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**Part 1 GENERAL**

**1.1 Scope**

- .1 The work consists of the furnishing of all plant, labour, equipment and material for uplands improvements at Pool's Cove, NL, in strict accordance with the specifications and accompanying drawings and subject to all terms and conditions of the Contract.

**1.2 DescriptionOf Work**

- .1 In general, work under this contract consist of, but will not necessarily be limited to, the following:
  - .1 Demolition and removal of the existing asphalt and gravel fill, as noted on the drawings. The Contractor will be required to submit a methodology for all deconstruction activities prior to demolition being permitted on Site. The Contractor is to account for these costs in the Bid and allow engineering assessment time in their construction schedule.
  - .2 Supply and installation of catch basins with covers, storm sewer piping, and storm sewer outfall as shown on the drawings. Note that rock busting may be required to achieve the depths shown on the drawings.
  - .3 Road excavation, scarifying, grading, and supply and installation of granular base as indicated on the drawings.
  - .4 Supply and installation of new asphalt paving as indicated and detailed on the drawings.

**1.3 Site of Work**

- .1 Work will be carried out at Pool's Cove, NL, in the location as shown on the accompanying drawings.

**1.4 Datum**

- .1 Datum used for this project is Lowest Normal Tides (LNT). Location and elevation of adjacent control points are shown on the location drawing "C1". Confirm with Departmental Representative prior to construction.
- .2 Bidders are advised to consult the Tide Tables issued by Fisheries and Oceans in order to make sure of the tidal conditions affecting work.

**1.5 Familiarization With Site**

- .1 Before submitting a bid, bidders can visit the site and its surroundings, at their own expense, to review and verify the form, nature and extent of the work, materials needed for the completion of the work, the means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid or costs to do the work. No allowance shall be made subsequently in this connection on account of error or negligence to properly observe and determine the conditions that will apply.

- .2 Contractors, bidders or those they invite to site are to review specification Section 01 35 29.06 - Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.

### **1.6 Codes and Standards**

- .1 Perform work in accordance with the latest edition of the National Building Code of Canada, Canadian Standards Association (CSA International), American Association of State Highway and Transportation Officials (AASHTO), Asphalt Institute (AI), American Society for Testing and Materials International, (ASTM), Canadian General Standards Board (CGSB) as referenced in other Specification sections, and any other code of provincial or local application including all amendments up to project bid closing date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

### **1.7 Term Engineer**

- .1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

### **1.8 Setting Out Work**

- .1 Set grades and layout work in detail from control points and grades established by Departmental Representative.
- .2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated or as directed by Departmental Representative.
- .3 Provide devices needed to layout and construct work.
- .4 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .5 Supply stakes and other survey markers required for laying out work.

### **1.9 Cost Breakdown**

- .1 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price.
- .2 Provide cost breakdown in same format as the numerical and subject title system used in this specification project manual and thereafter sub-divided into major work components as directed by Departmental Representative.
- .3 Upon approval by Departmental Representative, cost breakdown will be used as basis for progress payment.

- .4 All work items not designated in the unit price table as a measurement for payment, are to be included in the lump sum arrangement, as noted on the Bid and Acceptance Form.

### **1.10 Work Schedule**

- .1 Submit within 7 work days of notification of acceptance of bid, a construction schedule showing commencement and completion of all work within the time stated on the Bid and Acceptance Form and the date stated in the bid acceptance letter.
- .2 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .3 As a minimum, work schedule to be prepared and submitted in the form of Bar (GANNT) Charts, indicating work activities, tasks and other project elements, their anticipated durations and planned dates for achieving key activities and major project milestones provided in sufficient details and supported by narratives to demonstrate a reasonable plan for completion of project within designated time, e.g., show target dates for the placement of each crib, if applicable. Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.
- .4 Submit schedule updates on a minimum monthly basis and more often, when requested by Departmental Representative, due to frequent changing project conditions. Provide a narrative explanation of necessary changes and schedule revisions at each update.
- .5 The schedule, including all updates, shall be to Departmental Representative's approval. Take necessary measures to complete work within approved time. Do not change schedule without Departmental Representative's approval.
- .6 All work on the project will be completed within the time indicated on the Bid and Acceptance Form.

### **1.11 Abbreviations**

- .1 Following abbreviations of standard specifications have been used in this specification and on the drawings:
  - CGSB - Canadian Government Specifications Board
  - AI - Asphalt Institute
  - CSA - Canadian Standards Association
  - NLGA - National Lumber Grades Authority
  - ASTM - American Society for Testing and Materials
  - AASHTO - Association of State Highway and Transportation Officials
- .2 Where these abbreviations and standards are used in this project, latest edition in effect on date of bid call will be considered applicable.

### **1.12 Quarry and Explosives**

- .1 Make own arrangements with Provincial authorities and owners of private properties, for the quarrying and transportation of rock and all materials and machinery necessary for work over their property, roads or streets as case may be.

### **1.13 Site Operations**

- .1 Arrange for sufficient space adjacent to project site for conduct of operations, storage of materials and so on. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations in progress at site. All arrangements for space and access will be made by Contractor.
- .2 Remove snow and ice as required to maintain safe access in a manner that does not damage existing structures or interfere with the operations of others.

### **1.14 Project Meetings**

- .1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording minutes.
- .2 Project meetings will take place on site of work unless so directed by the Departmental Representative
- .3 Departmental Representative will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at the meetings.
- .4 Have a responsible member of firm present at all project meetings.

### **1.15 Protection**

- .1 Store all materials and equipment to be incorporated into work to prevent damage by any means.
- .2 Repair or replace all materials or equipment damaged in transit or storage to the satisfaction of Departmental Representative and at no cost to Canada.

### **1.16 Existing Services**

- .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 site operations, pedestrian, vehicular traffic and tenant operations.
- .2 Before commencing work, establish location and extent of service lines in area 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. This includes disconnection of electrical power and communication services to tenant's operational areas. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services when directed by Departmental Representative to maintain critical facility systems.

- .5 Provide adequate bridging over trenches which cross walkways or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.

#### **1.17 Permits**

- .1 Obtain and pay for all permits, certificates and licenses as required by Municipal, Provincial, Federal and other Authorities
- .2 Provide appropriate notifications of project to municipal and provincial inspection authorities.
- .3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.
- .4 Submit to Departmental Representative, copy of application submissions and approval documents received for above referenced authorities.
- .5 Submit to Departmental Representative, copy of quarry permit, if applicable, prior to start of quarry operations.
- .6 Comply with all requirements, recommendations and advice by all regulatory authorities unless otherwise agreed in writing by Departmental Representative. Make requests for such deviations to these requirements sufficiently in advance of related work.

#### **1.18 Documents Required**

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract Drawings
  - .2 Specifications
  - .3 Addenda
  - .4 Reviewed Shop Drawings
  - .5 List of outstanding shop drawings
  - .6 Change Orders
  - .7 Other modifications to Contract
  - .8 Field Test Reports
  - .9 Copy of Approved Work Schedule
  - .10 Site specific Health and Safety Plan and other safety related documents
  - .11 Other documents as specified.

#### **1.19 Cutting, Fitting And Patching**

- .1 Execute cutting, including excavation, fitting and patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make

good to match existing work. This includes patching of openings in existing work resulting from removal of existing services.

- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

### **1.20 Existing Sub- Surface Conditions**

- .1 Information pertaining to the existing sub-surface conditions may be available by contacting the Departmental Representative.
- .2 Contractors are cautioned that any previous investigations that may be available for review, were intended to provide general site information only. Any interpolation and/or assumptions made relative to any previous investigations is the Contractor's responsibility.

### **1.21 Location Of Equipment**

- .1 Location of work shown or specified shall be considered as approximate. Actual location shall be as required to suit conditions at time of installation and as is reasonable. Obtain approval of Departmental Representative.
- .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 when impending installation conflicts with other new or existing components. Follow directives for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

### **1.22 Fish Habitat**

- .1 This work is being conducted in an area where fish habitat may be affected. Perform work to conform with rules and regulations governing fish habitat and in accordance with authorization for work or undertakings affecting fish habitat.
- .2 Contact the local Department of Fisheries and Oceans detachment at least 48 hours in advance of starting any work on site. Submit confirmation to the Departmental Representative that DFO have been contacted.

### **1.23 Notice to Shipping/Mariners**

- .1 Notify the Marine Communications and Traffic Services' Centre, of Fisheries and Oceans Canada, at (709) 772-2083, ten (10) days prior to commencement and upon completion of the work, in order to allow for the issuance of Notices to Shipping/Mariners.
- .2 During construction any vessels or barges utilized must be marked in accordance with the provisions of the Canada Shipping Act Collision Regulations.

#### **1.24 Acceptance**

- .1 Prior to the issuance of the Certificate of Substantial Performance, in company with Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.

#### **1.25 Works Coordination**

- .1 Responsible for coordinating the work of the various trades, where the work of such trades interfaces with each other.
- .2 Convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required. Provide each trade with the plans and specifications of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
- .3 Canada will not be responsible for, or held accountable for, any extra costs incurred as a result of the failure to carry out coordination work. Disputes between the various trades, as a result of their not being informed of the areas and extent of interface work, shall be the sole responsibility of the General Contractor and shall be resolved at no extra cost to Canada.

#### **1.26 Contractor's Use of Site**

- .1 Construction operations, including storage of materials for this contract, not to interfere with the fishing activity and/or operations at this harbour facility.
- .2 Responsible for arranging the storage of materials on or off site, and any materials stored at the site which interfere with any of the day to day activities at or near the site will be moved promptly at the Contractor's expense, upon request by Departmental Representative.
- .3 Contractor will take adequate precautions to protect existing concrete decks and asphalt when operating tracked equipment.
- .4 Exercise care so as not to obstruct or damage public or private property in the area.
- .5 At completion of work, restore area to its original or better condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Departmental Representative.

#### **1.27 Work Commencement**

- .1 Mobilization to project site is to commence immediately after acceptance of bid and submission of Site Specific Safety Plan and insurance documentation, unless otherwise agreed by Departmental Representative.
- .2 Project work on site is to commence as soon as possible, with a continuous reasonable work force, unless otherwise agreed by Departmental Representative.



- .3 Weather conditions, short construction season, delivery challenges and the location of the work site may require the use of longer working days and additional work force to complete the project within the specified completion time.
- .4 Make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after acceptance of bid and replenished as required.

### **1.28 Facility Smoking Environment**

- .1 Comply with smoking restrictions.

### **1.29 Interpretation Of Documents**

- .1 Supplementary to the Order of Precedence article of the General Conditions of the Contract, the Division 01 sections take precedence over the technical specification sections in other Divisions of the Specification Manual.

### **1.30 Working Adjacent To Community Roads**

- .1 The Contractor will be responsible to restore any damage to existing roadways.

**Part 2        PRODUCTS**  
**Not used**

**Part 3        EXECUTION**  
**Not used**

**END OF SECTION**

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**Part 1        GENERAL**

**1.1 Section Includes**

- .1 Inspection and testing by inspecting firms or testing laboratories designated by Department Representative.

**1.2 Related Requirements Specified Elsewhere**

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

**1.3 Appointment and Payment**

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

**1.4 Contractor's Responsibilities**

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

**Part 2      PRODUCTS**

**Not Used**

**Part 3      EXECUTION**

**Not Used**

**END OF SECTION**

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**Part 1            GENERAL**

**1.1 Section Includes**

- .1 Unless otherwise specified, this section outlines the requirements and procedures for the contractor's submission of shop drawings, product data, samples, mock-ups, certificates, bonds and other pertinent pre-construction/construction documentation to the Departmental Representative for review.

**1.2 General Requirements**

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units, converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify 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 areas are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Submittal format: paper originals, or alternatively clear and fully legible photocopies of originals, or PDF electronic copies. Facsimiles are not acceptable, except in special circumstances pre-approved by Departmental Representative. Poorly printed non-legible photocopies or facsimiles will not be accepted and be returned for resubmission.
- .11 Make changes or revisions to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.
- .12 Keep one reviewed copy of each submission on site.

### 1.3 Shop Drawings and Product Data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of the Work.
- .2 Submit shop drawings bearing stamp and signature of qualified professional Departmental Representative registered or licensed in Province of Newfoundland and Labrador, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 7 days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of the Work, state such in writing to Departmental Representative prior to proceeding with the Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.

- .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit 3 prints of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit 3 copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit 3 copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit 3 copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit 3 copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Delete information not applicable to project.
- .16 Supplement standard information to provide details applicable to project.

- .17 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .18 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of Work of sub-trades.

