



INVITATION TO TENDER (“ITT”) No. PS10249

CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL

Tenders will be received in the City of Vancouver’s (“City’s”) Purchasing Services Office, 3rd Floor, Suite #320, East Tower, 555 West 12th Avenue, Vancouver, British Columbia, Canada, V5Z 3X7 prior to the Closing Time: 3:00:00 p.m. Vancouver Time (as defined in Note 2 below), on Tuesday November 9, 2010 and registered at 11:00:00 a.m. Wednesday, November 10, 2010.

NOTES:

1. Tenders are to be in sealed envelopes or packages marked with the Tenderer’s Name, the ITT Title and Number.
2. Closing Time and Vancouver Time will be conclusively deemed to be the time shown on the clock used by the City’s Purchasing Services Office for this purpose.
3. The City’s Purchasing Services Office is open on Working Days 8:30 a.m. to 4:30 p.m. Vancouver Time and closed Saturdays, Sundays, and holidays.
4. DO NOT SUBMIT BY FAX.

**All queries related to this ITT should be submitted
in writing to the attention of:**

Eamonn Savage, SCMP

Contracting Specialist

Fax: 604.873.7057

E-mail: purchasing@vancouver.ca

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
TABLE OF CONTENTS

PART A - INVITATION TO TENDER

Pages A1 - A8

- 1.0 Invitation to Tender
- 2.0 Administrative Requirements
- 3.0 Conduct of ITT - Inquires and Clarifications
- 4.0 Project Background
- 5.0 Overview of Scope of Work
- 6.0 Tender Documents
- 7.0 Information Meeting and Site Visit

PART B - INSTRUCTIONS TO TENDERERS

Pages B1 - B11

- 1.0 Definitions & Interpretation
- 2.0 Introduction
- 3.0 Tenders
- 4.0 Total Tender Price
- 5.0 Opening of Tenders
- 6.0 Contract
- 7.0 Consent of Surety and Bid Bond
- 8.0 Insurance
- 9.0 WorkSafeBC
- 10.0 Acceptance of Tenders
- 11.0 Site Examination
- 12.0 Tender Documents
- 13.0 Examination of Tender Documents
- 14.0 Interpretation
- 15.0 Taxes and Fees
- 16.0 Product Approval
- 17.0 Metric Measurements and Co-Ordination
- 18.0 Scheduling, Coordination and Completion
- 19.0 Excavation, Soil Support and Work Areas
- 20.0 Labour Rates
- 21.0 Experience
- 22.0 List of Subcontractors and Suppliers
- 23.0 Non-Resident Withholding Tax
- 24.0 Release, Indemnity and Limitation
- 25.0 Dispute Resolution
- 26.0 Confidentiality and Privacy
- 27.0 Release of Information Restricted
- 28.0 Enquiries

PART C - FORM OF TENDER, INCLUDING:

Pages FT 1-25

- 1.0 Total Tender Price and Schedule
- 2.0 Notice of Award
- 3.0 Notice to Proceed
- 4.0 Conditions
- 5.0 Amendments/Questions & Answers
- 6.0 Certification
- 7.0 Labour
- Schedule A Schedule of Quantities and Prices
- Schedule B Preliminary Construction Schedule
- Schedule C Subcontractors and Suppliers
- Schedule D Methodology
- Schedule E Tenderer's Experience with Related Work
- Schedule F Force Account Labour Rates

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
TABLE OF CONTENTS**

Schedule G	Consent of Surety
Schedule H	Tenderer's Proposed Variations
Schedule I	Preliminary Traffic Management Plan
Schedule J	Preliminary Site Specific Safety and Health Plan
Schedule K	Certificate of Existing Insurance

PART D - FORM OF AGREEMENT

Pages AGT 1- AGT 6

PART E - GENERAL CONDITIONS

Pages GC 1- GC 32

Table of Contents
General Conditions

APPENDIX A - PRIME CONTRACTOR AGREEMENT FORM

Pages AF 1- 4

1.0	Definitions
2.0	Prime Contractor's Responsibilities
3.0	Designation as Prime Contractor

PART F - SUPPLEMENTARY GENERAL CONDITIONS

Pages SGC 1 - SGC 10

PART G - WATERMAIN SUPPLY & INSTALLATION STANDARD DETAILED DRAWINGS

SDD 1

Appendix 1	Information Meeting Attendance Form (1)
Appendix 2	Vancouver Landfill Site Safety Orientation (5)
Appendix 3	Safety Awareness Sheet / Landfill Gas (2)
Appendix 4	Vancouver Landfill Site Hazard Identification List (3)
Appendix 5	Specifications (85)
Appendix 6	Design Drawings - issued for tender (provided separately) (2)
Appendix 7	General Certificate of Insurance (1)
Appendix 8	Water Meter Chamber and Backflow Preventer Specifications (2)
Appendix 9	Geotechnical Report (provided separately) (1)
Appendix 10	Site Bedding and Backfill Requirements (3)

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART A - INVITATION TO TENDER**

1.0 INVITATION TO TENDER

- 1.1 The City of Vancouver (the “City”) invites tenders (“Tenders”) for the construction of a new waterline at the Vancouver Landfill.

2.0 ADMINISTRATIVE REQUIREMENTS

- 2.1 It is the sole responsibility of the Tenderer to monitor the City’s website at <http://www.vancouver.ca/bid/bidopp/openbid.htm> regularly for amendments, addenda, and questions and answers related to this Invitation to Tender (the “ITT”).
- 2.2 All Tenders are to be completed and submitted in accordance with the instructions on the front page to this ITT and as provided within this ITT.

3.0 CONDUCT OF ITT - INQUIRIES AND CLARIFICATIONS

- 3.1 The City’s Director of Supply Chain Management will have conduct of this ITT, and all communications should be directed only to the contact person(s) named on the cover page.
- 3.2 It is the responsibility of the Tenderer to thoroughly examine the ITT documents and satisfy itself as to the full requirements of this ITT. All inquiries should be in written form only, faxed to (604) 873-7057 or e-mailed to purchasing@vancouver.ca to the attention of the appropriate contact person shown on the cover page before the deadline date. If required, an addendum will be issued to all registered Tenderers and posted on the City’s website as noted in item 2.1 above.
- 3.3 The lowest or any Tender may not be accepted and the City will not be responsible for any cost incurred by the Tenderer in preparing the Tender.
- 3.4 Tenders are scheduled to close at the Closing Time listed on the cover page of this ITT.
- 3.5 Key dates to be noted are:

Event	Dates
Information Meeting Response Form and Preliminary Enquiries should be submitted by	October 20, 2010
Information Meeting	October 21, 2010
All Inquiries should be submitted on or before:	November 2, 2010
ITT Closing Time	November 9, 2010

4.0 PROJECT BACKGROUND

- 4.1 The Vancouver Landfill (“Landfill”) is owned and operated by the City of Vancouver and is located in the southwest corner of Burns Bog in Delta, BC (about 5 minutes from the George Massey tunnel). The Landfill serves over one million people and is authorized to accept 750,000 tonnes of municipal solid waste (“MSW”) each year. The Ministry of Environment administers an Operational Certificate for the Landfill.
- 4.2 The ultimate goal is to upgrade the fire fighting (at least 3,800 lpm anywhere on the landfill within 24 hrs) and operational water capability of the landfill (plentiful water access across entire site). The construction of the waterline is a key component necessary for that goal to be achieved.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART A - INVITATION TO TENDER

- 4.3 The scope of work for the construction of the new waterline at the Vancouver Landfill is shown in the drawings and other appendices. It essentially includes the construction of 2,300m of 300mm waterline (with an option to install a further 440m) as shown in Figure 1, and the placement and connection of a water meter and double back flow preventer chamber(s) and associated components. The chamber(s) and associated parts will be supplied by the City and waiting on site, (refer to Appendix 8 for details of which parts the City will be supplying). Also included in the Work is the supply and installation of approximately ten hydrants, a watermain crossing underneath an active clean water ditch and over a leachate culvert and a Terasen gas main/numerous pipe crossings, the supply and installation of numerous associated components, and testing (i.e. fully functional waterline is expected).
- 4.4 The successful Tenderer will be required to act as the Prime Contractor, provide all necessary connections and complete all construction work to deliver a fully operational waterline. A flow test will be performed at the end of the waterline to confirm that it is functioning properly.
- 4.5 The successful Contractor will be required to complete the project by March 31, 2011 in order for the City to qualify for Federal Infrastructure Stimulus funding. Ideally, the project will be completed by February 2011 so that there is a safety factor of one (1) month for unforeseen delays. Please note that the City is using a consulting company for construction monitoring, and the consulting company has indicated that a work schedule of forty (40) working days of eight (8) hours per day will be sufficient time to complete the Work. Therefore, Tenderers should show, using Schedule B, how they would complete the Work within that timeframe.



Figure 1. Waterline Overview

5.0 OVERVIEW OF SCOPE OF WORK

- 5.1 An overview of the scope of the Work as required by this ITT is provided below.
- a) The Construction of the New Waterline at the Vancouver Landfill, as described in the Tender Documents, will include, but is not limited to:
 - i) acting as Prime Contractor in the designated Work Site (the Work Site will be clearly marked out but essentially includes land on both sides of the alignment);

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART A - INVITATION TO TENDER

- ii) coordinating all trades, inspections, approvals, permits and insurance;
- iii) making all provisions for the continuous operation of the landfill (i.e. includes vehicle access, water supply, etc) during construction, including (see Figure 1):
 - A) Connection to the Delta watermain (i.e. crossing 72nd street, which is a paved road, and exposing Delta's water main). Delta will tap to its existing main. The Contractor will be responsible from the tapping tee and valve installed by Delta on 72nd street. The waterpipes need to be close to each other and they need to be exposed with enough room for the connection crew to do its work. Therefore, the work will most likely have to be done during non-operating hours (10pm - 6am). Also, roadplates may have to be used in order to keep the road open while we wait for Delta to come and do the connection. A connection permit may be necessary and the Contractor will be required to obtain this permit. The City will pay Delta's connection bill (i.e. tapping the main and installing the tee and valve).
 - B) Two (2) tie-ins will be made to the existing City of Vancouver on-site watermain (one by the equipment road and one by the paved road). This work can be done during daytime as long as enough notice is given (1 day, permission will be given unless extenuating circumstance are present) and as long as the service interruption is less than four hours in length.
 - C) Coordination with the other contractor working in the area by the pump station. The area around the pump station has been given to another contractor while they upgrade the pump station and nobody is allowed into that area without prior permission. The other contractor will be expected to complete its work by mid November. If it will be necessary to work in this area while the pump station contractor is still working, then special coordination may be necessary. If necessary, the Engineer will set up a meeting between all parties and a mutually satisfactory agreement will be worked out.
 - D) There are two (2) crossings of the existing paved road: one (1) by the flare station and again at the corner of the paved road (i.e. turn off to compost area). The work will most likely have to be done during non-operating hours (10pm-6am). If it cannot be done in one night, then the road must be made operational through the use of road plates so that the landfill does not have to shut down.
 - E) Waterline in the pavement. The work may be done during non-operating hours (10pm-6am) or it may be done during other times as long as at least one lane is open to traffic. If the Contractor chooses to close one lane and do the work during operating hours, then the Contractor must hire at least two traffic control attendants to safely operate the one open lane during that time. The paved road must not be closed during operating hours, except for very short times (under five minutes in order to cross the road or drop off some material), and even these short times it can only be closed by using two traffic control attendants for which the Contractor is fully responsible.
 - F) Waterline on the shoulder of the paved road. The work may be done during non-operating hours (10pm-6am) or it may be done during other

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART A - INVITATION TO TENDER

times as long as no traffic issues are created (i.e. Contractor works entirely on the shoulder and no lanes are blocked). If the Contractor chooses to close one lane, then the Contractor must hire at least two traffic control attendants to safely operate the one open lane during that time. The paved road must not be closed during operating hours, except for very short times (under five minutes in order to cross the road or drop off some material), and even these short times it can only be closed by using two traffic control attendants for which the Contractor is fully responsible.

- G) Coordinate with another contractor (gas contractor) who will need to cut across the paved road in order to make the gas connection for a separate project. This work will likely occur during the same period as the waterline construction. Because of scheduling uncertainty, it is unknown whether the gas connection will occur first, or whether the waterline will go in first in that section; however, it must be coordinated that there are no scheduling conflicts in that area (which should not be difficult since that is one point in a long stretch of work). The engineer will talk to both contractors and advise them of their respective timelines to make sure that no conflicts occur, or work towards a mutually satisfactory solution should a conflict occur. Because the crossing pipes are going to be in proximity to each other, the water pipe should be protected with a steel sleeve (see drawing notes in the appendix for details).
 - H) Demolition road and rock road (or shoulder of paved road after compost operations) sections. These sections are expected to see only occasional traffic. The demolition road traffic would typically be in the form of heavy equipment such as compactors and bulldozers traveling for maintenance. The rock road traffic would consist of operational personnel or contractors accessing the stock pile areas or traveling to that side of the landfill, however this is expected to be relatively rare because that side of the landfill is not expected to be used during the period of the Work (the traffic is really expected to diminish to almost zero east of the lake because only some technicians use those areas). Therefore, the Contractor will be able to work relatively freely in these sections.
- iv) supplying and installing piping, valves and specified equipment (please note that the City wishes Tenderers to bid on the construction of approximately 2,300m of 300mm waterline and all associated components and then supply an optional price for the remaining approximately 440m, the stoppage point is shown on sheet 7 as "3+280", also note that the water meter and back flow preventer chamber(s) and inside components will be supplied by the City in practical proximity to where they need to go into the ground. Refer to Appendix 8 for details of this procurement being carried out by the City in order to see exactly what the City will be supplying on site. The Contractor will be responsible for installing these components which will probably require a crane);
 - v) testing, flushing and chlorinating the complete system;
 - vi) providing any additional cleanup as required;
 - vii) delivering final documentation;

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART A - INVITATION TO TENDER

- viii) delivering a complete, finished and operational waterline for the City of Vancouver Landfill site. (please note that the City will choose whether approximately 2300m or approximately 2740m of watermain is to be constructed, but whichever length is chosen the waterline must be operational and that means that if the shorter length is chosen then the joint restraints shown for the easterly end at "3+720" still need to be installed at "3+280" as well as the plug);
- 5.2 Detailed specifications and design drawings are in Appendices 5, 6, 8, 9, and 10. The Tenderer should clearly indicate any deviations from the equipment specifications set out therein. Please note that the use of trenchless technologies is acceptable.
- 5.3 The Contractor will be required to install pipe underneath a clean water ditch as per the drawings. This will most likely involve damming the ditch at two points where the crossing will occur, installing a temporary culvert to allow the majority of the water to flow from one side to the other, pumping any leakage from the ditch crossing during construction, placing of the waterpipe and appropriate surround, placing of the protective pad, and restoring the ditch surface to the original condition.
- 5.4 Tenderers are advised that the landfill has been filled over a fifty (50) year period with a variety of materials, including asbestos and large waste. Therefore, the successful Contractor will be required to exercise caution during excavation. In particular, asbestos, landfill gas, and large sized waste may be encountered and must be dealt with safely by the Contractor. Large sized waste must be excavated carefully by the Contractor so that nearby utilities (including gas mains) are not disturbed. The Contractor will be responsible for damage caused to nearby utilities during the excavation process. Tenderers are advised to carefully read the Geotechnical Report as provided in Appendix 9. For example, the report states that three of the ten holes had obstructions and two holes had to be relocated because of these obstructions.
- 5.5 Tenderers are advised that they should expect difficult driving conditions in the demolition road section as shown in Figure 1. This road has a topping of wood waste that deteriorates in rainy weather and the Work will be occurring during rainy weather. The road is used by the City's heavy equipment such as bulldozers and compactors to travel to the garage for maintenance. The Contractor will be required to allow the City's heavy equipment to pass as necessary (this is not expected to occur on a frequent basis). Tenderers are advised that only single vehicles will be able to travel on this road (i.e. no trailers) and that there is no place to turn around anywhere. Tenderers should make provisions for vehicles getting stuck and requiring help.
- 5.6 The City will make available the area to the south of the compost site for stockpiling any necessary construction materials, as shown in Figure 2. This area will be required to be returned to its original condition at the Contractor's expense prior to the project ending. Please note that Phase 3 Central Ditch and Gas Laterals construction will be in progress at the same time as the waterline construction and therefore the stockpile area must be shared (i.e. approximately half of the stockpile area will be available for this project). The Contractor may place a temporary office trailer in this area if he wishes.
- 5.7 The Work will include the transportation of all excavated material directly to the active face and all asbestos directly to the asbestos burial hole. The driving distance will vary depending upon where the active face is and where the excavation is. The successful Tenderer is to assume the presence of asbestos whenever double bagged plastic bags, bags labeled "asbestos", and uncompacted material is encountered. Whenever asbestos is encountered, the Contractor will be required to use respirators to prevent the breathing in of asbestos fibers and to follow all WorkSafeBC regulations. Tenderers are advised that asbestos may be present anywhere on the landfill, even when the material that is encountered is not double bagged and

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART A - INVITATION TO TENDER

well compacted and therefore the successful Contractor may wish to always use respirators. The Contractor will be required to adhere to WorkSafeBC regulations. The excavated material may be hauled to the active face free of charge. If any asbestos is encountered, then it may be hauled to the burial hole free of charge (asbestos material may be present anywhere; however, it is typically double bagged and uncompacted, often in yellow bags or labeled bags). The likely active face and burial hole locations are shown in Figure (please note that the speed limit at the landfill is 30 kph), but please note that these entities continuously move as materials come in and hence can change by 200m in either direction.

- 5.8 The Contractor will be required to use a gas detector during this project to detect the presence of harmful gases such as H₂S, CH₄, CO, and the lack of oxygen. The Contractor will be required to follow all WorkSafeBC regulations for dealing with such hazards.
- 5.9 Tenderers should carefully read the Geotechnical Report in the Appendix 9 and the Site Bedding And Backfill Requirements in Appendix 10. This report is specific to this project, and therefore it supersedes the more general specifications found in the Appendix 5. It is especially important to note that lightweight trench backfill will be required (i.e. report indicates that seven out of ten holes had woodwaste). Tenderers are to assume site bedding and backfill requirements as stated in Appendix 10. If it turns out that different materials were required, then Tenderers will either receive money from the City or they will owe money to the City if there is a difference in the per meter unit pricing for these materials After reading the geotechnical report, Tenderers should realize that the type of material that can be used in the trench will depend on exactly what is found in the trench at that point. Therefore, it will be necessary to be able to have the appropriate material delivered within a short order period (stockpiling may help in this regard) because the exact type of material cannot be known until the material is excavated. Please note that the City (or City's consultant) will monitor the construction and the City will have the final say as to what type of material to use (i.e. see the different scenarios outlined Appendix 10 and in the Geotechnical report in Appendix 9).
- 5.10 There will be a need for a base on which to place the water meter and back flow prevention chamber. For now, Tenderers should assume 0.5m pit-run gravel foundation and a chamber size of 5m by 2.5m and 2.5m deep ; and they should price this work into their overall Total Tender Price. But Tenderers should be prepared to offer a price (the City has the option of rejecting the price if it finds it unreasonable and using another contractor for this small part of the project) if it turns out that the requirements are different from above.
- 5.11 There is a Terasen gas main running in the north to south direction in between the ditches at the entrance to the landfill. The successful Tenderer will be required to obtain a permit and cross this gas main as shown in the drawings that are in the Appendix. The City will apply for the necessary permit.
- 5.12 Tenderers are required to read all documents. The drawings, Site Bedding and Backfill Requirements, water meter chamber and back flow preventer appendix, and the geotechnical report sometimes offer more specific information than the general specifications found in Appendix 5 and should be used instead in those instances.

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART A - INVITATION TO TENDER**



Figure 2. Active Face, Burial Hole, and Stockpile Area

6.0 TENDER DOCUMENTS

- 6.1 One set of Tender Documents on CD will be available for pick-up free of charge during Working Days from 8:30 a.m. to 4:30 p.m. at:

City of Vancouver
Purchasing Services
City Square
555 West 12th Avenue
Office 320, East Tower
Vancouver, BC V5Z 3X7

Couriers collecting documents from Purchasing Services will be required to provide the ITT number PS10249.

- 6.2 The Tender Documents will be available for viewing at:

Vancouver Regional Construction Association
3636 East 4th Avenue
Vancouver, BC V5M 1M3

7.0 INFORMATION MEETING AND SITE VISIT

- 7.1 Tenderers are invited to attend an information meeting and site visit (Information Meeting) on Thursday October 21, 2010, commencing at 10:00 AM and lasting until approximately 11:30 AM. This meeting will be held in the meeting room of the Engineering Design Building at the Vancouver Landfill.

Location of meeting: Vancouver Landfill
5400 72nd Street
Delta, BC

Visit vancouver.ca/landfill for directions to the site.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART A - INVITATION TO TENDER

- 7.2 All prospective Tenderers are to pre-register for the Information Meeting by submitting an Information Meeting Attendance Form (Appendix 1) by fax to (604) 873-7057 or e-mail to purchasing@vancouver.ca by October 20 2010.
- 7.3 Attendees to the site visit portion of the Information Meeting will be required to bring and wear steel toed boots and high visibility vests.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

1.0 DEFINITIONS & INTERPRETATION

1.1 Definitions

Capitalized terms used in these Tender Documents have the meanings ascribed to them in the General Conditions (GC.1. - *Definitions*), unless such terms are specifically defined in this Part B or the context of their use otherwise requires.

The defined terms in these Instructions to Tenderers include:

- (a) **"City"** or **"Owner"** means the City of Vancouver, a municipal corporation continued pursuant to the Vancouver Charter, SBC 1953, c.55;
- (b) **"Closing Time"** means the closing date, time and place as set out in the title page of this ITT;
- (c) **"Contract"** means the contract in the Form of Agreement the City will enter into with the successful Tenderer;
- (d) **"Contractor"** means a Tenderer whose Tender the City has accepted and to whom the Contract has been awarded;
- (e) **"Information and Privacy Legislation"** includes the *Freedom of Information and Protection of Privacy Act* (British Columbia) and all other similar legislation in effect from time to time;
- (f) **"Landfill"** means the Vancouver Landfill located at 5400-72nd Street in Delta, BC;
- (g) **"Losses"** means, in respect of any matter, all:
 - (i) direct and indirect; and
 - (ii) consequential,

claims, demands, proceedings, losses, damages, liabilities, deficiencies, costs and expenses (including without limitation, all legal and other professional fees and disbursements, interest, penalties and amounts paid in settlement, whether from a third person or otherwise);
- (h) **"Tax Legislation"** includes the *Income Tax Act* (Canada), *Excise Tax Act* (Canada), and all other similar legislation in effect from time to time;
- (i) **"Tender Contract"** means any contract whether simple or by deed formed upon receipt by the City of a tender from a Tenderer in response to the Invitation to Tender;
- (j) **"Tender Documents"** mean all the documents listed in section 12.0 of this Part B, including any addendum issued by the City;
- (k) **"Tenderer"** means the person(s) described in the beginning of the Form of Tender; and
- (l) **"Work Site"** or **"Site"** means the area or areas on and about the City property where the Work is to be carried out.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

1.2 Interpretation

- (a) In these Tender Documents, any reference to the masculine includes the feminine and bodies corporate, and each includes the others where appropriate. Also, any reference to the singular includes the plural where appropriate.
- (b) If there is a conflict between or among the Specifications and Drawings and the Invitation to Tender, Instructions to Tenderers, Form of Tender (including the Schedules), Form of Agreement, General Conditions and the Supplementary General Conditions (the "**Balance of Tender Documents**"), the Balance of Tender Documents shall prevail over the Specifications and Drawings.

2.0 INTRODUCTION

- 2.1 The City of Vancouver is inviting Tenders for the Construction of the New Waterline at the Vancouver Landfill Project. The Site is the active City of Vancouver Landfill site, located at 5400 72nd Street, Delta, British Columbia.

3.0 TENDERS

- 3.1 The City will make available for pick-up by each Tenderer one set of Tender Documents on CD in accordance with Section 6.0 of Part A of this ITT. The Tenderer shall complete and submit the Form of Tender in Part C of this ITT (and all required schedules and other documents) in accordance with this Part B (Instructions to Tenderers).
- 3.2 The Tenderer shall deliver a complete Tender (including all required schedules and other documents) prior to the Closing Time as outlined on the cover page of the ITT.
- 3.3 Tenders received after the Tender Closing Time may or may not be returned unopened to the Tenderer.
- 3.4 Tenders should be enclosed in a sealed plain envelope, clearly marked: "**Construction of New Waterline at the Vancouver Landfill, ITT. PS10249**", with the Tenderer's name in the upper left hand corner.
- 3.5 Each Tender should be signed in longhand by or on behalf of the Tenderer, with its usual signature. Tenders by partnerships should be signed by at least two of the partners, followed by the designations of the partners signing. Tenders by a company should specify the full legal name of the company followed by the signatures of the duly authorized signing officer(s) and should have the company's seal affixed. Each page of the Form of Tender, including the schedules should bear the initials of those persons who have executed the Form of Tender.
- 3.6 All blank spaces in the Form of Tender should be filled in. All prices and notations should be typewritten or written in ink. Erasures, interlineations or other corrections should be initialled by the person or persons signing the Tender.
- 3.7 Tenderers should submit on the Form of Tender provided, a Total Tender Price (hereinafter defined), including all taxes and fees.
- 3.8 Tenderers should submit on Schedule A (Schedule of Quantities and Prices) a breakdown of the Total Tender Price referred to in 3.7 above. These unit prices and/or lump sums will be used to compute interim progress payments and will be reviewed prior to Contract award so Tenderers should ensure that the sums accurately reflect the costs for each item. The Tenderer may be required to justify the submitted breakdown.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

- 3.9 Tenderers should submit a price for each item listed. For items which are not specifically listed, Tenderers shall place the costs for these in the nearest applicable item. Failure by the Tenderer to submit a complete breakdown may result in an incomplete Tender and may be cause for rejection.
- 3.10 Unless otherwise stipulated, Tenders should be made on the Form of Tender supplied and signed as specified in 3.5 above.
- 3.11 Tenders should be all inclusive and should be without qualification or condition.

4.0 TOTAL TENDER PRICE

- 4.1 The price for the Work (the “**Total Tender Price**”) shall be the sum in Canadian dollars of the following:
- (a) the product of the actual quantities of the items of Work listed in Schedule A (Schedule of Quantities and Prices) which are incorporated into or made necessary by the Work and their unit prices listed in Schedule A (Schedule of Quantities and Prices); plus
 - (b) all lump sums, if any, as listed in Schedule A (Schedule of Quantities and Prices) for items relating to or incorporated into the Work; plus
 - (c) all applicable taxes.
- 4.2 Subject to any adjustment for changes to the Work, which are approved by the Engineer in accordance with the Contract Documents, the Total Tender Price shall be the maximum compensation owing to the Contractor for the Work and the Contractor’s compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing and all other costs and expenses whatsoever incurred in performing the Work.
- 4.3 The City may delete any items in Schedule A in order to meet budget limitations, or otherwise, and award a contract for only the remaining items.

5.0 OPENING OF TENDERS

- 5.1 Tenders will be opened publicly in the Purchasing Services Office at the time and address shown on the cover page of this ITT.
- 5.2 Award of a Contract will be subject to the City’s required approval process, the insurability of the Contractor pursuant to the insurance provisions of the General Conditions and, if applicable, approval by City Council.

6.0 CONTRACT

- 6.1 The successful Tenderer will become a Contractor and will be required to sign the Contract (on the terms and conditions noted in the Form of Agreement) with the City.

7.0 CONSENT OF SURETY AND BID BOND

- 7.1 Each Tender should be accompanied by a Consent of Surety (Schedule G of the Form of Tender or equivalent) duly completed by a surety company authorized and licensed to carry on business in British Columbia and having an office in British Columbia.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

7.2 Each Tender should be accompanied by a Bid Bond valid for sixty (60) days from the day following the Closing Time, duly completed by a surety company authorized and licensed to carry on business in British Columbia and having an office in British Columbia, payable to the Owner, the City of Vancouver, in the amount of ten percent of the Total Tender Price, and not a dollar amount, as a guarantee of the due execution of an Agreement with the City and the delivery of the Bonds specified in section 2.0 - Part C of the Form of Tender by the successful Tenderer.

7.3 The forms of the Bonds should be those issued by the Canadian Construction Documents Committee as follows:

- | | | |
|-----|-----------------------------------|-------------------|
| (a) | Bid Bond: | CCDC 220 (latest) |
| (b) | Performance Bond: | CCDC 221 (latest) |
| (c) | Labour and Material Payment Bond: | CCDC 222 (latest) |

7.4 The Bid Bond of unsuccessful Tenderers will be returned to them as soon as possible after the Contract is awarded and the Bid Bond of the Tenderer to whom the award is made will be returned upon execution of the Agreement, delivery of a Performance Bond for 50% of the Total Tender Price and a Labour and Material Payment Bond for 50% of the Total Tender Price, and commencement of the Work. The cost of all Bond premiums shall be included in the Total Tender Price.

7.5 All bonds should be issued by a surety company authorized and licensed to carry on business in British Columbia and should have an office in British Columbia.

8.0 INSURANCE

8.1 The Contractor shall maintain the insurance provisions described in section GC.53 of the General Conditions at the Contractor's expense.

9.0 WORKSAFEBC

9.1 Tenderers should familiarize themselves with the latest WorkSafeBC requirements as laid out in sections GC.7 and GC.54 of the General Conditions.

10.0 ACCEPTANCE OF TENDERS

10.1 Notwithstanding anything to the contrary contained in the Invitation to Tender, the Instructions to Tenderers or any other contractual document:

- (a) Tenderers are notified that the lowest or any Tender need not necessarily be accepted and the City reserves the right to reject any and all Tenders at any time without further explanation or to accept any Tender considered advantageous to the City. Acceptance of any tender is contingent on funds being approved and a contract award being made by City Council if applicable and the insurability of the Contractor pursuant to the insurance provisions of the General Conditions. Tenders which contain qualifying conditions or otherwise fail to conform to these Tender Documents may be disqualified or rejected. The City may waive any non-compliance with the Tender Documents, specifications or any conditions, including the timing of delivery of anything required by these Tender Documents and may at its sole discretion elect to retain for consideration Tenders which are non-conforming because they do not contain the content or form required by the Tender Documents or because they have not complied with the process for submission set out herein.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

- (b) Where the City's Director of Supply Chain Management is of the view, in his/her sole discretion, that there is an ambiguity or other discrepancy which cannot be discerned or resolved from examining the contents of the Tender, then whether or not such an ambiguity or discrepancy actually exist on the face of the Tender the City may, prior to Contract award, solicit clarification from the Tenderer or accept clarification from the Tenderer on any aspect of the Tender. Such clarification may include the acceptance of any further documents or information which shall then form part of the Tender. The soliciting or accepting of such clarification (whether or not solicited) by the City shall be without any duty or obligation on the City to advise any other Tenderers or to allow them to vary their Total Tender Prices as a result of the acceptance of clarification from any one or more Tenderers and the City shall have no liability to any other Tenderer(s) as a result of such acceptance of clarification.
- (c) Tenders shall remain open for acceptance by the City for a period of sixty (60) calendar days after the Closing Time.
- (d) The award of any contract shall be based on the evaluation of the Tenders by the City on any basis the City deems will best serve its interests, including but not limited to the following criteria, as applicable in the City's sole opinion:
 - (i) the overall cost impact of the Tender on the operations of the City, including the addition of all applicable taxes to the prices quoted. Also, the City will use the per meter rates indicated by the Contractor in its evaluation of Tenders (the City has a specific formula for this).
 - (ii) the reputation and experience of the Tenderer and of the Tenderer's senior staff to be allocated to the Work;
 - (iii) the technical credibility, financial resources and environmental responsibility of the Tenderer;
 - (iv) the Tenderer's understanding of the Work based on its proposed methodology;
 - (v) the Tenderer's scheduling of the Work in relation to the City's schedule and the ability to complete the Work within the time frame required by the City;
 - (vi) the best value to the City based on quality, service, price and any of the criteria set out herein based solely on the City's subjective assessment of the Tender; and
 - (vii) the quality of the references, resumes, curriculum vitae, and reputation of the Tenderer, its Suppliers and Subcontractors, and all of their respective senior staff and key personnel, particularly as it relates to the Work.
- (e) Where the City determines that all Total Tender Prices are too high, all Tenders may be rejected.
- (f) The City may, prior to Contract award, negotiate changes to the scope of the Work or any conditions with the Tenderer considered to provide best value or any one or more Tenderers without having any duty or obligation to advise any other Tenderers or to allow them to vary their Total Tender Prices as a result of changes to the scope of the Work or any conditions and the City shall have no liability to any other Tenderer as a result of such negotiations or modifications.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

- (g) The Tenderer acknowledges and agrees that the City will not be responsible for costs, expenses, Losses, damages (including damages for loss of anticipated profit) or liabilities incurred by a Tenderer as a result of or arising out of submitting a Tender for the proposed Contract, or due to the City's acceptance or non-acceptance of their Tender or any breach by the City of the Tender Contract between the City and each of the Tenderers or arising out of any contract award not made in accordance with the express or implied terms of the Tender Documents.
- (h) The City may award the Contract on the basis of policies and preferences not stated in the Tender Documents or otherwise than as stated in the Tender Documents.
- (i) Guidelines or policies that may be applicable shall not give rise to legal rights on the part of any Contractor, Subcontractor or others as against the City and shall in no case create any liability on the part of the City.

11.0 SITE EXAMINATION

- 11.1 The Site on which the Work is to be executed is located on City owned property in Delta, British Columbia.
- 11.2 Tenderers shall make a careful examination of the Site and investigate and satisfy themselves at their own risk and expense as to all matters relating to the nature of the Work to be undertaken; the means of access; the extent of the Work to be performed and any and all matters which are referred to in the Drawings, Tables, Specifications and other Tender Documents, or which are necessary for the full and proper completion of the Work and the conditions under which it will be performed. No allowance shall be made subsequently in this connection on behalf of a Contractor for any error, negligence, interpretation, or misinterpretation on the Contractor's part.
- 11.3 The City and the Engineer do not guarantee Site and geotechnical information (if any) provided in or with the Tender Documents and the Tenderer must evaluate such information relative to actual conditions.
- 11.4 Site visits by potential Tenderer's must be prescheduled with the Purchasing Department. Before entering the Site for any independent examination or work, each of the Tenderer's personnel are required to complete a safety orientation, to adhere to procedures established for access to the Site, and to have and use personal protective equipment as required by the City of Vancouver and WorkSafeBC.

12.0 TENDER DOCUMENTS

- 12.1 The Tender Documents are:
 - (a) Part A - Invitation to Tender;
 - (b) Part B - Instructions to Tenderers;
 - (c) Part C - Form of Tender (including Schedules A to K);
 - (d) Part D - Form of Agreement;
 - (e) Part E - General Conditions (including Appendix A, Prime Contractor Agreement form);
 - (f) Part F - Supplementary General Conditions;

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS**

- (g) Appendix 1 - Information Meeting Attendance Form;
- (h) Appendix 2 - Vancouver Landfill Site Safety Orientation;
- (i) Appendix 3 - Safety Awareness Sheet / Landfill Gas;
- (j) Appendix 4 - Vancouver Landfill Site Hazard Identification List;
- (k) Appendix 5 - Specifications;
- (l) Appendix 6 - Design Drawings, issued for tender (provided separately electronically on CD); and
- (m) Appendix 7 - General Certificate of Insurance;
- (n) Appendix 8 - Water Meter Chamber and Backflow Preventer Specifications;
- (o) Appendix 9 - Geotechnical Report (provided separately electronically on CD);
- (p) Appendix 10 - Site Bedding And Backfill Requirements; and
- (q) any and all Amendments, Addenda, and Questions & Answers issued by the City prior to the Closing Time, as well as any and all Amendments, Addenda, and Questions & Answers issued by the City after the Closing Time and accepted in writing by the Tenderer, as well as any and all clarifications accepted by the City prior to award of the Contract.

13.0 EXAMINATION OF TENDER DOCUMENTS

- 13.1 Each Tenderer must examine the Tender Documents and must also satisfy him/herself of the extent of the Work. The Tenderer shall make his/her own estimate therefrom of the facilities and difficulties attending the performance and the completion of the Work.
- 13.2 No allowance shall be made subsequently on behalf of a Contractor for any error, omission or negligence on the Contractor's part or for non-compliance with the requirements of this clause.

14.0 INTERPRETATION

- 14.1 If any Tenderer is in doubt as to the true meaning and intent of any part of the Drawings, Specifications, or other Tender Documents, the Tenderer shall request the Engineer for an interpretation thereof at least five (5) Working Days prior to the Closing Time. If such an interpretation is not requested or confirmed by an addendum, the Tender will be presumed to be based upon the interpretation that may be subsequently given by the Engineer after award of the Contract.
- 14.2 Prior to the Closing Time for Tenders, all requests made according to subsection 14.1 for necessary clarification of the Specifications, Drawings, or other Tender Documents will be answered in writing by the Engineer by posting the answers on the City's website. It is the sole responsibility of the Tenderer to access the City's website at <http://www.vancouver.ca/bid/bidopp/openbid.htm> regularly to check for amendments, addenda, and questions and answers related to this ITT. The City shall not be responsible for verbal or any other explanations or interpretations of the Specifications, Drawings or other Tender Documents. As set out in section 12.0 of this Part B, all written notices so issued shall become part of the Tender Documents and shall be binding upon all Tenderers.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

15.0 TAXES AND FEES

- 15.1 The Contractor in the Contractor's Tender must allow for the payment of all Permit Fees and Licence Fees and all Municipal, Provincial and Federal taxes, custom duties and other assessments and charges, and the Contractor agrees that the City shall not be liable in any manner therefore and agrees to indemnify and save harmless at all times the City against all claims which shall be made with respect thereto.

16.0 PRODUCT APPROVAL

- 16.1 Wherever any Product (as defined in the General Conditions) is specified or shown by describing proprietary items, model numbers, catalogue numbers, manufacturer, trade names or similar reference, the Contractor obligates himself to submit his Tender and accept award of the Contract based upon the use of such Products. Use of such reference is intended to establish the measure of quality that the Engineer has determined as a requisite and necessary for the Work. Where two or more Products are shown or specified, the Contractor has the option of which to use.
- 16.2 For approval of Products other than those specified, Tenderers shall submit a request in writing at least ten Working Days prior to the Tender Closing Time. Requests shall clearly define and describe the Product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, performance data or other information necessary to completely describe the item. Approval by the Engineer will only be in the form of an addendum to the Specifications issued by the Engineer to each party receiving a set of Drawings and Specifications.
- 16.3 Approval of manufacturers and/or Products as noted are approved only insofar as they shall conform to the Specifications.

17.0 METRIC MEASUREMENTS AND CO-ORDINATION

- 17.1 The Work has been designed using metric dimensions. All linear dimensions have been expressed in millimetres in whole numbers (without decimal parts) and in metres with fractions thereof. The unit "mm" for millimetres has been deleted from the dimensioning of the drawings.
- 17.2 Within the Specifications, the unit symbols for all metric units are included. Also, the decimal parts have been included in the Specifications where Products have been "soft converted" (i.e., when the dimensions of the Product remain the same as they are at present but are expressed in metric equivalent units). Dimensions for spacing of Products have been expressed in millimetres in whole numbers in both the Specifications and Drawings.
- 17.3 As a general rule, all dimensioning of Products and equipment has been "soft converted". Exceptions to this rule are certain Products which are presently available in metric sizes and have been "hard converted"; i.e., where the Product itself is manufactured to rational metric dimensions.
- 17.4 Where "hard conversion" Products have been specified and are available they shall be supplied.
- 17.5 Care is required to be executed to ensure co-ordination of imperial and metric Products and in dimensioning and in this regard, the Contractor shall be entirely responsible for metric co-ordination of its Work.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

- 17.6 The Contractor will ensure that all persons employed on its Work know the metric system of measurement, and that they use metric references and measuring devices.

SCHEDULING, COORDINATION AND COMPLETION

- 17.7 Each Tenderer should complete and submit Schedule B with the Tender, showing the proposed critical path construction schedule for all Work under the Contract, to clearly demonstrate how the Tenderer will start the Work by December 13, 2010 and achieve Substantial Performance of the Work by: February 28, 2011 and with Total Performance of the Work by: March 31, 2011.
- 17.8 Time shall be of the essence for all purposes of this Contract and the performance of the Work.

18.0 EXCAVATION, SOIL SUPPORT AND WORK AREAS

- 18.1 The Work takes place at a number of locations and over a substantial area on the Site, and the Site is open to the public. The Vancouver Landfill Site contains a wide range of waste materials and the Contractor shall take appropriate care and shall implement measures to assess conditions at the Work Site locations and to take all necessary measures to assure the safety of workers, City staff and the public.
- 18.2 At locations where excavation is required, the removed material may not be suitable for use in backfilling and compaction. In such instances, the Contractor shall provide suitable clean and compactable fill material, and shall dispose of the originally removed material as directed by the Engineer.
- 18.3 The Contractor shall employ all work procedures necessary to minimize disturbance and inconvenience to operations at the Vancouver Landfill and shall strictly adhere to all construction procedures specified or referenced in the Tender Documents.
- 18.4 When interruption of gas at the Vancouver Landfill is necessary, the Contractor will be required to prepare and present a proposed schedule to the Engineer for approval and shall not proceed without approval. Where the Engineer determines that the requested timing of an interruption cannot be accommodated, the Contractor shall revise the proposed schedule to select times acceptable to the Engineer.

19.0 LABOUR RATES

- 19.1 Tenders should include Schedule F- Force Account Labour Rates. The Tenderer should insert the hourly rates for labour including allowances for taxes, assessments, benefits, small tools, overhead and profit as set out in section 8.0 [*Force Account*] of the Supplementary General Conditions.

20.0 EXPERIENCE

- 20.1 Tenderers are to confirm that they have suitable experience in the performance of this type of work. Each Tenderer should submit Schedule E on related projects completed including the following information:
- (a) a brief description of the project;
 - (b) location;
 - (c) contract value;
 - (d) start and completion dates;

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

- (e) completed on schedule or not;
- (f) name of project owner and representative to be contacted as reference with the reference's current phone number and email address; and
- (g) names and positions of Contractor's key personnel involved in the project.

21.0 LIST OF SUBCONTRACTORS AND SUPPLIERS

- 21.1 The Tenderer should insert in Schedule C to the Tender a list of Subcontractors and suppliers, providing name, address of place of business, and the portion of the Work to be done by the Subcontractor or the equipment or materials to be supplied by the Subcontractor.

22.0 NON-RESIDENT WITHHOLDING TAX

- 22.1 Tenderers are advised that, if they are not residents of Canada, the *Income Tax Act* (Canada) requires that a certain percentage of the monies otherwise payable to the Contractor be withheld by the City and remitted to the Receiver-General for Canada. The percentage required to be withheld and remitted varies depending among other things, on the country of residence, the provisions of any applicable treaties and the nature of the payment. Non-resident Tenderers may contact the Vancouver office of the Canada Revenue Agency, Taxation for further details. The City shall receive a credit under the Contract for monies withheld and remitted. The rights of the City in this matter are enlarged in the General Conditions.

23.0 RELEASE, INDEMNITY AND LIMITATION

- 23.1 The Tenderer:
- (a) agrees not to bring any claim against the City and any of its employees, advisors or representatives (including the Engineer) for damages in excess of an amount equivalent to the reasonable costs incurred by the Tenderer in preparing its Tender for any matter in respect of the Tender including without limitation in the event the City accepts a non-compliant Tender or otherwise breaches, or fundamentally breaches, the terms of this Tender; and
 - (b) waives any and all claims against the City and any of its employees, advisors or representatives (including the Engineer) for loss of anticipated profits or loss of opportunity if no agreement is made between the City and the Tender for any reason including without limitation in the event the City accepts a non-compliant Tender or otherwise breaches or fundamentally breaches the terms of this Tender.
- 23.2 The Tenderer now indemnifies and will protect and save the City and any of its employees, advisors or representatives (including the Engineer) harmless from and against all Losses, in respect of any claim or threatened claim by the Tenderer or any of its Subcontractors, subconsultants or materials or equipment suppliers alleging or pleading:
- (a) a breach of the Tender Contract by the City or any of its employees, advisors or representatives (including the Engineer);
 - (b) an unintentional tort, of the City or any of its employees, advisors or representatives (including the Engineer), occurring in the course of conducting this Invitation to Tender; or
 - (c) liability on any other basis related to the tendering process, bidding process or the Tender Contract.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART B - INSTRUCTIONS TO TENDERERS

24.0 DISPUTE RESOLUTION

24.1 Any dispute relating in any manner to this Invitation to Tender, except only disputes arising between the City and any Tenderer to whom the City has made an award of the Contract, will be resolved by arbitration in accordance with the *Commercial Arbitration Act* (British Columbia) amended as follows:

- (a) the arbitrator will be selected by the City's Director of Supply Chain Management; and
- (b) section 24.0 above will:
 - (i) bind the arbitrator, the Tenderer and the City; and
 - (ii) survive any and all awards made by the arbitrator.

