INVITATION TO TENDER ("ITT") No. PS08153

SUPPLY AND INSTALLATION OF POWER SYSTEMS (OCS / SUB-STATION)

Tenders will be received in the 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), ~~Friday~~Tuesday, October ~~3,~~7, 2008 and registered at 11:00 A.M on ~~Monday~~Wednesday, October ~~6,~~8, 2008.

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 shall be submitted
in writing to the attention of:

Eamonn Savage
Contracting Specialist

Fax: **604.873.7057** E-mail: **purchasing@vancouver.ca**

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PART A – INVITATION TO TENDER

1.0 Invitation to Tender

1.1 The City of Vancouver (the **"City**") invites Tenders for the supply, delivery and installation of power systems (OCS and sub-station) for the City's Downtown Historic Railway (the "**DHR"**) line which runs between Granville Island and the Cambie Bridge. In addition to normal DHR operations this rail line will be used to demonstrate modern street car technology.

1.2 The main track is approximately 1,740 meters long with a 170 meter passing loop. and two (2) # 8 turnouts at the passing loop.

1.3 The current season of operation of the DHR will complete by October 14, 2008. After this date the ~~site~~Site will be available for the removal of the existing track material and OCS infrastructure. OCS preliminary staging and wire work is expected to take place between ~~21 October~~10 November 2008 and ~~31 October~~21 November 2008.

1.4 The Contractor will arrange for the supply, delivery and installation of all materials and equipment required for the project.

1.5 A primary consideration in evaluating Tenders will be the ability of the Contractor to meet the Project Schedule.

2.0 Tender documents

2.1 Tender Documents are available for purchase during normal business hours after 1:00 PM on Wednesday, September 17, 2008 at:

City of Vancouver
Client Service Center,
1st ~~floor~~Floor, City Hall
453 West 12th Avenue
Vancouver, BC V5Y 1V4

on payment of a non-refundable amount of $50.00 including GST, payable to the "~~The~~ City of Vancouver".

2.2 The Tender Documents are available for viewing at:

Vancouver Regional Construction Association
3636 E 4th Avenue
Vancouver, B.C.
V5M 1M3

3.0 Information Meeting

3.1 Tenderers are invited to attend an Information Meeting on Thursday, September 25, 2008, commencing at 2:00 PM and lasting until approximately 4:00 PM. This meeting will be held at the DHR car barn located near the intersection of 6th Avenue and Ash Street in Vancouver.

3.2 **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 Tuesday , September 23, 2008.**

4.0 Administrative Requirements

4.1 Please indicate whether or not you will be submitting a Tender prior to the Closing Time by submitting the Response Notification Form (Appendix 2).

4.2 It is the sole responsibility of the Tenderer to check the City's website at **http://www.vancouver.ca/bid/bidopp/openbid.htm** regularly for amendments, addenda, and questions and answers related to this ITT.

4.3 All Tenders are to be completed and submitted in accordance with instructions on the front page to this ITT and as provided within this Part A.

5.0 Conduct of ITT – Inquiries and Clarifications

5.1 The City's Manager – Supply Management will have conduct of this ITT, and all communications are to be directed only to the contact person(s) named on the cover page.

5.2 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 are to 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 4.2 above.

5.3 The lowest or any Tender may not be accepted and the City of Vancouver will not be responsible for any cost incurred by the Tenderer in preparing the Tender.

5.4 Tenders are scheduled to close at Closing Time listed on the cover page of this ITT.

1.0 DEFINITIONS & INTERPRETATION

1.1 Definitions

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

The defined terms in this Instructions to Tenderers include:

"**City**" means the City of Vancouver, a municipal corporation continued pursuant to the Vancouver Charter, SBC 1953, c.55;

~~"**City's Designated Representatives**" means the City's employees or representatives who are authorized in writing to deal with the Contractor on behalf of the City in connection with the goods, materials, equipment, Products and services or to make decisions in connection with the Contract, and includes the person holding the title set out in Part A – Section 5.0 – *Conduct of the Contract*;~~

"Closing Time" means the closing date, time and place as set out ~~in Paragraph 3(b) of Part B, Instructions to Tenderers~~on the cover page of this ITT;

"Contract" (or "Agreement") means the contract in the Form of Agreement the City will enter into with the successful Tenderer;

"**Contractor**" means a Tenderer whose Tender the City has accepted and to whom the Contract has been awarded;

"**Form of Tender**" means the form of tender in Part C to the ITT;

"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;

"**Notice of Award**" means a written notice from the City to a Tenderer that the City accepts the Tenderer's Tender for the performance of the Work;

"**Notice to Proceed**" means a written notice from the City to a Tenderer to whom a Notice of Award has been delivered, directing the Tenderer to proceed with the Work in accordance with the Tender Documents;

"Losses" means, in respect of any matter, all:

direct and indirect; as well as

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);

"**OCS**" means overhead control systems and consists of the overhead electrical control system to be installed by an Other contractor separately and apart from the Work (but in coordination with the Work);

"Tax Legislation" includes the *Income Tax Act* (Canada), *Excise Tax Act* (Canada), and all other similar legislation in effect from time to time;

"**Tender**" means a tender submitted to the City in response to the ITT;

"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;

"Tender Documents" mean all the documents listed in Paragraph 12 of this Part B, including any addendum issued by the City; ~~and~~

"Tenderer" means the person(s) described in the beginning of the Form of Tender~~.~~;

"**Tender Price**" means the total monetary amount of all prices proposed in the Tender, including all applicable taxes;

"Trackworks" means the work to be performed by the Other contractor pursuant to Invitation to Tender PS080140 "Installation of Trackwork for Streetcar Demonstration Line" all as more particularly described at **www.vancouver.ca/bid/bidopp/ITT/ITT_PS08140.htm;**

"**UL**" means Underwriters Laboratories Inc. the independent product safety certification organization which tests products and writes standards for safety; and

"**Work Site**" or "**Site**" means the area or areas on and about the City property where the Work is to be carried out.

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, Supplementary General Conditions, Appendices and any addenda issued by the City (collectively, the

"Balance of Tender Documents"), the Balance of Tender Documents shall prevail over the Specifications and Drawings.

2.0 INTRODUCTION

The City of Vancouver is inviting Tenders for the supply, delivery and installation of power systems for the City's Downtown Historic Railway. The work as described in the Tender Documents includes but is not limited to:

a) Taking down of the existing OCS system and setting aside for re-use or disposal;

b) Supply, delivery and installation of complete OCS System;

c) Supply, delivery and installation of two (2) sub-stations;

The Site is generally located along the rail corridor linking Granville Island and the South end of the Cambie Bridge.

3.0 TENDERS

a) Upon payment of $50.00 (including GST), each Tenderer will be given one copy of the Tender Documents. The Tenderer should complete and return the Form of Tender and Schedules as hereinafter provided, and should furnish a Bid Bond.

b) The sealed Tender on the Form of Tender provided, together with all other documents required by the Tender Documents, shall be filed with:

Purchasing Services Office
3rd Floor, Suite 320, East Tower,
555 West 12th Avenue
Vancouver, B.C. V5Z 3X7

up to the Tender Closing Time shown on the cover of this ITT.

The Tender Closing Time will be conclusively deemed to be the time shown on the clock used by the City's Purchasing Services Office for this purpose.

Tenders received after the Tender Closing Time will be returned unopened to the Tenderer.

Faxed or emailed Tenders and/or other documents will not be accepted, and will be returned to the Tenderer.

c) Tenders should be enclosed in a sealed plain envelope, clearly marked: "**Supply and Installation of Power Systems (OCS / Sub-Station), ITT PS08153**", with the Tenderer's name in the upper left hand corner.

d) Each Tender should be signed in longhand by or on behalf of the Tenderer, with her 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.

e) 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.

f) Tenderers should submit on the Form of Tender provided, a Total Tender Price (hereinafter defined), including all taxes and fees.

g) Tenderers must submit on Schedule A provided, a breakdown of the Total Tender Price referred to in (f) 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.

h) 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.

i) Unless otherwise stipulated, Tenders should be made on the Form of Tender supplied and signed as specified in (d) above.

j) Tenders should be all inclusive and should be without qualification or condition.

~~k) Provide the following with the tender submission:~~

~~i. Proposed material such as conduit, duct, wires, ground rods with technical details~~

~~ii. Proposed equipment such as cables, switchgear, transformer and rectifier etc. with supporting technical data, job references (for major equipment that have been installed elsewhere before), type test certificates~~

~~iii. Drawing for all walk-in substations with both external and internal layout dimensions.~~

k) All Schedules except Schedule H – Certificate of Insurance are to be completed in accordance with this ITT and attached to and included with the signed Form of Tender.

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 the Schedule of Quantities and Prices which are incorporated into or made necessary by the Work and their unit prices listed in the Schedule of Quantities and Prices; plus

b) all lump sums, if any, as listed in the 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 Part C Form of Tender Schedule A in order to meet budget limitations, or otherwise, and award a contract for only the remaining items.

5.0 OPENING OF TENDERS

Tenders will be opened publicly in the Purchasing Services Office at the address ~~and time~~ shown on the cover page of this ITT promptly after the Closing Time.

Award of a Contract will be subject to approval by City ~~Council and the insurability of the Contractor pursuant to the insurance provisions of the General Conditions.~~ and the evaluation criteria and legal terms and conditions of this ITT.

6.0 CONTRACT

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 BONDS

a) Each Tender should be accompanied by a Consent of Surety (Schedule "F" 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 and a Bid Bond, payable to the Owner, the City of Vancouver, in the amount of ten percent (10%) of the Total Tender Price, and not a dollar amount, as a guarantee of the due execution of the Agreement with the City and the delivery of the Bonds specified in Paragraph 7(b) hereof.

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

Bid Bond:	CCDC 220 (latest)
Performance Bond:	CCDC 221 (latest)
Labour and Material Payment Bond:	CCDC 222 (latest)

c) 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 to him/her 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.

d) 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

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

9.0 WORKSAFE BC

Tenderers should familiarize themselves with the latest Worksafe BC requirements as laid out in Sections 7 and 54 of the General Conditions.

10.0 ACCEPTANCE OF TENDERS

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 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 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.

b) Tenders shall remain open for acceptance by the City for a period of ninety (90) calendar days after the Closing Time.

c) **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, <u>as applicable in the City's sole opinion</u>:**

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;

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 all components 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;**

vii) the reputation, references and previous experience of the Tenderer or its Subcontractors;

d) Where the City determines that all Total Tender Prices are too high, all Tenders may be rejected.

e) The City may, prior to Contract award, negotiate changes to the scope of the Work or any conditions with the low Tenderer 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.

f) 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.

g) 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.

h) Guidelines or policies that may be applicable shall not give rise to legal rights on the part of any Tenderer, 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

a) The Site on which the Work is to be executed is located on City owned property in Vancouver, B.C.

b) 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 Specifications and Drawings, Tables, 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.

c) 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.

12.0 TENDER DOCUMENTS

The Tender Documents shall consist of the Invitation to Tender, Instructions to Tenderer, Form of Tender (including Schedules A, A1, B, C, D, E, F, G, H and ~~H~~I), Form of Agreement, General Conditions, Supplementary General Conditions, Appendix A (the Prime Contractor Agreement Form), Specifications, Drawings, and any ~~Amendments and Appendices 1, 2, 3, 4 and 5.~~and all Amendments to this ITT issued by the City prior to the Closing Time and any and all Amendments issued by the City after the Closing Time (provided that same are accepted in writing by the Tenderer).