#### **1.4 Certificates and Transcripts**

- .1 Immediately after award of Contract, submit Letter of Good Standing, WHSCC.
- .2 Submit transcription of insurance's immediately after award of Contract.

#### **Part 2 PRODUCTS**

**Not used**

#### **Part 3 EXECUTION**

**Not used**

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Fire Department Briefing**

- .1 Departmental representative will co-ordinate arrangements for contractor for briefing on fire safety at pre-work conference by fire chief before work is commenced.

### **1.2 Reporting Fires**

- .1 Know location of nearest fire alarm box and telephone, including emergency phone number.
- .2 Report fire incidents immediately to fire department as follows:
  - .1 Activate nearest fire alarm box; or
  - .2 Telephone.
- .3 Person activating fire alarm box will remain at box to direct fire department to scene of fire.
- .4 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify location.

### **1.3 Interior and Exterior Fire Protection and Alarm Systems**

- .1 Fire protection and alarm system will not be: obstructed; shut-off; and left inactive at end of working day or shift without authorization from fire chief.
- .2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by fire chief.

### **1.4 Fire Extinguishers**

- .1 Supply fire extinguishers, as approved by fire chief, necessary to protect work in progress and contractor's physical plant on site.

### **1.5 Blockage of Roadways**

- .1 Advise fire chief of work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by fire chief, erecting of barricades and digging of trenches.

### **1.6 Smoking Precautions**

- .1 Observe smoking regulations.

### **1.7 Rubbish and Waste Materials**

- .1 Keep rubbish and waste materials at minimum quantities.
- .2 Burning of rubbish is prohibited.



- .3 Removal:
  - .1 Remove rubbish from work site at end of work day or shift or as directed.
- .4 Storage:
  - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
  - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove as specified.

### **1.8 Flammable and Combustible Liquids**

- .1 Handling, storage and use of flammable and combustible liquids governed by current national fire code of Canada.
- .2 Keep flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing underwriters' laboratory of Canada or factory mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of fire chief.
- .3 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.
- .4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.
- .5 Do not use flammable liquids having flash point below 38 degrees c such as naphtha or gasoline as solvents or cleaning agents.
- .6 Store flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities minimum and fire department is to be notified when disposal is required.

### **1.9 Hazardous Substances**

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, in accordance with national fire code of Canada.
- .2 Obtain from fire chief a "hot work" permit for work involving welding, burning or use of blowtorches and salamanders, in buildings or facilities.
- .3 When work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for fire watch is at discretion of fire chief. Contractors are responsible for providing fire watch service for work on scale established and in conjunction with fire chief at pre-work conference.
- .4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used, eliminate sources of ignition. Inform fire chief prior to and at cessation of such work.

### **1.10 Questions and/or Clarification**

- .1 Direct questions or clarification on fire safety in addition to above requirements to fire chief.

**1.11 Fire Inspection**

- .1 Co-ordinate site inspections by fire chief through departmental representative.
- .2 Allow fire chief unrestricted access to work site.
- .3 Co-operate with fire chief during routine fire safety inspection of work site.
- .4 Immediately remedy unsafe fire situations observed by fire chief.

**Part 2 PRODUCTS**

**Not used.**

**Part 3 EXECUTION**

**Not used.**

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Section Includes**

- .1 Procedures to isolate and lockout electrical facility or other equipment from energy source.

### **1.2 Related Work**

- .1 Section 01 35 24 - Special Procedures on Fire Safety Requirements.
- .2 Section 01 35 29.06 - Health and Safety Requirements.

### **1.3 References**

- .1 C22.1-06-Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
  - .1 CAN/CSA C22.3 No. 1-06 - Overhead Systems.
  - .2 CAN/CSA C22.3 No. 7-06 - Underground Systems.
  - .3 COSH, Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

### **1.4 Definitions**

- .1 **Electrical Facility:** means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation/ transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 **Guarantee of Isolation:** means a guarantee by a competent person in control or in charge that a particular facility or equipment is isolated.
- .3 **De-energize:** in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 **Guarded:** means that an equipment or facility is covered, shielded/ fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.
- .5 **Isolate:** means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.

- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

### 1.5 Compliance Requirements

- .1 Perform lockouts in compliance with:
  - .1 Canadian Electrical Code.
  - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 29.06 - Health and Safety Requirements.
  - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized
  - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

### 1.6 Submittals

- .1 Submit copy of proposed Lockout Procedures and sample form of lockout permit or lockout tags for review.
- .2 Submit documentation within 7 calendar days of acceptance of bid. Do not proceed with work until submittal has been reviewed by Departmental Representative.
- .3 Submit above documents in accordance with the submittal requirements specified in Section 01 33 00- Submittal Procedures.
- .4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.

### 1.7 Isolation of Existing Services

- .1 Obtain Departmental Representative's written authorization prior to conducting work on an existing active, energized service or facility required as part of the work and before proceeding with lockout of such services or facility.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
  - .1 Written Request for Isolation of the service or facility and;
  - .2 Copy of Contractor's Lockout Procedures.
  - .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, and as follows:
    - .1 Fill-out standard forms in current use at the Facility when so directed by Departmental Representative or;

- .2 Where no form exist at Facility, make request in writing identifying:
  - .1 Identification of system or equipment to be isolated, including its location;
  - .2 Time duration, indicating Start time and date, and Completion time and date when isolation will be in effect;
  - .3 Voltage of service feed to system or equipment being isolated;
  - .4 Name of person making the request.
- .3 Document to be in typewritten format.
- .4 Do not proceed until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the isolation of designated equipment or facility. Departmental Representative may designate other individual at the Facility as the person authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shutdown of equipment or facilities, de-energize and isolate power and other sources of energy and lockout items in accordance with requirement of clause 1.8 below.
- .6 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of facility operations.
- 7 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require a Request for Isolation. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the planning process of isolating existing equipment and facilities. Hazard Assessments to conform to requirements of Health and Safety Section 01 35 29.06 - Health and Safety Requirements.

## 1.8 Lockouts

- .1 Isolate and lockout electrical facilities, mechanical equipment and machinery from all potential energy sources prior to starting work on such items.
- .2 Develop and implement lockout procedures to be followed as an integral part of the Work.
- .3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .4 Use industry standard lockout tags.

- .5 Provide appropriate safety grounding and guards as required.
- .6 Prepare Lockout Procedures in writing. Describe safe work practices, work functions and sequence of activities to be followed on site to safely isolate all potential energy sources and lock out/tag out facilities and equipment
- .7 Include within procedures a system of worker request and issuance of individual lockout permit by a person, employed by Contractor, designated to be "in-charge" and being responsible for:
  - .1 Controlling issuance of permits or tags to Workers.
  - .2 Determining permit duration.
  - .3 Maintaining record of permits and tags issued.
  - .4 Submitting a Request for Isolation to Departmental Representative when required in accordance with Clause 1.7 above.
  - .5 Designating a Safety Watcher, when one is required based on type of work.
  - .6 Ensuring equipment or facility has been properly isolated, providing a Guarantee of Isolation to worker(s) prior to proceeding with work.
  - .7 Collecting and safekeeping lockout tags, returned by workers, as a record of the event.
  - .8 Clearly establish, describe and allocate, within procedures, the responsibilities of:
    - .1 Workers.
    - .2 Designated person controlling issuance of lockout tags/permits
    - .3 Safety Watcher.
    - .4 Subcontractors and General Contractor.
- .8 Procedures shall meet the requirements of Codes and Regulations specified in clause 1.5 above.
- .9 Generic procedures, if used, must be edited, supplemented with pertinent information and tailored to reflect specific project conditions. Clearly label as being the procedures applicable to this contract.
  - .1 Incorporate site specific rules and procedures established by Facility Manager and in force at site. Obtain such procedures through Departmental Representative.
- .10 Procedures to be in typewritten format.
- .11 Submit copy of Lockout Procedures to Departmental Representative, in accordance with submittal requirements of clause 1.6 herein, prior to commencement of work.

### **1.9 Conformance**

- .1 Ensure that lockout procedures, as established for project on site, are stringently followed. Enforce use and compliance by all workers.
- .2 Brief all persons working on electrical facilities, mechanical and other equipment fed by an energy source on requirements of this section.
- .3 Failure to perform lockouts in accordance with regulatory requirements or follow procedures specified herein may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 29.06 - Health and Safety Requirements.

### **1.10 Documents on Site**

- .1 Post Lockout Procedures on site in common location for viewing by workers.
- .2 Keep copies of Request for Isolation submitted to Departmental Representative and lockout permits or tags issued to workers during the course of work for full project duration.
- .3 Upon request, make such data available to Departmental Representative or to authorized safety representative for inspection.

### **Part 2 PRODUCTS**

**Not Used**

### **Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

**Part 1 GENERAL**

**1.1 References**

- .1 Code and standards referenced in this section refer to the latest edition thereof.
- .2 Canadian Standards Association (CSA)
  - .1 FCC No. 301 Standard for Construction Operations.
- .3 Transportation of Dangerous Goods Act Regulations.
- .4 Newfoundland Occupational Health and Safety Act, Amended
- .5 Consolidated Newfoundland and Regulations 1149 WMIS Regulations Under the Occupational Health and Safety Act
- .6 Consolidated Newfoundland and Regulations 1165 Occupational Health and Safety Regulations under the Occupational Health and Safety Act.
- .7 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .8 National Building Code of Canada.

**1.2 Related Sections**

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 24 – Special Procedures on Fire Safety Requirements
- .3 Section 01 35 25 – Special Procedures on Lockout Requirements
- .4 Section 01 35 43 – Environmental Procedures

**1.3 Submittals**

- .1 Submit to Departmental Representative copies of the following document within 7 days after date of notice to proceed, including updates:
  - .1 Site Specific Health and Safety Plan.
  - .2 On Site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
  - .3 Reports or directions issued by Federal and Provincial inspectors or other Authority having jurisdiction.
  - .4 Accident or Incident Reports.
  - .5 MSDS data sheets.
  - .6 Name of Contractor's Representative(s) designated to perform full time health and safety supervision on site.
  - .7 Letter of Good Standing/Certificate of Clearance from the Provincial Worker's Compensation Board.



- .2 Medical Surveillance: Obtain and maintain worker medical surveillance documentation for work posing a potential hazard to workers as stipulated in Federal or Provincial Occupational Health and Safety Regulations. Upon request, submit copy of documentation to Departmental Representative.
- .3 Upon request by Departmental Representative, submit reports and other documentation as stipulated to be produced and maintained by Federal and Provincial Occupational Health and Safety Regulations and as specified herein.
- .4 Submit above documents in accordance with the submittal procedures specified in Section 01 33 00
- .5 Acceptance of the Project Health and Safety Risk Assessment and Management Plan and other submitted documents by the Departmental Representative shall only be viewed as acknowledgement that the contractor has submitted the required documentation under this specification section.
- .6 The Departmental Representative makes no representation and provides no warranty for the accuracy, completeness and legislative compliance of the Project Health and Safety Risk Management Plan and other submitted documents by this acceptance.
- .7 Responsibility for errors and omissions in the Project Health and Safety risk Assessment and Management Plan and other submitted documents is not relieved by acceptance by the Departmental Representative.

**1.4 Occupational Health and Safety (Project Health and Safety Risk Assessment and Management Plans)**

- .1 Conduct operations in accordance with latest edition of the Newfoundland Occupational Health and Safety (OH&S) Act and Regulations.
- .2 Prepare a detailed Project Health and Safety Risk Assessment and Management Plan for the Departmental Representative. Assessment shall identify, evaluate and control job specific hazards and the necessary control measures to be implemented for managing hazards.
- .3 Provide a copy of the Project Health and Safety Risk Assessment and Management Plan to the Departmental Representative.
- .4 The written Health and Safety Risk Assessment and Management Plan shall incorporate the following:
  - .1 A site-specific health and safety plan, refer to clause 1.5 Site-Specific Health and Safety Risk Assessment and Management Plan of this section for requirements.
  - .2 An organizational structure which shall establish the specific chain of command and specify the overall responsibilities of contractor's employees at the work site.