25.0 CONFIDENTIALITY AND PRIVACY

25.1 The Tender, once submitted to the City, becomes the property of the City, which is a public body required under Information and Privacy Legislation to protect or disclose certain types of records according to certain statutory rules. The Tender, upon submission to the City, will be received and held in confidence by the City unless and to the extent that it is or must be disclosed pursuant to Information and Privacy Legislation or the award and evaluation process adopted by the City for this Invitation to Tender.

26.0 RELEASE OF INFORMATION RESTRICTED

26.1 No information concerning one Tenderer's Tender will be given out to the other Tenderers between the Closing Time and the time the Contract award (or decision not to award the Contract) is recommended to Council and then made by Council. Tenderers may attend the opening and registering of Tenders (referred to on the cover page of this ITT) in order to obtain information concerning the names of the other Tenderers who submitted a Tender and the Total Tender Price shown on each Form of Tender. However, no other information is anticipated to be disclosed by the City unless and until a report to Council recommending an award of Tender is submitted to the City Clerk.

27.0 ENQUIRIES

27.1 All enquiries prior to the Closing Time shall be directed to the contact person listed on the cover page of this ITT.

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART C - FORM OF TENDER**

Tender of:			
	(Name of Person, Firm, or Company)		
Business Address:			
Postal or Zip Code:			
Cheques Payable to/Remit to Address:			
Postal or Zip Code:			
Key Contact Person:			
Telephone No.:		Fax No.:	
E-mail:			
H.S.T Registration Number			
Dun & Bradstreet Number (if available)		WorkSafeBC Account Number	
City of Vancouver Business License Number		Incorporation Date	
<i>(If your office is located in Vancouver)</i>			

For the following work:

The Work for the Construction of the New Waterline at the Vancouver Landfill Project, as described in the Tender Documents, will include, but is not limited to the following major items:

- i) acting as Prime Contractor in the designated Work Site (the Work Site will be clearly marked out but essentially includes land on both sides of the alignment);
- ii) coordinating all trades, inspections, approvals, permits and insurance;
- iii) making all provisions for the continuous operation of the landfill (i.e. includes vehicle access, water supply, etc) during construction, including (see Figure 1):
 - A) Connection to the Delta watermain (i.e. crossing 72nd street, which is a paved road, and exposing Delta's water main). Delta will tap to its existing main. The Contractor will be responsible from the tapping tee and valve installed by Delta on 72nd street. The waterpipes need to be close to each other and they need to be exposed with enough room for

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART C - FORM OF TENDER

the connection crew to do its work. Therefore, the work will most likely have to be done during non-operating hours (10pm - 6am). Also, roadplates may have to be used in order to keep the road open while we wait for Delta to come and do the connection. A connection permit may be necessary and the Contractor will be required to obtain this permit. The City will pay Delta's connection bill (i.e. tapping the main and installing the tee and valve).

- B) Two (2) tie-ins will be made to the existing City of Vancouver on-site watermain (one by the equipment road and one by the paved road). This work can be done during daytime as long as enough notice is given (1 day, permission will be given unless extenuating circumstance are present) and as long as the service interruption is less than four hours in length.
- C) Coordination with the other contractor working in the area by the pump station. The area around the pump station has been given to another contractor while they upgrade the pump station and nobody is allowed into that area without prior permission. The other contractor will be expected to complete its work by mid November. If it will be necessary to work in this area while the pump station contractor is still working, then special coordination may be necessary. If necessary, the Engineer will set up a meeting between all parties and a mutually satisfactory agreement will be worked out.
- D) There are two (2) crossings of the existing paved road: one (1) by the flare station and again at the corner of the paved road (i.e. turn off to compost area). The work will most likely have to be done during non-operating hours (10pm-6am). If it cannot be done in one night, then the road must be made operational through the use of road plates so that the landfill does not have to shut down.
- E) Waterline in the pavement. The work may be done during non-operating hours (10pm-6am) or it may be done during other times as long as at least one lane is open to traffic. If the Contractor chooses to close one lane and do the work during operating hours, then the Contractor must hire at least two traffic control attendants to safely operate the one open lane during that time. The paved road must not be closed during operating hours, except for very short times (under five minutes in order to cross the road or drop off some material), and even these short times it can only be closed by using two traffic control attendants for which the Contractor is fully responsible.
- F) Waterline on the shoulder of the paved road. The work may be done during non-operating hours (10pm-6am) or it may be done during other times as long as no traffic issues are created (i.e. Contractor works entirely on the shoulder and no lanes are blocked). If the Contractor chooses to close one lane, then the Contractor must hire at least two traffic control attendants to safely operate the one open lane during that time. The paved road must not be closed during operating hours, except for very short times (under five minutes in order to cross the road or drop off some material), and even these short times it can only

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART C - FORM OF TENDER

be closed by using two traffic control attendants for which the Contractor is fully responsible.

- G) Coordinate with another contractor (gas contractor) who will need to cut across the paved road in order to make the gas connection for a separate project. This work will likely occur during the same period as the waterline construction. Because of scheduling uncertainty, it is unknown whether the gas connection will occur first, or whether the waterline will go in first in that section; however, it must be coordinated that there are no scheduling conflicts in that area (which should not be difficult since that is one point in a long stretch of work). The engineer will talk to both contractors and advise them of their respective timelines to make sure that no conflicts occurs, or work towards a mutually satisfactory solution should a conflict occur. Because the crossing pipes are going to be in proximity to each other, the water pipe should be protected with a steel sleeve (see drawing notes in the appendix for details).
- H) Demolition road and rock road (or shoulder of paved road after compost operations) sections. These sections are expected to see only occasional traffic. The demolition road traffic would typically be in the form of heavy equipment such as compactors and bulldozers traveling for maintenance. The rock road traffic would consist of operational personnel or contractors accessing the stock pile areas or traveling to that side of the landfill, however this is expected to be relatively rare because that side of the landfill is not expected to be used during the period of the Work (the traffic is really expected to diminish to almost zero east of the lake because only some technicians use those areas). Therefore, the Contractor will be able to work relatively freely in these sections.
- iv) supplying and installing piping, valves and specified equipment (please note that the City wishes Tenderers to bid on the construction of approximately 2,300m of 300mm waterline and all associated components and then supply an optional price for the remaining approximately 440m, the stoppage point is shown on sheet 7 as "3+280", also note that the water meter and back flow preventer chamber(s) and inside components will be supplied by the City in practical proximity to where they need to go into the ground. Refer to Appendix 8 for details of this procurement being carried out by the City in order to see exactly what the City will be supplying on site. The Contractor will be responsible for installing these components which will probably require a crane);
- v) testing, flushing and chlorinating the complete system;
- vi) providing any additional cleanup as required;
- vii) delivering final documentation;
- viii) delivering a complete, finished and operational waterline for the City of Vancouver Landfill site. (please note that the City will choose whether approximately 2300m or approximately 2740m of watermain is to be

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

constructed, but whichever length is chosen the waterline must be operational and that means that if the shorter length is chosen then the joint restraints shown for the easterly end at "3+720" still need to be installed at "3+280" as well as the plug);

The work to be done by the Contractor for this Contract shall include overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as specified in the Tender Documents.

(All of the above collectively hereinafter referred to as the "Work".)

To be Initialled at Tender Opening:

Director of Supply Chain Management or designate

Witness

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART C - FORM OF TENDER**

1.0 TOTAL TENDER PRICE AND SCHEDULE

Having carefully read and examined the Tender Documents, including without limitation the Invitation to Tender, the Instructions to Tenderers, the Form of Tender, the Form of Agreement, the General Conditions, the Supplementary General Conditions, the Appendices, the Specifications and Drawings, and the Addenda issued as supplements to the aforementioned documents (if any), the undersigned hereby offers to complete the Work covered by the Tender Documents and to furnish all plant, tools, equipment, labour, Products, material and supervision necessary to execute the Work for the Total Tender Price of:

Contract No. PS10249 - Construction of New Waterline at the Vancouver Landfill
Total Tender Price
\$ _____ in lawful money of Canada, including H.S.T. and all other taxes and fees.

Accordingly, the undersigned offers to complete the Work according to the following schedule:

- (a) Work will begin by December 13, 2010.
- (b) Substantial Performance of the Work by: February 28, 2011.
- (c) Total Performance of the Work will be achieved by: March 31, 2011;

The undersigned confirms that the above stated price includes all Federal, Provincial, and Municipal taxes, all permits and inspection costs, and all customs and excise import duties and WorkSafeBC assessments relating to the Work in force at this date.

If a Schedule of Quantities and Prices forms part of this Tender, and if there is any conflict between the Total Tender Price entered above and the correct summation of the lump sum prices, provisional sums and/or correct extensions of the unit prices and approximate quantities entered in the aforesaid Schedule, the said correct summation shall take precedence.

2.0 NOTICE OF AWARD

The undersigned agrees that this Tender will be irrevocable and open for acceptance by the City for a period of sixty (60) calendar days from the day following the Tender Closing Time, even if the Tender of another Tenderer is accepted by the City. If within this period the City delivers a written notice by which the City accepts the subject Tender (the "**Notice of Award**"), the undersigned will, within ten (10) Working Days of the receipt of the Notice of Award, deliver to the City:

- (a) a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Total Tender Price, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the City;

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

- (b) a detailed Construction schedule, as required by section GC.22 of the General Conditions;
- (c) a "clearance letter" indicating that the Tenderer is in WorkSafeBC compliance; and
- (d) a Certificate of insurance or certified copy of the insurance policies as specified in section GC.53 of the General Conditions indicating that all such insurance coverage is in place;

3.0 NOTICE TO PROCEED

The undersigned agrees that upon City acceptance of the submissions of section 2.0 above, the City will deliver a Notice to Proceed by which the undersigned will:

- (a) commence the Work within two (2) Working Days of the receipt of the written Notice to Proceed or such longer time as may be otherwise specified in the Notice to Proceed;
- (b) sign the Contract Documents (including the Prime Contractor Agreement referred to in section GC.7 of the General Conditions) and return them to the City within five (5) Working Days after receiving the Contract Documents from the City; and
- (c) issue, post, and copy the Owner on the Notice of Project as and when required under subsection (e) of section GC.7 of the General Conditions.

4.0 CONDITIONS

The undersigned understands and agrees that:

- (a) If the undersigned receives written Notice of Award of this Contract and, contrary to sections 2.0 and 3.0 above of this Form of Tender, the undersigned:
 - (i) fails or refuses to deliver the documents as specified by sections 2.0 and 3.0 of this Form of Tender; or
 - (ii) fails or refuses to commence the work as required by the Notice to Proceed,then such failure or refusal will be deemed to be a refusal to enter into the Contract and the City may, on written notice to the undersigned, award the Contract to another party. It is further agreed that, as full compensation on account of damages suffered by the City because of such failure or refusal, the Bid security shall be forfeited to the City in the amount equal to the lesser of:
 - (iii) the face value of the Bid security; and
 - (iv) the amount by which the Total Tender Price is less than the amount for which the City contracts with another party to perform the Work.
- (b) The lowest submitted tender will not necessarily be accepted. The City reserves the right to reject this Tender at any time without further explanation or to accept any tender considered advantageous to the City.
- (c) The Schedules attached to this Form of Tender form a part hereof.

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

5.0 AMENDMENTS/QUESTIONS & ANSWERS

Acknowledgment of receipt of the following addenda to the Tender Documents is hereby made:

Amendment No.
Questions & Answers No.

The undersigned agree that they thoroughly understand the terms and conditions contained therein.

6.0 CERTIFICATION

The undersigned hereby certify that our Tender complies in all respects with the Tender Documents.

7.0 LABOUR

The above stated price is based on the Work under the Contract being performed by union/non-union labour. (Delete "union" or "non-union" as applicable).

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

SIGNED and SEALED this _____ day of _____, 2010 by the duly authorized officers of the Tenderer:

Tenderer's Legal Name or Registered Corporate Name and Address:

(Seal)

Per: _____

Per: _____

Witness' Name, Signature and Address where Tenderer is a Proprietorship or Partnership:

(Signature)

(Name)

(Address)

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

SCHEDULE A

Schedule of Quantities and Prices

The Tenderer submits the following lump sums and/or unit prices for the items listed below. The lump sums and unit prices shall include the supply and installation of all labour, materials and services, together with the Tenderer's overhead and profit and all fees and taxes, but shall not include the HST. The HST shall be shown separately. The Tenderer is required to verify the extent of the Work in relation to this Contract. Tenderers should review GC.3 (Personal Examination) of the General Conditions.

Mandatory Work Pricing Table:

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Price per Item
1.0	Up to "3+280" fully functional (includes end restraint)	N/A	Lump Sum	Lump Sum	\$
HST 12%					\$
Total Tender Price					\$

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

Optional Work Pricing Table (i.e. the City will decide whether or not to pursue this option and let the Contractor know):

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Price per Item
1.0	Section from "3+280" to "3+720" (if selected, only one end restraint will be necessary)	N/A	Lump Sum	Lump Sum	\$
HST 12%					\$
Total Optional Price					\$

Tenderers should also fill out this table:

Per meter cost difference between using imported conventional and excavated existing select fill as described in Appendix 10 - Site Bedding And Backfill Requirements	
Per meter cost difference between using light weight and conventional fill as described in Appendix 10 - Site Bedding And Backfill Requirements	

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

**SCHEDULE B
Preliminary Construction Schedule**

Please clearly define time requirements. If necessary, please add an attachment to this Schedule. Each such additional page should be clearly marked "CONTRACT No. PS10084, FORM OF TENDER - SCHEDULE B", and should be signed by the Tenderer.

The following table outlines the suggested list and order of major work items. The Tenderer may create an additional Schedule for consideration, by varying the items, order or format, as long as the major work items and time requirements are clearly outlined.

		Nov					Dec					Jan					Feb					Mar					Apr				
No.	Major Work Items	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25				
1	Mobilization																														
2	Locating and uncovering Delta's watermain (supply) at 72 nd street so that Delta can do the connection																														
3	Waiting for Delta to do the connection																														
4	Crossing 72 nd Street																														
5	Crossing Delta's ditch																														
6	Restoring 72 nd street																														
7	Crossing Terasen gas main																														
8	Section by pump station up to the meter and back flow																														

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

		Nov			Dec			Jan			Feb			Mar			Apr		
	prevention chamber(s) (includes leachate pipe crossing)																		
9	Installing the meter and back flow prevention chamber(s) and connecting to it																		
10	Section from meter and back flow prevention chamber(s) to the gas plant ("1+047.5" to "1+653" on drawings)																		
11	Paved road section ("1+653" to "1+849" on drawings, indicate if work is occurring during non-operating hours)																		
12	Section on shoulder of paved road ("1+849" to "2+174" on drawings, indicate if work is occurring during non-operating hours)																		
13	Crossing paved road ("2+174" to "2+220" on drawings, indicate if work is occurring during non-operating hours)																		

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

		Nov			Dec			Jan			Feb			Mar			Apr		
14	Section in between the road bends ("2+220" to "2+830" on drawings)																		
15	Section from road bend up to Phase 1 ("2+830" to "3+280" on drawings)																		
16	Optional section to be done only if selected by the City: Phase 1 section (i.e. from "3+280" until "3+720")																		
17	Testing the waterline																		
18	Documentation																		
19	Final Cleanup & Demobilization																		

Tenderers to also fill out this table:

Number of work shifts during daylight (7am - 6pm) to complete main part (up to "3+280")	
Number of work shifts during non-operating hours (10pm - 6am) to complete main part (up to "3+280")	
Number of work shifts during daylight (7am - 6pm) to complete optional part (from "3+280" to "3+720")	
Number of work hours per shift (excludes breaks)	

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE C

Subcontractors and Suppliers

1.0 SUBCONTRACTORS

The Tenderer should list all Subcontractors that it intends to use on this project, and the work that each will be undertaking. All Subcontractors who will perform any portion of the Work should be listed.

Subcontractor	Address	Type Of Work

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE C (Cont'd)

Subcontractors and Suppliers

2.0 SUPPLIERS

The Tenderer should list all major suppliers and manufacturers that it intends to use on this project, including documentation on all materials to be used in any portion of the Work.

Supplier	Manufacturer	Address	Item

Additional pages may be attached to this page. Each such additional page should be clearly marked "CONTRACT No. PS10249, FORM OF TENDER - SCHEDULE C", and should be signed by the Tenderer.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE D

Methodology

GENERAL METHODOLOGY

The Tenderer should describe the methodology to be used in completing the Work. This description should include the equipment that will be used (especially the number and size of excavators and the number and size of dump trucks) and a detailed operating plan with respect to its activities, including expected Work schedule, sequencing of Work and expected daily production.

PLEASE NOTE:

The Contractor's proposed methodology shall be solely provided for the benefit of the City in evaluating the Contractor's understanding of the Work and site constraints (as identified in section 18.0 *[Scheduling, Coordination and Completion]* of the Instruction to Tenderers). The Tenderer agrees that the methodology shall not form a part of the Contract Documents and shall not be used to interpret the Contract Documents, except as expressly stated herein.

If the Contractor's proposed methodology does not achieve the requirements of the Contract Documents, or if any assumptions made by the Contractor turn out to be incorrect, the Contractor shall be allowed to adjust his proposed methodology for completing the Work; however, such changes shall not be a cause for claiming extra compensation from the City. For certainty, any changes to the Contractor's proposed methodology for completing the Work and meeting the REQUIREMENTS OF THE CONTRACT DOCUMENTS shall be the sole responsibility of the Contractor and completed at the Contractor's expense.

Additional pages may be attached to this page. Each such additional page should be clearly marked "CONTRACT No. PS10249, FORM OF TENDER - SCHEDULE D", and should be signed by the Tenderer.

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

SCHEDULE E

Tenderer's Experience with Related Work

The Tenderer should list any comparable projects which it has undertaken by providing the following information:

Description of Project: _____

Location of Project: _____

Contract Value (Canadian Funds): \$ _____

Start and Completion Dates: _____

Completed on Schedule? Yes/No *(Circle Correct Response)*

Name of Contract Owner: _____

Name of Project Reference: _____

Current Telephone Number and E-mail of Project Reference:

Names of Key Personnel and Subcontractors:

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE E (Cont'd)

Tenderer's Experience with Related Work

Description of Project: _____

Location of Project: _____

Contract Value (Canadian Funds): \$ _____

Start and Completion Dates: _____

Completed on Schedule? Yes/No *(Circle Correct Response)*

Name of Contract Owner: _____

Name of Project Reference: _____

Current Telephone Number and E-mail of Project Reference:

Names of Key Personnel and Subcontractors:

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE E (Cont'd)

Tenderer's Experience with Related Work

Description of Project: _____

Location of Project: _____

Contract Value (Canadian Funds): \$ _____

Start and Completion Dates: _____

Completed on Schedule? Yes/No *(Circle Correct Response)*

Name of Contract Owner: _____

Name of Project Reference: _____

Current Telephone Number and E-mail of Project Reference:

Names of Key Personnel and Subcontractors:

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE F

Force Account Labour Rates

(Refer to Part F, section 8.0 [*Force Account*] of the Supplementary General Conditions)

Job Classification	Regular Rate	Overtime Rate

Additional pages may be attached to this page and/or separate numbered documents such as specifications, descriptive literature and drawings may be submitted with this Schedule. Each such additional page and/or separate document should be clearly marked "**CONTRACT No. PS10249, FORM OF TENDER - SCHEDULE F**", and should be signed by the Tenderer.

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER**

SCHEDULE G

Consent of Surety

PROJECT

Should it be required, we the undersigned Surety Company do hereby consent and agree to become bound as sureties in an approved Contract Performance Bond and Labour and Material Payment Bond each in the amount of 50% of the awarded Total Tender Price for the fulfillment of the CONTRACT and for the performance of the Work as described herein, which may be awarded to _____ at the price set forth in the attached Tender, which Performance Bond and Labour and Material Payment Bond we understand are to be filed with the City of Vancouver within ten (10) Working Days of receipt of Notice of Award of the CONTRACT.

We hereby further declare that the undersigned Surety Company is legally entitled to do business in the Province of British Columbia and that it has a net worth over and above its present liabilities and the amounts herein set forth.

THE COMMON SEAL OF _____
was hereto affixed in the presence of:

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE H

Tenderer's Proposed Variations

The Tenderer should make a full and complete statement and description of any proposed variations to the Tender Documents.

Additional pages may be attached to this page and/or separate numbered documents such as specifications, descriptive literature and drawings may be submitted with this Schedule. Each such additional page and/or separate document should be clearly marked "**CONTRACT No. PS10249, FORM OF TENDER - SCHEDULE H**", and should be signed by the Tenderer.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE I

Preliminary Traffic Management Plan

Tenderers are to describe in this Schedule their proposed Traffic Management Plan, articulating how the requirements and constraints described in Part E of the General Conditions, section GC.36 [*Traffic Control*] will be met or exceeded.

Additional pages may be attached to this page and/or separate numbered documents such as specifications, descriptive literature and drawings may be submitted with this Schedule. Each such additional page and/or separate document should be clearly marked "**CONTRACT No. PS10249, FORM OF TENDER - SCHEDULE H**", and should be signed by the Tenderer.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART C - FORM OF TENDER

SCHEDULE J

Preliminary Site Specific Safety and Health Plan

Tenderers are to describe in this Schedule their Preliminary Site Specific Safety and Health Plan, articulating how the requirements and constraints described in Part F of the Supplementary General Conditions, section 18.0 *[Health and Safety]* will be met or exceeded.

Additional pages may be attached to this page and/or separate numbered documents such as specifications, descriptive literature and drawings may be submitted with this Schedule. Each such additional page and/or separate document should be clearly marked "**CONTRACT No. PS10249, FORM OF TENDER - SCHEDULE H**", and should be signed by the Tenderer.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART C - FORM OF TENDER

Schedule K



CERTIFICATE OF EXISTING INSURANCE
TO BE COMPLETED AND APPENDED TO THE PROPOSAL/TENDER

Section 2 through 8 – to be completed and executed by the Insurer or its Authorized Representative

1. THIS CERTIFICATE IS ISSUED TO: City of Vancouver, 453 W 12th Avenue, Vancouver, BC, V5Y 1V4
and certifies that the insurance policy (policies) as listed herein has/have been issued to the Named Insured and is/are in full force and effect.
2. NAMED INSURED (must be the same name as the proponent/bidder and is either an individual or a legally incorporated company)

BUSINESS TRADE NAME or DOING BUSINESS AS _____

BUSINESS ADDRESS _____

DESCRIPTION OF OPERATION _____

3. PROPERTY INSURANCE (All Risks Coverage including Earthquake and Flood)

INSURER _____	Insured Values (Replacement Cost) -
TYPE OF COVERAGE _____	Building and Tenants' Improvements \$ _____
POLICY NUMBER _____	Contents and Equipment \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____

4. COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)

Including the following extensions:	INSURER _____
✓ Personal Injury	POLICY NUMBER _____
✓ Property Damage including Loss of Use	POLICY PERIOD From _____ to _____
✓ Products and Completed Operations	Limits of Liability (Bodily Injury and Property Damage Inclusive) -
✓ Cross Liability or Severability of Interest	Per Occurrence \$ _____
✓ Employees as Additional Insureds	Aggregate \$ _____
✓ Blanket Contractual Liability	All Risk Tenants' Legal Liability \$ _____
✓ Non-Owned Auto Liability	Deductible Per Occurrence \$ _____

5. AUTOMOBILE LIABILITY INSURANCE for operation of owned and/or leased vehicles

INSURER _____	Limits of Liability -
POLICY NUMBER _____	Combined Single Limit \$ _____
POLICY PERIOD From _____ to _____	If vehicles are insured by ICBC, complete and provide Form APV-47.

6. ☐ UMBRELLA OR ☐ EXCESS LIABILITY INSURANCE Limits of Liability (Bodily Injury and Property Damage Inclusive) -
- | | |
|-----------------------------------|---------------------------------|
| INSURER _____ | Per Occurrence \$ _____ |
| POLICY NUMBER _____ | Aggregate \$ _____ |
| POLICY PERIOD From _____ to _____ | Self-Insured Retention \$ _____ |

7. PROFESSIONAL LIABILITY INSURANCE

INSURER _____	Limits of Liability
POLICY NUMBER _____	Per Occurrence/Claim \$ _____
POLICY PERIOD From _____ to _____	Aggregate \$ _____
	Deductible Per Occurrence/Claim \$ _____

If the policy is in a "CLAIMS MADE" form, please specify the applicable Retroactive Date: _____

8. OTHER INSURANCE

TYPE OF INSURANCE _____	Limits of Liability
INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____
TYPE OF INSURANCE _____	Limits of Liability
INSURER _____	Per Occurrence \$ _____
POLICY NUMBER _____	Aggregate \$ _____
POLICY PERIOD From _____ to _____	Deductible Per Loss \$ _____

SIGNED BY THE INSURER OR ITS AUTHORIZED REPRESENTATIVE

PRINT NAME OF INSURER OR ITS AUTHORIZED REPRESENTATIVE, ADDRESS AND PHONE NUMBER

Dated _____

PS10084 - Certificate of Existing Insurance

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART D - FORM OF AGREEMENT**

THIS AGREEMENT is made as of the ____ day of _____, 2010.

BETWEEN:

CITY OF VANCOUVER

having an office at 453 West 12th Avenue
Vancouver, British Columbia, V5Y 1V4

(hereinafter referred to as the "**Owner**")

OF THE FIRST PART

AND:

[NTD: Insert Successful Tenderer Name, Address]

(hereinafter referred to as the "**Contractor**")

OF THE SECOND PART

WHEREAS:

- A. The Owner has appointed the Wedler Engineering LLP (hereinafter referred to as the "**Engineer**" for the purposes of this Contract) to act as its sole and exclusive agent for purposes of managing and administering the performance of the Work by the Contractor in accordance with the Specifications, Drawings and other Contract Documents.
- B. The Contractor has agreed with the Owner to perform the Work and to furnish all plant, tools, equipment, labour, Products, material and supervision necessary therefor as hereinafter set forth.

NOW THEREFORE THIS AGREEMENT WITNESSES as follows:

1.0 ROLE OF THE ENGINEER

The Owner hereby designates and appoints the Engineer as its sole and exclusive agent for the purpose of managing and administering for the Owner under the Contract as set out in the Contract Documents. Unless otherwise notified in writing by the Owner to the Contractor, the agency of the Engineer shall continue for the entire duration of this Contract including the period of any guarantees or warranties given by or through the Contractor. In the event of the revocation in writing of the agency of the Engineer by the Owner, the Engineer shall have no further authority under this Contract, except as may be specifically designated in writing by the Owner and agreed to in writing by the Engineer, and all references to the Engineer in this Contract shall thereafter be deemed to be a reference to the Owner or to such other person designated in writing to the Contractor. The Engineer may from time to time delegate to a representative the performance of or the authority to perform the duties, responsibilities, rights and obligations of the Owner in respect of which the Engineer has been designated and appointed its sole and exclusive agent.

2.0 WORK TO BE DONE

The Contractor and the Owner hereby agree that the Products to be furnished and the Work to be done by the Contractor are to:

- (a) Furnish all materials, equipment, Products, labour and services, and supervision necessary for the Work. Any materials, equipment, products, labour and services, and supervision performed

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART D - FORM OF AGREEMENT

by the Engineer or the Engineer's representative with regard to the work required in these Contract Documents shall be in accordance with the requirements of the Contract Documents.

- (b) All of the Work shall be done, performed or furnished by the Contractor in a proper and workmanlike manner and in accordance with the requirements of the Contract Documents.

3.0 CONTRACT DOCUMENTS

The following is a list of the constituents of the Contract Documents referred to in this Agreement. This list is subject to subsequent amendments in accordance with the provisions of the Contract Documents. Terms used in the Contract Documents which are defined in GC.1. - DEFINITIONS shall have the meaning designated in those definitions.

- (a) **Form of Agreement**
- (b) **Invitation to Tender**
- (c) **Instructions to Tenderers**
- (d) **Form of Tender**, including:
- (i) Schedules A, B, C, D (but only to the extent expressly stated therein), E, F, G, H, I, J, and K
 - (ii) General Conditions
 - (iii) Supplementary General Conditions
- (e) **Appendices**, including:
- (i) Prime Contractor Agreement Form
 - (ii) Performance Bond
 - (iii) Labour and Material Payment Bond
- [NTD: List all Amendments, etc. issued by the City]**
- (f) **Specifications**
- (g) **Design Drawings and drawing notes**

Drawing No.	Description
COVER SHEET	DRAWING LIST AND SITE LOCATION
SHEET 1	WATERWORKS PLAN AND PROFILE CHAINAGE 0+980 TO 1+330
SHEET 2	WATERWORKS PLAN AND PROFILE CHAINAGE 1+330 TO 1+680
SHEET 3	WATERWORKS PLAN AND PROFILE CHAINAGE 1+680 TO 2+030
SHEET 4	WATERWORKS PLAN AND PROFILE CHAINAGE 2+030 TO 2+380
SHEET 5	WATERWORKS PLAN AND PROFILE CHAINAGE 2+380 TO 2+730
SHEET 6	WATERWORKS PLAN AND PROFILE CHAINAGE 2+730 TO 3+080
SHEET 7	WATERWORKS PLAN AND PROFILE CHAINAGE 3+080 TO 3+430
SHEET 8	WATERWORKS PLAN AND PROFILE CHAINAGE 3+430 TO 3+780
SHEET 9	DETAILS AND NOTES
SHEET 10	DRAINAGE DITCH CROSSING DETAILS
SHEET 9 - D3155	TYPICAL WATER METER CHAMBER

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART D - FORM OF AGREEMENT

- (h) Watermain Supply & Installation Standard Detailed Drawings
- (i) Geotechnical Report
- (j) Site Bedding And Backfill Requirements

The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intent and spirit of the Contract Documents is that the Contractor is required to complete the Work in every detail within the times and for the purposes designated, and that the Contractor shall furnish and do any and everything necessary for such purposes notwithstanding any omission from the Contract Documents.

4.0 SCHEDULE OF WORK

- 4.1 The Contractor will commence the Work in accordance with the Notice to Proceed. The Contractor will proceed with the Work diligently, will perform the Work in accordance with the construction schedules as required by the Contract Documents and will achieve Substantial Performance of the Work on or before February 28, 2010 and Total Performance of the Work by March 31, 2011 (the "**Contract Time**") subject to the provisions of the Contract Documents for adjustments to the Contract Time.
- 4.2 Time shall be of the essence in this Contract.

5.0 PAYMENT

5.1 Amount to be Paid

The Owner agrees, subject to additions and deductions for variation in the Work and to quantities utilized as may be agreed upon in writing, and to the provisions of this Agreement, to pay to the Contractor, the sum of \$ _____ **[state Total Tender Price]** (the "**Contract Amount**"), including all Taxes and Fees, in Canadian funds for the performance of the Work under this Contract.

5.2 Application for Payment

- (a) During progress of the Work, the Contractor may make application to the Engineer for payment, in the form approved by the Engineer, on or before the last day of every month for Work done to the date of the application, provided that the Engineer may at any time require as a condition of payment the submission of documentation set out in GC.60.
- (b) On Substantial Performance being certified in accordance with the procedures set out in subsection (b) of GC.60 and the value of the certified deficiencies being agreed upon, the Contractor may make application to the Engineer for the balance of all monies then owing under this Contract to the Contractor, submitting also such documentation as is required by GC.60.
- (c) On correction and completion of all deficient work listed on the Certificate of Substantial Performance, the Contractor shall submit his application to the Engineer for final payment, accompanied by the documentation required by GC.60.

5.3 Payment

The payment for any Work under this Contract which shall be made to the Contractor by the Owner shall not be construed as an acceptance of any Work as being in accordance with the

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART D - FORM OF AGREEMENT

Contract Documents. The issuance of the Certificate of Total Performance shall constitute a waiver by the Contractor of all claims except those previously made in writing and still unsettled, if any, and specified by the Contractor in its application for final payment pursuant to subsection 5.2(c) above.

Payments to the Contractor will be made by the Owner as follows:

- (a) On or before the fifth day of the month following the Contractor's application for payment, the Engineer will adjust, if necessary, and certify the Contractor's progress estimate. Where the Engineer makes any changes to the amount submitted by the Contractor for payment, the Contractor shall be notified in writing within five Working Days and shall be given the opportunity to defend the Contractor's application without delay.
- (b) Within 30 calendar days of the date the Owner receives any Engineer certified application for payment the Owner will make payment to the Contractor up to the value of the completed Work as certified by the Engineer less a *Builders Lien Act* holdback amount equal to ten percent of such certified value and less the aggregate of any previous payments all in accordance with the Contract and with the *Builders Lien Act*.
- (c) The Owner will, in addition to other holdbacks as provided by the Contract Documents, be entitled to deduct and retain from payments otherwise due to the Contractor, a Maintenance Security holdback in the amount of five percent of the Contract Amount to cover the cost of corrections to the Work that may be required under General Condition 51. The balance of the Maintenance Security not required under GC.51., and the remaining at the end of the warranty period, shall be paid without interest to the Contractor.

The Contractor may substitute a letter of credit, in the amount of the Maintenance Security, in a form and from a financial institution acceptable to the Owner, for the Maintenance Security holdback.

- (d) Where the Engineer has issued a certificate of completion in respect of a subcontract to which the Contractor was a party, and where 55 calendar days have elapsed since the issuance of the certificate without any claims of builders lien being filed which arose under the subcontract, the Owner will release to the Contractor the *Builders Lien Act* holdback amount retained for such subcontract work.
- (e) After 55 calendar days have elapsed from the date of the Certificate of Substantial Performance issued in accordance with GC.60 and upon the Engineer's satisfaction that no encumbrance, lawful claim or lien exists, the Owner will, within a further ten calendar days, make payment to the Contractor of all monies due under this Contract at the date of Substantial Performance, including the release of all remaining *Builders Lien Act* holdback amounts, but retaining at least twice the estimated value of the certified deficiencies.
- (f) Upon the issuance of the Certificate of Total Performance, the Owner will make a final payment of all monies owing to the Contractor under the Contract, except any Maintenance Security holdback in accordance with subsection (c) above.

5.4 Interest on Overdue Payments

Where payment is not made in accordance with the payment provisions contained in subsection 5.3 above, the overdue amount shall bear interest at the lending rate of the Bank of Montreal

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART D - FORM OF AGREEMENT

for its prime commercial customers and such interest shall be calculated from and after the date upon which such payment was due and shall accrue until the date that payment of the overdue amount together with interest is made. This interest obligation on the Owner shall constitute the sole remedy of the Contractor for late payment.

6.0 DELAYS

6.1 Liquidated Damages for Late Completion

If the Contractor fails to complete the Work by the Contract Time as set out in section 4.0 above, as may be adjusted pursuant to the provisions of the Contract Documents, then the Owner may deduct from any monies owing to the Contractor for the Work:

- (a) as a genuine pre-estimate of the Owner's increased costs for delay of sequential construction tasks, an amount of \$2,000 per day or pro rata portion for each calendar day that completion of the Work is achieved after the Contract Time; plus
- (b) all direct out-of-pocket costs such as costs for safety, security, or equipment rental, reasonably incurred by the Owner as a direct result of such delay.

6.2 If monies owing to the Contractor are less than the total amount of liquidated damages owed by the Contractor to the Owner under (a) above then any shortfall shall be immediately, upon written notice from the Owner, be due and payable by the Contractor to the Owner.

7.0 NOTICES

Unless otherwise specifically provided in the Contract Documents, all notices, instructions, orders or other communications in writing shall be conclusively deemed to have been given to the Contractor if delivered to the Contractor personally (or in the case of a company, to any of its officers or directors personally), or to the Contractor's superintendent or foreman, or delivered by mail to the Contractor at the business address of the Contractor set forth below:

Contractor:

[INSERT NAME OF CONTRACTOR]
[insert address]

Unless otherwise specifically provided in the Contract Documents all notices, requests, claims or other communications by the Contractor shall be in writing and shall be given by personal delivery or by registered mail addressed to the:

Owner:

CITY OF VANCOUVER
453 West 12th Avenue
Vancouver, British Columbia
V5Y 1V4

Attention: Jerry Sobejko, CE II

Either of the said addresses may be changed from time to time by written notice to the other party.

Any such notices, instructions, orders, requests or other communications sent by mail as aforesaid shall be deemed to have been given on the second Working Day following the mailing thereof, unless there is a postal service strike.

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART D - FORM OF AGREEMENT**

8.0 SUCCESSORS AND ASSIGNS

This Contract shall be binding upon and shall enure to the benefit of the successors and permitted assigns of the respective parties hereto.

IN WITNESS WHEREOF the parties hereto have set their hands and seals as of the day and year first above written.

CITY OF VANCOUVER

BY: _____
Jim Bornholdt - Director of Supply Chain Management.

BY: _____
Peter Judd - General Manager of Engineering

[INSERT CONTRACTOR'S NAME]

By: _____

Print Name & Title

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

TABLE OF CONTENTS

GC NO.		Page
GC.1	DEFINITIONS	3
GC.2	INTERPRETATION	4
GC.3	PERSONAL EXAMINATION	5
GC.4	CONTRACT AMOUNT	6
GC.5	PERFORMANCE BOND.....	6
GC.6	LABOUR AND MATERIALS PAYMENT BOND	6
GC.7	WORKSAFE BC COVERAGE AND CONTRACTOR TO BE PRIME CONTRACTOR	6
GC.8	LABOUR	8
GC.9	COMMENCEMENT AND COMPLETION OF THE WORK	8
GC.10	DELAY IN PROGRESS OF THE WORK	9
GC.11	SPECIFICATIONS AND DRAWINGS	11
GC.12	SHOP DRAWINGS.....	12
GC.13	RECORD PLANS.....	12
GC.14	ENGINEER SOLE JUDGE	12
GC.15	ENGINEER'S ABSENCE	12
GC.16	ACCESS AND ASSISTANCE	13
GC.17	NOTICES TO CONTRACTOR	13
GC.18	CONTRACTOR'S SUPERINTENDENT AND EMPLOYEES	13
GC.19	INSPECTION OF WORK / QUALITY CONTROL	14
GC.20	WEEKLY REPORT	14
GC.21	WEEKLY MEETINGS	14
GC.22	CONSTRUCTION SCHEDULE	14
GC.23	MAINTENANCE OF SCHEDULE	15
GC.24	EMERGENCIES	16
GC.25	SUBCONTRACTORS AND SUPPLIERS	16
GC.26	CONTRACTOR'S PLANT AND UTILITIES	16
GC.27	PLANT, LABOUR AND MATERIALS.....	16
GC.28	MATERIAL AND EQUIPMENT SUPPLIED BY THE CONTRACTOR	17
GC.29	MATERIAL IN IMPERIAL UNITS.....	17
GC.30	SUPPLY OF MATERIALS BY THE CITY.....	17
GC.31	TEMPORARY STRUCTURES.....	17
GC.32	WORK AREAS AND CONTRACT LIMITS.....	18
GC.33	OFFICE FACILITIES FOR THE ENGINEER [Intentionally Deleted]	18
GC.34	STORAGE AREAS	18
GC.35	HOURS OF WORK	18
GC.36	TRAFFIC CONTROL.....	18
GC.37	PUBLIC CONVENIENCE	19
GC.38	ACCESS TO EXISTING STRUCTURES.....	19
GC.39	PROTECTION OF WORK AND PROPERTY	19
GC.40	FIRE, SECURITY AND SAFETY REGULATIONS.....	20
GC.41	OVERLOADING.....	20
GC.42	DRAINAGE.....	20
GC.43	CLEANING UP.....	21
GC.44	SAFEGUARDING EXISTING PROPERTY	21
GC.45	EXISTING UTILITIES.....	21
GC.46	DUST CONTROL	21
GC.47	ALTERATIONS, EXTRAS, DEDUCTIONS & CLAIMS	21
GC.48	ERRORS BY CONTRACTOR	22

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.49	TESTING OF MATERIALS.....	22
GC.50	DEFECTIVE WORK.....	22
GC.51	WARRANTY	22
GC.52	CONTRACTOR'S LIABILITY.....	23
GC.53	INSURANCE BY THE CONTRACTOR	24
GC.54	WORKSAFE BC ASSESSMENTS.....	26
GC.55	CLAIMS FOR WAGES	26
GC.56	LIENS	27
GC.57	PATENT INFRINGEMENT.....	27
GC.58	MONEY DUE TO OWNER.....	27
GC.59	ASSIGNMENT.....	27
GC.60	CERTIFICATES AND PAYMENTS.....	28
GC.61	TERMINATION OF CONTRACT WITHOUT DEFAULT OF CONTRACTOR	30
GC.62	TERMINATION OF CONTRACT FOR CONTRACTOR'S DEFAULT	30
GC.63	SUBMITTALS	31
GC.64	NON-RESIDENT WITHHOLDING TAX	31
GC65	TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS	32

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.1 DEFINITIONS

Where used in the Form of Agreement, Invitation to Tender, Instructions to Tenderers, Form of Tender (including the Schedules), Bonds, General Conditions, Supplementary General Conditions, Specifications and Drawings, or Addenda (if any), or any other documents forming part of the Contract Documents:

"Abnormal Weather" means temperature, precipitation, wind, or other weather condition which, in any two week period, differs from the statistical average for that condition in that period by more than one standard deviation, calculated based on relevant data from Environment Canada, but for further certainty, excludes any isolated weather-related act of God such as by way of example only and without limitation, a hurricane or flood;

"Approved Equipment Rental Rate Guide" means the publication (as revised from time to time) which is listed on <http://www.roadbuilders.bc.ca/bluebook.php>.

"Certificate of Substantial Performance" means, subject always to subsection 5.3 of the Form of Agreement and to the warranty under GC.51, the certificate issued by the Engineer indicating that Substantial Performance of the Work has been achieved. Under no circumstances will issuance of the Certificate of Substantial Performance be deemed to mean that the Owner has accepted the Work as being in compliance with the Contract Documents;

"Certificate of Total Performance" means subject always to subsection 5.3 of the Form of Agreement and to the warranty under GC.51, a certificate issued by the Engineer accepting the Contractor's certification that the entire Work of the Contract has been performed by the Contractor to the requirements of the Contract Documents;

"City" or **"Owner"** means the City of Vancouver (unless the context requires a different meaning);

"Contract Documents" has the meaning set out in of the Form of Agreement;

"Contractor" or a pronoun in place thereof, means the person or persons who have undertaken to carry out the Contract;

"Drawings" means all plans, profiles, drawings, sketches, or copies thereof exhibited, used or prepared for or in connection with the Work embraced under this Contract;

"Engineer" means the Engineer as defined in the Agreement or his delegate, who may be an employee of the City or an independent engineer engaged by the City on its behalf;

"Environmental Legislation" means any laws, statutes, regulations, orders, bylaws, permits or lawful requirements of any governmental authority with respect to environmental protection;

"Event of Force Majeure" shall have the meaning ascribed to it in subsection (a)(iii) of section GC.10 of the General Conditions;

"Notice of Award" has the meaning set out in section 2.0 of the Form of Tender;

"Notice to Proceed" has the meaning set out in section 3.0 of the Form of Tender;

"Other Contractors" means any person, firm or corporation employed by or having a contract with the Owner and/or associated parties otherwise than through the Contractor;

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

"Plant" means every temporary or accessory means necessary or required to carry on or complete the Work and extra work, in the time and manner herein provided including, without limiting the generality of the foregoing, all tools, fixed and moveable machinery, engines, motor vehicles, trucks, compressors, all temporary structures such as workshops, sheds, storehouses, shoring forms, trestles and hoardings and all other appliances, apparatus or equipment of every sort, kind and description whatsoever;

"Products" means material (including but not limited to backfill), machinery, equipment and fixtures incorporated or to be incorporated in the Work as required by the Contract Documents;

"Site" means the place or places where the Work under the Contract is to be carried out, erected, built or constructed;

"Specifications" means those portions of the Contract Documents listed under the headings entitled "List of Specifications" and "List of Design Drawings" in section 3 [*Contract Documents*] of the Form of Agreement;

"Subcontractor" means the person or persons with whom the Contractor has made an agreement to perform a portion or portions of the Work or to supply Products therefor;

"Substantial Performance" means that the Contract is "substantially performed" in accordance with the criteria set out in section 1(2) of the *Builders Lien Act*;

"Surety" means the company which executes a bond required by the Contract to be furnished to the Owner;

"Total Performance" means when all the Work, including all deficiencies but excluding any correction of completed Work that appears during the Warranty period or other on-going warranty or guarantee as provided by the Contract Documents, has been performed as required by the Contract Documents, as certified by the Engineer;

"WCB" means the *Workers Compensation Act* (British Columbia), including without limitation, the Occupational Health & Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99) enacted pursuant to such Act, all as such Act or Regulations are amended or re-enacted from time to time;

"WorkSafeBC/OH&S Regulation" means the *Workers Compensation Act* (British Columbia), including without limitation, the Occupational Health & Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99) enacted pursuant to such Act, and as such Act or Regulations are amended or re-enacted from time to time;

"Work" or "Works" means (unless the context requires a different meaning) the whole of the Work as defined in the Form of Tender, including all materials, matters, Products and things required to be done or supplied therefor, and all work(s) mentioned or referred to in the Contract Documents, including all extra or additional work or materials, matters or things which may be ordered by the Owner or the Engineer as herein provided;

"Working Day" means any day other than a Saturday, Sunday or "holiday" as defined in the *Interpretation Act* (British Columbia).

