gravel.

2.4 PIT RUN SAND

1. To be well graded pit run sand, free from organic materials and conform to following gradations:

Sieve Designation	Percent Passing
12.5mm	100
4.75mm	35-100
2.36mm	20-70
1.18mm	13-50
0.600mm	8-35
0.300mm	5-25
0.150mm	2-15
0.075mm	0-6

2.5 RIVER SAND

1. River sand, to be used only where shown on Contract Drawings or otherwise specified and approved by Department Representative, to be free of organic material, salt and foreign objects and conform to following gradations:

Sieve Designation	Percent Passing
19mm	100
4.75mm	80-100
0.600mm	20-80
0.150mm	0-20
0.075mm	0-8

2.6 DRAIN ROCK

.1 To consist of clean round stone or crushed rock conforming to the following gradations:

Sieve Designation	Percent Passing Course	Fine
25.0mm	100	
19.0mm	0-100	
9.5mm	0-5	100
4.75mm	0	50-100
2.36mm		5-15
1.18mm		15-38
0.600mm		0-8
0.300mm		0-5
0.150mm		0-2
0.075mm		0

.2 Drain rock to be used only where specified on Contract Drawings. Use of drain rock other than as specified requires approval of the Departmental Representative after examination of soils against which drain rock will be placed.

2.7 GRANULAR PIPE BEDDING AND .1 Crushed or graded gravels to conform to following

SURROUND MATERIAL

gradations:

Sieve Designation	Percent Passing Type 1*	Type 2*
25.0mm	100	100
19.0mm	90-100	90-100
12.5mm	65-85	70-100
9.5mm	50-75	
4.75mm	25-50	40-70
2.36mm	10-35	25-52
1.18mm	6-26	15-38
0.600mm	3-17	6-27
0.300mm		3-20
0.075mm	0-5	0-8

Type 1* standard gradation
Type 2* to be used only in dry trench conditions and with Departmental Representative's prior approval

Recycled concrete free from contaminated and other extraneous material, conforming to the Type 1 gradations, may be used as pipe bedding and surround material.

.2 Other permissible materials: only where shown on Contract Drawings or directed by Departmental Representative shall drain rock, pit run sand or approved native material be used for bedding and pipe surround.

2.8 SELECT GRANULAR SUB-BASE 1. To be well graded granular material, substantially free from lumps and organic matter, screened if required to conform to following gradations:

Sieve Designation	Percent Passing
75mm	100
25mm	50-85
0.150mm	0-15
0.075mm	0-8

2.9 CRUSHED GRANULAR SUB-BASE .1 To be 75mm crushed gravel conforming to following gradations:

Sieve Designation	Percent Passing
80mm	
75mm	100
38mm	60-100
25.0mm	-
19.0mm	35-80
12.5mm	-
9.5mm	26-60
4.75mm	20-40
2.36mm	15-30

1.18mm	10-20
0.60um	5-15
0.30um	3-10
0.18um	-
0.15um	-
0.075um	0-5

2.10 GRANULAR BASE

.1 To be 19mm crushed gravel conforming to following gradations:

Sieve Designation	Percent Passing
19.0mm	100
12.5mm	75-100
9.5mm	60-90
4.75mm	40-70
2.36mm	27-55
1.18mm	16-42
0.600mm	8-30
0.300mm	5-20
0.075mm	2-8

2.11 RECYCLED AGGREGATE MATERIAL

.1 Aggregates containing recycled material may be utilized if approved by the DEPARTMENT Representative. In addition to meeting all other conditions of this specification, recycled material should not reduce the quality of construction achievable with quarried materials. Recycled material should consist only of crushed Portland cement concrete; other construction and demolition materials such as asphaltic pavements, bricks, plaster, etc. are not acceptable.

PART 3 - EXECUTION

3.1 HANDLING

.1 Handle and transport aggregates to avoid segregation, contamination and degradation.