13.0 EXAMINATION OF TENDER DOCUMENTS

a) 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.

b) 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

a) If any Tenderer is in doubt as to the true meaning and intent of any part of the Specifications, Drawings, or other Tender Documents, the Tenderer shall request the Engineer for an interpretation thereof at least three (3) 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.

b) Prior to the Closing Time of Tenders, all requests made according to Paragraph 14(a) for necessary clarification of the Specifications, Drawings, or other Tender Documents will be answered in writing by the Engineer. The City shall not be responsible for verbal or any other explanations or interpretations of the Specifications, Drawings or other Tender Documents. All Addenda and other written notices so issued shall become part of the Tender Documents and shall be binding upon all Tenderers.

15.0 TAXES AND FEES

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 therefor 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

a) Wherever any Product (as defined in the General Conditions) is specified or shown by describing proprietary items, model numbers, catalogue numbers, manufacturer or 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 which 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.

b) For approval of Products other than those specified, Tenderers shall submit a request in writing to the Engineer at least five (5) 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 Specifications and Drawings.

c) Approval of manufacturers and/or Products as noted are approved only insofar as they shall conform to the Specifications.

17.0 METRIC MEASUREMENTS AND COORDINATION

a) 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~~Drawings.

b) 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.

c) 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.

d) Where "hard conversion" Products have been specified and are available they shall be supplied.

e) Care is required to be executed to ensure coordination of imperial and metric Products and in dimensioning and in this regard, the Contractor shall be entirely responsible for metric coordination of its Work.

f) 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.

18.0 SCHEDULING, COORDINATION AND COMPLETION

Time shall be of the essence for all purposes of the Contract and the performance of the Work.

Each Tenderer shall 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 ~~complete~~achieve Total Performance of the Work by May 29, 2009**

The Work is taking place amidst a number of other construction activities ("~~site~~Site constraints") on the rail corridor ~~site~~Site. The Contractor will be responsible for completing the Work in a way that does not hinder other work on the rail corridor ~~site~~Site. The other existing and future construction activities (which are subject to change) include, but are not limited to:

a) Installation of Trackwork;

b) Traffic signal work at the Moberly intersection;

c) Station construction at both ends of the ~~job site~~Site;

The dates for starting and completing the Work will be in accordance with the following schedule (Project Schedule).

Project Start Date	~~15~~29 October 2008
OCS Preliminary Staging and Wire Work	~~21 – 31 October~~10 November 2008 – 21 November 2008
OCS Installation	23-February 2009 – 6 April 2009
Substation Procurement and Installation	24 April 2009 – 22 May 2009
Substantial Performance	To be provided by the Contractor but must be prior to Total Performance
Total Performance	29 May 2009

19.0 EXCAVATION, SOIL SUPPORT AND WORK AREAS

The following items are brought to the Tenderer's attention:

a) The Contractor shall employ all work procedures necessary to eliminate disturbance and inconvenience to all residents and business owners adjacent or near the Site and shall strictly adhere to all construction procedures specified or referenced in the Tender Documents.

b) Contractor work areas will be approximately as indicated in the Drawings.

c) Other contractors completing other construction work items will be on-~~site~~Site during the Work as noted in Paragraph 18 of this Instructions to Tenderers. The Contractor will be required to work together with the City and ~~other~~Other contractors to resolve any coordination issues that arise as a result of these construction activities.

20.0 LABOUR AND EQUIPMENT RATES

Tenders should include Schedule “E”- Force Account Labour and Equipment Rates. The Tenderer should insert the hourly rates for labour and equipment including allowances for taxes, assessments, benefits, small tools, overhead and profit as set out in the Supplementary General Conditions paragraph section titled “Force Account”.

21.0 EXPERIENCE

Tenderers should confirm that they have suitable experience in the performance of this type of work. Each Tenderer should submit Schedule "D" 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;

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 (if available); and

g) names and positions of Contractor's key personnel involved in the project.

22.0 LIST OF SUBCONTRACTORS AND SUPPLIERS

The Tenderer should insert in Schedule "C" to the Tender a list of Subcontractors, 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.

23.0 NON-RESIDENT WITHHOLDING TAX

Tenderers are advised that, if they are not residents of Canada, the Income Tax Act of 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 Revenue Canada, 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.

24.0 RELEASE, INDEMNITY AND LIMITATION

a) Release

The Tenderer now releases the City from all liability for any Losses in respect of:

i) any alleged (or judicially imposed) breach by the City or its employees, officers, officials or agents, including the Engineer, of the Tender Contract (it being acknowledged and agreed that to the best of the parties’ knowledge, the

City has no obligation or duty under the Tender Contract which it could breach (other than obligations or duties merely alleged or imposed judicially));

ii) any unintentional tort of the City or its employees, officers, officials or agents, including the Engineer, occurring in the course of conducting this Invitation to Tender;

iii) the Tenderer preparing and submitting a signed Form of Tender;

iv) the City accepting or rejecting the Tenderer's tender;

v) the manner in which a Contract award is made or in which no Contract award is made; and

vi) the Tenderer(s), if any, to whom a Contract award is made.

b) Indemnity

The Tenderer now indemnifies and will protect and save the City and its employees, officers, officials and agents, 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:

i) any alleged (or judicially imposed) breach by the City or its employees, officers, officials or agents, including the Engineer, of the Tender Contract (it being agreed that, to the best of the parties' knowledge, the City has no obligation or duty under the Tender Contract which it could breach (other than obligations or duties merely alleged or imposed judicially));

ii) any unintentional tort of the City or its employees, officers, officials or agents, including the Engineer, occurring in the course of conducting this Invitation to Tender; or

iii) liability on any other basis related to the tendering process, bidding process or the Tender Contract.

c) Limitation

In the event that, with respect to anything relating to the tendering process, bidding process or the Tender Contract, the City or its employees, officers, officials or agents, including the Engineer, are found to have breached (including fundamentally breached) any duty or obligation of any kind to the Tenderer or its Subcontractors, subconsultants or suppliers, whether at law or in equity or in contract or in tort, or are found liable to the Tenderer or its Subcontractors, subconsultants or suppliers on any basis or legal principle of any kind, the City's liability is limited to a maximum of Five Hundred Dollars ($500) in Canadian currency, despite any other term or agreement (either expressly stated or implied) to the contrary.

25.0 DISPUTE RESOLUTION

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 Manager of Materials Management; and

b) Paragraph 24 above - Release, Indemnity and Limitation will:

   i) bind the arbitrator, the Tenderer and the City; and

   ii) survive any and all awards made by the arbitrator.

26.0 CONFIDENTIALITY AND PRIVACY

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.

27.0 RELEASE OF INFORMATION RESTRICTED

No information will be given out between the Closing Time and the time the Contract award (or decision not to award the Contract) is made. Tenderers must attend the tender opening in order to obtain information prior to the making of the Contract award.

28.0 ENQUIRIES

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

29.0 MASTER MUNICIPAL SPECIFICATIONS AND STANDARD DETAIL DRAWINGS

All Tenderers are required to thoroughly review the Tender Documents. Specifications for the Work are based on the Master Municipal Specifications and Standard Detail Drawings (printed 2000) as amended by the City of Vancouver (refer to Part G - Specifications and Drawings part of the Tender Documents). For certainty, all of Volume I and the following parts of Volume II of the MMCD are expressly excluded from this ITT and the Contract Documents: Instruction to Tenderers – Part II. General Conditions (including Schedule 17.5.3 Letter Agreement with Referee, Changes Flow Chart, and Dispute Resolution Flow Chart). The Master Municipal Specifications and Standard Detail Drawings may be purchased separately from:

Support Services Unlimited
#302 - 1107 Homer Street
Vancouver, B.C. V6B 2Y1
Phone: 604.681.029

The Contractor shall perform all Work in a manner that at all times maintains a standard of care, skill and diligence in performing the Work in accordance with good construction practices.

INVITATION TO TENDER NO. PS08153
SUPPLY AND INSTALLATION OF POWER SYSTEMS (OCS / SUB-STATION)
PART C – FORM OF TENDER

Tender of _____

(Name of Person, Firm, or Company)

Address: _____

_____

_____

Telephone No.: _____

Fax No.: _____

Email: _____

For the following work:

The Supply, Delivery and Installation of Power Systems (OCS/Sub-station) as described in the Tender Documents (as previously defined in the Instructions to Tenderers), including but not limited to and by way of example only:

a) Taking down of the existing OCS system and setting aside for re-use or disposal;

b) Supply, delivery and installation of complete OCS System;

c) Supply, delivery and installation of sub-station;

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".**)

1.0 TOTAL TENDER PRICE AND SCHEDULE

Having fully examined the Site, the access to the Site and all conditions affecting the Work and 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~~all Amendments 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:

ITT PS08153 – Supply and Installation of Power Systems (OCS/Sub-station):
Total Tender Price **$**_____ in lawful money of Canada, **including all taxes and fees.**

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

a) Work will begin by **October ~~15,~~29, 2008**, subject to Council approval and the City issuing the Notice to Proceed.

b) Substantial Performance of the Work will be achieved by _____**, 2009**.

c) Total Performance of the Work will be achieved by **May 29, 2009**.

The undersigned confirms that the above stated price includes all Federal, Provincial, and Municipal taxes and all customs and excise import duties and WorkSafe BC 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~~Tender of another tenderer is accepted by the City. If within this period the City delivers a written ~~notice~~Notice of ~~award~~Award by which the City accepts the subject Tender, the undersigned will, within ~~five (5) working days~~5 Working Days of the receipt of the written ~~notice~~Notice of ~~award~~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;

b) a detailed Construction schedule, as required by Section 22 of the General Conditions;

c) a "clearance letter" indicating that the Tenderer is in WCB compliance, as required by Section 7(f) of the General Conditions; and

d) a Certificate of Insurance or certified copy of the insurance policies as specified in Section 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 Paragraph 2 above, the City will deliver a Notice to Proceed by which the undersigned will:

a) commence the Work within ~~fourteen (~~14~~)~~ calendar 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 ~~GC 7~~in Section 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 Section 7(e) 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 Paragraphs 2 and 3 above of this Form of Tender, the undersigned:

i) fails or refuses to deliver the documents as specified by Paragraphs 2 and 3 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:

i) the face value of the Bid security; and

ii) 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.

5.0 AMENDMENTS

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

Amendment No. 1

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(AMENDMENTS, IF ANY)

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).

SIGNED and SEALED this ___ day of _____, 2008 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:

(Address)

(Name and Signature)

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 GST. The GST shall be shown separately. The Tenderer is required to verify the extent of the Work in relation to this Contract. See paragraph "PERSONAL EXAMINATION" of the General Conditions.

