Public Works and
Government Services Canada

Requisition No. EZ899-172263

DRAWINGS & SPECIFICATIONS
for
CSC - Kent Institution
Petroleum Storage Tank Systems Replacement

Project No.: R.082450.001

APPROVED BY:

Regional Manager, AES — Date: 2016-11-25

Construction Safety Coordinator — Date: Nov 16/16

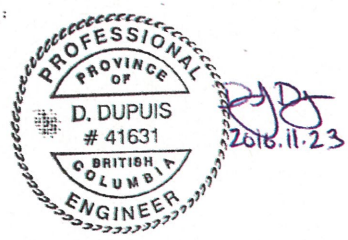
TENDER:

Project Manager — Date: Nov. 28/16

Real Property Services Branch, Professional and Technical Services, Pacific Region
Room 219 - 800 Burrard Street, Vancouver, B.C. V6Z 0B9

CONSULTANTS – SEAL & SIGNATURE

Seal / Signature / Date



END OF SECTION

TABLE OF CONTENTS

		No. of Pages
DRAWING LIST		2
DIVISION 00		
00 01 07	Seals Page	1
DIVISION 01 - GENERAL REQUIREMENTS		
01 01 50	General Instructions	21
01 14 10	Security Requirements	7
01 35 33	Health and Safety Requirements	9
01 35 43	Environmental Procedures	11
DIVISION 02 – EXISTING CONDITIONS		
02 65 00	Underground Storage Tank Removal	4
DIVISION 03 - CONCRETE		
03 10 00	Concrete Forming & Accessories	3
03 20 00	Reinforcing Steel	2
03 30 00	Cast-In Place Concrete	3
DIVISION 23 - MECHANICAL		
23 11 00	Mechanical Petroleum Systems	8
DIVISION 26 - ELECTRICAL		
26 05 00	Electrical Systems	4
26 05 28	Grounding Secondary	3
DIVISION 31 – EARTH WORKS		
31 05 16	Aggregates and Granular Materials	3
31 23 10	Excavating, Trenching and Backfilling	6
DIVISION 32 – EXTERIOR IMPROVEMENTS		
32 12 13.16	Asphalt Tack Coat	2
32 12 13.23	Asphalt Prime	3
32 12 16	Asphalt Paving	11
DIVISION 33 - UTILITIES		
33 65 76	Direct Buried Underground Cable Ducts	1

Drawing List

DWG. NO.	REV	TITLE
R.082450.001 Sheet 1	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT DEMO/REMOVAL SITE PLAN
R.082450.001 Sheet 2	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT NEW SITE PLAN
R.082450.001 Sheet 3	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT DISPENSING AREA CIVIL PLAN, SECTIONS & DETAILS
R.082450.001 Sheet 4	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT GENERATOR/FIRE PUMP TANK AREA CIVIL PLAN, SECTIONS & DETAILS
R.082450.001 Sheet 5	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT DISPENSING AREA MECHANICAL PLAN, SECTIONS & DETAILS
R.082450.001 Sheet 6	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT GENERATOR/FIRE PUMP TANK AREA MECHANICAL PLAN, SECTIONS & DETAILS
R.082450.001 Sheet 7	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT GENERATOR/FIRE PUMP TANK AREA MECHANICAL DETAILS
R.082450.001 Sheet 8	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT ELECTRICAL SITE PLAN
R.082450.001 Sheet 9	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT ELECTRICAL PLANS & DETAILS

Drawing List Cont'd

R.082450.001 Sheet 10	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT ELECTRICAL DETAILS
R.082450.001 Sheet 11	P3	CSC KENT INSTITUTION PETROLEUM STORAGE TANK SYSTEMS REPLACEMENT ELECTRICAL HAZARDOUS ZONE AREAS

PART 1 GENERAL

1.1 SUMMARY OF WORK

.1 Work covered by Contract Documents:

.1 This Contract covers the following work at the Kent Institution, Agassiz, B.C.

.1 Disconnect and temporarily store two existing single product fuel dispensers, hose hangers, cardlock terminal and fire extinguisher cabinet/posts.

.2 Sawcut, remove and dispose of the concrete slab/apron over the gasoline and diesel USTs including concrete dispensing island and catch basin.

.3 Remove and dispose of existing oil-water separator pvc inlet piping. Protect and maintain existing oil-water separator and discharge drainage piping. Oil-water separator to be reconnected and reused.

.4 Pump out one (1) existing 10,000L gasoline and one (1) existing 5,000L diesel underground storage tanks and temporarily store fuel in approved tanks or containers. Upon completion of the upgrade work, filter stored fuel and re-transfer into the new storage tanks.

.5 Excavate, remove and dispose of underground dispenser sumps, underground fuel piping, electrical cable, equipment and underground conduit.

.6 Excavate, remove and dispose of one (1) 10,000L gasoline and one (1) 5,000L diesel fiberglass underground storage tanks (UST), including approx. 800L (400L per tank) of residual waste fuel/sludge. Completed excavation limits to be sampled by Departmental Representative, with access to sample locations along base and walls of excavation provided by the Contractor.

.7 Stockpile excavated soil for testing by the Departmental Representative. Stockpiles to be contained within polyethylene liner, and segregated based upon field observation for potential contamination. Remove and dispose of excavated material, including any contaminated soil, as directed by the Departmental Representative.

.8 Backfill excavated areas and compact to grade.

.9 Excavate, remove and dispose of existing concrete curbed island garden.

.10 Excavate, supply and install new catch basin in asphalt area south of new dispensing are and underground PVC drainage piping. Tie-in new drainage piping to existing catch basin north of the new dispensing area.

.11 Supply and install new catch basin and underground PVC drainage piping at the dispensing area. Tie-in new drainage piping to existing oil-water separator. Supply and install new cast iron manholes c/w composite covers for oil-water separator inspection hatches.

.12 Excavate, prepare site and install new oil-water separator shut-off butterfly valve on discharge piping including concrete pad, extension handle, concrete filled pipe bollards and signage.

.13 Sawcut, excavate and supply and install new underground electrical conduit between the new dispensing area and the Go1 Building.

.14 Supply and install new ground rods and underground ground loop at the new dispensing area and new ground rod at 25,000L main storage tank.

.15 Prepare site and construct new reinforced, curbed, sloped concrete tank pad and dispensing apron including new concrete filled pipe bollards and dispensing island.

.16 Prepare site and construct new pre-cast concrete lock block retaining wall and reinforced, curbed concrete tank pad including ball vale and scupper drain.

.17 Supply and install one (1) new 20,000L (12,500L Gasoline / 7,500L Diesel) split compartment storage tank including platform/stairway and ancillaries.

.18 Supply and install one (1) new 25,000L diesel storage tank including platform/stairway and ancillaries.

.19 Supply and install new pre-cast concrete highway barriers and relocate existing barriers as required.

.20 Supply and install new aboveground stainless steel bottom fill piping to the new split compartment storage tank including new stainless steel fill cabinet, valves and pipe supports.

.21 Supply and install new aboveground stainless steel dispensing piping including new aboveground dispenser pedestal/sump, stainless steel flexible hose, valves and pipe supports. Note: Electric solenoid valves to be activated by dispenser pump control (i.e. solenoid valve opens on pump start).

.22 Supply and install new aboveground stainless steel bottom fill piping to the new 25,000L diesel storage tank including new stainless steel fill cabinet, valves, stainless steel flexible hose and pipe supports.

.23 Core new holes through the exterior concrete walls on the generator building and the old pump hose building as required to facilitate installation of new piping. Sleeve piping passing through walls. Inspect walls for hidden reinforcing and utilities prior to coring.

.24 Supply and install new stainless steel aboveground supply piping from the new 25,000L diesel storage tank to the tie-in point for the fire pump day tank fill line including valves and pipe supports.

.25 Supply and install new stainless steel aboveground supply piping and polish/return piping from the new 25,000L diesel storage tank to the tie-in point for the generator day tank pump package including valves and pipe supports.

.26 Supply and install new grounding for the storage tanks, piping and fill cabinets including new grounding reels.

.27 Supply and install new aboveground conduit at the dispensing area and new aboveground conduit from the dispensing area to the new 25,000L diesel storage tank.

.28 Supply and install new emergency stop system including new emergency stop contactor and Hazardous circuits panel. Pull new wire as required and reuse/reconnect emergency stop pushbutton on relocated cardlock terminal.

.29 Pull new wire as required for relocated dispensers and cardlock terminal.

.30 Reinstall existing dispensers, existing hose hangers and connect new piping and wiring.

.31 Reinstall existing Cardlock and connect new wiring.

.32 Reinstall existing fire extinguisher cabinets/posts.

.33 Supply and install new level probes in the gasoline and diesel compartments of the split compartment storage tank and in the new 25,000L diesel storage tank.

.34 Supply and install new dispenser pedestal/sump sensors in both of the dispensers.

.35 Supply and install new Vacuum switches on the new aboveground storage tanks.

.36 Fabricate new alarm stand and relocate/reinstall existing Incon TS-550 remote alarm and acknowledge button. Pull new wire as required to connect remote alarm and acknowledge button to existing Incon TS-550 and power supply.

.37 Pull new wire as required to connect new vacuum switches, level probes and dispenser pedestal/sump sensors to the existing Incon TS-550 monitoring console. Re-configure and test the existing monitoring console, remote audible/visual alarm, level probes, vacuum switches and the sump sensors as follows. Indication to be provided on Incon console and remote alarm activated for:

- Gasoline tank compartment high level alarm (to be set at 90% of the tank capacity);
- Diesel dispensing tank compartment high level alarm (to be set at 90% of the tank capacity);
- 25,000L diesel main storage tank high level alarm (to be set at 90% of the tank capacity);
- Split compartment tank vacuum switch leak detected;
- 25,000L diesel main storage tank vacuum switch leak detected;
- Diesel Dispenser pedestal/sump sensor leak detected; and
- Gasoline Dispenser pedestal/sump sensor leak detected;

.38 Supply and install new printer for Incon TS-550 tank monitoring console.

.39 Supply and install new Teck cable and relocate and reinstall existing ultrasonic level transmitter on new 25,000L diesel storage tank. Recalibrate transmitter to suit new tank. Reconnect transmitter to existing generator day tank pump package control panel.

.40 Transfer and filter fuel from the existing 25,000L underground storage tank to the new 25,000L aboveground storage tank.

.41 Excavate, remove and dispose of one (1) existing 25,000L diesel fiberglass underground storage tank (UST), including approx. 400L of residual waste fuel/sludge, underground fuel piping, vent piping,

including removal of old monitoring system, surface-mounted conduit, visual and audible alarms, obsolete equipment and ancillaries. Completed excavation limits to be sampled by Departmental Representative, with access to sample locations along base and walls of excavation provided by the Contractor.

.42 Stockpile excavated soil for testing by the Departmental Representative. Stockpiles to be contained within polyethylene liner, and segregated based upon field observation for potential contamination. Remove and dispose of excavated material, including any contaminated soil, as directed by the Departmental Representative.

.43 Backfill excavated areas and compact to grade.

.44 Construct new chain link fencing around storage tanks.

.45 Rotate two existing light post to better suit new storage tank areas.

.46 Prepare surfaces and construct new asphalt surfaces as required.

.47 Supply and install direction of flow and product labels on all piping and tubing.

.48 Supply and install new signage and tag fill connections.

.49 Relocate existing spill kit and garbage can.

.50 Commission systems.

.51 Restore all areas affected by construction to the satisfaction of the Departmental Representative.

.52 Remove and dispose of all waste materials.

.53 Provide close out documents as required by contract and specifications.

.2 All Work of this project is located outside the institution perimeter.

.3 All work associated with removing and disposing of existing fuel storage tank equipment and materials must be strictly performed in accordance with Section 1.6 – Environmental Procedures.

.4 The work of this project specifically involving petroleum systems shall be performed by personnel certified as "Petroleum Equipment Installer" by the Industry Training Authority of British Columbia.

.5 It is possible that historic fuel contaminated soils and groundwater may be encountered during excavation work which may present safety and environmental concerns. Upon encountering fuel contaminated soil or groundwater, the Contractor shall immediately stop excavating, notify the Departmental Representative and take appropriate safety measures for the situation. The Departmental Representative shall provide direction.

.6 The Work shall be scheduled so that the time the fire pump day tank and emergency generator day tank are disconnected from the main storage tank is minimized (i.e. the new aboveground 25,000L storage tank is to be installed and connected to the existing systems prior to the removal of the underground storage tank).

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

.1 Provide a detailed work plan including a project schedule and phasing. This detailed work plan shall be submitted to the Departmental Representative for review to verify that there will be no interruption of service.

.2 Do not start work until all essential equipment is delivered to the site and the work can proceed without delays.

.3 Provide as-built drawings and closeout submittals in accordance with Section 1.18.

.3 Contractor's Use of Premises:

.1 Contractor has limited use of site for work of this contract until Substantial Completion:

.1 Contractor use of premises for storage and access, as approved by the Departmental representative.

.2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

1.2 WORK RESTRICTIONS

.1 Where Work involves breaking into or connecting to existing services, give departmental Representative 48 hours of notice for necessary interruption of services throughout course of work. Keep duration of interruptions to a minimum. Coordinate interruptions with local authority having jurisdiction and local residences and businesses affected by the disruption.

.2 Provide for access by pedestrian and vehicular traffic on and around site where work is in progress.

.3 Construct barriers in accordance with Section Temporary Barriers and Enclosures.

.4 Security Requirements: refer to Section 01 14 10 - Security Requirements.

.5 Hours of work:

.1 Perform work during normal working hours of the Institution 0730 to 1600, Monday through Friday except holidays.

.2 When it is necessary, arrange in advance with Departmental Representative to work outside of normal working hours.

1.3 CONSTRUCTION WORK SCHEDULE

.1 Commence work immediately upon official notification of acceptance of offer and complete the work within 14 weeks from the date of such notification.

.2 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Substantial Certificate and Final Certificate as defined times of completion are of essence of this contract.

.3 Submittal:

.1 Submit to Departmental Representative within 10 working days of Award of Contract, a Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of construction progress.

.2 Identify each trade or operation.

.3 Show dates for delivery of items requiring long lead time.

.4 Departmental Representative will review schedule and return one copy.

.5 Re-submit two (2) copies of finalized schedule to Departmental Representative within five (5) working days after return of reviewed preliminary copy.

.4 Project Scheduling Reporting:

.1 Update Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

.5 Project Meetings:

.1 Discuss Project Schedule at bi-weekly site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

.3 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price. After approval by Departmental Representative cost breakdown will be used as basis for progress payments. Only PWGSC paper work is acceptable.

1.4 SUBMITTAL PROCEDURES

.1 Administrative:

.1 Submit to Departmental Representative submittal listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

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

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

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

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

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

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

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative review of submittal.

.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.

.2 Shop Drawings:

.1 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate sections.

.3 Product Data:

.1 Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings, provided that the product concerned is clearly identified. Submit in sets, not as individual submissions.

.4 Samples:

.1 Submit samples in sizes and quantities specified.

.2 Where colour is criterion, submit full range of colours.

.3 Submit all samples as soon as possible after the contract is awarded, to facilitate production of complete colour scheme by the Departmental Representative.

.5 Mock-ups:

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.2 Construct in location as specified in specific Section.

.3 Prepare mock-ups for Departmental Representative' review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

.6 Progress Photographs:

.1 Provide construction photographs in accordance with procedures and submission requirements specified in this clause.

.2 Progress Photographs:

.1 Provide digital photographs with images of minimum 3.1 mega pixel resolution and stored in Jpeg format with minimal compression.

.2 Number of viewpoints: four (4), locations of viewpoints directed by Departmental Representative.

.3 Frequency: monthly, submitted on disk with monthly progress statement, sent via e-mail or as directed by Departmental Representative.

.4 Identify photos by location, date and sequential numbering system.

.3 Final Photographs:

.1 Provide digital photographs with images of minimum 3.1 mega pixel resolution and stored in Jpeg format with minimal compression. Where photos are e-mailed compression can be increased.