.2 Do not use intermixed or contaminated materials. Remove and dispose rejected materials within 48 h of rejection.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. Section 01 35 43-Environmental Procedures.

2. Section 31 05 16-Aggregate Materials:

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM C 117, Standard Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
.2 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.3 ASTM D 422-63, Standard Test Method for Particle-Size Analysis of Soils.
.4 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m ^{3}).
.5 ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700 kN-m/m ^{3}).
.6 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
.2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Green Building Council (CaGBC)
.1 LEED Canada-NC Version 1.0, LEED (Leadership in Energy and Environmental Design): Green Building Rating System For New Construction and Major Renovations.

.4 Canadian Standards Association (CSA International)
.1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
.1 CSA-A3001, Cementitious Materials for Use in Concrete.
.2 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.5 U.S. Environmental Protection Agency (EPA)/Office of Water
.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 DEFINITIONS

1. Common Excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, partially cemented materials, clay or frozen

materials which can be ripped and excavated with heavy construction equipment.

2. Over-excavation: excavation below design elevation of bottom of specified bedding, and including backfilling of resultant excavation with specified material, as authorized by Department Representative.

3. Removals: removal and disposal at an approved location off-site of surface concrete structures and walks, curbs, gutters, manholes, catchbasins, pipes, culvers, enwalls, and any other structure on surface or underground specifically designated on Contract Drawings for removal. Removals to include backfilling of resultant excavation with specified material.

1.4 SAFETY REQUIREMENTS

1. Comply with Section 01 35 33-Health and Safety Requirements.

2. Design and install trench shoring in accordance with the regulations of the Workers Compensation Act of British Columbia.

1.5 BLASTING

1. Not Permitted.

1.6 DISPOSAL

1. Dispose of all surplus spoil from excavations on-site and/or off-site as shown on Contract Drawings or as specified in Contract Documents. Suitability of excavated material for use as native bedding or trench backfill will be governed by Part 2 of this Section. Dumping of spoil on private property will be permitted only upon written approval from property owner and provided all necessary permits and approvals have been obtained.

1.7 LIMITATIONS OF OPEN TRENCH

1. Excavate trenches only as far in advance of pipe laying operation as safety, traffic, and weather conditions permit and, in no case, to exceed 30m. Before stopping work on last day of work before each weekend or holiday, completely backfill every trench. If circumstances do not permit complete backfilling of all trenches, adequately protect all open trenches or excavations with approved fencing or barricades and, where required, with flashing lights.

PART 2 - PRODUCTS

2.1 USE OF SPECIFIED MATERIALS

1. Back filling for over-excavated trench or structure excavations to be one of the following:
   .1 Granular pipe bedding and surround material.
   .2 Pit run sand.
   .3 Drain rock (only where approved by Department Representative)
   .4 Concrete.
   .5 Controlled density fill.

2. Pipe bedding and surround: see applicable Sections:
   1. Section 33 41 00-Storm Utility Drainage Piping

3. Trench and excavation backfill to be one of the following:
   .1 Approved native material.
   .2 Pit run gravel.
   .3 Pit run sand.
   .4 Controlled density fill.

4. Surface treatment to be:
   .1 Restoration to match existing conditions
   .2 Subgrade, subbase and base for works described in other Sections
   .3 Topsoil, grass, sod or requirements for landscaping works

2.2 MATERIALS

1. Refer to Section 31 05 16 – Aggregates Materials for specifications for approved granular materials and approved native materials.

2. Other granular materials: granular materials approved for roadwork (subbase, base,) also acceptable for trench backfill subject to approval of Department Representative.

3. Concrete: to Section 03 30 00, to be minimum 35 MPa.

PART 3 - EXECUTION

3.1 SITE PREPARATION

1. Remove all brush, weeds, grasses and accumulated debris to an approved offsite location.

2. Cut pavements or sidewalk neatly along limits of proposed excavation as shown on Contract Drawings in order that surface may break evenly and cleanly. Cut beyond limits shown only if authorized by Department Representative.