GC.2 INTERPRETATION

In this Contract, the masculine includes the feminine and bodies corporate, and each includes the others. Also, any reference to the singular includes the plural where appropriate.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

Drawings and Specifications are intended to be complementary. Should any difference exist between the Drawings and Specifications, or should any errors or inconsistency occur in any or between any of the Drawings and Specifications, the Contractor, before proceeding, shall bring them to the attention of the Engineer.

The Engineer will furnish from time to time such detail drawings and information as the Engineer may consider necessary for the Contractor's guidance. These detail drawings shall take precedence over Contract Drawings and shall be considered as explanatory of them and not as indicating changes in the Work.

On all Drawings, figures take precedence over scaled dimensions. Scaling of dimensions, if done, is done at the Contractor's own risk. Despite the above, in the event of any inconsistency between the Drawings and Specifications or between any other Contract Documents or within any Contract Documents which could be construed as creating an ambiguity in the amount of Work involved, the cost or amount of Product being supplied, the Contract Amount being lower or higher, or any other similar discrepancy or inconsistency, the discrepancy or conflict will be resolved as follows:

- (a) the portion of the Contract Documents most favourable to the Owner will be deemed to be correct;
- (b) the more specific provision will take precedence over the less specific;
- (c) the more stringent will take precedence over the less stringent; and
- (d) the more expensive item will take precedence over the less expensive.

GC.3 PERSONAL EXAMINATION

As set out in the Instructions to Tenderers, the Contractor is required to

- (a) examine carefully the Site of the proposed Work, and the Drawings, Tables, and Specifications and other Contract Documents, and
- (b) satisfy itself as to the character, quality and quantity of work to be performed, materials to be furnished, and as to the requirements of the Drawings, Specifications and other Contract Documents,

and now confirms by the submission of a Tender that it has done so.

The Drawings and Tables show or describe conditions as they are believed by the Engineer to exist, but it is not to be inferred that all of the conditions as shown thereon are actually existent, nor shall the Owner or any of its respective officers be liable for any loss sustained by the Contractor as a result of any variance between the conditions as stated in the Drawings, Tables, or other Contract Documents and the actual conditions revealed during the progress of the Work, or otherwise.

The Contractor agrees that the Contractor has satisfied itself by the Contractor's own investigation and research regarding all conditions, that the Contractor's conclusion to enter into the proposed Contract is based upon such investigation and that the Contractor will make no claim against the Owner or the Engineer because any of the estimates, tests or representations of any kind affecting the Work made by any officer or agent of the Owner or the Engineer may prove to be in any respect erroneous. The Contractor assumes the risk of unforeseen conditions and agrees to complete the Work under whatever circumstances that may develop. Any information shown or described in the Drawings, Tables, Specifications or

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

any other Contract Documents as to the soil or material borings or tests of existing material is not guaranteed, and no claim for extra work or damages will be considered if it is found during construction that the actual soil or material conditions vary from those indicated.

GC.4 CONTRACT AMOUNT

Bids shall include all Federal, Provincial and Municipal fees and other taxes, rates and assessments, and the Contractor agrees that the Owner shall not be liable in any manner therefor and the Contractor agrees to indemnify and save harmless at all times the Owner against all claims which shall be made with respect thereto. All such taxes, rates, assessments and fees shall be paid by the Contractor, but if refundable, shall be refunded to the City and shall be the exclusive property of the City.

The Contractor shall include in the Contract Amount all cash allowances mentioned in the Specifications, if any, which allowances shall be expended in the whole or in part as the Engineer shall direct, the Contract Amount being adjusted in conformity therewith. The Contract Amount includes such sums for expenses and profit on account of such cash allowances as the Contractor requires.

The Contractor must obtain any City of Vancouver, Corporation of Delta, BC Hydro, telecommunications and other permits for the Work. Extra compensation will not be allowed for costs incurred by the Contractor as a result of the failure of the City or the Contractor to secure construction or other permits such that the Contractor can proceed on the Contractor's predetermined schedule.

GC.5 PERFORMANCE BOND

The Contractor, together with a surety company authorized to carry on business in the Province of British Columbia, shall be required to enter into a bond in a form satisfactory to the Engineer for a sum equal to 50% of the Contract Amount as surety for the due and proper performance of the Contract including warranty. The expense of the bond shall be borne by the Contractor.

GC.6 LABOUR AND MATERIALS PAYMENT BOND

The Contractor, together with a surety company authorized to carry on business in the Province of British Columbia, shall be required to enter into a bond in a form satisfactory to the Engineer for a sum equal to 50% of the Contract Amount as surety for the due and proper payment for material and labour used in carrying out the Contract. The expense of the bond shall be borne by the Contractor.

GC.7 WORKSAFE BC COVERAGE AND CONTRACTOR TO BE PRIME CONTRACTOR

- (a) **Payment of WorkSafeBC Assessments** - The Contractor agrees that it shall at its own expense procure and carry or cause to be procured and carried and paid for, full WorkSafeBC coverage for itself and all workers, employees, servants and others engaged in or upon any work or service which is the subject of this Contract. The Contractor agrees that the City has the unfettered right to set off the amount of the unpaid premiums and assessments for such Worker's Compensation Board coverage against any monies owing by the City to the Contractor. The City shall have the right to withhold payment under this Contract until the Worker's Compensation Board premiums, assessments or penalties in respect of work done or service performed in fulfilling this Contract have been paid in full.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

- (b) **Designation of Contractor as Prime Contractor** - The City now designates the Contractor as the Prime Contractor, and the Contractor now acknowledges and agrees to its designation as the Prime Contractor, for the purposes of the WorkSafeBC OH&S Regulation.
- (c) **Prime Contractor's Obligations** - Without in any way limiting the Contractor's obligations under the WorkSafeBC OH&S Regulation, and by way of example only, the Contractor will:
 - (i) appoint and provide a qualified coordinator for the purpose of ensuring the coordination of health and safety activities for the Site;
 - (ii) provide and receive and respond to all information required to be given, received or relayed by the Contractor (both as an employer and as the Prime Contractor) pursuant to the WorkSafeBC OH&S Regulation; and
 - (iii) within five (5) Working Days of the City delivering the Contract Documents to the Contractor, sign and deliver to the City, the "Prime Contractor Agreement" in the form attached.
- (d) **General WCB Obligations** - In addition to, and not in lieu of, the Contractor's obligations as the Prime Contractor, the Contractor will have a safety program acceptable to the WorkSafeBC and will ensure that all City and WorkSafeBC safety policies, rules and regulations are observed during performance of this Contract, not only by the Contractor but by all Subcontractors, workers, material suppliers and others engaged in the performance of this Contract.
- (e) **Notice of Project** - Prior to commencement of construction, the Contractor will:
 - (i) complete and file a "Notice of Project" with the WorkSafeBC in compliance with section 20.2 of the WorkSafeBC OH&S Regulation;
 - (ii) post the Notice of Project at the Site; and
 - (iii) will provide a copy of the Notice of Project to the City and confirm in writing that the Notice of Project has been posted at the Site.
- (f) **Initial Proof of WorkSafeBC Registration/Good Standing** - Within five (5) Working Days of the City delivering the Notice of Award to the Contractor, the Contractor will provide the City with the Contractor's and all Subcontractor's WorkSafeBC registration numbers.
- (g) **Subsequent Proof of WorkSafeBC Registration/Good Standing** - Within five (5) Working Days of the City delivering the Notice of Award to the Contractor, and concurrently with making any application for payment under this Contract, the Contractor will provide the City with written confirmation that the Contractor and all Subcontractors are registered in good standing with the WorkSafeBC and that all assessments have been paid to date of the Notice of Award or date of application for payment, as applicable.
- (h) **Pre-Contract Hazard Assessment** - The Contractor may or may not have received, as part of the Contract Documents, a "Pre-Contract Hazard Assessment" prepared by or for the City pursuant to the City's statutory obligations under the WorkSafeBC OH&S Regulation (section 119 of the WCA) as an "owner of a workplace". Despite the City's statutory obligations, the Prime Contractor now acknowledges and agrees that the

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

Contractor may not rely on the "Pre-Contract Hazard Assessment" and now agrees to assume by the terms of this Contract full responsibility for carrying out the City's obligations under section 119 of the WCA, including without limitation and by way of example only, conducting all due diligence inquiries of all applicable City staff and departments in order to ascertain what, if any, information is known or has been recorded by City staff about the Site that is necessary to identify and eliminate or control hazards to the health or safety of persons at the Site. The City now agrees to make all reasonable efforts to assist the Contractor in obtaining timely access to City staff and City records for this purpose. Within five Working Days of the City delivering the Notice of Award to the Contractor, the Contractor will start conducting such due diligence inquiries and must complete and deliver written confirmation of the completion of such inquiries to the Engineer prior to the City being obligated to issue the Notice to Proceed.

- (i) **Special Indemnity Against WorkSafeBC Non-Compliance** - The Contractor will indemnify the City and hold harmless the City from all manner of claims, demands, costs, losses, penalties and proceedings arising out of or in any way related to:
- (i) unpaid WorkSafeBC assessments of the Contractor or any other employer for whom the Contractor is responsible under this Contract;
 - (ii) the acts or omissions of any person engaged directly or indirectly by the Contractor in the performance of this Contract, or for whom the Contractor is liable pursuant to the Contractor's obligations as the Prime Contractor, and which acts or omissions are or are alleged by the WorkSafeBC to constitute a breach of the WorkSafeBC OH&S Regulation or other failure to observe safety rules, regulations and practices of WorkSafeBC, including any and all fines and penalties levied by the WorkSafeBC; or
 - (iii) any breach of the Contractor's obligations under this General Condition.
- (j) **Prime Contractor Agreement Form** - The Contractor must complete and sign and deliver the Prime Contractor Agreement in the form set out in Appendix A prior to commencing work on the Site.

GC.8 LABOUR

The Contractor agrees to employ appropriate tradesmen on the Work. Where the tradesmen are covered by collective agreements, the Contractor shall abide by the wages and conditions of such collective agreements covering such tradesmen. Notwithstanding the foregoing, the Contractor shall pay or cause to be paid to every person employed on the Work not less than the wages or remuneration generally accepted as current at the time.

The Contractor shall endeavour to avoid labour problems and minimize work stoppages, jurisdictional or other labour disputes on the Site.

GC.9 COMMENCEMENT AND COMPLETION OF THE WORK

The Contractor shall not commence the Work or procure any material therefor until it has received the Notice to Proceed from the Owner. Forthwith after the receipt of the Notice to Proceed, the Contractor shall at once begin and continuously carry on to completion (subject as herein provided) and shall complete and give full possession thereof on or before the date specified by the Contractor in her tender, unless a longer period shall be allowed in writing by the Engineer in which case it shall be carried on to completion and possession given to the Owner within the additional time so allowed. No progress or interim estimate or certificate

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

shall release the Contractor or its surety from any responsibility or shall be taken as evidence of any such release, or as an acceptance of any Work or material, or as a waiver of any condition herein. The whole Work and every portion and detail thereof shall, at the time of completion, be put and left by the Contractor in good and satisfactory condition, finished in all respects and at the time must be fully up to the requirements of the Drawings and Specifications in every particular aspect; all surplus and refuse material and rubbish removed from the vicinity of the Work; the premises left in a neat and tidy condition; all damages to adjacent property, including pavements, foot walks, boulevards, sodding, trees, shrubs and plants, or other things injured or interfered with by the Contractor, or in any way due to her work, made good; all wages paid, and every other requirement of the Contract complied with. In case of the Contractor's failure to finish the Work properly and fully, and as required, or in case of the Work or any part thereof being taken out of her hands, as provided in these General Conditions, the Owner may proceed to finish the Work for the Contractor as her agent in this respect and at the Contractor's expense or proceed as provided in GC.62.

Before the completed Work is accepted and paid for, the Contractor shall notify the Engineer in writing that it is ready for final inspection. Upon receipt of the notifications, the Engineer will arrange to give the entire Work a minute and thorough inspection, either in person or through a competent representative.

Any defects or omissions noted during this inspection must be made good by the Contractor without extra charge before the Work will be accepted.

When the defects or omissions, if any, have been made good to the satisfaction of the Engineer, the Engineer will communicate the Engineer's acceptance of the Work, to the Owner, subject always to section 5.0 of the Form of Agreement and to the Contractor's warranty obligations.

GC.10 DELAY IN PROGRESS OF THE WORK

(a) Delays

- (i) If the Contractor is delayed in the performance of the Work by an act, omission or wilful default of the Owner, or the Engineer, or anyone employed or engaged by them, contrary to the provisions of the Contract Documents, then the time fixed herein for completion shall be extended for such reasonable time as the Engineer may decide.
- (ii) If the Contractor is delayed in the performance of the Work by a Stop Work Order issued by a court or other public authority and provided that such Stop Work Order was not issued as the result of an act or fault of the Contractor or anyone employed or engaged by him directly or indirectly, then the time fixed for completion herein shall be extended for such reasonable time as the Engineer may decide.
- (iii) If the Contractor is delayed in the performance of the Work by labour strikes, acts of God, Abnormal Weather, or by unforeseeable causes beyond the Contractor's control (an "Event of Force Majeure"), then the time fixed for completion herein shall be extended for such reasonable time as the Engineer may decide, but in no case shall the extension of time be less than the time lost as the result of the event causing the delay, unless such shorter extension be agreed to by the Contractor. The Contractor shall not be entitled to payment for any costs, loss, or damages incurred as the result of such delay. Despite the foregoing, an Event of Force Majeure shall not include a strike, lockout, labour disturbance or industrial action involving the Contractor's or its

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

Subcontractors' own employees, inclement weather (except for Abnormal Weather), any fire or explosion or other escape or combustion of LFG caused or contributed to in any way by the Contractor or those for whom it is responsible, or a circumstance or cause resulting from the fault or negligence or omission of the Contractor or those for whom it is responsible, or the Contractor's failure to perform its obligations under this Contract including a failure to properly plan or carry out the Work in accordance with the terms hereof including the Construction Schedule pursuant to GC.22, or an event or circumstance which by the exercise of reasonable diligence could have been avoided or the effect of which could have been mitigated or which arises from a lack of funds.

- (iv) The Engineer may, from time to time and for such period as the Engineer may deem expedient, suspend in whole or in part, the performance of the Work under the Contract, and the Engineer will order the time herein fixed for the completion of the Work to be extended for a period which is deemed by the Engineer equivalent to the time lost by reason of such suspension.
- (v) No extension shall be made for delay unless written notice of claim is given to the Engineer not later than seven calendar days after the commencement of delay, providing however, that in the case of a continuing cause of delay only one notice of claim shall be necessary.
- (vi) In the event that the Work is delayed or suspended in accordance with:
 - (1) subsections (a)(i) or (a)(iv) of this GC.10, the Contractor shall not be entitled to make any claim by reason of such delay or suspension for any losses, costs of damages except and unless, within seven calendar days of the occurrence of such delay or suspension the Contractor shall give notice in writing to the Engineer of the basis of her claim. Such claim shall be limited to such unavoidable direct costs (excluding all charges for storage of Products, tools and equipment and indirect, overhead or other like costs) incurred as a result of such delay or suspension, and approved by the Engineer. In the case of a delay as described in subsection (a)(i) above or a suspension pursuant to subsection (a)(iv) above, a sum equal to five percent of such approved, unavoidable direct costs (in lieu of all profit) shall also be allowed. Despite any other term of this Contract, in no event will the City's liability for any delay claim (whether under this GC.10 or otherwise, at law or in equity, in contract or in tort) exceed the lesser of \$500.00 for each Working Day of delay or two percent of the Contract Amount. All unavoidable direct costs claimed by the Contractor must be submitted and substantiated to the Engineer for verification on a weekly basis as incurred, failing which, they shall not be considered nor payable by the City. Authorization for any payment of the claim shall only be given by written Work Order, duly signed and issued by the Engineer; and
 - (2) subsections (a)(ii) or (a)(iii) above, the Contractor shall not be entitled to payment for any costs, loss, or damages incurred as the result of such delay and despite any other term of this Contract, the City will incur no liability for any such delay claim whether or not such claim is brought at law or in equity, contract or tort, or any other basis.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

(b) Non-Avoidance

No delay or suspension described in this GC.10 shall vitiate or avoid the Contract, or any part thereof, or any security or obligation for the performance thereof, unless the City elects to the contrary.

(c) Resumption of Work

At the end of such delay or suspension, or upon the removal of the cause thereof, or upon the Contractor receiving notice from the Engineer requiring the resumption of work, the Contractor shall at once resume the performance of the Work and diligently carry on the same under the direction of the Engineer.

(d) Continuance of Work After Time Fixed for Completion

The Contractor shall not construe any direct or inferred permission to continue work after expiry of time for completion of the Work, as stipulated in the Contract or as amended by the order of the Engineer, as a waiver of damages for non-compliance with the requirement for the completion of the Work by or within such time. The Engineer may withhold such amounts from amounts otherwise due to the Contractor as the Engineer deems necessary to satisfy claims by the Engineer, the City, or by other contractors caused by such non-compliance with the requirement for the completion of the Work by or within such time.

GC.11 SPECIFICATIONS AND DRAWINGS

The Contractor shall keep in its field office and available to the Engineer a complete set of the Specifications and Drawings, and of any further drawings which may from time to time be supplied or approved by the Engineer. The Contractor shall be supplied with five sets of Specifications.

Wherever standard Specifications are referred to, they shall be the latest edition of those Specifications and they shall be considered to be a part of the Contract.

The Contractor will be supplied with five (5) prints of each of the Drawings and the Contractor must satisfy itself as to the accuracy of the said copies in every detail. Any additional copies desired will be furnished by the Engineer at cost to the Contractor.

The Drawings forming part of the Contract are intended to show the position and extent of the works, the general features of the design and construction, and the dimensions and proportions of all principal parts, but neither they nor the Specifications are guaranteed to show or describe every part or detail of the Work; anything omitted from the Drawings and Specifications, which may fairly be considered to be necessary for the proper execution and completion of the Work, shall be deemed to be included in the Contract.

Anything whatever which may be imperfectly specified or imperfectly shown on the Drawings, must be taken, considered and done as if it were perfectly shown and perfectly specified.

All dimensions on the Drawings, except as noted thereon, are shown in metric units.

The Engineer may from time to time issue further drawings or revised drawings as the Engineer deems necessary and such drawings shall be deemed to form part of the Contract. All sets of Drawings and Specifications shall be kept up to date at all times utilizing the Engineer's revised drawings and other documents issued to the Contractor.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

All Drawings, Specifications, model and copies thereof furnished by the Engineer are and shall remain the Engineer's property. Such documents and models are to be used only with respect to the Work, are not to be copied or revised in any manner without the written authorization of the Engineer and are to be returned to the Engineer on request at the completion of the Work.

GC.12 SHOP DRAWINGS

- (a) The Contractor shall submit, with such promptness so as to cause no delay in his work, or that of any other contractor, one sepia and one copy of all shop or setting drawings and schedules required for the Work of the Contractor, and the Engineer shall pass upon them with reasonable promptness. The Contractor shall make any corrections required by the Engineer, and file with him one sepia and one copy.
- (b) The Engineer's review of shop drawings or schedules shall not relieve the Contractor from responsibility for deviations from Drawings and Specifications unless the Contractor has in writing called the Engineer's attention to such deviation at the time of submission, nor shall it relieve the Contractor from the responsibility for errors of any sort in shop drawings or schedules.

GC.13 RECORD PLANS

The Contractor shall supply the Engineer with three (3) complete sets of "as constructed record plans" of the Work, on or before the date the Contractor makes application to the Engineer for a Certificate of Substantial Performance.

GC.14 ENGINEER SOLE JUDGE

Should any discrepancies appear or difference of opinion or misunderstanding arise as to the meaning of the Contract Documents, or as to any omissions therefrom, or misstatements therein, in any respect, or as to quality or dimensions or sufficiency of materials, Products, Plant or Work, or any part thereof, or as to the due and proper execution of the Work, or as to the measurement of quantity or valuation of any Work executed or to be executed under the Contract or as to extras thereupon, or deductions therefrom, or as to any other questions or matters arising out of the Contract, the same shall be determined by the Engineer and the Engineer's decisions shall be final and binding upon all parties concerned, and from it there shall be no appeal; and the Contractor shall immediately, when ordered by the Engineer, proceed with and execute the Work, or any part thereof, forthwith, according to such decision, and with such additions to or deductions from the Contract Amount as are provided under the terms of the Contract, without making any claim for any extension of time in completing the Contract or the Work, unless arranged for in writing with the Engineer as provided herein.

In all cases of misunderstanding and disputes, oral arrangements will not be considered, and the Contractor must produce written authority in support of her contentions, and shall advance no claim in the absence of such written authority, or use, or attempt to use, any conversation with any person whomsoever against the Engineer or the Owner or in prosecuting any claim against any of them.

GC.15 ENGINEER'S ABSENCE

In the absence of the Engineer, any of the Engineer's assistants whom the Engineer may designate to supervise the Work, shall have (subject to the instructions of the Engineer) full power to decide as to the manner of conducting and executing the Work in every particular aspect, and the Contractor shall follow the instructions or orders of the person so designated.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.16 ACCESS AND ASSISTANCE

The Contractor shall furnish the Engineer and any of the Engineer's assistants at all times with convenient means of access to all parts of the Work, and also with all required assistance, to facilitate thorough examination of the same, and inspection, culling or removal of doubtful or defective material or Products and for any other purpose required in connection with the Work, or in the discharge of their respective duties, for which service no additional allowance will be made.

GC.17 NOTICES TO CONTRACTOR

During the continuance of the Work, the Contractor may erect and maintain an office within the Vancouver Landfill Site and may use this office on all Working Days between 7:30 a.m. and 6:00 p.m. or longer as necessary for the project.

Before commencement of construction, the Contractor shall provide the Engineer with a list of at least three persons who have authority to act on behalf of the Contractor in times of emergency. At least one on the list shall be available at all times beyond the normal working hours of the City (7:30 a.m. to 5:00 p.m., on all Working Days).

The Contractor shall within five (5) Working Days after receipt of the Notice of Award, advise the Engineer in writing of one civic address (within the Greater Vancouver area, with postal code, fax number, and e-mail address) at which the Contractor can receive notices and correspondence from the Engineer or the Owner (and which can be inserted into section 7.0 of the Form of Agreement).

Any notice or communication to the Contractor shall be deemed to be well and sufficiently given and served if handed to the Contractor or to any of the Contractor's clerks or agents, or if mailed or sent to the Contractor at the address given in the Tender for the Work, or to the Contractor's place of business, or to the place where the Work is to be or is being carried on, or if mailed to or left at the Contractor's last known address; and any papers so mailed, left, sent or addressed shall be considered to be and to have been legally served upon the Contractor. In any written or printed notice to the Contractor in respect of general, special or other repairs, or of any Work of any nature required to be done under any of the provisions of the Contract, or of any other matter, it shall not be obligatory upon the Engineer to specify minutely or in detail everything required, or to specify by measurement the exact extent thereof, or the precise spot or spots where the Work, material or products may be defective or faulty, or where any of the requirements of the Specifications have not been observed; but a reference in such notice to the clause or clauses bearing upon the matter, and a description of the locality in general terms and sufficiently clear, in the Engineer's opinion, to indicate where the defects or trouble exists, shall be deemed to be and shall be ample notice.

GC.18 CONTRACTOR'S SUPERINTENDENT AND EMPLOYEES

The Contractor shall keep on the Site, during the progress of the Work, a competent superintendent and any necessary assistants, all satisfactory to the Engineer. The superintendent shall not be changed except with the consent of the Engineer, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor in the Contractor's absence and directions on minor matters given to the superintendent shall be held to be given to the Contractor. Important decisions shall be given in writing to the Contractor. The Contractor shall give efficient supervision to the Work, using his best skill and attention.

Should any person employed on the Site, or in connection therewith, give any just cause for complaint, the Engineer may require that such person be replaced forthwith, and such person

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

shall not be again employed by the Contractor on the Site without the consent, in writing, of the Engineer.

GC.19 INSPECTION OF WORK / QUALITY CONTROL

All quality control and testing of materials and workmanship shall be at the sole cost and responsibility of the Contractor.

The Engineer may appoint inspectors or surveyors to inspect all materials used, Products made and all work done. Such inspections may extend to any or all parts of the Work and to the preparation or manufacture of the Products to be used whether on Site or elsewhere. Inspectors and surveyors are not authorized to revoke, alter, enlarge or accept any portion of the Work or to issue instructions contrary to the Drawings and Specifications.

GC.20 WEEKLY REPORT

During active construction, the Engineer will prepare a weekly progress and issues report. A copy of the report will be provided to the Contractor and the Engineer will review the report and any issues with the Contractor. The Contractor will be required to read and sign each report. In case of differences of opinion between the Engineer and the Contractor regarding the particulars stated in the weekly report, the Contractor shall, within seven days, give notice in writing to the Engineer, expounding such difference.

GC.21 WEEKLY MEETINGS

The Contractor shall meet weekly with the Engineer on the Site to discuss work done in the previous week, and work proposed to be done in the week just starting, and as requested by the Engineer during the course of the Work.

GC.22 CONSTRUCTION SCHEDULE

Before beginning work, the Contractor shall furnish the Engineer with a complete construction schedule showing the Contractor's proposed program of operations. This schedule shall indicate the various subdivisions of the Work and the dates of commencing and finishing of each. The construction schedule shall be completed using Microsoft Project or other scheduling software as approved by the Engineer.

The form of the schedule must be approved by the Engineer. On the last day of each calendar month, a copy of the schedule shall be submitted to the Engineer with particulars indicating the percentage completed of each division of the Work to that date.

The Contractor shall immediately advise the Engineer of any proposed changes in the submitted construction program. If, in the opinion of the Engineer, the construction program as submitted is inadequate to ensure the completion of the Work within the time limited therefor, or is otherwise not in accordance with the Tender, or if the Work is not being adequately or properly prosecuted in any respect, the Engineer, without derogating from the Owner's rights under the Contract, shall have the right to require the Contractor to submit a new construction schedule providing for proper and timely completion of the Work, and the Contractor shall be entitled to no claim for extension of time on account of such requirement.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.23 MAINTENANCE OF SCHEDULE

(a) Work Delayed by the Contractor

The Contractor shall at all times provide a sufficient number of skilled personnel to maintain the progress of the Work and compliance with the master schedule, and if in the opinion of the Engineer the Contractor delays the progress of the works of other contractors then the Contractor shall be responsible for all loss and damage, including, without limitation, that of other contractors for stand-by and/or delay occasioned thereby.

If, in the opinion of the Engineer, the Contractor delays or is about to delay the Work or the progress of any portion of the Work as shown by the master schedule, then upon the written notification by the Engineer, the Contractor shall use such additional overtime work or shifts as may be necessary to catch up and/or maintain the general progress of the master schedule and the cost and expenses incurred by use of said overtime work or shift shall be borne entirely by the Contractor.

(b) Work Accelerated by the Engineer

Should the Engineer be required to expedite the final completion of the Work or the works of other contractors, then, provided the Contractor is not in default in any of the provisions of the Contract affecting the master schedule, the Engineer may order the Contractor to work additional shifts for which the Owner will pay:

- (i) the substantiated extra premium wage incurred by such shift work;
- (ii) the approved additional wages of supervision; and
- (iii) an agreed percentage addition for profit for accelerated work.

Such instructions to the Contractor will only be valid when given in writing by the Engineer. The Contractor shall be responsible for having time sheets covering all such shift work checked and approved daily by the Engineer and claims for reimbursement of the extra wages will only be accepted when properly supported by such signed time sheets.

(c) Work Out-of-Sequence

The Contractor shall at no additional cost perform his Work as to operation or location out-of-sequence as and when directed by the Engineer.

(d) Execution of Other Works or Contracts

The Contractor shall afford all facilities for the execution of any other works which may be undertaken by the Owner or by such parties as may be employed by them, so that such works may be properly and conveniently completed, and the Engineer shall have full authority to make and enforce such regulations as the Engineer may deem necessary for the conduct of the works; and the Contractor shall proceed in such manner and with and complete in such order such portions of the Work as the Engineer may require, and the Engineer shall be the sole judge as to what facilities are due and proper, and can be afforded without any undue interference with the execution of the Contract.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

The Contractor shall at all times give free access and every reasonable facility to the employees of the Owner and to other contractors, to such portion of the works and adjoining land as may be necessary to enable them to execute and maintain works of any description; such accommodation and access being regulated and directed by the Engineer and no inconvenience or alleged inconvenience arising therefrom shall form any ground for claims, losses or damages, compensation or otherwise, by the Contractor against the Owner.

GC.24 EMERGENCIES

The Engineer has the authority in an emergency to stop the progress of the Work whenever in his/her opinion such stoppage may be necessary to ensure the safety of life, or the Work or neighbouring property. This includes authority to make changes in the Work, and to order, assess and award the cost of work extra to the Agreement or otherwise, as may in his/her opinion be necessary. The Engineer shall within two Working Days confirm in writing any such instructions.

GC.25 SUBCONTRACTORS AND SUPPLIERS

The Contractor shall supply complete information to Subcontractors and equipment and material suppliers. The Contractor agrees to bind every Subcontractor by the terms of the General Conditions, Supplementary General Conditions, Drawings, Specifications, and other Contract Documents as far as applicable to their component of the Work. Where both Specifications and Drawings are required to provide complete information on any aspect of the Work, the Contractor shall supply both to the Subcontractor or supplier concerned.

In every subcontract the Contractor shall specify that the Contractor or agent of the Contractor shall be the person responsible for payment certification under that subcontract for the purposes of the *Builders Lien Act* (and not the Owner or Engineer).

GC.26 CONTRACTOR'S PLANT AND UTILITIES

The Contractor shall at its own expense supply, maintain and remove its field office and whatever electric or telephone facilities the Contractor requires for his Plant for either domestic or construction purposes.

The Contractor must provide and properly maintain, in clean and sanitary condition, suitable and convenient privy or toilet accommodation for the Contractor's employees so that they shall not be a source of inconvenience, complaint or nuisance to the public or to others in the vicinity of the Site.

GC.27 PLANT, LABOUR AND MATERIALS

The Contractor at its own expense shall provide all necessary temporary buildings and storage grounds and shall furnish all necessary labour, materials and plant together with all proper and required facilities for moving and transporting the same, so that the Contract and all Work required to be done under it can and will be carried on in a workmanlike manner, properly, satisfactorily, continuously and expeditiously, to completion, to the Engineer's satisfaction in all respects. Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of good quality.

Should any Plant, equipment, appliance, materials or workmanship which the Engineer may deem to be inferior or unfit for use in or on the works be brought on the ground or used, the same shall be wholly removed therefrom within twenty four (24) hours after notification to that effect from the Engineer, and in the case of failure or neglect on the part of the

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

Contractor to remove the same the Engineer may cause the same to be taken away at the Contractor's expense, and deposited, wasted or otherwise disposed of in any locality, place or way the Engineer considers convenient or proper, and the Contractor shall forthwith pay to the Owner on demand, all expenses incurred including storage, if any, or the same may be deducted or collected by the Owner as provided in GC.58.

GC.28 MATERIAL AND EQUIPMENT SUPPLIED BY THE CONTRACTOR

Material and equipment supplied by the Contractor shall be as specified. If the Contractor wishes to supply and install items other than specified, the Contractor shall apply for and must receive written permission from the Engineer before incorporating such items into the Work. Descriptive literature and price schedules covering such alternative items shall be supplied to the Engineer if requested.

The Contractor shall furnish for the approval of the Engineer as the Engineer may reasonably require samples of any material of any kind to be used in the Work and no material shall be used which is in any way inferior to the approved samples; but it is understood that the approval of any material shall not subject the Owner or the Engineer to pay for the same nor prevent the rejection afterwards of any portion thereof which is found in the Engineer's judgement to be unsound or unfit to be used, nor shall such approval be considered as any waiver of objection to the Work at any subsequent period on account of the unsoundness or imperfection of the materials used.

GC.29 MATERIAL IN IMPERIAL UNITS

Where manufactured materials that are specified in metric units are not available, materials manufactured to Imperial units may be substituted, provided the Contractor can satisfy the Engineer that the substitute materials are at least equivalent to those specified.

GC.30 SUPPLY OF MATERIALS BY THE CITY

The Contractor's responsibility for materials supplied by the City shall begin upon the Contractor's acceptance at the points of supply to the Site. All such materials shall be examined and the Contractor shall advise the Engineer in writing of any defective or damaged material. Any material supplied by the City which is damaged after acceptance by the Contractor shall be replaced by the Contractor at his own expense.

Any material supplied by the City that is not required for the Work shall remain the property of the City. Such material shall be neatly stored at the point of original supply.

GC.31 TEMPORARY STRUCTURES

Temporary structures erected by the Contractor shall remain the Contractor's property and be removed from the site on completion of the Work.

The Contractor shall be responsible for the design, adequacy, safety and efficiency of all falsework, temporary structures and construction processes required in connection with the completion of the Contract. All such designs and plans shall be prepared and sealed by a Professional Engineer licensed to practice in British Columbia and submitted to the Engineer for review and comment, but such review shall not relieve the Contractor of any responsibility. The Contractor shall make good at the Contractor's expense immediately all defects arising from the Contractor's faulty design, equipment or application thereof.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.32 WORK AREAS AND CONTRACT LIMITS

The Contractor shall, as far as is practicable, confine operations to the Engineer's specified area within the Site. Any land or property outside Site boundaries which the Contractor requires during construction shall be acquired by the Contractor at the Contractor's own expense, and the Contractor shall make his/her own arrangements for the use of such land or property and for the compensation of its owners.

Work to be performed by the Contractor outside the Contract Work limits includes:

- (a) installation of barricades and barriers and other traffic control measures; and
- (b) repairing and making good property and improvements which are damaged or destroyed by the Contractor's operations.

GC.33 OFFICE FACILITIES FOR THE ENGINEER [Intentionally Deleted]

GC.34 STORAGE AREAS

Working and storage areas will be allocated by the Engineer for use by the Contractor. The Contractor shall be responsible for the maintenance and clean-up of the allotted areas.

GC.35 HOURS OF WORK

The Contractor must comply at all times with all applicable requirements of Delta's Noise By-law.

The Contractor shall keep the Engineer advised on the proposed hours of work so that inspection can be co-ordinated. Work without inspection shall not be permitted.

The Owner's forces work between the hours of 7:00 a.m. and 3:30 p.m. on all Working Days. The Contractor shall not expect any work to be performed by the Owner's crews outside these hours except by special arrangement agreed to by the Engineer or in case of emergency.

GC.36 TRAFFIC CONTROL

All traffic control shall be provided by the Contractor, at the Contractor's expense, except where otherwise specifically provided for in this Contract. The Contractor shall adhere to the standard procedures and practices prescribed in the Ministry of Transportation and Highways "Traffic Control Manual for Work on Roadways" (Second Field Edition) as amended or replaced from time to time.

The Contractor shall also provide, at the Contractor's expense, erect and maintain all requisite barriers, fences or other proper protection and must provide and maintain such Traffic Control Person (as defined by WorkSafeBC), watchpersons and lights as may be necessary or as may be ordered by the Engineer, in order to ensure safety to the public as well as to those engaged about the premises or Works, and must (where it is practicable in the Engineer's opinion) keep any roadway open for the use of the public, or for some restricted use specified by the Engineer, for such width as the Engineer may direct.

Within ten (10) Working Days of receipt of the Notice of Award, or at any other time within two (2) Working Days of such request by the Engineer, the Contractor shall submit a detailed Traffic Management Plan for the Engineer's approval incorporating all aspects of the preliminary traffic management plan provided as Schedule I [Preliminary Traffic Management Plan] to the

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

Form of Tender as well as all further details then available to the Contractor or reasonably requested by the Engineer in preparation for commencement of the Work following receipt of a Notice to Proceed.

The Contractor shall, from the date of commencement to the date of completion of the Work, assume responsibility for the barricading and signing of hazards resulting from such works as utility trenches, out-of-grade utility-access covers, or any other obstruction or impediment to pedestrian or vehicular traffic, be these works in progress prior to or subsequent to the above mentioned date of commencement.

Unless ordered otherwise by the Engineer, the Contractor shall inspect the barricades and warning signs of unattended construction Sites at least once per day.

When any work is carried out at night, the Contractor must supply, at the Contractor's expense, a sufficient number of electric or other approved lights to enable the work to be done in an efficient and satisfactory manner, and the Engineer shall have the right to order additional lights at the Contractor's expense if, in the Engineer's opinion, they are or may be required.

GC.37 PUBLIC CONVENIENCE

In carrying out the Work, or any portion thereof, the convenience of the public must always be specially considered and provided for by the Contractor, who must not obstruct any street, thoroughfare or sidewalk longer or to any greater extent than is absolutely necessary in the Engineer's opinion. The Contractor shall not deposit any material upon any roadway, sidewalk, boulevard, grass plot, or other City or public property, without the Engineer's permission nor shall the Contractor allow the same to remain thereon longer than necessary but must remove all rubbish and other material, clean and thoroughly restore all such places to as good and as tidy a condition as the Contractor found them, as speedily as possible, from time to time as the Work progresses, or as directed. Unless material and rubbish are removed within four days after the completion of the Work and without previous notice to the Contractor the Engineer will proceed to do whatever is necessary to restore such places to as good and as tidy a condition as before the commencement of the Work and charge the cost thereof against the Contractor. Where the Contractor obstructs more of the street, roadway or place than is ordered or sanctioned by the Engineer in writing, then the Engineer may cause such obstructions to be removed at the expense of the Contractor.

GC.38 ACCESS TO EXISTING STRUCTURES

The Contractor shall at all times maintain satisfactory pedestrian access to buildings and private property.

The Contractor shall provide suitable notice to affected property owners prior to changes in access. Interruption of access to any entrance shall be kept to a minimum.

The Contractor shall maintain fire exits from existing buildings as required by the Fire Department.

GC.39 PROTECTION OF WORK AND PROPERTY

The Contractor shall maintain continuously adequate protection of all the Contractor's Work from damage and shall protect the Owner's property from all injury arising in connection with the Contract. The Contractor shall make good any such damage or injury. The Contractor shall protect adequately adjacent property as required by law and the Contract.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.40 FIRE, SECURITY AND SAFETY REGULATIONS

(a) Fire and Security

The Contractor shall comply and the Contractor shall enforce compliance by all his agents, employees, Subcontractors and suppliers with any and all fire regulations which have been or may be established from time to time by the Engineer and anybody having jurisdiction over such matters.

All security regulations which have or may be promulgated by the Engineer or other authorized representatives of the Owner shall be complied with. Watchmen for the buildings and grounds may be provided by the Owner at the Owner's discretion. However, neither the Owner nor the Engineer will be responsible for any loss or damage to the property of the Contractor whether or not watchmen are provided by the Engineer. The Contractor will furnish such security as the Contractor feels necessary for the protection of the Contractor's equipment and Products stored or used on Site.

(b) Loss Control

The Contractor will provide a Loss Control Program, satisfactory to the Owner to meet WorkSafeBC and other requirements.

(c) Safety

When required by WorkSafeBC Regulations, first aid facilities, including an attendant, shall be provided on the Site at all times during working hours by the Contractor. Such facilities will be completely equipped in accordance with the requirements of the WorkSafeBC.

The Contractor shall be fully responsible for taking all necessary precautions for the safety of the Contractor's workers on the Site or of complying with all applicable safety laws and regulations, particularly those regulations pursuant to the *Workers' Compensation Act* to prevent accidents or injury to persons on, about or adjacent to the Site.

The Contractor shall provide all safeguards required directly for or as a result of the Work as referred to in GC.39 - Protection of Work and Property and in the scope of work described in the Contract Documents.

GC.41 OVERLOADING

No part of the Site shall be loaded with a load greater than it is calculated to bear safely. Should any damage or accident occur through the violation of this requirement, the Owner will hold the Contractor solely answerable and liable.

GC.42 DRAINAGE

The Contractor shall keep all portions of the Work well, properly and efficiently drained until completion, and the Contractor will be held responsible for all damage which may be caused or result from water backing up or flowing over, through, from or along any part of the Work, or which any of the Contractor's operations may cause to flow elsewhere.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.43 CLEANING UP

The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by its employees or work, and at the completion of the Work, it shall remove all its rubbish from and about the site and all its tools, scaffolding and surplus materials, and shall leave the Site "broom clean" or the equivalent, unless more exactly specified. In case of dispute, the Engineer may remove the rubbish and charge the cost to the Contractor as the Engineer shall determine to be just.

GC.44 SAFEGUARDING EXISTING PROPERTY

Existing property, buildings, fences or other improvements of any kind shall be protected by the Contractor during the life of the Contract. The Contractor shall make good to the satisfaction of the Engineer any damage done to the existing property, buildings, fences or other improvements. This applies to areas of private property incorporated in the Work area.

Where removal of existing improvements such as pavement, fences, structures, sewers and ducts is necessary during the course of the Work, the same shall be re-established by the Contractor to the satisfaction of the Engineer. The cost of protection and rehabilitation shall be borne by the Contractor.

GC.45 EXISTING UTILITIES

The Contractor will be responsible for the care of all public utilities and in the event of any of these requiring to be removed, raised or lowered permanently, this will be done either by the City or by the utility company interested and at the expense of the City. If temporary alteration of location is required for purposes of the construction, such work shall be done by the City or by the utility company interested at the expense of the Contractor. The Contractor, however, will be held responsible for, and will have to bear the cost due to any damage done to utility services through its operations.

Reasonable notice must be given to the Engineer of any change required in utility services.

Existing utilities are shown on the Drawings. These, however, are shown for convenience only and the Owner assumes no responsibility for improper locations, or failure to show utility locations on the construction plans. The Contractor shall prove its locations by obtaining relevant plans and uncovering the utilities on Site at no extra cost to the Owner.

The Contractor shall provide adequate barricades and lighting around and adjacent to any open excavation or potentially dangerous location or other locations designated by the Engineer.

The Contractor shall at all times ensure that the fire hydrants are not obstructed.

GC.46 DUST CONTROL

The Contractor shall at all times control the generation of dust by its operations by water sprinkling or by other methods approved by the Engineer.

GC.47 ALTERATIONS, EXTRAS, DEDUCTIONS & CLAIMS

The Owner without invalidating the Contract shall have the right to make or order any alterations and changes, such as it may deem advisable, at any time before or during the prosecution of the Work, in any line, grade, Drawings, Specifications or detail thereof, or to increase or decrease the dimensions, quantity of material or work, or to alter the situation or level, or to vary the form or dimensions of any part of the Work, or to vary in any other way

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

the Work; or to order any additional or extra work to be done or additional or extra materials to be furnished; and the Contractor shall, in pursuance of the Engineer's written orders to that effect, proceed with, carry out and execute the Work as directed, and shall supply such additional materials and do such additional or extra work in pursuance of such orders without being entitled to any extension of time for completion, or any additional payment on account thereof, except only as herein provided.

In each and every case where additional or extra work or material of any kind is ordered to be done or supplied, or where the Contractor does or supplies, or contemplates doing or supplying, any work or material the Contractor shall notify the Engineer in writing and shall state in its notification clearly and fully what the circumstances are, and the additional sum or compensation it intends to demand therefor, otherwise it shall have no claim in respect thereof. If any work, labour or material is not required to be performed or supplied, then the Owner may deduct from the Contract Amount the value of such work, labour or material not required to be performed or supplied which shall be determined by:

- (a) using the unit or lump sum prices contained in the Schedule of Quantities and Prices applicable to such work, labour or material, or
- (b) if, in the opinion of the Engineer none of the unit or lump sum prices aforesaid apply, then using the hourly rates set out in Schedule F [Force Account Labour and Equipment Rates], or
- (c) such fixed sum as agreed upon between the Contractor and the Owner.