.2 Number of viewpoints:

.1 Underground petroleum tank systems before backfill, 6 per tank system for a total of 12.

.2 Reinforcing steel for new tank slab before concrete is poured for a total of 4.

.3 Locations of viewpoints determined by Departmental Representative.

.3 Submit final photographs in digital format on CD, before final acceptance of building.

.4 Label disks and identify with name and project number of project. Indicate exposure dates and viewpoints of each photo and photo number.

.7 Submission Requirements:

.1 Schedule submissions at least ten days before dates reviewed submissions will be needed.

.2 Submit number of copies of product data, shop drawings which Contractor requires for distribution plus four (4) copies which will be retained by Departmental Representative.

.3 Accompany submissions with transmittal letter in duplicate.

.4 Submit bond copies (hard copy) as directed by Departmental Representative.

.8 Coordination of Submissions:

.1 Review shop drawings, product data and samples prior to submission.

.2 Coordinate with field construction criteria.

.3 Verify catalogue numbers and similar data.

.4 Coordinate each submittal with requirements of the work of all trades and contract documents.

.5 Responsibility for errors and omissions in submittal is not relieved by Departmental Representative's review of submittal.

.6 Responsibility for deviations in submittal from requirements of Contract documents is not relieved by Departmental Representative's review of submittal, unless Departmental Representative gives written acceptance of specified deviations.

.7 Notify Departmental Representative, in writing at time of submission, of deviations in submittal from requirements of Contract documents.

.8 Make any changes in submissions which Departmental Representative may require consistent with Contract Documents and re-submit as directed by Departmental Representative.

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

.10 Shop Drawings Review:

.1 Review of shop drawings by Public Works and Government Services Canada (PWGSC) is for the sole purpose of ascertaining conformance with the general concept.

.2 The Departmental Representative's review does not mean that PWGSC approves the detail design inherent in the shop drawings, responsibility remains with the contractor submitting same, and such review will not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents.

.3 Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for co-ordination of the work of all subtrades.

1.5 HEALTH AND SAFETY

.1 Specified in Section 01 35 33.

1.6 ENVIRONMENTAL PROCEDURES

.1 Specified in Section 01 35 43.

1.7 REGULATORY REQUIREMENTS

.1 References and Codes:

.1 Perform Work in accordance with National Building Code of Canada (NBCC2015) and where applicable British Columbia Building Code (BCBC2012), National Fire Code of Canada (NFCC2015), Canadian Environmental Protection Act - Federal Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (CEPASTR2008) and Canadian Electrical Code (CSA C22.1-2015) including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

1.8 QUALITY CONTROL

.1 Inspection:

.1 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.2 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.

.3 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents,

correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

.2 Procedures:

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

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

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

.3 Rejected Work:

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.4 Reports:

.1 Submit (4) four copies of inspection and test reports to Departmental Representative.

.5 Tests and Mix Designs:

.1 Furnish test results and mix designs as may be requested.

.6 Mock-ups:

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.2 Construct in locations acceptable to Departmental Representative and as specified in specific Section.

.3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.

.6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

.7 Mill Tests:

.1 Submit mill test certificates as requested and as required of specification Sections.

.8 Equipment and Systems:

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

.2 Refer to specific Section for definitive requirements.

1.9 TEMPORARY UTILITIES

.1 Installation and Removal:

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

.2 Remove from site all such work after use.

.2 Dewatering:

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

.3 Temporary Communication Facilities:

.1 Provide and pay for temporary telephone and fax hook up, line(s) if necessary for own use.

.4 Fire Protection:

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

1.10 CONSTRUCTION FACILITIES

.1 Installation and Removal:

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

.2 Remove from site all such work after use.

.2 Hoisting:

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

.2 Hoists to be operated by qualified operator.

.3 Site Storage/Loading:

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

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

.4 Construction Parking:

.1 Make good damage to existing roads used for access to project site.

.2 Build and maintain temporary access where required and provide snow removal during period of Work.

.3 Park vehicles outside perimeter fence in designated parking areas.

.5 Contractor's Site Office and enclosure:

.1 If necessary for the work, provide office of size to accommodate Contractor's operations.

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

.3 Provide temporary fenced area to enclose site and operations.

.6 Equipment, Tools and Material Storage:

.1 If necessary for the work, provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

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

.7 Sanitary Facilities:

.1 Provide temporary sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Permanent facilities may be used on approval of Departmental Representative.

1.11 TEMPORARY BARRIERS AND ENCLOSURES

.1 Guardrails and Excavations:

.1 Provide secure, rigid guard rails and barricades around deep excavations, open edges of floors and roofs etc.

.2 Provide as required by governing authorities.

.2 Access to Site:

.1 Maintain immediate local access roads in clean condition used during work of this contract.

.3 Protection for Off-Site and CSC Property:

.1 Protect surrounding CSC property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.12 COMMON PRODUCT REQUIREMENTS

.1 Reference Standards:

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

.2 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

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

.2 Quality:

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

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve

responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

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

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

.3 Storage, Handling and Protection:

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

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

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

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

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

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative .

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

.4 Transportation:

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

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative. Unload, handle and store such products.

.5 Manufacturer's Instructions:

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

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

.6 Quality of Work:

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

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

.7 Co-ordination:

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

8 Concealment:

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

.2 Before installation, inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

.9 Remedial Work:

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

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

.10 Location of Fixtures:

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

.3 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

.11 Fastenings:

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

.12 Fastenings - Equipment:

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

.13 Protection of Work in Progress:

.1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

.14 Existing Utilities:

.1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.

.2 Before commencing work, establish location and extent of service lines in areas of work and notify Departmental Representative of findings.

.3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.4 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.5 Record locations of maintained, capped and re-routed services lines.

.15 Contractors Options for Selection of Products:

.1 Products specified by **"Prescriptive" specifications**: select any product meeting or exceeding specifications.

.2 Products specified under "**Acceptable Products**" (used for complex Mechanical or Electrical Systems): select any one of the indicated manufacturers, or any other manufacturer meeting or exceeding the Prescriptive specifications and indicated Products.

.3 Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.

.4 Products specified to meet particular design requirements or to match existing materials: use only material specified Approved Product. Alternative products may be considered provided full technical data is received in writing by Departmental Representative in accordance with "Instructions to Bidders".

.5 When products are specified by a referenced standard or by Performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the specified requirements.

.16 Substitution after award of Contract:

.1 No substitutions are permitted without prior written approval of the Departmental Representative.

.2 Proposals for substitution may only be submitted after Contract award. Such request must include statements of respective costs of items originally specified and the proposed substitution.

.3 Proposals will be considered by the Departmental Representative if:

.1 products selected by tenderer from those specified are not available;

.2 delivery date of products selected from those specified would unduly delay completion of Contract, or

.3 alternative product to that specified, which is brought to the attention of and considered by Departmental Representative as equivalent to the product specified, and will result in a credit to the Contract amount.

.4 Should the proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as result of substitution.

.5 Amounts of all credits arising from approval of the substitutions will be determined by the Departmental Representative, and the Contract price will be reduced accordingly.

1.13 EXAMINATION AND PREPARATION

.1 Existing Services:

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

.2 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 approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.14 EXECUTION REQUIREMENTS

.1 Preparation:

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

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

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

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

.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

.2 Execution:

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

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

.3 Uncover Work to install ill-timed Work.

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

.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.8 Cut rigid materials using purpose made saw or core drill. Pneumatic or impact tools not allowed on brittle materials without prior approval.

.9 Restore work with new products in accordance with requirements of Contract Documents.

.10 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.

.12 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.15 CLEANING

.1 Project Cleanliness:

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

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

.3 Clear snow and ice from access to building.

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

.5 Provide and use clearly marked separate bins for recycling. Refer to-Construction/Demolition Waste Management And Disposal.

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

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

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

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

.10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

.2 Final Cleaning:

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

.6 Clean lighting reflectors, lenses, and other lighting surfaces.

.7 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.8 Wax, seal, vacuum clean, shampoo or prepare floor finishes, as recommended by manufacturer.

.9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.10 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.11 Remove dirt and other disfiguration from exterior surfaces.

.12 Sweep and wash clean paved areas.

.13 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.

.14 Clean roofs, downspouts, and drainage systems.

.15 Remove snow and ice from access to building.

1.16 CONSTRUCTION/DEMOLITION WASTE MANAGEMENT AND DISPOSAL

.1 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials and waste.

.1 Separate non-salvageable materials from salvaged items.

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

.3 Transport and deliver non-salvageable items to licensed disposal facility.

.2 Provide containers to deposit reusable and/or recyclable materials. Locate containers in locations, to facilitate deposit of materials without hindering daily operations. Provide containers to deposit reusable and/or recyclable materials.

.3 Collect, handle, store on-site and transport off-site, salvaged materials in separate condition. Transport to approved and authorized recycling facility and/or users of material for recycling.

.4 Locate waste and salvage bins on site as directed by Departmental Representative.

.5 Handle and dispose of waste petroleum and petroleum equipment in accordance with Section 1.6 – Environmental Procedures.

1.17 CLOSEOUT PROCEDURES

.1 Inspection and Declaration:

.1 Contractor's Inspection: Conduct an inspection of Work with all subcontractors, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.2 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.3 Request Departmental Representative's Inspection.

.2 Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Operation of systems have been demonstrated to Departments personnel.

.5 Work is complete and ready for Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

1.18 CLOSEOUT SUBMITTAL

.1 As-built Drawings:

.1 As work progresses, maintain accurate records to show all deviations from the Contract Drawings. Mark "as-built" changes in red. Note on as-built drawings as changes occur. Record following information:

.1 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.

.2 Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

.3 Field changes of dimension and detail.

.4 Changes made by Change Order or Field Order.

.2 At completion of project and prior to final inspection, neatly transfer "as built" notations to set of white prints and submit to the Departmental Representative.

.2 Maintenance manual:

.1 On completion of project submit to Departmental Representative four (4) CD R/ disk copies and four (4) paper copies (in loose leaf type binder) of Operations and Maintenance Manual, made up as follows:

.1 Provide maintenance manual on CDs using pdf, or other approved format for descriptive writing, page size images and page size drawings. Organize manuals into industry standard maintenance manual tabs with links in index to each descriptive section describing the component or maintenance procedure etc.

.2 Organize files into CSI Masterformat numbering system or other approved descriptive titles.

.3 Label disk "Operation and Maintenance Data", project name, date, names of Contractor, subcontractors, consultants and subconsultants.

.4 Include scanned guarantees, diagrams and drawings.

.5 Organize contents into applicable sections of work to parallel project specification break-down. Mark each section by labeled tabs (navigational buttons).

.6 Drawings, diagrams and manufacturer's literature must be legible.

.7 Refer to Mechanical and Electrical Divisions for specific details for Mechanical and Electrical data.

.3 Maintenance Materials, Special Tools and Spare Parts:

.1 Specific requirements for maintenance materials, tools and spare parts are specified in individual sections.

.2 Deliver maintenance materials, special tools and spare parts to Departmental Representative and store in designated area as directed by Departmental Representative.

.3 Prepare lists of maintenance materials, special tools and spare parts for inclusion in Manual specified in Clause 18.2.

.4 Maintenance materials:

.1 Deliver wrapped, identify on carton or package, colour, room number, system or area as applicable where item is used.

.5 Special tools:

.1 Assemble as specified;

.2 Include identifications and instructions on intended use of tools.

.6 Spare parts:

.1 Assemble parts as specified;

.2 Include part number, identification of equipment or system for which parts are applicable;

.3 Installation instructions;

.4 Name and address of nearest supplier.

.4 Warranties and Bonds:

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

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

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

.4 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until the Date of Interim Completion is determined.

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

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

1.19 DEMONSTRATION AND TRAINING

.1 Demonstration and Training:

.1 Demonstrate operation and maintenance of equipment and systems to maintenance personnel following interim Completion and prior to date of final certificate of completion

.2 Departmental Representative will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

1.20 GENERAL COMMISSIONING

.1 Commission installed systems prior to Demonstration and Training.

END OF SECTION

PART 1 GENERAL

1.1 Purpose

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

1.2 Purpose

.1 "Contraband" means:

.1 an intoxicant, including alcoholic beverages, drugs and narcotics

.2 a weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization,

.3 an explosive or a bomb or a component thereof,

.4 currency over any applicable prescribed limit, $25.00, and

.5 any item not described in paragraphs (a) to (d) that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.

.2 Unauthorized smoking and related Items≅ means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing tobacco, cigarette making machines, matches and lighters.

.3 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.

.4 "CSC" means Correctional Service Canada.

.5 "Director" means Director or Warden of the Institution as applicable or their representative.

.6 "Construction employees" means persons working for the general contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.

.7 "Departmental Representative" means the Public Works and Government Services Canada representative defined in General Conditions.

.8 "Perimeter" means the fenced or walled area of the institution that restrains the movement of the inmates.

.9 "Construction zone" means the area, as indicated in the contract documents, that the contractor will be allowed to work". This area may or may not be isolated from the security area of the institution. Limits to be confirmed at construction start-up meeting.

.1 Construction zone for this contract includes the Mission Institution Admistration Building.

1.3 Preliminary Proceedings

.1 At construction start-up meeting:

.1 Discuss the nature and extent of all activities involved in the Project.

.2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.

.2 The contractors's responsibilities:

.1 Ensure that all construction employees are aware of the CSC security requirements.

.2 Ensure that a copy of the CSC security requirements is always prominently on display at the job site.

.3 Co-operate with institutional personnel in ensuring that security requirements are observed by all construction employees.

1.4 Construction Employees

.1 Submit CPIC form and scanned copy of government issued ID for each employee to the Departmental Representative.

.2 Allow 10 working days for processing of security clearances. Employees will not be admitted to the Institution without a valid security clearance in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC institutions are not valid at this institution except as approved otherwise.

.3 The Director may require that facial photographs may be taken of construction employees and these photographs may be displayed at appropriate locations in the institution or in an electronic database for identification purposes. The Director may require that Photo ID cards be provided for all construction workers. ID cards will then be left at the designated entrance to be picked upon arrival at the institution and shall be displayed prominently on the construction employees clothing at all time while employees are at the institution.

.4 Entry to Institutional Property will be refused to any person there may be reason to believe may be a security risk.

.5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:

.1 appear to be under the influence of alcohol, drugs or narcotics.

.2 behave in an unusual or disorderly manner.

.3 are in possession of contraband.

1.5 Vehicles

.1 All unattended vehicles on CSC property must have windows closed; fuel caps locked, doors and trunks locked and keys removed. The keys must be securely in the possession of the owner or an employee of the company that owns the vehicle.

.2 The director may limit at any time the number and type of vehicles allowed within the Institution.

.3 Drivers of delivery vehicles for material required by the project will require security clearances and must remain with their vehicle the entire time that the vehicle is in the Institution. The director may require that these vehicles be escorted by Institutional staff or PWGSC Construction Escorts while in the Institution.

.4 If the Director permits trailers to be left inside the secure perimeter of the Institution, the trailer doors must be locked at all times. All windows must be securely locked bars when left unoccupied. Cover all windows with expanded metal mesh. When not in use lock

all storage trailers located inside and outside the perimeter. All storage trailers inside and outside the perimeter must be locked when not in use.

1.6 Parking

.1 The parking area(s) to be used by construction employees will be designated by the Director. Parking in other locations will be prohibited and vehicles may be subject to removal.

1.7 Shipments

.1 To avoid confusion with the institution's own shipments, address all shipments of project material, equipment and tools in the Contractor's name and have a representative on site to receive any deliveries or shipments. CSC or PWGSC staff will **NOT** accept receipt of deliveries or shipments of any material equipment or tools for the contractor.

1.8 Telephones

.1 The installation of telephones, facsimile machines and computers with Internet connections is not permitted within the Institution perimeter unless prior approved by the Director.

.2 The Director will ensure that approved telephones, facsimile machine and computers with Internet connections are located where they are not accessible to inmates. All computers will have an approved password protection that will stop an Internet connection to unauthorized personnel.

