

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Definitions**

- .1 Defined terms in the Contract shall have the same meanings as set out in Section 00800, except where the contrary is expressed.
- .2 Pursuant to Section 00800, the Consultant for “Cambie Street Bridge Foundation Seismic Retrofit” is MMM Group having an office at #600 – 1455 West Georgia Street, Vancouver, BC V6G 2T3, and for “Southeast False Creek Energy Centre and Sewage Pump Station” is Sandwell Engineering Inc., having an office at 885 Dunsmuir Street, Suite 600, Vancouver, BC, V6C 1N5, plus other sub-consultants, or such other technical representative as the Owner may designate from time to time.
- .3 “Project Office” means the project offices of the Owner at the Southeast False Creek Project Office: 1800 Spyglass Place, Vancouver, BC, V5Z 4K8, Telephone (604) 871-6127.

**1.3 Work Covered By Contract Documents**

- .1 The Work, unless specifically stated otherwise, shall include the furnishing of all labour, supervision, materials, products, Contractor's Plant, transportation and all other things necessary to complete the construction of the Work shown on the Contract Documents, at the Work Site (the "Project"). The intent is that the Contractor provides a complete job.
- .2 The work is broken down into two parts. Cambie Street Bridge Foundation Seismic Retrofit is the construction of the micropiles through the existing pile caps of the Cambie Street Bridge. Southeast False Creek Energy Centre and Sewage Pump Station is the construction of the Energy Centre and Sewage Pump Station.
- .3 The Work shall not be deemed complete until the Work is accepted by the Owner.
- .4 Provide all labour, supervision, management, Materials, temporary works, supplies, services, Contractor's Plant, receiving and handling, transportation, foreign, federal, provincial and municipal taxes and duties of whatsoever kind, permits and licenses and other things necessary for and incidental to the performance of all the Work. Advise the Owner prior to applying for any permits or licenses.
- .5 Any minor or incidental item of the Work not called for in the Specifications or shown on the Drawings but clearly required to meet the intent of design and normally provided for the proper operation of the Work shall be provided as if specifically called for in the Contract Documents.
- .6 General
  - .1 Supplying and installing Materials as indicated on the Drawings or in the Specifications;
  - .2 Providing quality control;

- .3 Coordinating and co-operating with the Owner's or Others construction crews, the Owner's operations' personnel, and Other Contractors;
- .4 Providing as-built drawings; and
- .5 Performing the Work in such a manner as to minimize construction-related impacts to the environment and the neighborhood.
- .7 The Work may commence at the Work Site immediately following a Notice to Proceed. The Work is to be substantially complete by September 30, 2009.
- .8 Among its other responsibilities, the Contractor will be totally responsible for developing and working in accordance with a comprehensive quality control program. The Owner will audit the Contractor to ensure compliance in a complementary quality assurance program. Refer to Section 01400 – Quality Control, and Section 01401 – Quality Assurance.
- .9 The Contractor shall be actively managing construction worker parking, access to and from the Work Site, traffic control on the Work Site and hauling to disposal sites.

#### **1.4 Description of Work**

The Work of the Contract consists of the construction of all geotechnical, civil, structural, architectural, mechanical, piping and electrical components, and all other associated Work described and as shown in the Contract Documents including, but not limited to, the following:

- .1 General and Site Preparation
  - .1 Providing a construction schedule acceptable to the Owner;
  - .2 Providing a detailed review of the contract drawings and specifications and bringing to the timely attention of the Consultant any and all discrepancies noted therein. Particular attention is to be paid to the concrete profile dimensions inside the wet well;
  - .3 Providing shop drawings in a timely manner for review;
  - .4 Providing other submittals where called for in the Specifications, including where specified engineering calculations, sketches and drawings sealed by a Professional Engineer registered in the Province of British Columbia;
  - .5 Clearing and, if applicable, grubbing the laydown area and temporary access road;
  - .6 Developing a rock blasting procedure, if necessary for excavation in the wet well area;
  - .7 Constructing temporary security and tree protection fencing, if required, around the Work Site;
  - .8 Constructing temporary noise barrier fencing at specified areas if required;
  - .9 Constructing the temporary access road and the laydown area, including excavation and backfill; installation of drainage ditches, and drainage piping; gravel and asphalt surfacing;
  - .10 Set up site office, including Owner's/Consultant's site office;

- .11 Preparing and implementing an Environmental Protection Plan;
- .12 Preparing and implementing a Public Impact Mitigation Plan;
- .13 Installing environmental impact mitigation measures.
- .14 Providing construction input and management in order to achieve the LEED requirements for Gold certification
- .2 Cambie Street Bridge Pier Foundation Retrofit
  - .1 Seismic Retrofit of Pilecap at Pier A5/W14
  - .2 Seismic Retrofit of Pilecap at Pier E14
  - .3 Seismic Retrofit of Pilecap at Pier B5
- .3 Excavation and Foundations
  - .1 Excavation, as required to enable installation of the Work per the contract drawings and specifications;
  - .2 Producing Recycled Asphalt Pavement (RAP) Blend by milling the existing asphaltic concrete with an equal thickness of underlying granular base, and temporarily stockpiling this RAP Blend on site for use as Select Granular Sub-Base (Type 1 Fill) backfill at the lower depths.
  - .3 Removal of Excavated material not suitable for backfilling and transportation and disposal of "Contaminated" excavated material in accordance with Environmental regulations. Stockpiling excavated material to be used in the work as directed by the Consultant;
  - .4 Constructing concrete base slabs and footings at all levels, including embedded mechanical and electrical services as shown on the drawings, complete with backfilling within the building footprint for base and subbase preparation below slabs and footings, as shown on the drawings;
  - .5 Constructing concrete perimeter and internal dividing walls, including all mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
  - .6 Constructing the base, and walls of the wet well to the profile shown on the structural and mechanical drawings, including all mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
  - .7 Constructing concrete columns, beams, suspended floor and roof slabs, including all mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
  - .8 Leaving dowels with adequate worker safety protection for equipment pads as shown on the drawings;
  - .9 Constructing waterproofing and insulation to exterior of perimeter wall prior to backfilling, as shown on the drawings;

.10 Backfilling around the basement perimeter as specified, only after all the structural concrete elements have been cast and cured, including the roof slab.

.4 Civil

.1 Construction of utilities from the basement walls to the project property limits.

.2 Construction of a new storm sewer "looping bypass", (the existing in-service storm sewer is aligned right through the middle of the proposed CEC building basement and therefore needs to be rerouted).

.3 Construction of the following buried pipeline utilities:

.1 Incoming Nelson forcemain branch, including tie-in to Nelson forcemain at Commodore Road, and gravity drain to the proposed Cambie sewer manhole.

.2 Incoming Cambie gravity flow sanitary sewer along Wylie Street.

.3 Outgoing Cambie pumped flow forcemain along Wylie Street.

.4 Make-up sanitary flow forcemains from just inside the CEC basement to the Cambie sewer manhole on the southeast side of the Energy Centre.

.4 The Contractor shall also construct the buried:

.1 Electrical duct bank and chamber on the south side towards Commodore Road.

.2 Telecom duct bank and chamber on the south side towards Commodore Road.

.3 Potable and firewater connection on the northwest corner from Spyglass Place.

.5 Provide coordination and interface with other contractors:

.1 Terasen Gas will construct a new buried line, with a service connection into the Energy Centre at the northwest corner.

.2 The District Heat System (DHS) will be constructed as part of a separate contract by others, into the northeast corner of the CEC building.

.3 BC Hydro will construct a service line and 12.47 kV switch to serve the CEC, from which the electrical service will be installed.

.4 The City of Vancouver is reconstructing 1<sup>st</sup> Ave. including underground utilities surface infrastructure and a planned trolley car system.

.5 VANOC will be accessing adjacent sites in preparation for the upcoming 2010 Olympic Winter Games.

.6 Developers are constructing structures on neighbouring properties.

.7 Canada Line station construction will be carrying on adjacent to the Cambie Street Bridge

- .6 Refer to Section 02005 Summary of Work – Civil, for a more comprehensive description of the civil scope of work.
  
- .5 Architectural
  - .1 Construction of a 1380 m<sup>2</sup> Sewage Pump Station and Energy Centre (partial LEED Gold-certified) building consisting of:
    - 1. 800 m<sup>2</sup> interconnected basement level of solid reinforced concrete construction,
    - 2. 580 m<sup>2</sup> one-storey above grade building of architectural reinforced concrete, exposed structural steel roof and supports, pre-cast concrete cladding, curtainwall & other glazing, metal louvres and zinc standing-seam roof & cladding.
  - .2 This medium-hazard industrial facility will be fully sprinklered and house very large urban-infrastructure mechanical and electrical equipment, including operational & maintenance provisions, plus minor office, staff support and interpretive functions. The building is located on a gentle slope under, and in close proximity to, the Cambie Bridge and adjacent to an established residential neighborhood.
  
- .6 Structural
  - .1 Excavation, as required to enable installation of the Work per the contract drawings and specifications;
  - .2 Removal of Excavated material not suitable for backfilling and transportation and disposal of “Contaminated” excavated material in accordance with Environmental regulations and as specified. Stockpiling excavated material to be used in the work as directed by the Consultant;
  - .3 Constructing concrete base slabs and footings at all levels as noted on the drawings, including embedded mechanical and electrical services as shown on the drawings, complete with backfilling within the building footprint for base and sub base preparation below slabs and footings, as shown on the drawings;
  - .4 Constructing concrete perimeter and internal dividing walls in alternate panels as noted on the drawings, including all insert plates, anchor bolts, mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
  - .5 Constructing the base, walls and stair of the wet well to the profile shown on the structural and mechanical drawings, including all insert plates, mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
  - .6 Constructing concrete columns, beams, suspended floor and roof slabs, including all insert plates, mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
  - .7 Constructing equipment pads as shown on the drawings;
  - .8 Constructing damp proofing and insulation to exterior of perimeter walls prior to backfilling, as shown on the drawings;

- .9 Backfilling around the basement perimeter as specified, only after all the structural concrete elements have been cast and cured, including the roof slab.
- .10 Constructing the concrete superstructure walls, including all insert plates, anchor bolts, mechanical and electrical embedded items, sleeves, block outs, etc. as shown on the drawings;
- .11 Constructing structural steel framework including columns, beams, bracing etc, including designing all connections certified by a Professional Engineer licensed to practice in British Columbia, for the support of the plenum and roof levels.
- .12 Constructing reinforced concrete plenum floor slabs on structural steel beam supports.
- .13 Constructing the metal deck roof and connecting to the structural steel framework.
- .14 Epoxy injection of cracks over 0.2mm wide in the underground concrete walls and base slab as specified.
- .7 Mechanical
  - .1 Sewage Pump Station
    - .1 Supply and installation of 4 self priming sewage pumping units complete with all suction and discharge piping, valves and related equipment;
    - .2 Supply and installation of a submersible sewage transfer pump in the screen channel complete with all suction and discharge piping, valves and related equipment;
    - .3 Supply and installation of a self cleaning traveling wastewater screen and related equipment;
    - .4 Supply and installation of slide gates and actuators for controlling flows into the wet wells and screen channels;
    - .5 Supply and installation of manual valves and valves fitted with electric actuators and related piping systems for transferring wastewater flows from the Nelson forcemain to the inlet of the sewage pump station;
    - .6 Supply and installation of a Parshall Flume flow measuring system at inlet to the sewage pump station;
    - .7 Supply and installation of a sump pump system including discharge piping and related equipment;
    - .8 Supply and installation of all necessary instrumentation including flow meters, pressure gauges, pressure transmitters, level sensors, and related equipment required for operation of equipment in the sewage pump station and wet well area;
    - .9 Supply and installation of all necessary piping, small bore piping, fittings, couplings and related items required in the sewage pump station and wet well area;

- .10 Co-ordination with all other work in the sewage pump room and wet well area and in areas adjoining sewage pump room and wet well areas;
  - .11 Provision of all equipment, materials and labour necessary to provide a complete working sewage pump station and wet well including screening system as required by the contract documents and as indicated on the contract documents;
  - .12 Testing and commissioning of all equipment in the sewage pump room and wet well area
- .2 Central Heating Plant
- .1 Installation of the 3 gas-fired hot water boilers, (supplied by Owner), including economizer and all ancillary components provided by vendor.
  - .2 Supply and installation of 3 hot water district heat system circulation pumps.
  - .3 Supply and installation of 3 boiler hot water pumps, 1 economizer hot water pump, 1 heat pump hot water pump, and 1 genset exhaust cooler hot water pump.
  - .4 Installation of the sewage heat recovery heat pump, (supplied by Owner), including automatic 4-way valve and all ancillary components provided by vendor.
  - .5 Installation of the gas-fired emergency genset, (supplied by Owner), including exhaust cooler, jacket water heat exchanger, oil cooler heat exchanger, and all ancillary components provided by vendor.
  - .6 Supply and installation of all 4 discharge flue systems, including all components required for a complete assembly.
  - .7 Supply and installation of 2 expansion tanks, including related components.
  - .8 Supply and installation of district heat system duplex filter, including related components.
  - .9 Supply and installation of all piping within the central heating plant, including valves, supports, insulation, piping components, special fittings, high point vents, low point drains, etc., for a complete and fully functional system.
  - .10 Supply and installation of natural gas regulators for main supply and for the genset.
  - .11 Testing and commissioning of all equipment supplied by Contractor, and testing/commissioning support for all equipment provided by Owner.
- .3 HVAC
- .1 Supply and installation the odour control unit, including fan, controls, top platform/railing, first charge of media, and all component required for a complete assembly.

- .2 Supply and installation all fans, as described in Section 15700 HVAC Equipment.
  - .3 Supply and installation of 1 unit heater.
  - .4 Supply and installation of the chilled water system accessories, including expansion tank, make-up water stations and relief valves. Air chiller is part of heat pump assembly.
  - .5 Supply and installation of all HVAC and circulator pumps, as described in Section 15700 HVAC Equipment.
  - .6 Supply and installation of all air handling units, as described in Section 15720 Air Handling Units.
  - .7 Supply and installation of all ductwork, accessories, intake/exhaust louvres, dampers, access doors, grilles, diffusers, insulation, controls, actuators, silencers and all related equipment.
  - .8 Cleaning, testing, adjusting, balancing, and commissioning of all ventilation ducting systems.
  - .9 Supply and installation of the refrigerant alarm system.
  - .10 Supply and installation of hot water wash down system, and both hot and cold water hose stations in heat pump room, dry well (pump hall) and wet well.
- .8 Electrical and Instrumentation
- .1 Supply and install underground concrete chamber for BC Hydro 12.47 kV Switch. Supply and install underground ducts from Switch to the Service Entrance Room in the main building for BC Hydro 12.47 kV cables.
  - .2 Install all 12.47 kV Switchgear, including BC Hydro Service Entrance Cubicle and the complete 12.47 kV switchgear line-up, including the main incoming breaker, Instrument Transformer compartment, and feeder breakers.
  - .3 Install, test and commission 1500 kVA, 12.47kV / 600V and 12.47kV / 4.16kV, dry type transformers, in the Electrical Room, including installing and connecting items supplied loose by the vendor.
  - .4 Supply and install, BC Hydro Service Entrance Cubicle
  - .5 Install, test and commission 4.16 kV Medium Voltage Soft Starters
  - .6 Install, test and commission 600V Power Distribution Centers (PDCs)
  - .7 Supply, install, test and commission Motor Control Centres (MCCs)
  - .8 Supply, install, test and commission Variable Frequency Drives (VFDs)
  - .9 Install, test and commission Automatic Transfer Switch



- .10 Install, test and commission Active Harmonic Filters
- .11 Install, test and commission Generator Control Panel
- .12 Install electrical control panels and accessories supplied by OTHER
- .13 Supply and install local motor control selector switches and push button stations
- .14 Supply and install 600V/208-120V transformers, lighting panels and miscellaneous distribution panels
- .15 Supply and install all lighting fixtures and receptacles and data/telephone outlets in all areas, including lighting fixtures for hazardous locations.
- .16 Install and test and commission lights on stacks.
- .17 Supply and install Uninterruptible Power Supply (UPS) and distribution panel.
- .18 Supply and install Fire Alarm system including Annunciator
- .19 Supply and install security system, and data/voice outlets.
- .20 Supply and install all cable trays including accessories and supports.
- .21 Supply and install all cables including 15 kV power cables, 5 kV power cables, 1 kV power cables, 600V control cables and 600V instrument cables.
- .22 Supply and install all medium voltage termination kits as well as low voltage connectors and cable glands.
- .23 Supply and install all conduits, cables and wires for lighting and receptacles.
- .24 Supply and install all steel support and hardware required for installation of electrical equipment
- .25 Unload ,receive and install all electrical equipment
- .26 Test and commission all electrical equipment.
- .27 Supply and install control system panels and hardware
- .28 Install server rack supplied by CoV
- .29 Install HMI stations and LCD screens supplied by CoV
- .30 Supply and install all copper communication cabling
- .31 Supply, install and calibrate all instrumentation and control valves not included in package supplied by OTHER
- .32 Install all instrumentation and control valves included in package supplied by OTHER that are not mounted on skid

- .33 Supply and install all field junction boxes
  - .34 Supply and install gas detection beacon lights and horns
  - .35 Test and commission all instrumentation devices and control valves
  - .36 Refer to Section 16020 - Electrical and Instrumentation Construction Specification and Scope of Work, for a more comprehensive description of the electrical and instrumentation scope of work.
- .9 Public Art
- .1 Supply and installation of public art elements and features associated with the five-fingered flue stack
  - .2 Coordination with the separate lighting package (finger nails)
- .10 Landscaping
- .1 Supply and installation of all landscaping and hardscaping within the project site

#### **1.5 Contract Method**

- .1 Construct the Work under a lump sum contract, with lump sum payment items, unit price payment items, provisional sums and provisional items totaling to a Contract Price. Provisional sums and provisional items are to be expended only as directed by the Owner. Refer to Section 01105 – Measurement and Payment.
- .2 For the Owner's cost control purposes, the Contractor will be required to provide a detailed breakdown of the Contract Price as the Owner may require.

#### **1.6 Work by Others**

- .1 Other work for the Project, which is concurrent with the Contract, is being performed by Other Contractors, is specifically excluded from the Contract and requires cooperation from the Contractor.
- .2 The Owner may retain the services of an environmental monitor, acting through the Engineer, to review environmental related aspects of the Work. The Contractor shall coordinate and cooperate with the environmental monitor.

#### **1.7 Work Site Location and Access**

- .1 The Facilities are located at 1890 Spyglass Place, Vancouver, BC, V5Z 4K8.
- .2 Access to the Work Site shall only be along designated routes. The Contractor shall ensure that all its employees, agents, Subcontractors and suppliers use this access route to come to and leave the Work Site.
- .3 Initial access to the site will be via 1<sup>st</sup> Ave. and Wylie Street however, when the 1<sup>st</sup> Ave. intersection is rebuilt, access to the site will be from 1<sup>st</sup> Ave near Crowe Street.

**1.8 Documents Required**

- .1 Maintain at the Work Site at least one (1) copy of each of the following:
  - .1 Contract Drawings and Tender drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and Field Orders.
  - .5 Reviewed submissions, plans, shop drawings, erection drawings, product data and samples.
  - .6 Other modifications to the Contract.
  - .7 Field test reports.
  - .8 Copy of all permits from authorities having jurisdiction.
  - .9 Construction schedule.
  - .10 Signed copy of the Contract.
  - .11 Workers' Compensation Board Regulations.
  - .12 Contractor's Safety Program and manual.
  - .13 Manufacturer's installation and application instructions.
  - .14 Manufacturer's operations and maintenance instructions.
  - .15 Marked up Drawings to record actual construction.
- .2 See Section 01300 – Submittals

**1.9 Contractor Use of Premises**

- .1 Ascertain boundaries of the Work Site and construction area within which Work must be confined. Obtain and comply with all Work Site safety and security plans and regulations, and all environmental permits and regulations.
- .2 Ascertain and abide by conditions pertaining to use of temporary working easements or rights-of-way.
- .3 Assume full responsibility for protection and safekeeping of Materials and products under the Contract.
- .4 Obtain and pay for use of additional storage, access or work areas needed for Work under the Contract.

2 PRODUCTS

*Not Applicable*

3 EXECUTION

*Not Applicable*

END OF SECTION

## 1 GENERAL

### 1.1 Summary

- .1 The Owner intends to register this project for LEED® Canada NC 1.0 (“LEED®”) certification, for certification at the highest level possible.
- .2 To earn LEED® **PLATINUM** certification, the Project must satisfy prerequisites and earn at least **52** of the available points.
- .3 To earn LEED® **GOLD** certification, the Project must satisfy all of the prerequisites and earn at least **42** of the available points, which demonstrates that the project also conforms to the City of Vancouver sustainable goals for those sites.
- .4 LEED® NC 1.0 is organized into six categories of performance, and additional information about the LEED® standard can be found at: [www.cagbc.org](http://www.cagbc.org).
  - .1 Sustainable Sites;
  - .2 Water Efficiency;
  - .3 Energy and Atmosphere;
  - .4 Indoor Environmental Quality;
  - .5 Materials and Resources;
  - .6 Innovation in Design.
- .5 Certification by the Canada Green Building Council (“CaGBC”) will be based on submission criteria and support documentation provided by the entire design team and entire construction team and assembled by the Contractor and their assigned *Contractor LEED® Coordinator*.
- .6 Final collating and assembly of the LEED® submission will be by the *Project LEED® Coordinator*.
- .7 In order that complete and accurate information is provided, the Subcontractors will be required to participate in this process as part of the contract requirements, and as their portion of the work is undertaken. Each Subcontractor must assign their own *Subcontractor LEED® Coordinator* who will liaise with the *Contractor LEED® Coordinator*. The Subcontractors shall provide all data and information required for the LEED® submission on specified products, systems and practices.
- .8 The specific information required, and the time that the information will be provided to the Owner, is further detailed in Clause 4 – Submittals and in the Related Sections.

### 1.2 Related Requirements

- .1 Section 01560: Construction Waste Management

### 1.3 Orientation and Procedures

- .1 At tender award, each Subcontractor shall select and name a *Subcontractor LEED® Coordinator*. This person will be responsible for ensuring the Subcontractor's LEED® requirements are met and submittals are made on time. The *Subcontractor's LEED® Coordinator* will liaise with the *Contractor LEED® Coordinator*.
- .2 The *Subcontractor's LEED® Coordinator* will be responsible for attending orientation training sessions and site meetings arranged by the *Contractor LEED® Coordinator* or the *Project LEED® Coordinator*, and for reporting back to all Subcontractor's forces on their LEED® requirements.
- .3 The *Subcontractor LEED® Coordinator* shall not be removed from the Project without the *Contractor LEED® Coordinator's approval*, and not before a satisfactory replacement has been trained in the role.