All claims of every nature which the Contractor may have in respect of the Contract or Work done thereunder, are to be summarized and submitted by it (in duplicate) to the Engineer within one month of the completion of same, and the Contractor shall make no claim of any nature afterwards; and no claim not then made or not then allowed by the Owner shall be sustainable, and the Owner shall be in no way disentitled to determine any and all questions concerning said claims, and no action or suit shall be commenced by either party to the Contract until after the Final Certificate of Total Performance shall have been signed by the Engineer and then only for the amount appearing thereby to be due to the Contractor.

GC.48 ERRORS BY CONTRACTOR

Changes, errors or mistakes made by the Contractor or the Contractor's Subcontractors, workmen or employees, and all settlements, washouts and defects, shall be rectified by the Contractor at its expense.

GC.49 TESTING OF MATERIALS

Except where otherwise specified, testing of materials will be carried out by the Contractor and paid for by the Contractor.

GC.50 DEFECTIVE WORK

All defective work or work that is not in accordance with the terms of this Contract must be forthwith made good by the Contractor at its own expense to the Engineer's or Owner's satisfaction, as the case may be.

GC.51 WARRANTY

The Contractor shall perform the Work in a proper and workmanlike manner and in accordance with the requirements of the Contract Documents and maintain the Work against any defects

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

arising from faulty installation, material or workmanship during the period of 12 months from the date of issuance of the Certificate of Substantial Performance and make good in a permanent manner satisfactory to the Owner any defects arising from any of these causes.

Whether the Contractor should replace defective Products or Work that is not in accordance with the terms of this Contract, or repair the same, shall be determined by the Engineer. Should the Contractor fail to make good defects, deficiencies or work that is not in accordance with the terms of this Contract within three Working Days after being notified by the Owner to do so, the Owner at its option may do so and all costs, charges and expenses so incurred may be deducted or collected by the Owner as provided in GC.58 - Money Due to Owner. If the Owner warrants the defects to be dangerous and an emergency situation exists, the Owner, at the Owner's discretion will effect repairs immediately and all costs, charges and expenses so incurred may be deducted or collected by the Owner as provided in GC.58 - Money Due to Owner. The decision of the Owner shall be final as to the necessity of repairs or of any work done or required to be done under the provisions of the Contract and for the amounts expended thereunder. If in the opinion of the Engineer, it is in the Owner's best interests (taking into account effects on the Owner's overall schedule, the difference in value between the Work as performed and that called for by the Contract Documents, and other relevant factors) not to correct defective Work or Work not provided in the Contract Documents, the Engineer will assess the amount which should be deducted from the amount otherwise due to the Contractor and will assess the length of time by which the obligations should be extended in order to put the Owner in as close a position financially and in terms of the useful life of the Work as would have been the case had the Contractor performed the Work as called for by the Contract Documents. For further certainty, the Engineer may extend the warranty period in appropriate circumstances to a minimum of twice the warranty period originally provided for under the Contract Documents, subject always to the above parameters.

GC.52 CONTRACTOR'S LIABILITY

The Contractor shall be liable for any and all damages, or claims for damages, for injuries or accident to person or property done or caused by the Contractor, the Contractor's Subcontractors or employees, or resulting from the prosecution of the Work or any of its operations, or caused by reason of the existence or location or condition of the Work, or of any materials, Products or Plant used therein or thereon, or which may happen by reason thereof, or arising from any failure, neglect or omission on the Contractor's part, or on the part of the Contractor's Subcontractors or employees, to do or perform any or all of the several acts or things required to be done by the Contractor or them under and by the Contract, and the Contractor covenants and agrees to indemnify and save harmless at all times the Owner against all such damages and claims for damages whatsoever arising out of or in connection therewith, and in the event of any such action being brought by any person against the Owner, either directly or indirectly, or by reason of the execution of the Contract, the Owner may enforce payment by the Contractor of all such loss, costs, damages and expenses as a debt due to them.

In the case of the Contractor's failure, neglect or omission to observe and perform faithfully and strictly all the provisions of the Contract, the Owner may either with or without notice (except where in this Contract notice is specially provided for, and then upon giving the notice therein provided for), take such steps, procure such material, equipment, trucks, and men, and do such work or things as it may deem advisable towards carrying out and enforcing the same, and any and all expenses so incurred may be deducted or collected by the Owner under the provisions of GC.58.

Any such action taken by the Owner under this General Condition as it is herein empowered to take shall not in any way relieve the Contractor or its sureties from any liability under the Contract.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

GC.53 INSURANCE BY THE CONTRACTOR

1. ALL RISK COURSE OF CONSTRUCTION INSURANCE

(a) **Coverage**

"All Risks" of physical loss or damage.

(b) **Property Insured**

(i) *At Site*

All materials, equipment and machinery, labour and supplies of any nature whatsoever, Work in progress, including property of the Insured or of others for which the Insured may have assumed responsibility, to be used in or incidental to the Site preparations, demolition or existing structures, erection and/or fabrication and/or reconstruction and/or repair of the project insured, commencing when the property becomes at the Insured's risk, at the Site, and while there awaiting, during and subsequent to erection and/or fabrication and/or repair and/or testing.

(ii) *Transit*

Property to enter into and form a part of the project insured, from the commencement of loading at the original point of shipment anywhere in Canada or the Continental United States of America, but excluding such property in the course of manufacturing or processing within buildings at the manufacturer's or supplier's site.

(iii) *Off Site*

Off Site cover shall apply to property to enter into and form a part of the project insured, anywhere in Canada or the Continental United States of America, but excluding such property while in transit or in the course of manufacturing or processing within buildings at the manufacturer's or supplier's site.

(c) **Insureds**

The Owner, the Contractor, and their respective officials, officers, employees and agents.

(d) **Term**

During the period of the construction operations and also during any period in which the property insured is being prepared for occupancy and while partially occupied provided all coverage shall cease when the Work has been formally accepted as complete by the Owner, whichever shall first occur.

(e) **Limit and Deductibles at Site**

(i) *Limit of Liability:* Full Replacement Cost Value of the Work

(ii) Deductible not to exceed \$10,000.00.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

2. COMMERCIAL GENERAL LIABILITY INSURANCE

Commercial General Liability Insurance in sufficient amounts and description to protect the Contractor, its Subcontractors, the City and its respective officers, officials, employees, servants and agents against claims for damages, personal injury including death, bodily injury and property damage which may arise under this Contract.

The limit of commercial general liability insurance shall be not less than \$5,000,000.00 per occurrence inclusive for personal injury, death, bodily injury or property damage and in the aggregate with respect to products and complete operations.

The policy of insurance shall:

- (i) be on an occurrence form;
- (ii) add the City and its officials, officers, employees and agents as additional insureds;
- (iii) contain a cross-liability or severability of interest clause;
- (iv) extend to cover non-owned automobile, contingent employer's liability, blanket contractual liability, contractor's protective liability, broad form property damage, broad form completed operations and operations of attached machinery.

3. AUTOMOBILE INSURANCE

A standard owner's form automobile policy for licensed vehicles providing third party liability and accident benefits insurance as provided by the Insurance Corporation of British Columbia (Autoplan) in accordance with *The Automobile Insurance Act*, RSBC 1979, Ch. 204, the minimum limits as follows:

Bodily injury and property damage (third party limit) inclusive limit \$5,000,000.00.

4. CONTRACTOR'S EQUIPMENT INSURANCE

"All Risk" insurance with Insurers acceptable to the Owner, for the full replacement cost value of all construction equipment, owned or rented, or for which the Contractor or any of his/her subcontractors may be responsible and containing a waiver of subrogation against the City. In the event of loss or damage to the said construction equipment, or any part thereof, the Contractor or the subcontractor, as the case may be, shall, if so requested by the Owner in writing, forthwith replace such damaged or destroyed construction equipment.

5. ENVIRONMENTAL IMPAIRMENT LIABILITY CLAUSE

The Contractor will obtain or cause its Subcontractor to obtain Environmental Impairment Liability insurance for a limit not less than \$5,000,000.00 per occurrence with a deductible not greater than \$50,000.00 covering third party bodily injury, property damage and clean up costs arising out of a pollution event including but not limited to unexpected and unintentional spill, discharge, emission, dispersal, leakage, migration, release or escape of pollutants. Coverage will include the transportation, loading and unloading of materials.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

6. GENERAL

- (a) All insurance coverage described in this General Condition shall be issued by an insurance carrier or agent acceptable to the Owner and licensed to conduct business in the Province of British Columbia.
- (b) Contractors and Subcontractors shall be required to file with the Owner within ten Working Days of issuance of the Notice of Award, a Certificate of Insurance, and where required by the Owner's Director of Risk Management, certified copies of all policies and endorsements evidencing the placement and endorsement of insurance in accordance with this General Condition.
- (c) Contractors and their subcontractors shall be required to furnish evidence of the renewal of policies described in this General Condition by renewal certificate, endorsement or certified copy to be received by the owner at least 15 calendar days prior to the expiry date of the policy.
- (d) If the Contractor fails to obtain and maintain insurance as required hereunder, or if the Owner does not approve any insurance policy or policies submitted to the Owner and the Contractor thereafter does not meet the requirements of the Owner as to terms and conditions of the insurance policy, the Owner shall have the right to place and maintain such insurance in the name of the Contractor. The cost thereof shall be payable by the Contractor to the Owner on demand, and the Owner may deduct the cost thereof from any monies which are due or may become due to the Contractor. If coverage should lapse, all work by the Contractor shall be stopped until satisfactory evidence of renewal is produced.
- (e) Each policy described in this General Condition shall be required to be endorsed to provide the following Notice for Policy Changes and Cancellations to the City of Vancouver:

"It is understood and agreed that this policy will not be cancelled, reduced, materially altered or changed without the Insurer giving at least 30 days prior written notice by registered mail to the City of Vancouver."
- (f) Subject to the provisions of section 1, each Contractor and each of the Contractor's subcontractors shall provide at his/her own cost any additional insurance which he/she is required by law to provide or which he/she considers necessary.
- (g) **Deductibles**

All deductibles shall be for the account of and be paid by the Contractor upon demand by the City.

The Owner shall have the right to deduct amounts for which the Contractor is responsible under this section from any monies which are due or may become due to the Contractor.

GC.54 WORKSAFEBC ASSESSMENTS

Within ten (10) Working Days of receipt of the Notice of Award, the Contractor shall provide a letter from WorkSafeBC confirming the Contractor's registration and that all assessments have been paid to the date thereof. The Contractor shall and the Contractor shall require that the

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

Contractor's Subcontractors maintain such coverage and pay such assessments as will protect them, the Owner and the Engineer from claims under the *Workers' Compensation Act* (British Columbia), as amended from time to time and regulations pursuant thereto.

GC.55 CLAIMS FOR WAGES

The Owner may settle any claim for damages, and pay all wages overdue or the price of any materials or the amount due and payable by the Contractor to any Subcontractor, for which payment is in arrears, and the amount thereof shall be debt due by the Contractor to the Owner, as and for money paid by them for the Contractor and shall be deducted or collected by them as provided in GC.58 - Money Due to Owner, but they do not assume any liability in this respect; nor shall the persons to whom such wages or payments are paid become, by such payments, the employees or servants of the Owner.

GC.56 LIENS

The Contractor hereby agrees to make payment and take all other steps which may be necessary to insure that all Contract monies, and the Work, and every part thereof, shall be and remain at all times free from and not liable to any lien or charge at law or in equity, or to any claim of liability under the *Builders Lien Act*, or to any attachment for debt, garnishee process or otherwise, and the Contractor and his sureties, as well as its respective executors, administrators, successors and assigns, shall fully indemnify and save harmless the Owner and all its officers, servants and employees from any and all such liability, and shall, on demand, immediately cause any such lien, charge, claim or attachment to be removed or released from the records of any Land Title Office or Court in which the same may appear.

Notwithstanding anything to the contrary contained in the Contract Document, the Owners shall not be obliged to pay any monies to the Contractor if and for so long as any liens exist against the Works or the Site.

GC.57 PATENT INFRINGEMENT

The Contractor shall fully indemnify the Owner against and from all suits or actions arising from the claim of any person or persons who are or claim to be patentees of any process used in connection with the Work or of any material, Products, Plant, machinery, tool or appliance used therein or thereon, or in any way therewith.

GC.58 MONEY DUE TO OWNER

All money payable to the Owner by the Contractor may be retained out of any money then due, or which may become due from them to the Contractor under this or any other contract with the Owner, or otherwise howsoever, or may be recovered from the Contractor and its sureties, or any of either of them, in any Court of competent jurisdiction, as a debt due to them; and the Engineer shall have full power to withhold any estimate or certificate, if circumstances arise which may indicate to him the advisability of so doing, until the Engineer is satisfied that the Work and material so far done or furnished are in accordance with the Contract and that the Contractor is otherwise entitled thereto, though the sum to be retained may be unascertained.

GC.59 ASSIGNMENT

The Contractor shall not, without the consent in writing of the Owner first had and obtained, assign or transfer any sum or sums, or any part thereof, due or to become due to the Contractor under the Contract, or assign, transfer or sublet and portion of the Contract or of the Work but must carry out the Work with its own men or subcontract under the Contractor's

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

supervision. This section however does not apply to the furnishing of material for the different parts of the Work, for which material, however, the Contractor will be held strictly responsible, and no excuse for the quality of the material or for the non-delivery in good time by any Subcontractor, as affecting the progress of the Work, will be entertained, nor will the Owner's consent to the assigning, transferring or subletting of any portion of the Work relieve the Contractor from any of its obligations or liabilities under the Contract. No assignment, transfer or subletting hereinbefore mentioned, except if the same is made in accordance herewith, shall be in any manner valid or binding on the Owner.

GC.60 CERTIFICATES AND PAYMENTS

(a) Payment Certifier

The Engineer shall be the "payment certifier" and the person responsible for payment certification under the Contract for the purposes of the *Builders Lien Act*. The Engineer will not be the "payment certifier" under any subcontract.

(b) Certificate for Substantial Performance

- (i) The Contractor shall give written notice to the Engineer that the Work is substantially performed, and, upon subsequent inspection by the Engineer, a list of deficient work shall be issued to the Contractor by the Engineer. When these deficiencies have been rectified to the satisfaction of the Engineer, the Engineer shall recommend that the Work is substantially performed and ready for official inspection.
- (ii) At the time of the application for a Certificate of Substantial Performance, the Contractor shall deliver up to, and to the complete satisfaction of the Engineer:
 - (1) the "as constructed record plans" of the Work required by GC.13 - Record Plans;
 - (2) documentation showing compliance with WorkSafeBC requirements; and
 - (3) a sworn declaration in a form acceptable to the Engineer that all amounts relating to the Work, due and owing as of the end of the month covered by subsection 5.3 of the Form of Agreement to third parties including all Subcontractors and suppliers, have been paid.
- (iii) The Owner, the Engineer and the Contractor shall inspect the Work and any remaining deficiencies shall be detailed and included on the Certificate of Substantial Performance. The date of Substantial Performance shall be as stated in this Certificate. Upon issuance of the Certificate of Substantial Performance to the Contractor, the Engineer shall set a reasonable date for the Total Performance of the Work.
- (iv) For the purposes of the *Builders Lien Act*, the Certificate of Substantial Performance as described herein shall serve as the Contract's certificate for completion, and the date of Substantial Performance stated in the Certificate shall be deemed to be the date of the Certificate's issuance.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

(c) Certificate of Total Performance

Upon the provision of satisfactory evidence that the deficiencies have been rectified, the Owner and the Engineer will then be permitted to verify such rectification. Upon rectification of all claims and statutory declarations as specified in GC 60(d) ii and to the reasonable satisfaction of the Engineer, the Engineer will issue the Certificate of Total Performance.

(d) Statutory Declarations

The Contractor shall submit with the Contractor's application for payment such statutory declarations as may be required herein, which shall be sworn in duplicate by the Contractor, or by such person on behalf of the Contractor as the Engineer may approve.

- (i) *Prior to payment* and as condition to any payment, the Engineer may at any time require the Contractor to file with him a Statutory Declaration showing that all wages for the various classes of labour, the hire of trucks, equipment, etc., employed in or about the Site, all Products or other things supplied for use in or upon the Work and amounts due to Subcontractors and suppliers have been paid and satisfied and that there is no encumbrance, lawful claim or lien accruing for labour or services in connection with the Work.
- (ii) Should any amounts be due and unpaid for wages, equipment, hire, Products and Subcontractors or suppliers as above listed or any encumbrance, lawful claim or lien accrue, the amounts shall be listed on a duly attested statement, in duplicate, and attached to the Statutory Declaration referred to above.
- (iii) The Engineer may at any time, if the Engineer deems it advisable, require from the Contractor a statement showing the rates of wages paid by him for the various classes of labour, the rates of hire of trucks and equipment employed and the prices and quantities of any Products supplied for use in or upon the Work and may also require the statement to show in detail the names of unpaid employees, the rates of wages and amounts due to each, and the names of creditors, quantities, prices and amounts due to each. Such statement shall be duly attested in duplicate as above and be a condition precedent to the right of the Contractor to receive payment.
- (iv) *Prior to final payment* and as a condition to issuance by the Engineer of a Certificate of Total Performance, the Contractor shall file with the Engineer a Statutory Declaration showing that all Work in respect of the Contract has been completed; all accounts, detailed in the first sentence of subsection (d)(i) of this General Condition have been paid and satisfied and there is no encumbrance, lawful claim or lien accruing for labour, products or services in connection with the Work; and payments already received and now due under the final payment application are accepted by the Contractor as full compensation for everything furnished and done by the Contractor under the Contract.

(e) Other Documentation

The Engineer may as a further condition to any payment, at any time, require the Contractor to furnish such or other detailed information as may be necessary to establish to their satisfaction the compliance by the Contractor with the conditions of the Contract.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

(f) Books Open for Inspection

The Contractor's payrolls, time-books, books of account, invoices, receipt and statements relating to her Work under the Contract shall be at all times open for inspection and extract by the Engineer and the Owner and any authorized representative of them.

GC.61 TERMINATION OF CONTRACT WITHOUT DEFAULT OF CONTRACTOR

The Engineer may, as agent for and on behalf of the Owner, at the Engineer's discretion terminate the Contract at any time upon written notice to the Contractor notwithstanding the fact that the Contractor may not then be in default, in which event the Owner shall be liable to the Contractor only for a reasonable amount for Work done and materials delivered at or to the Site up to the date of the termination.

Upon payment of the aggregate of the aforesaid sums, the Owner, the Engineer and the Contractor shall be released from their liabilities or obligations under the Contract save and except that the liabilities and obligations of the Contractor shall continue with respect to deficiencies and warranties in the portion of the Work completed prior to termination.

GC.62 TERMINATION OF CONTRACT FOR CONTRACTOR'S DEFAULT

- (a) The Engineer as agent for and on behalf of the Owner, without prejudice to any other right, may elect to terminate the Contract forthwith upon notice to the Contractor if:
- (i) the Contractor shall neglect or refuse to sign the Drawings and execute the Contract within seven days after notification from the Engineer so to do;
 - (ii) the Contractor neglects or fails to commence work within seven days after the date of execution of the Contract by the Contractor;
 - (iii) the Contractor commits an act of bankruptcy or becomes a bankrupt or makes a general assignment for the benefit of the Contractor's creditors;
 - (iv) a receiver is appointed for the Contractor's business;
 - (v) the Contractor fails, on reasonable notice from the Engineer, to supply enough proper workmen or Products;
 - (vi) the Contractor does not pay promptly the Contractor's employees, Subcontractors or suppliers;
 - (vii) the Contractor does not comply with the requirements of the Occupational Health and Safety Regulation and *Workers Compensation Board Amendment Act*, and any failure to meet the safety requirements of the Contract; or
 - (viii) the Contractor persistently or substantially breaches any provision of this Contract.
- (b) On such termination the Engineer may arrange for the performance of the Work by whatever method the Engineer deems expedient but without undue delay or expense.
- (c) The Engineer may take possession of all Products, equipment, tools, structures and appliances belonging to or provided by the Contractor located on the Site which the Engineer deems necessary to prosecute the Work which possession the Contractor

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

hereby pledges to the Engineer as agent for and on behalf of the Owner, as security for the performance of the Contract and the Work, provided that upon completion of the Work the Engineer shall return to the Contractor or her legal representative any such chattels so taken in possession in their original condition (ordinary wear and tear excepted) if not incorporated in the Work, without any compensation for use thereof.

- (d) In case the Work or any part thereof is taken out of the hands of the Contractor, as herein provided, it shall in no way affect the relative obligations of the Owner and the Contractor or its sureties in respect of the Contractor's or their obligation, or in respect of the remainder of the Work (if any), as the Engineer may consider reasonable. The Contractor and its sureties in every case shall be liable for such damages, expenditures and extra expenditures, and for all additional cost of the Work which may be incurred by reason of termination of the Contract pursuant to this GC.62, together with the penalties, if any, from the date fixed for the completion of the Work, and the same may be deducted or collected by the Owner as provided by GC.58.
- (e) All the powers of the Engineer with respect to the determination of any doubts, disputes and differences, and the determination of the sum or sums, or balance of money to be paid to or received from the Contractor, and otherwise in respect of the Contract shall nevertheless continue in force.
- (f) The fulfilment by the Contractor of any stipulation in the Contract may be enforced by legal proceedings and judgement, or order of Court, without prejudice to any other remedy herein contained. Neither the Owner nor any of its officers or employees shall be liable or accountable to the Contractor in any way for the manner in which, or the price at which the Work, or any portion thereof, may have been or may be done or completed by the Owner.
- (g) No proceeding taken pursuant to this GC.62 or pursuant to any other provision of the Contract shall at any time be deemed to be an assignment of the Contract or of any portion thereof, unless otherwise agreed to in writing.

GC.63 SUBMITTALS

The Contractor shall submit product data and samples to the Engineer for review on request. The Contractor's responsibility for deviation in submissions is not relieved by the Engineer's review unless the Engineer gives written acceptance of specific deviations from the requirements of the Contract Documents. The Contractor shall make any changes in submissions which the Engineer may request consistent with the Contract Documents and shall resubmit as directed by the Engineer. The Contractor shall not proceed with work until relevant submittals have been reviewed by the Engineer. The Contractor shall co-ordinate submittals with the requirements of the Contract Documents and shall allow 14 days for the Engineer's review.

GC.64 NON-RESIDENT WITHHOLDING TAX

If the Contractor is, at any time, a non-resident of Canada, within the meaning of the *Income Tax Act* (Canada) as amended, then, and the Contractor hereby so agrees, the City may deduct from all money payable under the Contract and remit to the Receiver-General of Canada, the Government of Canada or the Canada Revenue Agency sums not greater than the greater of:

- (a) 25% of all money payable under the Contract; and
- (b) sums required to be withheld and remitted by the *Income Tax Act* (Canada) as amended.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS

The City will receive a further credit under the Contract for money withheld as of and from the date of the withholding (regardless of when or whether remitted) and no interest will be payable by the City on sums withheld, not remitted as aforesaid and later paid directly to the Contractor.

GC.65 TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS

The City has made no independent inquiries to ascertain the existence or nature, of any toxic or hazardous material, substance or condition at the Site (which expressly includes the subsurface as well as the surface at the Site), and accordingly makes no representations regarding the same. Prior to the Contractor commencing the Work, and thereafter through the term of performance of the Work, the Contractor must take all reasonable steps to determine whether any toxic or hazardous material, substance or condition is present at the Site.

If the Contractor encounters any toxic or hazardous material, substance or condition at the Site or has reasonable grounds to believe that any of the same are present at the Site, then the Contractor must promptly take all reasonable steps to ensure that no person suffers any injury, sickness or death and that no property is injured or destroyed as a result of exposure to or the presence of such material, substance or condition, and must immediately report the situation and circumstances to the City in writing.

The Contractor must in all instances comply fully with all requirements of applicable environmental legislation, the City, the WCA and of WorkSafeBC, whether specifically outlined above in this GC.65 or not, applicable to toxic and hazardous materials, substances and work/work site conditions.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS
APPENDIX A - PRIME CONTRACTOR AGREEMENT FORM

1.0 DEFINITIONS

- (a) **"OH&S Regulation"** means the Occupational Health & Safety Regulation (British Columbia Regulation 296/97) enacted pursuant to the WCA, and any successor legislation, all as such Regulation is amended or re-enacted from time to time;
- (b) **"Owner"** means City of Vancouver;
- (c) **"Place of the Work"** means the work site at 5400 72nd Street, Delta, BC;
- (d) **"Prime Contractor"** means the Contractor, who is designated pursuant to section 3.0 below by the Owner to be the Prime Contractor for the Project with respect to occupational health and safety for the purposes of WCB Legislation;
- (e) **"Project"** means the Vancouver Landfill Pump Station Controls Upgrade at 5400 72nd Street, Delta, BC, as contemplated by the Contract Documents, and includes all the Work;
- (f) **"WCA"** means the *Workers Compensation Act*, R.S.B.C. 1996, Chapter 492, and any successor legislation, as such Act is amended or re-enacted from time to time;
- (g) **"WCB"** means the Worker's Compensation Board of British Columbia; and
- (h) **"WCB Legislation"** means the WCA and all regulations thereto including the OH&S Regulation, and all rules, regulations and requirements of WorkSafeBC, and any successor legislation, rules, regulations and requirements, all as amended or re-enacted from time to time; and
- (i) **"WorkSafeBC"** means the British Columbia Provincial governmental organization by that name which is responsible, inter alia, for promoting workplace health and safety for the workers and employers of British Columbia, and for working with the affected parties to provide return-to-work rehabilitation, compensation, health care benefits and a range of other services, in the event of work-related injuries or diseases suffered by workers in British Columbia.
- (j) All other capitalized terms used in this Prime Contractor Agreement have the meanings given to them in the Contract Documents of which this Prime Contractor Agreement is a part, as applicable.

2.0 PRIME CONTRACTOR'S RESPONSIBILITIES

Proof of Qualification to act as Prime Contractor

- The Prime Contractor is to provide a current copy of its WorkSafeBC "Clearance Letter", a signed copy of this Prime Contractor Agreement and all other documents requested by the Owner prior to commencement of the Work.
- The Prime Contractor is to notify the Owner of any changes of status with WorkSafeBC or the WCB during the course of the Project.

After the Prime Contractor has been designated and before Work has commenced, the Prime Contractor shall:

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS
APPENDIX A - PRIME CONTRACTOR AGREEMENT FORM

- Conduct all necessary and appropriate inquiries of all relevant Owner staff and records in order to verify in writing to the Owner that the Owner has given to the Contractor all information known to the Owner that is necessary to identify and eliminate or control hazards to the health and safety of persons at the Place of the Work.
- Conduct a pre-contract hazard assessment and carefully review, and plan to address, all hazards identified in that assessment.
- Inform all other employers whose employees are providing services for the Project at the Place of the Work, that it is the Prime Contractor.
- Establish and maintain a system or process to ensure all employers, employees and visitors at/to the Place of the Work comply with the WCA, the OH&S Regulation and the requirements of WorkSafeBC. The Prime Contractor will thus be responsible for site orientation and hazard communication.
- Review and complete a "Pre-Job Meeting Form" if the Owner requests.
- For construction projects, post the Notice of Project on the Place of the Work and deliver a copy to WorkSafeBC at least 24 hours before construction commences.
- Comply with section 20.2 of the OH&S Regulation in respect of the Notice of Project.
- Identify and set expectations for each subcontractor's safety contact.
- Coordinate all safety-related activities, from site orientations to safety committee meetings and toolbox talks, to inspections and incident reviews.
- Inform employers and workers of the workplace hazards associated with the Place of the Work.
- At the Place of the Work, provide the information listed in section 20.3(4) of the OH&S Regulation.
- In all other respects strictly comply with, and strictly enforce compliance by others, as applicable, with, the WCA, the OH&S Regulation, the requirements of WorkSafeBC, the safety policies and procedures of the Owner and the terms and conditions of the Contract Documents applicable.

Throughout the term of the Project, the Prime Contractor shall:

- Ensure that all hazards are promptly and appropriately identified and addressed.
- Ensure the health and safety of the workers on the Project.
- Maintain a current list of persons that each sub-trade (employer) has designated to be responsible for that employer's health and safety activities.
- Ensure provision of first aid equipment and services as required by the OH&S Regulation.
- Coordinate all occupational health and safety activities for the Project.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS
APPENDIX A - PRIME CONTRACTOR AGREEMENT FORM

- Prepare, and communicate to all workers on the Place of the Work, an emergency response plan, taking into account the number of people onsite, the people who work outside regular hours and the types of emergencies that may arise. This plan should also describe subcontractor and individual worker responsibilities (e.g. responding to a fire) and provide for any necessary training and equipment, including first aid supplies as work processes change over the course of the Project, this emergency response plan must be updated as appropriate.
- Make and maintain detailed notes and reports in respect of the initial site safety meeting, safety committee meetings, reviews of contractors' safety systems, inspection and incident investigations, first aid records and orientation and training.
- On any site where workers of two or more employers are working at the same time and the combined workforce is greater than five, identify and designate a "Qualified Coordinator" to coordinate health and safety activities.
- In all other respects strictly comply with, and strictly enforce compliance by others, as applicable, with, the WCA, the OH&S Regulation, the requirements of WorkSafeBC, the safety policies and procedures of the Owner and the terms and conditions of the Contract Documents applicable.

Prime Contractor's Qualified Coordinator, if applicable, (Construction Only) responsibilities:

- Comply with all requirements listed in section 20.3(3) of the OH&S Regulation and on page 13 of the Owner's Multiple Employer Workplace/Contractor Coordination Program (2003).
- Coordinate all health and safety activities for the Project.
- Post workplace drawings showing where first aid is located, the emergency transportation system for injured workers and evacuation marshalling points.
- Ensure that regular workplace safety meetings are held and documented.
- Know who all other contractors' "Qualified Persons" are.
- Ensure that all workers at the Place of the Work are informed of workplace hazards, from both the pre-contract hazard assessment and from ongoing work activities of all employers at the Place of the Work, and ensure that hazards are properly and punctually addressed throughout the duration of the Project.

3.0 DESIGNATION AS PRIME CONTRACTOR

By signing this Prime Contractor Agreement, the undersigned Contractor accepts all responsibilities of a Prime Contractor as outlined above and in the Owner's Contractor Coordination Program (2003), Part III of the WCA and the OH&S Regulation, as well as any other responsibilities required by WorkSafeBC.

As a Contractor signing this Prime Contractor Agreement with the Owner, the undersigned company agrees that the company and its management staff, supervisory staff and workers will comply with the all WorkSafeBC requirements, the OH&S Regulation and Part III of the WCA.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART E - GENERAL CONDITIONS
APPENDIX A - PRIME CONTRACTOR AGREEMENT FORM

Any violation of a requirement of WCB Legislation by the Prime Contractor may be considered a breach of the Contractor's Contract with the Owner resulting in possible termination or suspension of the Contract and/or any other actions deemed appropriate at the discretion of the Owner.

Any penalties, sanctions or additional costs levied against the Owner, as a result of an action or inaction of the Prime Contractor in its capacity as such, are the sole responsibility of the Prime Contractor, as set out in the Contract.

I, the undersigned, acknowledge that I have read and understand the information above. By signing this Prime Contract Agreement, I agree as an authorized representative of the Contractor to accept all responsibilities of the Prime Contractor for this Project.

Date	_____
Contract #	_____
Name of Contractor	_____
Qualified Coordinator's Name	_____(Construction Only)_____
Signature of Authorized Representative	_____
Print Name and Title	_____

**INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS**

1.0 HOURS OF WORK

- (a) The Contractor must comply at all times with the Corporation of Delta's Noise Control By-Law and verify the hours within which construction work may be performed. No work noise shall be created except as permitted by all applicable Corporation of Delta By-laws.
- (b) Notwithstanding GC.35, the City's forces work between the hours of 7:00 a.m. and 3:30 p.m. Working Days. Work will not be performed by City forces or City inspectors outside these hours except by special arrangement agreed to by the Engineer or in case of an emergency. Work performed in the absence of a required inspection is not permitted.
- (c) The Contractor will confine its performance of the Work to the limits of the areas noted in the Design Drawings, except that the Contractor will, subject to GC.36 [Traffic Control], be entitled to utilize the roads within the Landfill for transporting its labour and equipment to and from such Work areas.

2.0 WORK WITH ENGINEER

The Work shall be done in accordance with the Contract Documents and to the satisfaction of the Engineer. The Contractor shall coordinate the Work with the Engineer. The Contractor shall have no cause for claim against the City whatsoever with respect to delays or other interruption of the Work by City forces or due to the above requirement to coordinate the Work with the Engineer.

3.0 COORDINATION WITH OTHER WORK ON SITE

The Contractor will be responsible for completing the Work in a way that does not hinder other work on the Site (as described in section 18.0 of the Instructions to Tenderers). The Contractor shall have no cause for claim against the City whatsoever with respect to delays or other interruption of the Work due to the above requirement to complete the Work in a way that does not hinder other work on the Site.

4.0 DESIGN AND INSPECTION

The Contractor must allow the Owner to perform reviews and inspections during the Work so that all quantities and prices may be independently verified.

5.0 COMPLY WITH APPLICABLE LAW

The Contractor will be required to conduct the Work in accordance with the requirements of all applicable Federal, Provincial and Municipal laws and regulations.

6.0 TRUCK SAFETY

- (a) All truck operators must operate the vehicle in a safe and courteous manner and in full compliance with the Motor Vehicle Regulations.
- (b) All truck operators must comply with the Corporation of Delta By-laws regulating truck use, including truck route, engine brake noise, and weight and load securement provisions (please note that the speed limit at the landfill is 30 kph).

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

7.0 EXTRA WORK

Adjustments to the Contract Amount on account of changes or extra Work shall be valued on the basis of the unit prices specified in the Schedule of Quantities and Prices. Where no price is identified, adjustments shall be valued as follows:

- (a) by any amount or method agreed to by the Engineer and the Contractor including new unit prices or a lump sum; or
- (b) by Force Account, as discussed below.

8.0 FORCE ACCOUNT

- (a) Payment for Force Account Work shall be calculated as follows:
 - (i) **Labour** - at the lower of the hourly rates set out in the Form of Tender or the actual cost to the Contractor including all amounts paid for labour and all related taxes, assessments payable as required by any statutory scheme such as Workers' Compensation, Employment Insurance, holiday pay, insurance and all employee benefits. A markup of three percent on the foregoing shall be allowed for all small tools. A markup of ten percent on the total of the foregoing shall be allowed for overhead. A further markup of ten percent on the total of the foregoing, including the markup for overhead, shall be allowed for profit.
 - (ii) **Equipment**
 - (A) Contractor owned or bare rented-at the non-operated hourly rates as set out in the Approved Equipment Rental Rate Guide based on actual hours, in minimum increments of 0.5 hours, plus a ten percent markup to cover all overhead costs and profit. If equipment is not listed in the Approved Equipment Rental Guide then at a rate determined by the Engineer based on local equipment rates; or
 - (B) Non-Contractor owned and operated-at the lower of the all found rate in the Approved Equipment Rental Rate Guide for operated equipment, or the actual rental costs incurred by the Contractor, as evidenced by invoice, plus, in either case, a ten percent markup to cover all overhead costs and profit.
 - (C) Separate rental for small tools will not be allowed.
- (b) Materials incorporated into the work or consumed in performing the Work by the Contractor shall be at the Contractor's actual cost, as evidenced by invoice, including all transportation, freight and haulage costs plus a markup of ten percent on such actual cost to cover all overhead, handling and profit.
- (c) Force Account Work performed by a Subcontractor shall be paid for in the lesser of:
 - (i) the amount as provided by subsections (a), and (b) above, plus a mark-up of five percent to cover all overhead and profit; or
 - (ii) the actual amount the Contractor pays the Subcontractor including a mark-up of ten percent on such actual cost to cover all overhead and profit.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

9.0 RELEASE AND INDEMNIFICATION

- (a) The Contractor now releases the City, its officers, officials, employees and agents from all costs, Losses, damages and expenses, including those caused by personal injury, death, property damage, loss and economic loss arising out of, suffered or experienced by the Contractor, its Subcontractors, and their respective officers, employees and agents in connection with the performance of the Work.
- (b) Despite the provision of insurance coverage by the City, the Contractor hereby agrees to indemnify and save harmless the City, its successors, assigns and authorized representatives and each of them from and against Losses, claims, damages, actions, and causes of actions that the City may sustain, incur, suffer or be put to at any time either before or after the expiration or termination of the Contract, that arise out of the acts of the Contractor, its Subcontractors, or their respective officers, employees or agents under the Contract.
- (c) This indemnity will not affect or prejudice the City from exercising any other rights that may be available to it at law or in equity.
- (d) The release and indemnity set out above will survive the expiry or sooner termination of the Contract.

10.0 NO PROMOTION OF RELATIONSHIP WITH THE CITY

The Contractor shall not disclose or promote its relationship with the City, including by means of any verbal declarations, announcements, sales, marketing or other literature, letters, client lists, press releases, brochures or other written materials (the "**Communications**") without the express prior written consent of the City (except as may be necessary for the Contractor to perform the Contractor's obligations under the terms of the Contract).

11.0 PERMITS FOR WORK

The Contractor must comply with all municipal and governmental regulations and bylaws governing construction and pay for and obtain all necessary permit fees. The Contractor must obtain any Corporation of Delta or other required permits for the Work. Extra compensation will not be allowed for costs incurred by the Contractor as a result of the failure of the City or the Contractor to secure construction permits such that the Contractor can proceed on the Contractor's predetermined schedule.

12.0 MATERIAL REQUIREMENTS

As detailed in Specifications and Drawings.

13.0 SURVEYS, DATUM AND LAYOUT

- (a) The Engineer and Owner will work with the Contractor to establish the required survey benchmarks for the project (NAD83UTM10 in meters or others). The Engineer will be responsible for establishing these prior to commencement of the Work.
- (b) The Contractor shall supply all wooden survey stakes and hubs which shall be of good quality.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

- (c) The Contractor shall maintain thereafter, all benchmarks, baselines, property boundaries and other references and construction points, as originally established by the Owner. The Contractor shall be responsible for keeping their accuracy, and pay to the Owner all costs of re-establishing them if they are disturbed.
- (d) The Contractor shall be responsible for all lay-out and survey control for this Contract. The location and coordinates of established survey monuments will be provided by the Owner.
- (e) The Engineer may, at any time, check Contractor's survey and layout work but this shall not relieve Contractor of any of his responsibilities to carry out Works to the lines and grades as set out in accordance with Drawings and Specifications.
- (f) The Contractor shall provide reasonable and necessary opportunities and facilities for setting points and making measurements during the Work.
- (g) The Contractor shall employ a competent surveyor to assist the Engineer, when required, in checking lines and elevation in the Contractor's layout.
- (h) Some elevations and co-ordinates on the Drawings refer to NAD83UTM10 in meters. Elevations/dimensions are generally shown in metres/millimetres.
- (i) The Contractor shall maintain a complete and accurate log of control and survey work as it progresses.

14.0 LINES AND GRADES

- (a) The Contractor shall be responsible for layout of all works.
- (b) Dimensions for the determination of quantities for payment will be taken from the Drawings where the location of the lines and points determining quantities for payment is not varied during the construction from the locations shown on the Drawings. Where, however, the location of such lines and points is altered during the construction, field measurements will be made by the Engineer to determine the changed dimensions shown on the Drawings. The Contractor shall notify the Owner before the work is covered up, so that the true dimensions can be established by the Owner. In all cases where the procedure for determination of quantities is not expressly defined in this Contract, the Engineer shall be the sole judge as to which measurements properly define the quantities.
- (c) The Contractor shall cooperate with the Engineer and provide a rod man or similar assistance in checking layout measuring quantities for payment.
- (d) No payment will be made for the cost to the Contractor of any work or delays occasioned by establishing or checking lines and grades or making other measurements and no extension of time will be allowed for any delay occasioned thereby.
- (e) The Drawings indicate the intent of the Work and construction details as accurately as is possible. Because of the nature of the work however, minor adjustments may be required in the field to meet specific conditions. Such adjustments shall be made by the Contractor without additional cost to the Owner.
- (f) The Contractor shall upon commencement of the work, survey all existing facilities, expose any work required and make any measurements required, to

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

confirm the accuracy of the existing facilities prior to ordering, fabricating or constructing any piece of work.

- (g) The Owner will not entertain extras to the Work due to the Contractor's failure to survey or measure the work properly in advance.

15.0 MATERIAL TESTING

- (a) Despite General Condition GC.19, the Owner will retain and pay for the services of testing agencies that will determine conformance with the Specifications except for testing which is specifically designated to be the Contractor's responsibility in the Contract Documents.
- (b) The Owner's testing does not release the Contractor of any responsibility to conduct his own quality control program or to ensure that the work complies with the Specifications.
- (c) Should any test performed by the Owner indicate non-compliance with the Specifications, it will be the responsibility of the Contractor to make good the work and have the tests performed again at the Contractor's expense to prove conformance with the Specifications.

16.0 CONSTRUCTION DURING INCLEMENT WEATHER

- (a) Any planned power outages shall not be conducted while it is raining or snowing, or when ground conditions are wet, unless approved by the Engineer.
- (b) The Engineer may order the Contractor to cease certain operations due to inclement weather.
- (c) There will be no extra compensation payable on account of delays caused by inclement weather unless such weather is Abnormal Weather.

17.0 ENVIRONMENTAL PROTECTION

- (a) The Contractor shall give prime consideration to protecting the environment during all stages of construction and shall cooperate fully with Owner, Engineer, Site operating personnel, and local authorities to protect the natural environment.
- (b) Inspectors from the Ministry of Environment and other authorities having jurisdiction may make periodic visits to the Site during construction. They have authority to order the Contractor to stop work if in their opinion work is not being completed in accordance with existing regulations and approvals applicable to Work.

18.0 HEALTH & SAFETY

- (a) A Preliminary site specific safety and health plan ("**Site Specific Safety and Health Plan**") is required to be submitted by the Tenderer as part of its Form of Tender as Schedule J - Preliminary Site Specific Safety and Health Plan.
- (b) The Contractor shall develop and maintain for the duration of this Contract, a Site Specific Safety and Health Plan prepared under the supervision of and signed by a qualified Health and Safety Specialist that will effectively incorporate and implement all required Municipal, Provincial (WorkSafeBC Occupational Health and

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

Safety Regulation), and Federal safety provisions. The Site Specific Safety and Health Plan is also required to meet the requirements contained in GC.7. The Contractor shall provide the Site Specific Safety and Health Plan for the Work prior to commencing Work at the Site or within ten Working Days after receiving a Notice to Proceed, whichever comes first. The Contractor shall maintain at least one copy of the Site Specific Safety and Health Plan at the Site. The Contractor shall assign an individual serving as a Site safety and health officer ("Site Safety and Health Officer") at the Site at all times during the Work who is responsible and authorized to supervise and enforce compliance with the Site Specific Safety and Health Plan. The Site Safety and Health Officer will act as the Qualified Coordinator as defined by WorkSafeBC.

- (c) Preparation of the Site Specific Safety and Health Plan shall be the Contractor's responsibility and no statement made in these provisions shall relieve the Contractor of responsibility for information included in and implementation of the Site Specific Safety and Health Plan.
- (d) The Engineer's review of the Contractor's performance is not intended to include a review or approval of the adequacy of the Contractor's safety supervisor, the safety program or any safety measures taken in, on, or near the Site.
- (e) The Contractor's Site Specific Safety and Health Plan should include, but not be limited to:
 - (i) A pre-contract hazard assessment, including mitigation measures, that may be encountered on the Landfill site or while carrying out the Work. Appendix 4 contains a list of site specific hazards which may be unique to the Landfill. Procedures or other practices which are followed by Landfill staff as mitigation measures are also listed for the Contractor's information. The Contractor is required to develop and implement their own mitigation measures which eliminate or control all identified hazards.
 - (ii) A system or process to ensure effective site orientation and hazard communication with all persons entering the Site. The City's Site Safety Orientation/Agreement, contained in Appendix 2, shall form part of the Contractor's site orientation.
 - (iii) A plan to carry out inspections, and pre-job, toolbox safety committee, incident review, and other meetings.
 - (iv) Identification of each Subcontractor's safety officer.
 - (v) Provision of first aid equipment and services.
 - (vi) An emergency response plan, including provision of training and equipment.
 - (vii) Documentation of the initial Site safety meeting, safety committee meetings, reviews of Subcontractors' safety systems, inspection and incident investigations, first aid records, orientation and training.
 - (viii) Communication protocols for reporting to the Engineer and WorkSafeBC Site safety issues or concerns, first aid incidents, emergencies, damage claims, and the like.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

- (ix) Any other relevant information or documentation to meet the provisions listed in Appendix A.
- (f) The Contractor shall submit three copies of the Site Specific Safety and Health Plan in accordance with this section to the Owner. Failure on the part of the Contractor to follow the Site Specific Safety and Health Plan or to continue any work in an unsafe manner may result in suspension of the Work by the Owner. The Contractor shall not be entitled to extra compensation for health and safety related suspensions, nor shall the date for completion of the Work be extended.
- (g) The Contractor shall perform whatever work is necessary for safety and be solely and completely responsible for conditions of the Site, including safety of all persons (including employees of the City, Engineer, any Site visitors, and Contractor) and property during the Contract period. This requirement applies continuously and is not limited to normal working hours.
- (h) No Work can commence on Site until the Contractor's Site Specific Safety and Health Plan has been submitted to and received written confirmation of receipt by the City.