.3 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, Blackberries, PDAs, telephone used as 2-way radios are not permitted within the Institution unless approved by the Director. If wireless cellular telephones are permitted, the user will not permit their use by any inmate.

.4 The Director may approve but limit the use of 2-way radios.

1.9 Work Hours

.1 Work hours within the Institution are: conform to Division 1.

.2 Work is not permitted during weekends and statutory holidays without the permission of the Director. A minimum of seven days advance notice will be required to obtain the required permission. In case of emergencies or other special circumstances, this advance notice may be waved by the Director.

1.10 Overtime Work

.1 Conform to Division 1.

.2 Provide 48 hours advance notice to Director for all work to be performed after normal working hours of the Institution. Notify Director immediately if emergency work is required, such as to complete a concrete pour or make the construction site safe and secure.

1.11 Tools and Equipment

.1 Maintain a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required by the Institution.

.2 Throughout the construction project maintain up-to-date the list of tools and equipment specified above.

.3 Keep all tools and equipment under constant supervision, particularly power-driven and cartridge-driven tools, cartridges, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device.

.4 Store all tools and equipment in approved secure locations.

.5 Lock all tool boxes when not in use. Keys to remain in the possession of the employees of the contractor. Secure and lock scaffolding when not erected and when erected Secure in a manner agreed upon with the Institution designate.

.6 Report all missing or lost tools or equipment immediately to the Departmental Representative/Director.

.7 The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks may be carried out at the following intervals:

.1 At the beginning and conclusion of every work day or shift upon entering and exiting the Institution.

.2 At any time when contractor is on Institution property.

.8 Certain tools/equipment such as cartridges and hacksaw blades are highly controlled items. The contractor will be given at the beginning of the day, a quantity that will permit one day's work. Used blades/cartridges will be returned to the Director's representative at the end of each day. Maintain up to date inventory of all used blades/cartridges.

.9 If propane or natural gas is used for heating the construction, the institution will require that the contractor supervise the construction site during non-working hours.

1.12 Keys

.1 Security Hardware Keys.

.1 Arrange with the security hardware supplier/installer to have the keys for the security hardware to be delivered directly to Institution, specifically the Security Maintenance Officer (SMO).

.2 The SMO will provide a receipt to the Contractor for security hardware keys.

.3 Provide a copy of the receipt to the Departmental Representative.

.2 Other Keys

.1 Use standard construction cylinders for locks for his use during the construction period.

.2 Issue instructions to employees and sub-trades, as necessary, to ensure safe custody of the construction set of keys.

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

.1 Prepare an operational keying schedule

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

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

.4 Upon putting operational security keys into use, the PWGSC construction escort will obtain these keys as they are required from the SMO and open doors as required by the

Contractor. The Contractor shall issue instructions to his employees advising them that all security keys shall always remain with the PWGSC construction escort.

1.13 Security Hardware

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

1.14 Prescription Drugs

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

1.15 Smoking Restrictions

.1 Smoking is not permitted inside correctional facilities or outdoors within the perimeter of a correctional facility and persons must not possess unauthorized smoking items within the perimeter of a correctional facility.

.2 Persons in violation of this policy will be requested to immediately cease smoking or dispose of any unauthorized smoking items and, if they persist will be directed to leave the Institution.

.3 Smoking is permitted outside the perimeter of a correctional facility in an area designated by the Director.

1.16 Contraband

.1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on institutional property.

.2 The discovery of contraband on the construction site and the identification of the person(s) responsible for the contraband shall be reported immediately to the Director.

.3 Contractors should be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.

.4 Presence of arms and ammunition in vehicles of contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.

1.17 Searches

.1 All vehicles and persons entering institutional property may be subject to search.

.2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of contraband, he may order that person to be searched.

.3 All employees entering the Institution may be subject to screening of personal effects for traces of contraband drug residue.

1.18 Access and Removal from Institution Property

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

1.19 Movement Vehicles

.1 Construction vehicles are not to leave the Institution until an inmate count is completed. Escorted commercial vehicles will be allowed to enter or leave the institution through the vehicle access gate during the following hours:

.1 AM: 0745 hrs. to 1100 hrs.

.2 PM: 1300hrs. to 1530 hrs.

.2 The contractor will advise the Director twenty four (24) hours in advance to the arrival on the site of heavy equipment such as concrete trucks, cranes, etc.

.3 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC staff or PWGSC construction escorts working under the authority of the Director.

.4 Commercial vehicles will only be allowed access to institutional property when their contents are certified by the Contractor or his representative as being strictly necessary to the execution of the construction project.

.5 Vehicles will be refused access to institutional property if, in the opinion of the Director, they contain any article which may jeopardize the security of the institution. Arrange with Director for parking of contractor=s vehicles at minimum security Institutions.

.6 Private vehicles of construction employees will not be allowed within the security wall or fence of medium or maximum security institutions without the authorization of the Director.

.7 With the approval of the Director, certain equipment may be permitted to remain on the construction site overnight or over the weekend. This equipment must be securely locked, with the battery removed. The Director may require that the equipment be secured with a chain and padlock to another solid object.

1.20 Movement of Construction Employees on Institutional Property

.1 Subject to the requirements of good security, the Director will permit the Contractor and his employees as much freedom of action and movement as is possible.

.2 However, notwithstanding paragraph above, the Director may:

.1 Prohibit or restrict access to any part of the institution.

.2 Require that in certain areas of the institution, either during the entire construction project or at certain intervals, construction employees only be allowed access when accompanied by a member of the CSC security staff or PWGSC Construction Escort Officer.

.3 During the lunch and coffee/health breaks, all construction employees will remain within the construction site. Construction employees are not permitted to eat in the Institution cafeteria and dining room.

1.21 Surveillance and Inspection

.1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.

.2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among construction employees and maintained throughout the construction project.

1.22 Stoppage of Work

.1 The director may request at any time that the contractor, his employees, sub-contractors and their employees not enter or leave the work site immediately due to a security situation occurring within the Institution. The contractor's site supervisor will note the name of the staff member giving the instruction, the time of the request and obey the order as quickly as possible.

.2 The contractor shall advise the Departmental Representative of this interruption of the work within 24 hours.

1.23 Contact with Inmates

.1 Unless specifically authorized, it is forbidden to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any employee doing any of the above will be removed from the site and his security clearance revoked.

.2 Digital cameras (or any other type) are not allowed on CSC property.

.3 Notwithstanding the above paragraph, if the director approves of the use of cameras, it is strictly forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this contract.

1.24 Completion of Construction Project

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

END OF SECTION

PART 1 - GENERAL

PSPCC Update on Asbestos Use
Effective April 1, 2016, all Public Works and Government Services Canada (PWGSC) contracts for new construction and major rehabilitation will prohibit the use of asbestos-containing materials. Further information can be found at http://www.tpsgc-pwgsc.gc.ca/comm/vedette-features/2016-04-19-00-eng.html

1.1 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 2015 (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 Regulation

1.2 Related Sections

.1 Refer to the following current NMS sections as required:

- .1 Section 01 01 50 General Instructions

1.3 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.

1.4 Compliance with Regulations

.1 PWGSC may terminate the Contract without liability to PWGSC 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.

1.5 Submittals

.1 Submit to Departmental Representative submittals listed for review in accordance with Section 01 01 50.

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

.3 Submit the following:

.1 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 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 project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 10 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 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.

1.6 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.

1.7 Health and Safety Coordinator

.1 The Health and Safety Coordinator (Registered Occupational Hygienist, Certified Industrial Specified Hygienist) must:

.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, daily enforcing, and monitoring the site specific Health and Safety Plan.

.3 Be on site during execution of work.

1.8 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.

1.9 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

1.10 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.

1.11 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.

1.12 Work Permits

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

1.13 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.

1.14 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 Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.15 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.

.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.

.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.

.5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.16 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (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 01 01 50.

.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.

1.17 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 in Division 2 specifications.

1.18 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 in Division 2 specifications.

1.19 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.

1.20 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.

1.21 Overloading

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

1.22 Falsework

.1 Design and construct falsework in accordance with CSA S269.1- 1975 (R2003).

1.23 Scaffolding

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 Code of Practice for Access Scaffold and BC Occupational Health and Safety Regulations.

1.24 Confined Spaces

.1 Carry out work in confined spaces in compliance with Provincial regulations.

1.25 Power-Actuated Devices

.1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

1.26 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.

1.27 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 Departmental Representative is required prior to any gas or diesel tank being brought onto the work site.

1.28 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.

1.29 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.

1.30 Posted Documents

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

.1 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. Must be posted in a non-inmate access are and locked up when not being used.

.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.

1.31 Meetings

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

1.32 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".

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Not Used

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 REFERENCES

.1 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.

1.3 SUBMITTALS

.1 Submit to Departmental Representative submittals listed for review in accordance with Section 01 01 50.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.3 Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

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

.5 Environmental protection plan to include:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Spill Prevention, Control and Emergency Response Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.3 Work Plan describing the Contractor's proposed methods for preparation, removal, transportation and disposal of all equipment and materials from the existing fuel system prior to commencement of the work.

.4 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

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

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

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

.8 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

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

1.4 FIRES

.1 Fires and burning of rubbish are not permitted.

1.5 SPILL PREVENTION, CONTROL AND EMERGENCY RESPONSE

.1 Prior to commencing the work, the Contractor shall submit a written site-specific Spill Prevention, Control and Emergency Response Plan for review/approval by the Departmental Representative and shall continue to implement, maintain, and enforce plan until final demobilization from site. The Plan must include a list of spill emergency response materials and equipment to be available on site for use in event of a spill.

.2 The Contractor shall complete a daily visual inspection of all hazardous material and equipment for signs of leakage. Daily visual inspection will include, among other things ensuring that all protective equipment and other emergency response equipment is in its place.

.3 The Contractor shall maintain a readily available supply of spill emergency response material and equipment on site at all times in effective working condition appropriate to the scale of the project. Spill kits and containment are to be ready for deployment in the event of spills or other releases.

.1 Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.

.2 Spill response materials are to be compatible with type of equipment being used or type of material being handled.

.3 Spill kits are to be in close proximity to machinery.

.4 During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.

.4 The Contractor and all its employees shall be trained in the use of the spill emergency response material and equipment and shall deal with any spills which occur immediately.

.5 The Contractor shall report any environmental incident or spill/release of a substance to the Contractor emergency response team, Departmental Representative and to the Authority having jurisdiction.

.6 The Contractor is responsible for all costs associated with a spill, leak, or other release of a deleterious substance as a result of their Work. This will include costs of spill response equipment and materials, associated sampling and analysis, and any required restoration of the impacted area.

.7 The Contractor shall provide sequence, methods and means, and facilities to prevent spills or releases.

.1 Maintain temporary erosion and pollution control features.

.2 Do not store fuel onsite other than tanks forming part of the equipment.

.3 Control emissions from equipment and plant to meet applicable authorities' emission requirements.

.4 Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.

.8 Inadequate procedures:

.1 Stop relevant Work if procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract.

.2 Submit procedures proposed to resolve problem.

.3 Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause spills or other releases.

.4 Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

.9 Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.

.10 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

.11 Departmental Representative can collect samples for chemical analyses prior to, during, and upon Final Completion of Work to monitor potential pollution caused by Contractor's activities. Assist Departmental Representative in collection of samples.

.12 Remediation of soil, sediment or water contaminated by Contractor's activities.

.1 Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.

.2 Remediation includes excavation, pumping, testing, transport, treatment and disposal as appropriate for the type of contamination incurred, in accordance with the Contract.

.3 Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities.

.4 Remediate as instructed by the Departmental Representative.

.5 Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.

1.6 REMOVAL AND DISPOSAL OF EXISTING WASTE PETROLEUM PRODUCTS AND FUEL SYSTEM EQUIPMENT/MATERIALS

.1 A work plan shall be submitted to the Departmental Representative for approval describing the Contractor's proposed methods for preparation, removal, transportation and disposal of all equipment and materials from the existing fuel system prior to commencement of the work.

.2 All product remaining in old fuel piping shall be drained/pumped into appropriate containers and disposed of in an acceptable manner.

.3 No hot work will be used when cutting/dismantling abandoned fuel piping.

.4 Care shall be taken to ensure no spills of product occur during removal/disposal operations. Suitable oil absorbent materials, spill pans etc. shall be available to prevent any spillage of products reaching the environment.

.5 The Contractor shall present for approval to the Departmental Representative the proposed method/location of disposal of all items.

.6 All waste petroleum products and petroleum equipment must be disposed of in accordance with applicable federal and provincial regulations.

.7 A waste disposal manifest for all removed waste petroleum products, materials and equipment must be provided to the Departmental Representative upon completion of the work

1.7 DRAINAGE

.1 Provide erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Ensure plan includes monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, and must include silt fencing.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

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

.2 Provide temporary drainage and pumping as necessary to keep excavations and site free from water during excavation and grading activities. Wastewater generated from dewatering of UST excavations to be temporarily stored on-site and tested by the Departmental Representative prior to discharge or disposal. Discharge of wastewater from the Site to be approved by the Departmental Representative and in compliance with all applicable regulatory requirements.

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

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

1.8 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree and plant removal to areas in accordance with the Contract or as instructed by the Departmental Representative. Protect all other trees and plants onsite and offsite.

.6 Salvage all trees and plants to be removed in accordance with the Contract or as instructed by the Departmental Representative.

1.9 WORK ADJACENT TO WATERWAYS

.1 Guidelines and Practices:

.1 Follow practices described in Fisheries and Oceans Canada (September 1993) *Land Development Guidelines for the Protection of Aquatic Habitat.*

.2 Follow practices described in BC Ministry of Environment (March 2004) *Standards and Best Practices for Instream Works.*

.3 Comply with Fisheries Act Authorization and other relevant authorizations and in accordance with the Contract.

.2 General:

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material.

.3 Do not dump excavated fill, waste material or debris in waterways.

.3 Machinery:

.1 Ensure all hydraulic machinery to be used adjacent to waterways use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life, and which are readily or inherently bio-degradable.

.2 Place oil drip trays or absorbent materials (e.g. pads) under any heavy equipment working within the Fisheries Sensitive Zone adjacent to the watercourse to ensure there is no potential for contamination of the streambanks or watercourse resulting from leaks or drip off machinery. Ensure that there is no potential for oil, grease or other deleterious substances to enter any watercourse, ravine or storm sewer system.

.3 All equipment and machinery working within 15 meters of any watercourse to be in good working condition (including power washed) and free of leaks or excess oil and grease. No fuels, lubricants, construction wastes or other deleterious substances can enter any watercourse at any time.

.4 Watercourse Maintenance:

.1 Do not disturb streamside or riparian vegetation in accordance with the Contract.

.2 Do not disturb important native in-water aquatic vegetation including cattails.

.3 Do not disturb the watercourse bank or the root systems of vegetation growing on the watercourse banks in accordance with the Contract.

.5 Sediment Control and Deleterious Substances:

.1 Undertake and complete all Work in such a manner to prevent the release of silt, sediment or sediment laden water, raw concrete or concrete leachate, or any other deleterious substances to any ditch, watercourse, ravine or storm sewer system.

.2 Dispose of, or place in a manner that prevents their entry into any watercourse, ravine or storm sewer system, construction and excavation wastes, Overburden, soil, sediment, concrete, concrete leachate, grout, oil, grease or any other substance deleterious to aquatic life.

.3 Remove all excavated material from the Site or place in a stable area above the high water mark of the watercourse, as far as possible from the channel and protected from erosion by mitigating measures including temporary covering exposed soil or sediment with: polyethylene covers, geotextile fabric, hydro-seed or planting vegetation. Dispose of material that is moved offsite in such a manner as to prevent its entry into any ditch, watercourse, wetland, floodplain, ravine or storm sewer system.

.4 Use fill that is inert material in accordance with the Contract and free from contaminants. Place fill so that it cannot gain entry into any ditch, watercourse, wetland, floodplain, ravine or storm sewer system.

.5 No fill is to be stockpiled on marsh or marsh fringe areas.

.6 Restoration of waterways impacted by Contractor's activities.

.1 Restore all waterways impacted by Contractor's activities associated with the Work onsite and offsite.