3. Where trench passes through lawn, neatly cut and remove sod before trench excavation. Save sod for replacement upon backfilling trench.

4. Strip topsoil after area has been cleared and stockpile in locations as directed by Department Representative. Stockpile height not to exceed 2m. Avoid mixing topsoil with subsoil. Dispose of unused topsoil as specified. Do not handle topsoil while wet or frozen condition or in any manner in which soil structure is adversely affected.

3.2 STOCKPILING

1. Stockpile fill materials in areas designated by Department Representative. Stockpile granular materials in manner to prevent segregation.

3.3 EXCAVATION

1. Connecting to existing mains:
.1 Prior to or at commencement for construction, check existing main for line and elevation at point of connection. If found different from Contract Drawings report such difference to Department Representative immediately.
.2 Connections to existing waterworks, sanitary and storm sewer systems to be made by the Contractor unless shown otherwise on Contract Drawings. Notify Department Representative minimum 48 hours in advance of schedule connection. Make connection in presence of Department Representative.
.3 To prevent damage to existing utilities, excavation last 300 mm over utility by hand.

2. Surface Drainage:
.1 Provide suitable temporary ditches or other approved means of handling drainage prior to excavation and during construction to protect construction area and adjacent lands. Provide siltation controls to protect natural watercourses or existing drainage facilities.
.2 Comply with Section 01 35 43-Environmental Procedures.

3. Excavation to grade: excavation trenches to allow pipe to be laid to alignment and grades required with allowance for specified pipe bedding.

4. Excavation below grade: when bottom of excavated trench at subgrade is unstable and in opinion of Department Representative, cannot adequately support pipe, install pipe as shown on Contract Drawings or over-excavate trench to suitable subgrade or as directed by Department Representative. Backfill over excavated with specified materials and compact to minimum 98% Modified Proctor density in compliance with ASTM D1557. Use drain rock backfill only if authorized by Department Representative.

5. Trench width: excavation trench to section and dimension shown on Contract Drawings. If width exceeds maximum allowable, Contractor may be required to demonstrate that specified pipe is still adequate or provide pipe with approved higher class bedding. All additional requirements as a result of excessive trench width to be to Contractor's cost.

6. Hand excavation: excavate by hand if necessary to preserve or minimize damage to existing trees, shrubs, building and all similar existing features or facilities.

7. Trench bottom conditions: remove disturbed or softened material from trench bottom before placing bedding

material. Maintain trench free from water and soft materials during placement of pipe bedding, pipe installation and trench backfill to ensure proper compaction of granular materials.

8. Trench drainage:
.1 During pipe laying, jointing, bedding and backfilling, keep trench free of water by pumping or other appropriate means. Provide pumps and dewatering equipment and take precautions to prevent any damage to adjoining buildings, structures, roads or land from prolonged or excessive pumping by installing shoring, sheeting or other supportive measures. Discharge water from excavations in such manner as not to cause nuisance, injury, loss or damage. Contactor to be responsible for any claims or actions arising from such discharge of water.
.2 Keep bell holes free from water during jointing. Diverting trench water through newly laid system not allowed, unless authorized by Department Representative.

9. Disposal of surplus soil: Dispose of surplus excavation soil off-site. Side-casting not allowed in restricted areas where, in opinion of Department Representative, side-casting would create interference with flow of traffic. In such case, temporarily store materials or dispose to an approved site. Provisions of Provincial Contaminated Sites Legislation must be met prior to disposal of soil offsite.

10. Where native backfill is approved for re-use, and side-casting not allowed, transport approved material to other locations where material is required or temporarily store at approved site. Protect stored material from contamination, segregation and weather.

11. Maintain roads used for transporting materials and equipment in clean condition. Clean, flush and/or sweep on daily basis and more frequently if directed by Department Representative.