19.0 MANUFACTURER'S INSTRUCTIONS

- (a) The Contractor shall install or erect Products in accordance with manufacturer's instructions unless otherwise indicated in the Specifications. The Contractor shall not rely on labels or enclosures provided with Products and shall obtain written instructions directly from manufacturers.
- (b) The Contractor shall notify the Engineer in writing, of conflicts between Specifications and the manufacturer's instructions, so that the Engineer may establish a course of action.
- (c) Improper installation or erection of Products, complying with these requirements, authorizes the Engineer to require removal and reinstallation at no increase in contract price.

20.0 UNION CONTRACTORS

(a) **Terminology**

In this section 20.0 the following terms have the following meanings:

- (i) **"Site Labour Disturbance"** means any strike, lock-out or labour disturbance, including those resulting from any jurisdictional or non-affiliation issues, involving employees, whether or not members of a trade union, of the Contractor, any Subcontractor, or any of their respective subcontractors of any tier, which delays or in any way adversely affects the performance and completion of Work at the Site.
- (ii) **"Trade Union Council"** means a council or association of trade unions of which employees of the Contractor or a Subcontractor are members.

(b) **Open Site**

The Site and adjacent work areas associated with the Project are, or are part of, an "open site" and the Work will be performed on a "no strike/no lockout" basis.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

Accordingly, the Contractor and its Subcontractors, as well as the Owner and Other Contractors, may employ labour at the Site who are members of a trade union, including a trade union affiliated with a Trade Union Council or who are members of another trade union, or who are not members of a trade union.

(c) Labour Disruptions

The Contractor will use its best commercial efforts to ensure that no Site Labour Disturbance shall occur and the Contractor:

- (i) will only retain Subcontractors for the Work whose employees are either:
 - (1) certified in British Columbia to be represented by a trade union and subject to a collective agreement which does not expire until after the date of Total Performance of the Work; or
 - (2) not so certified; and require such Subcontractors to only retain subcontractors and suppliers whose employees are either certified in British Columbia to be represented by a trade union and subject to a collective agreement which does not expire until after the date of Total Performance of the Work or are not so certified; and
- (ii) represents and warrants that, with respect to any employees of the Contractor who may work at or near the Site and who are certified in British Columbia to be represented by a trade union and subject to a collective agreement, such collective agreement to which such employees are subject does not expire until after the date of Total Performance of the Work but if any Site Labour Disturbance occurs and does or may adversely impact on the Owner, the Work or the Contract Time, the Contractor will use its best commercial efforts to ensure that the length and extent of such impact is minimized (including without limitation by cooperating with the Owner in any measures they may take to ameliorate such impact) and the Contractor will be liable to the Owner for any such impact.

(d) Required for Union Contractors

Without limiting the generality of subsection (c) above, if the Contractor, or any Subcontractor, proposes to employ labour at the Site who are members of a trade union, including a trade union that is affiliated with a Trade Union Council authorized to bind its member trade unions, then the Contractor must first submit to the Engineer:

- (i) a waiver of all non-affiliation or reservations rights under applicable collective agreements, including renewals or replacements thereof, effective for the duration of the Contract and executed by the Trade Union Council on behalf of all trades, or executed by the particular trade unions whose members will be so employed; and
- (ii) an agreement that there will be no Site Labour Disturbance at or affecting the Site and/or the progress of the Work, effective for the duration of the Contract, and executed by the Trade Union Council on behalf of all trades, or executed by the particular trade unions whose members will be so employed.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

21.0 SUBSURFACE CONDITIONS

The Contractor now acknowledges that it is experienced and familiar with assessing and working with the variable and unpredictable nature of compacted landfill waste and unknown material and sub-surface conditions and acknowledges that the Owner has made available to the Contractor all available information concerning the relatively unknown state of decomposition, compaction, and composition of the residential, commercial and industrial waste, demolition material, and other matter comprising the subject matter of the Work. Unless (and then only to the extent that) the Contractor adds qualifications or conditions into its Tender proposing a different allocation of the risks of performing the Work on and in landfill waste (by expressly stating such qualifications and deviations in Schedule H -Tenderer's Proposed Variations) the Contractor now assumes all risks of any kind or nature associated with performing the Work on and in landfill waste, whether or not such risks arise due to the reasonably foreseeable consequences of working in and around landfill waste, and whether or not such risks are the result of sub-surface conditions which were not known to the Contractor at the time of submitting its Tender and the Contractor now agrees not to make any claim for an extension of Contract Time or additional compensation for anything arising during the Contract which would not have occurred but for the existence of landfill waste.

22.0 APPLICABLE CODES AND STANDARDS

- (a) Where a material or item is required to conform to standards set out in a standard specification such as C.S.A. or A.S.T.M. or C.G.S.B. or B.C.B.C., the Contractor shall obtain assurance from supplier, in writing, (including trade literature), that its product does so conform.
- (b) All codes/standards shall be the latest issue of specified codes/standards as amended and revised to the tender closing date, except when a year date is mentioned.
- (c) The Contractor shall supply to the Engineer, on request, satisfactory evidence that all equipment and material complies with Standard Specification or test requirements.
- (d) When references to the following capitalized abbreviations are made, they refer to specifications, standards or methods of the respective association. Abbreviations listed herein, but not mentioned in the specifications, shall be disregarded.
- (e) All references to specifications, standards or methods of technical associations refer to the latest adopted revision, including all amendments.

AASHTO	American Association of State Highway & Transportation Officials
BCBC	British Columbia Building Code
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART F - SUPPLEMENTARY GENERAL CONDITIONS

AWS	American Welding Society
CAN	National Standard of Canada
CGA	Canadian Gas Association
CGSB	Canadian General Standards Board
CISC	Canadian Institute of Steel Construction
CPCA	Canadian Painting Contractor's Association
CPCI	Canadian Prestressed Concrete Institute
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CUA	Canadian Underwriters Association
CWB	Canadian Welding Bureau
ISO	International Organization of Standardization
MMCDA	Master Municipal Construction Documents Association
MMA	Millwork Manufacturers Association
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
RTAC	Road and Transportation Association of Canada
SJI	Steel Joist Institute
SSPC	Steel Structures Painting Council
UL	Underwriters Laboratories
ULC	Underwriters Laboratories of Canada
WCB	Worker's Compensation Board

23.0 MANUFACTURER'S INSTRUCTIONS

- (a) The Contractor shall install or erect Products in accordance with manufacturer's instructions unless otherwise indicated in the Specifications. The Contractor shall not rely on labels or enclosures provided with Products and shall obtain written instructions directly from manufacturers.
- (b) The Contractor shall notify the Engineer in writing, of conflicts between Specifications and manufacturer's instructions, so that the Engineer may establish a course of action.
- (c) Improper installation or erection of Products, complying with these requirements, authorizes the Engineer to require removal and reinstallation at no increase in contract price.

INVITATION TO TENDER No. PS10249
CONSTRUCTION OF NEW WATERLINE AT THEVANCOUVER LANDFILL
PART G - WATERMAIN SUPPLY & INSTALLATION STANDARD DETAIL DRAWINGS

Watermain Supply & installation Standard Detail Drawings are provided separately on CD together with the design drawings. Refer to Part A Section 6.0.



FINANCIAL SERVICES GROUP

Supply Management

INVITATION TO TENDER NO PS10084 CONSTRUCTION OF NEW WATERLINE AT THE VANCOUVER LANDFILL

To acknowledge your intent to attend the Information Meeting being held as per Part A [Introduction], section 7.1, and to ensure that you receive the required information, please submit this form to the person identified below before close of business day, October 20, 2010.

Donna Lee
City of Vancouver Supply Management Department
Fax: 604.873.7057
Email: purchasing@vancouver.ca

YOUR DETAILS:**Tenderer's Name:**

"Tenderer"

Address:**Key Contact Person:****Telephone:****Fax:****E-mail:**

Our company **WILL** ☐ / **WILL NOT** ☐ attend the information Meeting for
"Invitation to Tender No PS10249 "Construction of New Waterline at the Vancouver Landfill"

Name of Company (Please print)

Authorized Signatory

E-mail Address (Please print)

Date



VANCOUVER LANDFILL SAFE WORK PROCEDURE

Developed or Revised (most recent date):
Next Scheduled Review / Revision:

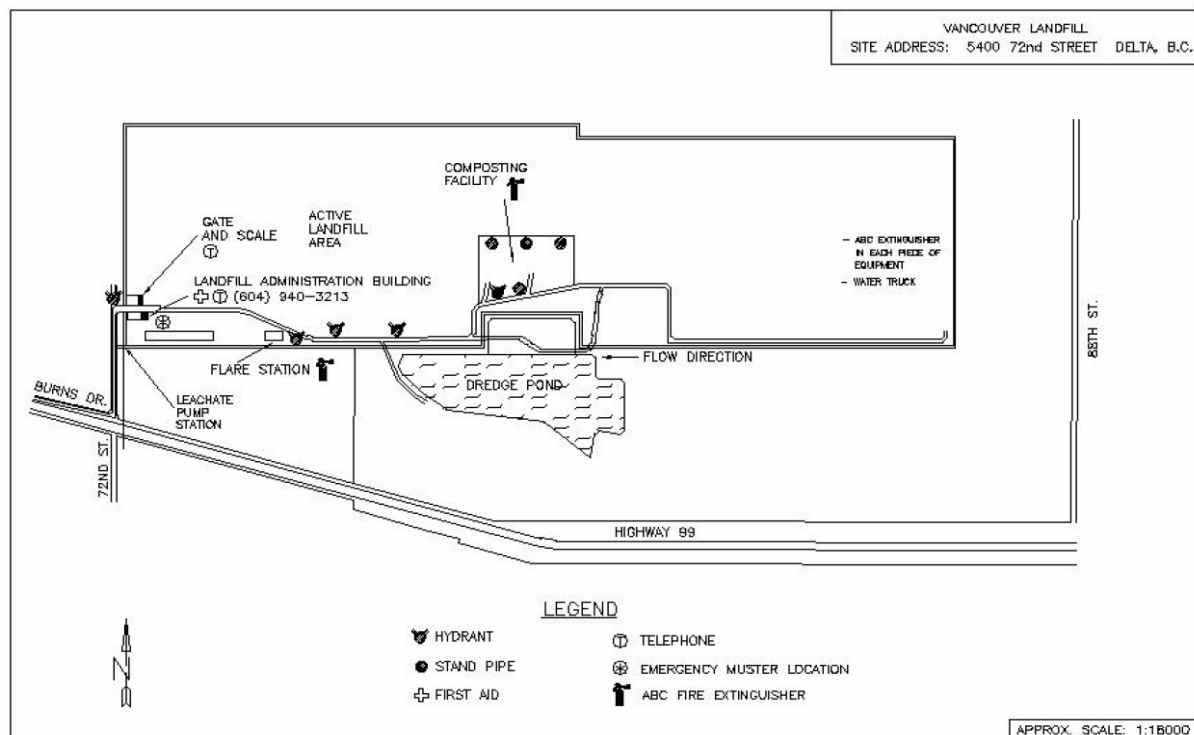
Sept 2008
Sept 2009

SITE SAFETY ORIENTATION / AGREEMENT

The City of Vancouver, Transfer & Landfill Operations Branch requires that all persons working on the Vancouver Landfill (VLF) site receive the following orientation before any work is to begin. The orientation includes an outline of general safety issues, working alone, emergency and first aid procedures, protocols for working near heavy equipment and personal protective equipment requirements. All individuals, understand, agree to comply with, and sign this document in order to have access to or do work on this site.

Sections

1. General Safety Issues
2. Working Alone
3. In The Event of an Emergency
4. First Aid
5. Heavy Duty Equipment
6. Personal Protective Equipment
Legal Terms and Conditions
Statement of Responsibility





VANCOUVER LANDFILL SAFE WORK PROCEDURE

1. GENERAL SAFETY ISSUES
 - The speed limit on the Landfill premises is 30 km/h (20 mph).
 - Smoking anywhere on the site is prohibited.
 - Scavenging is prohibited.
 - The use of cellular phones is not permitted while operating vehicles/equipment. Always move to a safe place out of the way of any equipment or vehicles prior to using a cellular phone or engaging in any other non-mobile activity.
 - All drivers/operators must observe traffic control measures (i.e. stop signs and cones).
 - Be aware of and stay clear of coned off areas. These are to protect you from any hazards.
 - Seatbelts must be worn at all times while vehicles are in motion.
 - Be aware that asbestos is routinely managed at the Landfill. Stay upwind of any yellow bags at the Landfill face.
 - All support workers must sign in and out by completing the "Visitor Sign-in Sheet" located at the Landfill Administration office during regular hours or at the Scalehouse after hours.
2. WORKING ALONE
 - Must sign in and out at the Landfill Administration office and advise reception staff they will be working alone.
 - Have reception staff assign a personal ID number (0010, 0020 or 0030).
 - Follow attached procedures for accessing the Safetyline Mobile Worker Monitoring System.
3. IN THE EVENT OF AN EMERGENCY
 - Report any fires, spills, accidents or other emergencies to the Landfill office immediately (604.940.3213). In the event of an emergency that requires outside assistance, call 911 immediately. The Landfill Manager is responsible for contacting additional authorities as required.
 - Report any health & safety accidents and/or near-miss incidents to the Landfill Office.
 - Your first priority is to warn others and evacuate the immediate area. Do not put yourself in danger.
 - If not directly and helpfully involved, report to the Emergency Assembly Location at the east side of the Landfill Administration building.
 - Do not return to the site until instructed that it is safe.
 - Material Safety Data Sheets are located in Superintendents office.
4. FIRST AID
 - The first aid room is located at the southeast corner of the Landfill Administration building.
 - For emergencies, call 911 (dial "9" first from landlines).
 - Notify the designated First Aid Attendant at 604.603.1655 (VLF First Aid Cell Phone). If no answer, contact the Landfill office at 604.940.3213 to alert the First Aid Attendant.
5. HEAVY EQUIPMENT
 - Do not walk in the active tipping area of the Landfill.
 - Do not move into the vicinity of any vehicle until you have made eye contact with the operator/driver and ensured that he/she is aware of your presence.
 - Do not, at any time, walk behind any piece of heavy equipment. Unless absolutely necessary, remain outside of the swing radius of excavators, approximately 15 metres (50 feet).



VANCOUVER LANDFILL SAFE WORK PROCEDURE

- Always maintain a safe distance between trucks (one truck and trailer length) in the demolition dumping area. End dump style demolition trucks pose an extreme hazard of tipping over on its side when the box is lifted in the air.
 - Remember that people are more mobile than equipment - it is your responsibility to stay out of the way.
 - All equipment must be turned off before fueling.
6. PERSONAL PROTECTIVE EQUIPMENT (PPE)
- The following are necessary while on the site:
 - WCB approved Hi- visibility reflective vest or coveralls.
 - WCB approved safety protective footwear ((heavy-duty, above the ankle, construction-type safety boots with an external triangular green CSA patch). Boots should also be approved as shock-resistant when working on electrical systems (display an external white Ω CSA patch).
 - Also necessary where appropriate:
 - Respirators as per WCB requirements.
 - Hard hats as per WCB requirements.
 - Hearing protection as per WCB requirements.
 - Safety glasses and/or masks as per WCB requirements.
 - Fall protection in situations where a fall of 3 metres (10 feet) or more could occur, or from a lesser height but which represents a higher risk of injury.
 - Other specific equipment where determined necessary or by regulation for the particular situation.
 - Always observe and follow Lockout and Confined Space Entry procedures (when applicable).



VANCOUVER LANDFILL SAFE WORK PROCEDURE

PROCEDURES FOR USING THE SAFETYLINE MOBILE WORKER MONITORING SYSTEM

Users log in to the SafetyLine IVR system at the start of working alone, at assigned intervals during the work, and at the end of working alone. Users, in consultation with their supervisor, should determine the interval period for checking in. The default interval is 60 minutes and may need to be shorter depending upon the risks of the particular task. Users without a personal ID/password will have one assigned by Landfill Reception staff.

To log-in to the SafetyLine IVR system, the user will:

1. phone SafetyLine at **604.299.6266**
2. enter the company ID **51#**
3. enter **personal ID** (as assigned) and #
4. enter **password** (same as ID) and #

The system will respond with a voice message "*not system monitored*".

Support Workers will need to enter their cell phone number by:

1. press **0** (Advanced Menu)
2. press **6**, enter your cell phone number then press #
3. press **1** (to confirm the phone number)
4. press ***** to exit to the main menu

To start system monitoring, all users will need to press **2**, record a voice message stating your work location, then # to report ok and * to exit.

To check-in during the work, log in to the system as above and at the voice prompt, enter **2** and #. If your work location has changed, record a new voice message.

To log-out at the end of work, log in to the system as above and at the voice prompt, enter **5** and #; you will hear "*Thank you for using SafetyLine*".

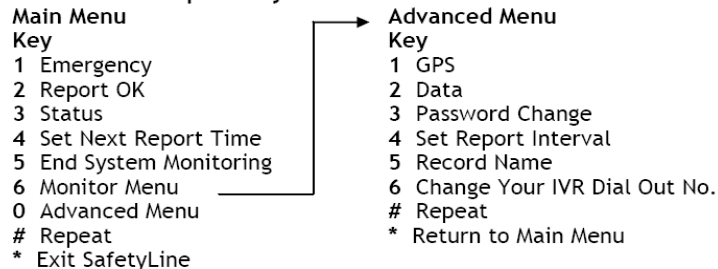
Note: these sequences can be programmed using the speed-dial or one touch button function on most cell phones.

To change the check in period from 1 hour, the user will:

1. press **0** (Advanced Menu)
2. press **4#** (Change your IVR dial out number)
3. enter the **number of minutes** for the desired interval, then #
4. press * to exit to the main menu
5. press * to exit the system

For more detailed instructions, please refer to the *SafetyLine Mobile Worker Monitoring System User Manual*.

Safety Line Interactive Voice Response System Menu





VANCOUVER LANDFILL SAFE WORK PROCEDURE

LEGAL TERMS AND CONDITIONS

- You agree that entry to and use of the site is at your own risk and that neither the City of Vancouver, nor its employees or agents will be liable for any loss or injury to person or property whether or not caused by negligence.
- You agree to comply at all times with the above requirements and to follow the instructions of the Landfill Manager, or their designate, and/or the First Aid Attendant at all times.
- You agree to reimburse the City of Vancouver for any and all costs, losses and damage which may be caused by your failure to carry out safe working practices while on the site or to otherwise comply with this Site Safety Orientation/Agreement.
- The terms of this Site Safety Orientation/Agreement are additional to, and not in replacement of any other Landfill agreement between you and the City of Vancouver. However, in the event of any inconsistency between the two, this agreement prevails.

STATEMENT OF RESPONSIBILITY

Name _____

Company _____

Address _____

Telephone _____

I certify that I have read, understood and agree to comply with and be bound by this Site Safety Orientation/Agreement.

Signature

Date

MEMORANDUM

TO: Lynn Belanger, P. Eng.
City of Vancouver Landfill Operations

DATE: May 19, 2005

FR: Evan Alvernaz, CIH
Colin Wong, P. Eng.

JOB NO: 04-1412-218/1000

**RE: SAFETY AWARENESS SHEET / LANDFILL GAS
VANCOUVER LANDFILL, DELTA, BC**

This document summarizes information regarding general health and safety hazards pertaining to landfill gas and associated general safety precautions, at the Vancouver Landfill, 5400 – 72nd Street, Delta, BC.

1.0 HAZARDS

Key potential hazards associated with landfill gas are:

- **Explosions** – landfill gas (LFG) contains methane that is combustible at concentrations of 5% to 15% by volume in air.
- **Oxygen Deficiency** – landfill gas is composed predominantly of methane (approximately 40% to 65%) and carbon dioxide (approximately 30% to 50%). These gases can displace oxygen from a work space resulting in an oxygen deficient atmosphere. Typically, oxygen deficient conditions will only develop in confined spaces, deep depressions and/or as a result of uncontrolled releases of landfill gas.
- **Hydrogen Sulphide** - concentrations as high as 1,000 ppm have been identified in one well on one occasion. The latest data from May 2, 2005 indicated hydrogen sulphide concentrations below 286 ppm in all measured wells; however, hydrogen sulphide concentrations in the ambient environment have typically been identified to be below the detection limit of data logging instruments when used on the site.
- **Volatile Organic Compounds (VOC)** - other VOCs may also be present in landfill gas; however, these compounds have typically been present in trace concentrations. Some of the VOCs identified on site include: benzene, xylene, toluene and vinyl chloride.

City of Vancouver
Lynn Belanger, P.Eng

- 2 -

May 19, 2005
04-1412-218/1000

2.0 OCCURRENCE OF LANDFILL GAS

Landfill gas exists in the landfill gas collection system and in leachate and condensate collection system piping. It can seep through the landfill cover into the atmosphere or it can be forced into the atmosphere from leaks when under pressure (within the landfill gas flare station compound and in buried transmission pipes leading to the Powerhouse). The majority of the landfill gas is collected under negative pressure by the landfill gas collection system, which is comprised of wells and headers from different regions of the landfill. Each of these regions has landfill gas with its own variable characteristics. Some known areas where there may be elevated levels of landfill gas include: manifold boxes, areas adjacent to lateral collection lines, condensate traps, soil depressions and leachate ditches.

3.0 SAFETY PRECAUTIONS

The following safety precautions must be followed with respect to landfill gas:

1. Do not smoke anywhere on the landfill. Open flames are only permitted on the landfill with prior written permission from appropriate Landfill personnel.
2. Comply Workers' Compensation Board of British Columbia regulations when entering any confined space, depression, or potentially poorly ventilated areas. Adhere to the precautions and procedures identified in Table 1: Important LFG Characteristics and Facts.
3. Ensure that all gas detection equipment is in good working order and that it is bump tested daily prior to use. If bump testing identifies gas detection equipment not be working within its tolerance limits or if the equipment is outside of its calibration period, it must be removed from service immediately. Personnel must be trained in the use and limitations of the gas detection equipment used and must use it in accordance with Vancouver Landfill procedures.
4. Do not access the fenced enclosure at the flare station or conduct any work around the landfill gas control system without a personal gas monitor (able to monitor LEL, oxygen and hydrogen sulphide concentrations) and hearing protection. If the personal gas monitor alarm sounds, evacuate the area immediately and notify appropriate Landfill personnel.



VANCOUVER LANDFILL SAFE WORK PROCEDURE

Developed or Revised (most recent date):	June 2010
Next Scheduled Review / Revision:	June 2011

LANDFILL SITE HAZARD IDENTIFICATION

This document provides general information on hazards and control measures for the Landfill hazards identified by the City of Vancouver Transfer and Landfill Operations Branch. Project specific hazards may be selected below.

Project: Waterline

Scope of Work: Cutting, excavating, pumping, culverting, lifting, compacting, filling, restoring, testing

Dates of Work: Nov 2010 - Mar 2011

Hazard	Typical Location	Yes	N/A	Landfill Mitigation Measure
Asbestos	<ul style="list-style-type: none"> Residential Drop Off Area asbestos bin Asbestos trench Buried throughout Landfill site - most locations not identified 	X		Landfill Respirator Use SWP; Landfill Emergency Response Plan; Landfill Asbestos Management SWP
Compressed Gas Cylinder Release	<ul style="list-style-type: none"> Residential Drop Off Area 		X	SWP for Compressed Gas Cylinders; Landfill Emergency Response Plan
Confined Spaces	<ul style="list-style-type: none"> As marked 	X		City of Vancouver Confined Space Entry Program; Landfill Confined Space Entry SWP
Electrical	<ul style="list-style-type: none"> Lockout procedures required Overhead power lines Buried utilities 	X		Landfill Lockout SWP; Lockout SWPs for Specific Equipment; Qualified electrician may be required; Identification of overhead power lines in work area during pre-job meeting
Eye Hazards	<ul style="list-style-type: none"> Air borne particles - all locations 	X		Landfill Personal Protective Equipment SWP - Eye protection
Fall Protection	<ul style="list-style-type: none"> Working at heights 		X	Landfill Fall Protection SWP

Fires/Explosion	<ul style="list-style-type: none"> Landfill active face Composting facility Flare station Equipment Anywhere on Landfill 		X	Landfill Emergency Response Plan
Lifting Hazards	<ul style="list-style-type: none"> All locations 	X		Task specific safe lifting techniques, Mechanical lifting devices
Landfill gas - explosive gases, methane, oxygen deficiency, hydrogen sulphide	<ul style="list-style-type: none"> Flare station (positive pressure) Landfill gas piping system above/below grade (negative pressure) Confined spaces, surface depressions, ditches, excavations 	X		Landfill Gas Awareness Sheet; Landfill Gas Health & Safety Plan; Landfill Emergency Response Plan
Mobile Equipment/Traffic	<ul style="list-style-type: none"> All locations 	X		Landfill Traffic Management and Operating Mobile Equipment SWP; Landfill Personal Protective Equipment SWP - High visibility vest
Moulds and Spores (bioaerosols)	<ul style="list-style-type: none"> Composting facility Landfill active face 	X		Landfill Control Measures Against Exposure to Microbiological Agents SWP
Needle Sticks/Blood Borne Pathogens	<ul style="list-style-type: none"> In garbage Potentially on wheels and tracks of equipment 		X	Landfill Cleaning Industrial Equipment, General Cleaning and Hygiene, Blood and Body Fluid Exposure, and Control Measures Against Exposure to Microbiological Agents SWPs; City Blood Borne Pathogen Exposure Control Plan Landfill Personal Protective Equipment SWP - Gloves
Noise	<ul style="list-style-type: none"> All locations 	X		Landfill Personal Protective Equipment SWP - Hearing protection
Power Outage	<ul style="list-style-type: none"> Buildings 		X	Emergency lighting
Spills (known and unknown products)	<ul style="list-style-type: none"> Landfill active face Residential Drop Off Area 		X	Landfill Management of Household Hazardous Waste SWP; Landfill Emergency Response Plan
Trip/Slip Hazards	<ul style="list-style-type: none"> All locations 	X		Landfill Personal Protective Equipment SWP - over the ankle steel toe boots - CSA triangle

Violence	<ul style="list-style-type: none">• Scalehouse• Residential Drop Off Area• Administration buildings		X	Landfill Scalehouse Emergency Response and Violence in the Workplace SWPs
Working Alone	<ul style="list-style-type: none">• Remote areas of site		X	Landfill Working Alone SWP; Landfill Emergency Response Plan

CITY OF		SECTION INDEX
VANCOUVER	INDEX	PAGE 1
SPECIFICATIONS		2009

DIVISION 1 - GENERAL REQUIREMENTS

01310	Construction Schedule
01340	Shops Drawings, Product Data and Samples
01535	Temporary Facilities
01561	Environmental Protection
01570	Traffic Regulation
01721	Project Record Documents

DIVISION 2 - SITEWORK

02104	Shrub and Tree Preservation
02210	Site Grading
02221	Rock Removal
02223	Excavation, Trenching, Backfill and Surface Restoration
02226	Aggregates and Granular Materials
02230	Hot-Mix-Asphalt for Surface Restoration
02523	Concrete Walks, Curbs and Gutters
02742	Waterworks
02921	Topsoil and Finish Grading
02938	Sodding

DIVISION 3 - CONCRETE

03300	Cast-in-Place Concrete
-------	------------------------

**CITY OF
VANCOUVER
SPECIFICATIONS****CONSTRUCTION SCHEDULE****SECTION 01310
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 01310 describes the Contractor's responsibilities in the preparation and submission of construction schedules. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Section Includes

- 1.1.1 Schedule, form, content.
- 1.1.2 Staged construction.
- 1.1.3 Scheduled revisions.

1.2 Schedules Required

- 1.2.1 Submit following schedules as required by the Engineer:
- 1.2.1.1 Construction Progress Schedule
 - 1.2.1.2 Submittal Schedule for Shop Drawings and Product Data
 - 1.2.1.3 Submittal Schedule for Samples
 - 1.2.1.4 Submittal Schedule for Owner supplied Products
 - 1.2.1.5 Product Delivery Schedule

1.3 Format

- 1.3.1 Prepare schedules in form of horizontal bar chart.
- 1.3.2 Provide separate bar for each activity.
- 1.3.3 Provide horizontal time scale identifying first work day of each week.
- 1.3.4 List activities in chronological order based on start of each item of work.

1.4 Submissions with Tender

- 1.4.1 Refer to Tender Documents for details regarding schedules to be submitted with tender.

1.5 Submissions Following Award of Contract

- 1.5.1 Submit required schedules within 15 days after Award of Contract.
- 1.5.2 Engineer will review schedules and return reviewed copy within 10 days after receipt.

**CITY OF
VANCOUVER
SPECIFICATIONS**

CONSTRUCTION SCHEDULE**SECTION 01310
PAGE 2
2009**

- 1.5.3 Resubmit finalized schedules within 7 days after return of reviewed copy.
- 1.5.4 Submit revised progress schedule with each application for payment or as directed otherwise by Engineer.
- 1.5.5 Distribute copies of revised progress schedule to:
 - 1.5.5.1 Job site office.
 - 1.5.5.2 Subcontractors.
 - 1.5.5.3 Other concerned parties as directed by Engineer.
- 1.5.6 Instruct recipients to report any problems anticipated with the schedule to Contractor within 10 days.

1.6 Construction Progress Schedule

- 1.6.1 Include complete sequence of construction activities.
- 1.6.2 Include dates for commencement and completion of each major element of construction including the following:
 - 1.6.2.1 Clearing.
 - 1.6.2.2 Utilities.
 - 1.6.2.3 Roadworks.
 - 1.6.2.4 Testing.
 - 1.6.2.5 Deficiencies.
 - 1.6.2.6 Completion.
- 1.6.3 Show projected percentage of completion of each item as of first day of month.
- 1.6.4 Indicate progress of each activity to date of submission schedule.
- 1.6.5 Show changes occurring since previous submission of schedule:
 - 1.6.5.1 Major changes in scope.
 - 1.6.5.2 Activities modified since previous submission.
 - 1.6.5.3 Revised projections of progress and completion.
 - 1.6.5.4 Other identifiable changes.
- 1.6.6 Provide a narrative report to define:
 - 1.6.6.1 Problem areas, anticipated delays, and impact on schedule.

CITY OF
VANCOUVER
SPECIFICATIONS

CONSTRUCTION SCHEDULE

SECTION 01310
PAGE 3
2009

1.6.6.2 Corrective action recommended and its effect.

1.7 Submittals Schedule

- 1.7.1 Include schedule for submitting shop drawings, product data and samples if required.
- 1.7.2 Indicate dates for submitting, review time, resubmission time, float time, and last date for meeting fabrication schedule.
- 1.7.3 Include dates when Owner supplied products will be required.
- 1.7.4 Include dates when reviewed submittals will be required from Engineer.

END OF SECTION

CITY OF VANCOUVER SPECIFICATIONS	SHOP DRAWINGS, PRODUCT DATA & SAMPLES	SECTION 01340 PAGE 1 2009
--	---------------------------------------	---------------------------------

1.0 GENERAL

- 1.0.1 Submit to Engineer, for review, shop drawings, product data and samples specified.
- 1.0.2 Until submission is reviewed, work involving relevant product may not proceed.

1.1 Shop Drawings

- 1.1.1 Drawings to be originals prepared by Contractor, Sub-Contractor, Supplier or Distributor, which illustrate appropriate portion of work. Drawings to show fabrication, layout, setting or erection details, as specified in appropriate Sections.
- 1.1.2 Identify details by reference to sheet and detail numbers shown on Contract Drawings.
- 1.1.3 Maximum sheet size 1,000 X 707 mm.

1.2 Product Data

- 1.2.1 Manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data may be accepted in lieu of shop drawings, as determined by Engineer.
- 1.2.2 The above must conform to the following:
 - 1.2.2.1 Delete information which is not applicable to the project.
 - 1.2.2.2 Supplement the standard information to provide additional information applicable to the project.

1.3 Coordination of Submissions

- 1.3.1 Review shop drawings, product data and samples prior to submission.
- 1.3.2 Verify:
 - 1.3.2.1 Field measurements;
 - 1.3.2.2 Field construction criteria; and
 - 1.3.2.3 Catalogue numbers and similar data.
- 1.3.3 Coordinate each submission with requirements of work and Contract documents. Individual shop drawing will not be reviewed until all related drawings are available.
- 1.3.4 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submittals. Refer to GC.12.

**CITY OF
VANCOUVER
SPECIFICATIONS****SHOP DRAWINGS, PRODUCT DATA & SAMPLES****SECTION 01340
PAGE 2
2009**

- 1.3.5 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Engineer's review of submission, unless Engineer gives written acceptance of specified deviations. Refer to GC.12.
- 1.3.6 Notify Engineer in writing at time of submission, of deviations from requirements of Contract documents.
- 1.3.7 After Engineer's review, distribute copies.

Submission Requirements

- 1.4.1 Schedule submissions at least 10 days before date that reviewed submission will be needed.
- 1.4.2 Submit number of copies of shop drawings and product data which Contractor requires for distribution plus two (2) copies which will be retained by Engineer.
- 1.4.3 Accompany submissions with transmittal letter, in duplicate, containing:
 - 1.4.3.1 Data;
 - 1.4.3.2 Project title and number;
 - 1.4.3.3 Contractor's name and address;
 - 1.4.3.4 Number of each shop drawing, product data and sample submitted; and
 - 1.4.3.5 Other pertinent data.
- 1.4.4 Submission shall include:
 - 1.4.4.1 Data and revision dates;
 - 1.4.4.2 Project title and number;
 - 1.4.4.3 Name of:
 - 1.4.4.3.1 Contractor;
 - 1.4.4.3.2 Sub-Contractor;
 - 1.4.4.3.3 Supplier;
 - 1.4.4.3.4 Manufacturer; and
 - 1.4.4.3.5 Separate detailer, when pertinent.
 - 1.4.4.4 Identification of product or material;
 - 1.4.4.5 Relation to adjacent structure or material;

CITY OF		SECTION 01340
VANCOUVER	SHOP DRAWINGS, PRODUCT DATA & SAMPLES	PAGE 3
SPECIFICATIONS		2009

1.4.4.6 Field dimensions, clearly identified as such;

1.4.4.7 Specification Section number;

1.4.4.8 Applicable standards, such as CSA or CGSB numbers; and

1.4.4.9 Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with contract documents.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS**

TEMPORARY FACILITIES**SECTION 01535
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 01535 addresses general requirements for temporary utilities and construction facilities not incorporated into the final or permanent work. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Section Includes

- 1.1.1 Temporary utilities.
- 1.1.2 Construction facilities.
- 1.1.3 Office and sheds.
- 1.1.4 Project identification.

1.2 Installation and Removal

- 1.2.1 Provide temporary utilities and construction facilities in order to execute work expeditiously.
- 1.2.2 Remove from site all such work after use.

1.3 Dewatering

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

1.4 Sanitary Facilities

- 1.4.1 Provide sufficient sanitary facilities for workers in accordance with local health authorities.

1.5 Water Supply

- 1.5.1 Arrange for connection to municipal water system and pay all costs for installation, maintenance and removal.
- 1.5.2 Provide adequate supply of potable water.
- 1.5.3 A hydrant use permit is required if any hydrant is to be used for the supply of water. Fees (including applicable deposits) for permits are the responsibility of the Contractor.

1.6 Site Storage/Loading

- 1.6.1 Confine work and operations of employees in accordance with Contract Documents. Do not unreasonably encumber premises with products.

**CITY OF
VANCOUVER
SPECIFICATIONS**

TEMPORARY FACILITIES**SECTION 01535
PAGE 2
2009**

- 1.6.2 Do not load or permit to load any part of work with a weight or force that will endanger the work.
- 1.7 Construction Parking**
- 1.7.1 Parking will be permitted on or near the site provided it does not disrupt the performance of work and does not contravene any Traffic By-laws.
- 1.8 Hoarding and Barricades**
- 1.8.1 Provide hoarding and/or barricades and flashers as required and as requested by the Engineer to protect the public from injury and private and City property from damage.
- 1.9 Site Offices**
- 1.9.2 Provide adequate first aid facilities in accordance with Workers' Compensation Board requirements.
- 1.9.3 Contractors may provide their own offices as necessary. Location of these offices must be approved by the Engineer prior to construction.
- 1.9.4 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- 1.9.5 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with the public or work activities.
- 1.10 Public Notice Prior to Construction**
- 1.10.1 Prior to construction, advise residents and/or other parties within the affected area of planned construction activities and schedule.
- 1.10.1.1 Coordinate with and obtain Engineer's approval before delivery or mailing of public notices.
- 1.11 Measurement for Payment**
- 1.11.1 Payment for all work performed under this section will be incidental to payment for work described in other sections unless shown otherwise on the Form of Tender.

END OF SECTION

1.0 GENERAL

- 1.0.1 Section 01561 addresses general requirements for environmental protection. This section is not intended to identify all and/or specific requirements. This section must be referenced to and interpreted simultaneously with all other section pertinent to the works described herein.
- 1.0.2 The Contractor shall have due regard for the protection of the environment in the performance of the Work and shall not place any materials, or dispose of any materials, or perform any Work in a manner contrary to applicable Federal or Provincial or municipal environmental laws and regulations, either at the place of the Work, or at any other place or property.
- 1.0.3 Cleanup shall progress as rapidly as the work itself and upon completion of the job, the Contractor shall remove all debris and waste material caused by construction operations and leave the job site in a clean and neat condition. Where vehicular, bicycle, or pedestrian conditions are heavy and where weather conditions result in unsightliness, discomfort, or hazards, the Contractor shall always take special precautions, to ensure that the site is kept both clean and safe. Fire hydrants shall be left clear for hose connections at all times.

1.1 Fires

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

1.2 Disposal of Wastes

- 1.2.1 Do not bury rubbish and waste materials on site unless approved by Engineer.
- 1.2.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3 Drainage

- 1.3.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- 1.3.2 Do not discharge water containing suspended materials into waterways, sewer or drainage systems, unless approved by Engineer. Place filter cloth in catch basins to prevent suspended materials entering into drainage systems.
- 1.3.3 Control disposal of runoff of water containing suspended materials or other harmful substances in accordance with Municipal, Provincial and Federal requirements.

1.4 Site Clearing and Plant Protection

- 1.4.1 Protect trees and plants on site and adjacent properties.

**CITY OF
VANCOUVER
SPECIFICATIONS****ENVIRONMENTAL PROTECTION****SECTION 01561
PAGE 2
2009**

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

1.4.3 Minimize stripping of topsoil and vegetation.

1.4.4 Restrict tree removal to areas approved by Engineer.

1.5 Pollution Control

1.5.1 Maintain temporary erosion and pollution control features as required by this contract.

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

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

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

1.6 Payment

1.6.1 Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Form of Tender.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS****TRAFFIC REGULATION****SECTION 01570
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 01570 addresses the general requirements for accommodation of roadway traffic during construction. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- 1.0.2 Comply with GC.36, Traffic Control.
- 1.0.3 During progress of the Works, make adequate provisions to accommodate normal pedestrian and vehicle traffic along streets and lanes immediately adjacent to or crossing the Works so as to cause minimum inconvenience to the general public.
- 1.0.4 Give minimum 48 hours notice to local police, fire departments and emergency services prior to beginning construction and comply in all respects with their requirements.
- 1.0.5 Inform all owners or occupants of properties where access is affected in advance of proposed road and/or sidewalk closures.
- 1.0.6 The Contractor shall, at his own expense and without further or other order, provide, erect and maintain all requisite barriers, fences, or other proper protection in accordance with the "B.C. M. O. T. Traffic and Control Manual for Work on Roadways".
- 1.0.7 The Contractor shall also abide by any instructions issued by the City Engineer regarding traffic control.

1.1 Protection of Public Traffic

- 1.1.1 Comply with requirements of the "Traffic Control Manual for Work on Roadways, published by the Ministry of Transportation and Highways, for regulation of vehicle and pedestrian traffic or use of roadways upon or over which it is necessary to carry out work or haul materials or equipment.
- 1.1.2 Observe all traffic regulations in accordance with the City of Vancouver Traffic By-law.
- 1.1.3 When working on traveled way:
 - 1.1.3.1 Place equipment in position to present minimum of interference and hazard to traveling public.
 - 1.1.3.2 Keep equipment units as close together as working conditions will permit and preferably on same side of traveled way.
 - 1.1.3.3 Do not leave equipment on traveled way overnight.
 - 1.1.3.4 Photograph traffic control setup at the end of each day.

**CITY OF
VANCOUVER
SPECIFICATIONS**
TRAFFIC REGULATION
**SECTION 01570
PAGE 2
2009**

- 1.1.4 Do not close any portions of road or lane without approval of the Engineer. Notify all contacts on the Emergency Notification Checklist of any closed roads. Before rerouting traffic, erect suitable signs and devices as approved by the Engineer. Provide sufficient crushed gravel to ensure a smooth riding surface during work.

Emergency Notification Checklist

Company or Entity	Fax Number
Ambulance (911) Radio Room	(604) 872-6742
Vancouver Police Department	(604) 665-5078
Vancouver Fire Department	(604) 665-6016
Coast Mountain Bus Company	(604) 953-3509
Coast Mountain Bus Company	(604) 953-3315
Translink	(604) 453-4628
City of Vancouver Engineering Operations	(604) 873-7212
BC Trucking	(604) 888-2941
ICBC Compliance	(604) 592-6440
BC Ambulance Charge Dispatcher	(604) 872-6742

- 1.1.5 Keep traveled way well grade, free of pot holes and of sufficient width that required number of lanes of traffic may pass.
- 1.1.6 When directed by the Engineer, provide well graded, graveled detours or temporary roads to facilitate passage of traffic around restricted construction area. Provide and maintain signs and lights and maintain roadway.
- 1.1.7 Provide and maintain road access and egress to property fronting along or in vicinity of Work unless approved otherwise by the Engineer.

1.2 Informational and Warning Devices

- 1.2.1 Provide a traffic management plan to the Engineer prior to commencement of construction for approval. Include locations and duration of road and sidewalk closures and signage required for closures.

CITY OF VANCOUVER SPECIFICATIONS	TRAFFIC REGULATION	SECTION 01570 PAGE 3 2009
---	---------------------------	--

- 1.2.2 Provide 48 hours notice to the Engineer for erection or relocation of temporary no parking or no stopping signs. Parking regulation signage placed by the contractor is unenforceable.
- 1.2.3 Supply and erect signs, delineators, barricades and miscellaneous warning devices in accordance with the traffic management plan.
- 1.2.4 Place signs and other devices in additional locations as appropriate or as directed by the Engineer.
- 1.2.5 Continually maintain traffic control devices in use by:
 - 1.2.5.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair, or replace to ensure clarity and reflectance.
 - 1.2.5.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.3 Control of Public Traffic

- 1.3.1 Provide flag persons, trained and properly equipped in following situations:
 - 1.3.1.1 When public traffic is required to pass working vehicles or equipment which may block all or part of traveled roadway.
 - 1.3.1.2 When it is necessary to institute one way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - 1.3.1.3 When workmen or equipment are employed on traveled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
 - 1.3.1.4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - 1.3.1.5 For emergency protection when other traffic control devices are not readily available.
 - 1.3.1.6 In situations where complete protection for workmen, working equipment and public traffic is not provided by other traffic control devices
- 1.3.2 Provide and maintain suitable detours or temporary access routes for pedestrian traffic, complete with suitable warning and advisory signs.

**CITY OF
VANCOUVER
SPECIFICATIONS****TRAFFIC REGULATION****SECTION 01570
PAGE 4
2009**

- 1.3.3 Maintain existing conditions for traffic throughout period of Contract except that, when required for construction under Contract and when adequate measures have been taken as specified herein and approved by the Engineer to protect and control public traffic, existing conditions for traffic may be restricted.

1.4 Payment

- 1.4.1 Payment for all work performed by the Contractor under this Section will be incidental to payment for work described in other Sections unless shown otherwise in the Form of Tender.
- 1.4.2 Temporary parking signs will be supplied and installed at the City's cost.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS****PROJECT RECORD DOCUMENTS****SECTION 01721
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 01721 addresses general requirements for submittal of record documents. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Section Includes

- 1.1.1 Record documents, samples, specifications.