### 1.4 Submittals

- .1 The Subcontractor will be required to submit documentation on all installed materials in order to meet the requirements of the LEED® rating system. At initiation of the contract, a submittal form will be supplied through the *Contractor LEED® Coordinator* for the trades to complete. Note: A sample submittal form called Green Building Product Information Submittal Form, as prepared by the *Project LEED® Coordinator*, has been included as part of this Section, and shall be used for submittal purposes described herein.
- .2 The Subcontractor shall be required to submit completed submittal forms to the Contractor two (2) weeks prior to materials being brought onto the site. No work shall proceed if the Green Building Product Information Submittal Form is not provided at least two (2) weeks prior to product site delivery. No work shall proceed if the submittal form is improperly filled out.
- .3 Delay caused by failure to fill out the forms in a timely and complete manner will not be accepted. The Contractor or Subcontractor causing the delay will be expected to make up this time at their own expense.
- .4 Documentation shall include:
  - .1 Cost of material (excluding labor).
  - .2 Percentage of post-consumer and post-industrial recycled content.
  - .3 Location of manufacturer and geographic distance from project site.
  - .4 Location of extraction of the raw material.
  - .5 Method of transporting the product to the project site.
  - .6 Material Safety Data Sheets (MSDS) for the following materials, highlighting the materials Volatile Organic Compound (VOC) levels:
    - .1 adhesives
    - .2 sealants

- .3 paints
- .4 coatings
- .5 carpet
- .7 Material Safety Data Sheets (MSDS) for composite wood confirming the product has no used formaldehyde content.
- .5 Subcontractors: Submit final Material Information Sheet along with supporting documentation as listed above for listed emission limits (e.g. Material Safety Data Sheets, signed attestations or other official literature from the manufacturer clearly identifying the emission limits) BEFORE product installation, and with sign-off from the Contractor LEED® Coordinator.
- .6 Contractor: Summarize collected information of all products with recycled content using LEED® Canada - NC Version 1.0 Letter Template. Recycled content materials shall be defined in the LEED® Canada Reference Guide and accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at: [www.ftc.gov/bcp/gmrule/guides980427.htm](http://www.ftc.gov/bcp/gmrule/guides980427.htm). (p.214).
- .7 The Contractor shall submit the cost (excluding labor) for each of building materials and evidence of product's location of final assembly and location of material's origin of extraction, harvest, or recovered. Based on building material cost (excluding labor) use a minimum of 20% of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 800 km (500 miles) of the project site;
  - .1 OR
    - .1 Use a minimum of 20% of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 2400 km (1500 miles) of the project site, and shipped by rail or water;
  - .2 OR
    - .1 Use a minimum of 20% of building materials or products that reflect a combination of the above extraction, manufacturing and shipping criteria (e.g. 5% within 800 km and 5% shipped by rail within 2400 km).
- .8 The Contractor shall summarize the collected information of all the products regionally manufactured using the LEED® Canada – NC Version 1.0 Letter Templates.
- .9 Indoor Air Quality (IAQ):
  - .1 During-Construction IAQ Management Plan: The *Project LEED® Coordinator* shall develop and the Contractor shall modify the Plan to be project specific and shall implement the modified IAQ Management Plan during the construction process.
    - .1 At contract award, the Contractor shall provide a copy of Indoor Environmental Quality (IAQ) Management Plan to all Subcontractors.
    - .2 Within ten (10) days of contract award, the Subcontractors shall review the project IAQ Management Plan.

- .3 The Subcontractor is responsible for ensuring that Plan requirements are met during their own activities. The Contractor may require the Subcontractor's presence at an IAQ Management Plan training session, and may undertake disciplinary action if the Plan is not being followed.
- .4 Upon Substantial Completion, the Contractor shall complete the LEED® Letter Templates for EQ Credits 3.1 and 3.2. This will include all back-up documentation as specified in the credit requirements, and in the IAQ Management Plan.
- .2 **After-Construction IAQ Testing:** The Contractor shall coordinate with the *Contractor LEED® Coordinator*, the *Project LEED® Coordinator*, and shall pay for the *Owner-approved* IAQ testing company to perform testing in accordance with LEED® requirements, and per the following guidelines:
  - .3 **Summary:** The following guidelines shall provide the requirements for Baseline Indoor Air Quality (IAQ) testing for the maximum allowable indoor air pollutant concentrations for acceptance of each building after construction has been completed and prior to occupancy. Testing shall be carried out by a certified industrial hygienist, a licensed engineer or a qualified IAQ testing contractor.
- .10 **Submittals:** The following information shall be submitted:
  - .1 Floor plan noting IAQ sampling locations.
  - .2 Summary report / table listing test locations and sampling results for each category.
  - .3 Qualifications of the IAQ testing company performing the sampling.
    - .1 **Sequencing and Scheduling:** Identify, program and schedule all IAQ testing well in advance of construction in a manner to prevent delays to the performance of the work of this Contract in order to perform and complete all testing after the completion of construction activities and prior to occupancy.
- .11 **Baseline IAQ Testing:** Conduct baseline IAQ testing to meet the following criteria:

Baseline IAQ Testing	Standards / Criteria
< 5 mg/m3 of formaldehyde	State of Washington Program and IAQ Standards
< 5 mg/m3 of total volatile organics	State of Washington Program and IAQ Standards
< outside air level +700 ppm of carbon dioxide	ASHRAE 62-2001
< 9 ppm of carbon monoxide	NAAQS 8 hr
< 5 mg/m3 of airborne particulates	OSHA PEL

- .12 Develop and implement an IAQ Management Plan for the pre-occupancy phase. Conduct baseline IAQ using testing protocols consistent with the United States Environmental Protection Agency (EPA) "Compendium of Methods for the Determination of Air Pollutants in Indoor Air" and as additionally detailed in the LEED® Canada-NC Reference Guide. Demonstrate that the following contaminants are not exceeded:



- .1 < 5 ug/m<sup>3</sup> particulate matter (PM<sub>10</sub>)
- .2 < 50 parts per billion of formaldehyde
- .3 < 500 ug/m<sup>3</sup> total volatile organic compounds
- .4 < 9 ppm and no greater than 2 ppm above outdoors of carbon monoxide
- .5 < 6.5 ug/m<sup>3</sup> 4-Pheycyclohexene (4-PC)
  - .1 Note: Required only if carpets with styrene butadiene (SB) latex backing material are installed.
- .13 Sampling: Perform IAQ testing for at least the minimum number of required sampling locations, determined as follows:
  - .1 10% of the first 100 dwelling units.
  - .2 5% of any additional units.
  - .3 Distribution of the tested units should reflect wind and buoyancy conditions experienced by the building, i.e. on different faces and elevations in the building and floors.
  - .4 Testing shall be completed over the course of one (1) normal operating day (additional days are acceptable if required due to sampling equipment limitations).
  - .5 All HVAC systems shall be fully operational during the testing period.
  - .6 A minimum of one (1) outdoor sample is required for each day of indoor testing. Outdoor sampling locations should be collected near the building outdoor air intakes if possible.
  - .7 Indoor testing shall be completed between 1200 mm (4'-0") and 2100 mm from the floor in an effort to represent the breathing zone of the occupants.
  - .8 Retesting: For each building area where the maximum concentration limits are exceeded, identify and mitigate pollutant sources and conduct a partial building flush-out for a maximum of two weeks. Retest any contaminant concentrations that were exceeded. Repeat this process until appropriate concentration levels are achieved.
- .14 Erosion and Sedimentation Control: (LEED® Sustainable Sites PREREQUISITE 1) will be met for this project.
  - .1 At contract award, the Contractor shall provide a copy of the Erosion and Sedimentation Control Plan to all Subcontractors.
  - .2 Within ten (10) days of contract award, the Subcontractors shall review project Erosion and Sedimentation Control Plan.
  - .3 The Subcontractor is responsible for ensuring that the Plan requirements are met during their own activities. The Contractor may require the Subcontractor's presence at an Erosion and Sedimentation Control training session, and may undertake disciplinary action if the Plan is not being followed.

- .15 Construction Waste Management:
- .1 Submit a waste management plan in accordance with Section 01560 to include analysis of expected waste to be generated, a list of alternatives to land filling, allowance for pre-construction and site meetings to coordinate the execution of the plan, materials handling procedures, transportation of waste materials, and implementation. The goal is to divert a minimum of 75% of generated construction waste from going to landfills.
  - .2 Designate an area on the construction site for construction waste collection and sorting. Clearly label containers.
  - .3 The Subcontractors shall train their employees in waste collection and sorting requirements required by the Waste Management Plan. Refer to Section 01560 – Construction Waste Management.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Site Conditions / Limits**

- .1 Prior to commencing actual construction Work, inspect field conditions, obtain and confirm actual Work Site dimensions and elevations, examine surface conditions as required to ensure correct execution of the Work.
- .2 Commencement of construction constitutes acceptance of existing conditions and means that dimensions have been considered, and verified.
- .3 Incorporate into the construction activities and schedule all construction activities so that no conflict will exist with existing operations and other construction contracts.
- .4 Conduct a joint survey with the Owner (including elevations and photographic records) of existing structures and other features, and record their condition prior to commencing Work.

**1.3 Documents / Instructions**

- .1 Within fourteen (14) days after Notice of Award, the Owner will furnish the Contractor the following:
  - .1 Six (6) sets of the Contract Documents (reduced sized Drawings)
  - .2 One (1) set of full-size Drawings, and
  - .3 Additional copies of the Contract Documents, if required by the Contractor, will be furnished by the Owner at cost to the Contractor.
- .2 Notify the Consultant immediately upon discovery of errors, omissions or discrepancies in the Contract Documents, or of any doubt as to the meaning or intent of any part thereof.
- .3 Maintain one copy of all current Contract Documents, Change Orders, record drawings and all shop drawings on the Work Site, in good order and available to the Consultant or other representatives of the Owner.
- .4 For convenience of reference only, the Specifications are separated into titled sections (see Section 00010 – Table of Contents). Sections are identified by title and a five digit numbering system.
- .5 Although the Specifications set forth the work of various trades under separate Specification sections, it is not intended that the Work of that trade is limited to or includes all Work set forth in that particular Section. The Contractor shall delegate the extent of the Work to be done by the various trades and shall coordinate the execution of the Work by all trades.

- .6 Although the Specifications are separated into titled Sections, neither the Owner, nor the Consultant will be an arbitrator of the delegation of the Work to a particular trade in event of a disagreement between the Contractor and its Subcontractors.
- .7 The Contractor shall examine all the Contract Documents before beginning the Work and report to the Consultant any discrepancies or interferences.

#### **1.4 Related Activities**

- .1 Notify the Consultant, in writing, fourteen (14) days in advance of the time when construction operations will require connection to, modification, demolition or additions to existing structures or features.
- .2 No existing structure or feature shall be modified, dewatered, de-energized or removed from the Work Site until authorized by the Consultant.
- .3 Provide coordination with Other Contractors and the Owner's Operations personnel while they are performing work on or adjacent to the Work Site as required and as specified elsewhere in the Contract Documents.
- .4 Provide coordination of all Subcontractors, suppliers, manufacturers and other activities related to the Work.

#### **1.5 Protection**

- .1 Be responsible for damage incurred and pay costs to correct damage caused by the Contractor's forces.
- .2 Provide necessary screens, covers, hoardings and temporary handrails as required.
- .3 Be responsible for damage incurred due to lack of proper protection.

#### **1.6 Cutting and Patching**

- .1 The Contractor shall do all cutting, fitting, or patching of the Work that may be required to make its several parts come together properly and fit if to receive or be received by the work of Other Contractors shown in, or reasonably implied by the Contract Documents.
- .2 Any cost caused by cutting and patching due to ill-timed work shall be borne by the Contractor.
- .3 The Contractor shall not endanger any existing property or portion of the Work by cutting, digging or any other method unless noted otherwise in the Contract Documents, and shall be responsible for any damages it causes.
- .4 Where new Work connects with existing work and where existing work is altered, cut and patch as required.
- .5 Coordinate the Work to minimize the amount of cutting and patching required.
- .6 Do no cutting that may impair the strength of structures. Obtain the Consultant's approval before cutting, boring or sleeving load bearing members.
- .7 Make cuts clean and smooth and make patches equivalent to new Work.

- .8 Drill or field cut smaller openings or holes and cast openings larger than 100 mm diameter.
- .9 Install guards around openings.
- .10 Maintain and relocate protection until such Work is complete.
- .11 Remove debris promptly from the area of Work. Load removed material directly on trucks for removal from Work Site.
- .12 Suppress dust. Prevent the occurrence of unsanitary conditions, dirt or debris on the Work Site.

**1.7 Regulatory Requirements**

- .1 Execute the Work in accordance with applicable laws, regulations, and building codes; conform to latest published revisions, addenda, supplementary and/or appropriate current standards presently recognized and enforced by authorities having jurisdiction.
- .2 Should conflicts arise between one document or authority and another, obtain clarification from the Consultant before proceeding with the Work. Generally, the most stringent regulation will govern.
- .3 Take out and pay for all permits required by authorities having jurisdiction necessary for completion of the Work (excluding City of Vancouver Building Permit).
- .4 Submit to the Consultant during construction and upon completion of the Work all permits and certificates of inspection provided by authorities having jurisdiction.

**1.8 Public Safety**

- .1 Refer to Section 01060 – Safety Regulations and Requirements.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Requirements Prior to Mobilization**

- .1 Prior to mobilizing to the Work Site and in addition to other submission requirements of other Specification sections, the Contractor shall submit the following information to the Consultant for approval:
  - .1 Survey methodology for the following:
    - .1 Layout surveys of the whole and various parts of the Work;
    - .2 Initial surveys applicable to each pay item for quantity calculations;
    - .3 Interim surveys as required to demonstrate compliance with design and upon which to base progress payments; and
    - .4 Final surveys for as-built records and upon which to base final payment.

**1.3 Survey Reference Points and Legal Survey Markers**

- .1 Locate, confirm and protect control points and legal survey markers prior to starting Work. Preserve permanent reference points during construction.
- .2 Replace legal survey markers lost or destroyed as a result of construction activities and re-establish survey control by a B.C. Land Surveyor at no cost to the Owner.

**1.4 Survey Requirements**

- .1 Establish permanent benchmarks on the Work Site referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project record documents.
- .2 Perform all surveying, establish lines and levels, locate and layout, by instrumentation.
- .3 Perform all surveys, affecting the line and elevation under the direction of a qualified surveyor.
- .4 Assist Owner's survey crew and Consultant with check surveys, checking of layout, measurement of quantities and compilation of record data as required.

**1.5 Records**

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

**1.6 SUBMITTALS FOR INFORMATION ONLY**

- .1 On request of the Consultant, submit documentation in accordance with Section 01300 – Submittals, to verify accuracy of field engineering work and to indicate compliance of installations with the Contract Documents.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Related Requirements**

- .1 The performance of the Work shall conform to WorkSafe BC Regulations.
- .2 Nothing contained in the Contract Documents shall be so construed as to be in conflict with any law, by-law or regulation of the City, Provincial or other authorities having jurisdiction. Work shall be performed in conformity with all such laws, by-laws and regulations.
- .3 The Work shall conform to the City of Vancouver Building By-Law 2007 and applicable Federal and Provincial regulations.
- .4 Contract forms, by-laws, codes, specifications, standards, manuals and installation, application and maintenance instructions, referred to in these specifications shall be the latest published editions at the date of signing the Contract.
- .5 In the event of conflict between any provisions of the above authorities, the more stringent provision will apply.

**1.2 Construction Safety Procedures and Accident Prevention Program**

- .1 The Contractor shall be solely responsible for:
  - .1 Initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work. Without limiting the foregoing, the Contractor and his Subcontractor(s) shall take all reasonable precautions against all risks of loss of life or injury to their employees, the Owner's employees, any other person employed about the Work, and authorized visitors; and to this end shall properly guard and light the Work.
  - .2 All safety measures in connection with construction means, methods, techniques, sequences and procedures and shall comply with all applicable laws and regulations of the City of Vancouver Building By-Law, and the Federal and Provincial authorities concerning and public safety.
- .2 The Contractor shall employ and pay for a full-time Construction Safety Officer for the Work. The safety officer shall be a person different than the Site Superintendent and the first aid attendant.
- .3 The Construction Safety Officer Shall:
  - .1 Prepare a Construction Safety Program. In addition, the Construction Safety Officer shall ensure that each Subcontractor appoints a Trades Safety Coordinator.
  - .2 Ensure the Work is carried out in compliance with the Construction Safety Program and all applicable WorkSafe BC Regulations, as well as all local, Federal and Provincial safe work procedures and regulations.
  - .3 Carry out regular site reviews, to satisfy themselves that work is proceeding safely and in compliance with the Construction Safety Program, and WorkSafe BC regulations,



and after each inspection shall post a copy of their review in the same manner as and in close proximity to the Site Safety Plan.

- .4 The Construction Safety Program shall include:
  - .1 Provisions for regular inspections of the job site, investigations of all accident/incidents, first aid services, personal protective equipment standards and coordination of all Trade Contractor activities. In addition, each Subcontractor shall be required to submit their company safety program prior to commencing work on the site.
  - .2 Names and emergency telephone numbers of the Contractor, Subcontractors, the Trade Safety Coordinators, and the City of Vancouver Fire Department.
  - .3 Details of Construction Procedures relating to site access, maintenance of any required exits, barricades, traffic control, scaffolding and swing stages, hoisting equipment, fire protection facilities, emergency shut-off locations, material storage, waste materials, control of dust and debris, and any other items required by the City of Vancouver Chief Building Inspector.
- .5 Prior to commencement of the Work, the Contractor shall meet with the Construction Safety Officer, Subcontractors, and their respective Trade Safety Coordinators to discuss the Safety Program.
- .6 Contractors and Subcontractors shall be registered employers with WorkSafe BC.
- .7 It is the Subcontractors' responsibility to ensure that it's employees and their Subcontractor's employees comply with WorkSafe BC's safe work procedures and regulations.
- .8 Scaffolding or temporary stages shall be provided by the Contractor as required for his work and to meet construction safety regulations. Such equipment shall be self-supporting throughout and comply with applicable jurisdictional and code requirements. Scaffolding and temporary stages when not in use shall be relocated if necessary by the Contractor to permit installation of other work and shall be removed promptly when not required.
- .9 The Contractor and his Subcontractor(s) shall not employ any person on the work who, by the use of unsafe working practices, will, in the opinion of the Consultant or the safety officer endanger the safety of others, endanger the safety of the Owner's property, or interfere with other operations at the site.
- .10 Anyone (including all Consultants, visitors, staff and personnel) shall wear WorkSafe BC approved hard hats, safety gear, and footwear while on the site, and shall comply with safety rules and regulations laid out pursuant to the Workers' Compensation Act and all other applicable rules and regulations established by law, practice or policy for the type of work that is included in the Contract.

### **1.3 Fire Protection Regulations**

- .1 The Contractor shall prepare a Fire Safety Plan for the site prior to commencing Work.
- .2 The Fire Safety Plan shall be in compliance with the City of Vancouver Building By-Law and Section 2.14 of the National Fire Code and shall be incorporated as part of the Construction Safety Program.

- .3 The Contractor and Subcontractors shall:
  - .1 Take all necessary precautions to eliminate fire hazards and make periodic inspections to ensure proper preventative measures are being complied with by personnel working on the site.
  - .2 Comply with Fire Safety Plan and Provincial and Municipal fire safety requirements and other regulations pertaining to fire protection during the Work.
- .4 The Contractor shall enforce fire protection methods, good housekeeping, and adherence to local authorities and Underwriters fire regulations, and shall provide and maintain ULC approved fire extinguishers in each area in which work is being carried out. Note: The number of fire extinguishers required shall be per the City of Vancouver Building By-Law and National Fire Code. The location of the fire extinguishers shall be in prominent positions to the approval of the authorities having jurisdiction.
- .5 Where torch cutting and electric welding are required by the Work, the Subcontractor concerned shall notify the Contractor and shall provide additional fire safety measures considered necessary to protect existing facilities from fire. A suitable fire extinguisher shall be provided by the applicable Subcontractor adjacent to all welding operations.
- .6 As required by LEED® standards, the building has been designated as a “NO SMOKING” building. The Contractor shall post “NO SMOKING” signs within and on the exterior of the building. No open flame tools will be permitted in the building.
- .7 Fires are not permitted on site and precautions shall be taken by the Contractor and Subcontractors at all times to prevent fire by spontaneous combustion.
- .8 The Contractor shall remove all combustible salvaged material, waste material and debris resulting from his Work from the site on a daily basis and shall not allow any accumulation of such materials on site. No combustible salvaged materials, waste material or debris shall be stored on the site. Whenever workers leave the jobsite after using hazardous equipment, a thorough check must be made to ensure that there is not a possibility of fire resulting from the work.

#### **1.4 Protective Clothing and Equipment**

- .1 The Contractor and Subcontractors shall provide their own protective clothing equipment. This shall include, but not be limited to items such as, hard hats, safety footwear, respirators or dust masks, high visible vests, hearing protection, and fall protection equipment. Items which require custom fitting, such as respirators, shall not be made available for use by more than one person.
- .2 Respirators or dust masks shall conform to requirements of WorkSafe BC for the type of work involved.

#### **1.5 Workplace Hazardous Material Information**

- .1 The Contractor, Subcontractors and Suppliers shall comply with WorkSafe BC's Workplace Hazardous Material Information System (WHMIS) Regulations pertaining to labeling, provision of Material Safety Data Sheets (MSDS), education and training programs, safe handling and emergency procedures for “Controlled Products” being used in the Project. This includes

handling hazardous materials so that project workers, the public, building occupants, and property are not at risk.

- .2 Operations producing odors such as the application of adhesives and painting shall be carried out in a safe manner and in a manner to prevent the spread of fumes to occupied areas of the building. The Subcontractor shall submit to the Contractor the WHMIS Material Safety Data Sheets for all chemical treatments, adhesives and potentially harmful products to be used in the Project.

## **1.6 Spills and Clean-up**

- .1 The Contractor, Subcontractors and Suppliers must comply with the B.C. Ministry of the Environment Regulations involving the required response to spills of hazardous materials that could result in contamination of the environment (air, water, ground).
- .2 The Contractor, Subcontractors and Suppliers shall respond to spills of a hazardous or unknown material while working at the site. Procedures shall include isolating the area to prevent further exposure to the material and immediately informing the Contractor.
- .3 The Contractor, Subcontractors and Suppliers shall have available the material, procedures, and trained personnel required to clean up spills of any hazardous material they use in their work.

## **1.7 Overloading**

- .1 No part of the structures shall be loaded during the construction with a load greater than it is calculated to bear safely when complete. Every temporary support shall be as strong as the permanent support. No load shall be placed on concrete floors until they have obtained their permanent set.