3.4 PIPE INSTALLATION

1. Related work: Pipe installation, including bedding, pipe laying, and granular surround to be in accordance with following sections:
1. Section 33 05 13-Manholes and Catch Basin Structures
2. Section 33 41 00-Storm Utility Drainage Piping

2. Concrete encasements or protection: where specified or required by Department Representative provide concrete encasements of pipe or slab protection as shown on Contract Drawings. Do not place backfill material until concrete has taken its initial set and in no case less than 1 hour.

3. Anchor blocks: where specified or required by Department Representative provide anchor blocks as shown on Contract Drawings. Ensure all concrete anchor blocks at least 150 mm into undisturbed ground on bottom side of each trench.

3.5 BACKFILL AND COMPACTION

1. General: Place backfill carefully in trench to prevent damage to installed pipe.

2. Shoring: during backfill and compaction of trench, remove shoring in such a manner as to allow proper compaction and to prevent trench walls from collapsing. Remove all bracing and/or shoring from trench.

3. Backfill Materials:
.1 Boulevards and easements: for trenches in boulevards, easements or other areas not subjected to vehicle loading, and outside of ditch lines, backfill with approved native materials except as shown otherwise on Contract Drawings.
.2 Roads, driveways and shoulders: for trenches in paved or graveled roads, driveways, shoulders or other areas subjected to vehicle loading, backfill with imported granular material or approved native material as specified on Contract Drawings. Road shoulder is that portion of right-of-way between travelled, and road ditch. Where no ditch exists, ensure shoulder width minimum of 1.5 m.
.3 Ditches: backfill with imported granular material or approved native material as specified on Contract Drawings.
.4 Department Representative may permit native materials for all above uses subject to suitability of native material for said use. Native material approved for re-use to be handled, stockpiled and compacted using construction method appropriate for given moisture content and weather conditions.

4. Compaction: place backfill and compact to following Modified Proctor densities in compliance with ASTM D1557. (All following references to density imply compliance with ASTM D1557).
.1 Boulevards and easements to minimum 980%.
.2 Roads, driveways, shoulders, re-shaped ditches and sidewalks to minimum 98%.
.3 Use caution in pipe zone to ensure no damage to pipe.

5. Compaction for loading dock: place backfill and compact to following Modified Proctor densities in compliance with ASTM D1557. (All following references to density imply compliance with ASTM D1557).
.1 reworked soils under sub-base to minimum 98%.
.2 Sub-base to minimum 100%.
.3 Base to minimum 100%.

3.6 SURFACE RESTORATION

1. General:
.1 Restore all disturbed surfaces to condition at least equal to which existed prior to construction.
.2 Make good any damage to adjacent lands or improvements.
.3 Resolve all reasonable claims arising from Contractor's actions and obtain written releases from land owners following final restoration.

2. Boulevards and easements:
.1 Restore surface to minimum 100 mm depth.
.2 Restore unimproved surfaces with material equal to that removed at surface.
.3 Restore gardens with approved topsoil or bark mulch to match existing conditions.
.4 Restore lawns with approved topsoil and seed or sod to match existing lawn.
.5 Restore gravel surfaces with matching granular materials.
.6 Complete final restorations immediately upon completion of trench backfilling.

3. Graveled roads and driveways:
.1 Restore surface with minimum 75 mm to 100 mm thick lift of 19 mm granular road base material.
.2 Compact to minimum 98% Modified Proctor density.
.3 Complete final restoration immediately upon completion of trench backfilling.

4. Ditches:
.1 Re-shape ditches to specified lines, grades and sections as specified to ensure stability of ditch slopes and bottom.
.2 Compact to minimum 95% Modified Proctor Density.
.3 Complete final restoration immediately upon completion of trench backfilling.

5. Base preparation for paved surfaces:
.1 Paved surfaces to include all paved roads, driveways, sidewalks and parking areas.
.2 If native material used for backfill provide specified depth of subbase as shown on Contract Drawings.

6. Temporary pavement patching:
.1 Patch roads same day excavation made.
.2 Patch all other roads within 24 hours of closing trench.
.3 Patching material to be hot-mix asphalt on all roads unless specified otherwise, cold-mix may be used only where directed by Department Representative.
.4 Place temporary pavements to 50 mm minimum thickness.