ITEM	SCHEDULE	DESCRIPTION	TOTAL PRICE
	SECTION 1	GENERAL	**$**
	SECTION 2	OCS SYSTEM	**$**
	SECTION 3	SUB-STATION	**$**
SUBTOTAL			**$**
Goods and Services Tax (5.0%)			**$**
TOTAL TENDER PRICE*			**$**_____

LEGEND

ea – each
lm – linear metre
LS – lump sum
N/A – not applicable
m2 – square metre
m3 – cubic metre

SCHEDULE "A" (Continued)

SCHEDULE A1 - GENERAL

ITEM No.	DESCRIPTION OF WORK	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1.0	**SECTION 1 - GENERAL**				
1.1	Mobilization	L.S.	1		**$**
	TOTAL SECTION 1 - GENERAL				**$**
2.0	**SECTION 2 - OCS SYSTEM**				
2.1	Take down existing OCS system and set aside for re-use or dispose as required for the work*	L.S.	1		**$**
2.1	Supply, Deliver and Install Complete OCS System*	L.S.	1		**$**
					$
	TOTAL SECTION 2 – OCS SYSTEM				**$**
3.0	**SECTION 3 – SUB-STATION**				
3.1	Supply, Deliver and Install two (2)Sub-Stations	L.S.	1		
	TOTAL SECTION 3 – SUB-STATION				**$**
	TOTAL CONTRACT WORK				**$**

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 "ITT PS08153 – SCHEDULE B", and should be signed by the Tenderer.

~~Work Description~~	~~October 2008~~			~~November 2008~~					~~December 2008~~				~~January 2009~~				~~February 2009~~				~~March 2009~~			
	~~12~~	~~19~~	~~26~~	~~02~~	~~09~~	~~16~~	~~23~~	~~30~~	~~7~~	~~14~~	~~21~~	~~28~~	~~4~~	~~11~~	~~18~~	~~25~~	~~1~~	~~8~~	~~15~~	~~22~~	~~1~~	~~8~~	~~15~~	~~22~~
~~Project Start Date October 15, 2008~~																								
~~Total Performance May 29, 2009~~																								

Work Description	October 2008			November 2008					December 2008				January 2009				February 2009				March 2009			
	12	19	26	02	09	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	1	8	15	22

Project Start Date October 29, 2008																									
Total Performance May 29, 2009																									

SCHEDULE "C"

SUBCONTRACTORS AND SUPPLIERS

1.0 SUBCONTRACTORS

a) 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

2.0 SUPPLIERS

The Tenderer should list all major suppliers and manufacturers (including those suppliers/manufacturers for the items listed in the table below) that it intends to use on this project, including documentation on significant Products, goods, materials and equipment 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 "ITT PS08153, FORM OF TENDER – SCHEDULE C", and should be signed by the Tenderer.

SCHEDULE "D"

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:

_____

_____

SCHEDULE "D" – Continued

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:

_____

_____

SCHEDULE "D" - Continued

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:

_____

_____

SCHEDULE "E"

FORCE ACCOUNT LABOUR AND EQUIPMENT RATES

(See ~~paragraph "Force Account"~~Section 47 of the General Conditions and Section 8.0 of the Supplementary General Conditions)

[Tenderers are to describe precise terms and conditions to which "Overtime Rates" will apply. All other times and conditions will be conclusively deemed to be "Regular Rates"]

~~JOB~~LABOUR CLASSIFICATION	REGULAR RATE (/hr)	OVERTIME RATE (/hr)	~~SPECIFY MAKE & MODEL~~DESCRIBE MINIMUM QUALIFICATIONS AND EXPERIENCE
Lineman (Foreman)			
Lineman (Journeyman)			
Equipment Operator (Journeyman)	Not Applicable – See Equipment Table below	Not Applicable – See Equipment Table below	
[Tenderers are to describe all other types of applicable labour]			

EQUIPMENT CLASSIFICATION	REGULAR RATE (/hr)	OVERTIME RATE (/hr)	SPECIFY MAKE & MODEL
Hi-rail Platform Truck (WITH Equipment Operator (Journeyman))			Elliot or similar
Hi-rail Bucket Truck (WITH Equipment Operator (Journeyman))			Elliot, International or similar
Hi-rail Boom truck (Crane) (WITH Equipment Operator (Journeyman))			National or similar
Pick-up truck (WITH Equipment Operator (Journeyman))			Ford F-150 or similar

Rack truck (~6 m) (WITH Equipment Operator (Journeyman))			Ford F-350 or similar
[Tenderers are to describe all other types of applicable equipment]			

SCHEDULE "F"

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 fifty percent (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 ~~five (5) days~~5 Working Days of receipt of the 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:

_____

SCHEDULE "G"

TENDERER'S PROPOSED VARIATIONS

The Tenderer shall make a full and complete statement and description of its proposed variations to the Tender Documents, if any**.**

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 **"ITT PS08153, FORM OF TENDER – SCHEDULE G"**, and should be signed by the Tenderer.

CITY OF VANCOUVER

SCHEDULE "H"

CERTIFICATE OF INSURANCE

[NOT REQUIRED FOR TENDER FORM -
TO BE SUPPLIED ONLY FOLLOWING NOTICE OF AWARD]

Section 8 b) – to be completed by City staff. Select # of days Written Notice is required.
Section 2 through 7 – to be completed 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 either an individual or a legally incorporated company)***

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**
(All Risks Coverage including Earthquake and Flood) **INSURED VALUES: (Replacement Cost)**
INSURER: _____ Building and Tenants Improvement: $ _____
TYPE OF COVERAGE: _____ Contents and Equipment: $ _____
POLICY NUMBER: _____ Deductible Per Loss: $ _____
POLICY PERIOD: From _____ to _____

4. **COMMERCIAL GENERAL LIABILITY INSURANCE (Occurrence Form)**
Including the following extensions: **LIMITS OF LIABILITY: (Bodily Injury and Property Damage Inclusive)**
√ **Personal Injury**
√ **Products and Completed Operations** Per Occurrence: $ _____
√ **Cross Liability or Severability of Interest**
√ **Employees as Additional Insureds** Aggregate: $ _____
√ **Blanket Contractual Liability**
√ **Non-Owned Auto Liability** All Risk Tenant's Legal Liability: $ _____
INSURER: _____
POLICY NUMBER: _____ Deductible Per Occurrence: $ _____
POLICY PERIOD: From _____ to _____

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. **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

_____ Dated: _____

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

SCHEDULE "I"
TENDERER'S LIST/DRAWINGS OF MATERIAL AND EQUIPMENT

THE CITY NOW ACKOWLEDGES THE CONTRACTOR'S PROPOSED USE OF THE FOLLOWING MATERIALS AND EQUIPMENT. HOWEVER, DESPITE ANY OTHER TERM OF THIS CONTRACT, THE CITY NEITHER APPROVES/ACCEPTS OR REJECTS THE FOLLOWING LIST AND THE CONTRACTOR NOW ACKNOWLEDGES AND AGREES THAT ALL OF THE FOLLOWING ITEMS MUST COMPLY WITH AND PERFORM TO THE STANDARD AND MEET OR EXCEED THE REQUIREMENTS SET OUT IN PART G – SPECIFICATION AND DRAWINGS OF THIS CONTRACT. IN PERFORMING THE WORK, THE CONTRACTOR WILL NOT MODIFY OR DEVIATE FROM THE BELOW ITEMS/DESCRIPTIONS WITHOUT THE PRIOR WRITTEN CONSENT OF THE CITY.

[Tenderers are to review all of Specification 04001 – Traction Power Sub-Station, Part G – Specifications and Drawings and then list out in this Schedule I all:

i. Proposed material such as conduit, duct, wires, ground rods with technical details

ii. Proposed equipment such as cables, switchgear, transformer and rectifier etc. with supporting technical data, job references (for major equipment that have been installed elsewhere before), type test certificates

iii. Drawing for all walk-in substations with both external and internal layout dimensions.]

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 **"ITT PS08153, FORM OF TENDER – SCHEDULE I"**, and should be signed by the Tenderer.

Form of Agreement

This AGREEMENT is made as of the ____the day of _____ , 2008.

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 CONTRACTOR NAME/ADDRESS]

(hereinafter referred to as the "Contractor")

OF THE SECOND PART

WHEREAS:

(A) The Owner has appointed **Eric Mital, P.Eng** Project Engineer (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; and

(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:

ARTICLE I – 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~~Owner in respect of which the Engineer has been designated and appointed as its sole and exclusive agent.

ARTICLE II – 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:

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

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 (as hereinafter defined).

ARTICLE III – 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.

Form of Agreement

Invitation to Tender

Instructions to Tenderers

Form of Tender, including:

Schedules A, A1, B, C, D, E, F, G, H, and ~~H~~I

General Conditions

Supplementary General Conditions

Appendices, including:

Prime Contractor Agreement Form

Appendices 1, 2, 3, 4 and 5

Performance Bond

Labour and Material Payment Bond

Amendments:

[NTD: List ~~any addenda~~all Amendments issued by the City]

Specifications

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.

ARTICLE IV – SCHEDULE OF WORK

(a) 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 Total Performance of the Work by **May 29, 2009** (collectively, the "Contract Time"), subject to the provisions of the Contract Documents for adjustments to the Contract Time.

(b) Time shall be of the essence in this Contract.

ARTICLE V – PAYMENT

(a) 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 **[NTD: State Total Tender Price $_____]** (the "Contract Amount"), including all Taxes and Fees, in Canadian funds for the performance of the Work under this Contract.

(b) Application for Payment

(i) 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.

(ii) On Substantial Performance being certified in accordance with the procedures set out in paragraph (a) 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.

(iii) On correction and completion of all deficient work listed on the Certificate of Substantial Performance, the Contractor shall submit her application to the Engineer for final payment, accompanied by the documentation required by GC.60.

(c) 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 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 Article V(b) (iii) above.

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

(i) 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 (5) Working Days and shall be given the opportunity to defend the Contractor's application without delay.

(ii) Within thirty (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 (10%) of such certified value and less the aggregate of any previous payments all in accordance with the Contract and with the *Builders Lien Act*.

(iii) 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 Conditions 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.

(iv) Where the Engineer has issued a certificate of completion in respect of a subcontract to which the Contractor was a party, and where fifty-five (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.

(v) After fifty-five (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 (10) 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.

(vi) 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.

(d) Interest on Overdue Payments

Where payment is not made in accordance with the payment provisions contained in paragraph (c) above, the overdue amount shall bear interest at the lending rate of the Bank of Montreal 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.

ARTICLE VI – DELAYS

(a) Liquidated Damages for Late Completion

If the Contractor fails to complete the Work by the Contract Time as set out in Article IV 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:

(i) as a genuine pre-estimate of the Owner's increased costs for delay of sequential construction tasks, an amount of $1000.00 per day or pro rata portion for each calendar day that completion of the Work is achieved after the Contract Time; plus

(ii) 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.

(b) 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 owing by the Contractor to the Owner.

ARTICLE VII – 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:

[NTD: INSERT CONTRACTOR INFO]

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: Eric Mital, Project Engineer,
Olympic Transportation Office

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.

[*INTENTIONALLY BLANK*]

ARTICLE VIII – 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: _____ C/S

_____
Print Name & Title

Refer to Council Minutes of _____, 2008.

[NTD: INSERT CONTRACTOR NAME]

BY: _____ C/S

_____
Print Name & Title

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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:

"**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 Insurance**" means, subject always to Section 53 of the General Conditions, a certificate of insurance duly completed by the Contractor's insurers or insurance brokers, substantially on the form attached as Schedule "H" of the Contract Documents;

"**Certificate of Substantial Performance**" means, subject always to Article V(c) 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 Article V(c) 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)~~, a municipal corporation continued pursuant to the *Vancouver Charter*;

"**Contract Documents**" means the documents set out in Article III of the Agreement;

"**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;

"Force Account Work" means work directed by the Owner pursuant to General Condition 47.