## **1.8 Permits**

- .1 The Owner will obtain and pay for the Building Permit.
- .2 The Subcontractor shall apply and pay for all necessary permits or licenses required for the execution of the Work of his Subcontract excluding obtaining of permanent easements or rights of servitude.
- .3 The Subcontractor shall give all necessary notices and pay all fees required by law and comply with all laws, ordinances, rules and regulations relating to the Work and to the preservation of the public health.
- .4 The Subcontractor shall be responsible for ensuring that no work whatsoever is undertaken which is conditional on permits, approvals, guarantees, until he is certain that all conditions necessary to obtain these are met. No time extension will be allowed for delay by the Subcontractor in obtaining necessary permits or licenses.
- .5 The Subcontractor shall be responsible to the Contractor for reporting any conditions, in writing, which would prohibit granting of any permit or approval before any work affecting such items is commenced.

**END OF SECTION**

**1 GENERAL**

**1.1 Abbreviations of Specified Standards**

.1 When the following abbreviations are listed in the Contract Documents, they shall have the meanings listed below:

.1	AA	Aluminum Association (USA)
.2	ASTM	American Society for Testing Materials
.3	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
.4	AWI / AWMAC	Architectural Woodwork Institute / Architectural Woodwork Manufacturers' Association of Canada
.5	AWCC	Association of Wall and Ceiling Contractors' Association of B.C.
.6	BCBC	British Columbia Building Code 2006
.7	BCLMA	British Columbia Lumber Manufacturers' Association
.8	CaGBC	Canada Green Building Council
.9	CAN	National Standards of Canada
.10	CCDC	Canadian Construction Documents Committee
.11	CEC	Canadian Electrical Code (published by CSA)
.12	CGSB	Canadian Government Standards Board
.13	CICS	Canadian Institute of Steel Construction
.14	CLA	Canadian Lumberman's Association
.15	CSA	Canadian Standards Association
.16	CSSBI	Canadian Sheet Steel Building Institute
.17	FSC	Forest Stewardship Council
.18	IAQ	Indoor Air Quality
.19	LEED®	Leadership in Energy and Environmental Design
.20	MPI	Master Painter's Institute of B.C.
.21	MSDS	Material Safety Data Sheet
.22	NBC	National Building Code 1995

.23	RCABC	Roofing Contractors Association of B.C.
.24	SCAQMD	South Coast Air Quality Management District
.25	SMACNA	Sheet Metal and Air Conditioning National Contractors Association
.26	TTMAC	Terrazzo, Tile and Marble Association of Canada
.27	ULC	Underwriters' Laboratories of Canada
.28	UL	Underwriters' Laboratories
.29	VBBL	City of Vancouver Building By-Law 2007
.30	WCB	WorkSafe BC (formerly Workers' Compensation Board)
.31	WHI	Warnock Hersey Intertek

**END OF SECTION**

**1 GENERAL**

**1.1 Materials or Products**

- .1 The Contract Price and the Work shall be based upon using new materials and products specified, or indicated by reference to standards, codes, manufacturer's name, or product name. Where two or more manufacturer or product names are specified the choice shall be optional with the Contractor.
- .2 Materials or products specified without the term "or other pre approved manufacturer" or "pre approved equivalent" following the name of the materials or product shall be supplied without substitution.
- .3 Where the specification includes the term "or other preapproved manufacturer" or "preapproved equivalent" substitutions will be considered by the Consultant during the tender periods in accordance with the Instructions to Bidders as issued by the Owner.
- .4 Substitutions during the construction period will only be considered if:
  - .1 The materials or products specified should become unavailable, or
  - .2 Proposed substitute materials or products to those specified, are brought to the attention of and considered by the Consultant as "equivalent" to those specified and will result in a credit to the Contract Price.
    - .1 Note: Proposed substitute materials or products must be presented to the Owner together with a sample of the original material or products specified.
- .5 Substitutions during the construction period may be proposed by the Contractor under the following conditions:
  - .1 Proposed substitutions shall show the materials or product names and complete specifications and shall state what difference, if any, will be made in Contract Price for each substitution, should it be acceptable.
  - .2 Should the proposed substitution be accepted, either in part or in whole, the Contractor shall assume full responsibility for the cost when the substitution affects any other work. Any drawing changes required as a result of the substitution shall be executed by the Consultant at the Contractor's expense.
- .6 Proposed substitutions shall satisfy all design conditions and other specified requirements. Properties of proposed substitutions for consideration shall include, but not necessarily be limited to the following.
  - .1 Physical dimension requirements to satisfy the space limitations, static and dynamic weight limitations, structural properties, audible noise level, vibration generation, interchangeability of parts or components, accessibility for maintenance, possible removal or replacement, color, texture, durability and compatibility with other materials, products, assemblies and components.
- .7 All proposed material substitutions shall satisfy the original intent of the LEED® Certification requirements.

- .8 All proposed material substitutions shall be documented on the Green Building Product Information Submittal Form, and submitted to the Contractor LEED Coordinator by the Subcontractor LEED Coordinator for review.

## **1.2 Alternative Methods or Processes**

- .1 The Contractor may suggest for the consideration of the Owner and the Consultant, alternatives to methods or processes described in the specifications and/or shown on the drawings. Any application for such alternatives shall indicate how such alternatives are advantageous to the Owner or to the better fulfillment of the Contract Documents. There shall be no obligation on the parties concerned to accept any such suggested alternatives.
- .2 The Contractor shall be responsible for alternative methods or processes concerning such Work, and the warranty covering all parts of the Work shall not be affected.
- .3 Alternative methods or processes shall fit into space(s) allotted for the specified methods or processes. Any drawing changes required as a result of an alternative will be executed by the Consultant at the Contractor's expense.
- .4 The cost of all changes in the Work of other trades, necessitated by the use of alternative methods or processes, shall be borne by the Contractor concerned.

## **1.3 Credits Arising from Substitutions and/or Alternative Methods**

- .1 Any and all credits arising from the substitutions and/or alternatives mentioned above will be credited to the Contract in such amounts as may be approved by the Owner. The Contract Price will be adjusted accordingly. No substitutions or alternative methods or processes will be permitted without the prior written approval of the Consultant.

## **1.4 Code Requirements – Substitutions**

- .1 Proposed substitutions for materials, products, methods and processes shall meet the requirements of the City of Vancouver Building By-Law 2007 where applicable and the requirements of other authorities having jurisdiction.
- .2 Proposed substitute materials, products, methods and processes shall not negate the compliance of adjacent materials, products and construction with the requirements of the City of Vancouver Building By-Law 2007 and the requirements of authorities having jurisdiction, to which the proposed substitutions may be applied or attached.
- .3 The Contractor or Subcontractor shall obtain written approval of proposed substitutions from the authority having jurisdiction and shall submit the approval with the proposed substitution for the Consultant's consideration.

**END OF SECTION**

**1 GENERAL**

**1.1 Parking**

- .1 Workers shall park off-site in areas where parking is lawfully permitted, and as designated by the Contractor.

**1.2 Supervision and Cooperation**

- .1 The Contractor shall ensure that his Superintendent is on site at all times, and if he is required to leave the site he shall advise of the name of his designated replacement.

**1.3 Maintenance of Existing Facilities**

- .1 The Contractor shall plan the construction with these requirements in coordination and cooperation with the Owner.
- .2 The Contractor shall maintain fire exit routes, emergency exits and entrances to the site as required by the Owner and the local authorities at all times. Note: Provide the Owner with minimum one (1) week advance notice of any change to existing or temporary fire exit routes.
- .3 At that time in the Work when disruption of any access is necessitated by the construction the Contractor shall provide alternate protected routes approved by the Owner. Maintain such routes until no longer required.

**1.4 Maintenance of Existing Services**

- .1 Ensure existing services are maintained continuously throughout construction and keep temporary interruptions to electrical power, water and other services to an absolute minimum.
- .2 When interruptions or connections to existing services are required, i.e., electrical, power, water, etc., the Contractor shall give a minimum of three (3) days notice in writing to the Owner. If, because of the City of Vancouver requirements, it is required that the Work be done outside of Contractor's normal working hours, the cost of such overtime incurred by the Contractor will be the Contractor's responsibility.
- .3 The Owner will cooperate in shutdown of services as is necessary to allow connections to be made to existing services. However, if as a result of defective materials or workmanship it is necessary for any shutdowns to be repeated, then the cost of the labor provided by the Owner, to repeat the shutdown and the later connection will be charged against the Contract, and this cost will be deducted from the contract price.

**1.5 Fire Regulations**

- .1 The Contractor shall:
  - .1 Communicate with the Owner to receive instructions on fire regulations.
  - .2 Provide a fireguard with fire extinguisher and take all necessary precautions whenever any open flames, work such as welding, burning, soldering is undertaken.



- .3 Keep entrances and exits clear at all times; comply with fire safety requirements and other regulations pertaining to fire protection during construction.
- .4 Provide fire extinguishers as required by code. The Owner's extinguishers will not be considered as part of the required complement of extinguishers for compliance of fire regulations within the job site.

### **1.6 Special Protection**

- .1 The Contractor shall:
  - .1 Take all necessary precautions to fully protect the adjoining properties, utilities and services.
  - .2 Make good, at no expense to the Owner, any damage or disruption caused to the adjoining property including buildings, and utilities and services not called for as part of the Work of this contract. All repair work shall only be done after consultation with the Consultant, appropriate parties and authorities and to standards and codes of the authorities having jurisdiction.
  - .3 Make good damage of any nature done to existing adjacent buildings required by Work to the satisfaction of the Consultant and at no additional cost to the Owner.
  - .4 Making good shall mean restoration to at least the original condition in terms of strength, safety, workmanship and appearance.
  - .5 Provide for treatment of ground water and surface run-off over entire site through a designated Treatment Facility.

### **1.7 Fire Truck Access**

- .1 The Contractor shall:
  - .1 Maintain access for fire trucks to the site at all times during the Work.
  - .2 Keep fire truck access routes free of encumbrances at all times during construction. Coordinate any work within fire truck access routes with the Owner and the local fire department and make arrangements to determine specific dates and periods for such construction. Any such work shall be expedited to minimize the time when access for fire trucks may be limited or obstructed.
  - .3 Not encumber any fire truck access with storage, materials, temporary offices and the like, at any time during the Contract.

### **1.8 Access and Use of Vehicles and Equipment**

- .1 Comply with City of Vancouver traffic regulations and approved site ingress and egress locations, use of sidewalks, use of existing streets for parking, use of existing parking and delivery facilities, relevant to this contract, as determined between Contractor and Owner.
- .2 The Contractor and/or Subcontractors' vehicles are not allowed to park overnight within the site.

- .3 Keep self-propelled equipment that must be kept overnight within the construction site park safely with ignition keys removed and power sources disconnected.
- .4 When not in use, leave hydraulic equipment or components secured and immobilized.
- .5 Keep Power equipment, such as table saws, locked up at night.

**END OF SECTION**

**1 GENERAL**

**1.1 Payments**

- .1 Applications for Progress Payments of the General Conditions, as amended by Supplementary General Conditions, if applicable.
- .2 Payments to the Contractor will be made in accordance with Article GC 5.2 – Applications for Progress Payments of the General Conditions, as amended by Supplementary General Conditions, if applicable.

**1.2 Payments Withheld**

- .1 The Consultant may withhold or nullify the whole or a part of any application for payment made by the Contractor, or a Certificate for Payment as may be necessary to protect the Owner from loss because of:
  - .1 Defective work not remedied.
  - .2 Claims filed or reasonable evidence indicating possible filing of claims.
  - .3 Failure of Contractor to make payments properly to Subcontractors for material or labour.
  - .4 A reasonable doubt that the Contract can be completed, and unpaid claims, charges, liens and encumbrances satisfied, for the balance then unpaid.
  - .5 Damage to another Contractor.
  - .6 Erroneous estimates by the Contractor of the value of work performed.
  - .7 Unauthorized deviations by the Contractor from the Contract Documents.
  - .8 Unsatisfactory progress of the Work by the Contractor.
  - .9 Delay of Construction Schedule.
  - .10 Unsatisfactory documentation of LEED® related products, assemblies and procedures by the Contractor and/or the Subcontractors. Refer to Section 01015 - LEED® Certification, Section 01560 – Construction Waste Management and Section 01300 – Submittals.
- .2 At the time of application for payment, submit all Green Building Product Information Submittal Forms for new products brought onto the site that month. Supply project-to date summaries for the following LEED® Credits:
  - .1 MRc2 Construction Waste Management
  - .2 MRc4 Recycled Content
  - .3 MRc5 Regional Materials

- .4 MRC7 Certified Wood
  - .5 EQc4.1 Low-Emitting Materials: Adhesives & Sealants
  - .6 EQc4.2 Low-Emitting Materials: Paints and Coatings
  - .7 EQc4.3 Low-Emitting Materials: Carpet
  - .8 EQc4.4 Low-Emitting Materials: Composite Wood and Laminate Adhesives
- .3 A working example spreadsheet will be made available to the Contractor from the *Project LEED® Coordinator*.
- .4 When the above grounds are removed, payments will be made for amounts withheld because of them. No interest will be paid on payments withheld. The Consultant's determination as to issuance or withholding of, or amount of payment reflected by Certificates for Payments, shall be final and shall subject the Consultant to no liability whatsoever to the Owner, Contractor, Surety or any other person.

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Administrative**

- .1 The Consultant or his designate will administer the preconstruction meeting, and regular progress meetings to be held at intervals of approximately seven (7) days commencing soon after mobilization.
- .2 The Contractor's project manager, superintendent, and senior representatives of major Subcontractors shall attend all meetings.
- .3 Representatives of the Contractor, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.
- .4 The Consultant will chair and record discussions and decisions, and circulate the minutes to the Owner and the Contractor. The Contractor shall circulate the minutes to Subcontractors and suppliers.
- .5 The Contractor shall notify the Consultant in writing of any discrepancies or inconsistencies within seven (7) days of receipt of minutes for recording in the next meeting. Failure to notify the Consultant of discrepancies or inconsistencies within seven (7) days of receipt of minutes will be deemed acceptance of the minutes as recorded.

**1.3 Preconstruction Meeting**

- .1 Within seven (7) days after Notice of Award, the Owner will schedule a meeting to discuss administrative procedures and responsibilities.

**1.4 Progress Meeting**

- .1 The Contractor's project manager, superintendent and senior representatives of major Subcontractors involved in the Work shall be in attendance at progress meetings.
- .2 The Contractor shall submit for information only, in accordance with Section 01300 – Submittals, at each regularly scheduled progress meeting:
  - .1 Totals of all personnel currently on the Work Site associated with the Contract, broken down by trade and Subcontractor including all staff.
  - .2 Totals of all major equipment currently on the Work Site valued at a replacement value of over two thousand dollars (\$2,000) each, broken down by type and Subcontractor and indicate, for the purposes of this Contract, whether the equipment is classified as “rental equipment” or “Contractor's equipment”.

**1.5 Location of Meetings**

- .1 Progress meetings will be held at the Consultant's site office located at the Work Site, or at such other location determined by the Consultant.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Categories or Submittals**

- .1 General requirements and various sections of the Specifications require various submissions to demonstrate and ensure that Materials, products, equipment, methods, and Work comply with the provisions and intent of the Contract Documents.
- .2 Within seven (7) days of the Notice to Proceed, submit to the Consultant for review a Submittal Control Document Listing of all submittals specified in the Contract Documents. Provide two lists grouped by category:
  - .1 Submittals for review.
  - .2 Submittals for information only.
- .3 Provide submittals in accordance with this section and as specified in the various sections in the Specifications.
- .4 The Owner or the Consultant may require additional submittals from the Contractor when, in the opinion of any of them such additional submittals are warranted. The Contractor shall provide the requested submittals promptly, at no additional cost to the Owner.

**1.3 Administrative**

- .1 Submittals covered by these requirements include manufacturers' information and data sheets, descriptive data, certificates, product data, shop drawings, test procedures, test results, samples, requests for substitutions, all mechanical, electrical and electronic equipment and systems, fabricated items, piping and miscellaneous work-related submittals.
- .2 Adjustments made by the Owner or, the Consultant on shop drawings or other submittals are not intended to change the Contract Price. If adjustments affect the value of the Work, state such in writing to the Consultant prior to proceeding with any additional work.
- .3 Provide to the Consultant for review the submittals specified. Submit all information promptly and in an orderly sequence so as to not cause delay in the Work. Failure to submit in ample time to facilitate the Consultant's review is not considered sufficient reason for an extension of Contract time, and no claim for extension by reason of such default will be allowed.
- .4 Prepare and submit a schedule fixing the dates for all submissions and return of all submittals for review. Include this information in the construction schedule specified in Section 01310 – Construction Schedule.
- .5 Do not proceed with Work affected by any submittal until review is complete. Normally, submittals for review and comment will be returned to the Contractor within seven (7) days, (fourteen (14) days for substitution), exclusive of any time awaiting clarification or further information; however, the time for returns will necessarily vary and may exceed seven (7) days

- depending upon the complexity of the submittal, the number of submittals, and the express needs of the Contractor.
- .6 Make submittals far enough in advance to allow adequate time for coordination, review, revisions and resubmittals, and for the supply and delivery of Materials in time for the scheduled installation of the Work.
  - .7 The Contractor shall review all submittals from Subcontractors and suppliers prior to submission to the Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of the Work and the Contract Documents. The Contractor shall include a cover sheet with each submittal verifying compliance with the Specifications and summarizing the Materials of construction, set points, size, and other details as applicable. Submittals not stamped, signed, dated and identified by the Contractor will be returned without being examined and will be considered rejected.
  - .8 Clearly edit submittal documents to indicate only those items, models, or series of equipment, which are being submitted for review. Cross out or otherwise obliterate all extraneous materials.
  - .9 Ensure that there is no conflict with other submittals and notify the Consultant in each case where submittal may affect the work of Other Contractor(s) or the Owner.
  - .10 Coordinate submittals among Subcontractors and suppliers. Coordinate submittals between trades.
  - .11 Coordinate submittals with requirements under laws, codes, regulations and authorities having jurisdiction.
  - .12 Coordinate submittals with the Work so that Work will not be delayed, and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another.
  - .13 The Contractor is responsible for the accuracy and completeness of information submitted. Notify the Consultant in writing of Materials, equipment or methods of Work, which deviate from the Contract Documents. Notification in writing, to accompany submittal transmittal and noted under deviations, and request specific review of those deviations.
  - .14 The Contractor's responsibility for errors, omissions and deviations in submission is not relieved by the review of submittals by the Owner, nor the Consultant.
  - .15 Keep one reviewed copy of each submission on the Work Site.
  - .16 Detail all shop drawings and data sheets using the metric system. Prepare to a drafting standard equivalent to the Contract Drawings.
  - .17 Shop drawings and data sheets indicating modified design requirements or design requirements not included in the Contract Documents require the seal of a qualified Professional Engineer, registered in the Province of British Columbia.

#### **1.4 Transmittal Procedure**

- .1 Accompany all submittals with an appropriate transmittal.



- .2 Use a separate form for each specific item, class of Material, equipment, and items specified in separate, discrete sections, for which the submittal is required. Identify Contract Document, equipment numbers, equipment descriptors, Drawing numbers, and Specification sections for each submittal and item in each submittal.
- .3 Identify submittal documents common to more than one piece of equipment with all the appropriate equipment numbers.
- .4 Use a single form for submittals for various items when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.
- .5 Note a unique number, sequentially assigned, on the transmittal form accompanying each item submitted. Submittals will be classified according to categories agreed to by the Contractor and Consultant. Use the following format by category for submittal numbers: "XXX", where "XXX" is the sequential number assigned by the Contractor. Resubmittals will have the following format: "XXX-Y", where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 025-B, for example, is the second resubmittal of submittal 25.

#### 1.5 Submittals for Review

- .1 All submittals, except where specified to be submitted for information only, are to be submitted by the Contractor to the Consultant for review. Provide submittals for review for all equipment and material substitutions, alternatives or deviations from that identified in the Specifications.
- .2 Submittals that do not have all the information required to be submitted, including notation of all deviations from the Contract Documents, are not acceptable and will be returned without review.
- .3 Review by the Owner, or the Consultant is for the sole purpose of ascertaining general conformance with the general design concept in accordance with the Drawings and Specifications. This review does not indicate a thorough review of all dimensions, quantities, and details of the Material, equipment, device or item shown. Furthermore, this review does not mean that the Owner, or the Consultant approves the detail design inherent in the submittals, shop drawings and data sheets, responsibility for which remains with the Contractor, and such review does not relieve the Contractor of responsibility for errors or omissions or deviations in the shop drawings and data sheets, or of sole responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the Work Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination and interconnection of the work of all trades and Subcontractors.
- .4 Indicate Materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of the Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the section under which the adjacent items will be supplied and installed. Indicate cross-references to Contract Drawings and Specifications.
- .5 Submit six (6) copies of submittals, except where other quantities are specified, including shop drawings for each requirement requested in Specification sections and as the Consultant may reasonably request. In addition, for all drawings larger than 11×17 inches, submit one reproducible vellum or double-sided Mylar.

- .6 Submittals for review will be returned to the Contractor with one of the four following notations:
  - .1 If the review indicates that the Material or equipment complies with the Contract Documents, submittal copies will be marked "Reviewed". In this event, the Contractor may begin to implement the Work method or incorporate the Material or equipment covered by the submittal.
  - .2 If the review indicates limited modifications are required, copies will be marked "Reviewed as Noted". The Contractor may begin implementing the Work method or incorporating the Material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in operation and maintenance data, provide a corrected copy.
  - .3 If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "Revise and Resubmit". Do not undertake work covered by this submittal until it has been revised, resubmitted and returned marked either "Reviewed" or "Reviewed as Noted".
  - .4 If the review indicates that the material, equipment, or work method does not comply with the Contract Documents, copies of the submittal will be marked "Rejected – See Remarks". Submittals with deviations, which have not been identified clearly, may be rejected. Do not undertake the work covered by such submittals until a new submittal is made and returned marked either "Reviewed" or "Reviewed as Noted".
- .7 After submittals are stamped "Reviewed" or "Reviewed as Noted", no further revisions are permitted unless re-submitted to the Consultant for further review.
- .8 If upon review by the Owner, or the Consultant, no errors or omissions are discovered or if only minor corrections are made, three (3) copies will be returned and fabrication and installation of Work may proceed. If shop drawings and data sheets are rejected, noted copy and two (2) unmarked copies will be returned and resubmission of corrected shop drawings and data sheets, through the same procedure indicated above, to be performed before fabrication and installation of Work may proceed. Where four (4) copies have been submitted, one (1) copy will be returned.
- .9 The Owner may deduct, from payments due to Contractor, costs of additional engineering reviews incurred if shop drawings and data sheets are not corrected after one (1) review.

#### **1.6 Submittals for Information Only**

- .1 Where specified, furnish submittals to the Consultant for information only at least twenty-eight (28) days prior to commencement of the Work covered by the submittal. Submittals for information only will be used by the Owner or the Consultant for general information and filed without comment. The Owner and the Consultant retain the right to return submittals for information only if the submittal does not comply with the Contract Documents or general design criteria.
- .2 Submittals for information only are not subject to review procedures. They are to be provided as part of the Work under the Contract and their acceptability determined under normal inspection procedures.
- .3 Submit four (4) copies of information only submittals including product data, manufacturer's standard data sheets or brochures for requirements requested in Specifications sections and as

the Owner may reasonably request where shop drawings will not be prepared due to standardized manufacture of Materials.