.5 Maintain temporary patch to ensure safe and smooth conditions.

7. Permanent pavement restoration:
   .1 Install permanent pavement within 30 days of placement of temporary patch or sooner where directed by Department Representative.
   .2 Remove broken or cracked pavement as well as any paves areas showing settlement and dispose off-site.
   .3 Remove underlying granular road base material as required to permit placement of specified thickness of permanent pavement. Ensure remaining base meets specified thickness. Material and placement of road base to Section 32 11 23-Aggregate Base Courses
   .4 Compact base to minimum 95% Modified Proctor density.
   .5 Restore pavement as detailed on Contract Drawings. If thickness of existing pavement permits, grind 40 mm depth along edge of pavement. Dry if necessary and paint clean, dry edge with asphalt emulsion (tack coat).
   .6 Place and compact hot-mix pavement material to minimum thickness as shown on Contract Drawings.
   .7 Material and placement of hot-mix pavement to Section 32 12 16-Asphalt Paving.
   .8 Restore surface to smooth condition and match with grade of adjacent pavement.
   .9 Where shown on Contract Drawings place hot-mix overlay over restored trench section and adjacent pavement to Section 32 12 16-Asphalt Paving.
   .10 Maintain restored pavements in complete repair during Maintenance Period. Effect repairs within 14 days from receipt of written notice from Department Representative or immediately if so directed by Department Representative if dangerous situation exists.

8. Landscape Restoration:
   1. Restoration of planted areas to consist of restoration to original condition by replacement to original depth of approved topsoil (minimum 100mm), seeding or sodding of grassed areas and replacement of any dead plants or shrubs of equal quality, type and maturity to originals.
   2. Plant replacement trees and shrubs at a suitable time of year in accordance with good horticulture practice, to provide maximum assurance of plant survival. If tree or shrub has died, or shows signs of dying, as a result of environmental disturbance, cutting of roots, or other causes directly attributed to Contractors work, close to but not actually

within excavation areas, replace with new tree or shrub of a similar variety, age and size, up to limits of maximum available size.

9. Restoration acceptance: no restoration work to be considered satisfactory until acceptance by Department Representative.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 16 - Aggregate Materials.

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

.3 Section 32 11 23 - Aggregate Base Courses.

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM).

.1 ASTM C117, standard Test Method for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) (600 kN-m/m3).

.4 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2,700 kN-m/m3).

.5 ASTM D4318, Standard Test Methods for Liquid Unit, Plastic Unit and Plasticity Index of Soils.

PART 2 - PRODUCTS

.1 Granular sub-base material to Section 31 05 16 - Aggregate Materials and following requirements:

.1 75mm minus sand and/or gravel mixture that is process (screened and/or crushed) or drawing directly from a suitable aggregate source.

.2 Other properties as follows:

.1 Liquid limit: to ASTM D4318, maximum 25

.2 Plasticity index: to ASTM D4318, maximum 6

PART 3 - EXECUTION

3.1 PLACING

.1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative.

.2 Construct granular sub-base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Place granular sub-base materials using methods which do not lead to segregation or degradation.

.6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace portion of layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact to density of 95% Modified Proctor Density.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.4 Apply water as necessary during compaction to obtain specified density.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Deparmental Representative.

.6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 SITE TOLERANCES

.1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished sub-base in condition conforming to this section or until granular sub-base is accepted by Departmental Representative.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED SECTIONS

1. Section 01 35 14-Special Procedures for Traffic Control.
2. Section 31 05 16-Aggregate Materials.
3. Section 32 11 16.01-Granular Sub-Base.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)
.1 ASTM C 117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
.2 ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
.3 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.4 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m³).
.5 ASTM D 1557-[00], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700kN-m/m³).
.6 ASTM D 1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
.7 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
.2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused granular material from landfill to local facility as approved by Department Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Material for road base to be:
.1 Select granular sub-base (SGSB)
.2 Refer to Section 31 05 16-Aggregate Materials for material specifications.