- .3 A comprehensive workplan which shall:
  - .1 define work tasks and objectives of site activities/operations and the logistics and resources required to reach these tasks and objectives
  - .2 establish personnel requirements for implementing the plan, and
  - .3 establish site specific training and notification requirements and schedules.
- .4 A personal protected equipment (PPE) Program which shall detail PPE:
  - .1 Selection criteria based on site hazards.
  - .2 Use, maintenance, inspection and storage requirements and procedures.
  - .3 Decontamination and disposal procedures.
  - .4 Inspection procedures prior to during and after use, and other appropriate medical considerations.
  - .5 Limitations during temperature extremes, heat stress and other appropriate medical consideration.
- .5 An emergency response procedure, refer to Clause 1.6 Supervision and Emergency Response Procedure of this section for requirements.
- .6 A hazard communication program for informing workers, visitors and individuals outside of the work area as required.
- .7 A health and safety training program.
- .8 General safety rules.
- .5 Periodically review and modify as required each component of the Project Health and Safety Risk Assessment and Management Plan when a new hazard is identified during completion of work and when an error or omission is identified in any part of the Project Health and Safety Risk Assessment and Management Plan.
- .6 Implement all requirements of the Project Health and Safety Risk Assessment and Management Plan.
  - .1 Ensure that every person entering the project site is informed of requirements under the Project Health and Safety Risk Assessment and Management Plan.
  - .2 Take all necessary measures to immediately implement any engineering controls, administrative controls, personal protective equipment required or termination of work procedures to ensure compliance with the Project Health and Safety Risk Assessment and Management Plan.

### **1.5 Site Specific Health and Safety Risk Assessment and Management Plan**

- .1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.
  - .1 Submit copy to Departmental Representative with seven (7) calendar days of acceptance of bid.
  - .2 Submit updates as work progresses.

- .2 Health and Safety Plan shall contain three (3) parts with following information:
  - .1 Part 1 – Hazards: List of individual health risks and safety hazards identified by hazard assessment process.
  - .2 Part 2 – Safety Measures: Engineering controls, personal protective equipment and safe work practices used to mitigate hazards and risks listed in Part 1 of Plan.
  - .3 Part 3a: Emergency Response – Standard operating procedures, evacuation measures and emergency response in the occurrence of an accident, incident or emergency.
    - .1 Include response to all hazards listed in Part 1 of Plan.
    - .2 Evacuation measures to complement the Facility's existing Emergency Response and Evacuation Plan. Obtain pertinent information from Departmental Representative.
    - .3 List names and telephone numbers of officials to contact including:
      - .1 General Contractor and all Sub-Contractors.
      - .2 Federal and Provincial Departments as stipulated by laws and regulations of authorities having jurisdiction and local emergency resource organizations, as needed based on nature of emergency.
  - .4 Part 3b: Site Communications:
    - .1 Procedures used on site to share work related safety issues between workers, subcontractors, and General Contractor.
    - .2 List of critical tasks and work activities, to be communicated with the Facility Manager, which has risk of affecting tenant operations, or endangering health and safety of Facility personnel and the general public. Develop list in consultation with the Departmental Representative.
- .3 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

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Column 1	Column 2	Column 3
Part 1	Part 2	Part 3a/3b
Identified	Safety	Emergency Response &
Hazard	Measures	Site Communications

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- .4 Develop Plan in collaboration with subcontractors. Address work activities of all trades. Revise and update Plan as sub-contractors arrive on site.
- .5 Implement and enforce compliance with requirements of plan for full duration of work to final completion and demobilization from site.
- .6 As work progresses, review and update Plan. Address additional health risks and safety hazards identified by on-going hazard assessments.

- .7 Post copy of Plan and updates, on site.
- .8 Submission of the Health and Safety Plan and updates, to the Departmental Representative, is for review and information purposes only. Departmental Representative's receipt, review and any comments made of the Plan shall not be construed to imply approval in part, or in whole, of such Plan by Departmental Representative, and shall not be interpreted as a warranty of being complete and accurate, or as a confirmation that all health and safety requirements of the Work have been addressed, and that it is legislative compliant. Furthermore, Departmental Representative's review of the Plan shall not relieve the Contractor of any of his legal obligations for Occupational Health and Safety provisions specified as part of the Work and those required by provincial legislation or those which would otherwise be applicable to the site of the work.

## **1.6 Supervision and Emergency Rescue Procedure**

- .1 Carry out work under the direct supervision of competent persons responsible for safety by ensuring the work complies with the appropriate section of OH&S Act and Regulations
- .2 Assign a sufficient number of supervisory personnel to the work site.
- .3 Provide a suitable means of communications for workers required to work alone.
- .4 Develop an emergency rescue plan for the job site and ensure that supervisors and workers are trained in the emergency rescue plan.
- .5 The emergency response plan shall address, as a minimum:
  - .1 Pre-emergency planning.
  - .2 Personnel roles, lines of authority and communication.
  - .3 Emergency recognition and prevention.
  - .4 Safe distances and places of refuge.
  - .5 Site security and control
  - .6 Evacuation routes and procedures
  - .7 Decontamination procedures which are not covered by the site specific safety and health plan.
  - .8 Emergency medical treatment and first aid.
  - .9 Emergency alarm, notification and response procedures including procedures for reporting incidents to local, provincial and federal government departments.
  - .10 PPE and emergency equipment.
  - .11 Procedures for handling emergency incidents.
  - .12 Site specific emergency response training requirements and schedules.
- .6 The emergency response procedures shall be rehearsed regularly as part of the overall training program.

- .7 Provide adequate first aid facilities for the jobsite and ensure that a minimum number of workers are trained in first aid in accordance with the First Aid Regulations.

### **1.7 Contractor's Safety Officer**

- .1 The contractor's Safety Officer will be solely responsible for the implementation and monitoring of the Project Health and Safety Risk Assessment and Management Plan, and will have the authority to implement health and safety changes as directed by the Departmental Representative. The Safety Officer shall have as a minimum:
  - .1 Completed training in hazardous occurrence management and response/protocols.
  - .2 Completed training in First Aid.
  - .3 Have working knowledge of occupational safety and health regulations.
  - .4 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .5 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .6 Be on site during execution of Work and report directly to and be under direction of site supervisor.

### **1.8 Health and Safety Committee**

- .1 Establish an Occupational Health and Safety Committee where ten or more workers are employed on the job site as per the OH&S Act and Regulations.
- .3 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.
- .4 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.

### **1.9 Responsibility**

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

### **1.10 Unforeseen Hazards**

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction. Advise the Departmental Representative verbally and in writing.

### **1.11 Project Site Conditions**

- .1 The following are known or potential project related safety hazards at site:
  - .1 Working on and near water.
  - .2 Inclement Weather.
  - .3 Heavy equipment activity in the area.
  - .4 Overhead and underground power/utility lines.
  - .5 Heavy Lifting.
  - .6 Cutting tools and other construction/power tools.
  - .7 Risk of electric shock.
  - .8 Vehicular/pedestrian traffic.
  - .9 Trench excavation.
- .2 Above lists shall not be construed as being complete and inclusive of potential health and safety hazards encountered during work. Include above items into hazard assessment process.
- .3 Obtain from Departmental Representative, copy of MSDS Data sheets for existing hazardous products stored on site or being used by Facility personnel.

### **1.12 Instruction and Training**

- .1 Workers shall not participate in or supervise any activity on the work site until they have been trained to a level required by this job function and responsibility. Training shall as a minimum thoroughly cover the following:
  - .1 Federal and Provincial Health and Safety Legislation requirements including roles and responsibilities of workers and person(s) responsible for implementing, monitoring and enforcing health and safety requirements.
  - .2 Limitations, use, maintenance and care of engineering controls and equipment.
  - .3 Limitations and use of emergency notifications and response equipment including emergency response protocol.
  - .4 Work practices and procedures to minimize the risk of an accident and hazardous occurrence from exposure to a hazard.
- .2 Provide and maintain training of workers, as required, by Federal and Provincial legislation.
- .3 Provide copies of all training certificates to the Departmental Representative for review, before a worker is to enter the work site.

- .4 Authorized visitors shall not access the work site until they have been:
  - .1 Notified of the names of persons responsible for implementing, monitoring and enforcing the health and Safety Risk Assessment and Management Plan.
  - .2 Briefed on safety and health hazards present on the site.
  - .3 Instructed in the proper use and limitations of personal protective equipment.
  - .4 Briefed as the emergency response protocol including notification and evacuation process.
  - .5 Informed of practices and procedures to minimize risks from hazards and applicable to activities performed by visitors.

### **1.13 Minimum Site Safety Rules**

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements to be obeyed by all persons granted access.
  - .1 Wear personal protective equipment (PPE) appropriate to function and task on site: the minimum requirements being hard hat, safety footwear and eye protection and for work on or near water, a personal flotation device.
  - .2 Immediately report unsafe activity or condition at site, near miss accident, injury and damage.
  - .3 Maintain site in tidy condition.
  - .4 Obey warning signs and safety tags.
- .2 Brief workers on site safety rules, and on the disciplinary measures to be taken by Departmental Representative for violation or non-compliance of such rules. Post rules on site.
- .3 The following actions or conduct by Contractor, workers and sub-contractors will be considered as non-conformance with the health and safety requirements of the contract for which a Non-Compliance Notification will be issued to the General Contractor by the Departmental Representative.
  - .1 Failure to follow the minimum site safety rules specified above.
  - .2 Negligence resulting in serious injury or major property damage.
  - .3 Deliberate non-compliance with Federal and Provincial Acts and Regulations.
  - .4 Falsification of information in Worker's Compensation Reports, safety reports and other health and safety related documents submitted to Departmental Representative or to Authority having jurisdiction.
  - .5 Possession of firearms on site.
  - .6 Possession of non-prescriptive illegal drugs or alcohol.
  - .7 Action, or lack thereof, resulting in the issuance of Warnings, Fines, or Stop Work Orders from a Provincial Authority having jurisdiction.
  - .8 Violation of other specified health and safety rules and requirements as determined by Departmental Representative.

- .4 See elsewhere in this section for details on Non-Compliance Notifications and resulting disciplinary measures.

#### **1.14 Construction Safety Measures**

- .1 Observe construction safety measures of National Building Code, latest edition, Provincial Government, OH&S Act and Regulations, Workplace Health and Safety and Compensation Commission and Municipal Authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.
- .2 Administer the project in a manner that will ensure, at all times, full compliance with Federal and Provincial Acts, regulations and applicable safety codes and the site Health and Safety Risk Assessment and Management Plan.
- .3 Provide Departmental Representative with copies of all orders, directions and any other documentation, issued by the Provincial Department of Government Services, Occupational Health and Safety branch immediately after receipt.

#### **1.15 Posting of Documents**

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Federal, Province and authority having jurisdiction, and in consultation with the Departmental Representative.

#### **1.16 Health and Safety Monitoring**

- .1 Periodic inspections of the Contractor's work may be carried out by the Departmental Representative to maintain compliance with the Health and Safety Program. Inspections will include visual inspections as well as testing and sampling as required.
- .2 The Contractor shall be responsible for any and all costs associated with delays as a result of Contractor's failure to comply with the requirements outlined in this section.

#### **1.17 Notification**

- .1 The contractor shall, prior to the commencement of work, notify in writing the Work Place Health and Safety Division, Department of Labour with the following information:
  - .1 Name and location of construction site.
  - .2 Company name and mailing address of contractor doing the work.
  - .3 The number of workers to be employed.
  - .4 A copy of the Health and Safety Risk Assessment and Management Plan if requested.

#### **1.18 Non-Compliance and Disciplinary Measures**

- .1 Immediately address and correct health and safety violations and non-compliance issues.