"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;

"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 substations, Overhead Contact System (OCS) wire, OCS Poles, bracket arms and supports, site furnishings, machinery, equipment, goods and fixtures) incorporated or to be incorporated in the Work as required by the Contract Documents;

"Site" or **"Work Site"** means the ~~place or places~~areas where and within which the Work ~~under the Contract~~ is to be carried out~~, erected, built or constructed~~ all as more particularly delineated in the Drawings;

"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 Board established and functioning pursuant to the *Workers Compensation Act* (British Columbia) (the "WCA"), as amended, and/or related or successor legislation, and any successors in function thereto now referred to as "WorkSafe BC";

"**WorkSafe BC/OHS Regulation**" means the *WCA*, and all regulations thereto, including, without limitation, the Occupational Health & Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99), as 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;

v) **"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.

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

The Contractor is required to examine carefully the ~~site~~Site of the proposed Work, and the Drawings, Tables, Specifications and other Contract Documents. The Contractor shall satisfy himself 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. 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 submission of a tender shall be prima facie evidence that the Contractor has made such an examination. The Contractor agrees that the Contractor has satisfied him/herself 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 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.

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 fifty per cent (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 fifty percent (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 WorkSafe BC (WCB) 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 WorkSafe BC 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 WorkSafe BC 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 WorkSafe BC premiums, assessments or penalties in respect of work done or service performed in fulfilling this Contract have been paid in full.

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 WorkSafe BC OH&S Regulation.

c) **Prime Contractor's Obligations** – Without in any way limiting the Contractor's obligations under the WorkSafe BC / 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 WorkSafe BC / 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 WorkSafe BC 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 WorkSafe BC and will ensure that all City and WorkSafe BC 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 WorkSafe BC in compliance with Section 20.2 of the WorkSafe BC / 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 WorkSafe BC 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 WorkSafe BC registration numbers.

g) **Subsequent Proof of WorkSafe BC 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 WorkSafe BC 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 WorkSafe BC / 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 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 (5) 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 WorkSafe BC 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 WorkSafe BC 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 WorkSafe BC to constitute a breach of the WorkSafe BC / OH&S Regulation or other failure to observe safety rules, regulations and practices of WorkSafe BC, including any and all fines and penalties levied by WorkSafe BC; 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 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 Article V – 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, fire, or by 'unforeseeable causes beyond the Contractor's control, 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.

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 (7) 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:

- paragraphs (a)(i) or (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 (7) 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 paragraph (a)(i) or a suspension pursuant to paragraph (a)(iv), a sum equal to five percent (5%) 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 2% 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

- paragraphs (a)(ii) or (a)(iii), 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.

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~~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 (5) 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 ~~the City Overhead Contact System~~Contractor.

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~~Other contractor, one (1) sepia and one (1) 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 (1) sepia and one (1) 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.

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. COMMUMICATIONS WITH CONTRACTOR

At all times during the performance of the Work, the Contractor will maintain within the Greater Vancouver area an office equipped with a telephone and staffed at all times on all Working Days between 8:30 a.m. and 4:30 p.m. with a representative of the Contractor authorized to act on its behalf in connection with the Work and the Contract.

Before commencement of construction, the Contractor will provide the Engineer with a list of at least three persons with authority to act on the Contractor's behalf in times of emergency in connection with the Work, at least one of whom will be available at all times 24 hours per day after commencement of the Work until completion thereof.

Any notice or communication to the Contractor pursuant to the Contract will be deemed to be well and sufficiently given, delivered and received by the Contractor if handed to the Contractor or any of the Contractor's apparent representatives, if the Contractor is an individual, or to any of its apparent representatives, it is not an individual, or if mailed or sent to the Contractor at the address set out in its Tender, or to its place of business, if that is different from the address given there, or left for the Contractor at any Work site or by fax or e-mail to the Contractor's fax number or email address as set out in the Tender.

In any written or printed notice the City gives communicating to the Contractor regarding requirements for the Work or otherwise in connection with the Work or the Contract, the

City will not be obligated 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 that may be defective, or where any 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, will be deemed to be and will 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 her 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 her 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 shall not be again employed by the Contractor on the Site without the consent, in writing, of the Engineer.

GC.19. INSPECTION OF WORK

The Engineer may appoint inspectors or surveyors to inspect all materials used, Products made and all ~~work~~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. DAILY REPORT

The Engineer will maintain, in detail, a daily report to record progress of the Work, the number of personnel at the Site, the materials delivered to the Site, and all such other items which the Engineer deems necessary to record. The daily reports will be kept in the Engineer's Site Office and the Contractor or the Contractor's representative shall 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 daily report, the Contractor shall, within seven (7) 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.

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~~Other contractors then the Contractor shall be responsible for all loss and damage, including, without limitation, that of ~~other~~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~~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.

The Contractor shall at all times give free access and every reasonable facility to the employees of the Owner and to ~~other~~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 (2) 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 her 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.

Contractors shall make all necessary arrangements with the Engineering Department of the City for obtaining water from the City.

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~~Work 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 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~~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.

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 the City'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 7:30 a.m. and 3:30 p.m. on all Working Days, except those where City Hall is closed. 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

For all works on City streets, lanes or sidewalks, 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).

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 flagpersons, 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.

At the request of the Engineer, the Contractor shall submit a traffic management plan for the Engineer's approval prior to commencing work or at any other time within two (2) Working Days of such request.

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.

Licence numbers of vehicles legally parked at the time of placement of signs shall be recorded by the Contractor and made available for the Engineer. If these vehicles are still parked when work commences, the Engineer shall be contacted by the Contractor for further instructions.

For the information of the Contractor, the Parking Enforcement Branch or the Vancouver City Police are the only designated authorities approved to call tow trucks. Providing the signing is adequate and the Contractor has contacted the Engineer, the City of Vancouver will pay the costs of towing. Owners of vehicles unlawfully parked will be charged with costs of towing and other costs.

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 street, 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 (4) 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.

GC.40. FIRE, SECURITY AND SAFETY REGULATIONS

a) Fire and Security

The Contractor shall comply and the Contractor shall enforce compliance by all her 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 WorkSafe BC and other requirements.

c) Safety

When required by WorkSafe BC 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 WorkSafe BC.

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.

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~~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 City of Vancouver plans and uncovering the utilities on ~~site~~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 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, and to the extent that, in the opinion of the Engineer some or none of the unit or lump sum prices aforesaid apply, then using the hourly rates ~~for work and labour or cost of material set out herein~~set out in Schedule E 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 (1) 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 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 arising from faulty installation, material or workmanship during the period of twelve (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, or repair the same, shall be determined by the Engineer. Should the Contractor fail to make good defects within three (3) ~~working days~~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.

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 coverage shall apply to property that is to be incorporated 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 Value of the Work

ii) Deductible not to exceed $5,000.

2. "WRAP UP LIABILITY INSURANCE"

a) Insureds

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

b) Limits

Bodily Injury Liability and Property Damage Liability including aggregate products and completed operations: $5,000,000 each occurrence.

c) Extensions of Coverage

i) broad form products and completed operations liability, including coverage for activities of the Contractor and Subcontractors during the completed operations period,

ii) owner's and contractor's protective liability

iii) blanket contractual liability

iv) contingent employer's liability

v) personal injury liability

vi) non-owned automobile liability

vii) cross liability or severability of interest clause

viii) employees as additional insureds;

ix) Blasting, collapse, underpinning, shoring, pile driving, dredging or grading activities

x) Loading and unloading of automobiles

xi) Hoist liability

xii) Unlicensed and specially licensed vehicles

xiii) Operation of attached machinery

xiv) Limited pollution liability arising out of hostile fire and sudden and accidental release of contaminants

d) Deductibles

Deductible not to exceed $5,000.

e) Cross Liability

The insurance shall apply to any action brought against any one of the Insureds by any other Insured in the same manner as though separate policies were issued to each.

f) Term

Period of construction or completion of the project, whichever shall first occur, plus twenty-four (24) months for completed operations liability thereafter.

g) Waiver of Subrogation

It is understood and agreed that in the event of a loss and upon payment of claim hereunder, the Insurer will waive his/her right of subrogation against the Owner, the Engineer and all architects, engineers or consultants engaged in or connected with the construction and Site preparation and related operations of the Work and any of their servants, agents, employees, and parent, subsidiary, affiliated or associated firms.

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,~~all applicable British Columbia laws, the minimum limits as follows:

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

4. CONTRACTOR'S EQUIPMENT INSURANCE

"All Risk" insurance with Insurers acceptable to the Owner, covering all construction equipment, owned or rented, or for which the Contractor or any of ~~his/her subcontractors~~its Subcontractors may be responsible. In the event of loss or damage to the said construction equipment, or any part thereof, the Contractor or the ~~subcontractor~~Subcontractor, as the case may be, shall, if so requested by the Owner in writing, forthwith replace such damaged or destroyed construction equipment.

5. 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~~Subcontractors shall be required to file with the owner prior to commencement of Work, a Certificate of Insurance, and where required by the Owner's Director of Risk Management, certified copies of all policies and endorsements ~~indicated in~~evidencing the placement and endorsement of insurance in accordance with this General Condition.

c) Contractors and their ~~subcontractors~~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 lease fifteen (15) 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

thirty (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~~Subcontractors shall provide at ~~his/her~~their own cost any additional insurance which ~~he/she~~they is required by law to provide or which ~~he/she considers~~they consider 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.

6. The Contractor will obtain or cause its Subcontractors to obtain Hull and Machinery Insurance with a minimum limit of not less than the full value of such vessel, barge or equipment and a deductible of not more than Five Thousand ($5,000) Dollars protecting the Contractor and its Subcontractors from all claims for loss or damage to any vessel, barge or equipment arising out of ownership or operation of the Contractor or its Subcontractors. This policy shall contain a Waiver of Subrogation that in the event of a loss or damage and upon payment of claim hereunder, the Insurer will waive his/her subrogation against the Owner (City), its officers, officials and employees.

7. The Contractor will obtain or cause its Subcontractors to obtain Protection and Indemnity Insurance to cover all claims for bodily injury including death, property damage or loss arising out of the activities conducted by the Contractor, the Subcontractors, or their employees, agents or subcontractors, with a minimum limit of not less Five Million ($5,000,000) Dollars per occurrence and a deductible of not more than Five Thousand ($ 5,000) Dollars. This policy shall name the City, its officials, officers, employees and agents as an additional insured or co-insured.

GC.54. WORKSAFE BC ASSESSMENTS

Prior to execution of the Agreement and prior to commencing the Work under the Contract, the Contractor shall provide a letter from the WorkSafe BC confirming the Contractor's registration and that all assessments have been paid to the date thereof. The Contractor shall require that the 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~~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 her sureties, as well as its respective executors, administrators, successors and assigns, shall fully indemnify and save harmless the Owner and all its officials, officers, ~~servants and~~ employees and agents 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 any portion of the Contract or of the Work but must carry out the Work with its own men or subcontract under the Contractor's 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.

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:

- the "as constructed record plans" of the Work required by GC.13 – *Record Plans*;
- documentation showing compliance with WCB requirements; and
- 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 Article V (c) of the Form of Agreement to third parties including all Subcontractors and suppliers, have been paid.

ii) 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.

iii) 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.

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.

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.

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.

ii) 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 paragraph (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.

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 (7) days after notification from the Engineer so to do;~~

i) the Contractor fails to comply with the requirements following Notice of Award under paragraph 2 of the Form of Tender;

ii) the Contractor ~~neglects or~~ fails to commence ~~work within seven (7) days after the date of execution of the Contract by the Contractor~~the Work or otherwise comply with the requirements following the Notice to Proceed under paragraph 3 of the Form of Tender;

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 WorkSafe BC / Occupational Health and Safety Regulations, 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 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~~compensation for liquidated damages, 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 officials, officers ~~or~~ , employees or agents 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~~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~~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 fourteen (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) twenty-five percent (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.