1.2 Submission

- 1.2.1 Submit one (1) complete set of drawings of the Work, as constructed, on or before the date of application to the Engineer for a Certificate of Substantial Completion.
- 1.2.2 Submit record documents in accordance with GC.13, Record Document.
- 1.3.3 Revise content of drawings as required by Engineer prior to issuance of Final Certificate of Acceptance.

1.3 Record Documents and Samples

- 1.3.1 Maintain at site for Engineer one record copy of all Contract Documents including:
- 1.3.1.1 Contract Drawings.
 - 1.3.1.2 Specifications.
 - 1.3.1.3 Addenda.
 - 1.3.1.4 Change Orders and other modifications to the Contract.
 - 1.3.1.5 Reviewed shop drawings, product data, and samples.
 - 1.3.1.6 Field test records.
 - 1.3.1.7 Inspection certificates.
 - 1.3.1.8 Manufacturer's certificates.
- 1.3.2 Store record documents and samples in site office apart from documents used for construction. Provide files, racks, and secure storage.
- 1.3.3 Label and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- 1.3.4 Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.

**CITY OF
VANCOUVER
SPECIFICATIONS****PROJECT RECORD DOCUMENTS****SECTION 01721
PAGE 2
2009**

- 1.3.5 Keep record documents and samples available for inspection by Engineer.

1.4 Recording Actual Site Conditions

- 1.4.1 Record information concurrently with construction progress. Do not conceal work until required information is recorded.

- 1.4.2 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

1.4.2.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced from property lines and finished surface improvements.

1.4.2.2 Field changes of dimension and detail.

1.4.2.3 Changes made by addenda and change orders.

1.4.2.4 Details not on original Contract Drawings.

1.4.2.5 References to related shop drawings and modifications.

1.4.2.6 The type of soil conditions encountered during trench excavation and the location of any changes in soil conditions.

- 1.4.3 Other Documents: maintain manufacturer's certifications, inspection certifications and field test records required by individual specifications sections.

1.5 Payment

- 1.5.1 Payment for all work under this Section will be incidental to payment for work described in other Sections.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS**

SHRUB AND TREE PRESERVATION**SECTION 02104
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 02104 refers to those portions of the Work that are unique to the preservation of existing shrubs and trees. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

- | | | |
|-------|--|---------------|
| 1.1.1 | Site Grading | Section 02210 |
| 1.1.2 | Excavation, Trenching, and Backfilling | Section 02223 |
| 1.1.3 | Topsoil and Finish Grading | Section 02921 |

1.2 Payment

- 1.2.1 Payment for all work under this Section will be incidental to payment for work described in other Sections.

2.0 EXECUTION**2.1 Existing Trees**

- 2.1.1 Protect all trees, shrubs, and planting from damage. Any damage to trees, shrubs, and or planting must be remedied as directed by the Engineer. Do not carry out any construction activity whatsoever on private property,
- 2.1.2 Ensure construction procedures, stockpiling of materials or disposal are not undertaken adjacent to trees, shrubs, planting or areas to be preserved.
- 2.1.3 Ensure construction procedures do not substantially alter natural drainage patterns. Provide interim drainage or irrigation as necessary to compensate for construction interference.
- 2.1.4 Do not prune any tree branches or roots without prior approval of the Engineer. Branches or roots must be cut with a sharp axe or saw, not with a backhoe or excavator bucket. When required by the Engineer, excavation adjacent to trees will be hand dug.
- 2.1.5 Do not excavate closer than 3 times the trunk diameter or 0.5m, whichever is the greatest, from the base of the tree without prior approval of the Engineer.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS**

SITE GRADING**SECTION 02210
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 02210 is a "LANDSCAPING" Section and refers to those portions of the work that are unique to preparation of subgrade, by rough grading and filling, to provide a base that will allow placing of growing medium (topsoil) to specified depths. THIS SECTION DOES NOT APPLY TO GRADING PRIOR TO PLACEMENT OF PAVED OR CONCRETED SURFACES. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

- 1.1.1 Topsoil and Finish Grading Section 02921
- 1.1.2 Sodding Section 02938

1.2 Site Conditions

- 1.2.1 Size, depth and location of existing utilities and structures shown on Detailed Design Drawings are for guidance only. Completeness and accuracy are not guaranteed.
- 1.2.2 Examine site with Engineer and obtain approval of previous work prior to commencing site grading.
- 1.2.3 Prevent damage to all adjacent natural growth, landscaping, buildings, structures and underground and overhead utilities. Make good all damage to satisfaction of Engineer.

1.3 Measurement for Payment

- 1.3.1 Payment for all work under this Section will be incidental to payment for work described in other Sections.

2.0 PRODUCTS**2.1 Materials**

- 2.1.1 Obtain approval from Engineer for excavated or graded material to be used as fill for grading work. Protect approved material from contamination.
- 2.1.2 Fill material to be placed under areas to be landscaped, i.e., with grass, sod, groundcover, shrubs and trees, to be non-toxic to plant and animal life in part or in concentration (leachate).

3.0 EXECUTION**3.1 Grading**

- 3.1.1 Rough grade to levels, profiles, and contours that existed prior to construction and allow for surface treatment.

CITY OF VANCOUVER SPECIFICATIONS	SITE GRADING	SECTION 02210 PAGE 2 2009
--	--------------	---------------------------------

- 3.1.2 Compact subgrade to a consistent 90% Modified Proctor Density in compliance with ASTM D1557.
 - 3.1.3 Excavate soft and unstable areas below subgrade that cannot be compacted to this standard and fill with approved fill material, except in locations where special environmental conditions have been identified. In such cases, appropriate alternative solutions to be approved by Engineer and carried out.
 - 3.1.4 Remove and dispose to approved off-site disposal area, all debris, roots, branches, stones, building material, contaminated subsoil, visible weeds and anything else that may interfere with proper growth and development of planned finished landscaping.
 - 3.1.5 Place fill materials to elevations that existed prior to construction. Place in maximum 200 mm lifts and compact each lift to 90% Modified Proctor Density.
 - 3.1.6 Scarify areas showing excessive compaction to minimum depth of 100 mm and compact as directed by Engineer immediately before placing topsoil.
 - 3.1.7 Grade transitions of subgrade smooth and even, such that ponding cannot occur on subgrade surface.
- 3.2 Surplus Material**
- 3.2.1 Remove surplus material unsuitable for fill, grading or landscaping from site and dispose at approved disposal area.
- 3.3 Topsoil and Finish Grading**
- 3.3.1 See Section 02921 - Topsoil and Finish Grading for placement and finish grading of topsoil.

END OF SECTION

1.0 GENERAL

- 1.0.1 Section 02221 refers to those portions of the work that require rock removal. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

- 1.1.1 Excavating, Trenching and Backfilling Section 02223

1.2 Definitions

- 1.2.1 Rock is defined as all solid rock in the form of bedrock, consolidated glacial till and hardpan that requires breaking by continuous drilling and blasting before excavation. Rock also includes rocks, boulders, buried concrete and foundations having individual volumes in excess of 1.0 m³, removed by blasting.
- 1.2.2 Dense tills, hardpan, partially cemented materials, clay or frozen materials which do not require breaking by continuous drilling and blasting before excavation and removal are not classified as rock.
- 1.2.3 Concrete forming part of the road pavement structure is not classified as rock.

1.3 Qualifications

- 1.3.1 Retain licensed explosives expert to supervise and program blasting work, and to determine precautions, preparation and operations techniques.

1.4 Blasting Operation Proposal

- 1.4.1 Submit to Engineer for approval, written proposal of operations for removal of rock by blasting.
- 1.4.2 Indicate proposed method of carrying out work. Include details on protective measures, time of blasting and other pertinent details.

1.5 Method of Measurement Rock Excavation

- 1.5.1 All units of measurement for payment will be as specified herein unless shown otherwise in Form of Tender.
- 1.5.2 Rock removed prior to the examination and measurement by the Engineer will not be classified as rock excavation and no payment will be made for rock removal, backfilling and surface restoration.
- 1.5.3 Rock will be measured in cubic meters.
- 1.5.4 Payment for rock removal by blasting, including any additional material required to backfill the excavated rock, and restore damaged surfaces will be made at the unit prices bid.

**CITY OF
VANCOUVER
SPECIFICATIONS****ROCK REMOVAL****SECTION 02221
PAGE 2
2009**

- 1.5.5 Payment for rock removal where blasting is specifically prohibited will be measured in cubic meters.
- 1.5.6 No payment will be made for bedrock or consolidated glacial till or hardpan excavated beyond the limits of the maximum trench width and depth specified.
- 1.5.7 No payment will be made for repairing damage to existing pipelines or utilities caused by rock removal.

1.6 Seismic Survey and Monitoring

- 1.6.1 The Contractor and the Engineer will visit owners of buildings and structures to determine existing conditions and describe blasting and seismic recording operations.

1.7 Blasting and Vibration Control

- 1.7.1 Complete all blasting before any structural elements are installed within 15m from blast holes.
- 1.7.2 Minimize ground vibrations which may damage structures or shatter or damage rock mass to remain.
- 1.7.3 Exercise care and limit use of explosives to such charges that do not cause damage to existing pipelines and other utilities.
- 1.7.4 Blasting is not permitted within a distance of 30m of concrete or grout less than 24 h after pouring.
- 1.7.5 Maintain complete and accurate record of all drilling and blasting operations. Submit records to Engineer at end of each shift.

1.8 Protection

- 1.8.1 Prevent damage to surroundings and injury to persons. Post guards, sound warnings and display signs when blasting is to take place.

2.0 EXECUTION**2.1 Rock Removal**

- 2.1.1 Do blasting operations in accordance with City of Vancouver By-laws.
- 2.1.2 Remove rock to alignments, profiles, and cross sections as shown on Contract Drawings.
- 2.1.3 Locations where explosive blasting is not permitted will be determined by Engineer.

**CITY OF
VANCOUVER
SPECIFICATIONS****ROCK REMOVAL****SECTION 02221
PAGE 3
2009**

- 2.1.4 Use methods, techniques and procedures for control of all factors affecting operations in order to produce smooth and sound peripheral surfaces of all completed excavations, to minimize overbreak, and to avoid damage to adjacent structures.
- 2.1.5 Except as specified otherwise or as directed by Engineer, employ pre-shearing, cushion blasting or other smooth wall drilling and blasting techniques to achieve final excavation surfaces.
- 2.1.6 Remove boulders and fragments which may slide or roll into excavated areas.

2.2 Rock Disposal

- 2.2.1 As directed by the Engineer, dispose of surplus removed rock.

END OF SECTION

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 1 2009
--	--	---------------------------------

1.0 GENERAL

- 1.0.1 Section 02223 refers to those portions of the work that are unique to excavating, trenching, backfilling and surface restoration for underground utility installations and related structures. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

- | | | |
|-------|---|---------------|
| 1.1.1 | Environmental Protection | Section 01561 |
| 1.1.2 | Rock Removal | Section 02221 |
| 1.1.3 | Waterworks | Section 02742 |
| 1.1.4 | Hot-Mix-Asphalt for Surface Restoration | Section 02230 |
| 1.1.5 | Concrete Walks, Curb and Gutter | Section 02523 |

1.2 Definitions

- 1.2.1 Rock Excavation: As defined in Section 02221 - Rock Removal.
- 1.2.2 Common Excavation: Excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, partially cemented materials, clay or frozen materials which can be ripped and excavated with heavy construction equipment.
- 1.2.3 Overexcavation: Excavation below design elevation of bottom of specified bedding, and including backfilling of resultant excavation with specified material, as authorized by the Engineer.
- 1.2.4 Removals: Removal and disposal off-site of surface concrete structures and walks, curbs, gutters, manholes, catchbasins, pipes, culverts, endwalls, and any other structures on surface or underground specifically designated on Contract Drawings for removal. Removals to include backfilling of resultant excavation with specified material.

1.3 Safety Requirements

- 1.3.1 Comply with applicable Municipal regulations to protect existing features.
- 1.3.2 Trench shoring to be designed and installed in accordance with the regulations of WorkSafeBC.
- 1.3.3 Sides of trenches or other excavations to be adequately supported. Trench stability and safety procedures to meet or exceed minimum requirements of "Accident Prevention Regulations" current issue of WorkSafeBC.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 2 2009
--	--	---------------------------------

1.4 Blasting

- 1.4.1 Ensure all blasting operations comply with Section 02221 - Rock Removal.

1.5 Disposal

- 1.5.1 Contractor to be responsible for off-site disposal of all surplus spoil from excavations. Dumping of spoil on private property will be permitted only upon written request from property owner and provided all necessary permits and approvals have been obtained.

1.6 Limitations of Open Trench

- 1.6.1 Excavate trenches only as far in advance of pipe laying operation as safety, traffic, and weather conditions permit and, in no case, to exceed 30 m. Before stopping work on last day of work before each weekend or holiday, completely backfill every trench. If circumstances do not permit complete backfilling of all trenches, all open trenches or excavations to be adequately protected by approved fencing or barricades and, where required, with flashing lights. Under no circumstances shall an inactive open trench be open for more than five working days.
- 1.6.2 No more than 1 block of construction can remain unbackfilled at one time.
- 1.6.3 Maintain access to local residents by plating excavations in intersections, private driveways, and any other area where vehicular traffic could be expected.

1.7 Permits and Approvals

- 1.7.1 Obtain all required permits and approvals from regulatory authorities before commencing any excavation.
- 1.7.2 Conduct with Engineer, a condition survey prior to commencing any excavation.

1.8 Measurement for Payment

- 1.8.1 All units of measurement for payment will be as specified herein unless shown otherwise in Form of Tender.
- 1.8.2 With the exception of payment for rock excavation, overexcavation, and surface restoration, payment for all work performed under this section will be incidental to payment for work described in other sections.
- 1.8.3 Measurement for payment for surface restoration will be made in a lump sum for each payment item described in the Form of Tender.
- 1.8.4 Payment for rock excavation will be made in accordance with Section 02221 - Rock Removal.
- 1.8.5 Payment for overexcavation /additional excavation, including any additional material to backfill the overexcavated area will be made at the unit prices bid.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 3 2009
--	--	---------------------------------

- 1.8.6 All costs incurred as a result of unnecessary excavation beyond neat lines or limits of excavation shown on the Detailed Design Drawings or Standard Waterworks Drawings will be at Contractor's cost.

1.9 Inspection and Testing

- 1.9.1 Testing of materials and compaction to be carried out at Contractor's cost by testing laboratory approved by Engineer. Tests will be performed every 20 meters at top of trench fill, 0.45m of cover or other depths if required by the Engineer.
- 1.9.2 Additional testing may be required by the Engineer. If the test shows adequate compaction, the Owner shall pay for the testing. Otherwise, the cost of testing and retesting is the Contractor's responsibility.
- 1.9.3 Sources and gradation curves for backfill materials must be submitted to the Engineer prior to construction. Material samples are required if requested by the Engineer.

2.0 PRODUCTS

2.1 General

- 2.1.1 Unless shown otherwise on Contract Drawings, the materials specified in 2.2 following are approved for their respective uses.

2.2 Use of Specified Materials

- 2.2.1 Backfill for overexcavated trench:
- 2.2.1.1 20mm minus combined crushed aggregate (CoV #9).
 - 2.2.1.2 80mm crushed tailings (CoV #13).
 - 2.2.1.3 Drain rock (only where approved by the Engineer).
- 2.2.2 Pipe bedding and surround:
- 2.2.2.1 20mm minus combined crushed aggregate (CoV #9) for pipes without polyethylene encasement.
 - 2.2.2.2 Sand Fill (CoV #17) for pipes with polyethylene encasement.
- 2.2.3 Trench backfill:
- 2.2.3.1 20mm minus combined crushed aggregate (CoV #9).
 - 2.2.3.2 Sand fill (CoV #17) (only where approved by the Engineer).

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 4 2009
--	--	---------------------------------

2.2.4 Surface treatment to be:

2.2.4.1 Restoration to match existing conditions.

2.2.4.2 Subgrade, subbase and base for works described in other Sections.

2.2.4.3 Topsoil, grass, sod or requirements for other landscaping works described in other Sections.

2.3 Materials

2.3.1 Refer to Section 02226 - Aggregates and Granular Materials for specifications for approved granular materials.

2.3.2 Concrete (except pavement base): to Section 03300, to be minimum 20MPa.

2.3.3 Portland Cement Concrete for pavement base - refer to Standard Detailed Drawing DWG. P2.

2.3.3.1 Sufficient water for proper hydration must be used. Extremely dry concrete known as double zero slump concrete shall not be used.

2.3.3.2 Under no circumstances shall the calcium chloride content exceed 3% by weight.

2.3.3.3 Mechanical vibration and compaction are required under all conditions.

3.0 EXECUTION

3.1 Site Preparation

3.1.1 Sawcut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly. Milling is not allowed. Vacuum slurries from saw cutting and place filter cloth at catch basins to prevent suspended material entering drainage systems. Filter cloth to remain in catch basins until end of construction.

3.1.2 In grass areas, strip topsoil after area has been cleared and stockpile, if approved by Engineer, in locations as directed. Stockpile height not to exceed 2 m. Avoid mixing topsoil with subsoil. Dispose of unused topsoil as directed by Engineer. Do not handle topsoil in wet or frozen condition or in any manner in which soil structure is adversely affected.

3.2 Stockpiling

3.2.1 Stockpile fill materials in areas designated by Engineer. Stockpile granular materials in manner to prevent segregation. Do not block curb and gutter drainage with granular materials.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 5 2009
--	--	---------------------------------

3.3 Excavation

3.3.1 Existing utilities:

3.3.1.1 Utilities shown on Contract Drawings are based on available information and are not necessarily accurate. Contractor to take extreme care when working near or around existing utilities or services. Any utility or service disturbed during construction to be rectified to the satisfaction of the Engineer at the Contractor's cost.

3.3.1.2 To prevent damage to existing utilities, excavate last 300mm over utility by hand.

3.3.1.3 Provide uninterrupted flow of all watercourses, sewers and drains encountered during the work.

3.3.2 Connection to existing mains: Prior to or at commencement of construction, check existing mains for line and elevation at points of connection. If found to be different from Contract Drawings, report such difference to Engineer immediately.

3.3.3 Surface Drainage:

3.3.3.1 Provide suitable temporary ditches or other approved means of handling drainage prior to excavation and during construction to protect construction area and adjacent and other affected properties. Provide siltation controls to protect natural watercourses or existing municipal drainage facilities.

3.3.3.2 Comply with Section 01561 - Environmental Protection.

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

3.3.5 Excavation below grade: when bottom of excavated trench at subgrade is unstable and, in opinion of Engineer, cannot adequately support pipe, overexcavate trench to suitable subgrade as directed by Engineer. Backfill overexcavation with specified materials and compact to minimum 95% Modified Proctor density in compliance with ASTM D1557. Use drain rock backfill only if authorized by Engineer.

3.3.6 Trench width: excavate trench to dimensions shown on Waterworks Standard 305/1/4a. All additional requirements as a result of excessive trench width to be Contractor's cost.

3.3.7 Hand and Hydro Vacuum excavation: excavate by hand if necessary to preserve or minimize damage to existing trees, shrubs, buildings and all similar existing features or facilities. Where, in the opinion of the Engineer, mechanical excavation presents a high risk of damage to existing underground utilities, the Engineer can require either hand or Hydro Vacuum excavation to be done in order to expose those underground utilities.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 6 2009
---	---	--

- 3.3.8 Trench bottom conditions: remove disturbed or softened material from trench bottom before placing bedding material. Maintain trench free from water and soft materials during placement of pipe bedding, pipe installation and trench backfill to ensure proper compaction of granular materials.
- 3.3.9 Trench drainage:
- 3.3.9.1 During pipe laying, jointing, bedding and backfilling, keep trench free of water by pumping or other appropriate means. Provide pumps and dewatering equipment and take precautions to prevent any damage to adjoining buildings, structures, roads or land from prolonged or excessive pumping by installing shoring, sheeting or other supportive measures. Discharge water from excavations in such a manner as not to cause nuisance, injury, loss or damage. Contractor to be responsible for any claims or actions arising from such discharge of water.
- 3.3.9.2 Do not discharge silt or sand laden water into storm sewers. Water discharged into storm sewers must meet the requirements of the City of Vancouver Sewer Use Regulation By-law (No. 5320).
- 3.3.9.3 Material that becomes unsuitable, in the opinion of the Engineer, through the Contractor's failure to divert surface water or control water in the trench must be excavated and disposed of.
- 3.3.9.4 Keep bell holes free from water during jointing.
- 3.3.10 Disposal of surplus material: dispose of surplus excavated soil, concrete, and asphalt off-site. Side-casting not allowed.
- 3.3.11 Rock Excavation: As indicated in Section 02221 - Rock Excavation.
- 3.3.12 Dust Control: haul routes and across any public traveled way shall be kept free of all rubbish and debris including spillage, resulting from construction operations. Water or dust palliative, or both, shall be supplied as necessary to prevent dust nuisance, to the satisfaction of the Engineer.
- 3.3.13 If sites are not adequately controlled for dust, or kept clean to the satisfaction of the Engineer, the City will do the work at the Contractor's expense. Flushing of debris into City catchbasins is not permitted without the express written consent of the Engineer.

3.4 Pipe Installation

- 3.4.1 Related Work: Pipe installation, including bedding, pipe laying, and granular surround to be in accordance with following sections:
- 3.4.1.1 Waterworks Section 02742
- 3.4.2 Concrete encasement or protection: where specified or required by Engineer provide concrete encasement of pipe or slab protection. Do not place backfill material until concrete has taken its initial set and in no case less than 1 hour.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 7 2009
--	--	---------------------------------

3.5 Backfill and Compaction

- 3.5.1 General: Place backfill carefully in trench to prevent damage to installed pipe.
- 3.5.2 Shoring: During backfill and compaction of trench, remove shoring in such a manner as to allow proper compaction and to prevent trench walls from collapsing. Remove all bracing and/or shoring from trench.
- 3.5.3 Backfill Materials:
 - 3.5.3.1 Boulevards and easements: for trenches in boulevards, easements or other areas not subjected to vehicle loading, backfill with approved granular materials for watermain trenches and approved native materials for service connection trenches.
 - 3.5.3.2 Roads, driveways, shoulders and sidewalks: for trenches in paved or gravelled roads, driveways, shoulders, sidewalks and other areas subjected to vehicle loading, backfill with imported granular material as specified on Contract Drawings.
- 3.5.4 Compaction: place granular backfill and compact to following Modified Proctor densities in compliance with ASTM D1557. (All following references to density imply compliance with ASTM D1557).
 - 3.5.4.1 Boulevards and easements with no utilities and at least 1.5m from roads, driveways, shoulders, and sidewalks to minimum 90%.
 - 3.5.4.2 All other boulevards and easements to minimum 95%.
 - 3.5.4.3 Roads, driveways, shoulders, and sidewalks to minimum 95%.
 - 3.5.4.4 Use caution in pipe zone to ensure no damage to pipe.
 - 3.5.4.5 Compact bedding with mechanical plate tamper to min. 95%. Compacting by hand is not permitted.

3.6 Surface Restoration

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

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 8 2009
---	---	--

3.6.2 Boulevards and easements:

3.6.2.1 Restore surface to minimum 100 mm depth.

3.6.2.2 Restore unimproved surfaces with material equal to that removed at surface.

3.6.2.3 Restore gardens with approved topsoil or bark mulch to match existing conditions.

3.6.2.4 Restore lawns with approved topsoil and sod to match existing lawn.

3.6.2.5 Restore gravel surfaces with matching granular materials.

3.6.2.6 Complete final restoration within 2 weeks of trench backfilling.

3.6.3 Gravelled driveways:

3.6.3.1 Restore surface with minimum 75 mm granular road base material.

3.6.3.2 Compact to minimum 95% Modified Proctor density.

3.6.3.3 Complete final restoration immediately upon completion of trench backfilling.

3.6.4 Base preparation for paved surfaces:

3.6.4.1 Paved surfaces to include all paved roads, driveways, sidewalks and parking areas.

3.6.4.2 Provide specified depth of sub-base as shown on Standard Detail Drawings. Provide 100mm of sub-base for concrete sidewalks.

3.6.5 Temporary pavement patching:

3.6.5.1 Patch arterial and collector roads, and all residential road and lane intersections, same day backfilling done.

3.6.5.2 Patch all other roads within 2 weeks of closing trench. Compact trench adequately to support vehicular load prior to temporary patching and maintain trench in safe condition.

3.6.5.3 Patching material to be hot-mix asphalt on all roads.

3.6.5.4 Place temporary pavement to 50mm minimum thickness.

3.6.5.5 The practice of mounding up a repair in order to rely on passing traffic to complete consolidation and compaction will cause of immediate rejection by the Engineer.

3.6.5.6 Maintain temporary patch to ensure safe and smooth conditions.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 9 2009
---	---	--

3.6.6 Permanent pavement restoration:

3.6.6.1 Pavement restoration to be completed by City of Vancouver approved Paving Contractors only. Contractor to submit asphalt mix design to Engineer for approval 7 days prior to paving.

3.6.6.2 Install permanent pavement within 30 days of placement of temporary patch or sooner where directed by Engineer.

3.6.6.3 Remove broken or cracked pavement as well as any paved areas showing settlement by sawcutting in neat straight lines and dispose off-site. Milling is not allowed.

3.6.6.4 Sawcut 200mm minimum on both sides of trench as indicated on Standard Detail Drawings P1 through P5, with the exception of P6. If the existing cut is 500mm or less from a pavement edge, joint or crack, remove the portion of pavement between the trench and the edge, joint or crack and dispose of off-site. Milling is not allowed.

3.6.6.5 Remove underlying granular road base material as required to permit placement of specified thickness of permanent pavement. Ensure remaining base meets specified thickness in Standard Detail Drawings.

3.6.6.6 Compact base to minimum 95% Modified Proctor density.

3.6.6.7 Restore pavement as shown on standard Detail Drawings. Dry edge of pavement if necessary and paint clean, dry edge with asphalt emulsion (tack coat).

3.6.6.8 Place and compact hot-mix pavement material to minimum thickness as shown on Standard Detail Drawings.

3.6.6.9 Material and placement of hot-mix pavement to Section 02230 - Hot-Mix-Asphalt for Surface Restoration.

3.6.6.10 Restore surface to smooth condition and match with grade of adjacent pavement.

3.6.6.11 Maintain restored pavements in complete repair during the Contract Maintenance Period. Effect repairs within 3 days from receipt of written notice from Owner or immediately if so directed by Engineer if dangerous situation exists. If the situation is deemed as dangerous by the Engineer and the Contractor is unable or unwilling to effect repair immediately, the Owner will effect the repair at the Contractor's expense.

3.6.7 Concrete Sidewalk Restoration: Whenever a part of a panel, square or section of sidewalk is broken, damaged or undermined, the entire panel, square or section shall be removed neatly to the nearest score, groove or joint.

CITY OF VANCOUVER SPECIFICATIONS	EXCAVATION, TRENCHING BACKFILL AND SURFACE RESTORATION	SECTION 02223 PAGE 10 2009
--	--	----------------------------------

3.6.8 Concrete Driveway Restoration: Refer to Standard Detail Drawing DWG P5.

The outline of the final repair shall be rectangular in shape and shall provide for a minimum shoulder of 0.2m in each direction from the excavation. Thus, the width and length of the final repair shall be at least 0.4m oversize from that of the original cut dimension. If a side of the cut is 0.5m or less from the concrete edge, joint or crack after providing a 0.2m shoulder, the portion of the concrete between the cut and the edge, joint or crack shall be replaced.

3.6.9 Concrete curb and gutter: Restore damaged curb and gutter to the satisfaction of the Engineer.

3.6.10 Landscape Restoration:

3.6.10.1 Landscape restoration to following sections:

3.6.10.1.1 Topsoil and Finish Grading Section 02921

3.6.10.1.2 Sodding Section 02938

3.6.10.2 Restoration of planted areas, either in private or public places, to consist of restoration to original condition by replacement to original depth of approved topsoil (minimum of 100 mm), sodding of grassed areas and replacement of any killed or removed plants or shrubs by ones of equal quality, type and maturity to originals. Should restored item fail to grow successfully either throughout work area, or in patches, restore so that a successful regrowth is established over entire area.

3.6.10.3 Replacement trees and shrubs to be planted at a suitable time of year in accordance with good horticultural practice, to provide maximum assurance of plant survival. Trees or shrubs close to, but not actually within excavated area, which show signs of dying during maintenance period to be replaced by new trees of a similar variety, age and size, up to limits of maximum available size, if tree has died as a result of environmental disturbance, cutting of roots, or other cause directly attributable to Contractor's work.

3.6.11 Restoration acceptance: no restoration work to be considered satisfactory until acceptance by Engineer and in case of properties not owned by the City, until a written and signed statement of release from property owner has been obtained by Contractor and provided to Engineer.

END OF SECTION

1.0 GENERAL

- 1.0.1 Section 02226 refers to those portions of the work that are unique to the supply and processing of aggregates. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

- 1.1.1 Section 02226 includes specifications for aggregates and granular materials referred to in the following sections:

1.1.1.1 Shrub and Tree Preservation Section 02104

1.1.1.2 Excavation, Trenching and Backfilling Section 02223

1.1.1.3 Portland Cement Concrete Pavement Section 02521

1.1.1.4 Waterworks Section 02742

- 1.1.2 Section 02226 does not include specifications for aggregates to be incorporated into controlled density fill, hot-mix asphalt concrete paving, pavement crack filling, ready-mixed concrete or granular materials for landscaping purposes.

1.2 Approvals

- 1.2.1 Inform Engineer of proposed source and provide samples or access for sampling at least 2 weeks prior to commencing production.
- 1.2.2 If materials from proposed source do not meet specified requirements, locate alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
- 1.2.3 Should a change of material source be proposed during work, advise Engineer 2 weeks in advance of proposed change to allow sampling and testing.
- 1.2.4 Acceptance of material does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified.

1.3 Measurement for Payment

- 1.3.1 Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless shown otherwise in Schedule of Quantities and Prices.

1.4 Inspection and Testing

- 1.4.1 Engineer to arrange for all testing for work described in this Section.

2.0 PRODUCTS**2.1 Materials - General**

- 2.1.1 Gravel to be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrated particles.
- 2.1.2 All crushed gravel when tested according to ASTM C-136 and ASTM C-117, or latest revised issue, to have a generally uniform gradation and conform to following gradation limits and 60% of the material passing each sieve must have one or more fractured faces. Determination of the amount of fractured material shall be in accordance with the Ministry of Transportation and Highways' Specification I-11, Fracture Count for Coarse Aggregate, Method "A", which determines fractured faces by count. The plasticity Index for crushed gravel not to exceed 6.0.
- 2.1.3 All details of material not covered in this section shall comply with the latest edition of the City of Vancouver street Restoration Manual.

2.2 Sand (CoV #17)

- 2.2.1 To be of uniform quality and unwashed river sand or any clean sand containing less than 5% organic materials, clay or silt (passing 80 micro metre sieve) is acceptable. It can contain a limited amount of small stones or rocks as it comes from the pit. Material to compact to specified density and conform to following gradations:

Total Passing	12.5 mm	100 %
Total Passing	9.5 mm	91 to 100 %
Total Passing	4.75 mm	83 to 100 %
Total Passing	2.36 mm	73 to 94 %
Total Passing	1.18 mm	57 to 80 %
Total Passing	600 um	3 to 60 %
Total Passing	300 um	10 to 37 %
Total Passing	150 um	4 to 17 %
Total Passing	75 um	0 to 5 %

2.3 20mm Minus, Combined Crushed Aggregate (CoV #9)

- 2.3.1 To be of uniform quality, crushed to size as necessary and consisting of sound, tough, durable, mechanically crushed fragments with the portion retained on a 9.5 mm sieve not being less than 60% crushed. Material to compact to specified density and conform to following gradations:

**CITY OF
VANCOUVER
SPECIFICATIONS**
AGGREGATES & GRANULAR MATERIALS
**SECTION 02226
PAGE 3
2009**

Total Passing	19 mm	100 %
Total Passing	12.5 mm	61 to 95 %
Total Passing	9.5 mm	45 to 85 %
Total Passing	4.75 mm	35 to 60 %
Total Passing	2.36 mm	26 to 47 %
Total Passing	1.18 mm	20 to 39 %
Total Passing	600 um	13 to 29 %
Total Passing	300 um	8 to 21 %
Total Passing	150 um	5 to 15 %
Total Passing	75 um	2 to 8 %

2.4 80mm Crushed Tailings (CoV #13)

2.4.1 To be well-graded 80mm minus 100% crushed quarried material of uniform quality suitable for use in fills and road subgrade. It shall consist of durable particles capable of withstanding the effects of handling, spreading and compacting without degradation productive of deleterious fines. Material to compact to specified density and conform to following gradations:

Total Passing	75 mm	100 %
Total Passing	19 mm	40 to 50 %
Total Passing	4.75 mm	20 to 35 %
Total Passing	0.075 mm	2 to 8 %

2.5 Drain Rock

2.5.1 To consist of clean crushed rock conforming to following gradations:

Total Passing	25 mm	100 %
Total Passing	19 mm	0 to 100 %
Total Passing	9.5 mm	0 to 5 %

3.0 EXECUTION
3.1 Handling

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

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

END OF SECTION

CITY OF VANCOUVER SPECIFICATIONS	HOT MIX ASPHALT FOR SURFACE RESTORATION	SECTION 02230 PAGE 1 2009
--	---	---------------------------------

1.0 GENERAL

- 1.0.1 The work of this section includes the supply and placement of all hot mix asphaltic concrete required for surface restoration of roads or other travelled or non-travelled areas disturbed during excavation, trenching or other construction activities.
- 1.0.2 Hot mix asphalt concrete materials and procedures shall meet the requirements of these specifications and the requirements of the City of Vancouver in all respects unless otherwise approved by the Engineer.
- 1.0.3 Additional surface restoration requirements are provided in other specification sections and on the Contract drawings.

1.1 Related Work

- 1.1.1 Construction Schedule Section 01310
- 1.1.2 Excavating, Trenching, Backfill and Surface Restoration Section 02223

1.2 Material Certification

- 1.2.1 At least 4 weeks prior to commencing work submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175⁰ C.
- 1.2.2 Upon request submit manufacturer's test data and certification that asphalt cement meets requirements of this section.

1.3 Submission

- 1.3.1 Submit asphalt concrete mix design and trial mix test results to Engineer for review at least 4 weeks prior to commencing work.

1.4 Repair of Asphalt Surfaces

- 1.4.1 Where asphalt surfaces existed prior to construction, restoration of surfaces shall be provided using hot-mix-asphaltic concrete as soon as possible following final backfilling and other related work.
- 1.4.2 The Contractor may place a temporary patch using hot or cold mix asphalt patch but must remove temporary patch prior to installing final hot mix materials.
- 1.4.3 Should the Engineer determine that the Contractor is not restoring asphalt surfaces in a prompt manner, the City of Vancouver shall require the Contractor to accelerate pavement activities or to install temporary cold mix asphalt patches, all at no additional cost to the City.

CITY OF		SECTION 02230
VANCOUVER	HOT MIX ASPHALT FOR SURFACE RESTORATION	PAGE 2
SPECIFICATIONS		2009

2.0 PRODUCTS AND SPECIFICATIONS FOR SUPERPAVE ASPHALT MIX DESIGN

2.1 Materials

2.1.1 Asphalt cement:

Asphalt cement shall meet Performance Grade PG 64-22 for industrial/arterial pavements and PG 58-22 for higher zoned residential pavements and light duty residential pavements and shall conform with PG specifications according to Superpave Level 1 Mix, Superpave Series No.2 (SP-2). Test results and Temperature-Viscosity Relationships for the Project Binder shall be provided to the City Engineer.

2.1.2 Mineral Aggregates :

Aggregates shall meet the Superpave established standards for aggregate characteristics. The requirement for each of these properties is based on traffic level and position within the pavement structure. Specifications shall be based on the traffic level of 3 to 10 million ESALs and mat thickness of less than or equal to 100 mm.

2.1.3 Consensus Aggregate Requirements :

2.1.3.1 Coarse Aggregate Angularity:

ASTM D5821, "Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate." The required minimum value shall be 95/90 that is 95% of the coarse aggregate shall have one or more freshly fractured face and at least 90% shall have two or more freshly fractured faces.

2.1.3.2 Fine Aggregate Angularity;

AASHTO TP33, "Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate." The required minimum value shall be 45% for <100mm and 40% for >100mm.

2.1.3.3 Flat and Elongated Particles:

ASTM D4791, "Flat or Elongated Particles in Coarse Aggregate." Test is performed on coarse aggregate larger than 4.75 mm. The required maximum value shall be 10%.

2.1.3.4 Clay Content:

ASTM D2419, "Sand Equivalent Value of Soils and Fine Aggregate." The allowable clay content value for fine aggregate shall be sand equivalent of minimum 45%.

2.1.4 Source Aggregate Requirements

**CITY OF
VANCOUVER
SPECIFICATIONS**

HOT MIX ASPHALT FOR SURFACE RESTORATION

**SECTION 02230
PAGE 3
2009**

2.1.4.1 Toughness:

ASTM C131, "Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine." The required maximum loss shall be 35%.

2.1.4.2 Soundness:

ASTM C88, "Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate." The required maximum loss shall be 18% for Coarse aggregate and 20% for Fine aggregate.

2.1.4.3 Deleterious materials:

ASTM C142, "Clay Lumps and Friable Particles in Aggregates."

2.4.1.4 Asphalt Mixture Gradation Requirements

The design aggregate structure shall meet the Superpave gradation requirements. A design structure must pass between gradation control points while avoiding gradation restricted zones.

2.1.4.5 9.5 mm Nominal Maximum Size

City of Vancouver, Slot-Mix (also referred to as #32 1/2" Surface Mix). The design aggregate gradation for the above shall pass below the restricted zone.

Sieve (mm)	Control Points		Restricted Zone Boundary	
			Minimum	Maximum
19				
12.5	100.0			
9.5	90	100.0		
4.75		90		
2.36	32.0	67	47.2	47.2
1.18			31.6	37.6
0.600			23.5	27.5
0.300			18.7	18.7
0.150				
0.075	2.0	10.0		

**CITY OF
VANCOUVER
SPECIFICATIONS**
HOT MIX ASPHALT FOR SURFACE RESTORATION
**SECTION 02230
PAGE 4
2009**
2.1.4.6 12.5 mm Nominal Maximum Size

City of Vancouver, Heavy Duty Surface Mix (also referred to as 3/4" Surface Mix). The design aggregate gradation for the above shall pass below the restricted zone.

Sieve (mm)	Control Points		Restricted Zone Boundary	
			Minimum	Maximum
19		100.0		
12.5	90.0	100.0		
9.5				
4.75				
2.36	28.0	58.0	39.1	39.1
1.18			25.6	31.6
0.600			19.1	23.1
0.300			15.5	15.5
0.150				
0.075	2.0	10.0		

2.1.4.7 25 mm Nominal Maximum Size

City of Vancouver, Base Mix (also referred to as 1 ½" Base Mix)

It is recommended that the design gradation pass below the restricted zone.

Sieve (mm)	Control Points		Restricted Zone Boundary	
			Minimum	Maximum
37.5		100.0		
25	90	100.0		
19				
12.5				
9.5				
4.75			39.5	39.5
2.36	19.0	45.0	26.8	30.8
1.18			18.1	24.1
0.600			13.6	17.6
0.300			11.4	11.4
1.150				
0.075	1.0	7.0		

CITY OF
VANCOUVER
SPECIFICATIONS

HOT MIX ASPHALT FOR SURFACE RESTORATION

SECTION 02230
PAGE 5
2009

2.1.4.8 Mixing tolerances:

Permissible variation in an aggregate gradation from the job mix (percent of total mass) shall be as follows:

<u>Gradation</u>	<u>Tolerance</u>
Passing 4.75 mm and larger sieves	+/- 5%
Passing 2.36 mm to 0.6 mm	+/- 4%
Passing 0.6 mm to 0.3 mm	+/- 3%
Passing 0.3 mm to 0.15 mm	+/- 2%
Passing 0.15 mm to 0.075 mm	+/- 1.5%

*Note: Superpave uses these aggregate size definitions:

Maximum Size: One sieve size larger than the nominal maximum size.

Nominal Maximum Size: One sieve size larger than the first sieve to retain more than 10 percent.

Control Points: Function as master range between which gradation must pass.

Restricted Zone: Resides along the maximum density gradation. It forms a band through which the gradation cannot passed.

2.2 Asphalt Mix Design

2.2.1 Submit job mix formula to the Engineer for review and approval.

2.2.2 Mix Designs should be based on the improvements and updates (May 1999) made to the following AASHTO Standards:

MP2: Specifications for SuperPave Volumetric Mix Design

PP2: Practice for Mixture Conditioning of Hot-Mix Asphalt (HMA)

PP28: Practice for Designing Superpave Volumetric Design for HMA

TP4: Method for Preparing And Determining the Density of Hot-Mix (HMA) Specifications by means of the SHRP Gyratory Compactor

"Superpave 2000 - Improved Standards For A New Millennium" issued by Canadian Strategic Highways Research Program (C-SHRP): C-SHRP Technical Brief #17.

2.2.3 Laboratory compaction shall be by means of a Superpave Gyratory Compactor (SGC) and the asphalt content selected based on volumetric design requirements according to Asphalt Institute Manual Series No.2 (SP-2), Superpave Level 1 Mix Design.

CITY OF
VANCOUVER
SPECIFICATIONS

HOT MIX ASPHALT FOR SURFACE RESTORATION

SECTION 02230
PAGE 6
2009

<i>Mixture Properties</i>	Criteria
Air Voids, %	4.0
VMA, % for 25 mm Nominal Max. Size	12.0 min
VMA, % for 12.5 mm Nominal Max Size	14.0 min
VFA, %	65 - 70
Dust Proportion	0.6 - 1.2
% Gmm @ N - ini	less than 89
% Gmm @ N - max	less than 98
Gmm - maximum theoretical specific gravity	

2.2.4 The Superpave level 1 specimen preparation procedures shall be according to AASHTO Designation TP4, and for the volumetric design, AASHTO Designation MP2 as referred above.

2.3 Compactive Effort

Asphalt mix shall be designed at the following specified design number of gyrations:

N-initial	8
N-design	100
N-maximum	160

2.4 Mixture Properties

The design asphalt content is established at 4.0 % air voids.

2.5 Reclaimed Asphalt Pavement (RAP)

Superpave may contain up to a maximum 15% RAP by weight of total mix without a special mix design. The Engineer may approve a higher proportion of RAP if the Contractor demonstrates the ability to produce a mix meeting the requirements of the specification.

<i>TIER</i>	% RAP by wt of Total Mix	Determine RAP AC Content	Measure RAP Graduation	Measure RAP AC Stiffness	Measure Agg Blend Properties	PG Grade Change
1	< 15%	(a)	yes	no	yes	none
2	16% to 25%	yes	yes	no (b)	yes	one grade lower (c)
3	> 25%	yes	yes	yes	yes	use blending chart
(a) At the discretion of the agency						
(b) Unless blending chart is used						
(c) Or use blending chart						

CITY OF VANCOUVER SPECIFICATIONS	HOT MIX ASPHALT FOR SURFACE RESTORATION	SECTION 02230 PAGE 7 2009
--	---	---------------------------------

3.0 EXECUTION

3.1 Equipment

- 3.1.1 Pavers: mechanical self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.
- 3.1.2 Spreader boxes shall not be used for the placement of asphalt under this contract unless approved by the City of Vancouver.
- 3.1.3 Rollers: sufficient number of rollers of type and weight to obtain specified density of compacted mix.
- 3.1.4 Vibratory Rollers:
 - 3.1.4.1 Vibratory Rollers may be used only if it can be operated safely, without vibratory damage to nearby structures and utilities, or caused unreasonable discomfort to nearby citizens.
 - 3.1.4.2 Minimum drum diameter: 1200 mm.
 - 3.1.4.3 Maximum amplitude of vibration: 0.5 mm for lifts less than 40 mm thick.
- 3.1.5 Haul trucks: of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - 3.1.5.1 Boxes with tight metal bottoms.
 - 3.1.5.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
 - 3.1.5.3 In cool weather or for long hauls, insulate entire contact area of each truck box.
 - 3.1.5.4 Trucks which cannot be weighed in a single operation on scales supplied will not be accepted.
- 3.1.6 Hand tools:
 - 3.1.6.1 Lutes or rakes with covered teeth for spreading and finishing operations.
 - 3.1.6.2 Tamping irons having mass not less than 12 kg and a bearing area not exceeding 310cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Engineer, may be used instead of tamping irons.
 - 3.1.6.3 Straight edges, 4.5 m in length, to test finished surface.