- .2 Negligence or failure to follow occupational health and safety provisions specified in the Contract Documents and those of applicable laws and regulations could result in disciplinary measures taken by the Departmental Representative against the General Contractor.
- .3 A system of Non-Compliance Notifications and Disciplinary Measures on projects is detailed as follows:
  - .1 A non-compliance notification is issued to the General Contractor, by the Departmental Representative, whenever there is a violation or non-compliance of the project's health and safety requirements and of those of Provincial and Federal regulations by any worker, sub-contractor or other person to whom the Contractor has granted access to the work site.
  - .2 Non-compliance notifications are progressive in nature resulting in disciplinary measures imposed depending on the frequency, nature and severity of the infraction.
  - .3 Disciplinary measures could include:
    - .1 Removal of the offending person or party from site;
    - .2 Financial penalties in the form of progress payment reduction or holdback assessments made against the contract; and
    - .3 Taking the Work Out of Contractor's Hands in accordance with the General Conditions.
- .4 Departmental Representative will make final decision as to what constitutes a violation and when to issue a Non-compliance Notification.
- .5 Non-compliance Notifications issued by Departmental Representative shall not be construed as to overrule or disregard warnings, orders and fines levied against Contractor by a regulatory agency having jurisdiction.
- .6 Each non-compliance notification issued is given a numerical rating based on a three (3) level numbering system. Each level is progressive in nature to reflect:
  - .1 The seriousness of the infraction as viewed by the Departmental Representative.
  - .2 The degree of disciplinary action which will be taken by the Departmental Representative.
- .7 Numerical ratings are as follows:
  - .1 Non-compliance Notification-Level No. 1 Rating:
    - .1 Situation: occurrence of a first time infraction by a person or party on site.
    - .2 Action: verbal warning to General Contractor, documented in Departmental files and copy sent to the General Contractor

- .2 Non-compliance Notification-Level No. 2 Rating:
  - .1 Situation:
    - .1 The second occurrence of a previous infraction by the same person or party on site; or
    - .2 Accumulation of several level-1 notifications for different infractions by the same person or party on site; or
    - .3 Non-action on the part of the Contractor or sub-contractor to rectify non-compliance infractions previously identified in one or several level-1 notifications; or
    - .4 Violation or non-observance of a Federal or Provincial Safety Law or Regulation by sub-contractor or Contractor; or
    - .5 Negligence by a person or party resulting in injury or major property damage.
  - .2 Action: written notice to General Contractor complete with an order for immediate remedial action to be taken. Depending on the severity of the offense, the order may include request for the immediate removal of the offending person or party from site.
- .3 Non-compliance Notification-Level No. 3 Rating:
  - .1 Situation:
    - .1 Continued and repeated non-compliance with health and safety requirements by the General Contractor or by sub-contractor(s); or
    - .2 The occurrence of a serious accident on site resulting in serious bodily injury or death.
  - .2 Action:
    - .1 Formal letter issued to General Contractor with an order to “Immediately Stop Work” until so notified to proceed.
    - .2 Review of all non-compliance and/or accident occurrences in the project with possible investigation by the Departmental Representative.
    - .3 Based on outcome of the review/investigation, work could be suspended or taken out of the Contractor’s hands in accordance with the General Conditions.
  - .3 The term “serious accident” used herein shall have the same meaning as defined in the Canadian Dictionary of Safety Terms – 1987 issue from the Canadian Society of Safety Engineers (C.S.S.E.).
- .8 Decision on which rating level to be placed on any given Non-Compliance Notification will be determined solely by Departmental Representative.

- .9 Further details on the disciplinary system will be provided at the pre-construction Health and Safety meeting after contract award.
- .10 Be responsible to fully brief workers and sub-contractors on the operation and importance of this system.

### **1.19 WHMIS**

- .1 Ensure that all controlled products are in accordance with the Workplace Hazardous Materials Information System (WHMIS) Regulations and Chemical Substances of the OH&S Act and Regulations regarding use, handling, labelling, storage, and disposal of hazardous materials.
- .2 Deliver copies of relevant Material Safety Data Sheets (MSDS) to job site and the Departmental Representative. The MSDS must be acceptable to Labour Canada and Health and Welfare Canada for all controlled products that will be used in the performance of this work.
- .3 Train workers required to use or work in close proximity to controlled products as per OH&S Act and Regulations.
- .4 Label controlled products at jobsite as per OH&S and Regulations.
- .5 Provide appropriate emergency facilities as specified in the MSDS where workers might be exposed to contact with chemicals, e.g. eye-wash facilities, emergency shower.
  - .1 Workers to be trained in use of such emergency equipment.
- .6 Contractor shall provide appropriate personal protective equipment as specified in the MSDS where workers are required to use controlled products.
  - .1 Properly fit workers for personal protective equipment
  - .2 Train workers in care, use and maintenance of personal protective equipment.
- .7 No controlled products are to be brought on-site without prior approved MSDS.
- .8 The MSDS are to remain on site at all times.

### **1.20 Overloading**

- .1 Ensure no part of work or associated equipment is subjected to loading that will endanger its safety or will cause permanent deformation.

### **1.21 Personal Protective Equipment**

- .1 Ensure workers on the jobsite use personal protective equipment appropriate to the hazards identified in the Health and Safety Risk Assessment and Management Plan and those workers are trained in the proper care, use, and maintenance of such equipment.

- .2 PPE selections shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, task-specific conditions, duration and hazards and potential hazards identified on site.
- .3 Provide all workers and up to five (5) visitors to the site with proper hearing protection. Workers and visitors shall not be exposed to noise levels greater than 85 dB (A) over an eight hour shift without proper hearing protection.
- .4 Provide all workers and up to five (5) visitors to the site with CSA approved eye protection sufficient to act as a protective barrier between the eye and airborne contaminants, hazardous materials and physical hazard.
- .5 Provide workers and up to five (5) visitors to the site with CSA approved hard hats.

### **1.22 Excavation Safety**

- .1 Protect excavations more than 1.25 metres deep against cave-ins or wall collapse by side wall sloping to the appropriate angle of repose, an engineered shoring/sheathing system or an approved trench box. Provide a ladder which can extend from the bottom of the excavation to at least 0.91 metres above the top of the excavation.
- .2 Ensure that all excavations less than 1.25 metres deep are effectively protected when hazardous ground movement may be expected.
- .3 Design trench boxes, certified by a registered Professional Engineer, and fabricated by a reputable manufacturer. Provide the manufacturer's Depth Certificate Statement permanently affixed. Use trench boxes in strict accordance with manufacturer's instructions and depth certification data.
- .4 For excavations deeper than six (6) metres, provide a certificate from a registered Professional Engineer stating that the protection methods proposed have been properly designed in accordance with accepted engineering practice. The engineer's certificate shall verify that the trench boxes, if used, are properly designed and constructed to suit the depth and soil conditions.
- .5 Ensure that the superintendent and every crew chief, foreperson and lead hand engaged in trenching operations or working in trenches have in his/her possession a copy of the Department of Labour's "Trench Excavation Safety Guide".

### **1.23 Hazardous Materials**

- .1 Should material resembling hazardous materials (asbestos/mould) be encountered during the execution of work and notify the Departmental Representative. Do not proceed until written instructions have been received from the Departmental Representative.
- .2 Unless otherwise noted, for hazardous materials abatement and repair, employ the services of a recognized Environmental Consultant to provide all air monitoring and testing services for regulatory requirements.

**1.24 Heavy Equipment**

- .1 Ensure mobile equipment used on jobsite is of the type specified in OH&S Act and Regulations fitted with a Roll Over Protective (ROP) Structure.
- .2 Provide certificate of training in Power Line Hazards for operators of heavy equipment.
- .3 Obtain written clearance from the power utility where equipment is used in close proximity to (within 5.5 metres) overhead or underground power lines.
- .4 Equip cranes with:
  - .1 A mechanism which will effectively prevent the hook assembly from running into the top boom pulley.
  - .2 A legible load chart.
  - .3 A maintenance log book.

**1.25 Work Stoppage**

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations of Work.

**Part 2 PRODUCTS**

**Not used**

**Part 3 EXECUTION**

**Not used**

**END OF SECTION**

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## **Part 1 GENERAL**

### **1.1 Related Sections**

- .1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

### **1.2 Definitions**

- .1 Hazardous Material: Product, substance, or organism that is used for its original purpose and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released to the environment.
- .2 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.
- .3 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.

### **1.3 Fires**

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

### **1.4 Disposal of Wastes and Hazardous Materials**

- .1 Do not bury rubbish and waste materials on site. Dispose of materials at approved landfill sites.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Store, handle and dispose of hazardous materials and hazardous waste in accordance with applicable Federal and Provincial laws, regulations, codes and guidelines.
- .4 Dispose of construction waste materials including creosote treated timbers and demolition debris, resulting from work, at approved landfill sites only. Carry out such disposal in strict accordance with Provincial and Municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills. The cost for removal and disposal all waste material to be included in the lump sum price for Section 02 41 16.01 – Structure Demolition.
- .5 Establish methods and undertake construction practices which will minimize waste and optimize use of construction materials. Separate at source all construction waste materials, demolition debris and product packaging and delivery containers into various waste categories in order to maximize recycling abilities of various materials and avoid disposal of debris at landfill site(s) in a “mixed state”. Where recycling firms, specializing in recycling of specific

materials exist, transport such materials to the recycling facility and avoid disposal at landfill sites.

- .6 Communicate with landfill operator prior to commencement of work, to determine what specific construction, demolition and renovation waste materials have been banned from disposal at the landfill and at transfer stations.

### **1.5 Drainage**

- .1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .3 Provide control devices such as filter fabrics, sediment traps and other necessary means to control drainage and run-off. Maintain in good order for the duration of the project.

### **1.6 Work Adjacent to Waterways**

- .1 Do not operate construction equipment in waterways.
- .2 Do not dump excavated fill, waste material or debris in waterways.
- .3 Maintain equipment in good order with no fluid leaks.

### **1.7 Pollution Control**

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- .4 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
- .5 Have emergency spill response equipment and rapid clean-up kit, appropriate to work, at site. Locate adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.
- .6 Report, to Federal and Provincial Department of the Environment, spills of petroleum and other hazardous materials as well as accidents having potential of polluting the environment. Also notify Departmental Representative and submit a written spill report to Department Representative within 24 hours of occurrence.
- .7 Provide a floating debris containment boom whenever any of the Contractors methods of work allow for the potential of floating debris.

**1.8 Notification**

- .1 Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

**Part 2 PRODUCTS**

Not Used.

**Part 3 EXECUTION**

Not Used.

**END OF SECTION**



**Part 1 GENERAL**

**1.1 Related Sections**

- .1 Section 01 29 83 – Payment Procedures for Laboratory Services.
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 78 00 – Closeout Submittals.

**1.2 Inspection**

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

**1.3 Independent Inspection Agencies**

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

**1.4 Access to Work**

- .1 Allow inspection/testing agencies access to Work.
- .2 Co-operate to facilitate such inspections and tests.
- .3 Make good work disturbed by inspectors and tests.

### **1.5 Procedures**

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

### **1.6 Rejected Work**

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

### **1.7 Tests and Mix Designs**

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

### **1.8 Mill Tests**

- .1 Submit mill test certificates and other certificates as specified in various sections.

## **Part 2 PRODUCTS**

**Not Used**

## **Part 3 EXECUTION**

**Not Used**

**END OF SECTION**





### **1.9 Temporary Power and Light**

- .1 Provide and pay for temporary power during constructing for temporary lighting, heating, site construction trailers and operating of power tools in accordance with governing regulations and the Canadian Electrical Code, latest edition.
- .2 Arrange for connection with utility company. Pay all costs for installation, maintenance and removal of cables, distribution and branch panel boards, poles, lighting, heating and general power receptacles as required.
- .3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

### **1.10 Equipment, Tool and Materials Storage**

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

### **1.11 Sanitary Facilities**

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

### **1.12 Water Supply**

- .1 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

### **1.13 Clean-Up**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways. Store materials resulting from demolition activities that are salvageable.

## **Part 2 PRODUCTS**

**Not Used**

## **Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Related Sections**

- .1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

### **1.2 Section Includes**

- .1 Barriers.

### **1.3 Installation and Removal**

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

### **1.4 Hoarding**

- .1 Erect temporary site enclosure using new 1.2M high snow fence wired to rolled steel “T” bar fence posts spaced at 2.4 meters.

### **1.5 Guard Rails and Barricades**

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open edges of deck , etc.
- .2 Provide as required by governing Authorities.

### **1.6 Access to Site**

- .1 Provide and maintain access to adjacent facilities.

### **1.7 Fire Routes**

- .1 Maintain access to property.

### **1.8 Protection for Off-Site and Public Property**

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

### **1.9 Waste Management and Disposal**

- .1 Separate waste materials for reuse and recycling. Refer to Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

**Part 2        PRODUCTS**

**Not Used**

**Part 3        EXECUTION**

**Not Used**

**END OF SECTION**

**Part 1 GENERAL**

**1.1 Description**

- .1 This section specifies requirements for board, lodgings and related services to be provided by the Contractor for the Site Inspector.
- .2 Due to the location of this site, it is a requirement of this contract that the Contractor provide and pay for all board and lodgings for the Site Inspector's sole use for the duration of the project. Provide for and maintain acceptable living accommodations on site for the Site Inspector's sole use. The minimum requirement would be a self-contained unit with private sleeping accommodation and shower or bath or other arrangement approved by the Site Inspector.

**1.2 Board and Lodgings**

- .1 For the purpose of this contract, board and lodgings shall include but not necessarily be limited to: sleeping accommodation, meals and dining facilities, washroom facilities, laundry facilities, electrical and heating service, linens and bedding, etc. and any reasonable service as directed by the Site Inspector.
- .2 Board and lodgings must be approved by the Site Inspector and the Contractor will cooperate in providing all services required to maintain an acceptable standard of living during construction period.
- .3 The Contractor shall include all calendar days, including weekends and statutory holidays in determining the cost.

**1.3 Requirements of Regulatory Agencies**

- .1 Comply with any or all applicable Agencies regulation of the Province of Newfoundland and Labrador, relating to the setup, servicing and maintenance of accommodations for the Site Inspector.
- .2 Obtain and pay for any permits which may be required and comply to regulations of same.