- .4 Where specified, submit engineering calculations sealed by a qualified Professional Engineer, registered in the Province of B.C. for information only.

### **1.7 Request for Substitution**

- .1 Make requests for substitution by written application accompanied with sufficient information as specified under Section 01100 – Substitution, to permit the Consultant to identify the nature and scope of the request.
- .2 Follow submittal procedures and submit six (6) copies of all information for each substitution request.
- .3 Upon receipt of written application for substitution from the Contractor, including the specific information specified, the Consultant will estimate the cost and time requirement of evaluating the request and present the estimates to the Contractor. The Contractor is advised that the estimates are based upon the best information available to the Consultant at the time; however, the actual cost, based on time and expense, will be documented and applied in the final analysis of the substitution request.
- .4 If the Contractor wishes the Consultant to continue the review of the request, advise the Consultant in writing and submit sufficient additional information as may be requested by the Consultant. No evaluation will take place until such time as the Contractor has agreed to the estimate in writing and has authorized the Owner to deduct the cost of the evaluation from progress payments due the Contractor.

## **2 PRODUCTS**

*Not Applicable*

## **3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 Prepare a time scaled, cost loaded precedence diagramming network construction schedule in the form of a horizontal bar chart using the critical path method. Show all the principal phases and elements of the Work and include all resources related to the Work. The construction schedule will provide a basis for determining the progress status of the project relative to the completion time and specific dates and for determining the acceptability of the Contractor's requests for payment.
- .2 Prepare all schedules on "Primavera SureTrak" software version 2.0 or later.
- .3 Unless specifically approved by the Consultant, show activities on the schedule with a duration not longer than 14 days or an assigned value not greater than \$100,000 (except activities showing only submittal, fabrication or delivery of Materials or Contractor's Plant). Divide activities which exceed these limits into more detailed components. Base the scheduled duration of each activity on the Work being performed during the work week established and agreed upon as of the date of the Notice of Award with allowances made for legal holidays and normal weather conditions. Provide a separate bar for each trade or operation within each significant portion or area of the Work Site.
- .4 Provide horizontal time scale identifying the first work day of each week.
- .5 Depict all significant construction activities, shop drawing submittals, procurement activities and receipts of Materials and Contractor's Plant which the Contractor intends to store on the Work Site for at least one month prior to installation. Indicate assigned dollar values for each scheduled activity. Show the dependencies between activities so that it may be established what effect the progress of any one activity has on the schedule. Assign each activity an identification number (first two characters must be the specification division number). Include items embedded in concrete in concrete activities or identify embedded items separately. Include unloading in delivery activities.
- .6 Assign an activity code to all activities to allow sorting reports and schedules by Specification section number. Confirm activity codes by mutual agreement with the Consultant.
- .7 Assign activity codes to all appropriate construction activities to allow sorting on each of the following items in reports and schedules:
- .1 Coordination/tie-in activities associated with existing structures and Other Contractors.
- .2 Submittal, fabrication, delivery, installation and testing of items.
- .8 Show completion time and all specific dates and sequencing requirements. Identify activities making up the critical path.

- .9 Balance the costs assigned to each activity so that the value assigned to each activity represents the best estimate of the actual cost of performing the activity. Provide sufficient detail to permit its use as one basis for evaluating progress payments.

### **1.3 Schedules Required**

- .1 Submit the following schedules to the Consultant:
  - .1 Construction schedule.
  - .2 Projected labor curve for entire Contract.
  - .3 Cash flow curve.
  - .4 Percentage complete curve.
  - .5 Scope of Subcontractor Work.
  - .6 List of Contractor's Plant for each phase and stage of Work.

### **1.4 Submission**

- .1 It is intended that the Consultant will meet with the Contractor as soon as practicable after Notice of Award to review significant aspects of the overall schedule of the Work, and establish suitable intermediate milestones in keeping with the constraints at the Work Site.
- .2 Within fourteen (14) days following Notice of Award and prior to commencement of Work at the Work Site, the Contractor shall prepare for submission to the Consultant the schedules listed in Clause 1.3 incorporating the dates shown below in Item 1.7 – Project Milestone Dates, along with the other supporting information.
- .3 The Consultant and Owner will review the schedules and return one (1) reviewed copy within seven (7) days after receipt.
- .4 Resubmit finalized schedules within seven (7) days after return of review copy.
- .5 Distribute copies of the finalized schedules to:
  - .1 Owner.
  - .2 Consultant.
  - .3 Contractor (internal).
  - .4 Subcontractors and Suppliers.
  - .5 Other concerned parties.
- .6 Instruct recipients listed in Clause 1.4.5 to report to the Contractor within two (2) days, any problems anticipated by any activity shown in the schedule.

- .7 Within fourteen (14) days of the distribution of the finalized schedule referred to in Clause 1.4.5, submit a detailed cost-loaded construction schedule to the Consultant in the format identified in Clause 1.2 in electronic format and hard copy:
  - .1 Tabular listing of activities sorted by early start and showing activity description, scheduled duration in working days, early and late start and finish dates, total float, predecessors and/or successors to each activity and the cost assigned to each activity.
  - .2 Time scaled logic diagram for all scheduled activities.
  - .3 Projected monthly draw request (histogram and tabular).
  - .4 Critical path report.
  - .5 Narrative describing the basis of the schedule.
  - .6 Days when the Contractor proposes to Work more than the normal work week established and agreed upon as of the date of the Notice of Award.
- .8 The Consultant will review the submitted detailed cost-loaded construction schedule within seven (7) days of its receipt. If the Consultant finds that it does not comply with the specified requirements, or does not provide an acceptable schedule detail or cost breakdown, the deficiencies will be identified in writing to the Contractor for correction and resubmittal. Correct and resubmit the schedule within seven (7) days after the deficiencies have been identified by the Consultant.
- .9 The accepted detailed cost-loaded schedule will serve as the basis for the requests for payment. Cost loading of the schedule will not relieve the Contractor of the responsibility for the adequacy of the schedule and for managing all construction activities.
- .10 Submittals for review shall be in accordance with Section 01300.

### **1.5 Contents of Construction Schedule**

- .1 Include the complete sequence of construction activities.
- .2 Include the dates for the commencement and completion of each major element of the design, supply, construction and installation, including the events listed in Schedule 8 – Tenderer's Construction Schedule of Section 00200, the Milestone Dates listed in Clause 1.7, and to the level of detail noted in Clause 1.2.3.

### **1.6 Updates to Construction Schedule**

- .1 Update the schedules listed in Clause 1.3 monthly (or more often as may be directed by the Consultant) and submit to the Consultant within the first seven (7) days of the month for which the schedules are issued.
- .2 Indicate progress of each item or activity achieved from the date of Notice of Award up to the first day of the month for which the schedules are issued.
- .3 Show the percentage of completion of each item or activity as projected for the last day of the month for which the schedule is issued. Modify the timing and duration of future activities to indicate current planning.

- .4 Submit proposed revisions to the accepted detailed cost-loaded construction schedule to the Consultant for review. Changes in timing for activities may be modified with agreement of the Contractor and Consultant. A change affecting the Contract Price, the completion time and Work sequencing may be made only by approved Change Order.
- .5 Add separate activities to the cost loaded construction schedule for each approved Change Order.
- .6 Add separate activity codes for Change Orders to allow separate sorting.
- .7 Should the actual sequence of Work performed by the Contractor deviate from the planned sequence indicated in the accepted schedule, the Consultant may require the Contractor to revise the schedule to reflect changes in the actual sequence and the future sequence of Work.
- .8 Submit with each schedule revision all information as called for in submitting the original detailed cost-loaded construction schedule in both electronic format and on hard copy.
- .9 Submit an updated schedule on a monthly basis concurrent with the submittal of the progress payment request. Indicate on the updated schedule progress achieved to date on all activities. Modify the timing and duration of future activities to indicate current planning. Submit the updated schedule and other information in both electronic format and on hard copy as specified for the original cost loaded construction schedule.

**1.7 Project Milestone Dates**

- .1 Schedule the Work in accordance with the following Project Milestone Dates:

Contract Award	(target)
Field Offices installed and fully functional complete with fencing around the laydown area.	
Complete Excavation	
Complete Concrete Placement, including roof slab.	
Complete backfilling around perimeter retaining walls.	
Attain Substantial Completion	
Total Completion	

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Requirements**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Daily Report**

- .1 The Contractor shall submit Daily Reports to the Consultant commencing with the start of the Work and, continuing until Substantial Completion.
- .2 Each Daily Report shall include, for a particular day:
  - .1 A breakdown of labor and their hours used for the Work;
  - .2 Make(s) and model(s) of each piece of Contractor's Plant present at the Work Site;
  - .3 Hours of working, standby, standdown and downtime associated with each piece of Contractor's Plant;
  - .4 Details of delays and breakdowns;
  - .5 Quality control testing and instrumentation results; and
  - .6 Weather.
- .3 Each Daily Report shall be neatly and clearly written, otherwise it may be rejected by the Consultant.
- .4 Each Daily Report shall be dated and signed by the Contractor and submitted to the Consultant for approval by noon of the following day.
- .5 Acceptance of a Daily Report will not necessarily constitute approval of the quality of the Work or approval of quantities for the purposes of payment. Further verification may be required.
- .6 The format for the Daily Report shall be as agreed by the Consultant.

**1.3 Monthly Report**

- .1 The Contractor shall submit Monthly Reports to the Consultant commencing upon mobilization.
- .2 Each Monthly Report shall include, for a particular month:
  - .1 A comprehensive summary of all Daily Reports.
  - .2 A narrative description of the changes occurring since the previous submission of the Monthly Report including:
    - .1 Major changes in the Work.
    - .2 Activities modified since the previous submission.



- .3 Revised projections of progress and completion.
- .4 Other identifiable changes.
- .3 An updated Progress Measurement Spreadsheet showing each pay item and estimated quantities for the purposes of payment for progress achieved up to the end of the month for which the progress application is submitted.
- .4 Actual manpower, cash flow and percentage complete curves, updated to show status up to the last day of the month for which the report is submitted.
- .3 Progress Measurement Spreadsheet
  - .1 Base the Progress Measurement Spreadsheet on the accepted construction schedule. The form and detail of the Progress Measurement Spreadsheet shall be in a form acceptable to the Consultant.
  - .2 Show the achieved progress in the construction by appropriate measurement of significant portions of the Work.
  - .3 Indicate progress as a percentage complete for each pay item from date of Notice to Proceed up to the last day of the month for which the spreadsheet is submitted. State the progress achieved during the month for which the spreadsheet is submitted.
- .4 Each Monthly Report shall be neatly and clearly written, otherwise it may be rejected by the Consultant.
- .5 Each Monthly Report shall be dated and signed by the Contractor and submitted to the Consultant for approval with each monthly application for payment.
- .6 Acceptance of a Monthly Report will not necessarily constitute approval of the quality of the Work or approval of quantities for the purposes of payment. Further verification may be required.
- .7 The format for the Monthly Report shall be as agreed by the Consultant.

## 2 PRODUCTS

*Not Applicable*

## 3 EXECUTION

*Not Applicable*

**END OF SECTION**

## 1 GENERAL

### 1.1 Documents

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

### 1.2 Description – General

- .1 This section addresses general requirements for environmental protection, including but not limited to the Work required by the Contractor to protect all areas of the Work Site, and identifies the preventive measures, earthwork activities, sanitary requirements, emergency response procedures, the Environmental Protection Plan and construction finalization. Therefore, the Contractor shall pay strict adherence to an approved Environmental Protection Plan, the basis of which are set out herein. Refer to Section 01460 – Public Impact Mitigation for other requirements. This section is not intended to identify all specific requirements.
- .2 Work Site is located within a residential neighborhood in Vancouver, BC. The surrounding environs will all be exposed to potential environmental damage by the construction and related activities. Therefore, the Contractor shall pay strict adherence to an approved Environmental Protection Plan, the basis of which is set out herein, and shall implement all necessary mitigation measures to protect this environment. Refer to Section 01460 – Public Impact Mitigation for other requirements.

### 1.3 Compliance

- .1 The Contractor and each Subcontractor, while performing the Work, shall comply with relevant statutes, regulations, laws and directives of legislative authorities in all matters relating to the protection of the environment. An environmental monitor, acting through the Consultant, has been retained by the Owner to review the Work and monitor the Work Site conditions during construction. If, in the opinion of the Owner or the Consultant, the Contractor's construction practices or facilities require immediate modification to reduce the risk of environmental damage, the Contractor shall be required to stop Work and make the necessary changes prior to proceeding with the Work. No compensation shall be provided by the Owner for any losses resulting from the shutdown of Work and no payment will be made for the necessary changes.
- .2 The environmental monitor will also review construction protocols, inspect the Work and ensure that the specified Work practices and precautions are followed for all aspects of the Work that may pose a risk to the environment. As a further precaution, a Spill Response Plan shall be developed by the Contractor and approved by the Owner that identifies procedures for dealing with unlikely incidents such as accidental release of deleterious materials. Refer to Clause 3.18.
- .3 Throughout the course of the Project, the environmental monitor will be responsible for informing the Contractor and the Consultant of any concerns regarding potential impacts to wildlife resources. The monitor will also be responsible for checking the storage and handling of explosives, fuels, lubricants and hydraulic oils.
- .4 The Contractor shall follow specific Work practices that will safeguard the environment. The Contractor will also be responsible for enforcement of good housekeeping, Workers' Compensation Board of British Columbia Occupational Health and Safety Regulations, and relevant codes and bylaws for Work Site services and conditions. At no time will discharge of demolition debris and other waste products, cleaning materials, new materials (including

concrete, concrete slurries, and concrete truck wastage), vehicle fuels and lubricants or other deleterious materials, be permitted onto Park lands. Secure storage and handling of all such materials shall be a Contract requirement. All waste materials generated during the Project shall be loaded into dump trucks or portable bins, transported out of the Park, and disposed of in an acceptable manner at disposal or recycling sites approved by the Owner.

- .5 The Contractor shall also familiarize itself and comply with the following documents:
  - .1 Federal Fisheries Act 1970 (and applicable updates);
  - .2 BC Ministry of Water, Land and Air Protection Approved Working Criteria for Water Quality – (most recent version);
  - .3 BC Water Act 1988 Section 9 Changes in and about a Stream (and applicable updates); and
  - .4 Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans Canada, and BC Ministry of Environment, Lands and Parks, 1993 (and applicable updates).
  - .5 Contaminated Sites Regulation, Waste Management Act (includes amendments up to B.C. Reg. 244/99), B.C. Reg. 375/96, Deposited December 16, 1996, O.C. 1480/96, effective April 1, 1997 (and applicable updates).

#### **1.4 Conflicts and Omissions**

- .1 If the Contractor finds or observes that there appears to be a conflict between the contents of this section or other sections of the Specifications and the requirements of legislative authorities, then such conflict shall be brought to the attention of the Consultant for resolution. Similarly, any omissions or apparent omissions from this section relevant to current legislation shall be referred to the Consultant. Omissions or apparent omissions shall in no way diminish the Contractor's responsibility to comply with the statutes, regulations, bylaws and directives of legislative authorities.

#### **1.5 Submittals**

- .1 The Contractor shall employ a Subcontractor specializing in environmental protection to prepare and submit to the Consultant and Owner for review within fourteen (14) days of Notice to Proceed and prior to mobilization for the Work, a detailed, comprehensive Environmental Protection Plan (EPP) specific to the Work, based on the outline submitted with the Tender. The Contractor shall not commence the Work until the EPP has been approved by the Consultant and Owner.
- .2 This comprehensive EPP shall contain measures to be implemented by the Contractor to protect the quality of air and the general environment of the Work Site and its immediate vicinity. The EPP shall address all environmental requirements associated with the Work, which include but are not limited to:
  - .1 Erosion and sediment control details and procedures;
  - .2 Spill contingency procedures;
  - .3 Spill Response Plan;

- .4 Detailed drawings and procedures to ensure surface water quality protection;
- .5 Waste management procedures;
- .6 Fire prevention procedures;
- .7 Liquid storage, fueling and equipment operation and maintenance procedures;
- .8 List of all Materials and products to be used on the Work Sites;
- .9 Environmental protection measures to be used for each Material and product;
- .10 Disposal and preservation plans for excavated materials, topsoil, woody debris, organics, rock;
- .11 Containment plans for equipment service areas;
- .12 Site restoration and clean-up plans;
- .13 List of applicable regulations that apply for all jurisdictions;
- .14 List of environmental hazards that will be created in the course of construction;  
Protection measures to mitigate environmental hazards;
- .15 Dewatering including sediment control measures; and
- .16 Confirmation of all points of discharge.
- .3 The scope of the EPP shall address all aspects of the Work of the Contract including but not limited to:
  - .1 Access roads and laydown area;
  - .2 Equipment storage and service area development if any;
  - .3 Site clearing and grubbing;
  - .4 Excavation and material transport to disposal and/or stockpile sites;
  - .5 Disposal and stockpile sites;
  - .6 Drilling;
  - .7 Blasting;
  - .8 Concrete construction;
  - .9 Water handling and drainage controls;
  - .10 Water treatment and Work Site discharge;
  - .11 Materials storage, handling and disposal;

- .12 Filling;
- .13 Asphalt paving;
- .14 Restoration of the Work Site and landscaping.
- .4 More specific details regarding the above can be found elsewhere in the Contract Documents. Several important sections to refer to include, but are not limited to:
  - .1 Section 01460 – Public Impact Mitigation
  - .2 Section 01705 – Restoration of Improvements
  - .3 Section 01712 – Final Cleaning
- .5 The Contractor's specialist environmental Subcontractor shall submit to the Consultant, on a weekly basis, comprehensive environmental reports demonstrating that the Contractor is complying with the approved Environmental Protection Plan, detailing non-compliances and detailing corrective actions.

## **2 PRODUCTS**

*Not Applicable*

## **3 EXECUTION**

### **3.1 Preventive Measures – General**

- .1 All soil waste shall be removed from the Work Site to the satisfaction of the Owner.
- .2 Domestic animals will not be allowed on the Work Site.
- .3 Petroleum products or waters containing sheens or rainbows shall not be discharged or be permitted to drain into the storm system. Spillage shall be mopped up immediately by the Contractor.
- .4 Particular attention shall be given to housekeeping practices in the Work Site. The area shall be kept free of such things as trash, debris, waste, oily rags, empty containers and other deleterious items. It shall be the Contractor's responsibility to haul all refuse out of the Work Site, and dispose of it. All extraneous or partially full containers of petroleum products or other chemicals shall be removed from the Work Site.
- .5 Potentially hazardous substances, other than necessary petroleum products, will not be allowed in the Work Site without express written approval by the Owner.
- .6 There shall be no overnight camps on the Work Site.

### **3.2 Fires and Fire Prevention**

- .1 The Contractor shall not permit open burning on the Work Site or any adjoining areas.
- .2 The Contractor shall protect the Work Site and adjoining areas from fires resulting from its activities.

- .3 As part of the EPP, the Contractor shall prepare a fire prevention plan and submit it to the Owner for review. The Contractor shall identify personnel, fire suppression equipment, water sources and procedures to be followed to firstly, avoid fire situations and secondly, to fight any fire that occurs.
- .4 The Contractor shall supply and maintain on the Work Site adequate fire suppression equipment. Such fire suppression equipment shall be consistent with good fire prevention/suppression practice and local municipal regulations.
- .5 When the fire hazard reaches a moderate rating and higher, the Contractor shall employ a watchman to patrol the Work Site for a minimum of one (1) hour after the Work ceases.
- .6 No smoking will be allowed on the Work Site.
- .7 In the event of a fire, contact the Consultant, the City of Vancouver Fire Department at 911 and the Owner.

### **3.3 Erosion and Sediment Control**

- .1 Erosion and sediment control shall be achieved by the placement of a granular base in stripped areas, by the use of silt fences in drainage areas on land, by use of settlement ponds, by the use of hydroseeding and replanting and such other means as are required to satisfy governing standards. Construction Work shall not proceed until the control works have been reviewed and accepted by the Owner and any governing authority having jurisdiction.
- .2 Silt fences shall be geotextile synthetic fiber fabric product of Terrafix 370 RF, AMOCO 2125 or approved equivalent, and shall be securely anchored. The use of straw or hay bales is not permitted.
- .3 The Contractor shall be responsible for the provision and maintenance of all erosion and sediment control installations at all points and areas of natural drainage.

### **3.4 Surface Water Quality Protection**

- .1 The Contractor shall prepare and submit, as part of the EPP, detailed drawings and procedures associated with surface water quality protection which shall address the following, and include, but not be limited to:
  - .1 methods and locations for storing and containing petroleum products in a designated area;
  - .2 methods for the control of turbidity and waste materials resulting from road drainage and trench water from Work areas during construction;
  - .3 methods for collection and disposal of all sanitary wastes where facilities are not provided by the Owner;
  - .4 procedures and equipment for notifying the Owner, containing contaminants, ensuring personal safety, and clean-up in the event of an environmental emergency;
  - .5 composition and methods for use and storage of fertilizers or any other chemicals to be used during landscaping, restoration or other components in the Work;

- .6 design of containment and treatment works including calculations, design drawings and equipment specifications for all water collection, conveyance, treatment, pH adjustment and release facilities.
- .2 The Contractor shall provide, operate and maintain containment and treatment works to ensure no material resulting from the construction activity enters the storm drainage system.
- .3 Accidental chemical or fuel spills shall be cleaned up immediately by the Contractor and reported as required.
- .4 The Contractor shall collect, treat and release all water which falls upon or drains across the Work Site. The use of flocculants to treat water is not permitted. Release of water shall be in accordance with Clause 3.6.6.
- .5 Release of water to the City of Vancouver Storm Water System shall comply with water quality criteria specified in the latest BC Ministry of Environment/ Department of Fisheries and Oceans (DFO) standards for "Land Development Guidelines for the Protection of Aquatic Habitat".
- .6 Water falling upon and draining across the Work Site shall be collected, pumped to a holding pond, treated and released at the discharge point identified in Clause 1.3.6 of Section 01510 – Temporary Utilities and Facilities.
- .7 The holding ponds shall be designed to store the volume of runoff generated by a minimum of the one in 5-year return period, 6 hour rainfall event for the geographical area of the reservoir, with an average intensity of at least 7 mm/hour. The combined capacity of holding ponds and any necessary treatment system shall accommodate the volume of runoff generated by a minimum of the one in 10-year return period, 24 hour rainfall event for the geographical area of the reservoir, with an average intensity of 4.8 mm/hour. Ponds shall be fitted with an overflow to convey inflow in excess of the design event directly to the storm sewer.
- .8 The approved water collecting, retaining and treatment system shall be installed and operational before any excavation and reservoir demolition begins for the Work.