PART 3 - EXECUTION

3.1 INSPECTION OF UNDERLYING SUBGRADE SURFACE

.1 Ensure underlying subbase surface true to cross-section and grade and compacted to 98% Modified Proctor Maximum Dry Density or 100% Standard Proctor Maximum Dry Density under loading bay. Do not place granular subbase until subgrade is inspected and approved by Department Representative.

3.2 PLACING

1. Place material only on clean unfrozen surface, properly shaped and compacted and free from snow or ice.

2. Begin spreading sub-base material on crown line or high side of one-way slope.

3. Place granular sub-base materials using methods which do not lead to segregation or degradation.

4. Place material to full width in uniform layers not exceeding 150mm compacted thickness. Department Representative may authorize thicker lifts (layers) if specified compaction can be achieved.

5. Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

6. Remove and replace portion of layer in which material has become segregated during spreading.

3.3 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact to density of not less than 95% Modified Proctor Density.

.3 At loading dock, compact to density of not less than 95% Modified Proctor Density.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.5 Apply water as necessary during compaction to obtain specified density. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is suitable for compaction.

.6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Department Representative.

3.4 SITE TOLERANCES

1. Ensure finished base within plus or minus 10 mm of specified grade and cross-section but not uniformly high or low.

2. Ensure finished surface has no irregularities exceeding 10 mm when checked with a 3 m straight edge placed in any direction.

3. Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.5 MAINTENANCE

.1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Department Representative.

----------END OF SECTION----------

PART 1 - GENERAL

1.1 RELATED WORK

.1 Section 01 33 00-Submittal Procedures.

1.2 REFERENCES

.1 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner.

.2 CGSB 1-GP-12c-68, Standard Paint Colours.

.3 CGSB 1-GP-71-83, Method, of Testing Paints and Pigments.

.4 CGSB 1-GP-74M-79, Paint, Traffic, Alkyd.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint:
.1 To CGSB 1-GP-74M, alkyd traffic paint.
.2 To CGSB 1-GP-149M, alkyd reflectorized traffic paint.
.3 Colour: to CGSB 1-GP-12C, yellow 505-308, black 512-301, white 513-301.

.2 Thinner: to CGSB-1-GP-5M.

.3 Glass beads:
.1 Overlay type: to CGSB 1-GP-74M.

.4 Temporary pavement marking tape:
.1 Self adhesive temporary pavement marking tape designed to provide reflective delineation.
.2 To consist of high quality optical glass spheres embedded into weather and traffic-resistant binder on conformable metallic backing precoated with pressure sensitive adhesive.
.3 Colour as specified.
.4 To be readily removable by methods not requiring sandblasting, solvents or grinding.

.5 Thermoplastic material:
.1 Material composition shall be at the discretion of the manufacturer subject to the approval of the Department Representative. Each formulation shall be identified by a code number.
.2 No retained water when tested by ASTM D-570.
.3 Specific gravity of the supplied product shall be within 3% of that specified for the selected formulation.
.4 Material shall not deteriorate upon contact with deicing chemicals, gasoline, diesel fuel or grease dropped by traffic.
.5 Material shall not break down, deteriorate, scorch or discolour, if held within the application temperature range specified by the manufacturer for a period of four hours and it must be able to be reheated from room temperature to the application temperature four (4) times without showing any of these detrimental

effects.

.6 When applied at the temperature recommended by the manufacturer and at a film thickness of 2 to 4mm, the material shall set solid and show no tracking under traffic after elapsed times as follows:

.1 Two (2) minutes at an air temperature of 10°C, relative humidity less than 75%, and road surface temperature from 10°C to 20°C.

.2 Five (5) minutes at an air temperature of 32°C, relative humidity less than 75%, and road surface temperature from 32°C to 50°C

.3 The drying time under conditions intermediate between the two air temperatures shall be interpolated using a straight line model.