.2 Restoration includes removal of material, regrading, and revegetation to restore to original pre-impacted state.

.3 Submit procedures for restoration.

.4 Restore as instructed by the Departmental Representative.

1.10 WATERWAY IMPACT REQUIREMENTS

.1 Meet Waterway Impact Requirements for all impacts to a waterway, including runoff, discharge, or work in or adjacent to waterways.

.2 Meet or exceed Waterway Impact Requirements, unless specifically identified in a site specific criteria or authorizations.

.3 Waterway Impact Requirements:

.1 Laws, regulations, and permits applicable to the performance of the Work.

.2 BC *Approved Water Quality Guidelines* for Freshwater Aquatic Life water use.

.3 CCME *Canadian Environmental Quality Guidelines* for the Protection of Aquatic Life.

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

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.5 Pollution includes spills or other releases from Contractor's activities that could potentially contaminate soil, sediment, water, and atmosphere from discharge of hazardous, deleterious or regulated substances, including from equipment and material handling.

1.12 DISPOSAL OF WASTES

.1 Remove all Waste within Work areas in accordance with the Contract and as instructed by the Departmental Representative.

.2 Assume ownership of, and be responsible for, Waste once it is loaded on a vehicle, barge, or other vessel for transport offsite.

.3 Remove surplus materials and temporary facilities from Site.

.4 Dispose waste offsite.

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

.6 Do not discharge wastes into streams or waterways.

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

.8 Under no circumstances dispose of rubbish or waste materials on adjoining property.

1.13 WASTEWATER CONTROL

.1 Dewater various parts of Work including, without limitation, excavations, structures, foundations, and Work areas.

.2 Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.

.3 Direct surface waters that have not contacted potentially Contaminated Wastes to surface drainage systems.

.4 Control surface drainage including ensuring that gutters are kept open, wastewater is not allowed across or over pavements or sidewalks except through accepted pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

1.14 WASTEWATER DISPOSAL

.1 Dispose of Wastewater in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

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

.3 Ensure pumped Wastewater into waterways, sewer or drainage systems is free of suspended materials. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas

.4 Obtain permits to discharge Wastewater to environment or Municipal sewers.

.5 Do not discharge water directly offsite to the environment or to municipal sewers which may have come in contact with potentially Contaminated Waste or potentially Contaminated Wastewater or otherwise may have become Contaminated Wastewater.

1.15 EROSION AND SEDIMENT CONTROL

.1 Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other Work areas. Prevent erosion and sedimentation.

.2 Minimize amount of bare soil or sediment exposed at one time. Stabilize disturbed soil or sediment as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as instructed by the Departmental Representative.

.3 Provide and maintain temporary erosion and sediment control measures.

.1 Temporary erosion and sediment control measures are required to prevent erosion and migration of silt, mud, sediment, and other debris offsite or to other areas of Site where damage might result, or that might otherwise be required by laws and regulations.

.2 Temporary erosion and sediment control measures include: silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, vegetative cover, dikes, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition.

.3 Temporary improvements to remain in place and in operation as necessary or until otherwise instructed by the Departmental Representative

.4 Place silt fences and/or hay or straw bales in ditches to prevent sediment from escaping from ditch terminations.

.5 Do not construct bale barriers and silt fence in flowing streams or in swales.

.6 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

.7 Bales and/or silt fence can be removed at beginning of Working Day, replace at end of Working Day.

.8 Repair damaged bales, end runs, and undercutting beneath bales.

.9 Unless instructed by the Departmental Representative, remove temporary erosion and sediment control devices upon Final Completion of Work. Temporary erosion and sediment control devices once removed become property of Contractor.

.4 Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.

.5 Construct fill areas to prevent erosion.

.6 Do not disturb existing embankments or embankment protection in accordance with the Contract.

.7 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

.8 If soil, sediment and debris from Site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where it is undesirable, remove accumulation and restore area to original condition, as instructed by the Departmental Representative.

1.16 EQUIPMENT OPERATION

.1 Contractor shall maintain construction equipment in good condition.

.2 Waste oils and other materials related to equipment shall be removed from site upon completion of project.

.3 Any fuel spills shall be absorbed immediately.

.4 Maintenance of equipment shall be confined to specific areas such that spills can be contained and collected before contaminants reach ditches, watercourses and storm water systems.

1.17 HISTORICAL / ARCHAEOLOGICAL CONTROL

.1 Provide historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.

.2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental representative.

1.18 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan, or other environmental procedure violations.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Do not take action until after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

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

1.19 MAINTENANCE OF PUBLIC ROADS

.1 Prevent tracking or spilling of debris or material onto public roads.

.2 Immediately sweep or scrape up debris or material on public roads.

.3 Clean public roads within a 200 m radius of the Site entrance at least once per shift.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Materials and procedures for removal of underground storage tanks.

1.2 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures

1.3 REFERENCES

.1 Canadian Council of Ministers of the Environment (CCME)

.1 CCME PN 1326-2003, Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.

.2 Canadian Federal Legislation

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.2 Canada Labour Code (R.S. 1985, c. L-2).

.1 Part II (September 2000) - Occupational Health and Safety.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.4 Storage Tank Systems for Petroleum and Allied Products Regulations (2008).

.3 Underwriters' Laboratories of Canada (ULC)

.1 ULC-S603-2000, Standard for Steel Underground Tanks for Flammable and Combustible Liquids.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 01 50 – General Instructions.

.2 Provide the Departmental Representative with copy of vapour removal test results.

.3 Provide the Departmental Representative with affidavit of destruction from the approved disposal facility proving disposal of the storage tanks.

.1 Affidavits of Destruction shall clearly identify tanks such as EC #, Serial number etc.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE AND HANDLING

.1 Divert metal materials from landfill to metal recycling facility approved by Departmental Representative.

.2 Segregate and deliver non-salvageable or non-recyclable materials, including waste liquids and sludges to Provincially/Territorially licensed waste facility.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 WORK PLAN

.1 Prior to the commencement of Work a work plan shall be submitted to the Departmental Representative for approval. The Work Plan is not limited to but should as a minimum include the following:

.1 Describe the methods, means, sequence, and schedule to be employed in the pumping, cleaning, de-vaporizing, testing, inspecting, cutting, and disposal of the underground fuel storage tanks and related piping, equipment and appurtenances.

.2 Include methods to be employed for any product storage; sludge and liquid removal; purging and inerting.

3.2 PREPARATION SAFETY AND SECURITY

.1 Conform to or exceed Federal, Provincial and Territorial codes, local municipal by-laws, by-laws, and codes and regulations of utility authorities having jurisdiction.

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

.3 Protection:

.1 Meet safety requirements of Occupational Safety and Health, Canada Labour Code Part II and Regulations for Construction Projects.

.2 Disconnect or remove source of ignition from vicinity of tank.

.3 Provide temporary protection for safe movement of personnel and vehicle traffic.

.4 Cut, braze or weld metal only in monitored areas established to be free of ignitable vapour concentrations.

.5 Ground and bond metal equipment, including tanks and transfer pipes, before operating equipment or transferring flammable materials.

.6 Use non-sparking tools and intrinsically safe electrical equipment.

.7 Smoking is not permitted.

3.3 DRAINING

.1 Drain and flush piping into tank.

.2 Pump out liquid from tank

.1 Use explosion proof, air driven or hand pump.

.3 Remove sludge from tank bottom.

.1 Dispose of product and sludge in accordance with local, Provincial and Territorial regulations using waste disposal carrier licensed by Provincial/Territorial Environmental Agency having jurisdiction.

3.4 EXCAVATION TRENCHING AND BACKFILL

.1 Do work in accordance with Section 31 23 10 - Excavation, Trenching and Backfilling.

.2 Provide protective material around excavation.

.3 Provide constant supervision during excavation and backfilling.

.4 Excavation:

.1 Excavate until top of tank and connections and openings are exposed.

.2 Disconnect piping:

.1 Remove fill tube.

.2 Disconnect sensors, gauges, product and vent lines.

.3 Cap or plug open ends of lines that are not to be used further.

.4 Remove piping from ground.

.3 Temporarily plug tank openings.

.4 Continue excavation until tank is completely exposed.

.5 Temporarily stockpile on site soil in vicinity of tank, until waste classification can be established prior to final disposal.

.5 Prevent movement, settlement or damage of adjacent structures, services, paving and adjacent grades. Provide bracing and shoring as required.

3.5 TANK REMOVAL

.1 Remove tank in accordance with Storage Tank Systems for Petroleum and Allied Petroleum Products Regulations (2008), CCME Code of Practice PN 1326 and/or applicable provincial standards and regulations, and place in secure location.

.2 Block tank to prevent movement.

.3 Contact the Departmental Representative immediately if there is evidence of contamination in tank excavation, and stop Work until further notice.

3.6 VAPOUR REMOVAL

.1 Purging:

.1 Purge vapours to less than 10% of lower explosive limit (LEL).

.2 Verify with combustible gas metre.

.2 Inverting:

.1 Displace oxygen to levels below necessary to sustain combustion.

.2 Verify with combustible gas metre.

.3 Water Method:

.1 Fill tank with water to expel vapours.

.2 Remove and dispose of contaminated water in accordance with regulations after tank is removed from site.

.3 Verify with combustible gas metre.

.4 Dry Ice Method:

.1 Add 1.85 gm of solid carbon dioxide (dry ice) for each 100 litre capacity.

.2 Crush and distribute ice evenly over greatest area to secure rapid evaporation. Avoid skin contact.

.3 Verify dry ice has vapourized.

.5 Air Method:

.1 Ventilate tank with air using small gas exhauster operated with compressed air or other suitable means.

.2 Air to enter opening at one end and to exit opening at other end to quickly remove vapour.

.3 Test interior of tank to determine when tank is free of vapour.

3.7 CAPPING

.1 Plug/cap holes after tank has been freed of vapours and before tank is moved from site.

.1 Leave vents open.

.2 Plug corrosion leak holes using screwed (boiler) plugs.

3.8 SECURING AND REMOVAL FROM SITE

.1 Check vapour levels prior to transport:

.1 Remove vapour if required.

.2 Dispose of tank in accordance with local, Provincial, Federal or Territorial regulations.

.3 Truck removal:

.1 Secure tank on truck for transport to disposal site.

.2 Cut suitable openings in tank sides to render tank unusable.

.3 Ensure 3 mm vent hole located at uppermost point on tank.

.4 The storage tank shall be transported in conformance with the TDGA and in a manner prescribed by the authority having jurisdiction to an approved disposal facility.

3.9 WORKMANSHIP AND DISPOSAL

.1 Dismantle, cut sufficient openings or otherwise render unusable.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 The General Requirements shall form part of this section.

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Requirements, and specific requirements outlined in the following sub-sections.

1.2 RELATED WORK

.1 Section 03 20 00 - Reinforcing Steel.

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

1.3 REFERENCE STANDARDS

.1 Design and construction of formwork and falsework shall conform to the following codes and standards:

.1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.2 CAN3-086 and CAN/CSA-086.1, Engineering Design in Wood (Working Stress Design & Limit States Design).

.3 CSA S269.1, Falsework for Construction Purposes, and CAN/CSA - S269.3, Concrete Formwork.

.4 Local codes and by-laws

.5 Workers Compensation Board regulations

.6 National Building Code (NBC).

.7 ACI Standards

1.4 EXAMINATION

.1 Structural drawings and specifications shall be examined for work that might affect formwork.

PART 2 - PRODUCTS

2.1 WOOD

.1 Sawn lumber: Douglas fir, construction grade, or as approved.

.2 Plywood: Douglas fir, concrete form grade, conforming to CSA 0121.

.3 Chamfer strips: cut from sawn lumber, 20 mm x 45 degrees.

2.2 METAL FORMS

.1 Metal forms: made of sheet or plate steel with sufficient rib stiffening.

2.3 OIL

.1 Form oil: non-staining, mineral type, free from volatile constituents.

2.4 TIES

.1 Internal form ties shall be metal and of a type so that no metal will be within 25 mm of the concrete surface when forms have been removed.

.2 Ties shall have tapered plastic cones at faces of concrete to allow for grouting.

.3 Ties for watertight and underground structures shall have a waterstop flange at mid-length and be completely free of grease and oil.

.4 Form ties shall have a minimum ultimate strength of 250 MPa. Form ties shall be adjustable in length to permit tightening. Twisted wire form ties shall not be used.

2.5 SHORING

.1 Shoring shall be either lumber or steel.

.2 Lumber grade no less than that used in formwork design.

.3 Steel shoring shall be adjustable with provisions for attachment of bracing, and shall have a rated load- bearing capacity.

PART 3 - EXECUTION

3.1 DESIGN OF FORMS AND FALSEWORK

.1 Forms shall be built sufficiently strong and rigid to sustain the weight or fluid pressure of concrete plus any superimposed construction loads without noticeable deflection. Forms shall be sufficiently tight to prevent leakage of mortar.

.2 Forms shall be so constructed that they may be dismantled and removed without damaging concrete.

3.2 TREATMENT

.1 Forms shall be treated with oil prior to placing of reinforcement.

.2 Reinforcement shall not be contaminated with form oil.

.3 Untreated forms shall be kept wetted down to prevent shrinkage prior to placing concrete and shall be surface wetted at the time of placing.

3.3 ALIGNMENT DURING PLACING

.1 Forms shall be checked frequently for alignment and elevation during placing. A suitable means for checking forms shall be provided.

.2 Corrective adjustments shall be carried out as required until concrete is in place.

3.4 SHORING

.1 Shores shall be set on wedges or shall be adjustable so they may be removed without causing undue strains in the concrete.

.2 Shores shall be braced horizontally and diagonally in two (2) directions. Braces shall be adequate in strength to prevent buckling and to withstand lateral forces.

3.5 FORMWORK TOLERANCES

.1 Variation from plumb: in lines and surfaces of walls and in arises - 2 mm per metre, but not more than 25 mm.

.2 Footings:

.1 Variation in dimensions in plan:

.1 Minus 12 mm

.2 Plus 50 mm

.2 Misplacement or eccentricity:

.1 2% of the footing width in the direction of misplacement but not more than 50 mm

.3 Reduction in thickness:

.1 Minus 5% of specified thickness

3.6 REMOVAL

.1 The Departmental Representative will have the right to order concrete removed which has become mis-aligned during placing.

3.7 RE-USE

.1 Forms may be re-used after adequate cleaning, provided the faces have not become cracked or roughened. Forms so used shall be trimmed and properly patched.

3.8 STRIPPING

.1 Unless otherwise authorized by the Departmental Representative, leave form work in place for the following minimum period of time after placing concrete:

.1 Three days for walls, columns and sides of beams.

.2 Twenty-eight days for beam soffits, slabs and other structural members, or five days when replaced immediately with adequate shoring to Standard specified for falsework.

3.9 CHAMFER

.1 Chamfer exposed external corners 20 mm unless otherwise specified.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 The General Requirements shall form part of this section

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Requirements, and specific requirements outlined in the following sub-sections.

1.2 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories

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

1.3 FIELD REVIEW

.1 Notify Departmental Representative 72 hours prior to concrete pour for review of placement of reinforcement.

1.4 REFERENCE STANDARDS

.1 CAN / CSA-A23.1 - Concrete Materials and Methods of Concrete Construction.

.2 CAN-A23.1S1 / A23.1S2 - Methods of Concrete Construction.

.3 Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada (current edition).

.4 Referenced standards refer to the latest edition or revision except where specified otherwise.

1.5 ALTERNATE LAYOUT

.1 Submit in writing all proposed alternate steel reinforcing layouts to Departmental Representative for review.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 See Structural Notes and Drawings for type and grade.

.2 In accordance with CSA-G30.18 - Billet Steel Bars for Concrete Reinforcement.

.3 Welded Steel Fabric shall be smooth finish in accordance with CSA-G30.5 Welded Steel Wire Fabric for Concrete Reinforcement.

.4 Welding of reinforcing steel shall be in accordance with CSA-W186 Welding of Reinforcing Bars in Reinforced Concrete Construction and shall be performed by a company certified by the Canadian Welding Bureau.