### **3.5 Waste Management**

- .1 The Contractor shall comply with all requirements for managing waste through the course of the Work.
- .2 Waste types anticipated at the Work Site may include sanitary sewage, sediment-laden water from the reservoir, pipes or from washdown operations, domestic waste, construction garbage, rock and soil wastes, concrete, grout and drilling wastes, reinforcing and other steel waste, recovered granular materials, formwork and falsework waste, operating fluid wastes from vehicles and construction equipment, collected sediment, and hazardous wastes. Disposal of these and other wastes shall be as indicated in this section of the Specifications.
- .3 Solid Waste:
  - .1 An approved landfill site shall be used for disposal of domestic and construction garbage.
  - .2 Concrete demolition rubble shall be removed from the Work Site. Preference shall be given to approved constructive reuse or recycling away from the Work Site; alternatively, the material shall be disposed of at an appropriate local landfill disposal

- site. Concrete reinforcing steel not embedded in concrete and structural and miscellaneous steel shall be removed for separate disposal with preference to approved construction reuse or recycling.
- .3 Preference shall be given to constructive reuse of uncontaminated granular materials no longer required for the Contract; alternatively waste granular materials shall be removed to an appropriate local landfill disposal site. Contaminated granular materials shall be disposed of at an approved waste disposal site.
  - .4 Waste wood and debris shall be disposed of off-site at a recycling facility or at an approved landfill. Burning at the Work Site is not permitted.
  - .5 Where practical, consideration shall be given to recycling waste materials.
  - .6 Rock waste and excess common excavation materials shall be disposed at an appropriate local landfill disposal site.
  - .7 Waste storage bins shall be provided for collection and temporary storage of domestic garbage. The bins shall be provided with wildlife-proof lids to discourage access by wildlife. The bins shall be emptied on a regular basis and the waste removed off-site to a local landfill. Nuisance wildlife shall be reported to the Owner.
  - .8 Bins shall be clean and dedicated to the project to avoid contamination from construction wastes.
- .4 Drilling Waste:
- .1 It is anticipated that some drilling waste will be generated.
  - .2 All concrete, grout and drilling wastes shall be completely contained, collected and removed and disposed of as per regulations from the Work Site. Onsite handling and temporary containment shall be designed in consultation with the Consultant and shall be reviewed and accepted by the Consultant prior to commencement of Work.
- .5 Sanitary Waste:
- .1 The Contractor shall provide portable toilets for the Contractor's and Owner's and Consultant's use at the Work Site. Waste will be removed by the Contractor on a regular basis consistent with health and safety requirements.
  - .2 Any additional sanitary waste generated by the Contractor shall be collected in holding tanks. Waste shall be disposed of at a licensed disposal location by a licensed hauler. The Contractor shall arrange for this additional waste removal on a regular basis consistent with health and safety requirements.
- .6 Equipment Operating Wastes/Hazardous Wastes:
- .1 Potentially hazardous substances shall be defined as petroleum products, coolants, herbicides, pesticides, paint/thinner products, solvents, detergents, and other chemicals or substances regulated by the "Guidelines for Canadian Drinking Water Quality, 1996" by Health Canada.



- .2 Hazardous substances that the Contractor may intend to use and store in significant volumes at the Work Site during construction are diesel fuel, hydraulic and motor oils, explosives, cement and concrete admixtures. The Contractor shall promptly provide to the Consultant and the Owner and maintain copies onsite of all Material Safety Data Sheets (MSDS) relating to all hazardous substances brought to the Work Site and shall comply with all requirements of the Workplace Hazardous Materials Information System (WHMIS) Regulations. Refer to Section 01065 – Safety and Health for additional requirements.
- .3 The Contractor shall make itself fully aware of all Federal and Provincial legislation and restrictions on the storage and use of certain products or materials considered harmful to the environment or persons, and shall comply with all applicable regulations and guidelines.
- .4 Operating fluid wastes from vehicles and construction equipment, contaminated water collected from the containment areas, contaminated soil from spillage or leakage and other waste deemed hazardous, shall be collected in drums with tight sealing lids, labeled and removed from the Work Site for recycling or disposal as hazardous waste at a facility approved to accept such waste.
- .5 Collected sediment shall be labeled and removed from the Work Site and disposed of at an appropriate landfill location.
- .6 Hazardous or subject solid or liquid wastes shall be disposed of offsite using licensed disposal agents and haulers, and in accordance with any permits required under the Waste Management Act.
- .7 Drums of waste shall be removed off site. If temporary storage is approved by the Owner in writing, drums shall be labeled to identify their contents and located in the approved drum storage area.
- .8 Silica sand shall not be used in any power blasting operation.
- .9 Hazardous substances shall be labeled and stored in a secure area approved by the Consultant at a distance of at least 50 m from the reservoir.
- .10 The quantity of hazardous substances stored at the Work Site shall be limited to a sufficient quantity for two (2) days of Work only.
- .11 Drums of liquid shall be labeled and stored on pallets in a covered, contained area which will comprise of a flat lying dyked enclosure that is lined with a heavy duty impermeable membrane. Other hazardous materials shall be stored in a covered area to protect them from the weather. The storage capacity of the dyked area must exceed 120% of the volume of all liquids stored within.
- .12 The drum storage and tank containment areas shall be inspected daily and pumped out as required. Any water deemed to be contaminated shall be pumped and removed from the Work Site by a licensed disposal company to a facility approved to accept such waste.
- .13 All hazardous materials shall be identified as required by WHMIS, the BC Fire Code and the Transportation of Dangerous Goods Regulation.

- .14 Workers shall be trained in WHMIS.
- .15 Sorbent materials shall be available in the storage areas to respond to and clean up any spills that may occur.
- .16 No explosives shall be stored overnight at or near the Work Site.
- .7 Sediment-Laden Water
  - .1 The Contractor shall prepare and submit, as part of the EPP, detailed procedures supported with drawings if required, for handling and disposing sediment-laden water, or sediment-laden wash down wastewater. The procedure shall address, but not be limited to, the following items:
    - .1 Methods of collection and containment;
    - .2 Methods of storage;
    - .3 Methods of turbidity control and treatment, including calculations, equipment and material specifications, and operational procedures. The use of flocculents to treat water is not permitted;
    - .4 Methods of conveying and disposing of any solid waste that is generated;
    - .5 Methods of releasing treated water and/or disposing of wastewater.
  - .2 The Contractor shall provide, operate and maintain the collection, containment, storage and treatment works to ensure that sediment does not enter the storm or sanitary drainage systems.
  - .3 Release of water to the City of Vancouver storm water drainage system or sanitary drainage system shall comply with City of Vancouver requirements and conditions. Release of water to the City of Vancouver storm drainage system shall comply with water quality criteria specified in the latest provincial Ministry of Land, Water and Air Protection / federal Department of Fisheries and Oceans standards for "Land Development Guidelines for the Protection of Aquatic Habitat".
  - .4 The approved sediment-laden water collection, containment, storage, treatment and disposal system shall be installed and operational before sediment laden water is handled in any way.

### 3.6 Site Preparation

- .1 Clearing of trees, brush and shrubs shall be as noted on the Drawings and may only be carried out following written approval by the Owner. Ensure that no bird nests are present before clearing trees. Grubbing shall be minimized as a precaution against erosion.
- .2 Stripping and grading shall be confined to areas designated for construction, borrow, stockpile, access or laydown.
- .3 Stripped soil may be stockpiled for future use in restoration. Topsoil and underlying soil shall be separately stockpiled. Stockpiles shall be protected against erosion. The location of all stockpiles within the Work Site shall be subject to the approval of the Owner.

**3.7 Construction Dust Control**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.8.

**3.8 Construction Noise Control**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.7.

**3.9 Construction, Laydown and Parking Areas**

- .1 Construction processing areas and laydown areas have been identified and designated for use by the Contractor, as described in the Contract Documents. Materials storage, site office facilities, limited parking and vehicle servicing will be restricted to these areas. For parking for the Contractor's and Subcontractor's workers and staff, refer to Section 01460 – Public Impact Mitigation.
- .2 Silt fencing shall be installed prior to the start of construction as appropriate to the drainage conditions to prevent erosion and to control sediment in laydown run-off water. The Contractor shall clean and maintain these facilities for the duration of the Contract and shall remove them at the conclusion of the Work. The use of straw or hay bales is not permitted as a supplement or substitute for silt fencing.
- .3 Contractor shall clean up the laydown and Work areas upon completion of the Work. The final clean-up shall include raking the entire areas by hand to ensure even the smallest debris is collected and removed.

**3.10 Liquid Storage, Refueling and Equipment Operation**

- .1 Storage of fuels and lubricants will not be allowed within the reservoir. Storage of fuels and lubricants shall be in locations designated for that purpose and subject to approval by the Owner. All petroleum products or containers shall be stored in a bulk fuel storage area.
- .2 Onsite fuel storage tanks and storage for other environmentally hazardous liquids shall be located as far away the reservoir as is practicable, and shall be contained within berms, dykes or equivalent enclosures on flat ground in the laydown area. Enclosures in liquid storage areas shall be such as to contain the total volume stored plus precipitation. Protection against seepage shall be provided by the use of impermeable liners.
- .3 Sorbent materials shall be on hand at liquid storage areas as a means of containing or soaking up errant spills.
- .4 Empty drums shall be on hand for predisposal storage of spilled substances; sufficient drums shall be available to accommodate stored and in-service volumes of spillable substances.
- .5 Refueling
  - .1 Bulk fuel trucks are prohibited from entering the Work Site.
  - .2 Readily mobile highway vehicles shall be refueled off site.
  - .3 Refueling of equipment within the Work Site shall be conducted by the use of vehicle-mounted small capacity storage tanks ("Tidy-Tanks") only. Tanks shall be refilled only

- by personnel from a commercial fuel handling company and shall not be refilled by the Contractor's workers.
- .4 During transfer of fuels from one container or vehicle to another, a competent operator shall be on-site to oversee the operation. Dispensing devices shall automatically shut off when the container is full and dispensing tanks shall contain a 400 mm extension on the breather. Precaution should be taken to prevent overflows and spillage including the use of absorbent pads and drip trays immediately below fuelling operation. Condensation siphoned from fuel tanks shall not be discharged onto the ground.
- .5 Storage tanks and support racks shall be structurally capable of holding the full contents without leakage. Excessive rust, perforations, holes, splits, etc., on tanks will not be permitted.
- .6 All fuel trucks shall be labeled or marked as such, and shall carry a minimum of two 5-gallon buckets with lids, one shovel, and a minimum of 25 oil absorptive pads for use in the event of a spill.
- .7 Motorized mobile equipment and machinery shall be refueled in a refueling/service area to be developed in the laydown area as required by the Contractor to meet the intent of other clauses in this section. Care shall be taken to ensure that petroleum products do not spill during refueling.
- .8 Equipment, which is not readily mobile, may be refueled at the Work Site location as far as possible from the reservoir. Drip trays shall be used and sorbent materials shall be immediately on hand for rapid deployment in the event of a spill.
- .6 Equipment Operation
- .1 Equipment shall be cleaned and serviced as necessary to prevent deposition of soils, oil, grease, coolant, fuel and any other contaminants.
- .2 Stationary and mobile equipment operating in dewatered areas shall be equipped with drip trays to contain any fuel, oil, coolant or grease leakage. Drip trays for grout pumps and grout reservoirs shall be capable of containing all accidental spills/leakage during hose connection and operation.
- .3 No equipment shall be washed within the reservoir (once base slab construction commences).
- .4 All equipment used in the reservoir must be in sound mechanical condition. Equipment displaying oil leaks or deteriorated hydraulic hoses is prohibited. Equipment is to be steam-cleaned prior to entering the reservoir (once base slab construction commences).
- .5 All equipment shall be in good operating condition and meet applicable statutory requirements for serviceability and exhaust emissions. Exhaust systems shall function in a manner to control exhaust noise within acceptable levels.
- .6 In the event of repair or routine maintenance such as oil changes or adjustment to hydraulic gear, equipment shall be moved to the designated "storage and maintenance area" to effect repairs. In the case where this is not practical, other arrangements will be permitted, provided they are approved in advance by the Consultant and the Owner.

- .7 An equipment service area, if required by the Contractor, shall be on relatively flat ground in the laydown area. A granular mat overlying an impermeable liner shall be used in this service area and shall be placed so as to contain seepage. The Contractor shall take precautions to ensure that this liner does not become punctured. Drip trays shall be used to control on-ground spillage of fuels, oils, coolants and grease. The Contractor shall be responsible for any and all clean-up of contamination resulting from its operations. Contaminated granular materials and other contaminated soils shall be carefully excavated and shall be disposed of at an appropriate location outside of the watershed. These materials may be classified as hazardous waste.
  - .8 All stationary and mobile equipment shall be stored in a designated "storage and maintenance area". This includes generators, compressors, and engine driven pumps in addition to other equipment while not in use, such as backhoes, loaders, dozers, trucks, cranes, drill rigs and other construction vehicles. Each equipment item, whether it is left overnight in the designated area or shut down temporarily, shall have drip trays and oil absorbent pads placed beneath it.
  - .9 Soiled pads shall be replaced as often as necessary to preclude runoff of water containing sheens. Pads need to be picked up immediately when equipment is moved. Pads are to be disposed of in the appropriate manner. Also, when the equipment is moved, any contaminated soil beneath it shall be excavated to a minimum depth of 150 mm, and removed to an acceptable location outside the Work Site.
- .7 Truck Washing
- .1 Truck and equipment washing involving the removal of collected dirt, grease, oil and other contaminants shall only be done in a service area suitably protected, to the satisfaction of the Consultant and the Owner, by impermeable liners. Washings and underlying granular mat materials shall be treated as hazardous waste.
  - .2 Waste water and washings from concrete truck mixers shall be directed to the excess concrete disposal basin to be developed by the Contractor. The Contractor shall obtain approval of the disposal basin site prior to development.

### 3.11 Demolition

- .1 Materials resulting from all demolition Work shall be removed from the Work Site for disposal in an approved manner.
- .2 Explosives shall not be used for demolition.

### 3.12 Earthwork Activities

- .1 The Contractor shall exercise judgment and skill in carrying out all earthwork-related activities due to the suspended solids loading they pose to runoff water. All Work shall be within accepted standards of good practice for environmentally sensitive locations.
- .2 The Contractor shall conduct its activities under the premise that an intense precipitation event can occur at any time and shall take preventive measures to protect against erosion.
- .3 The laydown area shall be protected by perimeter ditches. Runoff contaminated with sediment shall be collected. Use of other facilities such as silt fences and settling ponds shall also be required. Runoff contaminated with petroleum products or other chemicals shall be disposed of.

Disposal of all runoff shall be in accordance with the requirements of the acts, legislations and regulations of the B.C. Ministry of Water, Land and Air Protection.

- .4 The Owner may from time to time check excavated materials for contaminants such as fuel, oil or other chemicals. If contaminated material is encountered or suspected, the Contractor shall immediately cease Work in that area and notify the Consultant and the Owner. The Consultant shall direct the Contractor to prepare a plan for identification, safe handling, use or disposal of contaminated soil.

### **3.13 Dewatering**

- .1 Pumps used to maintain dewatered areas on the Work Site shall not discharge water directly into storm sewers. Refer to Clause 3.6 for the requirements for the treatment of water prior to discharge. Disposal of retained sediment shall be in accordance with Clause 3.7.
- .2 Work area runoff water contaminated with hazardous substances shall be treated as the product of a spill to the environment.
- .3 Dewatering facilities shall also be constructed and maintained so that all placement of concrete is completed in a dry area.

### **3.14 Restoration**

- .1 Upon completion of the Work, all temporary facilities shall be removed including containment berms, settling ponds, dykes, culverts, ditches and other devices. Contaminated materials shall be taken from the area and disposed of in a proper location, outside of the Park.
- .2 The spill containment kits shall remain intact and on-site until other Work items are complete.
- .3 All disturbed areas shall be returned to their original condition or as otherwise noted on the Drawings.

### **3.15 Spill Contingency Planning**

- .1 The Contractor shall be familiar with all regulatory requirements and be adequately prepared to respond to a spill condition within the shortest possible time.
- .2 The Contractor shall designate a Spill Response Team formed from suitably qualified members of its workforce at the Work Site.
- .3 The spill contingency procedures must be posted in a visible location within the Contractor's Work Site offices and worker trailers. These plans shall be reviewed by the Contractor's Spill Response Team, on a scheduled basis to ensure a thorough understanding.
- .4 Any spill greater than 0.5 liters shall be reported to the Consultant.
- .5 Drainage control measures shall be put in place as required by site drainage features to protect the storm sewer system from potential spill substances.
- .6 Sorbent material shall be on hand at Work areas as a means of containing and soaking up any spill substance before it reaches the groundwater table.

- .7 Excess concrete, grout, drilling wastes and other liquid waste products shall be directed to secure containment facilities for subsequent removal and disposal by the Contractor in accordance with Clause 3.7.
- .8 Empty drums shall be provided by the Contractor at the Work Site for pre-disposal storage of spillable substances and for disposal of used sorbents, contaminated soil, and the like. Storage of full containers shall be off drainage to the reservoir site.
- .9 Contractor shall be responsible for providing "oil spill kits" in order to comply with the Specifications. A typical kit may include:
  - .1 2 shovels;
  - .2 2 screened pitchforks;
  - .3 1 axe;
  - .4 2 flashlights (with 6-volt batteries);
  - .5 6 five (5) gallon empty containers with lids;
  - .6 2 pairs of cotton work gloves;
  - .7 50 oil absorbent pads (minimum); and
  - .8 25 plastic garbage bags (minimum).
- .10 The Owner will provide the Contractor a copy of the notification procedures and telephone numbers.
- .11 These items shall be used by the Contractor in containing and cleaning up a spill. The Contractor shall be responsible for maintaining the kit and contents for the duration of the Contract.
- .12 The Contractor shall inspect each of its vehicles and machines on a daily basis to check for leaks and worn hoses, and will make the necessary repairs prior to using such equipment.
- .13 Two 5-gallon pails of sorbent material and a minimum of 25 oil-absorptive pads shall be carried within each vehicle and machine to provide fast response if a spill occurs.
- .14 Where feasible, existing drains shall be blocked to provide containment in the event of a spill.
- .15 Workers shall be instructed on storage and handling requirements and on spill response procedures.

### **3.16 Environmental Emergencies and The Spill Response Plan**

- .1 Environmental Emergencies
  - .1 Any condition causing, or threatening to cause, chemicals or petroleum products to enter the storm drainage system or natural streams will be considered an environmental emergency, and actions to stop or remove the violation shall be taken immediately.

- .2 The Contractor shall provide the Owner with a list of personnel, their addresses, and telephone numbers, who can be contacted if a spill or other environmental emergency condition occurs during the Contractor's absence.
- .3 The Contractor shall immediately notify the Owner and the Consultant if an environmental emergency condition occurs and maintain contact until the matter is corrected. Containment and clean-up measures are subject to review and approval by the Consultant.
- .4 The Contractor shall comply with all regulatory requirements and provide the best response to a spill within the shortest possible time. To meet these objectives, the Contractor shall comply with the following spill contingency procedures, which include mechanisms for initiating and carrying out the required notifications, spill containment, clean-up and remedial actions.
- .5 As part of the EPP, the Contractor shall develop a Spill Response Plan for review and approval by the Owner. The Spill Response Plan must be posted in a visible location within the Contractor's offices and worker trailers. These plans shall be reviewed by the Contractor's Spill Response Team, on a scheduled basis to ensure a thorough understanding.
- .6 In the event that an environmental emergency is a spill, the primary objective shall be to ensure health and safety and to minimize environmental damage due to the spill. The order of priority when dealing with a spill shall be people, environment and property. A spill kit shall be maintained at the Work Site and sorbents shall be available on each vehicle and machine.
- .7 The Spill Response Plan shall include the following steps:
  - .1 Stop the flow:
    - .1 Use common sense. Act quickly.
    - .2 Shut off machinery, pumps, valves etc.
    - .3 Plug leaks.
    - .4 Right containers.
    - .5 No smoking.
    - .6 No open flames.
  - .2 Implement safety measures:
    - .7 Report any spill over 0.5 liters.
    - .8 Obtain assistance immediately for large spills.
    - .9 Do not attempt to contain a large spill by yourself.
    - .10 Call for assistance as required.



- .11 Contact the Owner and Consultant.
- .8 Contain the spill:
  - .1 Immobilize the product with sorbents, earth, and sand as required.
- .9 Notify government authorities:
  - .1 For spills that reach reportable quantities, call:
    - .1 Provincial Emergency Program (PEP) 24 hours: 1-800-663-3456

Substance	Reportable Quantity to PEP
Flammable Liquid, Class 3	100 liters
Corrosive Liquids, Class 8	5 kg or 5 liters
Oil	100 liters

- .10 Report:
  - .1 Note: Spill reporting is mandatory under the Waste Management Act.
  - .2 The report shall include:
    - .1 Name and phone number of person reporting the spill.
    - .2 Name and phone number of person causing the spill.
    - .3 Location and time of the spill.
    - .4 Type and quantity of the spill.
    - .5 Cause and effect of the spill.
    - .6 Details of action proposed or taken to contain and minimize impact.
    - .7 Names of agencies on the scene.
    - .8 Names of other persons or agencies advised.
- .11 Clean-up:
  - .1 Procedures will vary depending on the product spilled and the location of the spill.
  - .2 For product spills and leaks on soil, liquid shall be collected using sorbents and the soiled sorbent material then transferred into a drum. The contaminated soil shall then be excavated and also drummed. Drums of waste shall be removed off site. If temporary storage is approved by the Owner in writing, drums shall be labeled to identify their contents and located in the approved drum storage area.

- .12 Contingency materials and equipment:
  - .1 Additional supplies of clean up equipment such as brooms, shovels, drums, sorbent pads, etc. may be obtained from:
    - .1 Versatech Products  
11951 Forge Place  
Richmond  
Office: 271-7500  
Fax: 271-7501  
After Hours: 757-2648
    - .2 Stanchem Inc.  
800 Terminal Avenue  
Vancouver  
Office: 685-1411  
After Hours: 685-5036
    - .3 Hazmasters Environmental Controls Inc.  
3131 Underhill Avenue  
Burnaby  
Office: 420-0025  
Fax: 420-5282
- .13 Additional assistance
  - .1 Additional spill response assistance is also available through:
    - .1 BC Petroleum – Burrard Clean: 985-0855
    - .2 After hours (emergencies only): 980-3901

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 This section of the Specifications contains the general requirements for the performance of quality control activities by the Contractor.