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.

1.0 DEFINITIONS

(a) "**OH&S Regulation**" means Occupational Health & Safety Regulation (British Columbia Regulation 296/97), as amended by British Columbia Regulation 185/9) 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 consisting of the Downtown Heritage Railway corridor~~has the same meaning as **"Work Site"** or **"Site"**.

(d) **"Prime Contractor"** means the Contractor, who is designated pursuant to Article 3 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 supply, delivery and installation of ~~Power Systems~~the OCS and Sub-stations along the railway corridor to be used for the Downtown Heritage Railway and the Streetcar ~~demonstration~~Demonstration Line 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;

(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.

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 RESPONSIBLITIES

Proof of Qualification to act as Prime Contractor

- The Prime Contractor is to provide a copy of its WCB/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:

- Conduct all necessary and appropriate inquires 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~~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 twenty-four (24) hours before construction commences.

- Comply with OH&S Regulation 20.2 in respect of the Notice of Project.

- Identify and set expectations for each ~~subcontractor~~Subcontractor's safety contact.

- Coordinate all safety-related activities, from ~~site~~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 WorkSafeBC OH&S Regulation 20.3(4).

- 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.
- 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~~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~~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~~Site where workers of two (2) or more employers are working at the same time and the combined workforce is greater than five (5), 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 OH&S Regulation Clause 20.3(3) 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.

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 a 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 _____

1.0 HOURS OF WORK

The City Noise By-Law allows construction between the hours of 7:00 A.M. to 8:00 P.M., Monday to Saturday, and 10:00 A.M. to 8:00 P.M. on Sundays and holidays. No work shall be done outside these hours except as approved by the Engineer. A request for a Noise By-Law exemption to work outside the specified hours must be made in writing to the Mayor's Office a minimum of two (2) weeks prior to the work being done.

Notwithstanding GC.35, the City's forces work between the hours of 7:30 A.M. and 3:30 P.M. Mondays to Fridays, except statutory holidays. 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.

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

Time shall be of the essence for all purposes of this Contract and the performance of the Work.

The Contractor will be responsible for completing the Work in a way that does not hinder other work on the Site (as described in Paragraph 18 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.

The Contractor will ensure that its construction schedule and its Work is performed and sequenced in such a way as to be fully coordinated with, and so as not to impede the Other contractor charged with carrying out, the Trackworks, provided such work is carried out in accordance with the following schedule:

Trackworks Start Date	29 October 2008
Trackworks Total Performance	28 February 2009

4.0 DESIGN AND INSPECTION

Hatch Mott Macdonald ("**HMM**") has been hired to prepare the Specifications and Drawings and conduct inspections during the Work. The Contractor must allow inspectors from HMM and its sub-consultants and from the City to perform their reviews and inspections during the Work so

that all design standards, specification requirements, 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

All truck operators must operate the vehicle in a safe and courteous manner and in full compliance with the Motor Vehicle Regulations.

All truck operators must comply with the City of Vancouver By-laws regulating truck use, including truck route, engine brake noise, and weight and load securement provisions. There will be zero tolerance on overloading trucks and untarped loads.

> [Note: The City of Vancouver Street and Traffic By-Law 2849 - Spilling of Vehicle Loads on Streets - Securing of Loads
>
> 99. (2) (a) No person shall drive, ride, or propel any vehicle containing any sawdust, solid waste, liquid waste, dirt, gravel, rocks, or other loose material on any street in the City unless such vehicles are kept tightly and securely covered in such a manner as to prevent any of the load from being blown, dropped or spilled from such vehicle.]

All vehicles must be inspected prior to leaving a ~~site~~Site to ensure that loads are properly secured and tarped and that there is no debris on the vehicle and no debris or rocks between the tires.

7.0 INTENTIONALLY 0MITTED

8.0 FORCE ACCOUNT

Payment for Force Account Work shall be calculated as follows:

a) Labour - at the lower of the hourly rates set out in Schedule E of 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 WorkSafe BC, Employment Insurance, holiday pay, insurance and all employee benefits.

b) Equipment:

i) Contractor Owned or Bare Rented-at the non-operated hourly rates as set out in Schedule E of the Form of Tender based on actual hours, in minimum increments of 0.5 hours, inclusive of 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 market equipment rates; or

ii) 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 10% markup to cover all overhead costs and profit.

Separate rental for small tools under $1000.00 (purchase price) will not be allowed.

c) 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 10% on such actual cost to cover all overhead, handling and profit.

d) Force Account Work performed by a Subcontractor shall be paid for in the lesser of: (i) the amount as provided by subparagraphs (a), (b) and (c) above, plus a mark-up of 5% to cover all overhead and profit; or (ii) the actual amount the Contractor pays the Subcontractor including a mark-up of 10% on such actual cost to cover all overhead and profit.

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 OR THE OLYMPICS

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 Agreement).

Furthermore, the Contractor undertakes not to disclose or promote its relationship with the City in any Communications in a manner which could suggest or create an association, express or implied, between the Contractor and the International Olympic Committee, the 2010 Olympic and Paralympic Winter Games, the Olympic Movement or the Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (also known as "VANOC"). Without limiting the generality of the foregoing, the Contractor shall not refer to "VANOC", "Vancouver 2010", the "2010 Games", the "Games", "Host City", Olympic Village", "Athletes' Village" or "Olympics", and shall not use any official emblem, logo, website, domain name, or

mascot of the 2010 Games, in any Communications, without the express prior written consent of the City.

11.0 SUPPLY AND INSTALLATION RISK

Notwithstanding anything to the contrary in the Contract Documents (expressly stated or implied), the Products ~~(including, but not limited to and by way of example only, the products to be supplied pursuant to the Supply Contracts)~~ to be transported and delivered by the Contractor will be so transported and delivered at no risk or cost to the City with the intent and effect that until such Products are delivered, installed/planted and accepted in writing by the Engineer, all freight, brokerage, customs, insurance, handling, shipping, risk of loss or damage, and all other costs and risks will be borne by the Contractor.

12.0 DESIGN WORK

Notwithstanding anything to the contrary in the Contract Documents (expressly stated or implied), all design Work to be performed by the Contractor will be the sole responsibility of the Contractor and notwithstanding any approval or acceptance by the City or any of its consultants will remain the sole responsibility of the Contractor and the Contractor now warrants that all drawings, designs, calculations, material selections, equipment selections, decisions to combine certain materials or equipment with other materials or equipment, and all other planning and preparatory work incorporated into or forming an integral part of the Work will comply in all respects with the functional, performance, safety, longevity, and other requirements set out in Part G – Specifications and Drawings.

13.0 EXISTING OCS SALVAGE

The Contractor is responsible for removing and salvaging or disposing of all aspects of the existing OCS infrastructure. No part of the existing OCS infrastructure is to be used in the Work except as expressly permitted in the Specifications and all other Work is to be carried out using only new materials and equipment. Title to, and all risk of loss or damage to, any and all existing OCS infrastructure will vest in the Contractor immediately upon issuance of the Notice to Proceed and will only re-vest in the City upon its re-installation and incorporation into the completed Work. For certainty, any and all proceeds from the sale of such salvaged material as is not incorporated into the Work may be retained by the Contractor and no deduction from the Contract Price will be required to be paid by the Contractor to the City on account of same.

INVITATION TO TENDER NO. PS08140
INSTALLATION OF TRACKWORK FOR STREETCAR DEMONSTRATION LINE
PART G –SPECIFICATIONS AND DRAWINGS

All references to "Specifications", "Master Specifications", "Master Municipal Specifications", "Technical Specifications", etc. will be taken to mean Volume II of the "Master Municipal Construction Document" ("MMCD") and Standard Detail Drawings (printing 2000) as amended by the City of Vancouver in the Supplemental Specifications and Detail Drawings. For certainty, all of Volume I and the following parts of Volume II of the MMCD are expressly excluded from this ITT and the Contract Documents: Instruction to Tenderers – Part II. General Conditions (including Schedule 17.5.3 Letter Agreement with Referee, Changes Flow Chart, and Dispute Resolution Flow Chart) but expressly excluding Volume I and all Measurement and Payment provisions of Volume II. Note: Superpave Asphalt Specifications and Design Mix added (revised 2004).

Section numbers in the form ##### are to be taken directly from the Master Municipal Construction Document (MMCD). Section numbers in the form S-##### are to be taken directly from The City of Vancouver Street Restoration Manua available on-line at http://www.vancouver.ca/engsvcs/streets/design/pdf/SRMFinalN59August2008.pdf. Sections which are specific to this contract are noted as such. All specifications should be read in conjunction with the contract drawings.

Index

DIVISION 1 - GENERAL

Section No.	Title	Comments
01535	Temporary Facilities	Direct MMCD Specification
01570	Traffic Regulation	Direct MMCD Specification

DIVISION 2 – SITE WORK

Section No.	Title	Comments
02223	Excavating Trenching and Backfilling	Direct MMCD Specification
02831	Chain Link Fences and Gates	Direct MMCD Specification

DIVISION 3 - ELECTRICAL

Section No.	Title	Comments
04001	Traction Power Sub-station	Project specific specification.
04402	Trolley Contact System, Cables and Bonding	Project specific specification.
04403	Testing And Commissioning	Project specific specification.

04001 TRACTION POWER SUBSTATION

1.0 GENERAL

1.1 SUMMARY

This specification covers the requirements for designing, manufacturing, furnishing, delivering, unloading, and setting in-place, complete installation, testing and commissioning of two (2) new, 300 KW DC traction power substations, ready for operation for the Vancouver Downtown Streetcar Demonstration Line in the City of Vancouver (the City). The equipment shall operate as a complete system to convert 600 V AC, 3-phase, 60 Hz. AC power to a rated 600 V DC system measured at the DC bus of the substation. The Works shall include, but not limited to the followings:

- submission of all design, proposed equipment data and detailed drawings for construction, testing and commissioning of the traction power substations;
- Submission to BC Hydro (the Utility) for design, construction and connection of the 600/347 V 3-phase 4-wire incoming power supply for the 500 kVA pad-mounted transformer (transformers to be provided by the Utility) installation at the two substation locations;
- coordinate with the City for the electrical specifications of the new demo vehicles and the existing historical trolley vehicles to ensure all design requirements are fully complied;
- removal and disposal of the existing concrete foundation at 691 West, 6th Avenue, Vancouver (Moberley Road and 6th Avenue);
- removal of the existing substation equipment at Moberley Road and deliver to the City storage location as directed; and
- provide all documentation, including as-built drawings, test results and list of recommended spares for operation and future maintenance.

1.2 STANDARD REFERENCES

Supply and installation shall conform to the following and relevant standards:

- Canadian Electrical Codes (CEC) : all relevant sections;
- Canadian Standards Association (CSA) : all relevant sections;
- American National Standards Institute (ANSI): all relevant sections;
- Electronic Industries Association (EIA): RS-282;
- National Electrical Manufacturer's Association (NEMA): RI-9, TR-1; and
- Building Codes (British Columbia) : all sections relevant to substation enclosure.