**Part 2 PRODUCTS**

**Not Used**

**Part 3 EXECUTION**

**Not Used**

**END OF SECTION**



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**Part 1 GENERAL**

**1.1 General**

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply;
  - .1 name and address of manufacturer;
  - .2 trade name, model and catalogue number;
  - .3 performance, descriptive and test data;
  - .4 manufacturer's installation or application instructions;
  - .5 evidence of arrangements to procure.
  - .6 evidence of manufacturer delivery problems or unforeseen delays.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations except where required for operating instructions, or when located in mechanical or electrical rooms.

**1.2 Quality**

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 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.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

**1.3 Availability**

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

#### **1.4 Storage, Handling and Protection**

- .1 Deliver, handle and store products in manner to prevent damage, 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 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .6 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.
- .7 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

#### **1.5 Transportation**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

#### **1.6 Manufacturer's Instructions**

- .1 Unless otherwise indicated in the 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 will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

### **1.7 Quality Of Work**

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

### **1.8 Co-Ordination**

- .1 Ensure coordination of Work. Maintain efficient and continuous supervision.

### **1.9 Concealment**

- .1 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

### **1.10 Remedial Work**

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

### **1.11 Fastenings**

- .1 Prevent electrolytic action between dissimilar metals and materials.
- .2 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.
- .3 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.
- .4 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .5 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

**1.12 Protection Of Work In Progress**

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

**1.13 Existing Utilities**

- .1 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

**Part 2 PRODUCTS**

**Not Used**

**Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

**Part 1 GENERAL**

**1.1 Related Sections**

- .1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

**1.2 Project Cleanliness**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .6 Dispose of waste materials and debris at designated approved dumping areas. For creosote treated timber, refer to Section 01 74 21 – Construction/Demolition Waste Management.
- .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.
- .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.

**1.3 Final Cleaning**

- .1 When work is substantially performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Owner or other Contractors.

- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .9 Remove dirt and other disfiguration from exterior surfaces.

#### **1.4 Waste Management and Disposal**

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Dispose of construction waste materials including creosote treated timbers and demolition debris, resulting from work, at approved landfill sites only. Carry out such disposal in strict accordance with Provincial and Municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.

#### **1.5 Measurement for Payment**

- .1 No measurement will be made under this section.

### **Part 2 PRODUCTS**

**Not Used**

### **Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

**Part 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 35 43 – Environment Procedures.

**1.2 WASTE MANAGEMENT PLAN**

- .1 Prior to commencement of work, prepare Waste Management Work Plan.
- .2 Work Plan to include:
  - .1 Waste audit.
  - .2 Waste reduction practices.
  - .3 Material source separation process.
  - .4 Procedures for sending recyclables to recycling facilities.
  - .5 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
  - .6 Training and supervising workforce on waste management at site.
- .3 Work Plan to incorporate waste management requirements specified herein and in other sections of the Specifications.
- .4 Where applicable, develop Work Plan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed.
- .5 Implement and manage all aspects of Waste Management Work Plan for duration of work.
- .6 Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill.

**1.3 WASTE AUDIT**

- .1 At project startup, conduct waste audit of:
  - .1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.
  - .2 Develop written list. Record type, composition and quantity of various salvageable items and waste anticipated, reasons for waste generation and operational factors which contribute to waste.

#### **1.4 Waste Reduction**

- .1 Based on waste audit, develop waste reduction program.
- .2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.
- .3 Identify materials and equipment to be:
  - .1 Protected and turned over to Departmental Representative when indicated.
  - .2 Salvaged for resale or reuse by Contractor.
  - .3 Sent to recycling facility.
  - .4 Sent to waste processing/landfill site for their recycling effort.
  - .5 Disposed of in approved landfill site.
- .4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials.

#### **1.5 Material Source Separation Process**

- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.
- .2 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
  - .1 Use suitable containers for individual collection of items based on intended purpose.
  - .2 Locate to facilitate deposit but without hindering daily operations.
  - .3 Clearly mark containers and stockpiles as to purpose and use.
- .3 Perform demolition and removal of existing structure components and equipment following a systematic deconstruction process.
  - .1 Separate materials and equipment at source carefully dismantling, labelling and stockpiling alike items for the following purposes:
    - .1 Reinstallation into the work where indicated.
    - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.
    - .3 Sending as many items as possible to locally available recycling facility.
    - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .4 Send leftover material resulting from installation work for recycling whenever possible.
- .5 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and regulations from authorities having jurisdiction.

#### **1.6 Worker Training and Supervision**

- .1 Provide adequate training to workforce to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.



- .2 Waste Management Coordinator: designate full-time person on site, experienced in waste management and having knowledge of the purpose and content of Waste Management Plan to:
  - .1 Oversee and supervise waste management during work.
  - .2 Provide instructions and directions to all workers and subcontractors on waste reduction, source separation and disposal practices.
- .3 Post a copy of Plan in a prominent location on site for review by workers.

### **1.7 Certification Of Material Diversion**

- .1 Submit to Departmental Representative, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities confirming receipt of building materials and quantity of waste diverted from landfill.
- .2 Submit data at pre-determined project milestones as determined by Departmental Representative.
- .3 Compare actual quantities diverted from landfill with projections made during waste audit.

### **1.8 Disposal Requirements**

- .1 Burning of rubbish and waste materials is prohibited. Dispose of construction waste materials including creosote treated timbers and demolition debris, resulting from work, at approved landfill sites only. Carry out such disposal in strict accordance with Provincial and Municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.
- .2 Disposal of waste, volatile materials, mineral spirits, oil, paint, paint thinner or unused preservative material into waterways, storm, or sanitary sewers is prohibited.
- .3 Do not dispose of preservative treated wood through incineration.
- .4 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .5 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.
- .6 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.
- .7 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
- .8 Transport waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.

- .9 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
- .10 Sale of salvaged items by Contractor to other parties not permitted on site.

**Part 2 PRODUCTS**

**Not Used**

**Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

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**Part 1            GENERAL**

**1.1    Related Sections**

- .1    Section 01 78 00 – Closeout Submittals.
- .2    Section 01 74 11 - Cleaning

**1.2    Inspection and Declaration**

- .1    Contractor's Inspection: Contractor and Subcontractors to conduct inspection of Work, identify deficiencies and defects, and repair as required conforming to Contract Documents.
  - .1    Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  - .2    Request Departmental Representative's Inspection.
- .2    Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor is to correct work accordingly.
- .3    Completion: submit written certificate that following have been performed:
  - .1    Work has been completed and inspected for compliance with Contract Documents.
  - .2    Defects have been corrected and deficiencies have been completed.
  - .3    Equipment and systems have been tested, and are fully operational.
  - .4    Operation of systems have been demonstrated to Owner's 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, and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
- .5    Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.
- .6    Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7    Final Payment: when Departmental Representative considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
- .8    Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with Contract Documents.

**1.3 Cleaning**

- .1 In accordance with Section 01 74 11 - Cleaning.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site.

**Part 2 PRODUCTS**

**Not Used**

**Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

**Part 1 GENERAL**

**1.1 Related Sections**

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

**1.2 Submittals**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after final inspection, with Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Furnish evidence, if requested, for type, source and quality of products provided.
- .6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .7 Pay costs of transportation.

**1.3 Project Record Documents**

- .1 Departmental Representative will provide two white-print sets of contract drawings and two copies of specifications manual specifically for “as-built” purposes.
- .2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.
- .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative at any time during construction.
- .4 As-Built Drawings:
  - .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of project and prior to final inspection, neatly transfer notations to second set (also by use of red ink). Submit both sets to Departmental Representative. All drawings of both sets shall be stamped “As-Built Drawings” and be signed and dated by Contractor.
  - .2 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
  - .3 Record the following information:
    - .1 Horizontal and vertical location of various elements in relation to Benchmark #001 Datum.

- .2 Field changes of dimension and detail.
  - .3 All design elevations, sections and details dimensioned and marked-up to consistently report finished installation conditions.
  - .4 Any details produced in the course of the contract by Departmental Representative to supplement or to change existing design drawings must also be marked-up and dimensioned to reflect final as-built conditions and appended to the as-built drawing document.
  - .5 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.
- .5 As-Built Specifications: legibly mark in red each item to record actual construction, including:
- .1 Manufacturer, trade name and catalogue number of each product actually installed, particularly items substituted from that specified.
  - .2 Changes made by Addenda and Change Orders.
  - .3 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.
- .6 Maintain as-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Frequency of reviews will be subject to Departmental Representative's discretion. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

#### **1.4 As-Builts and Samples**

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

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

### **1.5 Recording Actual Site Conditions**

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish slab datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

### **1.6 Final Survey**

- .1 Submit final site survey certificate certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

### **1.7 Warranties and Bonds**

- .1 Warranty management plan to include required actions and documents to assure that Owner receives warranties to which it is entitled.
- .2 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .3 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

- .4 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.
- .5 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .6 Include information contained in warranty management plan as follows:
  - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
  - .2 Provide list for each warranted equipment, item, feature of construction or system indicating:
    - .1 Name of item.
    - .2 Model and serial numbers.
    - .3 Location where installed.
    - .4 Name and phone numbers of manufacturers or suppliers.
    - .5 Names, addresses and telephone numbers of sources of spare parts.
    - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
    - .7 Cross-reference to warranty certificates as applicable.
    - .8 Starting point and duration of warranty period.
    - .9 Summary of maintenance procedures required to continue warranty in force.
    - .10 Organization, names and phone numbers of persons to call for warranty service.
- .7 Respond in a timely manner to oral or written notification of required construction warranty repair work.

**Part 2 PRODUCTS**

**Not Used**

**Part 3 EXECUTION**

**Not Used**

**END OF SECTION**



## **Part 1 GENERAL**

### **1.1 Sections Includes**

- .1 Methods and procedures for demolishing, salvaging, recycling and removing site work items designated to be removed in whole or in part, and for backfilling resulting trenches and excavations.

### **1.2 Related Sections**

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 29.06 - Health and Safety Requirements
- .3 Section 01 35 43 - Environmental Procedures
- .4 Section 01 45 00 - Quality Control
- .5 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .6 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

### **1.3 Submittals**

- .1 Shop drawings
  - .1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.
  - .2 Submit drawings stamped and signed by qualified professional engineer licensed in Province of Newfoundland and Labrador, Canada.
- .2 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .3 Submit plan indicating:
  - .1 Descriptions of and anticipated quantities of materials to be salvaged, reused, recycled and landfilled.
  - .2 Schedule of selective demolition.
  - .3 Number and location of dumpsters.
  - .4 Anticipated frequency of tippage.
- .4 Submit copies of certified weigh bills, bills of landing from authorized disposal sites and reuse and recycling facilities for material removed from upon request from Owner's Representative.

#### **1.4 Quality Assurance**

- .1 Convene pre-installation meeting one week prior to beginning work of this section to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with building subtrades.
- .2 Arrange for site visit with Owner's Representative to examine existing site conditions adjacent to demolition work, prior to start of Work.
- .3 Hold project meetings every month.
  - .1 Ensure key personnel, site supervisor, project manager, subcontractor representatives attend.

#### **1.5 Delivery, Storage and Handling**

- .1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Owner's Representative and at no cost to Owner's Representative.
- .2 Remove and store materials to be salvaged, in manner to prevent damage.
- .3 Store and protect in accordance with requirements for maximum preservation of material.

#### **1.6 Site Conditions**

- .1 In all circumstances ensure that demolition work does not adversely affect adjacent water courses groundwater and wildlife, or contribute to excess air and noise pollution.
- .2 Do not dispose, of waste or volatile materials such as mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
- .3 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- .5 Protect trees, plants and foliage on site and adjacent properties where indicated.

#### **1.7 Existing Conditions**

- .1 Prior to start of any demolition work remove contaminated or hazardous materials as defined by authorities having jurisdiction from site and dispose of at designated disposal facilities

### **1.8 Scheduling**

- .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
- .2 Notify Owner's Representative in writing when unforeseen delays occur.

## **Part 2 PRODUCTS**

**Not Used**

## **Part 3 EXECUTION**

### **3.1 Preparation**

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

### **3.2 Removal of Hazardous Wastes**

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

### **3.3 Removal Operations**

- .1 Remove items as indicated.
- .2 Do not disturb items designated to remain in place.
- .3 Removal of Pavements
  - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Owner's Representative.
  - .2 Protect adjacent joints and load transfer devices.
  - .3 Protect underlying and adjacent granular material.
- .4 Removal from site
  - .1 Interim removal of stockpiled material will be required by Owner's Representative, if it is deemed to interfere with operations of Owner's Representative, Owner or other contractors.