**1.3 Requirements**

- .1 The Contractor shall conduct, at its own cost, all necessary quality control testing that is required to demonstrate that the Materials, mix designs and completed Work conform to the Contract Documents.
- .2 The Contractor shall be responsible for all aspects of the quality of the Work, and shall put into place a suitable Quality Control Program which shall include all necessary inspections to ensure that quality standards are met, and that the Work meets all the requirements and intent of the Contract Documents. Throughout the Contract Documents, any reference to quality control testing by the Contractor shall mean testing performed by the Contractor's independent certified laboratory.
- .3 The Owner will carry out quality assurance testing and inspection in order to provide the Owner with assurance that Work is generally in accordance with the Contract Documents and to verify the Contractor's quality control data.
- .4 Testing and inspection by the Owner or the Consultant will not relieve the Contractor of its responsibility to perform quality control testing and inspection.
- .5 The cost of the Quality Control Program shall be included in the Contract Price.

**1.4 Quality Control Program**

- .1 The Contractor shall develop a Quality Control Program. The program requires review by the Owner.
- .2 Within fourteen (14) days of Notice of Award, submit to the Owner for review and approval by the Consultant a Quality Control Program and list of independent inspection agencies. The Quality Control Program shall include but not be limited to the following:
  - .1 Conformance with Specifications.
  - .2 Qualification statements for all tradespersons.
  - .3 Concrete placement and curing procedures (including procedures to achieve specified concrete finishes).
  - .4 Materials testing procedures and frequency of tests.

- .5 Document control.
- .6 Remediation and non-conformance tracking.
- .7 Compaction methods and testing procedures.
- .8 Testing personnel and facilities.
- .9 Materials testing schedule.
- .3 The Contractor shall engage services of independent inspection and testing laboratory with facilities and personnel that are certified to CSA, ASTM and other specified test methods for the sampling and testing of Materials.
- .4 The Contractor shall prepare all test results in duplicate and provide copies of all tests for review by the Consultant and the Owner.
- .5 All test results shall specify at least the following data:
  - .1 Type of test.
  - .2 Dates of sampling, testing and reporting.
  - .3 Personnel involved.
  - .4 Location of test (with sketch if required).
  - .5 Specified requirements.
  - .6 Test results.
  - .7 Remarks regarding conformance with Contract Documents.
- .6 Provide written test results to the Consultant within twenty-four (24) hours of tests. If the tests are completed on the Work Site, provide the Consultant with field memo summarizing results immediately following testing.
- .7 Minimum testing requirements shall be in accordance with the relevant sections and all applicable laws, regulations, standards and codes.
- .8 Test locations shall be determined by independent agencies working for the Contractor and shall be selected to test all aspects of the Work.
- .9 The Contractor shall report, track, correct, and retest any deficient Work determined by the quality control or quality assurance programs at no additional cost to the Owner.
- .10 The Contractor's quality control testing will form the basis for acceptance of the Work, however the Owner may reject the Work based on its quality assurance testing

## **2 PRODUCTS**

***Not Applicable***

**3 EXECUTION**

**3.1 Quality Control Manager**

- .1 The Contractor shall provide a Quality Control Manager. The Quality Control Manager shall be independent from the Contractor's production staff and shall report directly to the Contractor's senior management.

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 This section of the Specifications contains the general requirements of the Owner's quality assurance program.

**1.3 Requirements**

- .1 The Contractor shall be responsible for all quality control, and the quality of the Work. Refer to Section 01400 – Quality Control.
- .2 The Owner will inspect the Contractor's Work by using the Consultant's subconsultant, an independent testing agency, to achieve quality assurance.

**1.4 Inspection**

- .1 The Owner and the Consultant shall have access to the Work at all reasonable times. If a part of the Work is in preparation at locations other than the Work Site, access shall be given to such Work whenever it is in progress, and the Contractor shall arrange safe access for such inspection.
- .2 The Contractor will be given timely notice requesting inspection if Work is designated for special tests, inspection or approvals, or the applicable legislation.
- .3 If the 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 the inspections or tests satisfactorily completed and make good such Work at no additional cost to the Owner.
- .4 The Owner or the Consultant may order any part of the Work to be examined if the Work is suspected to be not in accordance with the Contract Documents. If, upon examination, such Work is found not in accordance with the Contract Documents, the Contractor shall correct such Work and pay the cost of the inspection and correction.

**1.5 Independent Inspection Agencies**

- .1 Independent inspection/testing agencies may be engaged by the Owner for the purpose of inspecting or testing portions of Work. Cost of such services will be borne by the Owner.
- .2 Employment of inspection/testing agencies does not relax the responsibility of the Contractor to perform Work in accordance with the Contract Documents.
- .3 If any defects are revealed during inspection or testing, the appointed agency will request additional inspection or testing to ascertain full degree of defect. The Contractor shall correct defects and irregularities as advised by the Owner at no additional cost to the Owner. The Contractor shall pay all costs for retesting and reinspection. The Owner shall have the right to

deduct from payment otherwise due to the Contractor, the costs of all retesting and reinspection.

**1.6 Access to Work**

- .1 Allow inspection/testing agencies access to the Work at off-site facilities at all reasonable times.
- .2 Cooperate to provide reasonable facilities and safe conditions for such access.

**1.7 Procedures**

- .1 Notify appropriate agency and Owner in advance of the requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples of Materials, equipment and products required for testing as specifically requested in Specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.
- .3 Provide labor and facilities to obtain and handle samples of Materials, equipment and products on the Work Site. Provide sufficient space to store and cure test samples.

**1.8 Rejected Work**

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

**1.9 Reports**

- .1 The Owner may elect to submit to the Contractor copies of results of any tests undertaken by an independent inspection agency, should the Contractor so request them.
- .2 Provide to the Consultant copies of any inspection or test reports undertaken as part of these Contract Documents in accordance with Section 01400 – Quality Control.
- .3 Provide copies to Subcontractor of Work being inspected or tested and manufacturer or fabricator of Materials, equipment or products being inspected or tested.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 General**

- .1 The Project is located in close proximity to residents. It is of prime importance that the Contractor implements all possible mitigation measures to reduce impact to the neighborhood, environment and residents from execution of the Work.
- .2 The Contractor shall immediately bring to the Consultant's attention any potential conflict existing between the Contractor and the public.
- .3 The Contractor shall develop and implement procedures to the satisfaction of the Owner in order to minimize public impact and disruption from noise, traffic, dust, air emissions, parking and access. The Contractor shall take a proactive approach to mitigating construction impacts to the public. Therefore, the Contractor and any of its Subcontractors and Suppliers shall strictly comply with an approved comprehensive Public Impact Mitigation Plan, the basis of which is set out herein.
- .4 The Contractor shall provide support, services and personnel to the Owner in communicating with the public to promptly address concerns or impacts arising from execution of the Work.
- .5 The Owner may request, and the Contractor is to comply with, reasonable requests for changes in the methods or timing of performing portions of the Work in order to reduce public impacts or address concerns of the public.
- .6 The Owner will hold a public impact mitigation meeting with the Contractor within twenty-eight (28) days of the Notice of Award. Attendance by the Contractor at the meeting is mandatory.
- .7 Public Impact Mitigation Plan
  - .1 The Contractor shall prepare and submit to the Owner and Consultant for review within fourteen (14) days of Notice of Award a Public Impact Mitigation Plan specific to the Work, which shall address at a minimum the following:
    - .1 Access to the Work Site, traffic and parking management.
    - .2 Noise mitigation.
    - .3 Air quality mitigation.
    - .4 Visual impact mitigation.
    - .5 Methodology to address work hours outside those allowed by the City of Vancouver Noise Control By-Law.



### **1.3 Work Hours at the Work Site**

- .1 The Work shall be performed only between the hours specified in the City of Vancouver Noise Control By-Law No. 6555, Monday to Saturday excluding holidays, unless authorization has been granted in advance by the City.
- .2 Parking for the Contractor's and Subcontractors' employees' vehicles is permitted only within certain hours and at certain locations in order to mitigate impact on the neighborhood. Refer to Clause 1.6.

### **1.4 Traffic Management**

- .1 The Contractor shall follow all posted traffic control signs. The maximum speed within the Work Site for all vehicles shall be 15 km per hour.
- .2 The use of engine retarder brakes ("Jake Brakes") by Project vehicles is strictly prohibited on and in the vicinity of the Work Site.
- .3 Control of Public Traffic
  - .1 The Contractor shall provide competent flagpersons, properly equipped as specified in applicable regulations, in the following situations:
    - .1 When public traffic is required to pass working vehicles or equipment, which may block all, or part of travelled roadway.
    - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, visibility is limited and approach speeds are high.
    - .3 When workers or equipment are employed on travelled way at other locations where oncoming traffic would not otherwise have adequate warning.
    - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
    - .5 For emergency protection when other traffic control devices are not readily available.
    - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
    - .7 Install signing as indicated on the Drawings. The contractor should co-ordinate this with the City as some signs may need to be provided by and/or installed by the City to make them legally enforceable. The number, placement and type of signs should conform to City standards.
- .4 Access Route to the Work Site
  - .1 Access to the Work Site for all trucks, heavy equipment and deliveries shall be via the designated project gate at the South-East corner of the Site. Refer to A-001 Site Plan. Heavy equipment shall not travel beyond the boundaries of the Work Site unless mobilizing or demobilizing from the Work Site.

- .5 Neither the Owner, nor the Consultant will be responsible for any loss or damage whatsoever to vehicles brought on to the Work Site.
- .6 Cleaning of Streets
  - .1 The Contractor is responsible for dust control and cleaning of all travelled ways, access routes and parking areas.
  - .2 Conform to local ordinances and bylaws relating to littering of streets.
  - .3 Trim loads of trucks hauling excavated material, cement, sand, stone, gravel, debris, dust or other loose material before leaving the Work Site, and ensure that the bodies of such vehicles are tight so that no spillage of loads occurs.
  - .4 Take precautions to prevent depositing mud or debris on public or private roadways adjacent to or associated with the Work. The Contractor shall clean-up roadways immediately, otherwise the Consultant has the right to direct necessary clean-up and back charge all costs to the Contractor. The necessity for appropriate clean-up will be at the sole discretion of the Owner or the Consultant.
  - .5 The use of water in amounts that result in mud on roadways and walkways is not acceptable as a substitute for sweeping or other methods.

**1.5 Public Safety and the Contractor's Segregation of the Work Site**

- .1 Limit the Work to the limits of the Work Site as shown on the Drawings.
- .2 The public shall have unimpeded access to the area beyond the limits of the Work.
- .3 The Contractor shall effectively warn and protect the public from any danger as a result of the Work being done.
- .4 No Materials or equipment shall be stored where it will interfere with the free and safe passage of the public movements by pedestrian, vehicular or other modes of transport, except within the defined Work area, or in such a manner that it creates a hazard to the public or the Owner.
- .5 Protect surrounding public and private property from noise, dust, construction debris, operations and damages at all times during performance of the Work. All construction activities and operations shall be contained well within the perimeter of the Work Site property lines.
- .6 Prevent the public from entering all areas where Work is being performed. Refer to Section 01530 – Barricades and Enclosures.

**1.6 Parking**

- .1 The following parking, in order of preference, is available to the Contractor for worker parking Monday through Saturday (holidays excluded), hours per the City of Vancouver Noise By-Law, throughout the Contract duration and as directed by the Consultant:
  - .1 Parking which the Contractor can create and maintain at the Work Site in compliance with all other requirements regarding vehicles on the Work Site;

- .2 The Contractor shall coordinate and cooperate with the Consultant in the assignment of all worker parking at the above locations, or any other locations authorized by the Consultant, all at no extra cost to the Owner.
- .3 Parking will be permitted only within the designated parking described in Clause 1.6.1, or as otherwise indicated on the drawings or as directed by the Consultant. Parking that is required outside the hours per the City of Vancouver Noise ByLaw, Monday through Saturday, shall be approved in advance by the City and the Consultant.
- .4 Where necessary, be responsible for moving employees between parking area(s) and Work Site.
- .5 Do not allow parking on public roads in contravention of local regulations. The Contractor shall ensure that its employees, Subcontractors, suppliers and delivery drivers are aware of and follow the local parking regulations. The Contractor and Subcontractors' employees' vehicles may only park in the areas described in Clause 1.6.1. All vehicles parked on other portions of public roads will be subject to towing at the vehicle owner's expense.
- .6 Neither the Owner, nor the Consultant will be responsible for any towing charges, parking violation costs or loss or damage whatsoever to vehicles parked on any Work Site, in any public parking lot, on any private land or on any public street.

#### **1.7 Noise**

- .1 The potential for noise impact to the residential community adjacent to the Work Site and access roads has been predicted based upon anticipated construction activities and equipment. Noise monitoring will be conducted by the Owner throughout the Project and, if further measures are deemed necessary by the Owner to reduce noise, the Contractor shall cooperate with and assist the Owner in identifying and implementing any practical noise control measures that may be available. Such measures might include construction and use of temporary, portable noise barriers to shield noise from localized equipment/operations such as jackhammers or concrete saws.
- .2 In addition to the requirements of the Contract, Workers' Compensation Board of British Columbia (WCB) regulations and local municipal bylaws shall provide a regulatory basis for noise control and hearing protection.
- .3 Construction activity shall only be carried on during hours permitted by the City of Vancouver Noise Control By-law No. 6555. If any exception to the above is required due to unforeseen circumstances, the Contractor shall present all requirements for variance of Work outside of permitted hours to the Owner well in advance. If the Owner approves the request for variance, the Owner will make the application to the City for variance of the Noise Control By-law.
- .4 The Contractor shall promptly repair or remove from the Work Site at the Owner's request and sole discretion, excessively noisy equipment at no additional cost to the Owner.
- .5 The Contractor's lay-down area shall not be used for excessively noisy operations such as equipment repair involving grinding, etc. unless adequate noise attenuation is provided by localized noise barriers or other means to avoid disturbance to nearby residents.
- .6 Equipment Noise Limits

- .1 All trucks, including tandem trucks, shall not produce noise levels in excess of 82 dBA when measured under stationary test conditions recommended in SAE J1096 FEB93 or latest revision. The requirement that the test site be free of large reflecting surfaces located within 30 meters of either the microphone or the machinery being measured may be relaxed provided that this does not result in the maximum allowable noise level being exceeded during the test.
- .2 Mobile equipment including but not limited to auger drill rigs, rock drills, cranes, dozers, excavators, graders, pavers and scrapers shall not produce noise levels in excess of 85 dBA when measured under the stationary test conditions recommended in SAE J88 APR95 or latest revision. Backhoes, front-end loaders and ground compactors shall not produce noise levels in excess of 80 dBA under the same conditions. The requirement that the test site be free of large reflecting surfaces located within 30 meters of either the microphone or the machinery being measured may be relaxed provided that this does not result in the maximum allowable noise level being exceeded during the test.
- .3 Stationary equipment including but not limited to compressors, generators, welders, pumps and vibratory concrete mixers shall not produce noise levels in excess of 80 dBA measured at 15 meters in any direction from the equipment while it is operating under normal conditions.
- .4 Gas powered and pneumatic hand tools shall not produce noise levels in excess of 85 dBA when measured at 15 meters in any direction from the equipment while it is operating under normal conditions.
- .5 Concrete saws shall not produce noise levels in excess of 90 dBA when measured at 15 meters in any direction from the equipment while it is operating under normal conditions.
- .6 Jackhammers, hoe rams and pile drivers shall not produce noise levels in excess of 85 dBA, 90 dBA and 95 dBA respectively when measured at 15 meters in any direction from the equipment while it is operating under normal conditions (with sound level meter set on "slow" response).
- .7 The Owner reserves the right to test any equipment on the Work Site at any time for the purpose of verifying that equipment noise does not exceed the Contract requirements or to determine if equipment noise emission has increased beyond Contract limits subsequent to any previous testing. The Contractor shall make any equipment available for testing or re-testing (with operator), at or near the Work Site, at no additional cost to the Owner.
- .8 In the event that any equipment does not satisfy the Contract noise level limits, the equipment shall be replaced by a quieter machine or it shall be modified, for example by providing better exhaust silencing or reducing its governed engine speed, and the alternate or modified machine shall then be re-tested.
- .9 To avoid potential delays once the work commences, the Contractor is encouraged to verify that equipment noise levels satisfy the Contract limits by retaining a qualified independent consultant to carry out noise measurements and to submit test results to the Owner prior to the start of the Contract. Noise levels shall be measured with an ANSI Type I sound level meter that has been factory calibrated within two years and field calibrated immediately prior to the measurements. In the case of new equipment,

manufacturers' noise test data shall be acceptable in lieu of measurements initiated by the Contractor.

- .7 Maintenance and Use of Equipment
  - .1 Regular maintenance of machinery is required, including but not limited to regular greasing of treads, chassis and pivot points, replacement of worn parts, mechanical overhauls, attention to exhaust and emission control systems and any special noise control fixtures.
  - .2 All equipment used on the Work Site shall be equipped with and operated with all applicable covers, hoods, shields and guards in place and latched shut. Air-powered equipment such as rock drills and jackhammers shall be equipped with effective mufflers on the air exhausts. The manufacturer's recommendations shall be followed.
  - .3 Equipment, which is not in use, shall be shut down, and not left idling for periods longer than two (2) minutes.
  - .4 Operators of excavating equipment shall use minimum power consistent with reasonable operation of the item of equipment and shall avoid banging of buckets on truck bodies, or other objects.
  - .5 Brakes on trucks shall be adjusted and maintained to avoid objectionable break "squeal" or noise. Engine brakes shall not be used anywhere on the Work Site or on any access roads, except in an emergency.
  - .6 The local power grid shall be used wherever feasible to limit generator noise. No generators larger than 25 KVA shall be used and, where a generator is necessary, it shall have maximum noise muffling capability and meet the Contract noise limits for stationary equipment.
  - .7 Back-up alarms shall be used only where required by WCB regulations. That is, only on mobile equipment "in which the operator cannot directly or by mirror or other effective device see immediately behind the machine". Furthermore, where the addition of additional mirrors would alleviate the need for back-up alarms to suit WCB regulations, such mirrors shall be installed. Where back-up alarms are required, they shall be selected or configured to produce warning signals that are no louder than necessary to be audible above the ambient background noise (including equipment noise) in the immediate vicinity of the equipment. The use of back-up alarms shall also be minimized by designing site access such that delivery and dump trucks move through the site in a forward manner without the need to back up.
- .8 Construction and Maintenance of Noise Barriers
  - .1 Noise barriers shall be constructed and maintained as necessary by the Contractor to ensure their effectiveness throughout the entire project. They shall be removed and disposed of upon completion.

## 1.8 Air Quality

- .1 Dust shall be controlled throughout the Work. Environmentally acceptable dust suppressants or water shall be used as necessary to control dust on access roads, laydown, Work and disposal areas. No oils shall be used for dust control. Preference shall be given to the use of water, with consideration for water conservation and drainage where appropriate.
- .2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary and permanent roads.
- .3 Keep roads damp and sweep paved portions regularly.
- .4 The Owner may, at its sole discretion, order watering for dust control purposes. Failure of the Contractor to comply with such orders within sixty (60) minutes will result in the Owner conducting such watering and back-charging all costs to the Contractor. The necessity for watering for dust control purposes shall be at the sole discretion of the Owner's environmental monitor.
- .5 Nuisance dust concentrations (gravimetric) shall not exceed WCB (IHSR) limits. The Contractor shall monitor dust concentrations to ensure that these limits are not exceeded.
- .6 Equipment producing excessive exhaust pollution, as determined by the Owner's environmental monitor, shall be repaired or replaced at the Contractor's cost.
- .7 All on-road dump trucks used on the Project shall be model year 1994 or newer.
- .8 All dump trucks and ready-mix concrete trucks will be subject to visual inspection by the Owner's environmental monitor or AirCare on Road Program (ACORP) inspections. Vehicles shall have better than 10% opacity (i.e. 10% or lower). The Contractor shall provide written certification that all vehicles have been tested by ACORP or an ACORP Qualified Inspection Facility as having met or exceeded this 10% opacity requirement within 6 months of starting work on this project. This proof shall be provided to the Owner prior to the vehicle commencing work on this project. Vehicles deemed to have excessive emissions shall be removed from the Work Site at the sole discretion of the Consultant. Removal and replacement of equipment or vehicles shall be at the Contractor's expense.
- .9 The Owner reserves the right to test any equipment on the Work Site at any time subsequent to submission of the Contractor's emission data for the purpose of verifying the data or to determine if emission has increased beyond Contract limits subsequent to any previous testing. The Contractor shall make any equipment available for re-testing (with operator), at or near its current location, at no additional cost to the Owner. If the equipment is found to satisfy the Contract requirements, the cost of the Owner's consultant to conduct the test will be borne by the Owner. If the results of the re-test indicate that the equipment does not satisfy the Contract requirements, then the equipment shall be promptly modified or replaced and re-tested to verify compliance, and the cost of the Owner's consultant will be charged to the Contractor. Removal and replacement of equipment or vehicles shall be at the Contractor's expense.

## 1.9 Diesel Fuel Quality

- .1 All diesel equipment and vehicles used on-site shall be fuelled with diesel fuel containing no more than 500 parts per million (ppm) of sulphur (i.e., "on-road" diesel fuel quality).

**1.10 Enforcement**

- .1 The Contractor acknowledges that complying with Section 01130 is of fundamental importance to the proper execution of the Contract. The Contractor shall act in good faith and be diligent in its enforcement of the mitigation measures specified in Section 01130.
- .2 The Contractor is responsible for fines levied against the Owner, its representatives, the Consultant, the Contractor, its Subcontractors or its Suppliers, by any municipality or any other governmental authority having jurisdiction for breach of their bylaws, ordinances, statutes or regulations by the Contractor or those under its control or supervision. All such fines levied against the Owner or the Consultant will be deducted from progress payments due to the Contractor.
- .3 Notwithstanding Clause 1.9.2, if the Owner or the Contractor determines that there has been non-compliance with any clause under this Section 01130, the Contractor shall give the offender a warning upon the first infraction. Any further violations of the same clause in this Section will result in the Owner assessing the Contractor a charge of five hundred dollars (\$500) for the second and subsequent violations. In addition, the Owner may require the Contractor to remove from the Work Site any person or piece of equipment that in the Owner's sole discretion has not complied with Section 01130. All assessed charges for non-compliance will be deducted from progress payments due to the Contractor.
- .4 The Contractor and the Owner agree that \$500 per violation is a reasonable pre-determination of damage for failure to comply with Section 01130.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

## 1 GENERAL

### 1.1 Documents

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

### 1.2 Description

- .1 Be responsible for locating existing surface and underground structures that may affect the Work or may be damaged during construction. Drawings or descriptions, verbal or otherwise, of existing structures or their location that are given are intended only as an aid to the location of these structures. Measurements and location of the existing underground structures shown on the Drawings are not guaranteed to be accurate, and must be verified by the Contractor prior to proceeding with construction.
- .2 On request from the Consultant, excavate and uncover underground structures for the purpose of establishing line or grade for proposed installation of piping or other works. Immediately notify the Consultant as to any utility discovered in a different position than shown on the Drawings and the reference material or which is not shown on the Drawings and the reference material.