1.3 SUBMITTALS

Submit the following for approval within thirty (30) calendar days after Notice to Proceed:

- Single-line diagrams including metering and protection schemes;
- AC and DC circuit breakers control schematic;
- Rectifier transformer design details including physical and electrical properties and control schematic;
- Rectifier design details including physical and electrical properties, voltage regulation curves and control schematic;
- Auxiliary equipment control schematic;
- Equipment grounding schematic;
- Annunciator control schematic;
- Equipment layouts and physical dimensions consisting of:
    - Plan views
    - Elevation views
    - Sections
    - Details for all conduit connections
    - All other details where necessary
- Substation services including lighting, heating, ventilation and emergency lighting and backup power arrangement;
- Foundation and grounding design, calculation and installation details; and
- Foundation loadings and mounting details of all substation equipment, including weight of each major equipment.

Submit the following for approval within sixty (60) calendar days after Notice to Proceed:

- Substation drawings including equipment layout, foundation details of all proposed equipment, cable routes and ducts/conduit connections;
- Details and locations of all control and protective devices, and meters;
- Battery and battery charger details;
- Section drawings of all equipment, showing accessibility for operations and maintenance;

- Connection and interconnection diagrams of all equipment. Show all devices in their respective physical locations. All terminal blocks and terminals shall be uniquely identified;

- Protective device range and setting calculations showing basis on which each relay will be set. Submit protective device coordination curves showing coordination of all equipment;

- Structural calculations certified and stamped by a licensed professional structural engineer in the Province of British Columbia for the substation enclosures and the substation foundation;

- Equipment, device, and component nameplate data; and

- Operational instruction manuals including system/component description, trouble shooting guide, drawings and recommended spare parts list.

Submissions for the Utility Approval: The Contractor shall coordinate and make all necessary submissions to the Utility for review and approval. The contractor shall not proceed with building the substation until written approval is received from the Utility and the City. The Contractor shall review and update, as necessary, the followings with the Utility and obtain approval accordingly:

- Complete individual application for both substation locations (Sample application form in Appendix 4 for reference only);

- Single-line meter and relay diagrams;

- Three-line diagrams for the AC switchgear;

- Mounting details for metering equipment enclosures;

- Substation construction, ducting requirement and grounding design and details (Utility reference drawings in Appendix 5 for reference only); and

- Any other drawings and data as requested by the Utility.

1.4 GENERAL DESIGN REQUIREMENTS

Operation: The Traction Power Substation shall operate in conjunction with the new demonstration vehicles (by others) and thereafter the historical trolley vehicle (being provided by the City). Ensure the substation is fully compatible with the electrical specifications of both types of vehicles. The DC traction power system will operate with a floating negative system. As such the tracks are not grounded and provide a low impedance path to the substation rectifiers.

Safety Design: Avoid, eliminate, or reduce hazards identified by analysis, design selection, redesign, material selection, or substitution. Control or minimize any risks from hazards that cannot be eliminated. Incorporate fail-safe principles. Provide warning and caution notes in Operations and Maintenance Manuals and distinctive markings on hazardous components.

Operating Environment: Make the substation, inclusive of all its equipment, devices and materials capable of being operated and maintained at the performance levels indicated,

without impairment resulting from the impact of the environment as found at the installation ~~site~~Site.

Seismic Requirements: Construct the substation including equipment enclosures in accordance with requirements of Building Code, where applicable. Submit any calculations required to show compliance with the above requirements and obtain approval prior to fabrication.

Standard Products. Furnish materials and equipment that are new and free of defects, and are the standard products of manufacturers regularly engaged in the production of such materials and equipment.

Equipment Arrangement: Arrange the equipment, devices and components to result in minimum space requirement and optimum accessibility for operation and maintenance. Mount all devices, plumb and square with the lines of the panel and as recommended by the manufacturer. Provide neat, modular, and logical grouping with related functions in proximity. Take care to avoid wiring congestion. All devices on panel faces to be semi-flushed mounted.

Make all equipment and components readily accessible for inspection, maintenance, adjustment and reading of data. Mount all devices, including protective relays, from which data are to be read on the front panels. Mount all other devices to be readily accessible.

Equipment as assembled for operation shall have no openings that would allow the accidental entry of hand tools and the like.

1.5 UTILITY INTERFACE

Contractor shall coordinate all utility requirements with the Utility to ensure that all necessary requirements of the Utility are complied with in manufacture, installation, testing and commissioning of the substations.

Contractor shall coordinate with the Utility regarding the incoming power supply. The supply will be 600/347 V AC, 3-phase, 4-wire, 60 Hz, solidly grounded at the source. Prior to energization of the substation, set the transformer tap in accordance with the voltage regulation provided by the Utility at the time.

Contractor to confirm the grounding method and provide all grounding connections as required by the Utility for substations. All Utility grounding standards and requirements shall be met.

Coordinate with the Utility to provide cabling and any other equipment as required at the interface point on the line side of the 600 V AC circuit breaker. Make any installation and connections not provided by the Utility. The Contractor shall provide and manufacture enclosures conforming to the Utility's requirements to accommodate all metering equipment.

Obtain all permits and pay all fees necessary in providing final connections to the Utility.

1.6 PRICING

1.6.1 Pricing

The Contract Price shall be for two (2) Traction Power Substations and shall include full compensation for design, supply, fabrication and installation of the substation including all substation equipment, testing at the factory and ~~site~~Site, delivery to and off-loading at the ~~site~~Site, final installation of any devices separately packed, and final testing, commissioning and final startup at the ~~site~~Site. Payment for all appurtenances, labour, materials, tools, equipment, Utility requirement and incidentals required for the complete installation is to be included in the price.

The Contract Price shall include all design submissions, re-submissions, design reviews, and associated works required as well as all Operations and Maintenance Manuals, Test Results and As-built Drawings.

The Contract Price shall include all fees required to obtain all permits required including building or ~~site~~Site permits as well as Utility connections for the complete installation.

2.0 PRODUCTS

2.1 GENERAL

Substation Enclosure. All substation equipment shall be assembled, wired, tested, and installed in a compact, weather-tight, natural ventilated, self-supporting, transportable, walk-in outdoor type enclosure at the site of manufacture. Two entrance doors, one at each end, shall be provided in the substation enclosure. All substation equipment shall be fully tested and ready for all final connections upon delivery to the ~~site~~Site and for final testing and energisation thereafter.

Substation Equipment. The following major equipment shall be included in separated AC, DC Traction and Services sections within the substation enclosure:

- AC primary circuit breaker, Utility metering unit and station service equipment;
- Transformer-rectifier unit, Annunciation system;
- DC circuit breaker;
- Battery and Charger system;
- All necessary cables and/or bus connections; and
- Emergency Trip Button.

Nameplates and Signage. Provide nameplates for proper identification for all components and equipment. Provide nameplates for each piece of equipment at each opening required for service. Use laminated three-ply plastic with a dull white surface and black core for all interior nameplates. Use stainless steel, 0.125 thick minimum, or an approved suitable permanent plastic material for all exterior nameplates. Fasten nameplates with stainless steel screws.

Install warning signs on exterior of the traction power substation. Make warning signs with red enamel background with engraved, white enamel-filled lettering. Signs to include a lightning bolt symbol and lettering as follows:

First line - "DANGER"

Second line - "HIGH VOLTAGE"

Cubicle Heaters. Provide individually thermostatically-controlled strip-type cubicle heaters in each cubicle to prevent condensation in any sections inside each equipment enclosure.

Bus and Bus Connections. Provide high-conductivity copper for all AC and DC busses. Bus connections shall be bolted-pressure type. Bolted connections shall be with cadmium-plated, high strength steel bolts using Belleville Washers. Use silver-plated mating surfaces for bolted bus connections or taps. Rating of each bus and bus connection shall be capable of handling both normal and short circuit conditions.

The following suppliers are provided for reference only and shall not prejudice other suppliers who's products are fully compliant with or equivalent with the specification and approved by the City:

- Kinetics Industries Inc. 140 Stokes Ave., Trenton, NJ 08638 Tel. 609-883-9700;
- Reuel Inc. 200 W Dewey Street, Goldsboro, NC 27532 Tel 919-734-0460; and
- Envitech Automation Inc. 180 Boul Brunswick, Pointe-Claire, Quebec H9R 5P9 Tel 519-426-4430.

2.2 SUBSTATION EQUIPMENT

Description. Each substation equipment shall be designed for easy access and removal, installation, regular operation and maintenance inside the weather-tight, natural ventilated, walk-in, outdoor enclosure in accordance with NEMA 3R. All design, fabrication and erection of structural steel shall be in accordance with the AISC Manual of Steel Construction and Building Code. The enclosure shall of free standing, rugged and for outdoor pad-mounted installation.

The concrete foundation ~~shall be provided~~will be provided by the Other contractor retained to perform the Trackworks. The Other contractor will be responsible to supply the foundation (excluding grounding and connecting equipment) in accordance with the design specifications submitted by the Contractor pursuant to Section 1.3 [Submittals] above. As set out above, and for certainty, the Contractor (and not the Trackworks contractor) will be responsible to design the foundation with adequate reinforcement including sufficient safety margin for the total load of the substation enclosure and all substation equipment to be installed therein.

The rectifier transformer shall be provided with removable front and rear panels. Natural ventilation of the transformer shall be provided on all four sides of the transformer enclosure. The removable panels shall be bolted and equipped with padlock hasps.

The rectifier enclosure shall have double door for front and rear access. Both doors shall have large viewing windows for inspection of the unit and prevent access while the unit is energized. Each door shall have three point latches and shall be equipped with limit switch for monitoring at the annunciator. Each door shall be provided with key lockable and tampered-proof handle.

Lifting: All enclosures shall be designed for suitable lifting with sufficient lifting eyes provided.

Lighting / Receptacle: General lighting inside the substation enclosure, and where necessary specific task lighting for individual equipment shall be provided. A heavy-duty, 20 ampere, 120 V AC, GFI-type duplex receptacle shall be provided. Outdoor lights shall be provided above both doors of the substation enclosure.

Emergency Shutdown Switch (ESS). Provide an emergency shutdown switch on the exterior of each substation enclosure, where the ESS shall be enclosed in a temper-proof stainless steel box with hinged and lockable cover. Operation of the ESS shall trip the local DC breaker. Indication of operation of the ESS shall be provided on the Systems Status Monitoring panel. Provide terminal output for a remote ESS operation and monitoring. Provide signage at the ESS to indicate activation of this switch only shuts down this substation and trolley wire may still be energized by remote substation.

Enclosure Finish: Clean, prime, and paint all equipment enclosures as follows:

- All steel surfaces to be painted are to be cleaned and otherwise prepared for painting by a process recommended by the paint manufacturer. Paint to be ANSI61 gray enamel finish;
- Apply as a minimum one coat of rust-inhibitive primer and two coats of enamel to all surfaces;
- Coat under surfaces of the outdoor enclosure base with a thick, airtight coat of heavy sealing material to provide lasting protection of the under surfaces from deterioration;
- Protect all surfaces on the exterior walls and roof with two factory-applied coats of a non-sacrificial anti-graffiti protective coating, applied after the finish paint. The finish paint and protective coating are to be compatible. Mask hardware, such as locks, light fixtures and hinges, during applications of the protective coating; and
- Anti-condensation treatment shall be provided for all interior metal surfaces of all equipment enclosures.

Grounding: Conform to the requirements of Canadian Electrical Code (CEC) for grounding and bonding for electrical systems. Contractor shall design and install a grounding system in accordance with the CEC, acceptable to the Utility and any others having jurisdiction. Contractor shall also coordinate installation of the below-ground portions of grounding equipment (eg. grounding plates and connections) with the Trackworks contractor.