.5 Tie wire shall be 16 gauge, cold-drawn, annealed wire and shall be in accordance with CSA-G30.3.

2.2 TESTING

.1 CAN3-A23.2 - Methods of Test for Concrete.

2.3 FABRICATION

.1 Fabricate reinforcing steel in accordance with Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Fabricate reinforcing steel with bends, hooks, splice lengths as indicated on drawings.

.3 Do not field bend reinforcing steel unless indicated on drawings. Field bend shall be cold bent and shall not be straightened and re-bent. Replace if cracks or splits develop.

PART 3 - EXECUTION

3.1 PLACING

.1 Reinforcement of size and layout shown on structural drawings shall be accurately placed and aligned. Place all dowels accurately.

.2 Reinforcing steel shall be placed to meet standard tolerances.

.3 Place reinforcing steel to minimize number of splices.

.4 Use non-staining supports and spacers for exposed concrete.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 The General Requirements shall form part of this section

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Requirements, and specific requirements outlined in the following sub-sections.

1.2 DESCRIPTION

.1 This section specifies requirements for all plain and reinforced cast-in-place concrete as described herein and as shown on the Drawings, or reasonably implied to provide a complete structure.

1.3 REFERENCE STANDARDS

.1 Do cast-in-place concrete work in accordance with the latest issues of:

.1 CSA CAN3-A23.1 - Concrete Materials and Methods of Concrete Construction.

.2 CSA CAN3-A23.2 - Methods of Test for Concrete.

.3 CSA CAN3-A23.3 - Code for the Design of Concrete Structures for Buildings.

.4 ACI 350 - Environmental Engineering Concrete Structures.

.2 Keep a current copy of the above CSA Standards on site for the duration of the work. "Standard" referred to later in this Specification refers to these CSA Standards.

1.4 RELATED SECTIONS

.1 Section 03 10 00 - Concrete Forming and Accessories

.2 Section 03 20 00 – Concrete Reinforcing

1.5 MIX DESIGN SUBMISSION

.1 Submit certified copy of mix design conforming to specified requirements.

1.6 CONCRETE TESTING

.1 Contractor to employ an independent testing firm to make the required field and laboratory tests in accordance with the Standard for field control of concrete quality during construction. Make available materials, space, and equipment as are necessary for the tests.

PART 2 - PRODUCTS

MATERIALS

.1 Cement: Refer to Structural Notes and Drawings for type.

.2 Water, fine aggregates, Group 1, normal weight coarse aggregates: to CSA CAN3-A23.1, unless otherwise specified.

.3 Non-shrink grout: premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 50 MPa at 28 days.

2.2 CONCRETE

.1 Concrete shall be suitable for F2 exposure class (25 Mpa @ 28 days) with max aggregate size 20 mm, entrained air 4% - 1% and 100 mm max slump.

PART 3 - EXECUTION

3.1 FIELD REVIEW

.1 Refer to Section 03 20 00 – Concrete Reinforcing

3.2 CONCRETE PLACING

.1 Concrete placing method shall prevent segregation, ensure homogeneous concrete without voids, and ensure reinforcement and inserts are not disturbed.

.2 Prepare previously placed concrete by cleaning with steel brush and applying bonding agent according to manufacturer's instruction.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement. Have reinforcing steel worker in attendance during pour.

3.3 INSERTS

.1 Correctly position all pipes, sleeves, bolts, hangers and other inserts in the concrete as required by other trades or as shown on the Drawings.

3.4 FORMWORK

.1 Refer to Section 03 10 00 - Concrete Forming and Accessories.

3.5 CONSTRUCTION JOINTS

.1 Construction joint details and locations to be submitted to Departmental Representative for review.

3.6 FINISHING

.1 Formed Surfaces: finish to the requirements of the Standard and as shown on Drawings.

.2 Unformed surfaces: finish to the requirements of the Standard. The degree of finishing as defined below shall be noted on the Drawings or in the Special Specifications.

CSA Standards: Slab & Floor Finish Classifications:

.1 Class A - Conventional (smooth):

Steel trowel finish with hand screeding; free of trowel marks and ridges. Straightedge tolerance = ± 8mm. FF = 20, FL = 15, and SWI = 5mm.

.2 Class B - Conventional (nonslip):

Broom or float finish with hand screeding. Straightedge tolerance = ± 12mm. FF = 15, FL = 15mm, and SWI = 8mm.

.3 Class C - Moderately flat:

Steel trowel finish with highway straightedge in alternate strip placements typically 10m to 15m wide. Straightedge tolerance = ± 5mm. FF = 30, FL = 20, and SWI = 3mm.

.4 Class D - Flat:

Steel trowel finish with highway straightedge in alternate strip placements 3m to 8m wide. Straightedge tolerance is not recommended. FF = 40 to 60, FL = 30 to 50, and SWI = 2mm.

3.7 TOLERANCES

.1 Construct formwork and falsework to meet standard tolerances and closer tolerances for specific items such as follows:

.1 Plumbness of columns and walls shall be within 1:400 measured at any one surface but total variation shall be not more than 40 mm for the total height of the structure.

.2 Surface of wall tolerance: See section 3.6 Finishing

.3 Level of floor tolerance: See section 3.6 Finishing

.2 Tolerances shall not be cumulative.

3.8 DEFECTIVE CONCRETE

.1 Remove and replace excessive honeycomb or embedded debris in concrete as directed by Departmental Representative.

3.9 PATCHING

.1 As directed by Departmental Representative.

3.10 CURING

.1 Cure concrete in accordance with the Standard. Obtain approval of the Departmental Representative for each method used.

3.11 FAILURE TO MEET REQUIREMENTS

.1 When any concrete is not in accordance with these Specifications or the Standard, obtain Departmental Representative's ruling on whether to remove and replace it or apply the remedies provided in the Standard to the Departmental Representative's approval.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 The General Instructions shall form part of this section.

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Instructions, and specific requirements outlined in the following sub-sections.

.3 The work of this section shall include the supply of all labour, material, equipment and supervision for the mechanical/fuel systems work as shown on the drawings and specified herein.

.4 All petroleum piping, sumps and ancillaries shall be CSA or ULC approved in accordance with applicable codes and regulations.

1.2 CODES

.1 Perform Work of this section in accordance with National Fire Code of Canada (NFCC2015) and Canadian Environmental Protection Act - Federal Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (CEPASTR2008).

PART 2 PRODUCTS

2.1 PETROLEUM PIPING AND FITTINGS

.1 Stainless Steel - 3" Ø:

.1	Pipe:	Stainless Steel, Seamless, ASTM A312, Type 316L, Sch.40
.2	Connections:	All butt welded unless shown otherwise on drawings
.3	Fittings:	ASTM A403, ASTM A960, MSS SP-43, ASTM B16.9, Type 316L
.4	Flanges:	Forged S.S., 150# RFWN, ASTM A182, ASME B16.5, Type 316L
.5	Gaskets:	Non Asbestos, Flat ring, 2mm Thick
.6	Bolting:	Stud bolts - ASTM A193, GR.B8M, Class 2
.7	Nuts:	ASTM A194, GR.B8M, Class 2

.2 Stainless Steel - 2" Ø and Less:

.1	Pipe:	Stainless Steel, Seamless, ASTM A312, Type 316L, Sch.40
.2	Connections:	All socket welded unless shown otherwise on drawings
.3	Fittings:	Forged S.S., 3000#, ASTM A182, ASME B16.11, Type 316L
.4	Flanges:	Forged S.S., 150# RFSW, ASTM A182, ASME B16.5, Type 316L
.5	Gaskets:	Non Asbestos, Flat ring, 2mm Thick
.6	Bolting:	Stud bolts - ASTM A193, GR.B8M, Class 2
.7	Nuts:	ASTM A194, GR.B8M, Class 2

.3 S.S. Flexible Hose:

.1 Type 304 Stainless Steel corrugated metal hose with single Type stainless steel 304 braid, RFSO flanges, overall length 450mm. CRN metal tag to be affixed to each hose. Sized as per drawings.

2.2 UNDERGROUND PVC DRAIN PIPING AND FITTINGS

.1 Pipe:

.1 PVC/DWV Pipe, certified to CSA B181.2 with solvent-weld connections unless noted otherwise on drawings.

.2 Joints:

.1 Solvent weld for PVC: to ASTM D2564.

.3 Flanges:

.1 PVC 150# flange with solvent-weld socket connection.

.4 Butterfly Valve:

.1 150Ø (6") PVC wafer style butterfly valve with polypropylene disc, Viton liners and seals c/w S.S. shaft and stem extension handle.

2.3 PETROLEUM VALVES

.1 Ball Valves:

.1 316 Stainless steel body and trim, 150# RF flanged connections, full port, ANSI B16.34, Class 150, PTFE seats and packing, sized as per drawings.

.2 Check Valves:

.1 316 Stainless steel, horizontal, swing type, 150# RF flanged connections, full port, ANSI B16.34, Class 150, PTFE gasket, sized as per drawings.

.3 Solenoid Valves:

.1 Stainless steel, two way, normally closed, 120 volts AC, 150# RF flanged connections, zero pressure differential, Viton seats, built in thermal relief c/w watertight enclosure rated for hazardous locations.

.4 Anti-siphon Valves:

.1 Hydrostatic pressure adjusting mechanism with durable weather cap, ductile iron-zinc plated body, zinc plated steel spring, stainless steel adjustment screw, disc with fluorocarbon seal, sized as per drawings, built in thermal relief and set @ 8 ft. diesel differential.

2.4 FILL CABINET

.1 AST remote spill container, 15-gallon capacity, 12-gauge stainless steel approved to CAN/ULC-S663 c/w four leg adjustable stand, lockable lid, booted entries and drain valve.

2.5 DISPENSER PEDESTAL/SUMP

.1 AST dispenser pedestal, 12-gauge stainless steel, 18-gallon capacity c/w stabilizer bar kit and flexible entry boots.

2.6 ABOVEGROUND STORAGE TANKS

.1 The drawings provided show a conceptual arrangement for the storage tanks. The Tank Manufacturer shall supply certified shop drawings for approval prior to commencing manufacture. Tanks/tank manufacturer must be approved by the Departmental Representative prior to purchase.

.2 20,000L Split compartment storage tank:

.1	Quantity:	One (1) tank required
.2	Capacity:	20,000L Split Dual Compartment – 12,500L Gasoline, 7,500L Diesel
.3	Orientation:	Horizontal cylindrical
.4	Material:	Steel
.5	Support:	Saddles and bands. A 1/8" thick neoprene gasket shall be installed between the outer tank shell and the support saddles and restraining bands to prevent coating damage.
.6	Standard:	ULC-CAN-S601 labeled as per standard
.7	Style:	Double-walled, split compartment, with vacuum monitored interstice.
.8	Nozzles:	As per Fitting Schedule on Drawings
.9	Dipstick:	Dipstick and chart to be included with tank
.10	Spill Box:	Integral tank top spill box as per drawings, min. 30 litre capacity c/w lockable hinged lid and drain valve.
.11	Overfill Valve:	AST Overfill prevention valve, valve shall be set at 95% of tank capacity, sized as per drawings.
.12	Anchors:	Tank manufacturer shall provide seismic anchors, designed to comply with the National Building Code, and certified by a Professional Engineer registered in the Province of British Columbia, for mounting tank to concrete pad.
.13	Grounding Tab:	Two grounding tabs shall be provided on the tank shell and shall have a 15mmØ (1/2") hole for attachment of cable lug to tank. Grounding tabs shall be located on opposite ends of the tank.
.14	Lifting Lugs:	Lifting lugs shall be provided such that the tank and support can be lifted together as a unit.

.15 Painting Exterior:

- .1 Prepare surfaces to be coated to conform to SSPC SP6 Commercial Blast Cleaning with a minimum 1 to 3 Mils Angular Surface Profile
- .2 Primer Coat: Apply one coat of Epoxy Mastic at 4-6 mils dft
- .3 Top Coat: Apply one coat of two component acrylic aliphatic urethane at 3-5 Mils DFT
- .4 Colour: 6813 (White)

.16 Stair & Platform: Access stairs and platform shall be provided for the tank as per drawings. Platform and stair treads shall be galvanized and bolted to stringers. Stringers and other structural steel elements shall be prepared and coated as per the tank painting specification. The stairs and platforms shall conform with the National Building Code and WorkSafeBC standards.

.17 Decals: The tank shall be marked in conformance with CPPI, "Using the CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification" as well as any requirements of ULC CAN-S601. The sides of each compartment of the tank shall be decaled in 4" tall black letters and positioned to be in clear view, un-obscured by stair and platform as shown below, information below will be provided during construction:

"PRODUCT I.D." (Gasoline or Diesel)
"MAXIMUM FILL: XX,XXX LITRES (XXX CM)"
"EC-XXXXXXXX"
"CSC TANK NUMBER"

.3 25,000L storage tank:

.1 Quantity: One (1) tank required

.2 Capacity: 25,000L Diesel

.3 Orientation: Horizontal cylindrical

.4 Material: Steel

.5 Support: Saddles and bands. A 1/8" thick neoprene gasket shall be installed between the outer tank shell and the support saddles and restraining bands to prevent coating damage.

.6 Standard: ULC-CAN-S601 labeled as per standard

.7 Style: Double-walled with vacuum monitored interstice.

.8 Nozzles: As per Fitting Schedule on Drawings

.9 Dipstick: Dipstick and chart to be included with tank

.10 Spill Box: Integral tank top spill box as per drawings, min. 30 litre capacity c/w lockable hinged lid and drain valve.

.11 Overfill Valve: AST Overfill prevention valve, valve shall be set at 95% of tank capacity, sized as per drawings.

.12 Anchors: Tank manufacturer shall provide seismic anchors, designed to comply with the National Building Code, and certified by a Professional Engineer registered in the Province of British Columbia, for mounting tank to concrete pad.

.13 Grounding Tab: Two grounding tabs shall be provided on the tank shell and shall have a 15mmØ (1/2") hole for attachment of cable lug to tank. Grounding tabs shall be located on opposite ends of the tank.

.14 Lifting Lugs: Lifting lugs shall be provided such that the tank and support can be lifted together as a unit.

.15 Painting Exterior:

.1 Prepare surfaces to be coated to conform to SSPC SP6 Commercial Blast Cleaning with a minimum 1 to 3 Mils Angular Surface Profile

.2 Primer Coat: Apply one coat of Epoxy Mastic at 4-6 mils dft

.3 Top Coat: Apply one coat of two component acrylic aliphatic urethane at 3-5 Mils DFT

.4 Colour: 6813 (White)

.16 Stair & Platform: Access stairs and platform shall be provided for the tank as per drawings. Platform and stair treads shall be galvanized and bolted to stringers. Stringers and other structural steel elements shall be prepared and coated as per the tank painting specification. The stairs and platforms shall conform with the National Building Code and WorkSafeBC standards.

.17 Decals: The tank shall be marked in conformance with CPPI, "Using the CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification" as well as any requirements of ULC CAN-S601. The sides of the tank shall be decaled in 4" tall black letters and positioned to be in clear view, un-obscured by stair and platform as shown below, information below will be provided during construction:

"DIESEL"
"MAXIMUM FILL: XX,XXX LITRES (XXX CM)"
"EC-XXXXXXXX"
"CSC TANK NUMBER"

2.7 MISCELLANEOUS

.1 Supply and installation of signs printed on reflective Di-Bond, with black lettering on a white background and mounted at conspicuous locations as shown below. The information on the "Fill Procedures" and "Environmental Emergency Response" signs will be provided to the Contractor during construction. Contractor to submit "proofs" to the Departmental Representative prior to ordering the signs.