.7 The quantity, type, and gradation of the component reflecting glass spheres premixed in the thermoplastic material shall be at the discretion of the manufacturer, but shall provide retroreflection levels specified below.

.8 The colour of the marking to be brilliant white or yellow as specified. The brightness value shall exceed 70% for white and 45% for yellow obtained with a Gardner Multi-purpose Reflectometer when measuring 0° - 45° daylight luminous directional reflectance with the green filter.

.9 The material shall have a softening point not less than 103°C when tested in accordance with ASTM D36 (ASSHTOM-249-79).

PART 3 - EXECUTION

3.1 EQUIPMENT REQUIREMENTS

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

.2 Distributor to be capable of applying reflective glass beads as an overlay on freshly applied paint.

3.2 CONDITION OF SURFACES

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

3.3 APPLICATION

.1 Temporary Markings:

.1 Application and removal to manufacturer's instructions.

.2 Temporary traffic lines and stop bars shall be placed immediately following laying of the asphalt pavement.

.3 The traffic line shall be a 100mm x 300mm strip of prefabricated reflective yellow tape having an adhesive backing and shall be place at 10 metre intervals along the centre of pavement.

.4 The stop bar shall be 2 - 100mm continuous strips

of prefabricated reflective white tape having an adhesive backing and placed across the travel lanes at traffic control intersections.

.5 Remove the tape when instructed.

.2 Painted Markings:

.1 Layout pavement markings.

.2 Unless approved otherwise by DCC Representative, apply paint only when air temperature is above 10°C and no rain is forecast.

.3 Apply traffic paint evenly at rate of $3m^2/L$.

.4 Do not thin paint unless approved by DCC Representative.

.5 Symbols and letters to conform to dimensions shown on Contract Drawings.

.6 Ensure paint lines of uniform colour and density with sharp edges.

.7 Thoroughly clean distributor tank before refilling with paint of different colour.

.8 Apply glass beads at rate specified.

.9 Apply other marking materials specified in Contract Documents.

.10 Ensure all pavement markings in accordance with latest edition of TAC Manual of Uniform Traffic Control Devices.

.3 Thermoplastic Markings:

.1 Pavement shall be clean and dry and free of sand, grave, loose dust and foreign mater.

.2 Temperature of surface to be marked shall not be less than 50°C.

.3 Thermoplastic material shall be heated in the melter to a temperature of 382°C

.4 Thermoplastic material thickness shall be:

.1 Lane line 2.286mm

.2 Stop bars and crosswalks 3.157mm

.5 Testing of material thickness to be determined by placing metal plate of known thickness in the area to be painted. Once applied the sample is removed and the material plus metal plate is measured.

.6 Immediately following application glass spheres shall be dropped onto the molten surface. Spheres to be applied at a rate of 300 grams per square meter of line area.

3.4 TOLERANCE

.1 Paint markings to be within plus or minus 10mm of dimensions indicated.

3.5 PROTECTION OF COMPLETED WORK

.1 Protect pavement markings until dry.

----------END OF SECTION----------

APPENDIX A

PRELIMINARY HAZARD ASSESSMENT FORM

Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	**R.078170.001 – Loading Dock Concrete Apron Regrading**
Location:	**Pacific Highway Port of Entry**
Date:	September 19th, 2017
Name of Departmental Representative:	Robert Schmidt (for Julian Ho)
Name of Client:	Canada Border Services Agency
Name of Client Project Co-ordinator:	Michelle Copland