2.3 AC SWITCHGEAR

AC Switchgear. Provide AC Circuit Breaker to supply and control the Utility power to the transformer-rectifier unit. Provide all necessary current / potential transformers, fuses, meters, protective relays and accessories in accordance with the approved design. Requirements of the Utility and all applicable Codes and Standards shall be fully complied with.

AC Circuit Breaker: Provide 3-pole, molded or insulated case, thermal magnetic circuit breaker with shunt trip and the following minimum ratings:

AC Circuit Breaker	**Rating**
Service Voltage (rms)	600 V
Rated Continuous Current	600 A
Interrupting Current	22 kA

The circuit breakers shall be UL listed and tested in accordance with UL 489. The breaker shall be equipped with integrated solid-state adjustable trip with an interchangeable rating plug. Provide undervoltage relaying to detect loss of AC voltage on any phases. Indication of undervoltage shall be provided on the annunciator panel. Provide through the door operator and lockout / tagout capability.

Buses and Connections. Provide as per section 2.1. All buses and bus connections shall withstand all thermal and mechanical stresses associated with short-circuit currents equal to the momentary rating of the circuit breaker.

Station Service. Design and provide a 120/240 V AC feed with distribution panel, which shall be located away from the traction power equipment including main disconnect switch and provision for up to 10 branch circuit breakers.

Utility Metering. Contractor shall coordinate with the Utility and make provisions for installation and connections of the Utility's metering equipment including meters, CTs, PTs, and the associated protective devices.

2.4 TRANSFORMER-RECTIFIER UNIT

Equipment. Each Transformer-Rectifier Unit (TRU) consists of rectifier transformer and rectifier with rated output of 300 kW. The TRU shall be completed with all equipment and connections from the AC Switchgear and cables, through the rectifier transformer, rectifier and the DC switchgear. At the interface between the output of the rectifier transformer and the rectifier shall be electrically insulated from each other. The rectifier neutral shall not be grounded.

Ratings. The TRU shall be rated at 300 KW at the DC output terminals. Design the equipment to meet the duty cycle indicated in NEMA RI-9 for extra heavy-duty traction requirement. The TRU shall have the following characteristics:

- Efficiency: Greater than 97 percent at 100 % load
- Power factor: 95% at 100% load.
- Impedance: to be optimized for minimum losses and voltage regulation
- Regulation : At rated AC voltage

Loading	**DC Bus Voltage Output**
1% Load	660
100% Full Load	600
100% to 450%	6 % linearly

- Overloads - after steady state temperature reached at 100% load

Loading	**Operating Time**
100 %	Continuous
150 %	2 hours
300 %	5 minutes
450 %	15 seconds

Rectifier Transformer Type and Rating. The rectifier transformer shall be dry type, convection-cooled, 3-phase, 60 Hz, 600 V primary winding and two secondary windings (one delta and one star), with 30 degree phase shift, suitable for indoor operation. All windings shall be copper and cast coils shall be void-free epoxy resin impregnated using multi-cycle vacuum pressure encapsulation process with multiple treatments. Winding insulation to be 200°C Class and designed for Class F (150°C) full load operation. High and low voltage winding connectors to the AC switchgear and rectifier to be made by copper bus with braided copper connections on the transformer end to reduce bus vibration. The transformer noise not to exceed the allowable audible sound levels specified in NEMA TR1. Provide protection against transient surge voltages.

- Transformer Taps. The high-voltage windings shall have two 2.5 % taps above and two 2.5% taps below the nominal input. Tap changing to be by movable links. Tap connections to be brought out and rigidly supported on a terminal board located in the transformer enclosure, and be accessible through removable access panels.

- Accessories: Provide all standard accessories and protective devices. All contacts shall be electrically separated. Provide thermal switches for over-temperature and single-phase protection, installed on each phase and interlocked with AC circuit breaker shunt trip device. Provide a transformer "hot" indication on the annunciator. Furnish each rectifier transformer unit with surge arrestors at the primary terminals.

- Transformer Short-Circuits. Provide capability to withstand full short circuit at secondary terminals at rated voltage on the primary terminals. The duration of the short-circuit current to be at least 1 second.

Rectifier. Provide a natural, convection-cooled rectifier, with 3-phase, 12-pulse rectification in accordance with the circuit as defined in ANSI C34.2. An interphase transformer shall be provided. The rectifier negative shall not be directly grounded but shall be grounded through an automatic grounding device. The rectifier shall be a complete self-contained unit from the rectifier transformer output to the DC switchgear. The rectifier shall be a complete, operative assembly, consisting of silicon diodes, protective fuses, and all other necessary components, controls and accessories. Output to the DC switchgear shall be rated at 600 V DC.

- Diodes: Silicon diodes shall be hermetically sealed rated in accordance with EIA RS282. They shall be mounted on oversized aluminum heat sinks. Diodes are to be rated at 2000 V PRV minimum and have sufficient surge capacity to ride through a bolted fault for the time interval required to trip the DC circuit breaker. N-1 redundant diode configuration shall be provided with full capacity to produce rated voltage and current with the loss of one diode per phase.

Provide N-1 indication on the annunciator. In the event of an N-2 condition, the unit should be tripped off line. Diode temperature "hot" indication shall be provided on the annunciator.

- Fusing: Each diode shall be protected by current limiting fuse that shall disconnect the diode when fuse blows. Provide blown fuse indicator which is to be visible from outside the rectifier. Indication to the annunciator panel shall be provided for any blown fuses. Two blown fuses in a string of diodes shall result in substation trip and lockout.

- Surge Protection. Equip the rectifier unit with transient surge suppressors (MOV's) on both the AC input and DC output sides of the rectifier. Provide AC MOV/snubber circuit for transient protection of the bridge diodes.

- Lightning Arrestors: Provide protection against lightning surges on the AC and DC circuits.

- No-load Resistor: Provide a heavy duty DC bleed resistance to absorb small regenerative conditions and DC load spikes.

- Buses and Bus Connections. Provide as per section 2.1. The buses shall extend through the enclosure walls and be insulated from the enclosure. The rectifier DC positive output shall be connected to the DC circuit breaker. Negative bus shall be provided for connection of the negative return cables complete with manual disconnect facility.

- Reverse-Current Trip Device. Provide the rectifier positive bus with direct acting reverse-current relay to protect the rectifier from internal faults. The reverse-current trip device to be installed at the DC circuit breaker shall trip the upstream DC breaker simultaneously. All associated alarm and indication shall be provided on the annunciator panel.

- Rectifier Short-Circuits. Design all parts of the rectifier unit, including terminal and bus connections, to withstand maximum DC fault at the load side of the DC breaker without damages for the duration required for the DC breaker to open and clear the fault.

- A regeneration absorption protection circuit rated 10% above the rectifier capacity and set for pickup 15% above the nominal DC bus voltage shall be provided.

- Automatic Grounding Device. Thyristor controlled device shall monitor voltage between the rectifier negative and ground, and provide connection between the negative and ground if such voltage exceeds +/- 60 V DC. The Automatic Grounding Device shall automatically reset once negative to ground voltage has returned to normal. The Contractor shall determine the ratings of the Automatic Grounding Device and provide a complete design for acceptance by the City.

Protective Devices: Provide the Transformer-Rectifier Unit with the following devices;

- Transformer Temperature Relay
- Diode Hot Relay
- Enclosure Door Open Relay
- Loss of Diode/Fuse Relay

2.5 DC SWITCHGEAR

DC Switchgear Assembly: Provide one DC circuit breaker for each substation suitable for indoor operations. The metal enclosed cubicle shall be insulated from the floor to facilitate the installation of leakage-to-frame protection to the DC circuit breaker cubicle. The DC switchgear shall be served as the switching, control and protective device for the distribution of DC power to the OCS and hence the vehicles. The DC switchgear shall be of single pole, light weight design, truck mounted of horizontal draw out type. Provide the DC bus connection to the rectifier and the output positive terminations with termination area for up to at least two sets of feeder cable connections. Provide indicating lights, terminal blocks, protective and auxiliary relays, control circuitry, wiring, and all other devices necessary to form a complete and operable assembly. The proposed DC switchgear shall conform to, or exceed, the requirements of all applicable Codes and Standards.

DC Switchgear: The DC switchgear shall be of high-speed design and rated for 800 V dc, 2500 A rated continuous current, 100 kA prospective short-circuit current and with 2 kV insulation

Control Voltage: The operating mechanism shall successfully close the switchgear over a range of 90 to 130 V dc and trip the switchgear over a range of 70 to 140 V dc.

Operation. Control switches shall be provided for electrical closing and tripping of the switchgear. Provide mechanical means for manual closing and tripping the DC switchgear. Provide mechanical indicator, visible when the door is closed, to indicate when the DC Switchgear is in the "open" and "close" position. Provide lockout / tagout capability. Open (green) and closed (red) indicating lights shall be provided.

Bus and Bus Connections. Provide as per section 2.1. Construct the bus and bus connections between the rectifier output and the DC Switchgear that shall be capable of carrying current under normal, overload and short circuit conditions without exceeding the allowable temperature rise specified in ANSI, IEEE, and NEMA standards.

All positive feeder cables connected through the bottom of the DC switchgear and any enclosure floor openings shall be sealed with non-metallic material. Furnish standard NEMA 2-hole four bolt type connectors for all feeder cables. Properly sized cable lugs shall be provided.

Protective Devices: Provide the DC switchgear with the following devices;

- Reverse-Current Trip
- Direct-Acting Instantaneous Overcurrent Trip
- Definite Time Overcurrent Trip
- Current Rate-of-Rise Trip
- Load Measuring and Auto-Reclosing Scheme
- Low Resistance Ground Relay
- Lock-out relay

- Undervoltage trip for protecting high impedance ground fault

Surge Arrestor of MOV type, 950 V dc, with energy discharge capability not less than 2.2 kJ/kV shall be provided to protect the DC system against lightning strikes. The surge arrestor shall be connected between the feeder cable terminals and the substation ground. The connections shall be by means of insulated (2000 V class) copper cables not smaller than 2/0 in size.

Metering. Provide DC voltmeter and ammeter for measuring the rectifier output voltage and current on the DC switchgear.

2.6 DC CONTROL POWER SYSTEM

DC Control Power: The DC Control Power system shall include battery charger and battery with capacity of 50 Ah (Ampere-hours) at 125 V dc for control and monitoring operations of switchgears, annunciators and any other battery operated equipment and devices. The battery charger shall be capable of boosted charging and equipped with voltmeter and ammeter, ac and dc switches, boosted charge control switch and local and remote indications.

2.7 ANNUNCIATION

System Status and Alarm Monitoring: Provide System Status and Alarm Monitoring system that includes annunciation of system status and alarms;

- AC Switchgear Open – Incoming supply tripped;
- Loss of AC Voltage alarm;
- DC Switchgear Open – DC Switchgear tripped;
- 86 Lockout Relay activation alarm;
- N-1 annunciation alarm;
- Transformer temperature “hot” alarm;
- Diode temperature “hot” alarm;
- Ground fault alarm;
- Smoke/rate of temperature rise trip alarm;
- Enclosure door “open” alarm;
- Breaker trip batteries - “problem” alarm;
- Battery charger - “problem” alarm;
- Fault acknowledge/warning horn silence pushbutton;
- Undervoltage trip alarm; and
- ESS Activation alarm.