LETTERING	LOCATION	SIZE	QUANTITY
"Fill Procedures"	Mount to fencing adjacent to fill cabinets	16"W x 24"H	2 total, 1 for each tank
"Emergency Response"	Mount to fencing at tank area	16"W x 24"H	2 total, 1 at each tank area
DANGER FUEL STORAGE NO SMOKING	Mount to fencing at tank area	14"W x 10"H	8 total, 4 at each tank area.
CAUTION HANDLE FUEL CAREFULLY AVOID SPILLAGE	Mount to fencing adjacent to fill cabinets	14"W x 10"H	1
NO SMOKING WITHIN 7.5M TURN OFF IGNITION	At dispensing area	14"W x 10"H	1

2.8 PIPE IDENTIFICATION LABELS

.1 High performance, wrap-around, Size 1 pipe marker or approved equal for corresponding pipe diameter, ¾" black letters on yellow background with arrows in one direction. Piping to be identified as Diesel and/or Gasoline.

PART 3 EXECUTION

3.1 THREADED PIPING

.1 Threaded joints shall have clean-cut threads and be reamed clean. Joints shall be made using an approved pipe compound.

3.2 WELDED PIPING

.1 Welded piping shall conform to ANSI B31.3 "Chemical Plant and Petroleum Refinery Piping", latest edition, and all applicable Federal, Provincial and/or local codes, regulations and bylaws using procedures conforming to AWS B3.0, AWS C1.1 and all applicable provincial and federal codes.

.2 Contractor shall be responsible for the welding done by personnel of its organization and subcontractor and shall conduct the required qualification test to qualify the welding procedures and the welders. Non destructive examination shall be as per the requirements of ASME B31.3 and is to include full radio graphic examination of 5% of all welds.

.3 All welders shall be qualified to Section IX of the ASME Code and shall hold current Provincial tickets.

.4 Contractor's welding procedures, including welding procedure qualification records, shall be submitted for approval when requested by the Departmental Representative. Welding shall not be performed prior to Departmental Representative's approval of welding procedures and qualifications.

3.3 CLEANING OF PIPE

.1 Each length of pipe must be internally swabbed before being tied into the line. Contractor shall take all precautions to ensure that each pipe length is kept as free of dirt and other foreign materials as is practicable. Open ends of installed pipe shall be securely closed on completion of each day's work and shall not be opened until work is resumed.

.2 Any obstructions, which may occur in the line shall be removed by the Contractor and the line must be delivered to the Owner entirely free from water, dirt and other foreign substances. If for any reason, water, dirt, or foreign substances enter the line, it shall be taken apart, examined, cleared and replaced at the Contractor's expense.

3.4 TESTING OF STEEL PIPE

.1 Cleaning of the lines shall be done before testing.

.2 All new aboveground piping shall be pneumatically tested at 100 psig. Minimum test time shall be two hours. All joints shall be soap tested and inspected. The pressure must not drop more than 2 psi during this period, otherwise the leak source must be located, remedied and a retest performed. The piping shall also be tested by visual inspection for leaks during commissioning; both when the system is operating at full flow rate and when shut down.

.3 Contractor shall layout and perform all pressure testing activities, including installation and removal of test blinds and test gaskets to isolate equipment, and shall furnish and install all hoses, tools, gauges, recorders and equipment required to make the tests.

.4 All tests shall be carried out in the presence of the Departmental Representative. Corrections including, but not limited to, tightening or remaking of threaded connections, cleaning of plugged lines and removal of debris, shall be done by the Contractor, at his expense, to the satisfaction of the Departmental Representative.

.5 The Contractor shall isolate pumps, tanks, filters, dispensers and all other sensitive items rated lower than the test pressure.

.6 Records shall be made of each system tested and shall include date of test, identification of piping tested, test medium, test pressure, test temperature, signature of person responsible and Engineer.

3.5 TESTING OF HOSES

.1 All hoses shall be supplied pre-tested at 150 psig. Tags bearing the date of test and test pressure shall be affixed to each hose assembly.

3.6 PVC DRAINAGE PIPING:

.1 Install in accordance with National Plumbing Code and local authority having jurisdiction and to following standards except where specified otherwise.

.2 PVC drainage piping shall be installed in accordance with the manufacturer's instructions. Completed piping shall be air tested, prior to backfilling, in accordance with the "IPEX PVC Sewer Pipe Installation Guide"

3.7 PAINTING

.1 All miscellaneous steel members (pipe supports, etc.) shall be properly cleaned and painted per the following painting specification:

.1 Prepare surfaces to be coated to conform to SSPC SP6 Commercial Blast

.2 Apply two (2) coats, (2.5-3 mils dft/coat) self-priming satin gloss industrial enamel. Colour - White

3.8 PIPE IDENTIFICATION

.1 Provide pipe identification labels to clearly identify all piping and the direction of flow in the piping.

.2 Apply pressure sensitive markers in accordance with manufacturer's recommendations with complete wrap around.

.3 Any markings showing dog ears, bubbles or other failings shall be replaced.

.4 Apply pipe legend and arrow indication for each pipe run. Apply pipe legend and arrow indication within 80 mm of each valve to show proper identification of pipe contents and direction of flow.

.5 The legend shall be applied to the pipe so that the lettering is in the most legible orientation. For overhead piping, apply so that the legend may be read from floor or ground level.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 The General Requirements shall form part of this section.

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Requirements, and specific requirements outlined in the following sub-sections.

1.2 REFERENCE STANDARDS

.1 Complete installation in accordance with the Canadian Electrical Code – Part 1 (CSA 22.1). Note: All references are to latest edition at tender date.

1.3 SHOP DRAWING AND PRODUCT DATA

.1 Submit shop drawings and product data for electrical equipment in accordance with Section 01 01 50 General Instructions.

1.4 CARE, OPERATION AND START-UP

.1 Instruct Departmental Representative and operating personnel in the operation, care and maintenance of equipment.

.2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.

PART 2 PRODUCTS

2.1 GENERAL

.1 All products shall be ULC or CSA certified.

2.2 DISPENSER PEDESTAL/SUMP SENSORS

.1 Universal liquid sump sensor c/w explosion proof junction box.

.2 Sensors to be compatible with existing Incon TS-550 tank monitoring console

2.3 LEVEL PROBES

.1 Magnetostrictive level probe c/w product and water float, probe installation kit and explosion proof junction box.

.2 Length to suit tank diameter.

.3 Level probes to be compatible with existing Incon TS-550 tank monitoring console.

2.4 VACUUM SWITCHES

.1 Normally open on shelf. Switch closed under vacuum (25" Hg) and opens on vacuum leak c/w explosion proof junction box and SPDT contacts.

.2 Switches to be compatible with existing Incon TS-550 tank monitoring console.

2.5 EMERGENCY STOP CONTACTOR

.1 3 Pole, 3 phase, 30A, 208V contactor c/w 120V coil voltage and NEMA Type 1 general purpose enclosure sized to suit contactor.

2.6 HAZARDOUS CIRCUITS PANEL

.1 120/208V, 60A, 3 Phase, 4 wire, 24 circuit panel c/w circuit breakers as per drawings.

.2 Panel to be labelled "Panel BB".

2.7 CONDUIT

.1 Rigid galvanized steel conduit and fittings unless shown otherwise on drawings.

.2 Explosion-proof Flexible Conduit: ¾" Ø unless shown otherwise on drawings. Cl. I, Div. 1 & 2, Group B, liquid-tight, threaded ends, length to suit, exterior stainless steel braiding, bonded.

.3 Explosion-proof Conduit Seals: Feraloy body EYS, Cl. I, Div. 1 & 2, Group B c/w approved sealing compound.

.4 Boxes and fittings for use with galvanized steel conduit systems shall be Feraloy or equivalent. Boxes shall have threaded hubs for conduit connections.

2.8 JUNCTION BOXES

.1 General: As per CSA 22.1 Feraloy iron body.

.2 Explosion Proof: Feraloy iron body, Cl. I, Div. 1 & 2, Group B, Rain Tight, 2 Hub for rigid conduit, threaded hubs for conduit connections.

2.9 WIRE AND CABLE

.1 Unless otherwise noted or specified, all wiring shall be copper, with RW90 X-link polyethylene insulation.

.2 TECK 90, 600V, galvanized steel armoured cables c/w explosion proof connectors.

.3 Minimum conductor size for power circuits shall be #12AWG, and for control circuits shall be #14AWG except as noted.

.4 All conductors shall be stranded.

.5 Cable sizing shall be as indicated on drawings, in specifications or, if not indicated, as per CSA 22.1

PART 3 EXECUTION

3.1 CODE COMPLIANCE

.1 The installation shall comply in all respects with the Canadian Electrical Code CSA 22.1 (latest edition) and in particular sections 20, 18 and 10 and with all other applicable provincial and local building and electrical codes.

.2 Where there is a conflict with the drawings, the above code, rules and bylaws shall govern, but in no case shall the standards established on these drawings and specifications be reduced by any of these codes, rules or bylaws.

3.2 EQUIPMENT INSTALLATION

.1 The installation of all electrical equipment shall be in accordance with the manufacturer's instructions. The Contractor is responsible for obtaining certified drawings, operating/maintenance manuals and installation instructions from the supplier at the time of purchase. The Contractor shall submit certified data/shop drawings to the Departmental Representative prior to proceeding with the work.

.2 Supply and install grounding and bonding systems, as shown on drawings, and in accordance with CSA 22-1, for all service panels, wiring systems, equipment enclosures, lighting and electric motors.

3.3 EQUIPMENT IDENTIFICATION

.1 All equipment shall be clearly identified with lamicoid labels having minimum 3mm white letters on black background. Dymo tape labels are not acceptable.

3.4 PERMITS AND INSPECTIONS

.2 The Contractor shall obtain all permits and licenses and arrange for the final inspection of the works with the local Provincial Electrical inspector. All costs related to the permitting, licensing and inspection(s) shall be borne by the Contractor. Certificate(s) of inspection shall be submitted to the Departmental Representative.

3.5 TESTING

.1 The Contractor shall test all wiring point to point for continuity and insulation to ground. The installation shall also be tested for proper operation prior to handover.

3.6 FINISHES

.1 Clean and touch up surfaces of shop painted equipment which is marred or scratched during shipment or installation, to match original paint.

.1 Clean, prime and paint exposed hangers, racks, fastening to prevent rusting.

3.7 MANUFACTURER'S AND CSA LABELS

.1 Manufacturers' nameplates and CSA labels to be visible and legible after equipment is installed.

3.8 MANUFACTURER'S INSTRUCTIONS

.1 Follow manufacturer's instructions unless they contradict or reduce the stipulations of these specifications, applicable codes or regulations of an authority having jurisdiction. In such cases of conflict consult the Departmental Representative for a ruling, which shall be binding.

3.9 DELIVERY AND STORAGE

.1 Deliver and store on site material required for the progress of the work.

.2 All electrical equipment must be stored indoors.

3.10 QUALIFICATIONS

.1 Contractor to have qualified personnel to continuously direct and monitor all electrical work.

3.11 PROTECTION

.1 Protect exposed live equipment during construction for personnel safety.

3.12 DRAWINGS AND SPECIFICATIONS

.1 Specifications and related plans establish scope, material and installation quality but do not necessarily show offsets, fittings or installation difficulty that may be encountered during the execution of the work and therefore cannot be used as a claim for any such deficiency of omission.

.2 Where work that is obviously necessary for the operation of the system is not shown on the drawings or described in the Specifications; such work shall be carried out in a manner acceptable to the Departmental Representative at no additional cost.

.3 It shall be the responsibility of the Contractor to study all drawings and specifications, and understand the work thoroughly, taking into consideration requirements for each trade involved.

.4 In case of ambiguity, due to conditions at the site, information omitted or insufficient, conflict of requirements of different trades affecting the same portion of work, and so on, the Contractor shall notify the Departmental Representative in writing and obtain necessary clarification. Failure to do this prior to tendering will not relieve or provide grounds for additional costs. The Departmental Representative's decision on all matters shall be final and binding upon the Contractor.

.5 Drawings:

.1 Not intended to show structural details or architectural features unless specifically noted.

.2 Do not scale.

.3 Except where dimensioned, drawings indicate general electrical only. Furthermore, proper precautions shall be exercised to verity figures shown on the drawings.

.4 The drawings are diagrammatic and indicate the general arrangements of the systems and work included in this Contract. Exact locations of fixtures and equipment, where same are not definitely located, must be checked with the Departmental Representative prior to the installation of same.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 Reference Standards:

.1 American National Standards Institute /Institute of Electrical and Electronics Engineers (ANSI/IEEE)

.1 ANSI/IEEE 837, IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding.

PART 2 PRODUCTS

2.1 EQUIPMENT

.1 Grounding Reel:

.1 Steel with red enamel housing w/ automatic retraction, 50' cable length, 3/32" dia. 7 x 7 galvanized carbon steel meeting MIL spec W-83420 cable construction c/w 100 amp alligator-type solid copper jaw grip.

.2 Rod electrodes: copper clad steel 19 mm diameter by 3 m long.

.3 Grounding conductors: bare stranded copper, soft annealed, size as indicated.

.4 Insulated grounding conductors: green, stranded copper type RW90-XLPE.

.5 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:

.1 Grounding and bonding bushings.

.2 Protective type clamps.

.3 Bolted type conductor connectors.

.4 Thermit welded type conductor connectors.

.5 Bonding jumpers, straps.

.6 Pressure wire connectors.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL

.1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories. Where PVC or EMT is used, run ground wire in conduit.

.2 Install ground rods and ground rod inspection boxes as recommended by the manufacturer. Install box level and flush to the pavement/grade.

.3 Install connectors in accordance with manufacturer's instructions.

.4 Protect exposed grounding conductors from mechanical injury.

.5 Make buried connections, and connections to electrodes, using copper welding by thermit process, permanent mechanical connectors or irreversible wrought copper compression connectors to ANSI/IEEE 837.

.6 Use mechanical connectors for grounding connections to equipment provided with lugs.

.7 Soldered joints not permitted.

.8 Install bonding wire for flexible conduit, connected at one ends to grounding bushing, solderless lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.

.9 Install flexible ground straps for bus duct enclosure joints, where such bonding is not inherently provided with equipment.

.10 Make grounding connections in radial configuration only, with connections terminating at single grounding point. Avoid loop connections.

3.2 ELECTRODES

.1 Install rod electrodes and make grounding connections as indicated.

.2 Bond separate, multiple electrodes together.

.3 Use copper conductors for connections to electrodes; size as indicated on drawings.

.4 Make special provision for installing electrodes that will give acceptable resistance to ground value where rock or sand terrain prevails. Ground as indicated.

3.3 EQUIPMENT GROUNDING

.1 Install grounding connections to typical equipment included in, but not necessarily limited to following list:

- .1 Service equipment;
- .2 Transformers;
- .3 Switchgear;
- .4 Raceway systems including cable tray;
- .5 Frames of motors;
- .6 Motor control centers;
- .7 Process Piping
- .8 Starters;
- .9 Control panels;
- .10 Building steel work;
- .11 Generators;
- .12 Distribution panels;
- .13 Outdoor lighting and parking receptacles;
- .14 Motor shaft grounding devices where provided. See motor specifications in Division 25.

.15 Low voltage and telecommunications systems including but not limited to cabinets, racks, patch panels, electronics, device boxes, etc.

3.4 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 – Electrical Systems.

.2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.

.3 Perform tests before energizing electrical system.

.4 Disconnect ground fault indicator during tests.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 The General Instructions shall form part of this section.

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Instructions, and specific requirements outlined in the following sub-sections.

.3 Section 31 05 16 refers to those portions of the work that are unique to the supply and processing of aggregates. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.2 RELATED SECTIONS

.1 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 APPROVALS

.1 Inform Departmental Representative of proposed source and provide samples or access for sampling at least 2 weeks prior to commencing production.

.2 If materials from proposed source do not meet specified requirements, locate alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Should a change of material source be proposed during work, advise Departmental Representative 2 weeks in advance of proposed change to allow sampling and testing.

.4 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.

1.4 PRODUCTION SAMPLING

.1 Aggregate will be subject to continual sampling during production.

.2 Provide Departmental Representative with ready access to source and processed material for purpose of sampling and testing.

.3 Bear the cost of sampling and testing of aggregates which fail to meet specified requirements.