.5 Backfill

.1 Backfill in areas as indicated

### **3.4 Restoration**

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

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

### **3.5 Clean Up**

.1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 Summary**

- .1 This Section defines correction to maximum dry density to take into account aggregate particles larger than 4.75 mm.

**1.2 References**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C127-88, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
  - .2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .3 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>).
  - .4 ASTM D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

**1.3 Definitions**

- .1 Corrected maximum dry density is defined as:
  - .1  $D = (D1xD2)(F1 \times D2) + (F2 \times D1)$
  - .2 Where: D = corrected maximum dry density kg/m<sup>3</sup>.
    - .1 F1 = fraction (decimal) of total field sample passing 4.75 mm sieve.
    - .2 F2 = fraction (decimal) of total field sample retained on 4.75 mm sieve (equal to 1.00 - F1)
    - .3 D1 = maximum dry density, kg/m<sup>3</sup> of material passing 4.75 mm sieve determined in accordance with Method A C of ASTM D698.
    - .4 D2 = bulk density, kg/m<sup>3</sup>, of material retained on 4.75 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.
  - .3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253, dry method when directed by Owner's Representative.

**Part 2 PRODUCTS**

**Not Used**

**Part 3 EXECUTION**

**Not Used**

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Related Sections**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .3 Section 32 11 23 – Aggregate Base Courses.
- .4 Section 32 12 16 – Asphalt Paving

### **1.2 References**

- .1 American Society for Testing and Materials (ASTM International).
  - .1 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

### **1.3 Source Quality Control**

- .1 Source of materials to be incorporated into work or stockpiles requires approval.
- .2 Inform Owner's Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production.
- .3 If, in opinion of Owner's Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
- .4 Should a change of material source be proposed, advise Owner's Representative 4 weeks in advance of proposed change to allow sampling and testing.
- .5 Acceptance of material at source does not preclude future rejection if it is subsequently found to lack uniformity, or if its field performance is found to be satisfactory.

### **1.4 Samples**

- .1 Aggregate will be subject to continual sampling by Owner's Representative during production.
- .2 Provide Owner's Representative with access to source and processed material for sampling and testing.
- .3 Bear the cost of sampling and testing of aggregates which fail to meet specified requirements.

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**Part 2 PRODUCTS**

**2.1 Materials**

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
  - .1 Greatest dimension to exceed five times least dimension.
- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
  - .1 Natural sand.
  - .2 Manufactured sand.
  - .3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
  - .1 Crushed rock or slag.
  - .2 Gravel and crushed gravel composed of naturally formed particles of stone.

**Part 3 EXECUTION**

**3.1 Development of Aggregate Source**

- .1 Contractor to produce aggregates off site.
- .2 Contractor to develop aggregate source to prevent contamination of aggregates stockpiled.

**3.2 Processing**

- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Owner's Representative.
- .3 Wash aggregates, if required to meet specifications. Use only equipment approved by Engineer /Architect.
- .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

### **3.3 Handling**

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

### **3.4 Stockpiling**

- .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Owner's Representative. Do not stockpile on completed pavement surfaces.
- .2 Stockpile aggregates in sufficient quantities to meet Project schedules.
- .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
- .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into work.
- .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Owner's Representative within 48 h of rejection.
- .7 Stockpile materials in uniform layers of thickness as follows:
  - .1 Max 1.0 m for coarse aggregate and base course materials.
  - .2 Max 2.0 m for fine aggregate and sub-base materials.
  - .3 Max 1.5 m for other materials.
- .8 Complete each layer over entire stockpile area before beginning next layer.
- .9 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .10 Do not cone piles or spill material over edges of piles.
- .11 Do not use conveying stackers.
- .12 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

### **3.5 Cleaning**

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .2 Remove any unused aggregates from site as directed by Owner's Representative.

**END OF SECTION**



**Part 1 GENERAL**

**1.1 Related Sections**

- .1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Section 01 29 83 – Payment Procedures for Testing Laboratory Services
- .3 Sections 01 45 00 – Quality Control
- .4 Section 02 41 13 – Selective Site Demolition

**1.2 Section Includes**

- .1 This section specifies the requirements for:
  - .1 Excavation and backfilling for site work and site grading.

**1.3 References**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM D698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.

**1.4 Existing Conditions**

- .1 Known underground and surface utility lines and buried objects are as indicated on site plan.
- .2 Examine all drawings and specifications to ascertain the extent of the work. Visit the site to ascertain special conditions which might affect the work of this section.

**1.5 Protection**

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

**1.6 Measurement for Payment**

- .1 Rock and gravel backfill including supply, placement and compaction are considered incidental and will not be measured separately for payment.

- .2 Any excavated material deemed suitable for re-use by Departmental Representative shall be placed at another location on site at no extra cost.

## **Part 2 PRODUCTS**

### **2.1 Materials**

- .1 Backfill material: Type 3 with gradation to be within limits specified when tested to ASTM C136 (latest edition) and ASTM C117 (latest edition). Sieve sizes to CAN/CGSB-8.1 (latest edition).

<u>Sieve Designation</u>	<u>Passing</u>	<u>%</u>
	200 mm	100
	150 mm	80-100
	80 mm	55-95
	30 mm	25-65
	5 mm	5-25
	1 mm	0-10
	0.08mm	0-5

- .2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Departmental Representative.

### **2.2 Stockpiling**

- .1 Stockpile granular backfill material in manner to prevent segregation. Protect stockpiled fill material from freezing.

## **Part 3 EXECUTION**

### **3.1 Grading**

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Compact filled and disturbed areas to 95% corrected maximum dry density to ASTM D698.

### **3.2 Testing**

- .1 Costs of tests will be paid by Departmental Representative. Refer to Sections 01 29 83 - Payment Procedures for Testing Laboratory Services and 01 45 00 - Quality Control.

**3.3 Backfilling**

- .1 Do not commence backfilling until areas of work to be backfilled have been inspected and approved by Departmental Representative.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Place fill materials in 300 mm lifts and compact to 95% corrected maximum dry density.

**3.4 Surplus Material**

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

**END OF SECTION**

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**Part 1 GENERAL**

**1.1 Related Sections**

- .1 Section 01 33 00 - Submittal Procedure.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.
- .3 Section 01 35 29.06 - Health and Safety Requirements.
- .4 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

**1.2 Definition**

- .1 Rock: any solid material in excess of 1.0m<sup>3</sup> and which cannot be removed by means of mechanical excavating equipment having 0.95 to 1.15m<sup>3</sup> bucket. Frozen material not classified as rock.
- .2 PPV: peal particle velocity.

**1.3 Measurement Procedures**

- .1 Mass rock:
  - .1 Rock removal at the site is not anticipated. However, if rock is encountered and removal is necessary, rock quantities will not be measured separately for payment. Payment is considered incidental to the excavation.
- .2 Replacement imported fill: Imported fill quantities will be measured in cubic metres, compacted in place.

**1.4 Submittals**

- .1 Blasting Operation
  - .1 Submit to Departmental Representative and local authorities having jurisdiction for approval, written proposal of operations for removal of rock by blasting.
  - .2 Indicate proposed method of carrying out work, types and quantities of explosives to be used, loading charts and drill hole patterns, type of caps, blasting techniques, blast protection measures for items such as flying rock, vibration, dust and noise control. Include details on protective measures, time of blasting and other pertinent details.
  - .3 Submit records to Departmental Representative at end of each shift. Maintain complete and accurate records for drilling and blasting operations.
  - .4 Prior to any blasting operations, the contractor shall carry out a pre-blast survey. This survey will be conducted by an independent agency. The survey report will be submitted to the Departmental Representative for review.
  - .5 No blasting shall take place without a minimum of 48 hours notice to the Departmental Representative.

### **1.5 Qualifications**

- .1 Retain licensed explosives expert to program and supervise blasting work, to interpret recommendations of pre-blasting report, and to determine precautions, preparation and operations techniques.

### **1.6 Blasting and Vibration Control**

- .1 Reduce ground vibrations to avoid damage to structures or remaining rock mass.

## **Part 2 PRODUCTS**

**Not Used**

## **Part 3 EXECUTION**

### **3.1 Protection**

- .1 Prevent damage to surroundings and injury to persons in accordance with Section 01 56 00 - Temporary Barriers and Enclosures. Sound warnings and display signs when blasting to take place.

### **3.2 Rock Removal**

- .1 Co-ordinate this Section with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Remove rock to alignments, profiles, and cross sections as required to install new work.
- .3 Do blasting operations in accordance with local and provincial codes, requirements of authority having jurisdiction.
- .4 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize overbreak, and to avoid damage to adjacent structures.
- .5 Excavate rock to horizontal surfaces.
- .6 Excavate trenches to lines and grades to minimum of 300 mm below pipe invert indicated. Provide recesses for bell and spigot pipe to ensure bearing will occur uniformly along barrel of pipe.
- .7 Cut trenches to widths as indicated.
- .8 Use pre-shearing, cushion blasting or other smooth wall drilling and blasting techniques directed by Departmental Representative.
- .9 Remove boulders and fragments which may slide or roll into excavated areas.
- .10 Correct unauthorized rock removal at no extra cost, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### **3.3 Rock Disposal**

- .1 Dispose of surplus removed rock off site. Dispose in locations acceptable to authorities having jurisdiction and Departmental Representative.
- .2 Do not dispose removed rock into landfill. Material must be sent to appropriate location as approved by the Departmental Representative.

**END OF SECTION**

## Part 1 GENERAL

### 1.1 Related Sections

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 35 43 – Environmental Procedures.
- .3 Section 01 56 00 – Temporary Barriers and Enclosures.
- .4 Section 02 41 13 – Selective Site Demolition
- .5 Section 31 05 16 – Aggregate Materials.
- .6 Section 31 22 13 – Rough Grading for Fill
- .7 Section 31 23 16.26 – Rock Removal.

### 1.2 References

- .1 American Society for Testing and Materials (ASTM).
  - .1 ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D422, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CA/CGSB-8.2, Sieves, Testing, Woven Wire, Metric
- .3 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1 CSA-A3001, Cementitious Materials for Use in Concrete.
  - .2 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/ Methods of Test and Standard Practices for Concrete.

### 1.3 Definitions

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
  - .1 Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with

- its parent mass, and boulders or rock fragments having individual volume in excess of 1 m<sup>3</sup>. Frozen material not classified as rock.
- .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
  - .2 Unclassified excavation: excavation of deposits of whatever character encountered in work.
  - .3 Waste material: excavated material unsuitable for use in work or surplus to requirements.
  - .4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of work.
  - .5 Unsuitable materials:
    - .1 Weak and compressible materials under excavated areas.
    - .2 Frost susceptible materials under excavated areas.
    - .3 Frost susceptible materials:
      - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1.

<u>Sieve Designation</u>	<u>% Passing</u>
2.00 mm	100
0.10 mm	45-100
0.02 mm	10-80
<u>0.005 mm</u>	<u>0-45</u>

- .2 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

#### 1.4 Submittals

- .1 Inform Departmental Representative at least 4 weeks prior to commencing work, of proposed source of fill materials and provide access for sampling.
- .2 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
- .3 Ship samples as directed by Departmental Representative in tightly closed containers to prevent contamination.

#### 1.5 Quality Assurance

- .1 Submit design and supporting data at least 2 weeks prior to commencing work.
- .2 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in the province of Newfoundland and Labrador.
- .3 Keep design and supporting data on site.



- .4 Engage services of qualified professional engineer who is registered or licensed in Province of Newfoundland and Labrador to design and inspect cofferdams, shoring, bracing and underpinning required for work.
- .5 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.

## **1.6 Existing Conditions**

- .1 Buried services:
  - .1 Before commencing work verify location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
  - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .5 Prior to commencing excavation work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during work.
  - .6 Confirm locations of buried utilities by careful test excavations.
  - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
  - .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing.
  - .9 Record location of maintained, re-routed and abandoned underground lines.
  - .10 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
  - .1 Conduct, with Departmental Representative condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by work.
  - .2 Protect existing buildings and surface features from damage while work is in progress. In event of damage, immediately make repair to approval of Departmental Representative.
  - .3 Where required for excavation, cut roots or branches as approved by Departmental Representative.

## **Part 2 PRODUCTS**

### **2.1 Materials**

- .1 Backfill Type 1 and Type 2 fill: properties to Section 31 05 16 - Aggregate Materials and the following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.

- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	%Passing	
	<u>Type1</u>	<u>Type2</u>
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
<u>0.075 mm</u>	<u>3-8</u>	<u>0-10</u>

- .2 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

### Part 3 EXECUTION

#### 3.1 Site Preparation

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

#### 3.2 Preparation/Protection

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

#### 3.3 Stripping of Topsoil (N/A)

#### 3.4 Stockpiling

- .1 Stockpile fill materials in areas designated by Departmental Representative. Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

### **3.5 Cofferdams, Shoring, Bracing and Underpinning (N/A)**

### **3.6 Dewatering and Heave Prevention**

- .1 Keep excavations free of water while work is in progress.
- .2 Submit for Departmental Representative's review details of proposed dewatering or heave prevention methods.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in manner not detrimental to public and private property, or any portion of work completed or under construction.

### **3.7 Excavation**

- .1 Excavate to lines, grades, elevations and dimensions as indicated by Departmental Representative.
- .2 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Keep excavated and stockpiled materials a safe distance away from edge of trench as directed by Departmental Representative.
- .5 Restrict vehicle operations directly adjacent to open trenches.
- .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 bottom of excavation is reached.
- .10 Obtain Departmental Representative approval of completed excavation.
- .11 Correct unauthorized over-excavation as follows:
  - .1 Fill under bearing surfaces and footings with concrete specified for footings.
  - .2 Fill under other areas with Type 2 fill compacted to not less than 95% of corrected maximum dry density.

### **3.8 Fill Types and Compaction**

- .1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698 corrected maximum dry density.
  - .1 Exterior side of perimeter walls: use Type 3 fill to subgrade level. Compact to 95%.

- .2 To correct over excavation in trenches: use Type 2 fill to underside of sand bedding compacted to 95%.

### **3.9 Backfilling**

- .1 Vibratory compaction equipment: approved by 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 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Backfill around installations.
  - .1 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
  - .2 Place layers simultaneously on both sides of installed work to equalize loading. Difference not to exceed 600 mm.
  - .3 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

### **3.10 Restoration**

- .1 Upon completion of work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Clean and reinstate areas affected by work as directed by Departmental Representative.
- .3 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 h.

**END OF SECTION**

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**Part 1 GENERAL**

**1.1 Measurement for Payment Class "A"**

- .1 Measure granular base supply and placement in cubic metres (m<sup>3</sup>) to the limits shown on the drawings. Include as incidental any cost associated with reshaping and compaction to achieve finished grades as noted on the drawings.

**1.2 References**

- .1 American Society for Testing and Materials (ASTM), latest edition
  - .1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .5 ASTM D1557, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .6 ASTM D1883, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .7 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB), latest edition
  - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

**1.3 Waste Management and Disposal**

- .1 Separate and recycle waste materials.

**Part 2 PRODUCTS**

**2.1 Materials**

- .1 Granular base: material in accordance with the following requirements:
  - .1 Crushed stone or gravel.
  - .2 Aggregate quality: Sound, hard, durable material free from soft, thin elongated or laminated particles, organic material, or other substances that would act in deleterious manner for use intended.
  - .3 Flat and elongated particles of coarse aggregate: to ASTM D 4791.
  - .4 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Class "A" Granular Base

Sieve Designation	% Passing
19 mm	100
9.51 mm	55-80
4.75 mm	35-60
1.20 mm	17-35
0.300 mm	7-20
0.075 mm	3-6 (pit source)
0.075 mm	3-8 (rock source)

Class "B" Granular Sub-Base (Not in contract)

Sieve Designation	% Passing
50.8 mm	100
25.4 mm	50-100
4.75 mm	20-55
1.2 mm	10-35
0.300 mm	5-20
0.075 mm	2-6 (pit source)
0.075 mm	2-8 (rock source)

- .1 Liquid limit: to ASTM D4318, maximum 25
- .2 Plasticity index: to ASTM D4318, maximum 0
- .3 Los Angeles degradation: to ASTM C131. Max. % loss by weight: 35
- .4 Crushed particles: at least 50% of particles by mass retained on the 4.75mm sieve to have at least 1 freshly fractured face.
- .5 Soaked CBR: to ASTM D1883, min 100, when compacted to 100% of AASHTO T180-74.

**Part 3 EXECUTION**

**3.1 Sequence Of Operation**

- .1 Place granular base after sub-base surface is inspected and approved by Departmental Representative.
- .2 Placing
  - .1 Construct granular base to depth and grade in areas indicated.
  - .2 Ensure no frozen material is placed.
  - .3 Place material only on clean unfrozen surface, free from snow and ice.
  - .4 Begin spreading base material on crown line or on high side of one-way slope.
  - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
  - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
  - .7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
  - .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

- .9 Remove and replace that portion of layer in which material becomes segregated during spreading.

.3 Compaction Equipment

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from Departmental Representative before use.
- .3 Equipped with device that records hours of actual work, not motor running hours.

.4 Compacting

- .1 Compact to density not less than 98% corrected maximum dry density in accordance with ASTM D698.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .3 Apply water as necessary during compacting to obtain specified density.
- .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

**3.2 Site Tolerances**

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

**3.3 Protection**

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Summary**

- .1 This section is included for information to Contractor. Testing will be performed by testing firm selected by the Departmental Representative.
- .2 This method covers measurement of loss of Marshall Stability resulting from action of water on compacted asphalt paving mixtures containing penetration grade asphalt cement.
- .3 Numerical index of retained stability is obtained by comparing stability of specimens determined in accordance with usual Marshall procedures with stability of specimens that have been immersed in water for prescribed period.

### **1.2 Related Sections**

- .1 Section 32 12 16 - Asphalt Paving.

### **1.3 References**

- .1 American Association of State Highway and Transportation Officials (AASHTO)
- .2 AASHTO T245, Standard Method of Test for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.

## **Part 2 PRODUCTS**

### **2.1 Materials**

- .1 Representative samples of each asphalt paving mixture proposed for use on Project.

### **2.2 Equipment**

- .1 One or more water baths with automatic controls for immersing specimens. Baths normally used for Marshall test are suitable for test.
- .2 Scale and water bath with suitable accessory equipment for weighing test specimens in air and in water to determine their densities.
- .3 Flat transfer plates of glass or metal. Keep one plate under each specimen during immersion period and during subsequent handling, except when weighing and testing, to prevent breakage or distortion of specimens.
- .4 Apparatus required to conduct Marshall test.



## **Part 3 EXECUTION**

### **3.1 Preparation of Test Specimens**

- .1 Prepare at least 8 specimens for each test, with hand-operated hammer, in accordance with AASHTO T245, except where specified otherwise.

### **3.2 Test Procedure**

- .1 Do Marshall testing in accordance with AASHTO T245, except where specified otherwise.
- .2 Weigh each specimen in air and in water. Weigh in water as rapidly as possible to minimize absorption.
- .3 Calculate specific gravity of each specimen as follows:
  - .1 Specific Gravity =  $A / (A - B)$
  - .2 Where A = weight of specimen in air in grams
  - .3 B = weight of specimen in water in grams
- .4 Sort each set of 8 specimens into 2 groups of 4 specimens each so that average specific gravity of specimens in group 1 is essentially same as that of group 2.
- .5 Test group 1 specimens for Marshall stability. Calculate S1 = Marshall stability of group 1 (average).
- .6 Immerse group 2 specimens in water for 24 h at [60] °C, then test immediately for Marshall stability. Calculate S2 = Marshall stability of group 2 (average).

### **3.3 Test Report**

- .1 Report test results to Departmental Representative.
- .2 Report numerical index of retained stability as resistance of asphaltic paving mixtures to detrimental effect of water, expressed as percentage of original stability retained after immersion period.
- .3 Calculate index as follows:
  - .1 Index of Retained Stability =  $S2 / S1 \times 100$

**END OF SECTION**

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**Part 1            GENERAL**

**1.1 Section Includes**

- .1 Materials and installation for asphalt concrete pavement for facility access.

**1.2 Related Sections**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 45 00 – Quality Control.
- .3 Section 31 05 16 – Aggregate Materials.
- .4 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

**1.3 References**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1, Sieves Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2, Sieves Testing, Woven Wire, Metric.
  - .3 CAN/CGSB-16.3, Asphalt Cement for Road Purposes.
- .2 American Association of State Highway and Transportation Officials (AASHTO)
  - .1 AASHTO M320 - Standard Specification for Performance Grade Asphalt Binder.
- .3 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
  - .2 ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .3 ASTM C123, Standard Test Method for Lightweight Particles in Aggregate.
  - .4 ASTM C127, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
  - .5 ASTM C128, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
  - .6 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .7 ASTM C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .8 ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .9 ASTM D977 – Standard Specification for Emulsified Asphalt.
  - .10 ASTM D995, Standard Specification for Requirements Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

- .11 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .12 ASTM D3203, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- .13 ASTM D4318, Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .14 ASTM D4791, Standard Test Method for Flat Particles or Elongated Particles in Coarse Aggregate.
- .4 Asphalt Institute (AI)
  - .1 Asphalt Institute MS-2, Mix Design Methods for Asphalt Concrete.

#### 1.4 Submittals

- .1 Submit asphalt concrete mix design to Departmental Representative for approval at least 2 weeks prior to commencing work, in accordance with Section 01 33 00 Submittal Procedures.
- .2 Materials to be tested by testing laboratory approved by Departmental Representative.
- .3 Submit test certificates showing suitability of materials at least 2 weeks prior to commencing work.
- .4 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 2 weeks prior to commencing work.

#### 1.5 Measurement for Payment

- .1 Asphalt pavement shall be measured in square meters of the combined two (2) layers of placed material.

### Part 2 PRODUCTS

#### 2.1 Materials

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

- .1 Crushed or screened stone, gravel or sand.
- .2 Gradations: within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.
- .3 Table:

Sieve Designation	Granular Base	Granular Sub-Base
200 mm	-	-
75 mm	-	-
50 mm	-	75-100
38.1 m	-	-
25 mm	-	-

Sieve Designation	Granular Base	Granular Sub-Base
19 mm	100	-
15.9 mm	-	45-80
12.5 mm	-	-
9.5 mm	55-80	-
4.75 mm	35-60	25-55
2.00 mm	-	-
1.20 mm	17-35	12-35
0.425 mm	-	-
0.180 mm	-	-
0.075 mm	3-6	3-6

.4 Granular base aggregates:

- .1 Crushed particles: at least 50 % of particles by mass retained on 4.75 mm sieve to have at least 1 freshly fractured face.

.2 Asphalt concrete aggregates:

- .1 Coarse aggregate is aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C117.
- .2 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.
- .3 Separate stock piles for coarse and fine aggregate are not required for sheet asphalt.
- .4 Do not use aggregates having known polishing characteristics in mixes for surface courses.
- .5 Aggregate: material to Section 31 05 16 – Aggregate Materials and following requirements:
  - .1 Crushed stone or gravel.
  - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117, Latest Edition. Sieve sizes to CAN/CGSB-8.1, Latest Edition.

Sieve Designation (Type 1) Base	% Passing (Base Type 2)
19.0 mm	100
9.5 mm	60-80
4.75 mm	40-65
2.00 mm	30-50
0.180 mm	5-20
0.075 mm	3-8

- .3 Sand equivalent: to ASTM D2419, Minimum 50.
- .4 Magnesium Sulphate soundness: to ASTM C88. Max % loss by weight: coarse aggregate 12, fine aggregate 16.
- .5 Los Angeles Degradation: to ASTM C131, Max % loss by weight: coarse aggregate, 35.

- .6 Absorption: to ASTM C127, Max % by weight: coarse aggregate, 1.75.
  - .7 Lightweight particles: to ASTM C123, Max % by mass, with less than 1.95. Relative density (formally Specific Gravity): 1.5.
  - .8 Flat and elongated particles: to ASTM D4791, (with length to thickness ratio greater than 5): Max % by weight: coarse aggregate, 15.
  - .9 Crushed particles: at least 60 % 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
19 mm	to	9.5 mm
9.5 mm	to	4.75 mm
  - .10 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.
- .3 Mineral filler for asphalt concrete:
- .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 when necessary to meet job mix aggregate gradation or as directed by Departmental Representative to improve mix properties.
- .4 Asphalt cement: to AASHTO M320, Grade PG58-28 when tested to AASHTO R29.
- .5 Asphalt Prime: to ASTM D997.
- .6 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.
- .7 Asphalt tack coat: to ASTM D977.

## 2.2 Mix Design

- .1 Job mix formula to be approved by Departmental Representative.
- .2 Design of mix: by Marshall method to requirements below:
  - .1 Compaction blows on each face of test specimens: 75.
  - .2 Mix physical requirements:

Property	Asphalt / Concrete
Marshall Stability at 60°C kN minimum	5.5 Surface Course, 4.5 Lower Course
Flow Value, mm.	2 - 4
Air Voids in Mixture, %	3 - 5 Surface Course, 2 - 6 Lower Course
Voids in Mineral Aggregate, % minimum	15 Surface Course, 13 Lower Course
Index of Retained Stability, % minimum	75

- .3 Measure physical requirements as follows:
  - .1 Marshall load and flow value to AASHTO T245.