### 1.3 Performance Requirements

- .1 Provide all labor, supervision, Materials, equipment, Contractor's Plant and services necessary to remove, relocate, or maintain utilities, and service connections.
- .2 Perform all Work in a manner satisfactory to the utility owner.
- .3 The utility owner has the option of doing such Work with its own forces at the Contractor's expense, or permitting the Work to be performed by the Contractor.
- .4 Perform all Work in such a manner that any items around the Work Site remains intact or otherwise repair to the condition which existed prior to construction.
- .5 Locations of service connections are not specified on the Drawings.
- .6 The right is reserved to governmental agencies and to owners of utilities to enter upon streets, alleys, rights-of-way, or easements for the purpose of making changes in their property made necessary by the Work, and for the purpose of maintaining and making repairs to their property.

### 1.4 Protection of Existing Utilities

- .1 The Contractor shall make itself aware of and protect any existing utilities during the Work.
- .2 The Contractor shall submit to the Consultant for review details of all equipment to be utilized in the Work, and identify any situations, which could give rise to loadings on utilities beyond H20 loadings.

### 1.5 Existing Services

- .1 Protect all existing services from damage. Repair services damaged during the Work at no cost to the Owner.



- .2 Keep fire hydrants on or adjacent to the Work Site accessible to firefighting equipment.
- .3 If service interruptions are necessary, such interruptions are to be made only at times approved by the Owner.
- .4 When breaking into or connecting to existing services or utilities, carry out Work at times directed by local governing authorities, with a minimum amount of disturbance to the Work and building occupants and pedestrian and vehicular traffic.
- .5 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in a manner approved by local governing authorities having jurisdiction.

**1.6 Power Disruptions**

- .1 The Contractor is advised that the electric power utility owner (B.C. Hydro) or others may, from time to time, interrupt the supply of power to the Work Site and that power outages may be experienced during periods in which B.C. Hydro or others may conduct work on, or in proximity to, the Work Site. It is the responsibility of the Contractor to communicate and co-ordinate with BC Hydro or others and the Consultant to reduce or eliminate Contractor's cost of lost time or productivity due to such power outages. The Owner shall not be responsible for Contractor's costs or expenses incurred due to interruptions to the power supply whatsoever the cause.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Temporary Utilities**

- .1 Installation/Removal
  - .1 Provide temporary utilities specified at the Work Site in Clause 1.3 in order to execute the Work expeditiously.
  - .2 Make necessary applications to authorities having jurisdiction, obtain required permits, and pay all fees and related charges.
  - .3 Remove from the Work Site all such temporary utilities after use.
  - .4 Restore the Work Site to clean, sanitary condition.
- .2 Maintenance of Public Utilities
  - .1 Arrange Work to avoid interruption of utilities serving the public. Pay for any damage.
  - .2 Where interruption of public utilities is unavoidable, obtain prior approval for interruption from responsible authority.
  - .3 As required by utility authority, establish and pay for temporary relocation of utility during construction.
  - .4 Comply with utility authority requirements in giving notice to users and fire department prior to interruption of service.

**1.3 Work Site Requirements – General**

- .1 Sanitary Facilities
  - .1 The Contractor shall provide, maintain and pay for temporary portable toilet facilities for the use of Contractor's work force and Owner's Work Site Staff.
  - .2 The Contractor shall disinfect facilities frequently.
  - .3 The Contractor shall dispose of sanitary wastes, including that of commercial portable toilets, in accordance with the applicable regulations.
  - .4 Any other sanitary facilities (i.e. sinks or toilets in offices) being brought to the Work Site by the Contractor to be maintained in a sanitary condition at all times, with all waste water contained and disposed of offsite at an approved facility at the Contractor's cost.
  - .5 Keep Work Site and premises in a sanitary condition.

- .6 Post notices and take such precautions as required by local health authorities or other public agency having jurisdiction.
  
- .2 Construction Power
  - .1 Temporary power for the Work is available within 100m of the Work Site boundary. Provide meters at each temporary power connection such that the Owner or others can be reimbursed by the Contractor for all costs of temporary power usage.
  - .2 Locate temporary power at the location specified on the Drawings and in the Division 16 specifications. Provide all connections.
  - .3 The Contractor shall distribute temporary power and lighting as required for the execution of the Work.
  - .4 Install and maintain temporary facilities for power such as pole lines and cables to approval of local inspection authority.
  - .5 The Owner will not guarantee an uninterrupted supply of power.
  
- .3 Telephone
  - .1 Provide and pay for temporary telephones necessary for Contractor's use.
  - .2 Provide and pay for connection of telephone service to Work Site trailer provided for the Owner, suitable for 2 telephones, 1 fax, and one ADSL line. Pay for land-line telephone and fax usage (excluding long-distance) costs for the duration of the project.
  
- .4 Heating and Ventilation
  - .1 Natural gas connection is not available at the Work Site. Provide and pay for any propane heating or other means of heating for office or other facilities.
  - .2 Provide and pay for all other temporary heating and ventilation, coverings, hoarding, enclosures as necessary to protect and perform the Work.
  
- .5 Potable Water
  - .1 Potable water is available without charge at the location specified on the Drawings. The Contractor shall use this connection for field office and consumption on the Work Site area only.
  - .2 Furnish and install all necessary temporary piping and hoses from the connection point. Connections shall include an approved backflow prevention device.
  
- .6 Treated Water/ Runoff
  - .1 Obtain a Waste Discharge Permit under the City of Vancouver Sewer and Watercourse By law No. 8093 and Greater Vancouver Sewage and Drainage District Sewer Use Bylaw No. 164 to discharge water to sanitary sewer from the construction Excavation.
  - .2 The discharge point for treated water shall be to existing catch basins within the laydown area. In addition, there shall be two emergency shut-off valves and three

sampling ports along the pipe between any treatment pond(s) and the discharge point. The Contractor shall submit the piping system layout for review by the Consultant. The Contractor is responsible for obtaining/paying for all required permits associated with discharge.

- .7 Fire Protection
  - .1 Provide and pay all costs for temporary extinguishers and other fire protection equipment, adequate for fire protection of the Work and adjacent property.
- .8 Contractor's Field Offices
  - .1 Provide, maintain and subsequently remove any temporary field offices, lunch room and storage sheds necessary for the execution of the Work. Refer to Clause 1.3.1 (5) above for sanitary provisions to be observed.
  - .2 Pay all installation, monthly and other costs for the various supplies for the Contractor's offices throughout the construction period.
  - .3 Locate field offices in the laydown area, unless otherwise approved by the Consultant.
  - .4 The Contractor will connect and disconnect required services to the temporary field offices.
- .9 Owner/Consultant's Field Office
  - .1 Provide a fully serviced and furnished field office for the Owner and the Consultant equipped as specified herein, with in 15 days after the Notice to Proceed. Specific location of the office in the laydown areas to be as per agreement with the Consultant. The field office will be suitable for four (4) full time staff, including a conference room suitable to suit 10 persons, filing cabinets, bookcases, desks, chairs, drawing storage racks.
  - .2 Unless released earlier by the Consultant in writing, maintain the field office in full operation at the site with all utilities connected and operable until the Notice of Acceptance has been executed or recorded.
  - .3 Type: Equivalent to portable trailer mobile office separated, not attached or connected to any other structures. The office will have a minimum of three private offices, one conference room and a common area.
  - .4 Inside dimensions for both the private office and common area to be minimum 3.6 m long x 3.0 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4 – 50% opening windows and one lockable door.
  - .5 Insulate building and provide heating system to maintain 22°C inside temperature at – 20°C outside temperature.
  - .6 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.

- .7 Install electrical lighting system to provide minimum 500 lx at desk top height using surface mounted, shielded commercial fixtures with 10% upward light component. Provide exterior lighting at entrance doors.
- .8 Provide a minimum of four 120 VAC duplex electric convenience outlets in office and in the common area. Locate at least one such outlet on each wall. The electric distribution panel to service not less than twelve 120/1/60 VAC circuits.
- .9 Provide ventilation and air conditioning systems to maintain 22°C inside temperature at 35°C outside temperature.
- .10 Provide steps at exterior entrance.
- .11 For each private office and 2 locations in the common area provide: 760 x 1520 table, 1 office chair, standard arm rest type, adjustable swivel tilt-back with casters, 2 – 1200 wide 4 shelf bookcases and 2 office chairs, stiff leg type with arm rest.
- .12 For the common area provide: 4 file cabinets, legal size, 4 drawer with lock and 3 keys, double suspension, complete Pendaflex suspension racks for each drawer. File cabinet must be fire resistant, 4 – 1200 wide x 4 shelf bookcases, 3 full size drawing storage racks, and 1 water dispenser unit.
- .13 For conference room provide: 2 – 1200 x 1800 mm conference room tables, 1 whiteboard, 1200 x 900 mm with erasable color markers and supplies, and 10 office chairs, stiff-leg type with arm rest.
- .14 Provide regular janitorial services during working hours three days per week. Offices to be swept or wet mopped, and dusted, and waste receptacles emptied.
- .15 Maintain equipment and furnishings in good order.
- .16 Make all provisions and pay all installation and other costs for the Owner/ Consultant's field office in the laydown area in order to provide all utilities and services and any local code requirements. Pay all monthly and other charges for the various services provided to the Consultant's office throughout the construction period (all costs except long distance phone calls, rental of ADSL internet service, toner/paper/maintenance for Owner supplied fax/copier/printer).
- .17 The Contractor will connect and disconnect required services to the temporary field offices.
- .10 First Aid
  - .1 Refer to Section 01060 – Safety Regulations and Requirements.
  - .2 The Contractor shall provide suitable first aid equipment, supplies and personnel during working hours.
- .11 Equipment, Tool and Materials Storage
  - .1 Locate equipment, tool and Materials storage within the laydown area or inside the reservoir, unless otherwise approved by the Consultant.

- .2 Provide and maintain in a clean and orderly condition adequate lockable storage boxes for tools and equipment as required.
  - .3 Provide and maintain in a clean and orderly condition suitable weatherproof and lockable enclosures or sheds for storage and protection of Materials which require such protection.
  - .4 Allocate storage/laydown areas on the Work Site for Materials that do not require to be placed in weatherproof sheds. Maintain areas in a clean and orderly condition. Limit storage of Materials to storage areas only.
  - .5 The Contractor shall not unduly encumber the Work Site with excess Materials. Storage will be limited to the equipment required and not for long term storage.
- .12 Scaffolding and Ladders
- .1 Design, construct and dismantle ladders and scaffolding in accordance with CSA Standards and Workers' Compensation Board regulations governing scaffolding and ladders.
  - .2 Erect scaffolding independent of walls and erect ladders so as not to damage finishes. Remove promptly when no longer required.
- .13 Clean-up
- .1 Maintain the Work Site daily in a tidy condition, free from accumulation of waste products and debris.
  - .2 The Contractor shall provide waste containers required for the Work and also properly load the bins for disposal.
  - .3 Conduct cleaning and disposal operations to comply with local ordinances and regulations.
  - .4 Remove waste material and debris from the Work Site and deposit in waste container at the end of each working day.
  - .5 Contain lunchroom garbage to avoid wildlife being attracted to the Work Site.
  - .6 Failure to maintain and clean the Work Site will result in the Owner arranging for others to clean and backcharge the Contractor.

## 2 PRODUCTS

*Not Applicable*

## 3 EXECUTION

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 Provide temporary barriers and enclosures as required to protect against injury and damage.
- .2 Provide fencing to separate areas of the Work from the public. Fencing shall prevent the public from entering the Work Site.

**1.3 Submittals For Review**

- .1 Submit the following information in accordance with Section 01300 – Submittals:
- .2 Two copies of planned fencing layout and support details (security fence, tree protection fence, and Noise Barrier) Including Details of Materials.

**1.4 Guard Rails and Barricades**

- .1 Provide secure, rigid guard railings and barricades around deep excavations and trenches as required by governing authorities having jurisdiction.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

**3.1 Relocation, Removal and Maintenance**

- .1 Receive approval from the Consultant prior to removing or relocating any fencing.
- .2 Maintain fencing in good condition for the duration of the Work.
- .3 Replace fencing and as directed by the Consultant.

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 General Responsibility**

- .1 Notwithstanding whatever facilities and security measures the Owner may or may not provide, the Contractor shall be totally responsible for the security of the Contractor's Plant, equipment, tools, Materials, temporary facilities and the completed Work and Work in progress under its care and custody. Further, the Contractor shall take appropriate steps to ensure that the Work Site is secure, but not to the extent it does affect the work of the Owner or Other Contractors on the Work Site.

**1.3 Protection for Off-Site and Public Property**

- .1 Protect surrounding private and public property from damage during performance of the Work.
- .2 Be responsible for costs and reinstatement of damage incurred by surrounding private and public property as a result of the work.

**1.4 Site Storage/Loading**

- .1 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the Work Site with Materials, Construction Plant, equipment, products or debris.
- .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

**1.5 Site Security Requirements**

- .1 Comply with all Work Site security requirements.
- .2 Assist with maintaining Work Site security by:
- .3 Restricting access to the Work Site to those requiring access. Visitors and tours are allowed only with the approval of the Owner.
- .4 Providing temporary barricades and reinstating as soon as practical any breaches in fencing.
- .5 Reporting any breaches in security and/or suspicious situations to the Owner (and police, if appropriate).
- .6 Locking temporary facilities and gates during off-hours where practical and where it does not interfere with the work of Other Contractors.
- .7 Cooperating with the Consultant, the Owner and Other Contractors.



- .8 The Contractor shall be responsible for the safety and security of all Owner-supplied Materials at the Work Site.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 This section describes the temporary controls to maintain and safeguard environmental conditions at the Work Site.
- .2 This section does not supersede specific regulations, requirements of local authorities, but supplements those and other requirements found elsewhere in the Specifications.

**1.3 Maintenance of Work Site**

- .1 Maintain the Work Site in tidy condition, free from the accumulation of waste products and debris, other than that caused by the Owner or Other Contractors.
- .2 Promptly clean up any spillage that occurs on site roads, access roads or public roads, or other areas where construction vehicles are travelling.
- .3 If Contractor is negligent in maintaining cleanliness of roads, the Consultant will arrange for cleaning to be done at Contractor's expense.
- .4 Make temporary provisions for proper functioning of gutters, sewers, drainage ditches and culverts, irrigation ditches and natural water courses.

**1.4 Drainage**

- .1 Provide temporary drainage and pumping as necessary to keep excavations and Work Site free from surface and ground water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems, without first treating the water to reduce suspended materials to permitted levels.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 Maintain existing drainage facilities affected by the Work in good operating condition at all times during construction.
- .5 Provide temporary sheeting, piling or shoring as required by Workers' Compensation Board regulations to protect excavations, and trenches from damage caused by rain water, ground water and other soil and weather conditions. Erect in a manner which will not encumber the performance of the Work.
- .6 Control temporary drainage and pumping to ensure it does not affect the work of others.

**1.5 Temporary Dams**

- .1 Except in time of emergency, earth dams are not acceptable at catch basin openings, local depressions, or elsewhere.
- .2 Temporary dams of sand bags, or other material acceptable to the Consultant will be permitted when necessary to protect the Work, provided their use does not create a hazard or nuisance to the public or Other Contractors.
- .3 Remove such dams from the Work Site as soon as they are no longer necessary.

**1.6 Materials to Be Salvaged**

- .1 Remove, clean, deliver, unload and neatly stockpile at the Work Site materials which are specified or designated by the Consultant to be salvaged.
- .2 Repair or replace at Contractor's expense salvaged materials damaged during removal, unloading or in transit.

**1.7 Removal of Temporary Controls**

- .1 Prior to application for Substantial Completion, remove all temporary controls and all other items used in the performance of the Work. Make good surfaces.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

## 1 GENERAL

### 1.1 Waste Management Objectives

- .1 The Owner has established that this Project shall be registered for Leadership in Energy and Environmental Design (LEED®) Certification (refer to Section 01015) and as such the Project must generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing over packaging and poor quantity estimating.
- .2 Of the inevitable waste generated, waste materials designated in this specification shall be salvaged for reuse and or recycling. Minimize waste disposal in landfills or incinerators. This means careful recycling of job site waste.
- .3 The Contractor shall:
  - .1 Institute construction waste reduction practices.
  - .2 Effect optimum control of construction waste.
  - .3 Implement a site recycling program that includes source separation of solid waste materials.
  - .4 Prepare and implement a solid waste management and environmental protection plan for the Project.
  - .5 Submit monthly a summary of solid waste generated by construction operations.
  - .6 Be responsible for final implementation of site recycling program by disposal of recyclable solid waste at appropriate recycling centers.
  - .7 Transport and dispose of waste materials that are not identified to be recycled or reused at permitted landfill facilities.

### 1.2 Code of Practice

- .1 Contractor and Subcontractors shall comply with the GVRD's "3R's Code of Practice" as outlined in publication entitled "Job Site Recycling: A Guide for Builders and Developers" available from the GVRD, Solid Waste and Recycling Department, Telephone: (604) 436-6788. Website address: [www.gvrd.bc.ca/services/garbage/jobsite](http://www.gvrd.bc.ca/services/garbage/jobsite)

### 1.3 Submittals

- .1 Submit the following in accordance with Division 1 requirements:
  - .2 Construction Waste Management Plan.
  - .3 Hauling Records:
    - .1 Summarize and submit hauling records on a monthly basis.

- .2 Submit a project-to-date summary on a monthly basis.
- .3 Submit first set of hauling records within ten (10) days of first pick-up of project waste.
- .4 Final LEED® Submission
  - .1 Review all Construction Waste Management Reporting Sheets and summarize recycling, re-use, and waste generation amounts (by weight or volume, and be consistent).
  - .2 Input this information in the LEED® Canada Letter Templates. Provide Consultant with completed, signed letter template, and all back-up documentation tracking waste diversion prior to application for Substantial Performance.
- .5 Recycling and Waste Facilities: Submit a list of facilities used to process construction waste. List shall include: name and address of facility, phone number and contact person, type(s) of material(s) processed at the facility, and information on how material is used after it is processed.

#### 1.4 Quality Assurance

- .1 Meetings: Conduct Project Waste Management meetings. Meetings shall include Subcontractors affected by the Construction Waste Management Plan. At a minimum, waste management goals and issues shall be discussed at the following meetings:
  - .1 Pre-bid meeting.
  - .2 Pre-construction meeting.
  - .3 Regular job-site meetings.

#### 1.5 Construction Waste Management Plan

- .1 Develop a Construction Waste Management Plan before commencement of work, on a custom form generated by the Contractor. This form shall be reviewed and approved by the *Project LEED® Coordinator* before the Construction Waste Management Plan is in effect.
- .2 Prepare a plan that contains the following:
  - .1 Analysis of proposed job site waste to be generated, including types of recyclable and waste materials generated (by volume or weight, but be consistent throughout).
  - .2 Alternatives to Land Filling: The Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the Project.
  - .3 List of compulsory materials to be recycled, shall include, at minimum, the following designated materials:
    - .1 Old corrugated cardboard.
    - .2 Wood.
    - .3 Concrete/Brick/Concrete Block/Asphalt.

- .4 Metal.
  - .5 Drywall.
  - .6 Excavated materials.
  - .7 Organic materials.
  - .8 Paper.
  - .9 Glass.
  - .10 Land clearing debris.
  - .11 Paint (return to Paint Depot) and other hazardous materials.
- .3 Materials Handling Procedures: The Subcontractor shall prevent contamination of materials to be recycled and salvaged source and handle materials consistent with requirements for acceptance by designated facilities.
- .4 Recycling and Waste Bins: Provide individual waste bins for each recyclable solid waste material and shall clearly designate recycling bins by color coding and/or large identification signs. Example: orange bin for wood only, green bin for trash.
- .5 Source Separation: Educate and monitor the Subcontractors about the acceptable methods of source separation. The Subcontractor may be held liable for illegal dumping by his workers.
- .6 Location: Place recycling bins in convenient location out of the way of construction traffic and designate one locked recycling area on site to prevent misuse or contamination of bins.
- .7 Contamination: When the recycling program is first started, and during construction operations the Contractor and the Subcontractor shall remind workers to keep trash out of recyclable bins. Do not permit lunch bags, coffee cups, caulking tubes, or rubbish to be deposited into recycling bins unless they are recyclable.

#### **1.6 Delivery Storage and Handing**

- .1 Handling: Ensure recyclable materials are free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process. Monitor source separation and ensure workers clean materials which are contaminated prior to placing in collection containers.
- .2 Collection: Arrange and pay for collection by or delivery of recyclable materials to appropriate recycling company that accepts construction waste for purpose of recycling. Coordinate regular or "when-called" pick-up or delivery to eliminate overflowing bins.

## **2 PRODUCTS**

***Not Applicable***

### **3 EXECUTION**

#### **3.1 Construction Waste Management Plan Implementation**

- .1 Manager: Designate an on-site party (or parties) responsible for instructing workers and overseeing and recording results of Construction Waste Management Plan for the project.
- .2 Distribution: Distribute copies of Construction Waste Management Plan to each Subcontractor upon tender award.
- .3 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling to be used by all parties at the appropriate stages of the Project.
- .4 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for recycling and salvage. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
- .5 Hazardous Wastes: Separate, store, and dispose of hazardous wastes in accordance with requirements of authorities having jurisdiction including the Provincial Waste Management Act and B.C. Special Waste Regulation.
- .6 Coordinate final submittals.

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Scope**

- .1 The Contractor shall assume complete responsibility for control of pedestrian and vehicular access and traffic to and from and within the Work Site.
- .2 Provide and pay for all necessary control devices unless specified otherwise including lighting, signs, barricades, qualified flag people, all as required by the Consultant or other authority for safe completion of the Work.

**1.3 Reference Standards**

- .1 Regulate traffic in accordance with the Traffic Control Manual for Work on Roadways, Province of B.C., Ministry of Transportation (1999 or more current version), the City of Vancouver Standards and the requirements of the Workers' Compensation Board. In the event of a conflict between Ministry of Transportation requirements and City requirements, the City's requirements shall prevail.

**1.4 Protection Of Public Traffic**

- .1 Comply with requirements of acts, statutes, regulations and bylaws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul Materials, equipment or Contractor's Plant.
- .2 Working on Travelled Way
  - .1 The Contractor shall obtain a Highway Use Permit (or equivalent) from the City if required.
  - .2 Place equipment in position to present minimum of interference and hazard to travelling public.
  - .3 Do not leave equipment on travelled way overnight.
- .3 Do not close any lanes of road or highway without approval of the Consultant. Before re-routing traffic, erect suitable signs and devices in accordance with applicable regulations.

**1.5 Informational and Warning Devices**

- .1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Work which may require road user response.
- .2 Provide signing indicating what parking areas are closed and where alternative parking is available.



- .3 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in applicable regulations.
- .4 Place signs and other devices in locations recommended in applicable regulations.
- .5 Meet with the Consultant and Owner prior to commencement of Work to prepare list of signs and other devices required for the Project.
- .6 Continually maintain traffic control devices in use by:
  - .1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
  - .2 Removing or covering signs which do not apply to conditions existing from day to day.