3.2 Preparation

- 3.2.1 The Contractor shall examine all base course or other materials to be paved prior to commencing asphaltic concrete work and satisfy himself that it is properly prepared to receive pavement in all respects including compaction and grading.
- 3.2.2 The Contractor's responsibility for pavement failures shall include those caused by base, sub-base deficiencies or subgrade compaction failures.
- 3.2.3 When paving over existing asphalt surface, clean existing pavement surface. When levelling course is not required, patch and correct depressions and other irregularities to approval of the Engineer before beginning paving operations.
- 3.2.4 Apply prime coat and tack coat in accordance with City of Vancouver standards prior to paving.
- 3.2.5 Prior to laying mix, clean surfaces of loose and foreign material.

3.3 Transportation of Mix

- 3.3.1 Transport mix to job site in vehicles cleaned of foreign material.
- 3.3.2 Paint or spray truck beds with light oil, limewater, soap or detergent solution, at least once a day or as required. Elevate truck bed and thoroughly drain. No excess solution will be permitted.
- 3.3.3 Schedule delivery of material for placing in daylight, unless Engineer approves artificial light.
- 3.3.4 Deliver material to paver at a uniform rate and in an amount within capacity of paving and compacting equipment.
- 3.3.5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at a temperature within range directed, but not less than 135 °C.

3.4 Placing

- 3.4.1 Ensure base course materials and existing surfaces are satisfactory prior to placing asphalt.
- 3.4.2 Place asphalt concrete to thickness, grades and lines indicated on Contract Drawings or as directed by Engineer.
- 3.4.3 Placing conditions:
 - 3.4.3.1 Place asphalt mixtures only when air temperature is above 4 °C.

**CITY OF
VANCOUVER
SPECIFICATIONS**

HOT MIX ASPHALT FOR SURFACE RESTORATION**SECTION 02230
PAGE 9
2009**

- 3.4.3.2 When temperature of surface on which material is to be placed falls below 10 °C, provide extra rollers as necessary to obtain required compaction before cooling.
- 3.4.3.3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- 3.4.4 Place asphalt concrete in compacted lifts of thickness as follows:
 - 3.4.4.1 To thickness required but not exceeding 75 mm or less than 50mm each lift.
 - 3.4.4.2 Spread and strike off mixture with self propelled mechanical finisher.
 - 3.4.4.3 Place required total thickness in two lifts and confirm thickness of each lift with the Engineer prior to placement.
- 3.5 In addition to the requirements of this specification, the contractor shall adhere to the practices described in the Paving Manual Series No. 8 published by the Asphalt Institute.
 - 3.5.1 Roll asphalt continuously to average density not less than 97% of 75 blow Marshall density obtained in accordance with ASTM D1559 with no individual test less than 95% with specimens prepared from samples of mix being used.
 - 3.5.2 General:
 - 3.5.2.1 Provide at least two rollers and as many additional rollers as necessary to achieve specified pavement density. When more than two rollers are required, one roller must be pneumatic tired type.
 - 3.5.2.2 Start rolling operations as soon as placed mix can bear weight of roller without undue displacement of material or cracking of surface.
 - 3.5.2.3 Operate roller slowly initially to avoid displacement of material. For subsequent rolling do not exceed 5 km/h for static steel- wheeled rollers and 8 km/h for pneumatic- tired rollers.
 - 3.5.2.4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 20 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing should not exceed compacted lift thickness.
 - 3.5.2.5 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.
 - 3.5.2.6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
 - 3.5.2.7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.

**CITY OF
VANCOUVER
SPECIFICATIONS**

HOT MIX ASPHALT FOR SURFACE RESTORATION**SECTION 02230
PAGE 10
2009**

3.5.2.8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.

3.5.2.9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.

3.5.2.10 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.

3.5.2.11 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.

3.5.3 Breakdown rolling:

3.5.3.1 Commence breakdown rolling with static steel wheeled roller immediately following rolling of transverse and longitudinal joint and edges.

3.5.3.2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.

3.5.4 Second rolling:

3.5.4.1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.

3.5.4.2 Rolling shall be continuous after initial rolling until mix placed has been thoroughly compacted.

3.5.5 Finish rolling:

3.5.5.1 Accomplish finish rolling with two-axle or three-axle tandem steel wheel rollers while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, Engineer may specify use of pneumatic-tired rollers.

3.5.5.2 Conduct rolling operations in close sequence.

3.6 Joints

3.6.1 General

3.6.1.1 Trim to vertical face to provide true surface and cross section against which new pavement may be laid. Remove loose particles.

3.6.1.2 Paint joint face with thin coat of hot asphalt cement or preheat joint face with approved heater, prior to placing of fresh mix.

CITY OF VANCOUVER SPECIFICATIONS	HOT MIX ASPHALT FOR SURFACE RESTORATION	SECTION 02230 PAGE 11 2009
--	---	----------------------------------

3.6.1.3 Overlap previously laid strip with spreader by 100 mm.

3.6.1.4 Remove surplus material from surface of previously laid strip. Do not dispose on surface of freshly laid strip.

3.6.1.5 Construct joints between asphalt concrete pavement and portland cement concrete pavement as indicated.

3.6.1.6 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.

3.7 Finish Tolerances

3.7.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

3.7.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with a 4.5 m straight edge placed in any direction.

3.7.3 Water ponding is not permitted.

3.8 Defective Work

3.8.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form a true and even surface and compact immediately to specified density.

3.8.2 Repair areas showing checking or rippling.

3.8.3 Repair areas showing improper surface drainage.

3.8.4 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS**

CONCRETE WALKS, CURBS & GUTTERS**SECTION 02523
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 02523 refers to those portions of the work that are unique to the construction of Portland cement concrete walks, curbs and gutters. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

- 1.1.1 Cast-in-Place Concrete Section 03300
- 1.1.2 Excavation, Trenching, Backfilling and Surface Restoration Section 02223

1.2 Test Panels

- 1.2.1 If specified in Contract Documents construct test panels to set standard for acceptance of finished surfaces.

1.3 Measurement for Payment

- 1.3.1 Payment for work performed under this section will be incidental to work described in other Sections.

1.4 Inspection and Testing

- 1.4.1 Engineer will arrange for all testing for work described in this Section.

2.0 PRODUCTS**2.1 Materials**

- 2.1.1 Granular subbase: to Section 02226 - Aggregates and Granular Materials.
- 2.1.2 Granular base: to Section 02226 - Aggregates and Granular Materials.
- 2.1.3 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.
- 2.1.4 Concrete mixes and materials: to Section 03300 - Cast-in-Place Concrete with the following criteria specific to this section:

2.1.4.1 Hand-formed and hand-placed concrete:

Slump: 80mm.

Air entrainment: 6 to 9%.

Maximum aggregate size: 19 mm.

Minimum cement content: 335 kg/m³.

Minimum 28 day compressive strength 32 MPa.

2.1.4.2 Extruded concrete:

Slump: 0 - 25 mm.

Air entrainment: 7 to 10 %.

Maximum aggregate size: 9.5 mm.

Fineness modulus: 2.1 to 2.4.

Minimum cement content: 335 kg/m³.

Minimum 28 day compressive strength 32 MPa.

2.1.5 Joint filler and Curing Compound: to Section 03300 - Cast-in-Place Concrete.**3.0 EXECUTION****3.1 Granular Subbase and Base**

3.1.1 Place subbase and minimum of 100 mm granular base material to design grade as shown on Contract Drawings, including Standard Detail Drawings.

3.1.2 Compact subbase and base to minimum 95% Modified Proctor density.

3.1.3 Obtain Engineer's approval of compacted base prior to placing forms or control devices for extruding equipment.

3.2 Formwork

3.2.1 Ensure steel forms of approved design and free from twists and warp.

3.2.2 Ensure wood forms of select dressed lumber, straight and free from defects and thoroughly cleaned.

3.2.3 Use flexible forms for all curves less than 60 m radius.

**CITY OF
VANCOUVER
SPECIFICATIONS****CONCRETE WALKS, CURBS & GUTTERS****SECTION 02523
PAGE 3
2009**

- 3.2.4 After obtaining Engineer's approval of compacted base, set forms to line and grade as shown on Contract Drawings, free from waves or irregularities in line or grade.
- 3.2.5 Set special isolation forms as required around catchbasins, manholes, poles or other objects as shown on Contract Drawings or as directed by Engineer.
- 3.2.6 Forms to be to shape, lines and full dimensions of work being formed.
- 3.2.7 Adequately brace forms to maintain specified tolerances after concrete is placed.
- 3.2.8 Treat forms lightly with approved form release agent and remove surplus agent.
- 3.2.9 At lanes, crossings, etc., formwork shall be left in place until the concrete has attained sufficient strength to bear traffic loads without edge damage.

3.3 Inspection

Immediately prior to placement of concrete, carefully inspect all formwork to ensure forms are properly set at required horizontal and vertical alignment, sufficiently rigid, clean, surface treated and ready for placement of concrete. Obtain Engineer's approval of formwork and compacted base.

3.4 Concrete Placement

- 3.4.1 Place concrete to Section 03300 - Cast-in-Place Concrete and the following criteria specific to this section.
- 3.4.2 Do not place concrete during rain or on ponded water or frozen base.
- 3.4.3 Do not place concrete when air temperature appears likely to fall below 4°C within 24 h, unless specified precautions are taken and approved by Engineer.
- 3.4.4 Schedule concrete placement to ensure sufficient daylight hours available to permit edging and finishing or provide adequate illumination.
- 3.4.5 Moisten granular base immediately prior to placing concrete.
- 3.4.6 Place concrete within 1.5 h of batching time.
- 3.4.7 Place concrete in forms, ensuring no segregation of aggregate and consolidate with approved mechanical vibrator or power screed.
- 3.4.8 Place concrete in continuous operation until entire panel or section completed. Do not place fresh concrete on concrete which has achieved partial set.
- 3.4.9 Incorporate all castings into concrete at time of placement.
- 3.4.10 Discontinue placement at expansion, construction or isolation joints only.

**CITY OF
VANCOUVER
SPECIFICATIONS****CONCRETE WALKS, CURBS & GUTTERS****SECTION 02523
PAGE 4
2009**

- 3.4.11 Remove face forms as soon as practical to permit face finishing. Do not leave face forms in place overnight.

3.5 Extruded Sections

- 3.5.1 Extruding machine to be fitted with approved template consistent with sections shown on Standard Detail Drawings.
- 3.5.2 Extruded sections to be true to line, grade and cross-section.
- 3.5.3 Finished appearance, quality and workmanship to comply with Contract Drawings, this Specification and Standard Detail Drawings.
- 3.5.4 Where finished product does not conform to specifications, remove defective product and replace.
- 3.5.5 Defective extruded work replaced with hand placed concrete to be paid at tendered price for extruded product.

3.6 Driveway Crossings and Wheel Chair Ramps

- 3.6.1 Construct driveway crossings and wheel chair ramps where shown on Contract Drawings or to Standard Detail Drawings.

3.7 Tolerances

- 3.7.1 Maximum horizontal deviation = 6 mm.

Maximum vertical deviation = 6 mm.

Maximum deflection from horizontal or vertical alignment to be 6 mm in 3 m.

3.8 Control Joints

- 3.8.1 In sidewalks, construct control joints at maximum 3 m intervals.
- 3.8.2 In curb or curb and gutter construct control joints at maximum 3 m intervals and match with control joints in abutting sidewalk.
- 3.8.3 Cut to minimum depth of concrete section as directed by Engineer.
- 3.8.4 Use proper tool to make cut while concrete is still green or sawcut after concrete has hardened.

3.9 Isolation Joints

- 3.9.1 Form isolation joints around all poles, hydrants, manholes and all structures or fixed objects located within the concrete section by using specified joint filling material.

**CITY OF
VANCOUVER
SPECIFICATIONS****CONCRETE WALKS, CURBS & GUTTERS****SECTION 02523
PAGE 5
2009**

- 3.9.2 Form longitudinal isolation joints between sidewalk and abutting curb and gutter, abutting utility strips, abutting structures using 13 mm approved joint filling material.
- 3.9.3 Use 13 mm premoulded hardboard joint material to form isolation joints between sidewalks and abutting walls and structures.

3.10 Finishing

- 3.10.1 Finish surface of concrete sidewalks and utility strips to smooth surface with magnesium or wood float trowel and brush or broom to provide uniform non-skid surface.
- 3.10.2 Broom or brush crossways or as otherwise required to match adjacent finish or as directed by Engineer.
- 3.10.3 Grooves or scoring (dummy joints) used for aesthetic purposes as shown on the Contract Drawings or as directed by Engineer, to be marked with proper tools and set 15 mm deep.
- 3.10.4 Finish driveway crossings and wheel chair ramps as shown on Standard Detail Drawings.
- 3.10.5 Round edges with steel edging tool to a width of 50 mm around perimeter of each panel or as shown on Standard Detail Drawings.
- 3.10.6 Ensure surface of handformed curb and gutter is smooth trowelled finish. Ensure extruded curb and gutter is smooth finished and hand trowelled as required to correct irregularities.
- 3.10.7 Under no circumstances is concrete to be overworked by trowelling, dusted with dry cement or finished with a mortar coat.
- 3.10.8 Ensure finished surface as specified.
- 3.10.9 Finished curb and gutter shall have a smooth and uniform surface, true to line, grade and section, and be free from air pockets, sags, bumps, or other irregularities and shall be satisfactory to the Engineer.
- 3.10.10 Divisions and Markings
 - 3.10.10.1 Walks 1.5 m in width shall be marked off in panels 1.5 m long. Walks 1.8 m in width shall be marked off in panels 1.5 m long.
 - 3.10.10.2 Cutting and marking tool shall have a cutting edge not less than 25 mm in depth and the edge of the panel shall be rounded to a 6 mm radius.
- 3.10.11 Carefully fit, cut and mark the sidewalk around all waterworks boxes, lamp standards, poles, and hydrants to the satisfaction of the Engineer.

**CITY OF
VANCOUVER
SPECIFICATIONS****CONCRETE WALKS, CURBS & GUTTERS****SECTION 02523
PAGE 6
2009**

3.11 Special Effects

- 3.11.1 Exposed aggregate and coloured or stamped concrete as specified on Contract Drawings.
- 3.11.2 At Street intersections, the year shall be stamped in the surface of the sidewalk as directed by the Engineer. The necessary figures will be available from the Engineer.

3.12 Protection

- 3.12.1 Protect freshly finished concrete from dust, rain or frost by using tarpaulins or other suitable protective coverings for 24 hours after final set. Keep clear of finished surface.

3.13 Curing

- 3.13.1 Apply approved curing compound to all exposed concrete surfaces at rate recommended by manufacturer or alternatively, use moist curing procedures for a minimum of 7 calendar days.
- 3.13.2 When temperature is below 5°C, maintain all concrete at temperature not less than 10°C for at least 72 h and protect from freezing for at least another 72 h or such time as required to ensure proper curing of concrete. Admixtures are not to be used for prevention of freezing.

3.14 Perforated Drain Pipe

- 3.14.1 Where shown on Contract Drawings or where directed by Engineer install perforated drain pipe adjacent to sidewalk or curb and gutter.
- 3.14.2 Drain pipe or fittings to be continuously extruded polyvinyl chloride (PVC) or acrylonitrile butadienestyrene (ABS) plastics, meeting the requirements of the latest revision of CSA Standard B182.1-87. It shall be available in 3 metre lengths with nominal diameter of 100 mm and perforations as detailed in Section 4.1.4 of CSA Standard B182.1-87 for leach field pipe. The pipe will include bell and spigot design suitable for solvent welding.
- 3.14.3 Connect to catch basins and stamp letter "D" in walk where drain crosses under.
- 3.14.4 Perforated corrugated metal pipe (PCMP) shall conform to the latest revision of the requirements for Corrugated Metal Culvert Pipe AASHTO Designation M36. PCMP shall consist of 18 gauge (minimum 1.214 mm) metal with 6.35 mm minimum diameter rivets or the seam may be formed by welding. Helical corrugated pipe will be acceptable if it has corrugation 6.35 mm deep by 38 mm wide. Perforations shall consist of two groups of two lines each. The holes shall be not less than 6.35 mm nor more than 11.1 mm in diameter and shall be located in the inside ridges of all corrugations. The lines of holes shall be approximately 25 mm apart and the outer rows of holes shall be not more than 67.5 degrees from the centre line of the unperforated segment.

**CITY OF
VANCOUVER
SPECIFICATIONS**

CONCRETE WALKS, CURBS & GUTTERS**SECTION 02523
PAGE 7
2009**

- 3.14.5 Drain pipe placed across lane entrances shall be either corrugated metal pipe or non-perforated PVC pipe conforming to the latest CSA standard and having a S.D.R. of 28 or lower, 700 KPa at 5% deflection, and a minimum of 400 mm of cover.
- 3.14.6 Filter fabric shall be non-woven, needle punched or spun bonded with a minimum Grab Tensile strength of 330 N (75 lbs) ASTM D-1682; a minimum Ball Bursting strength of 550 N (125 lbs) ASTM D-3787 or Mullen Bursting strength of 0.86 MPa (125 psi) ASTM D751 and water permeability of 0.2 to 0.3 cm per second.

3.15 Acceptance

- 3.15.1 Before acceptance of finished concrete remove all irregular, cracked, vandalized or otherwise defective sections and replace in accordance with specifications.
- 3.15.2 Any portion marked or damaged by vandalism, rain, frost, equipment, traffic, or other, is to be replaced.

3.16 Adjustment of Existing Catchbasins

- 3.16.1 Adjust existing catchbasins to specified alignment and elevation using concrete bricks and mortar or concrete adjusting rings.
- 3.16.2 Remove all debris from inside catchbasin.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS****SECTION 02742
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 02742 refers to those portions of the Work that are unique to the supply and installation of watermain up to 450mm diameter, hydrants, valves and valve boxes, service connections and related appurtenances. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- 1.0.2 All details of waterworks facilities not specifically covered in this section to comply with the latest edition of the appropriate American Water Works Association (AWWA) standards, unless otherwise directed by the Engineer.

1.1 Related Work

- 1.1.1 Excavating, Trenching, Backfilling and Surface Restoration Section 02223
- 1.1.2 Cast-in-Place Concrete Section 03300

1.2 Material Certification

- 1.2.1 All materials to conform to this specification, to the latest edition of the appropriate specifications of the AWWA and of the American Society for Testing and Materials (ASTM) or to other standards expressly specified. All provisions in the AWWA, ASTM or other specified standards pertaining to materials, workmanship, finish, inspection and rejection form part of these specifications as far as they are applicable and not inconsistent. This specification takes precedence over the AWWA or ASTM specifications in the case of a discrepancy or conflict. Materials incorporated into the Work but not specifically covered in the specifications to be of good quality. Permission for use of these materials to be obtained from the Engineer prior to installation.
- 1.2.2 If requested by the Engineer and at least 2 weeks prior to commencing work, submit manufacturer's recent test data and certification that materials to be incorporated into the Works are representative and meet the requirements of this section. Include manufacturer's drawings where pertinent.
- 1.2.3 Material delivery and storage to meet the requirements of the manufacturer. Materials damaged during transportation or through rough handling to be repaired to the satisfaction of the Engineer prior to installation. If, in the opinion of the Engineer, the damaged material cannot be satisfactorily repaired, then the damaged material will be removed from the job site and replaced with new material.

1.3 Shop Drawings and Technical Data

- 1.3.1 Submit shop drawings and technical data, as requested by the Engineer, in accordance with General Condition 12.

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS****SECTION 02742
PAGE 2
2009**

1.4 Record Drawings

- 1.4.1 Provide record drawings, including locations of pipes, valves, hydrants, bends, cathodic protection test points and all other appurtenances and inverts of pipes, fittings, valves and valve chambers.
- 1.4.2 Provide connection change-over sheets for each block as shown in the example included in the standard drawings. Blank copies of this form are available from the Engineer.
- 1.4.3 Provide a completed work order slip for any work done on an individual service other than a change-over. Blank forms are available from the Engineer.

1.5 Scheduling

- 1.5.1 Notify affected residents and businesses at least 2 weeks prior to construction of the scope and timing of work. Submit notification to Engineer for approval prior to distribution.
- 1.5.2 Schedule work to minimize interruptions to existing services. Service interruptions limited to customers served off of the main being replaced, unless otherwise approved by Engineer.
- 1.5.3 Submit schedule and details of expected service interruptions to the Engineer for approval and adhere to approved schedule. Schedule and details to include:
 - 1.5.3.1 Methods for temporary servicing.
 - 1.5.3.2 Timing and duration of any temporary servicing.
 - 1.5.3.3 Tie-in sequence, method and timing.
- 1.5.4 Notify any affected residences and businesses, in writing, a minimum of 48 hours in advance of any interruption in service. Notices and corresponding distribution area to be approved by the Engineer prior to distribution.
- 1.5.5 Do not interrupt water service for more than 3 hours and confine this period between 0900 and 1600 hours unless otherwise approved by the Engineer. Provide temporary servicing to those customers who cannot accommodate a service interruption during this period, in the opinion of the Engineer, such as restaurants, hair salons, hospitals, educational institutions, daycares, process industries, and photo labs, or schedule work so as to minimize disruption. Payment for temporary servicing will be incidental to payment for watermain installation.
- 1.5.6 Notify Fire Department at 604-665-6031 and the City Waterworks Dept. at 604-323-4800 of any planned or accidental interruption of water supply to hydrants and label these hydrants "Out of Service" or "Not in Use".

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS**

**SECTION 02742
PAGE 3
2009**

1.6 Measurement For Payment

- 1.6.1 All units of measurement for payment will be as specified herein unless shown otherwise in the Form of Tender.
- 1.6.2 Form of Tender describes separate payment items for various sections of watermain consistent with pipe diameters and location of mains shown on the Contract Drawings.
- 1.6.3 Measurement for payment for watermain will be made in a lump sum for each payment item described in the Form of Tender.
- 1.6.4 Payment for watermain will include saw cutting, excavation, disposal of surplus excavated material, bedding, supply and installation of all pipe, valves, hydrants and fittings, all thrust blocking, polyethylene encasement and support concrete, bolts, gaskets and tie-rods, imported fill, cleaning, pressure and leakage testing, flushing, disinfection, removal and disposal of abandoned main as shown on drawing, service connection change over (transfer to new main), service replacements as shown on contract drawing, temporary servicing and all other work and materials necessary to complete the installation as shown on the Contract Drawings and specified herein
- 1.6.5 Payment for hydrants, including lateral connections from watermain to hydrants, valve and adjustable valve box, will be incidental to payment for watermain installation.
- 1.6.6 Payment for service connections, including the scope defined in 1.6.4, surface restoration and mainline saddles where specified, corporation stops, curb stops, and all related fittings and appurtenances specified or shown on Standard 301 Section 3, will be incidental to payment for watermain installation. The waterworks connection database service lists are provided for reference only. Contractor must verify locations and material in the field. All services from the old main must be changed over to the new main. The database may not have listed all the addresses or services. Payment for all services changed over from the existing main to the new main, whether listed in the database or not, will be incidental to payment for watermain installation.
- 1.6.7 Payment for mainline valves, including valves, valve boxes and support or anchor blocks will incidental to payment for watermain installation.
- 1.6.8 Payment for air-release / air-vacuum and combination air valves, chambers and apparatus will be incidental to payment for watermain installation.
- 1.6.9 Payment for polyethylene bagging shown on drawings will be incidental to payment for watermain installation. Payment for polyethylene bagging not shown on drawings will be measured in lineal metres at the unit price bid.
- 1.6.10 Miscellaneous fittings and appurtenances not specifically identified on the Contract Drawings, and not included in the described separate payment items in the Form of Tender, are deemed to be included in described payment items.

CITY OF VANCOUVER SPECIFICATIONS	WATERWORKS	SECTION 02742 PAGE 4 2009
--	------------	---------------------------------

- 1.6.11 Payment for abandoning old watermain, removal of old valves and hydrants, including scope defined in item 3.6 will be incidental to payment for watermain installation.
- 1.6.12 Payment for removing old curb stop riser pipe that contains asbestos will be in units removed.
- 1.6.13 Payment for sawcutting of asphalt and concrete pavement up to 150 mm depth will be incidental to payment for watermain installation.
- 1.6.14 Payment for sawcutting of asphalt and concrete pavement deeper than 150mm up to 300 mm depth, including removal of cut material will be measured in lineal metres at the unit price bid.
- 1.6.15 Payment for removal of existing watermain as shown on the Contract Drawings, including sawcutting, excavation, backfilling, disposal, surface restoration and temporary servicing will be incidental to payment for watermain installation.

1.7 Inspection and Testing

- 1.7.1 Engineer will arrange for testing other than that specified in Part 3.0, Execution, to be performed by Contractor.
- 1.7.2 Contractor to accommodate soil resistivity testing by City crew during excavation of trench and prior to laying pipe at least once per block, or as directed by the Engineer. Engineer will arrange for testing.

2.0 PRODUCTS

2.1 Mainline Pipe, Joints and Fittings

2.1.1 Ductile Iron Pipe:

- 2.1.1.1 Ductile iron pipe to conform to current AWWA Standards 151/A12-51-86, thickness Class 52, double cement mortar lined to AWWA C104/A21.4-90 with the added requirement that the lining not exceed a maximum thickness of 1/4" (6.4 mm) for 100-300 mm pipe, and 3/8" (9.5 mm) for 450 mm pipe.
- 2.1.1.2 Unless otherwise specified, the exterior surface of all pipes shall be coated in accordance with AWWA Standard C151/A21.51-86. The material shall be smooth, durable and water resistant. It shall be tough and well bonded to the pipe surface.
- 2.1.1.3 The nominal laying length of the pipe, as defined in AWWA C151/A21.51-86, Section 51-4 shall be 18 or 20 feet (5.5 or 6.0 m).

**CITY OF
VANCOUVER
SPECIFICATIONS**

WATERWORKS**SECTION 02742
PAGE 5
2009**

2.1.2 Joints:

- 2.1.21 Pipe shall be "Tyton" push-on bell and spigot type joints or mechanical bell and spigot joints in accordance with AWWA C111/A21.11-85. Restrained joint pipe shall conform to the design of "MJ-TJ" pipe as manufactured by "Pacific States Cast Iron Pipe", or City of Vancouver approved equal.
- 2.1.2.2 Gaskets shall be manufactured from Nitrile type (Acrylonitrile Butadiene, NBR) materials, in conformance with AWWA Standard C111/A21.11-85, excluding Section 11-7.4.1 and 11-8.3.1.
- 2.1.2.3 All gasket lubricant shall meet the specifications set out in AWWA C111/A21-11-85 Section 11-8-4.

2.1.3 Fittings:

- 2.1.3.1 All fittings shall be ductile iron and shall conform to AWWA C110/A21.10-87 suitable for pressure rating of 350 psi (2410 kPa), double cement mortar lined to AWWA C104/A21.4-90. The maximum cement lining thickness shall not exceed the specified minimum "double thickness" by more than 150 percent.
- 2.1.3.2 Flanged ends shall conform to American Standard Association (ASA) B16.1, Class 125 with drilling and dimension to ANSI B16.1, for cast iron flanges Class 125, unless otherwise specified by the Engineer.
- 2.1.3.3 "Tyton" push-on bell and spigot ends or mechanical bell and spigot ends shall conform to AWWA Standard C111/A21.11-85.
- 2.1.3.4 Bolts and nuts used with mechanical joints shall be made of high tensile strength (60,000 psi, 400 MPa) low alloy steel (Corten) conforming to Section 11-7.5, AWWA C111-85 composition specification.
- 2.1.3.5 Gaskets and lubricant shall be in accordance with Sections 2.1.2.2 and 2.1.2.3 respectively.
- 2.1.3.6 Couplings shall be mechanical type and shall be Dresser Style 38 or 162 Robar or approved equal, suitable for 150 psi (1034 kPa) pressure class and 50% surge, with ends suitable for the piping materials used. Flanged adapters shall be Dresser Style 128 Robar or approved equal, with flanges conforming in drilling and dimension to ANSI B16.1 for cast iron flange Class 125, unless otherwise specified by the Engineer.
- 2.1.3.7 Tie rods shall be in accordance with Section 2.1.3.4 and shall be sized in accordance with Waterworks Standard 415-5-1. No tie rods are permitted on installations requiring cathodic protection.

**CITY OF
VANCOUVER
SPECIFICATIONS**

WATERWORKS**SECTION 02742
PAGE 6
2009**

2.1.3.8 Wedge Action Restraints shall be Uni-Flange Series 1400 for ductile iron pipe, as manufactured by Ford Meter Box Co., or Engineer approved equal. Wedge Action Harness shall be Uni-Flange Series 1450 for ductile iron pipe, as manufactured by Ford Meter Co., or Engineer approved equal.

2.2 Valves and Valve Boxes

2.2.1 Isolating valves and accessories shall conform to the latest edition of AWWA Standard C509-94, "Resilient Seated Gate Valves for Water Supply Service" and C111 A21.11-85 "Rubber Gasket Joints for Ductile Iron and Grey Iron Pressure Pipe and Fittings" or as otherwise expressly

indicated in this specification. Isolating valves shall be located on all sides of each intersection, in line with adjacent property lines, or where otherwise required by the Engineer.

2.2.2 The body and bonnet of valves shall be made of ductile iron. AWWA C509 shall determine wall thickness of the valves. Valves shall be of the resilient wedge, non-rising stem and with "Tyton" push-on, mechanical or flanged ends as specified in the Contract Drawings.

2.2.3 Valves shall be designed for a working pressure of 200 psi (1380 kPa)

2.2.4 Bolts, studs and nuts shall be cadmium plated ASTM A307 Grade B.

2.2.5 The stem nuts, glands and bushings for NRS valves and the followers or glands on OS&Y valves shall be made of grade 1 bronze as specified in AWWA C509 and ASTM B62. The tensile strength must not be less than 30,000 psi (207 MPa) and yield strength of not less than 14,000 psi (96 MPa).

2.2.6 The stem shall be of the non-rising type and made of manganese bronze to ASTM B132 Grade B or ASTM B147-8A. The tensile strength must not be less than 65,000 psi (448 MPa) and yield strength of not less than 25,000 psi (172 MPa).

2.2.7 Where flanged end valves are used, unless otherwise specified, flanges shall conform in dimensions and drilling to ANSI B16.1 Class 125 and shall conform to the latest edition of ASTM A105 Grade 2.

2.2.8 All joint accessories (M.J. Glands, bolts and nuts, O-ring, gaskets, gasket lubricant etc.) shall be in accordance with appropriate Sections in this specification. Gaskets shall be nitrile.

2.2.9 Air release valves shall be Apco Combination Air Valve model 143C, 1-inch diameter(25 mm), or approved equal.

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS****SECTION 02742
PAGE 7
2009**

- 2.2.10 Valve boxes and lids shall be Telescopic, grey iron castings and conform to City of Vancouver, Waterworks Standards 407/1/1-4 and 407/4/1-2. Valve boxes and lids may be picked-up by the Contractor from the City of Vancouver Central Stores. The City will furnish the valve boxes and lids at no charge to the Contractor. Co-ordinate pick-up of materials with Engineer.

2.3 Service Connection and Appurtenances

- 2.3.1 No water services shall be installed or transferred to the watermain without approval of the Engineer. Pre-servicing in anticipation of future development will not be permitted. All services must be designed and located in accordance with "City of Vancouver Building Trades: City Water Information", available from Waterworks Design Office, City Hall.
- 2.3.2 Service pipe shall be certified 'K' type copper tube and shall conform to the latest edition of the ASTM Standard Specifications for Seamless Copper Tube, designation B88.
- 2.3.3 Service line valves (corporation stops and curb stops) and fittings shall conform to AWWA Standard C800-89 for underground service line valves and fittings. All valves and fittings shall withstand static pressure of 300 psi.
- 2.3.4 Saddles for service connections (where required , see section 3.12.4) shall conform to City of Vancouver, Waterworks Standard 415-4-1.
- 2.3.5 If cathodic protection of watermain is required, insulating main stop shall be used for each service connection, in accordance with Waterworks Standard 413-4-3.
- 2.3.6 The depth of the installed water service must be 2.5' (.75m) minimum.

2.4 Fire Hydrants

- 2.4.1 Fire hydrants shall be low head loss, dry, short barrel and compression type with two 2-1/2-inch (62.5 mm) ports and one 4-inch (100 mm) (I.D.) pump port conforming to AWWA Standard C502-85 for Dry-barrel Fire Hydrants and City of Vancouver, Waterworks Standard 409/1/1-4. The threads of the ports shall meet the specifications shown in City of Vancouver Waterworks Standard 409/2/2. Fire hydrants shall be Terminal City model C71PLT, Mueller model A442 or AVK dry barrel hydrant series 2780.
- 2.4.2 Fire hydrants shall be equipped with a (6-inch 150 mm) nominal diameter mechanical joint inlet connection, conforming to AWWA Standard C110/A21.10-87. The mechanical joint shall be wedge action restraint in accordance to City of Vancouver Standard 301/2/2. The gasket material shall be "Nitrile".
- 2.4.3 Fire hydrants shall be painted in the following manner:
- 2.4.3.1 The exterior of the hydrant shall be painted red. The paint shall be oil or acrylic enamel.

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS**

**SECTION 02742
PAGE 8
2009**

2.4.3.2 The exterior of the hydrant barrel below ground line shall be painted with one coat of coal tar enamel.

2.4.3.3 Fire hydrants shall be designed for a 1.0 m depth of bury, in accordance with City of Vancouver, Waterworks Standard 301-2-2, and shall be capable of extension with flanged barrel sections in 150 mm multiples (150, 300, 450 mm, etc.).

2.4.3.4 Hydrants shall be subjected to hydrostatic pressure test of 300 psi. The pressure test shall be certified by the manufacturer.

3.0 EXECUTION**3.1 General**

3.1.1 Pipe bedding details, including granular surround (pipe cushion) and material specifications, to be as shown on Contract Drawings.

3.2 Pipe Storage and Preparation

3.2.1 Pipe must be stacked using timbers to keep bottom tiers off the ground. Pipe must be stored to prevent dirt and debris from entering the pipe.

3.2.2 Thoroughly clean pipes, fittings, valves, hydrants, and appurtenances of debris and water before installation. Carefully inspect materials for defects before installing. Remove defective materials from site.

3.3 Utility Clearance

3.3.1 Install watermain with 300mm minimum clearance from all utilities and service connections, with the exception of gas services having a diameter of 20mm or less where the minimum clearance will be 100mm. Gas services larger than 20mm will require 300mm minimum of clearance.

3.4 Trenching

3.4.1 Do trenching in accordance with Section 02223 - Excavating, Trenching, Backfilling and Surface Restoration.

3.4.2 Trench alignment and depth as shown on Contract Drawings.

3.4.3 Trench depth to provide cover over pipe of not less than 0.9m from finished grade unless shown otherwise on Contract Drawings.

3.5 Granular Bedding

3.5.1 Fill over-excavation below design elevation of bottom of specified bedding with approved granular bedding placed and compacted in accordance with Section 02223 - Excavating, Trenching, Backfilling and Surface Restoration and Contract Drawings.

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS****SECTION 02742
PAGE 9
2009**

- 3.5.2 Place granular bedding material across full width of trench bottom in uniform layers to depth shown on Contract Drawings.
- 3.5.3 Shape bed true to grade to provide continuous uniform bearing surface for pipe. Do not use blocks when bedding pipe.
- 3.5.4 Shape transverse depressions in bedding as required to suit joints.
- 3.5.5 Compact each layer across full width of bed with mechanical plate tamper to minimum 95% Modified Proctor Density in compliance with ASTM D1557. (All following references to density imply compliance with ASTM D1557).
- 3.5.6 Place ductile iron watermain pipe and copper water services in trench and backfill with approved imported material and compact as specified. Use hand tools to compact material under 'haunch' area of pipe and around fittings and other materials.

3.6 Abandonment of Old Watermains

- 3.6.1 Abandoned watermains are to be plugged with a wooden plug at any point where an open abandoned watermain exists. Wood plugs will be supplied by the City at no charge to the contractor. Co-ordinate pickup of materials with the Engineer.
- 3.6.2 Once the old main has been taken out of service, each grey iron telescopic valve box, top, bottom and lid (refer Standard Water Drawing 301-1-6), and fire hydrants must be removed. Backfill the barrel extending to the valve nut and restore the surface to match established standards in Section 02223 and 02230.
- 3.6.3 Salvaged valve box castings and lids and hydrants may at the discretion of the Engineer be asked to be returned to the City of Vancouver works yard at 70th Avenue and Manitoba Street. Arrange delivery times through the Engineer.
- 3.6.4 No salvaged fittings or pipe to be used on the work without prior Engineer's approval.
- 3.6.5 Remove abandoned watermains at locations shown on Construction Drawings and dispose at Engineer approved disposal area.

3.7 Pipe Installation

- 3.7.1 Handle pipe in accordance with pipe manufacturer's recommendations. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.
- 3.7.2 Install pipe in accordance with the manufacturer's instructions and AWWA C600 except as noted in this specification. In the case of conflicting specifications, the order of precedence, from highest to lowest, is the COV Waterworks Specification, AWWA C600 and then the manufacturer's instructions.
- 3.7.3 Horizontal tolerance is ± 50 mm from specified alignment. Vertical tolerance is ± 25 mm from specified grade.
- 3.7.4 Lay pipes on prepared bed, true to line and grade. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
- 3.7.5 Face bell ends of pipe in direction of laying.
- 3.7.6 Do not exceed 3° (three degrees) joint deflection specified in AWWA C600.
- 3.7.7 Prevent groundwater, dirt and other foreign materials from entering the watermain during construction. Cap the watermain with a watertight plug at open ends as per AWWA C651, except for the addition of other pipes to the system, to prevent the entry of water and foreign materials. If contamination occurs in a watermain that is not connected to the existing system, the Contractor must immediately stop construction and flush the mains with clean water, chlorinate and test as per AWWA C651. If contamination occurs in a watermain that is in service or already connected to the existing system, the Contractor must stop construction, and immediately take the main out of service, flush the main, chlorinate and test as per AWWA C651.
- 3.7.8 Position and join pipes with equipment and methods specified in 3.7.2.
- 3.7.9 Cut pipes as required, and as recommended by pipe manufacturer, without damaging pipe or coating and leaving smooth ends at right angles to the axis of the pipe. For tyton joints, bevelling of cut pipe shall be done to resemble manufacturer's bevel.

**CITY OF
VANCOUVER
SPECIFICATIONS**

WATERWORKS

**SECTION 02742
PAGE 11
2009**

3.7.10 Joints:

- 3.7.10.1 Install gaskets as recommended by manufacturer.
- 3.7.10.2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
- 3.7.10.3 Align pipes carefully before joining.
- 3.7.10.4 Maintain pipe joints free from mud, silt, gravel and other foreign material.
- 3.7.10.5 Avoid displacing gasket or contaminating with dirt or other foreign material. Remove disturbed or dirty gaskets; clean, lubricate and replace before joining is attempted.
- 3.7.10.6 Complete each joint before laying next length of pipe.
- 3.7.10.7 Minimize joint deflection (no more than 3⁰) after joint has been made to avoid joint damage.
- 3.7.10.8 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.
- 3.7.11 Ensure completed joints are restrained by compacting bedding material alongside and over installed pipe or as specified otherwise.
- 3.7.12 When any stoppage of work occurs, restrain pipes in an approved manner to prevent "creep" during down time.
- 3.7.13 Recheck components assembled above ground after placing in trench to ensure that no movement of joints has taken place.
- 3.7.14 Test and/or bleed points consisting of Corporation cocks, sized to achieve minimum flushing velocities of 0.8 m/s in accordance with AWWA C651, to be provided where shown on Contract Drawings or as required by Contractor for pressure testing and flushing.

3.8 Valve Installation

- 3.8.1 Install valves in accordance with City Standard 301-1-6 and to manufacturer's recommendations at locations shown on Contract Drawings.
- 3.8.2 Air valves shall be installed in an underground chamber and vented to atmosphere in accordance with Waterworks Standards 301-9-2 and 407-6-1.

**CITY OF
VANCOUVER
SPECIFICATIONS**

WATERWORKS

**SECTION 02742
PAGE 12
2009**

3.9 Valve Boxes

- 3.9.1 Use precast units as shown on Contract Drawings. Precast units to be in accordance with City of Vancouver, Waterworks Standard 407 Section 4 - "Grey Iron Castings - Valve Boxes and lids".
- 3.9.2 Construct units as shown on Contract Drawings, plumbed and centred over valve nut, true to alignment and matching desired grade level.
- 3.9.3 Installation of the precast units shall be in accordance with Waterworks Standard 301-1-6. The 10-inch diameter riser pipe shall be SDR 64 PVC with minimum 1/8-inch wall thickness. Valve boxes to line up with the direction of the watermain, or, if on a service, in line with the service main.
- 3.9.4 The valve box shall be set centrally over the valve nut. The valve box and its appurtenances shall be set and backfilled within 24 hours of setting appurtenance.

3.10 Service Connection Installation

- 3.10.1 Replace water services as shown on Contract Drawings.
- 3.10.2 No water services shall be installed or transferred to the watermain without approval of the Engineer. Pre-servicing in anticipation of future development will not be permitted.
- 3.10.3 Install service connections to Section 3.7 and in accordance with "City of Vancouver Building Trades: City Water Information" (Refer Standard Water drawings 301-3-1, 301-3-2.)
- 3.10.4 Construct service connections at right angles to watermain unless otherwise directed by Engineer. Locate curb stops as shown on Contract Drawings or as directed by Engineer.
- 3.10.5 Tappings in ductile iron may be threaded without saddles, subject to the limitations below. Service saddles with galvanised malleable iron bodies and neoprene gaskets cemented in place may be used. Tappings in ductile iron pipe to conform to ANSI/ASME B1.20.1 for 3 to 4 threads shown as Appendix A to AWWA C151.
- 3.10.6 Services that are 100 mm or larger require a tee or tap tee off of the watermain as follows:

Pipe Diameter (mm)	Maximum Tap Without Saddle (mm)	Maximum Tap with saddle (mm)
100	20	50
150	20	50
200	25	50
250	25	50
300	40	75

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS**

**SECTION 02742
PAGE 13
2009**

- 3.10.7 Tap main at 2:00 o'clock or 10:00 o'clock position only; not closer to a joint nor closer to adjacent service connections than recommended by manufacturer, or 1 m whichever is greater.
- 3.10.8 Leave corporation stop valves fully open.
- 3.10.9 In order to relieve strain on connections, install service pipe in "goose neck" form "laid over" into horizontal position. Looping of services is not permitted.
- 3.10.10 Install curb stop, Ford Model BH41-233Q, B41-344Q, B41-666, B41-777 or Engineer approved equivalent, with valve riser and cap on services 50 mm or less in diameter. The City will furnish the riser caps at no charge to the Contractor. Equip larger services with a gate valve and cast iron box. Set box plumb over stop and adjust top flush with final grade elevation. Leave curb stop valves fully closed.
- 3.10.11 During connection installation and/or connection rehook, locate curb stop valve and measure long length from the street or lane and measure a short length from the opposite property line. These measurements will be transferred to the change-over sheet.
- 3.10.12 Place temporary location marker at ends of plugged or capped unconnected water lines. Each marker to consist of 38 x 89 mm (1.5 by 3.5 inch) stake extending from pipe end at pipe level to 600 mm (2 feet) above grade. Using black paint, mark exposed portion of stake with the description "WATER" and depth from top of stake to service in metres.
- 3.10.13 Some old curb stop riser pipes may contain asbestos. Prior to removing any old riser pipes the contractor shall determine if asbestos are present. If asbestos are present the contractor shall comply fully with all WCB requirements in the removal of the riser pipe. Payment for the removal of such pipes will be made at the unit prices bid.

3.11 Hydrants

- 3.11.1 Install hydrant assemblies at locations shown on Contract Drawings and in accordance with Waterworks Standard 301-2-1.
- 3.11.2 Install hydrant assemblies in accordance with AWWA Manual of Practice and in accordance with Waterworks Standard 301-2-2.
- 3.11.3 Set hydrants plumb, with hose nozzles parallel with edge of pavement or curb line, with pumper nozzle facing roadway at right angles to road centreline and with body flange set at elevation 50 to 150 mm (2-6 inches) above final grade.
- 3.11.4 To provide proper draining for each hydrant, excavate a pit as shown in section 301-2-2 and backfill with coarse gravel or crushed stone to a level 150 mm (6 inch) above drain holes.
- 3.11.5 Place appropriate sign on installed hydrants indicating whether or not they are in service during construction.