- .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.
- .3 Air voids: to ASTM D3203.
- .4 Voids in mineral aggregate: to Asphalt Institute, MS-2 chapter 4.
- .5 Index of Retained Stability: measure in accordance with Section 32 12 10 Marshall Immersion Test for Bitumen.
- .4 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.
- .5 Return plant dust collected during processing to mix in quantities acceptable to Departmental Representative.

### **2.3 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 for parking lots and driveway:
  - .1 Minimum drum diameter: 1200mm.
  - .2 Maximum amplitude of vibration (machine setting): 0.5mm for lifts less than 40mm thick.
- .4 Haul trucks: of sufficient number and 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.
  - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
- .5 Hand tools:
  - .1 Suitable hand tools for spreading and compaction in difficult to access areas.
  - .2 Straight edge, 4.5m long, to test finished surface for flatness.

## **Part 3 EXECUTION**

### **3.1 Subgrade Surface Preparation and Inspection**

- .1 Remove existing asphalt as noted on drawings or as otherwise directed by the Departmental Representative.
- .2 Scarify and regrade existing material as shown on drawings.

- .3 Verify grades of subgrade drains and other items set in paving area for conformity with elevations and sections before placing granular base material.
- .4 Obtain approval of subgrade by Departmental Representative before placing granular base.

### **3.2 Granular Base and Granular Subbase**

- .1 Place granular base and sub-base material on clean unfrozen surface, free from snow and ice.
- .2 Place granular base and sub-base to compacted thicknesses as indicated. Do not place frozen material.
- .3 Place in layers not exceeding 150 mm compacted thickness. Compact to density not less than 98 % maximum dry density in accordance with ASTM D698.
- .4 Finished base surface to be within 10 mm of specified grade, but not uniformly high or low.

### **3.3 Asphalt Prime**

- .1 Emulsified asphalt:
  - .1 Dilute asphalt emulsion with clean water at 1:1 ratio for application. Mix thoroughly by pumping or other method approved by Departmental Representative.
  - .2 Apply diluted asphalt emulsion at rate directed by Departmental Representative but do not exceed 5 L/m<sup>2</sup>.
  - .3 Apply on damp surface unless otherwise directed by Departmental Representative.
- .2 Do not apply prime when air temperature is less than 5°C or when rain is forecast within 2 hours.
- .3 If asphalt prime fails to set within 24 hours, spread sand blotter material in amounts required to absorb excess material. Sweep and remove excess blotter material.

### **3.4 Plant and Mixing Requirements**

- .1 To ASTM D995.

### **3.5 Asphalt Concrete Paving**

- .1 Obtain approval of primer from Departmental Representative before placing asphalt mix.
- .2 Place asphalt mix only when base or previous course is dry and air temperature is above 5°C.
- .3 Place asphalt concrete in compacted layers not exceeding 50 mm.

- .4 Minimum 135°C mix temperature required when spreading.
- .5 Maximum 160°C mix temperature permitted at any time.
- .6 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.
- .7 Compact parking lot and driveway asphalt concrete to density not less than 95 % of density obtained with Marshall specimens prepared in accordance with ASTM D1559, ion from samples of mix being used. Roll until roller marks are eliminated.
- .8 Keep roller speed slow enough to avoid mix displacement and do not stop roller on fresh pavement.
- .9 Moisten roller wheels with water to prevent pick up of material.
- .10 Compact mix with hot tampers or other equipment approved by Departmental Representative in areas inaccessible to roller.
- .11 Finish surface to be within 10 mm of design elevation and with no irregularities greater than 10 mm in 4.5 m.
- .12 Repair areas showing checking, rippling or segregation as directed by Departmental Representative.

### **3.6 Joints**

- .1 Remove surplus material from surface of previously laid strip. Do not deposit on surface of freshly laid strip.
- .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .3 For cold joints, cut back to full depth vertical face and tack face with hot asphalt.
- .4 For longitudinal joints, overlap previously laid strip with spreader by 25 to 50 mm.

### **3.7 Testing**

- .1 Inspection and testing of asphalt pavement will be carried out by designated testing laboratory. Refer to Sections 01 29 83 – Payment Procedures for Testing Laboratory Services and Section 01 45 00 - Quality Control.



**3.8 Protection**

- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38°C. Do not permit stationary loads on pavement until 24 hours after placement.
- .2 Provide access to buildings as required. Arrange paving schedule so as not to interfere with normal use of premises.

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Section Includes**

- .1 Materials and installation for the construction and placement of manholes frames and covers.

### **1.2 Related Sections**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 31 05 16 - Aggregate Materials.
- .3 Section 31 23 33.01 - Excavation, Trenching and Backfilling.

### **1.3 References**

- .1 American Society for Testing and Materials (ASTM International).
  - .1 ASTM A48/A48M, Standard Specification for Gray Iron Castings.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
  - .2 CAN/CSA-G30.18-M92, Billet Steel Bars for Concrete Reinforcement.
  - .3 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

### **1.4 Submittals**

- .1 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.

### **1.5 Scheduling of Work**

- .1 Schedule work to minimize interruptions to existing services and/or access.
- .2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

### **1.6 Measurement for Payment**

- .1 Catch basins will be paid for as per each structure supplied and installed.

## Part 2 PRODUCTS

### 2.1 Materials

- .1 Pre-cast or Cast-in-place concrete.
- .2 Frames and covers to dimensions as indicated and following requirements:
  - .1 Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
  - .2 Gray iron castings: to ASTM A48/A48M, strength class 30B.
  - .3 Castings: coated with two applications of asphalt varnish or cleaned and ground to eliminate surface imperfections.
  - .4 Catch basin covers: heavy duty municipal type for road service.
- .3 Granular bedding and backfill: in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
  - .1 Crushed screed stone, gravel or sand.
  - .2 Granulations to be within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.1.
  - .3 TABLE

Sieve Designation	% Passing Stone/Gravel	Gravel/Sand
200 mm	-	-
75 mm	-	-
50 mm	-	-
38.1 mm	-	-
25 mm	100	-
19 mm	-	-
12.5 mm	65-90	100
9.5 mm	-	-
4.75 mm	35-55	50-100
2.00 mm	-	30-90
0.425 mm	10-25	10-50
0.180 mm	-	-
0.075 mm	0-8	0-10

## Part 3 EXECUTION

### 3.1 Excavation and Backfill

- .1 Excavate and backfill in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling and as indicated.
- .2 Obtain approval of Departmental Representative before installing, catch basis frames and covers.

### **3.2 Installation**

- .1 Set frame and cover to required elevations as shown. Covers to be set 50mm below surrounding finished asphalt surface. Slope edges of asphalt to provide a smooth transition to the catch basin cover.

**END OF SECTION**

## **Part 1 GENERAL**

### **1.1 Section Includes**

- .1 Materials and installation for storm sewer.

### **1.2 Related Sections**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 31 05 16 - Aggregate Materials.
- .3 Section 31 23 33.01 - Excavating, Trenching and Backfilling
- .4 Section 33 05 13 - Manholes and Catch Basin Structures.

### **1.3 References**

- .1 American Society for Testing and Materials (ASTM).
  - .1 ASTM C117, Test Method for Material Finer Than 0.075 mm (No.200) sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft-lbf/ft<sup>3</sup>(600 kN-m/m<sup>3</sup>).
  - .4 ASTM D1056, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
  - .5 ASTM D3034, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
  - .6 ASTM F794, specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings based on Controlled Inside Diameter.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire.
  - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International), Latest Edition.
  - .1 CSA B1800, Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8 and B182.11).CSA B182.2, PVC Sewer Pipe and Fittings (PSM Type).
    - .1 CSA B182.4, Profile PVC Sewer Pipe and Fittings.
  - .2 CSA B182.11, Recommended Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings.

#### **1.4 Definitions**

- .1 A pipe section is defined as length of pipe between successive catchbasins and/or manholes.

#### **1.5 Submittals**

- .1 Shop drawings to indicate proposed method for installing carrier pipe for undercrossings.
- .2 Inform Owner's Representative at least 4 weeks prior to beginning Work of proposed source of bedding materials and provide access for sampling.
- .3 Submit manufacturer's test data and certification at least 2 weeks prior to beginning Work.
- .4 Certification to be marked on pipe.
- .5 Submit to Owner's Representative 1 copy of manufacturer's installation instructions.

#### **1.6 Delivery, Storage and Handling**

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

#### **1.7 Scheduling of Work**

- .1 Schedule Work to minimize interruptions to existing services and to maintain existing flow during construction.
- .2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

#### **1.8 Measurement for Payment**

- .1 Storm utility drains will be measured by metres of pipe supplied and installed.
- .2 Pipe Bedding supply and placement will be measured in cubic metres (m<sup>3</sup>) to the limits shown on the drawings. Include as incidental any cost associated with reshaping and compaction to achieve grades as noted on the drawings.

### **Part 2 PRODUCTS**

#### **2.1 Plastic Pipe**

- .1 Type PSM Polyvinyl Chloride (PVC): to ASTM D3034, DR 28.
- .2 Separate gasket and integral bell system.
- .3 Nominal lengths: 6 m.

## 2.2 Pipe Bedding and Surround Material

- .1 Granular material in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
  - .1 Crushed or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Table

Sieve Designation	% Passing Stone/Gravel	Gravel/Sand
25	100	-
19	-	-
12.5	65-90	100
9.5	-	-
4.75	35-55	50-100
2.00		30-90
0.425	10-25	10-50
0.180	-	-
0.075	0-8	0-10

## 2.3 Backfill Material

- .1 Type 3 to Section 31 23 33.01 - Excavating Trenching and Backfilling.

## Part 3 EXECUTION

### 3.1 Preparation

- .1 Clean pipes and fittings of debris and water before installation, and remove defective materials from site to approval of Owner's Representative.

### 3.2 Trenching

- .1 Do trenching Work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Do not allow contents of sewer or sewer connection to flow into trench.
- .3 Trench alignment and depth to approval of Owner's Representative prior to placing bedding material and pipe.

### 3.3 Granular Bedding

- .1 Place bedding in unfrozen condition.
- .2 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness.

- .3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.
- .4 Shape transverse depressions as required to suit joints.
- .5 Compact each layer full width of bed to at least 95 % corrected maximum dry density.
- .6 Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted bedding material.

### 3.4 Installation

- .1 Lay and join pipe in accordance with manufacturer's recommendations and to approval of Owner's Representative.
- .2 Handle pipe using methods approved by Owner's Representative. Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.
- .3 Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
- .4 Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
- .5 Do not exceed maximum joint deflection recommended by pipe manufacturer.
- .6 Do not allow water to flow through pipes during construction except as may be permitted by Owner's Representative.
- .7 Whenever Work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .8 Jointing Pipe to Pipe & Fittings
  - .1 PVC Pipe:
    - .1 Install rubber gasket in bell as per manufacturer's instructions or provide pre-installed gaskets.
    - .2 Slide the spigot end inside a lubricated bell end.
- .9 When any stoppage of Work occurs, restrain pipes as directed by Owner's Representative, to prevent "creep" during down time.
- .10 Plug lifting holes with Owner's Representative approved prefabricated plugs, set in shrinkage compensating grout.
- .11 Cut pipes as required for special inserts. Fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.



- .12 Make watertight connections to manholes and catch basins. Use shrinkage compensating grout when suitable gaskets are not available.
- .13 Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

### **3.5 Pipe Surround**

- .1 Place surround material in unfrozen condition.
- .2 Upon completion of pipe laying, and after Owner's Representative has inspected pipe joints, surround and cover pipes as indicated. Leave joints and fittings exposed until field testing is completed.
- .3 Hand place surround material in uniform layers not exceeding 150mm compacted thickness as indicated.
- .4 Place layers uniformly and simultaneously on each side of pipe.
- .5 Compact each layer from pipe invert to mid height of pipe to at least 95 % corrected maximum dry density.
- .6 Compact each layer from mid height of pipe to underside of backfill to at least 90 % corrected maximum dry density to ASTM D698.
- .7 When field test results are acceptable to Owner's Representative place surround material at pipe joints.

### **3.6 Backfill**

- .1 Place backfill material in unfrozen condition.
- .2 Place backfill material, above pipe surround, in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

### **3.7 Field Testing**

- .1 Repair or replace pipe, pipe joint or bedding found defective.
- .2 When directed by Owner's Representative, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.
- .3 Remove foreign material from sewers and related appurtenances by flushing with water.

**END OF SECTION**