1.5 MEASUREMENT FOR PAYMENT

.1 Payment for all work performed under in this Section will be incidental to payment for work described in other Sections unless shown otherwise in Form of Tender.

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.

.2 All crushed gravel when tested according to ASTM C136 and ASTM C 1 17, 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. 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 granular material obtained within limits of Contract may be deemed native material for purposes of payment if it meets specifications of granular material. Native material not acceptable if it is impracticable to control its water content or compact to specified density.

2.3 GRANULAR BASE

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

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

2.4 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	% Passing
75 mm	100
25 mm	50-85
0.150 mm	0-15
0.075 mm	0-8

2.5 GRANULAR SUB-BASE

.1 Granular Backfill: Clean, angular, well graded pit run gravel and quarry tailings, free from silt, shale, clay, friable materials and organic matter.

2.6 GRANULAR PIPE BEDDING

.1 Crushed or graded gravels: to conform to following and Surround Material gradations (not be used for the bedding of fuel piping):

Sieve Designation	% Passing Type 1	Type 2
25 mm	100	100
19 mm	90-100	90-100
12.5 mm	65-85	70-100
9.5 mm	50-75	-
4.75 mm	25-50	40-70
2.36 mm	10-35	25-52
1.18 mm	6-36	15-38
0.600 mm	3-17	6-27
0.300 mm	-	3-20
0.075 mm	0-5	0-8

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 hours of rejection.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 The General Requirements shall form part of this section.

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Requirements, and specific requirements outlined in the following sub-sections.

1.2 RELATED WORK

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

.2 Section 31 05 16 Aggregates and Granular Materials

1.3 REFERENCES

.1 ASTM C136 Method for Sieve Analysis of Fine and Coarse Aggregates

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

1.4 DEFINITIONS

.1 Compaction densities referred to in this section are modified maximum dry densities as determined by ASTM D1557 (Modified Proctor Density or MPD)

.2 Rock Excavation: excavation of material from solid masses of igneous, sedimentary of metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders of rock fragments having an individual volume in excess of 1m3 which cannot be removed by ripping as described in common excavation.

.3 Common Excavation: excavation of materials which do are not included under the definition of rock excavation, including dense tills, hardpans, frozen materials, ans partially cemented materials which can be ripped using a D9 or D235 Caterpillar or equivalent equipment with a single ripper tooth.

1.5 PROTECTION OF EXISTING FEATURES

.1 Existing buried utilities and structures:

.1 The location, size and burial depth of existing buried utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed. Contractor shall use ground penetrating radar to identify all services prior to excavation.

.2 Prior to excavation, the Contractor shall locate shut-off devices for any/all utilities that may be affected by the work and make preparations to operate these in event of an emergency.

.3 Whenever working in the vicinity of utilities, locate and expose all utilities using hand labour as required.

.4 Maintain and protect all utilities and structures encountered in the work. Obtain direction of the Departmental Representative before moving or otherwise disturbing utilities or structures.

.5 Advise the Departmental Representative to re-route existing lines in area of excavation. Costs for such work will be paid by Owner.

.6 Record location of maintained, re-routed and abandoned underground lines.

1.6 SHORING, BRACING AND UNDERPINNING

.1 Comply with Section 01 35 33 – Health and Safety Requirements and applicable local regulations and to protect existing features.

.2 Engage services of qualified professional engineer who is registered in province or territory in which work is to be carried out to design and inspect shoring, bracing and underpinning required for work.

.3 At least 2 weeks prior to commencing work, submit design and supporting data.

.4 Design and supporting data submitted to bear the stamp and signature of qualified Professional Engineer registered in the Province of British Columbia.

.5 Professional Engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is employee of Contractor, in which case Contractor shall submit proof that work by professional engineer is included in Contractor's insurance coverage.

1.7 MEASUREMENT FOR PAYMENT

.1 All units of measurement for payment will be as specified herein unless shown otherwise in Form of Tender.

.2 With the exception of payment for rock excavation, payment for all work performed under this Section will be incidental to payment for work described in other Sections.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Refer to Section 31 05 16 – Aggregates and Granular Materials for specifications for granular materials indicated on Contract Drawings

.2 Structural Backfill:

.1 Structural backfill shall be free-draining granular material.

.2 Free-draining granular source shall be located by the Contractor and submitted for review by the Departmental Representative. It may include blasted rock, washed rock, etc.

.3 General Fill:

.1 Clean, angular, well graded pit run gravel and quarry tailings, free from silt, shale, clay, friable materials and organic matter.

PART 3 EXECUTION

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Protect existing buildings and surface features which may be affected by the work from damage while the work is in progress and repair damage resulting from the work to the satisfaction of the Departmental Representative.

3.2 STOCKPILING

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

.2 Protect stockpiles from erosion, contamination and saturation by grading to shed water and covering with tarps.

3.3 SHORING, BRACING AND UNDERPINNING

.1 Construct temporary works to depths, heights and locations as indicated or approved by Departmental Representative.

.2 During backfill operation:

.1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least [500] mm above toe of sheeting.

.4 When sheeting is required to remain in place, cut off tops at elevations indicated or directed by Departmental Representative.

.3 Upon completion of substructure construction:

.1 Remove shoring and bracing.

.2 Remove excess materials from site and restore water courses to conditions indicated or as directed by Departmental Representative.

3.4 DEWATERING

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

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

.3 Dispose of water in a manner not detrimental to public health, environment, public and private property, or any portion of the work completed or under construction.

3.5 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions shown on the drawings.

.2 Remove concrete, masonry, paving, walks, demolished foundations and rubble, and other obstructions encountered during excavation.

.3 Excavation must not interfere with normal 45° splay of bearing from bottom of any footing.

.4 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw. Seal cuts with approved tree wound dressing.

.5 For trench excavation, unless otherwise authorised by Departmental Representative in writing, do not excavate more than 30m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.6 Dispose of surplus and unsuitable excavated material off site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.9 Notify Departmental Representative when soil at bottom of excavation appears unsuitable and proceed as directed by Departmental Representative.

.10 Obtain Departmental Representative approval of completed excavation.

.11 Remove unsuitable material from trench bottom to extent and depth directed by Departmental Representative.

.12 Where required due to unauthorized over-excavation, correct as follows:

.1 Fill under bearing surfaces and footings with concrete specified for footings.

.2 Fill under other areas with granular backfill compacted to minimum of 95% of Modified Proctor Density.

.3 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

.13 Excavate rock to 150mm below pipe inverts.

.14 Stockpile suitable excavated materials required for trench backfill in approved location.

.15 Dispose of surplus and unsuitable excavated material offsite as directed by Departmental Representative.

3.6 BACKFILLING

.1 Vibratory compaction equipment: rollers and plate compactors sized as necessary to achieve required compaction. Use of backhoe mounted vibratory compactors will require written permission of Departmental Representative.

.2 Do not proceed with backfilling operations until Departmental Representative has inspected and approved installations.

.3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.4 Do not use backfill material which is frozen or contains ice, snow or debris.

.5 Backfilling around installations.

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in- place concrete within 24 hr after placing.

.3 Place layers simultaneously on both sides of installed work to equalise loading. Difference not to exceed 50mm.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative or:

.2 If approved by Departmental Representative erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative.

.5 Place material by hand under, around and over installations until 600 mm of cover is provided. Dumping material directly on installations will not be permitted.

.6 Place backfill material in uniform layers not exceeding 200 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

3.7 COMPACTION

.1 Compact all material placed under this Section to minimum 95% Modified Proctor Density (MPD) unless indicated otherwise.

.2 Compact using approved compacting equipment or mechanical tamping devices, or by hand tamping to achieve specified compaction.

.3 Perform proof rolling with fully loaded dump truck (or other equipment approved by the Departmental Representative) upon completion of fine grading and compaction. Make sufficient passes with the proof roller to subject every point on the surface to three separate passes of the loaded tire. Excavate, re-backfill, and re-compact (to the satisfaction of the Departmental Representative) those areas where proof rolling reveals unsuitable subgrade.

3.8 FILL PLACEMENT – GENERAL FILL

.1 Place general fill in uniform layers not exceeding 300 mm uncompacted thickness.

.2 Compact each layer to a minimum 95% MPD.

.3 Take measures to protect placed material from erosion by wave action or storm run-off and to confine material to the limits indicated on the drawing.

.4 Take measures to ensure that placement of fill does not increase turbidity levels in surrounding waters.

3.9 RESTORATION

.1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by Departmental Representative.

.2 Replace topsoil as indicated or directed by Departmental Representative.

.3 Clean and reinstate areas affected by work as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 12 13.23 Asphalt Prime

.2 Section 32 12 16 Asphalt Paving

1.2 REFERENCES

.1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in Section 32 12 16 - Asphalt Paving.

1.3 SAMPLES

.1 Provide access on tanker for Departmental Representative to sample asphalt material to be incorporated into work, in accordance with ASTM D140.

1.4 ASPHALT MATERIAL CERTIFICATION

.1 Upon request by Departmental Representative, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this section.

Part 2 Products

2.1 MATERIALS

.1 Emulsified asphalt: to CAN/CGSB-16.2, grade SS-1.

Part 3 EXECUTION

3.1 EQUIPMENT

.1 Refer to 32 12 13.23 Asphalt Prime..

3.2 APPLICATION

.1 Obtain Departmental Representative's approval of surface before applying asphalt tack coat.

.2 Dilute asphalt emulsion with water at 1:1 ratio for application. Mix thoroughly by pumping or other method as required.

.3 Apply tack coat to pavement surface at rate as required but do not exceed 0.7 L/m2 when diluted with water at 1:1 ratio.

.4 Apply only on clean, dry surface.

.5 Paint contact surfaces of curbs, gutters, manholes and like structures with thin, uniform coat of asphalt tack coat material.

.6 Do not apply asphalt tack coat when air temperature is less than 5°C or When rain is forecast within 2 h of application.

.7 Apply tack coat only to surfaces that are expected to be overlayed on same day.

.8 Evenly distribute excessive deposits of tack coat by brooming.

.9 Where traffic is to be maintained, treat no more than one half of width surface in one application.

.10 Keep traffic off tacked areas until tack coat has cured.

.11 Re-tack contaminated or disturbed areas.

.12 Permit tack coat to cure before placing asphalt paving.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 12 13.16 Asphalt Tack Coat

.2 Section 32 12 16 Asphalt Paving

1.2 REFERENCES

.1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in Section 32 12 16 - Asphalt Paving.

1.3 SAMPLES

.1 Provide access on tanker for Departmental Representative to sample asphalt material to be incorporated into work, in accordance with ASTM D140.

1.4 ASPHALT MATERIAL CERTIFICATION

.1 Upon request by Departmental Representative, submit manufacturer's test data and certification that asphalt tack coat material meets requirements of this section.

Part 2 Products

2.1 MATERIALS

.1 Asphalt material: to CAN/CGSB-16.1 grade RM-20, MC-70 or CAN/CGSB-16.2 grade SS-1h, as specified in Supplementary Specifications.

.2 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.

Part 3 EXECUTION

3.1 EQUIPMENT

.1 Pressure Distributor:

.1 Designed, equipped, maintained and operated so that asphalt material at even temperature may be applied uniformly on variable widths of surface up to 5 m at readily determined and controlled rates from 0.2 to 5.4 L/m2 with uniform pressure, and with an allowable variation from any specified rate not exceeding 0.1 L/m2.

.2 Capable of distributing asphalt material in uniform spray without atomization at temperature required.

.3 Equipped with meter registering metres of travel per minute visibly located to enable truck driver to maintain constant speed required for application at specified rate.

.4 Pump equipped with flow meter graduated in units of 5 L or less per minute passing through nozzles and readily visible to operator. Pump to operate by separate power unit independent of truck power unit.

.5 Equipped with an easily read, accurate and sensitive device which registers temperature of liquid in reservoir.

.6 Equipped with accurate volume measuring device or calibrated tank.

.7 Nozzles to be of same make and dimensions, adjustable for fan width and orientation.

.2 Hand Sprayer:

.1 For small and/or inaccessible areas, a pressurized hand-held spray wand may be used.

3.2 APPLICATION

.1 Obtain Departmental Representative's approval of granular base surface before applying asphalt prime.

.2 Cutback asphalt:

.1 Heat MC70 asphalt prime to 60 to 70°C for pumping and spraying in accordance with manufacturer's instructions. For other grades refer to appropriate material section.

.2 Apply asphalt prime to granular base at rate as required but do not exceed 2 L/m2.

.3 Apply on damp surface unless otherwise directed by Departmental Representative.

.3 Emulsified asphalt:

.1 Dilute asphalt emulsion with clean water at 1:1 ratio for application. Mix thoroughly.

.2 Apply diluted asphalt emulsion at rate as required but do not exceed 5L/m2.

.3 Apply on damp surface unless otherwise directed by Departmental Representative.

.4 Paint contact surfaces of curbs, gutters, manholes and like structures with thin, uniform coat of asphalt prime material.

.5 Do not apply prime when air temperature is less than 5°C or when rain is forecast within 2 h of application.

.6 Where traffic is to be maintained, treat no more than one-half width of surface in one application.

.7 Prevent excessive overlap at junction of spreads.

.8 Do not prime surfaces that will be visible when paving is complete.

.9 Apply additional prime to areas not sufficiently covered.

.10 Keep traffic off primed areas until asphalt prime has cured.

.11 Permit prime to cure before placing asphalt paving.

3.3 USE of Sand Blotter

.1 If asphalt prime fails to penetrate within 24 h, spread sand blotter material in amounts required to absorb excess material.

.2 Sweep and remove excess blotter material.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 12 13.16 Asphalt Tack Coat

.2 Section 32 12 13.23 Asphalt Prime

1.2 REFERENCES

.1 AASHTO MP1, Performance Graded Asphalt Binders

.2 Asphalt Institute MS-2, Mix Design Methods for Asphalt Concrete and Other Hot Mixes – Sixth Edition.

.3 ASTM C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.

.4 ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.5 ASTM C123, Standard Test Method for Lightweight Particles in Aggregate.

.6 ASTM C127, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.

.7 ASTM C128, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.

.8 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

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

.10 .ASTM D242, Standard Specification for Mineral Filler for Bituminous Paving Mixtures.

.11 ASTM D995, Standard Specification for Mixing Plants for Hot Mixed, Hot Laid Bituminous Paving Mixtures.

.12 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.13 ASTM D2950, Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.

.14 ASTM D3203, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

.15 ASTM D4469, Standard Practice for Calculating Percent Asphalt Absorption by the Aggregate in an Asphalt Pavement Mixture.

.16 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.17 ASTM D4867M, Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures.

.18 ASTM D5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.

.19 ASTM D6927, Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures.

.20 CAN/CGSB 8.2 M, Sieves, Testing, Woven Wire, Metric.

Part 2 Products

2.1 MATERIALS

.1 Asphalt cement: to AASHTO MP1, Performance Graded Asphalt Binder designation PG 64-22.

.2 Aggregates: Shall comply with the requirements of Section 31 05 16 – Aggregates and Granular Materials: General and following requirements:

.1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.2 Gradations shall be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes shall comply with CAN/CGSB 8.2-M.

	% Passing	
Sieve Designation	**Lower Course**	**Surface Course**
25.0 mm	100	--
12.5 mm	70-85	100
9.5 mm	--	75-90
4.75 mm	40-65	55-75
2.00 mm	30-50	35-55
0.425 mm	15-30	15-30
0.180 mm	5-20	5-20
0.075 mm	3-8	3-8

.3 Coarse aggregate is aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C136.

.4 When dryer drum plant or plant without hot screening is used, process fine aggregate through 4.75 mm sieve and stockpile separately from coarse aggregate.

.5 Do not use aggregates having polishing characteristics in mixes for surface courses

.6 Sand equivalent: to ASTM D2419. Min: 50.

.7 Magnesium Sulphate soundness: to ASTM C88. Max % loss by mass:

.1 Coarse aggregate, Surface course: 12.

.2 Coarse aggregate, Lower course: 12.

.3 Fine aggregate, Surface course: 16.

.4 Fine aggregate, Lower course: 16.