This hazard assessment has been prepared by PWGSC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PWGSC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	**PWGSC, OGD's, or tenants**		**General Public or other contractors**		Note: When thinking about this pre-construction hazard assessment, remember a **hazard** is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the **risk** is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
	Yes	**No**	**Yes**	**No**	
Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)		X		X	
Slip Hazards or Unsound Footing		X		X	
Working at Heights		X		X	
Working Over or Around Water		X		X	
Heavy overhead lifting operations, mobile cranes etc.		X		X	
Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.	X		X		
Fire and Explosion Hazards		X		X	
High Noise Levels	X		X		
Excavations		X		X	
Blasting		X		X	
Construction Equipment	X		X		
Pedestrian Traffic (site personnel, tenants, visitors, public)	X		X		
Multiple Employer Worksite		X		X	Example: Contractor working in an occupied Federal Employee space.
Electrical Hazards					
Contact With Overhead Wires		X		X	
Live Electrical Systems or Equipment		X		X	
Other:		X		X	
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions		X		X	
Earthquake	X		X		
Tsunami		X		X	
Avalanche		X		X	
Forest Fires		X		X	
Fire and Explosion Hazards		X		X	

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	PWGSC, OGD's, or tenants		General Public or other contractors		Note: When thinking about this pre-construction hazard assessment, remember a **hazard** is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the **risk** is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
	Yes	No	Yes	No	
Working in Isolation		X		X	
Working Alone		X		X	
Violence in the Workplace		X		X	
High Noise Levels		X		X	
Inclement weather		X		X	Falling snow and ice from roof
High Pressure Systems		X		X	
Other:		X		X	
Hazardous Work Environments					
Confined Spaces / Restricted Spaces		X		X	Review and provide confined space assessment(s) from PWGSC or client confined space inventories. Refer to PWGSC Standard on Entry into Confined Spaces. Contact the Regional Construction Safety Coordinator.
Suspended / Mobile Work Platforms		X		X	
Other:		X		X	
Biological Hazards					
Mould Proliferations		X		X	
Accumulation of Bird or Bat Guano		X		X	
Bacteria / Legionella in Cooling Towers / Process Water		X		X	
Rodent / Insect Infestation		X		X	
Poisonous Plants		X		X	
Sharp or Potentially Infectious Objects in Wastes		X		X	
Wildlife		X		X	
Chemical Hazards					
Asbestos Materials on Site		X		X	If "yes" a pre-project asbestos survey report is required. Provide Contractor with DP – 057 ELF Form 16 "Contractor Notification and Acknowledgement"
Designated Substance Present		X		X	If "yes" a pre-project designated substance survey report is required.
Chemicals Used in work		X		X	
Lead in paint		X		X	If "yes" a pre-project lead survey report is required.
Mercury in Thermostats or Switches		X		X	If "yes" a pre-project mercury survey report is required.
Application of Chemicals or Pesticides		X		X	
PCB Liquids in Electrical Equipment		X		X	
Radioactive Materials in Equipment		X		X	
Other:		X		X	
Contaminated Sites Hazards					
Hazardous Waste		X		X	
Hydrocarbons		X		MAY BE	
Metals		X		X	
Other:		X		X	
Security Hazards					
Risk of Assault		X		X	

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	PWGSC, OGD's, or tenants		General Public or other contractors		Note: When thinking about this pre-construction hazard assessment, remember a **hazard** is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the **risk** is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
	Yes	No	Yes	No	
Other:				NO	
Other Hazards **This work site has armed CBSA Personnel on site 24/7**					

Other Compliance and Permit Requirements[1]	YES	NO	Notes / Comments[2]
Notice of Project Required	X		
Site Specific Orientation Provided at Project Location	X		
Is a Building Permit required?		X	
Is an Electrical permit required?		X	
Is a Plumbing Permit required?		X	
Is a Sewage Permit required?		X	
Is a Dumping Permit required?		X	
Is a Hot Work Permit required?		X	
Is a Permit to Work required?		X	Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?		X	Mandatory for all Confined Spaces
Is a Confined Space Entry Log required		X	Mandatory for all Confined Spaces
Discharge Approval for treated water required		X	

Notes:

(1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.
(2) TBD means To Be Determined by Service Provider.

Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.			
Service Provider Name			
Signatory for Service Provider		**Date Signed**	
RETURN EXECUTED DOCUMENT TO PWGSC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			