3.12 Thrust Blocks

- 3.12.1 Place concrete thrust blocks between valves, tees, plugs, caps, bends, changes in pipe diameter, reducers, hydrants and fittings and undisturbed ground as shown on Contract Drawings or as directed by Engineer. Concrete shall be placed so that pipe and fitting joints are accessible for repair. Bolts on flanged fittings are to remain accessible and extractable.
- 3.12.2 Size of bearing area for thrust blocks as per Standard Water drawings 301-6-1 to 301-6-4.
- 3.12.3 Keep joints and couplings free of concrete.
- 3.12.4 Do not backfill over concrete within 24 hours of placing, unless otherwise approved by the Engineer.
- 3.12.5 Minimum size of thrust blocks to be as shown on Contract Drawings. No thrust blocks shall be permitted in disturbed or unstable soils such as peat or loose fills. Restrained joint designs in accordance with section 2.0.2.1 will be required.

3.13 Pipe Surrounding

- 3.13.1 Upon completion of pipe laying and after the Engineer has inspected work in place, surround and cover pipes as shown on Contract Drawings.
- 3.13.2 End dumping (dumping fill out of a dump truck directly into an excavation) is not acceptable. Native material (such as the material in the excavation wall) must be kept out of the fill material and fill must be placed in a uniform manner that prevents voids.
- 3.13.3 Compaction to be done in 3 lifts, bedding, 600mm below final grade and final grade to minimum 95% Modified Proctor Density. Each lift shall not be more than 600mm.

3.14 Cleaning and Preliminary Flushing

3.14.1 Before flushing and testing, ensure waterworks system is completely finished except tie-ins to existing watermains and make arrangements for scheduling of testing and disinfection of mains.

3.14.2 Contractor may obtain water from the City as specified below:

3.14.3 Water may be supplied from fire hydrants upon application for a Hydrant Use Permit and presentation of valid test certificate for reduced pressure principle backflow prevention device conforming to AWWA C506. All hydrants to be used must be accompanied by an approved backflow preventive device.

3.14.4 Contractor may obtain water from a metered water connection, provided Contractor pays cost of connection fee plus cost of water used.

3.14.5 Remove foreign material from pipe and related appurtenances by flushing with water. In case of groundwater penetration refer to item 3.7.7. Main to be flushed at water velocities as high as can be obtained from available water sources. Minimum velocity to be 0.8 m/s, (2.6 fps) and/or in accordance with AWWA C651. Flushing water will not be discarded through storm sewers, water courses or ditches that discharge into natural waterways. Flushing water shall be discarded into storm or combined sewers that have sufficient capacity to carry flow. Use of a combined sewer is subject to approval by the Engineer. If in the event that a combined or storm sewer is not available, the flushing water must be shipped from the site to a suitable dump site. Flushing to continue at least until flow from most distant point has reached discharge point and until water discharged is clean and clear.

3.15 Testing Procedure

3.15.1 All testing to be done by a reputable, independent testing firm approved by the Engineer under the direction of the Contractor. Submit schedule and procedures to Engineer for approval before testing. Pressure test against valve is not permitted. Testing costs are to be included in the Contract Price.

3.15.2 Contractor to be in attendance during hydrostatic testing.

3.15.2.1 Before pipe is filled with water, pipe bedding, concreting of all valves and fittings and backfilling to be completed as required in this specification. Each section of pipe to be filled and allowed to remain full of water for a period of at least 24 h prior to commencement of any pressure tests. All corporation cocks are to be closed during the test.

**CITY OF
VANCOUVER
SPECIFICATIONS**

WATERWORKS

**SECTION 02742
PAGE 16
2009**

3.15.2.2 Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Engineer. Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to the Engineer.

3.15.2.3 Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi (35 MPa or 0.35 bar) of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

3.15.2.4 No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{133,200}$$

Where:

L = allowable leakage, in US gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = average test pressure during the leakage test, in pounds per square inch (gauge) In metric units,

$$L = \frac{SD\sqrt{P}}{2,816}$$

Where:

L = allowable leakage, in litres per hour
S = length of pipe tested, in metres
D = nominal diameter of the pipe, in inches
P = average test pressure during the leakage test, in bars

3.15.3 The pipeline is to be submitted to a test pressure of 1550 kPa (225 psi or 15.5 bars) applied at highest elevation in each section, for a minimum duration of 2.0 hours.

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS**

**SECTION 02742
PAGE 17
2009**

- 3.15.4 No additional leakage allowance will be made when testing against closed metal seated valves.
- 3.15.5 When hydrants are in the test section, they shall be included in the pressure test.
- 3.15.6 Acceptance shall be determined on the basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified in Item 3.15.2.4, the Contractor shall, at his/her own expense, locate and make approved repairs as necessary until the leakage is within the specified allowance.
- 3.15.7 All visible leaks are to be repaired, regardless of the amount of leakage.
- 3.15.8 Submit a certificate from the testing firm confirming that the pressure and leakage tests have been successfully carried out to the Engineer.
- 3.16 Disinfection, General**
- 3.16.1 All disinfections and testing to be done by Contractor, using an independent testing firm approved by the Engineer, at the Contractor's cost. Submit schedule and procedures to Engineer for approval before testing.
- 3.16.2 After Engineer has certified that pipes and appurtenances have passed water pressure test, pipes and appurtenances shall be flushed and disinfected.
- 3.16.3 Disinfection and flushing procedures in accordance with Item 3.17 following.
- 3.17 Disinfection and Flushing Procedure**
- 3.17.1 Disinfection procedure to include retaining water containing not less than 50 mg/L free chlorine in water system for a period of at least 24 h, in accordance with AWWA C651, Continuous Feed Method with liquid chlorine. An outline of proposed disinfection procedure accompanied by marked up schematic drawing to be submitted for approval 48 h in advance of commencement of disinfection.
- 3.17.2 Water from the existing distribution system, isolated by reduced pressure principle backflow prevention device or other approved source of supply shall be made to flow at a constant, measured rate into the newly laid watermain. In the absence of a meter, the rate may be approximated by methods such as placing a Pitot gauge in the discharge, measuring the time to fill a container of known volume, or measuring the trajectory of the discharge and using the formula presented in AWWA C651.
- 3.17.3 At a point not more than 3 m downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 50 mg/L free chlorine. To assure that this concentration is provided, measure the chlorine concentration at regular intervals as specified in AWWA C651.

**CITY OF
VANCOUVER
SPECIFICATIONS**

WATERWORKS**SECTION 02742
PAGE 18
2009**

- 3.17.4 Flow of water containing chlorine not to cease until entire main, all service connections, extremities and hydrants to be treated are filled with 50 mg/L chlorine solution. To ensure that this concentration has been attained throughout, free chlorine residual to be measured at a number of points and extremities along main. Chlorinated water to be retained in main for at least 24 h during which time all valves, curb stops and hydrants in section treated to be operated in order to disinfect them thoroughly.
- 3.17.5 At end of this 24 h period, treated water to contain no less than 25 mg/L free chlorine throughout main. If chlorine content is less than 25 mg/L the chlorination procedure is to be repeated until specifications are met.
- 3.17.6 After completion of chlorination, heavily chlorinated water to be flushed from system, hydrants and services until chlorine concentration in remaining water is less than 0.3 mg/L chlorine residual, or is equal to the source water residual. Chlorinated water flushed from mains shall be discharged into a **sanitary** sewer, or be treated in such a manner that does not pose a threat to aquatic life in receiving water. Obtain approval of Fisheries and Oceans Canada and BC Fish and Wildlife Authority and implement dechlorination procedures as required prior to discharge of chlorinated water anywhere other than into a sanitary sewer.
- 3.17.7 Bacterial samples can be collected one (1) hour after the watermain was flushed if clean dry construction procedure have been followed. However, if contamination of the main (such as groundwater) occurred during construction, the clear water must remain in the main at least sixteen (16) hours before sampling. One water sample per City block from the new watermain, and one sample from the source to be collected for bacterial tests (total and fecal coliforms). No sample shall be collected from fire hydrants.
- 3.17.8 Submit to the Engineer a certificate from the testing firm confirming the chlorination tests have been successfully carried out. Laboratory results for bacterial results must be approved by the Engineer before acceptance and before connections to existing watermains, or transfer of existing water services, will be permitted.
- 3.17.9 Fittings, valves and sleeves required to complete the tie-in from existing to proposed watermains will be swabbed with a 1 percent hypochlorite solution as per AWWA C651. Swabbing only applies for sections less than 3 pipe lengths and for sections that tie a new system to an old system.
- 3.17.10 Upon completion of disinfection and flushing, Contractor to remove and backfill test and bleed point apparatus, and complete any other work required for placing of waterworks system in service.

**CITY OF
VANCOUVER
SPECIFICATIONS****WATERWORKS****SECTION 02742
PAGE 19
2009**

3.18 Servicing Fire Hydrants

- 3.18.1 Immediately following completion, all hydrants installed as part of the Work will be inspected by City crews. All repair costs (parts and labour) to remedy defective parts or installation will be charged to Contractor.

3.19 Restoration of Service

- 3.19.1 Once all tie-ins, chlorination and pressure testing are complete and the new water piping is ready to be put into service, the contractor will ensure that all valves, including hydrant valves are in good operational order and are in the open position unless otherwise stated in the drawings and specifications. Contractor is required to maintain a log book for the closing and opening of valves. City crews and contractor will conduct joint inspections of the valves prior to substantial completion. Each valve found to be in its incorrect position at the time of this inspection will incur a charge of \$200.00 per valve to the contractor.

3.20 Polyethylene Encasement

- 3.20.1 Encase watermain in polyethylene tubes in areas shown on the Contract Drawings or as directed by the Engineer.
- 3.20.2 Install polyethylene tubes in accordance to ANSI / AWWA C105 / A21.5 Standard - Installation Method A.
- 3.20.3 Payment for polyethylene encasement will be incidental to watermain installation.
- 3.20.4 Addition and deletions to polyethylene encasement will be measured in lineal meters and paid or deducted at the bid price specified in the Tender Form.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS****TOPSOIL AND FINISH GRADING****SECTION 02921
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 02921 refers to those portions of the Work that are unique to the supply and placement of topsoil and subsequent finishing grade. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- 1.0.2 Topsoil to be a sandy loam or loamy sand texture (no less than 50% sand by weight) containing between 5% and 10% organic matter (dry weight basis). To be free from subsoil, roots, noxious grass, weeds, toxic materials, stones over 25mm, foreign objects, and with an acidity range (Ph) of 6.0 to 7.0. To be free from crab grass, equisetum, convolvulus or other noxious weeds or seeds or parts thereof.

1.1 Related Work

- 1.1.1 Excavation, Trenching, Backfill, and Surface Restoration. Section 02223
- 1.1.2 Sodding Section 02938

1.2 Scheduling of Work

- 1.2.1 Schedule placing of topsoil and finish grading to permit sodding operations under optimum conditions.

1.3 Measurement for Payment

- 1.3.1 Payment for all work under this Section will be incidental to payment for work described in other Sections.

2.0 EXECUTION**2.1 Topsoil Grading**

- 2.1.1 Grade topsoil, eliminate uneven areas and low spots, ensuring positive drainage. Remove soil contaminated with toxic materials. Dispose of removed materials as directed by Engineer.
- 2.1.2 Cultivate entire area which is to receive topsoil to depth of 100mm. Repeat cultivation in those areas where equipment used for hauling and spreading has compacted soil.
- 2.1.3 Remove surface debris, roots, vegetation branches and stones in excess of 25mm diameter.

2.2 Restoration of Stockpile Sites

- 2.2.1 Restore stockpile windrow sites to match existing surface grades and to be free draining and acceptable to Engineer.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS****SODDING****SECTION 02938
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 02938 refers to those portions of the work that are unique to the supply and placement of grassed sod. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein. This section is based on the "British Columbia Landscape Standard" published by the B.C. Society of Landscape Architects and the B.C. Nursery Trades Association. This standard is intended to set a level of quality which is to be equaled or bettered in the construction documents for each project.

1.1 Related Work

- 1.1.1 Site Grading Section 02210
- 1.1.2 Topsoil and Finish Grading Section 02921

1.2 References

- 1.2.1 British Columbia Landscape Standard.
- 1.2.2 Canadian System of Soil Classification

1.3 Scheduling

- 1.3.1 Schedule all operations to ensure optimum environmental protection, grading, growing medium placement, planting, seeding or sodding operations as outlined in these Specifications. Organize scheduling to ensure a minimum duration of on-site storage of plant material, minimum movement and compaction of growing medium, and prompt mulching and watering operations. Coordinate work schedule with scheduling of other trades on-site.
- 1.3.2 Coordinate and schedule such that no damage occurs to materials before or after placement. In particular, meet requirements of living plant material.
- 1.3.3 Plan, schedule and execute work to ensure a supply of water for landscape purposes in adequate amounts and at adequate pressures for satisfactory irrigation of all plants.

1.4 Handling and Storage

- 1.4.1 Protect sod during transportation to prevent drying out. Sod to arrive at site in fresh and healthy condition.
- 1.4.2 Install sod as soon as possible after delivery. If any delay in installation, keep sod moist and cool at all times until installation.
- 1.4.3 During growing season, install sod within 24 hours of delivery to site.
- 1.4.4 Do not store sod on site more than 3 levels in height.

CITY OF VANCOUVER SPECIFICATIONS	SODDING	SECTION 02938 PAGE 2 2009
--	---------	---------------------------------

1.5 Drainage Control

- 1.5.1 Provide for proper water management and drainage of site during construction. Include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance during construction period.

1.6 Samples

- 1.6.1 Provide samples of all materials required, handle and ship in such a manner that they are representative of material or product sampled.

1.7 Site Examination

- 1.7.1 Do not carry out landscaping work in areas or other surfaces that are not properly prepared. Examine site before starting work to verify all surfaces are properly prepared.

1.8 Measurement for Payment

- 1.8.1 Payment for work under this Section will be incidental to payment for work described in other Sections.

2.0 PRODUCTS**2.1 Sod**

- 2.1.1. Sod to be approved by the Engineer and to be nursery grown, true to type, conforming to standards of Nursery Sod Growers' Association and their Nursery Sod Specifications. Sod to be quality, cultured turfgrass grown from seed approved by Canada Department of Agriculture, free of diseases, clovers, stones, pests and debris. Sod to be relatively free of weeds, containing no more than two broadleaf weeds or ten annual weeds or weedy grasses per 40 m².
- 2.1.2 Grass mixture in sod to be suited to locality, site conditions, and intended maintenance procedures for each project area. Sod to be cut by machines designed for that purpose, and by accepted methods, and rolled for shipment. Strips to be 1 m² - 457 mm wide and 2.19 m long.
- 2.1.3 When lifted, height of grass in sod to be between 40 mm and 60 mm.
- 2.1.4 Sod to be lifted in such a manner as to prevent tearing or breaking.
- 2.1.5 Moving height limit to be 38 mm to 64 mm and thickness of soil portion of sod to not exceed 25.4 mm or be less than 16 mm.
- 2.1.6 Grasses in sod to be of sufficient density that no surface soil to be visible when mowed to height of 38 mm.
- 2.1.7 Broken, dry, discoloured pieces will be rejected by the Engineer.

**CITY OF
VANCOUVER
SPECIFICATIONS**

SODDING**SECTION 02938
PAGE 3
2009**

2.2 Water

- 2.2.1 Free of impurities that would inhibit germination and growth or may be harmful to environment.
- 2.2.2 Contractor to supply.

2.3 Fertilizer

- 2.3.1 To Section 02921 - Topsoil and Finish Grading and meeting requirements of Canada Fertilizer Act.

3.0 EXECUTION**3.1 Finish Grade Preparation**

- 3.1.1 Do not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil or soil covered with snow, ice or standing water.
- 3.1.2 Verify that grades are correct. If discrepancies occur, notify the Engineer and do not commence work until instructed by the Engineer.
- 3.1.3 Remove and dispose of weeds; debris; soil contaminated by oil, gasoline and other deleterious materials; to approved off-site disposal area.
- 3.1.4 Loosen surfaces of areas that are excessively compacted by means of thorough scarification, discing or harrowing, to minimum 150 mm depth.
- 3.1.5 Finish grade smooth to extent required for class of sodding to be carried out, firm against footprints, loose textured, and free of all stones, roots, branches, etc. larger than diameter required for removal for class of sodding to be carried out.

3.2 Sodding

- 3.2.1 Spread growing medium under all sodded areas evenly over approved subgrade to specified depth. See Section 02921- Topsoil and Finish Grading.
- 3.2.2 Apply required fertilizer to and work well into growing medium by discing, raking or harrowing, at rates specified. Do within 48 hours before laying sod.
- 3.2.3 Lay sod as soon as possible after delivery to prevent deterioration and lay within 24 hours of delivery.
- 3.2.4 Lay sod staggered, closely knit together such that no open joints are visible, and no pieces overlap.
- 3.2.5 Lay sod smooth and flush with adjoining grass areas and paving and top surface of curbs unless shown otherwise on Contract Drawings.

**CITY OF
VANCOUVER
SPECIFICATIONS**

SODDING**SECTION 02938
PAGE 4
2009**

- 3.2.6 On slopes of approximately 2:1 and steeper, lay sod lengthwise up slope, and peg every row with wooden pegs at intervals of not more than 0.5 metres. Drive pegs flush with sod.
 - 3.2.7 Wooden pegs, for pegging sod on steep slopes, to be lath pegs. Pegs to be sufficient length to ensure satisfactory anchorage of sod.
 - 3.2.8 Where required, place erosion control mesh or netting and secure with stakes or staples sunk firmly into ground to minimum depth of 150 mm at maximum intervals of 4.5 m along pitch of slope. Place stakes or staples horizontally across slope at intervals equal to width of mesh or netting minus 150 mm to drive flush with top of sod.
 - 3.2.9 Protect new sod from heavy foot traffic during laying. Place planks if necessary to prevent damage.
 - 3.2.10 Cut sod where necessary only with sharp tools.
 - 3.2.11 Roll, tamp, or plank sodded area providing sufficient pressure to ensure good bond between sod and growing medium.
 - 3.2.12 Water sod area immediately with sufficient amounts to saturate sod and upper 100 mm of growing medium.
- 3.3 Clean-up**
- 3.3.1 Remove all materials and other debris resulting from sodding operations from job site.
- 3.4 Grass Maintenance**
- 3.4.1 Begin maintenance for sodded areas immediately after sod has been installed, and continue until issuance of Certificate of Total Performance.
 - 3.4.2 Include all measures necessary to establish and maintain grass in a vigorous growing condition, including, but not limited to, the following:
 - 3.4.2.1 Mow at regular intervals as required, to maintain grass at maximum height of 60 mm. Do not cut more than 1/3 of blade at any one mowing. Neatly trim edges of sodded areas. Remove heavy clippings immediately after mowing and trimming.
 - 3.4.2.2 Water when required and with sufficient quantities to prevent sod and underlying soil from drying out.
 - 3.4.2.3 Roll when required to remove any minor depressions or irregularities.

CITY OF VANCOUVER SPECIFICATIONS	SODDING	SECTION 02938 PAGE 5 2009
--	---------	---------------------------------

- 3.4.2.4 Undertake weed control when density of weeds reaches 10 broadleaf weeds or 50 annual weeds or weedy grasses per 40 m² and reduce density of weeds to zero.
- 3.4.2.5 Immediately repair sodded areas that show deterioration or bare spots. Top-dress all areas showing shrinkage due to lack of watering and seed with seed mix that matches original seed mix.
- 3.4.2.6 Protect all sodded areas with warning signs, temporary wire or twine fences, or other necessary means.

3.5 Conditions for Performance

- 3.5.1 The Engineer will issue Certificate of Total Performance only when the following conditions exist:
 - 3.5.1.1 Growing medium quality, fertility levels, depths and surface conditions are as specified in Contract Documents.
 - 3.5.1.2 Grasses are required varieties, free of varieties other than those specified.
 - 3.5.1.3 Grass areas are relatively free of weeds, containing no more than two broadleaf weeds or ten annual weeds or weedy grasses per m².
 - 3.5.1.4 Sod is sufficiently established that its roots are growing into underlying growing medium.
 - 3.5.1.5 Sodded areas have been mown at least twice to a height of 38 mm, last mowing being within 48 hours of inspection for acceptance.
 - 3.5.1.6 Grasses established in sufficient density that no surface soil visible when mown to height of 38 mm.
 - 3.5.1.7 Specified maintenance procedures have been carried out.

3.6 Guarantee/Maintenance

- 3.6.1 Customary one year guarantee period for construction industry will apply as standard for landscape work. Contractor to guarantee all materials and workmanship for a period of one full year from date of Total Performance, unless specified otherwise in Contract Documents.
- 3.6.2 Guarantee includes replacing all sodded areas determined by the Engineer to be dead or failing at end of guarantee period. Replacements to be made at next appropriate season, and conditions of guarantee will apply to all replacement seeding for one full growing season.

CITY OF
VANCOUVER
SPECIFICATIONS

SODDING

SECTION 02938
PAGE 6
2009

- 3.6.3 Guarantee will not apply to sodded areas damaged after date of Total Performance by causes beyond Contractor's control, such as vandalism, "acts of God", "excessive wear and tear", or abuse. Contractor is responsible for work until Total Performance. After Total Performance, Owner is responsible for work and proper maintenance.

END OF SECTION

**CITY OF
VANCOUVER
SPECIFICATIONS****CAST IN PLACE CONCRETE****SECTION 03300
PAGE 1
2009**

1.0 GENERAL

- 1.0.1 Section 03300 refers to those portions of the work that are unique to the installation of manholes and catch basins, concrete works associated with the installation of sewers, and similar works incidental to municipal services type construction. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- 1.0.2 This Specification is **NOT** to be used for any structural facilities such as buildings, bridges, retaining walls, or any similar structure requiring site specific structural engineering design or for the construction of pavements, sidewalks or curbs and gutters.
- 1.0.3 Except where specifically stated otherwise, all materials and methods in this Section to conform to requirements of the latest version of CAN/CSA-A23.1.

1.1 Related Work

- 1.1.1 Waterworks Section 02742

1.2 References

- 1.2.1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in References - Section 02000.

1.3 Certification

- 1.3.1 Minimum 2 weeks prior to starting concrete work, submit to Engineer manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
- 1.3.1.1 Portland cement.
 - 1.3.1.2 Blended hydraulic cement.
 - 1.3.1.3 Supplementary cementing materials.
 - 1.3.1.4 Grout.
 - 1.3.1.5 Admixtures.
 - 1.3.1.6 Aggregates.
 - 1.3.1.7 Water.
 - 1.3.1.8 Waterstops.
 - 1.3.1.9 Waterstop joints.
 - 1.3.1.10 Joint filler.

**CITY OF
VANCOUVER
SPECIFICATIONS****CAST IN PLACE CONCRETE****SECTION 03300
PAGE 2
2009**

- 1.3.2 Provide certification from Materials Engineer that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.
- 1.3.3 Provide certification from Materials Engineer that mix proportions selected will produce concrete of specified quality, durability and yield, and that strength will comply with CAN/CSA-A23.1.
- 1.4 Construction Quality Control**
 - 1.4.1 Submit proposed quality control procedures for Engineer's approval.
- 1.5 Measurement for Payment**
 - 1.5.1 Payment for all work performed under this Section will be incidental to payment for work described in other sections
- 2.0 PRODUCTS**
- 2.1 Materials**
 - 2.1.1 Portland cement: to Type 10 CAN/CSA-A5.
 - 2.1.2 Supplementary cementing materials: to CAN/CSA-A23.5.
 - 2.1.3 Water: to CAN/CSA-A23.1.
 - 2.1.4 Aggregates: to CAN/CSA-A23.1.
 - 2.1.5 Air entraining admixture: to CAN/CSA-A266.1.
 - 2.1.6 Chemical admixtures: to CAN/CSA-A266.2. Engineer to approve accelerating or set retarding admixtures during cold and hot weather placing.
 - 2.1.7 Grouts:
 - 2.1.7.1 Provide grout certification prior to use.
 - 2.1.7.2 To be approved by Engineer prior to use.
 - 2.1.7.3 Use in accordance with manufacturer's recommendations.
 - 2.1.8 Curing compound:
 - 2.1.8.1 To be spray applied, liquid type conforming to ASTM C309 containing a fugitive dye.
 - 2.1.8.2 To be applied in accordance with manufacturer's recommendations.
 - 2.1.8.3 Other curing methods such as sheet material and burlap mats, subject to Engineer's approval.

**CITY OF
VANCOUVER
SPECIFICATIONS**

CAST IN PLACE CONCRETE

**SECTION 03300
PAGE 3
2009**

2.1.9 Pre-moulded joint fillers: Bituminous impregnated fibre board: to ASTM D1751.

2.2 Concrete Mixes

2.2.1 The City of Vancouver uses four different types of concrete mixtures for sewer applications as follows:

- 2.2.1.1 2828C -Structural concrete used for manholes, catch basins, or other underground chambers;
- 2.2.1.2 1528A -Protective concrete used over pipes, around manholes, as pipe cradling, and bedding for vertical separation;
- 2.2.1.3 1528B -Thrust blocks and other non-structural mass concrete needs; and,
- 2.2.1.4 0128 -Lean concrete for trench backfill and utility cuts (FillCrete).

2.2.2 Standard specifications for ready-mix concrete are as follows:

PROPERTIES	MIX NUMBER			
	2828C	1528A	1528B	0128
Cement Type	CAN/CSA 10	CAN/CSA 10	CAN/CSA 10	-
Maximum Aggregate Size	20 mm	28 mm	20 mm	10 mm
Slump	75 - 100 mm	0 - 20 mm	75 - 100 mm	150 - 200 mm
Total Air Content	5% - 8%	4% - 7%	4% - 7%	4% - 6%
Calcium Chloride (% by Wt. of Concrete)	Maximum 1% (from Nov. 1 to March 31)	Nil	Nil	0% - 3%
Hot Water	When Required	-	-	-
Exposure Class (CSA Table 7)	B	D	C	C
Compressive Strength (CAN/CSA-A23.1 M90, Clause 17.5) @ 28 Days Other	28 MPa 15 MPa @ 7 days	15 MPa -	15 MPa -	Max. 0.4 MPa 100 kPa @ 3 days

2.3 Forms

- 2.3.1 Forms to CAN/CSA-A23.1.11.
- 2.3.2 Free from surface defects for all concrete faces exposed to view.
- 2.3.3 Form ties to be metal and of type such that no metal left within 25 mm of concrete surface when forms removed.

**CITY OF
VANCOUVER
SPECIFICATIONS****CAST IN PLACE CONCRETE****SECTION 03300
PAGE 4
2009**

2.4 Form Release Agent

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

3.0 EXECUTION**3.1 General**

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

3.2 Formwork

- 3.2.1 Formwork to conform to shape, lines and dimensions shown on Contract Drawings.
- 3.2.2 Formwork to be substantial, sufficiently tight to prevent leakage of mortar and braced and tied to maintain position and shape.
- 3.2.3 Formwork to be unlined unless specified otherwise.

3.3 Workmanship

- 3.3.1 Obtain Engineer's approval before placing concrete. Provide minimum 24 h notice prior to placing of concrete.
- 3.3.2 Pumping of concrete is permitted only after approval of equipment and mix.
- 3.3.3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- 3.3.4 Prior to placing of concrete obtain Engineer's approval of proposed method for protection of concrete during placing and curing.
- 3.3.5 Ensure placement and compaction procedures to CAN/CSA-A23.1 and to approval of Engineer.
- 3.3.6 Protect exposed surfaces from weather and vandalism during initial set period.
- 3.3.7 Strip forms ensuring no damage to concrete.
- 3.3.8 Ensure curing procedures consistent with weather and temperature conditions.
- 3.3.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- 3.3.10 Do not place load upon new concrete until authorized by Engineer.

**CITY OF
VANCOUVER
SPECIFICATIONS****CAST IN PLACE CONCRETE****SECTION 03300
PAGE 5
2009**

3.4 Joint Fillers

- 3.4.1 Furnish filler for each joint in single piece for depth and width required for joint, unless authorized otherwise by Engineer. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
- 3.4.2 Locate and form all joints as specified or as directed by Engineer. Install joint filler where applicable.
- 3.4.3 Use 13 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to finished slab surface unless indicated otherwise.

3.5 Field Quality Control

- 3.5.1 Inspection and testing of concrete and concrete materials will be carried out by a CSA certified laboratory designated by Engineer.
 - 3.5.1.1 Owner will pay costs for inspection and initial testing.
 - 3.5.1.2 If initial tests determine materials or construction not as specified, Contractor to take all steps necessary to correct deficiencies. Subsequent testing will be at Contractor's cost.
 - 3.5.1.3 Engineer will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
 - 3.5.1.4 Non-destructive Methods for Testing Concrete to be in accordance with CAN/CSA-A23.2.
 - 3.5.1.5 Inspection or testing by Engineer will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

END OF SECTION

Design Drawings (issued for tender) are available electronically on CD. Refer to Part A Section 6.0.

The notes following modify the drawings:

1. Hydrant caps are to be painted green to indicate that they are capable of 3,800 lpm or more.
2. SHEET 9 - D3155 will be superseded by a shop drawing from the winning supplier of the Water Meter Chamber and Backflow Preventer RFQ, but it is almost certain that the chamber size will be bigger (or possibly two chambers may be necessary) because the back flow preventer has to be included as well
3. SHEET 7 AND SHEET 8 - The road is as built currently and it will not be changed by the City of Vancouver and therefore the finished road grade as per "Sperling Hansen Associates" drawing No 07008-C-12 REV 1 should be ignored. Contractors are to use the existing road grade and achieve a cover of at least 1m over the waterline (localized filling may be necessary if conflicts with underground utilities arise). The contractor should anticipate that the waterline would go as shown in the drawings and that localized filling will be necessary in order to achieve 1m of cover, and price this extra work into their Total Tender Price.
4. SHEET 4 - The hydrant at "2+240" should be on the south side of the waterline (as close as practically possible) instead of the north side. The cross should be replaced with a tee.
5. SHEET 3, SHEET 4, SHEET 5, SHEET 6, SHEET 7 - Lower the elevation of the watermain by 0.2m (i.e. deeper) in order to allow for easier placement of future gas crossings, starting from "1+780" and achieving the change by "1+830" and then continuing the decrease from that point until "3+280" at which point the drawing elevation may start to be restored (i.e. by "3+300" the change would be complete, in other words, the elevation of the watermain would be decreased by 0.2m from "1+830" to "3+280" and the transition zones would be from "1+780" to "1+830" and "3+280" to "3+300").
6. SHEET 3 - Protect the watermain from the future gas culvert at approximately "1+846" by encasing it with a steel pipe that is at least 2m long and at has a thickness of at least 12mm.
7. Typically, the watermain is to be PVC upto meter/back flow preventer chamber(s) and PVC lock joints afterwards (drawings may show additional details and supersede this particular note).

List of Design Drawings

Drawing No.	Description
COVER SHEET	DRAWING LIST AND SITE LOCATION
SHEET 1	WATERWORKS PLAN AND PROFILE CHAINAGE 0+980 TO 1+330
SHEET 2	WATERWORKS PLAN AND PROFILE CHAINAGE 1+330 TO 1+680
SHEET 3	WATERWORKS PLAN AND PROFILE CHAINAGE 1+680 TO 2+030
SHEET 4	WATERWORKS PLAN AND PROFILE CHAINAGE 2+030 TO 2+380
SHEET 5	WATERWORKS PLAN AND PROFILE CHAINAGE 2+380 TO 2+730
SHEET 6	WATERWORKS PLAN AND PROFILE CHAINAGE 2+730 TO 3+080
SHEET 7	WATERWORKS PLAN AND PROFILE CHAINAGE 3+080 TO 3+430
SHEET 8	WATERWORKS PLAN AND PROFILE CHAINAGE 3+430 TO 3+780
SHEET 9	DETAILS AND NOTES
SHEET 10	DRAINAGE DITCH CROSSING DETAILS
SHEET 9 - D3155	TYPICAL WATER METER CHAMBER



GENERAL CERTIFICATE OF INSURANCE

Appendix 7

Section 8 b) – City staff to select the required # of days Written Notice before sending the certificate out for completion
 Section 2 through 8 – to be completed and executed by the Insurer or its Authorized Representative

1. THIS CERTIFICATE IS ISSUED TO: City of Vancouver, 453 W 12th Avenue, Vancouver, BC V5Y 1V4
 and certifies that the insurance policies as listed herein have been issued to the Named Insured(s) and are in full force and effect as of the effective date of the agreement described below.
2. NAMED INSURED: (must be the same name as the Permittee/Licensee or Party(ies) to Contract and is/are either an individual(s) or a legally incorporated company(ies))

MAILING ADDRESS:

LOCATION ADDRESS:

DESCRIPTION OF OPERATION, CONTRACT, AGREEMENT, LEASE, PERMIT OR LICENSE:

3. PROPERTY INSURANCE naming the City of Vancouver as a Named Insured and/or Loss Payee with respect to its interests and shall contain a waiver clause in favour of the City of Vancouver.
 (All Risks Coverage including Earthquake and Flood)

INSURER: _____

TYPE OF COVERAGE: _____

POLICY NUMBER: _____

POLICY PERIOD: From _____ to _____

INSURED VALUES: (Replacement Cost)

Building and Tenants' Improvements: \$ _____

Contents and Equipment: \$ _____

Deductible Per Loss: \$ _____

4. COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)

Including the following extensions:

✓ Personal Injury

✓ Products and Completed Operations

✓ Cross Liability or Severability of Interest

✓ Employees as Additional Insureds

✓ Blanket Contractual Liability

✓ Non-Owned Auto Liability

INSURER: _____

POLICY NUMBER: _____

POLICY PERIOD: From _____ to _____

LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)

Per Occurrence: \$ _____

Aggregate: \$ _____

All Risk Tenants' Legal Liability: \$ _____

Deductible Per Occurrence: \$ _____

5. AUTOMOBILE LIABILITY INSURANCE for operation of owned and/or leased vehicles

INSURER: _____

POLICY NUMBER: _____

POLICY PERIOD: From _____ to _____

LIMITS OF LIABILITY:

Combined Single Limit: \$ _____

If vehicles are insured by ICBC, complete and provide Form APV-47.

6. ☐ UMBRELLA OR ☐ EXCESS LIABILITY INSURANCE

INSURER: _____

POLICY NUMBER: _____

POLICY PERIOD: From _____ to _____

LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)

Per Occurrence: \$ _____

Aggregate: \$ _____

Self-Insured Retention: \$ _____

7. OTHER INSURANCE (e.g. Boiler & Machinery, Business Interruption, Crime, etc.) – Please specify Name of Insurer(s), Policy Number, Policy Period, and Limit

8. POLICY PROVISIONS:

Where required by the governing contract, agreement, lease, permit or license, it is understood and agreed that:

a) The City of Vancouver, its officials, officers, employees, servants and agents have been added as Additional Insureds with respect to liability arising out of the operation of the Named Insured pursuant to the governing contract, agreement, lease, permit or license;

b) SIXTY (60) days written notice of cancellation or material change resulting in reduction of coverage with respect to any of the policies listed herein, either in part or in whole, will be given by the Insurer(s) to the Holder of this Certificate; the exception is cancellation for non-payment of premiums in which case the applicable statutory conditions will apply;

c) The insurance policy (policies) listed herein shall be primary with respect to all claims arising out of the operation of the Named Insured. Any insurance or self-insurance maintained by the City of Vancouver shall be in excess of this insurance and shall not contribute to it.

SIGNED BY THE INSURER OR ITS AUTHORIZED REPRESENTATIVE

PRINT NAME OF INSURER OR ITS AUTHORIZED REPRESENTATIVE, ADDRESS AND PHONE NUMBER

Dated: _____

PS10084 - General Certificate of Insurance

There is a requirement for the Supply and Delivery of a Water Meter Chamber & Backflow Preventer Assembly for the Transfer and Landfill Operations Department of the City of Vancouver, as set out herein. This assembly will be incorporated into the new Vancouver Landfill waterline which is currently being tendered for construction. The Water Meter Chamber & Backflow Preventer Assembly is to be as specified in drawing D-3155 as modified by the following notes:

Notes to Drawing D-3155:

- a) The assembly is to include a double check valve assembly downstream. This double check valve assembly may be contained in the same chamber if it fits, or, it can be in a separate chamber. The double check valves should be reduced one size to 250 mm (10 inch) as well (same as the size of the meter and piping).
- b) The majority of the waterline will be 300mm and the required flow rate will be at least 3,800 liters per minute. The double check valve assembly should be sized appropriately to deal with the waterline size and flow rate.
- c) Delivery and unloading will be to the Vancouver Landfill in Delta to ground level beside the Technical Trailer, (final placement and positioning into the excavation will be by others).
- d) The vendor should consider the use of an A E Concrete 4712 Chamber which is not so deep and still has the same length and width as similar A E concrete Chambers or the vendor should consider the use of a similar equivalent sized chamber. The lightest and smallest (especially with regards to depth) chamber is strongly preferred because of the site conditions that are present (i.e. depth is very important because the protective barrier layer of the landfill must not be compromised if possible and the weight is important because the site conditions cannot accommodate heavy structures without significant settlement).
- e) Drawing shows a Neptune Fire Flow Meter with a strainer, however, please note that a "Mag Meter" or Magnetic Flow Meter is acceptable and is preferable if it uses less space (i.e. helps with the one chamber concept for all required items) and/or is more economical as long as the remote is compatible to Sensus' or Neptune's and the mag meter is ABB WaterMaster or equivalent. Please provide the product sheet for the meter so that the City can confirm with the Municipality of Delta that it will be acceptable to Delta. (The Municipality of Delta provides the water and needs to be able to read the meter on a quarterly basis and so they must be satisfied with the functionality).
- f) All components for the meter and double check valve system must be certified and of good quality.
- g) The chamber meter access is to be USF hatch, instead of the proposed 2- manhole access due to safety requirements.
- h) Ideally, everything would fit into one chamber.
- i) The last 90 degree bend (ITEM 15 on the Material List) on the bypass line just before the bypass reconnects to the water main downstream of the Water Meter Chamber at the last 300 diameter Tee (Item 5 on the Material List) should be changed to a "300 HUB x 150FL x 300 HUB TEE" so that the 150 diameter Hydrant Valve (which is a FLANGE BY HUB GATE VALVE) allows the Fire Hydrant being installed near the Water

Meter Chamber to be attached directly to this TEE eliminating the need to install a separate 300 diameter Tee for this Fire Hydrant.

- j) The bypass piping, valves, tie rods and fittings should be included in the supplier's quotation so that all the Water Meter Chamber parts will fit and will be available for installation by the successful tenderer for the waterline construction project. The bypass piping should be PVC (same as the rest of the "exposed" piping - "exposed" meaning outside of the Water Meter Chamber) and not Ductile Iron. Ductile Iron pipe can be used inside the Water Meter Chamber for spools/stubs as needed. All the external bypass bends, etc., should be ductile iron fittings.

The Geotechnical Report is provided separately on CD together with the design drawings. Refer to Part A Section 6.0.

Site Bedding and Backfill Requirements

- 1.0 The site bedding and backfill requirements will be specifically indicated by the City's representative during excavation and the Contractor will have to follow this direction. It is expected that for each length of pipe or approximately 20ft, the City's representative will inspect what is being excavated and tell the Contractor what material to use. For each length (i.e. per meter), the actual material used will be recorded. The Contractor will either get paid extra or will reimburse the City based upon the actual materials used depending on how they differ from the assumed direction below which the Contractor is to use in order to come up with a bid price. Therefore, the Contractor should make a bid price with the assumptions below, and also state the per meter cost difference between using imported conventional and excavated existing select fill, and the per meter cost difference between using light weight and conventional fill. Those are the two major areas where there are likely to be adjustments (Tenderers should read the Geotechnical Report as well). For example, it is possible that in the section from "1+653" to "1+849" (approximately 196 meters) some of the material may have to be light weight instead of conventional fill. Similarly, it is possible that in the section from "2+220" to "2+240" (approximately 220 meters) some of the material may be conventional instead of light weight. So there may be differences in any of these sections and adjustments may have to be made. But the biggest difference is likely in the sections where existing fills are likely to be reused because the excavated existing select fill or conventional fill may become either existing select fill or conventional or lightweight. Please note that the City will use the per meter rates indicated by the Tnederer in its evaluation of the Tenders (the City has a specific formula in mind for this).

a) Start: 0 + 985.5 (Existing 300 Ø Watermain on 72nd Street) - Sheet 1.

End: 1 + 042.5 (Inlet to Water Meter Double Check Valve Chamber) - Sheet 1.

- i) Granular pipe bedding to top of pipe zone.
- ii) Imported granular backfill (pit-run gravel) in roadway/parking areas up to bottom of sub-base level. Min 500 pit-run gravel sub-base. Min 230 of 19Ø crushed gravel base. Min 100 asphaltic concrete pavement.
- iii) Pavement only in areas where pavement reinstatement is required.
- iv) Reinststate existing ground surface where watermain installed.

b) Start: 1 + 047.5 (Outlet of Water Meter Double Check Valve Chamber along Equipment Access Road) - Sheet 1.

End: 1 + 653 (45° Bend at Start of Existing Paved Main Access Road past Flare Station) - Sheet 2.

- i) Granular pipe bedding to top of pipe zone.
- ii) Imported light weight fill as per Levelton Soils Report from top of pipe zone to meet existing ground surface.
- iii) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.

-
- c) Start: 1 + 653 (45° Bend at Start of Existing Main Access Road past Flare Station along Paved Main Access Road) - Sheet 3.
- End: 1 + 849 (45° Bend in North Shoulder of Main Access Road) - Sheet 3.
- i) Granular pipe bedding to top of pipe zone.
 - ii) Imported granular backfill (pit-run gravel) in roadway/parking areas up to bottom of sub-base level. Min 500 pit-run gravel sub-base. Min 230 of 19Ø crushed gravel base. Min 150 asphaltic concrete pavement.
 - iii) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.
- d) Start: 1 + 849 (45° Bend in North Shoulder of Main Access Road) - Sheet 3.
- End: 2 + 174.0 (Start of Curvilinear Watermain at Start of Compost Site Access Road) - Sheet 4.
- i) Granular pipe bedding to top of pipe zone.
 - ii) Approved excavated existing select fill or imported conventional fill (assume that 25% of the length will be done with existing and that 75% will be done with imported conventional) compacted from top of pipe zone to underside of gravel shoulder reinstatement.
 - iii) Min 100 thickness of 19Ø crushed gravel shoulder material. Width to match previous existing gravel shoulder width.
 - iv) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.
- e) Start: 2 + 174.0 (Start of Curvilinear Watermain at Start of Compost Site Access Road) - Sheet 4.
- End: 2 + 220 (Past End of Curvilinear Watermain East of Compost Site Access Road) - Sheet 4.
- i) Granular pipe bedding to top of pipe zone.
 - ii) Imported granular backfill (pit-run gravel) in roadway/parking areas up to bottom of sub-base level. Min 500 pit-run gravel sub-base. Min 230 of 19Ø crushed gravel base. Min 150 asphaltic concrete pavement.
 - iii) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.

- f) Start: 2 + 220 (Past End of Curvilinear Watermain at Start of Compost Site Access Road) - Sheet 4.
- End: 2 + 440 (Tee for Future Fire Hydrant Location along Gravel Access Road) - Sheet 5.
- i) Granular pipe bedding to top of pipe zone.
 - ii) Imported light weight fill as per Levelton Soils Report from top of pipe zone to underside of road sub-base material. Min 500 pit-run gravel sub-base. Min 230 of 19Ø crushed gravel base surface course to meet existing road way surface.
 - iii) Reinstall existing road shoulder with 19Ø crushed gravel as required where watermain installed. Min 100 thickness.
 - iv) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.
- g) Start: 2 + 440 (Tee for Future Fire Hydrant Location) - Sheet 5.
- End: 3 + 280 (Fire Hydrant Located at End of Required Watermain Construction - Start of Provisional Watermain Construction) - Sheet 7.
- i) Granular pipe bedding to top of pipe zone.
 - ii) Approved excavated existing select fill or imported conventional fill (assume that 25% of the length will be done with existing and that 75% will be done with imported conventional) compacted from top of pipe zone to underside of previous existing road shoulder/boulevard.
 - iii) Reinstall existing ground surface where watermain installed.
 - iv) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.

2.0 PROVISIONAL WATERMAIN CONSTRUCTION

- a) Start: 3 + 280 (Fire Hydrant Located at End of Required Watermain Construction - Start of Provisional Watermain Construction) - Sheet 7.
- End: 3 + 720 (Fire Hydrant Located at End of Provisional Watermain Construction and East End of Landfill Site) - Sheet 8.
- i) Granular pipe bedding to top of pipe zone.
 - ii) Approved excavated existing select fill or imported conventional fill (assume that 25% of the length will be done with existing and that 75% will be done with imported conventional) compacted from top of pipe zone to underside of previous existing road shoulder/boulevard.
 - iii) Reinstall existing road shoulder with 19Ø crushed gravel as required. Min 100 thickness.
 - iv) Overexcavation and backfill below pipe zone as per Levelton Soils Report and Engineers Instructions.