.8 Los Angeles degradation: Grading B (or C as appropriate), to ASTM C131. Max % loss by mass:

.1 Coarse aggregate, Surface course: 25.

.2 Coarse aggregate, Lower course: 30.

.9 Absorption: to ASTM C127. Max % by mass:

.1 Coarse aggregate, Surface course: 1.75.

.2 Coarse aggregate, Lower course: 2.00.

.10 Loss by washing: to ASTM C117. Max % passing 0.075 mm sieve:

.1 Coarse aggregate, Surface course: 1.5.

.2 Coarse aggregate, Lower course: 2.0.

.11 Lightweight particles: to ASTM C123. Max % by mass less than 1.95 relative density:

.1 Surface course: 1.5.

.2 Lower course: 3.0.

.12 Flat and elongated particles: to ASTM D4791 (with length to thickness ratio greater than 5): Max % by mass:

.1 Coarse aggregate, Surface Course: 10.

.2 Coarse aggregate, Lower Course: 10.

.13 Crushed fragments: to ASTM D5821. 100% of particles by mass within each of following sieve designation ranges, to have at least 1 freshly fractured face. Material to be divided into ranges, using methods of ASTM C136.

Passing		Retained on
25 mm	to	12.5 mm
12.5 mm	to	4.75 mm

.3 Mineral filler:

.1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non plastic mineral matter, thoroughly dry and free from lumps.

.2 Add mineral filler, meeting the requirements of ASTM D242, when necessary to meet job mix aggregate gradation to improve mix properties.

.3 Mineral filler to be dry and free flowing when added to aggregate.

2.2 MIX DESIGN

.1 Job mix formula shall be reviewed by the Departmental Representative.

.2 Design of mix: Marshall mix design method shall be used to proportion mix to satisfy the requirements below and as directed by Departmental Representative.

.1 Compaction blows on each face of test specimens: 75.

.2 Mix physical requirements:

Property	**Pavements**
Marshall Stability at 60˚C KN min	12.5 Lower course 12.5 Surface course
Flow Value Mm	2-4
Air Voids in Mixture, %	3-5 Lower course 3-5 Surface course
Voids in Mineral Aggregate, % min	13 Lower course 15 Surface course
Index of Retained Stability % minimum	80
Tensile Strength Ratio % (TSR)	80 minimum

.3 Measure physical requirements as follows:

.1 Marshall Stability and flow value: to ASTM D6927.

.2 Compute void properties on basis of bulk specific gravity of aggregate (to ASTM C127 and ASTM C128). Make allowance for volume of asphalt absorbed into pores of aggregate (to ASTM D4469).

.3 Air voids: to ASTM D3203.

.4 Voids in mineral aggregate: to Asphalt Institute MS 2, Chapter 4.

.5 Tensile Strength Ratio (TSR): measure in accordance with ASTM D4867M including the freeze-thaw conditioning cycle. Test specimens shall have an air void content of 6 to 8 percent and a degree of saturation of 55 to 80 percent.

.4 Do not change job mix without prior approval of the Departmental Representative. Should change in material source be proposed, new job mix formula to be reviewed by the Departmental Representative.

.5 Return plant dust collected during processing to mix in quantities compatible with the job-mix formula.

Part 3 EXECUTION

3.1 PLANT AND MIXING REQUIREMENTS

.1 Batch and continuous mixing plants:

.1 Shall comply with the requirements of ASTM D995.

.2 Heat asphalt cement and aggregate to mixing temperature directed by the Departmental Representative. Do not heat asphalt cement above 160°C.

.3 Before mixing, dry aggregates to a moisture content not greater than 0.5% by mass or to a lesser moisture content if required to meet mix design requirements. Heat to temperature required to meet mixing temperature.

.4 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, direct temperature of completed mix at plant and at paver after considering hauling and placing conditions.

.5 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders.

.6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job mix requirements.

.7 Store hot screened aggregates in a manner to minimize segregation and temperature loss.

.8 Maintain temperature of materials within plus or minus 5°C of specified mix temperature during mixing.

.9 Mixing time:

.1 In batch plants, continue wet mixing as long as necessary to obtain a thoroughly blended mix but not less than 30 seconds or more than 75 seconds.

.2 In continuous mixing plants, mixing time shall not be less than 45 seconds.

.2 Dryer drum mixing plant:

.1 Feed aggregates to burner end of dryer drum by means of a multi bin cold feed unit and blend to meet job mix requirements by adjustments of variable speed feed belts and gates on each bin.

.2 Meter total flow of aggregate by an electronic weigh belt system with an indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and asphalt entering mixer remain constant.

.3 Provide for easy calibration of weighing systems for aggregates without having material enter mixer.

.4 Make provision for conveniently sampling the full flow of materials from the cold feed.

.5 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum.

.6 Provide a system interlock which will stop all feed components if either asphalt or aggregate from any bin stops flowing.

.7 Accomplish heating and mixing of asphalt mix in an approved parallel flow dryer mixer in which aggregate and asphalt enter drum at burner end and travel parallel to flame and exhaust gas stream. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with a printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each day in the form of a Plant Quality Control checklist.

.8 Mixing period and temperature to produce a uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 0.5%.

.3 Temporary storage of hot mix:

.1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.

.2 Do not store asphalt mix in storage bins in excess of 3 hours.

.4 Mixing tolerances:

.1 Permissible variation in aggregate gradation from job-mix (percent of total mass):

4.75 mm sieve and larger	4.5
2.00 mm sieve	4.0
0.425 mm sieve	3.0
0.180 mm sieve	2.0
0.075 mm sieve	1.0

.2 Permissible variation of asphalt cement from job mix, 0.25%.

.3 Mix temperature at discharge from plant shall be within the range shown on the submitted temperature:viscosity curve.

3.2 EQUIPMENT

.1 Pavers: mechanical grade controlled self powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of rollers of type and weight to obtain specified density of compacted mix.

.3 Vibratory rollers:

.1 Minimum drum diameter: 1200 mm.

.2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.

.4 Haul trucks: of adequate size, speed and condition to ensure orderly and continuous operation and as follows:

.1 Boxes with tight metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.

.5 Hand tools:

.1 Lutes or rakes with covered teeth for spreading and finishing operations.

.2 Tamping irons having mass not less than 12 kg and a bearing area not exceeding 310 cm^2 for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment may be used instead of tamping irons.

.3 Straight edges, 4.5 metres in length, to test finished surface planeness.

3.3 PREPARATION

.1 Reshape granular base to tolerances in Section 31 05 16 – Aggregates and Granular Materials.

.2 When paving over existing asphalt surface, clean pavement surface to approval of Departmental Representative. When levelling course is not required, patch and correct depressions and other irregularities to approval of the Departmental Representative before beginning paving operations.

.3 Apply tack coat / prime coat prior to paving.

.4 Prior to laying mix, clean surfaces of loose and foreign material.

3.4 TRANSPORTATION OF MIX

.1 Transport mix to job site in vehicles cleaned of foreign material.

.2 Paint or spray truck beds with light oil, limewater, soap or detergent solution, at least once a day or as required. Elevate truck bed and thoroughly drain.

.3 Schedule delivery of material for placing in daylight where permitted by schedule constraints.

.4 Deliver material to paver at a uniform rate and in an amount within capacity of paving and compacting equipment.

.5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within temperature range shown on the submitted temperature:viscosity curve for the asphalt cement, but not less than 135°C.

3.5 PLACING

.1 The Contractor's QC process shall include inspection of granular base, existing surface, tack coat, and prime coat prior to placing asphalt pavement. Results of this inspection are subject to review by the Departmental Representative.

.2 Place asphalt concrete to thicknesses, grades and lines as indicated on the Drawings.

.3 Placing conditions:

- .1 Place asphalt mixtures only when ambient temperature is above 5°C.
- .2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.
- .3 Do not place hot mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.4 Place asphalt concrete in compacted lifts of thickness as shown on the Drawings and as follows:

- .1 Lower course in layers of maximum 75mm each.
- .2 Surface course in layer of maximum 50mm.
- .3 Apply a tack coat between lifts, but do not exceed 0.2 L/m2 and as specified in Section 32 12 13.16 - Asphalt Tack Coat.

.5 Where possible do tapering and levelling where required in Lower Course. Overlap joints by not less than 200 mm.

.6 Spread and strike off mixture with self propelled mechanical finisher.

.1 Construct longitudinal joints and edges true to line markings. Lines for paver to follow to be established by Contractor parallel to centreline of proposed pavement. Position and operate paver to follow established line.

.2 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.

.3 Correct irregularities in alignment left by paver by trimming directly behind machine.

.4 Check surface planeness with 4.5 metre straightedge.

.5 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute excess material forming high spots. Fill and smooth indented areas with hot mix. Do not broadcast material over such areas.

.6 Do not throw surplus material on freshly screeded surfaces.

.7 When hand spreading is used:

.1 Approved wood or steel forms, rigidly supported to assure correct grade and cross section, may be used. Use measuring blocks and intermediate strips to aid in obtaining required cross section.

.2 Distribute material uniformly. Do not broadcast material.

.3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not readily break down.

.4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.

.5 Provide heating equipment to keep hand tools free from asphalt. Do not use tools at a higher temperature than temperature of mix being placed.

3.6 ASPHALT WASTE MANAGEMENT

.1 Prevent slurry residue from asphalt concrete from entering storm drains or receiving waters by:

.1 Placing temporary berms or sandbags around coring or sawcutting locations to capture and contain slurry runoff.

.2 Protect inlets using a block and gravel, a sandbag barrier, or straw bales around the inlets to prevent slurry from entering storm drains.

.3 Vacuum slurry at the time of saw-cutting or coring and dispose of offsite.

.2 Collect and remove all broken asphalt.

.3 Cover drainage inlet structures and manholes with filter fabric during the application of prime and tack coats.

.4 Do not apply tack coats if precipitation events are anticipated during the application and curing period.

.5 Clean asphalt-coated equipment off-site. When cleaning dry hardened asphalt from equipment, dispose of in accordance with the BC Waste Management Act.

3.7 COMPACTING

.1 Roll asphalt continuously to average density not less than 98% of 75-blow Marshall density when tested in accordance with ASTM D2950 with no individual test less than 96%.

.2 General:

- .1 When more than two rollers are employed, one roller must be pneumatic tired type.
- .2 Start rolling operations as soon as placed mix can bear weight of roller without undue displacement of material or cracking of surface.
- .3 Operate roller slowly initially to avoid displacement of material. For subsequent rolling do not exceed 5 km/h for static steel wheeled rollers and 8 km/h for pneumatic tired rollers.
- .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 20 impacts per metre of travel.
- .5 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.
- .6 Keep wheels of roller slightly moistened with water to prevent pick up of material but do not over water.
- .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
- .8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
- .9 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.
- .10 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re rolling.

.3 Breakdown Rolling:

- .1 Following rolling of transverse and longitudinal joint and outside edges, immediately commence breakdown rolling, beginning on the low side and progressing towards the high side.
- .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.
- .3 Operate breakdown roller with drive roll or wheel nearest finishing machine.

.4 Second rolling:

- .1 Use pneumatic tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature produces maximum density from this operation.
- .2 Rolling shall be continuous after initial rolling until mix placed has been thoroughly compacted.

.5 Finish rolling:

- .1 Accomplish finish rolling with two axle or three axle tandem steel wheel rollers while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, use pneumatic tired rollers.

.2 Conduct rolling operations in close sequence.

3.8 JOINTS

.1 General:

.1 Remove surplus material from surface of previously laid strip. Do not dispose on surface of freshly laid strip.

.2 Transverse joints:

.1 Offset transverse joint in succeeding lifts by at least 600 mm.

.2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.

.3 Compact transverse joints to provide a smooth riding surface.

.3 Longitudinal joints:

.1 Offset longitudinal joints in succeeding lifts by at least 200 mm.

.2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 120°C prior to paving of adjacent lane.

.1 Avoid cold joint construction in Surface Courses.

.2 If cold joint cannot be avoided, cut back by saw cutting previously laid lane, by at least 200 mm, to full depth vertical face, and tack face with thin coat of hot asphalt on adjacent lane.

.3 Saw cutting of cold joints is required in both Lower courses and Surface courses.

.3 Overlap previously laid strip with spreader by 100 mm.

.4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with a lute or rake.

.5 Roll longitudinal joints directly behind paving operation.

.6 When rolling with static roller, shift roller over onto previously placed lane in order that 100 to 150 mm of drum width rides on newly laid lane, then operate roller to pinch and press fines gradually across joint. Continue rolling until thoroughly compacted neat joint is obtained.

.7 When rolling with vibratory roller, have most of drum width ride on newly placed lane with remaining 100 to 150 mm extending onto previously placed and compacted lane.

3.9 FINISH TOLERANCES

.1 Finished asphalt surface (Surface Course and Lower Course) shall be within 5 mm of design elevation but not uniformly high or low. Minimum asphalt thickness shall be within 10 mm of the specified thickness indicated on the drawing regardless of the tolerance specified for the underlying courses.

.2 Finished asphalt surface (Surface Course) shall not have irregularities exceeding 5 mm. Metal straight edge shall be on site and used at all times during asphalt paving operations.

.3 Finished surface at inlets and crown grade break points shall be within 5 mm of design elevation.

3.10 MATERIAL ACCEPTANCE

.1 Sampling and Testing:

.1 Finish Tolerances

.1 Finished asphalt surface (surface course and base course) shall be free of irregularities exceeding 5 mm when checked with a 4.5 metre metal straight edge placed in any direction.

.2 Acceptability of Finished Work

.1 Asphalt pavement shall be deemed acceptable when conditions of 4.2. are met.

.2 Asphalt pavement shall be designated as defective when:

.1 Any Marshall property does not comply with those specified in Paragraph 2.2.2.

.2 Finished surface is not within tolerances specified in Paragraph 3.9.

.3 Average core density is less than 98% of Marshall Density, with no single core density less than 96% of Marshall Density.

.4 Finished surface ponds water.

.5 Asphalt pavement has been placed and compacted outside of the recommended range for the asphalt as shown on the Temperature-Viscosity chart.

.6 Asphalt pavement contains segregated material.

.7 Asphalt pavement has been placed at a material temperature less than 135°C.

.8 Asphalt pavement has been placed during periods of rain or other inclement weather.

.9 Asphalt pavement has been placed when ambient temperature was less than +5°C.

.10 Asphalt pavement has been placed on a frozen surface, on a surface where standing water is present or on a damp surface.

.11 Asphalt pavement has been placed using a mix design that has not been reviewed by the Departmental Representative.

.3 Repair of Defective Work

.1 Where possible, correct irregularities which develop before completion of rolling by loosening mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove asphalt promptly and lay new material to form a true and even surface and compact immediately to specified density.

.2 Repair areas showing checking or rippling.

.3 Defective areas where remedial work cannot be completed before the completion of rolling shall be removed and replaced with compliant pavement at no cost to the Owner.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 The General Requirements shall form part of this section.

.2 All works and materials shall meet the requirements of the standards referenced herein, the General Requirements, and specific requirements outlined in the following sub-sections.

PART 2 PRODUCTS

2.1 WARNING TAPE

.1 Standard 4-mil polyethylene 76 mm wide tape, yellow with black letters, imprinted with "CAUTION BURIED ELECTRIC CABLE BELOW ".

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install conduit in accordance with manufacturer's instructions and at depths as indicated.

.2 Clean inside of ducts before laying.

.3 Install plugs and cap both ends of ducts to prevent entrance of foreign materials during and after construction.

.4 Pull through each duct wooden mandrel not less than 300 mm long and of diameter 6 mm less than internal diameter of duct, followed by stiff bristle brush to remove sand, earth and other foreign material.

.1 Pull stiff bristle brush through each duct immediately before pulling-in cables.

.5 Install a pull rope continuous throughout each duct run with 3 m spare rope at each end.

.6 Place continuous strip of warning tape 300 mm above duct before backfilling trenches.

.7 Notify the Departmental Representative for field review upon completion of direct buried ducts and obtain acceptance prior to backfill.

END OF SECTION