**1.6 Control of Public Traffic**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.4.3.

**1.7 Access Route to the Work Site**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.4.4. The Contractor shall ensure that the Contractor's and Subcontractor's employees as well as all deliveries use an access route in order to reduce impact to the community.

**1.8 Access Points to the Work Site**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.4.5.

**1.9 Intersection Control**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.4.6.

**1.10 Delivery Hours**

- .1 Refer to Section 01460 – Public Impact Mitigation, Clause 1.3.4.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 This section contains the general requirements of Materials, equipment and workmanship. This section supplements but does not supersede specific requirements found elsewhere in the Specifications.

**1.3 Products and Materials Supplied By Contractor**

- .1 Quality
  - .1 Products, equipment and articles (referred to as Materials throughout the Specifications) incorporated in the Work shall be new, not damaged or defective, and of the best quality (compatible with Specifications) for the purpose intended.
  - .2 Defective products, whenever identified will be rejected, regardless of previous inspections. Remove and replace defective products at the Contractor's own expense and be responsible for delays and expenses caused by rejection.
  - .3 Should any dispute arise as to the quality or fitness of Materials, the decision rests solely with the Owner based upon the requirements of the Contract Documents.
  - .4 Unless otherwise indicated in the Specifications, maintain uniformity of manufacture for any particular or like item throughout the Work.
  - .5 Preliminary acceptance of Materials, equipment or products listed by supplier names will not in any way constitute a waiver of the Specifications covering such equipment. Final acceptance will be based on full conformity with the Contract Documents.
- .2 Availability
  - .1 Review Materials delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of Materials are foreseeable, notify the Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.
  - .3 Comply with Section 01100 – Substitutions, and Section 01300 – Submittals for proposed substitutions.

**1.4 Equipment Supplied By Owner**

- .1 The following equipment has been or will be purchased by the City of Vancouver, and will be furnished to the Contractor FOB jobsite:
  - .1 Sewage Heat Recovery Heat Pump, including 4-way valve, as per RFE01 PS07123 and RFP PS08013;

- .2 Boilers (2 at 4MWe and 1 at 8MWe), including 1 condenser, as per ITT No. PS08035;
  - .3 Emergency Genset, including exhaust gas cooler, as per ITT No. PS08092;
  - .4 Main Electrical Equipment, including medium voltage switchgear, dry-type transformers, medium voltage soft starters, power distribution centre, automatic transfer switch, and active harmonic filters, as per ITT No. PS08088;
  - .5 Plant Control System, as per specification Section 15916.
- .2 Copies of the above referenced RFEOI, RFP, ITT and specification are provided in Volume 4 of this ITT package, along with copies of any vendor drawings that have been submitted to date.

### **1.5 Manufacturer's Instructions**

- .1 Unless otherwise indicated in the Specifications, install or erect Materials in accordance with manufacturer's instructions.
- .2 Notify the Consultant, in writing, of conflicts between the Specifications and manufacturer's instructions.
- .3 Improper installation or erection of Materials, due to failure in complying with these requirements, to be removed and reinstalled at no increase in Contract Price.
- .4 The construction drawings provided in this ITT package have been produced using the best information available to date. The vendor drawings have only recently been made available for some of the Owner supplied equipment, and at that, have been preliminary at best. Therefore, the primary source of equipment information for both Owner and Contractor supplied equipment has been catalogue cuts and typical arrangements. Unless significantly different requirements result between the certified vendor documentation and the drawings used to create the construction drawings, the Contractor is responsible to adjust the design to suit at no increase in Contract Price.
- .5 Notify the Consultant, in writing, of significant differences between the certified vendor documentation and the drawings used to create the construction drawings

### **1.6 Workmanship**

- .1 General
  - .1 Execute the Work using workers experienced and skilled in the respective duties for which they are employed to obtain workmanship of the best quality.
- .2 Coordination
  - .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
  - .2 Coordinate all the Work of all Subcontractors.
  - .3 Ensure that all Subcontractors examine the Drawings and Specifications for other parts of the Work, which may affect the performance of their Work.

- .3 Protection of Work in Progress
  - .1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the Owner or the Consultant, at no increase in Contract Price.
  - .2 Prevent overloading of any structure.
- .4 Remedial Work
  - .1 Perform remedial Work required to repair or replace the parts or portions of the Work identified as defective or unacceptable at no increase in Contract Price. Coordinate adjacent affected Work as required.
  - .2 Perform remedial Work by specialists familiar with the Materials affected. Perform in a manner to neither damage nor endanger any portion of the Work.

**1.7 Quantities**

- .1 Materials or products indicating quantity and dimension, which are shown on the Drawings or in the Specifications, are not guaranteed to be accurate and are to be checked by the Contractor.
- .2 Claims for additional payment resulting from variations between quantities shown on the schedules and those actually installed will not be accepted.

**1.8 Metric Project**

- .1 Unless otherwise noted, this Project has been designed and is to be constructed in the S.I. metric system of measurements.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Description**

- .1 This section describes the general requirements for the shipment, protection and storage of Materials, equipment and products. This section supplements recommendations of suppliers, manufacturing and requirements found elsewhere in the Specifications.

**1.3 Care**

- .1 Ship, handle, store, and install Materials, equipment and products to prevent damage.
- .2 Damaged items will not be permitted as part of the Work except in cases of minor damage that have been satisfactorily repaired and are accepted in writing by the Owner.
- .3 Provide maintenance of stored Materials and products.

**1.4 Transportation**

- .1 Pay costs of transportation of Materials, equipment, Owner supplied items and products required in the performance of Work.
- .2 Provide protection against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to Work Site.
- .3 Use stiffeners where necessary to maintain shapes and to give rigidity.
- .4 Correct damage to conform to the requirements of the Contract before the assembly is incorporated into the Work.
- .5 Pay the costs arising out of dismantling, inspection, repair and reassembly.

**1.5 Storage, Handling and Protection**

- .1 Handle and store Materials, equipment and products in a manner to prevent damage and deterioration in accordance with manufacturer's instructions when applicable.
- .2 Adhere to manufacturer's recommendations in addition to these requirements.
- .3 Place Materials at an appropriate height above ground if stored outdoors.
- .4 Remove and replace damaged products at own expense and to the satisfaction of the Owner or the Consultant.

**2 PRODUCTS**

***Not Applicable***

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Structures**

- .1 Take all precautions necessary to protect the integrity and usefulness of nearby existing facilities and structures.
- .2 Rebuild the structures thus removed to the condition as found.
- .3 Repair existing structures which may be damaged as a result of the Work under the Contract.

**1.3 Roads, Streets and Walkways**

- .1 Unless otherwise specified, resurface and bring to the original grade and section, roads, streets, and walkways (referred to as Roadways throughout this section) in which the surface is removed, broken, or damaged, or in which the ground has caved or settled during the Work under the Contract.
- .2 Clean and repair roadways used by the Contractor.
- .3 Trim back edges of pavement far enough to provide clean, solid, vertical faces and keep free of loose materials before resurfacing material is placed.
- .4 Cut all paved surfaces with a pavement saw.

**1.4 Cultivated Areas and Other Surface Improvements**

- .1 Restore cultivated or planted areas and other surface improvements which are damaged in the course of the Contract to the original condition. Restore within seven (7) days from time of notification by the Consultant.
- .2 Protect and replace existing guard posts, barricades, and fences if damaged.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 Materials**

- .1 Use only proper cleaning materials and equipment.

**1.3 Final Cleaning**

- .1 In preparation for partial and final acceptance of the Work, perform final cleaning.
- .2 All concrete surfaces shall be free of oil, excess concrete/grout material and other dirt.
- .3 All wrapping, packaging and crating shall be removed from the Work Site.
- .4 The Work Site shall be free of any excess building Materials or garbage.
- .5 Broom clean paved surfaces and rake clean other surfaces of grounds.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**



**1 GENERAL**

**1.1 Documents**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 "As-Built" Drawings**

- .1 "As-built" drawings refer to those documents maintained and annotated by the Contractor during construction and are defined as:
  - .1 A neatly and legibly marked set of Contract Drawings showing the final details of the Work.
  - .2 Contractor layout and installation drawings.
- .2 Identify drawings as "As-Built Copy".
- .3 Maintain as-built drawings in clean, dry and legible condition.
- .4 Keep as-built drawings on-site and make as-built drawings available for inspection by the Consultant and the Owner.
- .5 Record neatly and accurately deviations from Contract Documents.
- .6 Record information concurrently with construction progress.
- .7 Do not conceal Work until required information is recorded.
- .8 Mark changes and annotations with an erasable colored pencil conforming to the following color code:
  - .1 Additions – Red
  - .2 Deletions – Green
  - .3 Comments – Blue
  - .4 Dimensions – Graphite
- .9 Record the following information on one set of prints:
  - .1 Elevations of various elements of concrete, earthworks and other components of the Work.
  - .2 Field changes of dimension and detail.
  - .3 Changes made by Change Orders, Field Orders and written instructions by the Consultant.

- .10 At completion of the Contract and prior to final inspection, neatly transfer notations to second set of prints and submit both sets of as-built drawings to the Consultant. Provide corporate seal on one set of as-built drawings.
- .11 Record details not on original Contract Drawings.
- .12 Provide references to related shop drawings and modifications.

**1.3 Specifications**

- .1 Legibly mark in the Specifications each item to record actual construction, including:
  - .1 Type of Material actually installed; particularly optional items and substitute items.
  - .2 Changes made by addenda, Change Orders and Field Orders.

**1.4 Other Documents**

- .1 Maintain certifications, inspection certifications and field test records associated with the Materials used in the Work.

**1.5 Updates**

- .1 Update Project record documents continuously with the progress of the Work. Review with the Consultant the progress of maintenance of record documents on a monthly basis as a condition of progress payment.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

**1 GENERAL**

**1.1 Guarantees**

- .1 In addition to guarantee requirements of Article GC 12.3 Warranty of the General Conditions to which all work of this Contract is to be guaranteed for one year after the date of Substantial Performance, the Contractor shall note that extended guarantee periods are required by the Contract Documents.
- .2 Where executed warranty periods of over two (2) years are required to be provided the product manufacturer shall provide the warranty for the period in excess of two (2) years.
- .3 Refer to architectural technical specification section for specific warranty requirements.
- .4 Warranties are deemed to commence at the date of Substantial Performance.
- .5 In case of work performed by Subcontractors and when guarantees are required, secure such guarantees from Subcontractors and furnish to Owner on or before Substantial Performance.
- .6 Bind guarantees and warranties into Operations and Maintenance Manuals prior to request for application for Substantial Performance review.

**END OF SECTION**

## 1 GENERAL

### 1.1 Partial Project Occupancy

- .1 Owner shall be permitted to occupy a completed portion, or portions of the project prior to Substantial Performance of the Work, and as directed by the Certified Professional.
- .2 Acceptance for occupancy or occupancy by Owner of part or all of the Work shall be by agreement mutually acceptable to both the Contractor and the Owner and shall not relieve either party of any of their responsibilities under the Contract.
- .3 Prior to acceptance for occupancy, Consultant will carry out a review to determine the condition of portion to be occupied and to record deficiencies and/or incomplete work. The Contractor shall be given access to the occupied spaces to correct and/or complete the work. Arrange to execute work in a manner and during a time that will cause least disruption to occupants.
- .4 Guarantees and warranties for specific items within occupied space shall become effective on date of Substantial Performance of the Work.
- .5 Partial occupancy is subject to on site conditions required by local authorities having jurisdiction, for such occupancy.
- .6 Refer to Section 01010 – Summary of Work regarding phasing of work, Exclusive Use Period Occupancy requirements.

### 1.2 Take Over Procedures

- .1 Contractor's Inspection: Conduct an inspection of the Work, and correct deficiencies.
- .2 Consultants' Review: Notify Consultant in writing of satisfactory completion of "Contractor's Inspection" and completion of deficiencies and request "Consultants' Review". Review team shall consist of Contractor, Consultant, and Engineering Consultants.
- .3 Deficiencies: During "Consultants' Review", draw up a list of deficiencies and obtain Consultant's signature. Correct deficiencies and obtain Consultant's approval.
- .4 Final Inspection: Request a Final Inspection in writing to Consultant after correction of deficiencies. Final review team shall consist of Consultant, Contractor and Owner.
- .5 Declaration of Completion: After Final Inspection, apply to Consultant for a Certificate of Substantial Performance.
- .6 Immediately following issuance of Certificate of Substantial Performance of the Work, establish, in consultation with Consultant, a reasonable date for finishing the Work.

### 1.3 Systems Demonstration

- .1 Where applicable and prior to final inspection, demonstrate operation of building systems to Owner and Consultant.
- .2 Instruct Owner's personnel in operation, adjustment, and maintenance of equipment and systems, using provided operation and maintenance data as basis for instruction.

**1.4 Project Commissioning**

- .1 Refer to "Proposal for LEED Commissioning Authority Services" and the "Commissioning Plan" for commissioning requirements for this Project.
- .2 Expedite and complete deficiencies and defects identified by Consultant.
- .3 Review maintenance manual contents (operating, maintenance instructions, record drawings, spare parts, materials) for completeness.
- .4 Review cash allowances in relation to contract price, change orders, holdbacks and other contract price adjustments.
- .5 Submit required documentation such as statutory declarations, WorkSafeBC certificates, and warranties, certificates of approval or acceptance from regulating bodies.
- .6 Review inspection and testing reports to verify conformance to intent of documents and that changes, repairs or replacements have been completed.
- .7 When partial occupancy of uncompleted Work is required by Owner, coordinate Owner's uses, requirements, access, with Subcontractor's requirements to complete project.
- .8 Review condition of equipment such as heating system, which has been used in the course of the Work to ensure turning over at completion in "as new condition" with warranties, dated and certified from time of Substantial Performance of the Work.
- .9 Arrange and coordinate instruction of Owner's staff in care, maintenance and operation of building systems and finishes by suppliers or Subcontractors.
- .10 Provide on-going review, inspection and attendance to building callback, maintenance and repair problems during warranty period.

**1.5 Contractor's Closeout Submittals to Consultant**

- .1 Submit for Substantial Performance items as listed under Section 01300 Submittals.
- .2 Submit for final payment items as listed under Section 01300 Submittals.

**1.6 Final Adjustment of Accounts**

- .1 Submit a final statement of accounting to Consultant.
- .2 Statement to reflect adjustments to Contract Sum:
  - .1 Original Contract Sum.
  - .2 Allowances.
  - .3 Unit Prices.
  - .4 Deductions for uncorrected work.
  - .5 Deductions for liquidated damages.

- .6 Other adjustments, including those brought about by changes to the work.
- .3 Total Contract Sum, as adjusted.
- .4 Previous payments.
- .5 Sum remaining due.
- .6 Consultant will prepare a final Change Order, reflecting approved adjustments to Contract Sum which were not previously made by Change Order.

**1.7 Final Application for Payment**

- .1 Submit Final Application for Payment in accordance with procedures and requirements stated in General Condition GC 5.6 Final Payment.

**2 PRODUCTS**

*Not Applicable*

**3 EXECUTION**

*Not Applicable*

**END OF SECTION**

## 1 GENERAL

### 1.1 Commissioning

- .1 This section of the specifications does not prevent systems other than those described herein from being tested, verified, or commissioned as per other sections of the specifications.
- .2 Refer to the LEED® Commissioning Plan (latest edition) attached to and forming part of **the Division 1 – General Requirements for the Project**. The LEED® Commissioning Plan has been written by the Owner's Commissioning Authority and describes the commissioning process and documentation requirements for this Project.
- .3 Commissioning is a methodical, team-based process. Each member of the commissioning team must fulfill his or her commissioning functions, as described in the LEED® Commissioning Plan in order for this process to be successful. The Commissioning Team is responsible for accomplishing the commissioning process activities and is to provide leadership in identifying and resolving all commissioning process issues.
- .4 "The commissioning process is a quality assurance method adopted by an Owner to consistently achieve successful construction projects. It is not an additional layer of construction or project management – it is the Owner's means of verifying that the planning, design, construction and operational processes are achieving their goals, and ensures the delivery of a well-performing building with high quality and asset value" (LEED® Canada-NC 1.0 reference manual).
- .5 "The commissioning process is a planned, systematic quality assurance process that involves the owner, users, occupants, operations and maintenance staff, design professionals and contractors." (LEED® Canada-NC 1.0 reference manual).
- .6 It is of primary concern that all "Commissioned Systems" in the project perform in accordance with the contract documents, the design intent and the Owner's Project Requirements. The process of assuring that such performance is achieved is referred to as "commissioning."
- .7 The commissioning process:
  - .1 Begins at project inception.
  - .2 Has ongoing verification of achievement of the owner's project requirements.
  - .3 Requires integration of contractor-completed commissioning process activities into the construction documents.
  - .4 Aids in the coordination of static and dynamic testing that acceptance is based on.
  - .5 Verifies staff training.
  - .6 Completes with warranty verifications and lessons-learned documentation and implementation (LEED® Canada-NC 1.0 reference manual).

### 1.2 Commissioned Systems

- .1 The following systems shall be commissioned for this Project per LEED®:

### 1.3 Commissioning Team

- .1 All commissioning team members are to refer to and perform tasks listed in the LEED® Commissioning Plan.
- .2 For this Project, the commissioning team will be comprised of, but not necessarily limited to, the following parties:
  - .1 Owner.
  - .2 Commissioning Authority (overseeing, multiple discipline role).
  - .3 Prime Consultant – Structural.
  - .4 Design Consultant – Architectural.
  - .5 Design Consultant – Building Enclosure.
  - .6 Design Consultant – Electrical.
  - .7 Design Consultant – Mechanical.
  - .8 Contractor.
  - .9 Subcontractor – Electrical.
  - .10 Subcontractor – Mechanical.
  - .11 Subcontractor – Controls.
  - .12 Subcontractor – Balancing.
  - .13 Commissioning Agent – Architectural/Building Enclosure.
  - .14 Commissioning Agent - Electrical.
  - .15 Commissioning Agent – Mechanical.
- .3 Commissioning requires cooperation and direct involvement by all Commissioning Team members throughout the construction and warranty processes. Commissioning Team member roles and responsibilities are listed within the LEED® Commissioning Plan.

### 1.4 LEED® Commissioning Plan

- .1 Refer to the LEED® Commissioning Plan (latest edition) attached to and forming part of the Division 1 – General Requirements for the Project. The LEED® Commissioning Plan has been written by the Owner’s Commissioning Authority and describes the commissioning process and documentation requirements for this Project.
- .2 The LEED® Commissioning Plan will be revised and re-issued over the course of the Project several times so that it is as accurate and as useful a document as is possible.



- .3 The LEED® Commissioning Plan includes the following elements (which are requirements according to LEED® Canada NC version 1.0):
  - .1 A brief overview of the commissioning process.
  - .2 A list of systems and assemblies included in Commissioning Authority's scope of work.
  - .3 Identification of Commissioning Team and its responsibilities.
  - .4 Description of the management, communication and reporting of the commissioning process.
  - .5 Overview of the commissioning process activities for the pre-design, design, construction, and occupancy and operations phases, including the following:
    - .6 Development of the owner's project requirements (pre-design phase).
    - .7 Review of the basis of design (design phase).
    - .8 Review of the schematic design (design phase).
    - .9 Review of the construction documents (design phase).
    - .10 Review of submittals (construction phase).
    - .11 Construction phase verification (construction phase).
    - .12 Functional performance test development (construction phase).
    - .13 Functional performance test implementation (construction phase).
    - .14 10-month warranty review (occupancy and operations phase).
  - .15 A list of the expected work products.
  - .16 A list of key commissioning process milestones.

### **1.5 Commissioning Responsibilities**

- .1 The LEED® Commissioning Plan describes the expected contributions from the various commissioning team members as per LEED®, as well as the expected commissioning work products.
- .2 The Commissioning Authority provides the services in support of the commissioning requirements of LEED® and for the overall commissioning of the project. The Commissioning Authority shall provide technical comments or advice to the Project team as the design documentation advances and shall assemble a LEED® Commissioning Plan to be followed by the commissioning team such that the project can be properly commissioned. By following the LEED® Commissioning Plan, the commissioning team can assure that the "commissioned systems" properly function in accordance with the owner's requirements and the consultant's design intent.

- .3 It is important to note the clear distinction between the Commissioning Authority and the Commissioning Agents (mechanical, electrical & architectural). The Commissioning Authority is responsible for overseeing the overall multi-discipline commissioning process while the Commissioning Agents perform and document the testing of the various mechanical, electrical and architectural "commissioned systems".
- .4 "The Commissioning Authority serves as an objective advocate for the Owner, plans and directs the commissioning process, and presents final recommendations to the Owner regarding the performance of commissioned systems and assemblies. The Commissioning Authority introduces standards and strategies early in the planning process and then verifies implementation of the commissioning process activities by clearly specifying the requirements in construction documents" (LEED® Canada-NC 1.0 reference manual).
- .5 Per the LEED® Canada-NC 1.0 Reference Guide and the LEED® Commissioning Plan, the Contractor's commissioning process responsibilities shall include, but shall not necessarily be limited to, the following:
  - .1 Commissioning team involvement.
  - .2 Submittal review procedures.
  - .3 Operations and maintenance documentation requirements.
  - .4 Training plan development.
  - .5 Construction verification procedures.
  - .6 Start-up plan development and implementation.
  - .7 Functional performance testing.
  - .8 Milestones.
  - .9 Training.
  - .10 Warranty review site visit.

## 1.6 Commissioning Documentation

- .1 All commissioning-related documentation shall to be copied to the Commissioning Authority in a timely manner. All commissioning issues shall be brought to the attention of the Commissioning Authority in a timely manner. All commissioning team members shall create or shall assist in the creation of all commissioning and commissioning-related documentation as indicated in the LEED® Commissioning Plan.
- .2 Project documentation (by others) shall be provided to the Commissioning Authority as requested. Such documentation may include the following:
  - .1 Owner's Project Requirements.
  - .2 Designers' design rationale, narratives, parameters, basis of design and design process minutes.

.3 LEED® prerequisite and credit narratives.

**END OF SECTION**

**1 GENERAL**

**1.1 Addenda and Bulletins**

- .1 Modifications, deletions and additions to the Contract Documents will be processed by the Consultant and issued in the following formats:
  - .1 Addenda:
    - .1 Throughout tender period, up to five (5) working days prior to tender closing date.
  - .2 Post Tender Addenda:
    - .1 Throughout the period between tender closing date and execution of Contract/Agreement.

**1.2 Documents, Sample Forms**

- .1 Maintain a copy of the following documents on site throughout the construction and post-construction phases of the Project. A sample copy of these forms may be obtained from the Consultant.
  - .1 Site Instruction Forms.
  - .2 Contemplated Change Notice / Change Order Forms.
  - .3 Change Directive Forms.
  - .4 Certificate of Payment Forms.
  - .5 Certificate of Completion Forms (Notice of).
  - .6 Transmittal Forms.
  - .7 Site Visit Report Form.

**END OF SECTION**