For each point monitored, a light module shall be lit for indication of current status. A warning horn shall sound for all alarm conditions. Provide digital output for remote annunciation of AC switchgear closed / power on, DC switchgear closed / Contact Wire Live, and the above alarm conditions. The annunciator panel shall be flush mounted on the rectifier enclosure door and equipped with a heavy gauge Lexan viewing window.

2.8 SMOKE DETECTION ALARM SYSTEM

A smoke detection system shall be provided complete with smoke detectors and control panel and all accessories required for the complete installation. Detectors shall be located at

strategic locations to detect smoke. Such locations to be selected such that operation of the DC switchgears will not activate smoke detection system. Control panel to provide alarm and trouble contacts.

2.9 SPECIAL TOOLS, TEMPLATES AND TEST EQUIPMENT

Furnishing. The Contractor shall furnish all special tools, such as special relay tools, required for the operation and maintenance of all equipment supplied under this Contract. Special tools and equipment shall also include but not be limited to extension cards for relays, test blocks, racking handles, manual closing handles, 3-meter of DC short circuit cables complete with fault rated cable clamps, adjustment tools and gauges, and specialized test equipment for proper operation and maintenance of the substations.

3.0 EXECUTION

3.1 GENERAL

Factory Inspection: Contractor shall provide, without charge, access to all facilities to ensure that materials and equipment being furnished are in accordance with the applicable standards and contract documents.

Equipment Grounding: Equipment grounding conductors and bonding shall be provided in accordance with standard practice and the Canadian Electrical Codes. Approved grounding bushings shall be used. Provide a continuous copper ground bus through the enclosure. Ground each unit of the assemblies to this bus.

Substation Wiring: Protect wiring from mechanical injury. Any wiring exceeding 600V shall be physically protected from personnel via barriers or conduit. Switchgear, transformer, and rectifier secondary and control wiring (low voltage) shall be minimum No. 14 AWG, stranded copper conductors, Type SIS insulation. Splices are not permitted. Ac and dc control wiring to be routed in separate raceways within and outside switchgear within the substation enclosure. Isolate control and instrument wiring from the mains compartments. Make connections only at terminals on the devices, on terminal blocks, or the ground bus.

- Secondary and control wiring to be Teflon insulated. Neatly lace and properly support wiring, use of double sided tape for wiring supports is not acceptable. Splices will not be permitted in any wiring. Wiring shall be kept readily accessible.

- Protect control wiring by a suitable raceway open to the side or top, not from the bottom.

- No splices or taps are allowed between terminal points. Make connections for wiring using ring-type compression connectors with insulated compression sleeves. Have the insulated sleeve firmly grip the wire insulation, and the metallic portion firmly gripped the strands of the conductors. Wire all control, metering, and relay circuits requiring external connections, and all unused terminals on auxiliary contacts, devices, relays, instrument transformers and control switches, to conveniently located terminal blocks having washer head screw-type terminals, circuit marking strips, and phenolic-laminated dust covers. Provide separate terminal blocks for AC and DC circuits. Identify all internal wiring with the Contractor's wire number at each termination

indicating location of the beginning and final termination by means of a suitable plastic sleeve of yellow or white PVC with machine-printed black marking on a matte surface.

Substation Storage: Should storage of the substation be required prior to installation the Contractor shall pay all storage fees and incidental costs. The Contractor shall take all necessary precautions to assure adequate protection and security during the storage period. Only indoor storage in a climate-controlled facility is permissible.

3.2 INSTALLATION

Substation Installation. The Contractor shall be fully responsible for safe handling, setting and installation of the substation until such time as it is fully operational and handed over to the City. Installation of outdoor substations shall include, but not limited, to the following;

- Coordinate the construction of the substation concrete foundation and ductwork with the Civil contractor.
- Deliver the substation to ~~sites~~Site including final setting on the substation foundation.
- Installation of all parts and appurtenances removed for shipping.
- Report, record and repair minor damage that may have occurred during shipping, including touch up paint. Minor damages shall mean those will not adversely affect the performance of the equipment or component of the traction power supply system.
- Field technical services during the installation, connection and on-~~site~~Site testing and commissioning of the substation.
- Coordinating with and assisting the Utility with the incoming AC supply, as necessary.
- Operational check-out, start-up and commissioning of the substation including; setting up protection relays, verifying correct and proper operation of all devices and systems. Output voltage of 600 V dc (nominal) shall be present at all locations on the contact wire throughout the project when integrated testing with trolley vehicles.
- Connect the ground mat to ground plates provided inside the substations. Connect the ground plates to equipment ground terminals.
- Dispose all non-usable material and debris, perform final ~~site~~Site clean-up prior to final handover to the City.

3.3 TESTING, COMMISSIONING AND AS-BUILT DOCUMENTATION

Prior to starting any pre-commissioning tests, the Contractor shall provide the City with a detailed test and startup plan for review and acceptance. Such plan shall include list of all tests to be performed, proposed test method, list of test equipment with certification of calibration and list and format of as-built documentation proposed. Upon completion of all installation to the satisfaction of the City, on ~~site~~Site testing, including but not limited to the following, shall be performed:

- All primary connections, CTs and PTs, secondary wiring shall checked and verify for ratios, continuity, polarity and insulation;
- Secondary injection on all protective relays, metering equipment and any other devices;
- Primary injection on all primary connections to ensure correct operation of all relays and devices; such as TRU overload protection and coordination between AC and DC equipment;
- Ratio test and insulation tests shall be performed on the rectifier transformer;
- Continuity and insulation test shall be performed on all DC equipment including rectifier, DC Switchgears and all associated devices;
- Ductor test for establishing contact resistance shall be performed on all DC high current connection and terminations;
- Grounding tests for both AC and DC systems; and
- After energisation of the traction power supply system, measurement shall be performed on train start currents and voltages.

All test results shall be documented for submission as part of the as-built document which shall include as-built drawings, certified test results that shall form the basis of final protective relay settings, and operation manuals.

04402 TROLLEY CONTACT SYSTEM, CABLES AND BONDING

4.0 GENERAL

4.1 SUMMARY

This specification covers the complete supply, delivery and installation of the trolley contact system, feeder cables and bonding for the operation of the Vancouver Downtown Streetcar Demonstration Line in the City of Vancouver (the City) of British Columbia. The trolley contact system, feeders and bonding shall operate in conjunction with the two traction power substations being provided as part of this contract, the new demonstration vehicles (to be provided by ~~others~~an Other contractor) and the existing historical vehicles to form a complete operational trolley contact system.

4.2 STANDARD REFERENCES

Supply and installation shall conform to the Canadian Electrical Codes, Canadian Standards and all relevant local codes and regulations.

4.3 WORK OF THIS CONTRACT

Provide all material as noted on the ~~drawings~~Drawings, plus all other material and hardware necessary to construct a complete, working trolley contact system. Principal items include wood poles, bracket arms, supports, spans, assemblies, support wires and guys, trolley wire, ~~insulted~~insulated cables, insulators, jumpers, surge arresters, conduits and hardware. Material and hardware to be stored and provided by the City are identified in these documents, and the ~~contractor~~Contractor shall make ~~arrangement~~arrangements with the City for delivery and handover of the material and hardware and shall be responsible for delivery to ~~site~~Site.

Construct the trolley contact system as shown in general on the drawings. Any assembly details or specific supporting calculations not shown on the drawings but necessary for the provision of a complete, operating system are the responsibility of the ~~contractor~~Contractor. The ~~contractor~~Contractor is responsible to ensure equipment provided is compatible with the existing historical vehicles (provided by the City) and the new demonstration vehicles (to be provided by ~~others~~an Other contractor) that will be used on the line. For certainty, the existing frog at the turnout for the storage hut shall be left in place and adjusted for the pantograph operation of the new demonstration vehicles (to be provided by an Other contractor). Runners shall be installed to assure a smooth transition of the pantograph over the assembly.

Provide and install all contact wire, insulated feeder cabling and jumper cabling and make all connections to the traction power substation. All feeders (positive and negative) from the substation to the trolley contact system shall be installed underground. All connections at the substation, track and trolley contact system are the responsibility of the ~~contractor~~Contractor.

Install rail bonding as described in this section and shown on the drawings.

Provide all documentation and record drawings for the complete trolley contact system as installed for operation and maintenance.

Complete and perform integrated testing of the Trolley Contact System, Traction Power Substations, the existing historical vehicle (provided by the City) and the new demonstration vehicles (to be provided by ~~others). The~~an Other contractor).

As set out in Part F – Supplementary General Conditions, Section 3.0 [Coordination with Other work on Site], the Contractor shall coordinate with the ~~Trackwork~~Trackworks contractor so that the Contractor ~~for~~'s Work of removing the ~~removal of~~ existing poles and accessories ~~to be removed as identified in drawings prior to the start of track~~(as identified in the Drawings) takes place within the time period scheduled for same in the Construction Schedule and so as not to impede the Trackworks contractor's work.

~~The contractor shall obtain necessary materials from the City for installation and staging and return all materials removed and found in excess to the City upon completion.~~

~~4.4 HISTORICAL TROLLEY VEHICLE AND DEMONSTRATION VEHICLE~~

~~Provision of the historical trolley vehicles and demonstration vehicles are not part of this contract. However, the contractor is required to provide and install equipment that is~~

~~compatible with the vehicles being provided by the City and by others. The contractor shall request final vehicle specifications from the City to ensure complete compatibility.~~

~~4.5~~4.4 PRICING

The Contract Lump Sum Prices and any Unit Prices shall be for the complete Trolley Contact System, Cables and Bonding and shall include full compensation for ~~final~~all design, removal, supply, delivery and installation ~~of all equipment~~work for the complete system. All appurtenances, ~~labor~~labour, materials, tools, equipment, and incidentals required for the complete ~~installation~~Work is to be included in the ~~price~~Contract Price.

The Contract Price shall include all submittals, re-submittals, reviews and associated design, engineering, review, revision, and re-design work required as well as all documentation and record drawings.

The Contract Price shall include all fees required to obtain all permits required including construction or ~~site~~Site permits.

5.0 PRODUCTS

5.1 MATERIALS

Trolley contact system components shown on the ~~drawings~~Drawings are by Impulse NC Inc. The use of products other than Impulse is permitted provided they are fit for the intended purpose and are of equivalent or better quality and are approved by the Engineer.

Wood poles shall be as identified in the plans and specifications. They shall be Douglas Fir, Class 2, pressure treated. They shall be erected according to all applicable Standards and Codes. The Contractor shall make all calculations and perform any soil tests necessary to ensure the wood poles are correctly installed considering the ~~site~~Site conditions present and the loads intended including embedment depth at no additional cost to the City.

Assemblies, cantilevers and hardware shall be provided by the contractor as shown on the ~~drawings~~Drawings. However, any final design calculations or adjustments required are the responsibility of the Contractor. ~~To ensure compatibility with~~The Contractor will have sole responsibility for ensuring that the OCS is concurrently and simultaneously fit for the intended purposes for both the existing historical ~~vehicle~~vehicles and the demonstration ~~vehicle for operations on the line shall form part of the Contractor's responsibility~~vehicles.

Feeder and negative return cables as well as rail head, cross and power bonds shall be provided by the ~~contractor~~Contractor as described and shown on the ~~drawings~~Drawings.

All wood poles, bracket arms and down guys not reasonably able to be obtained by the Contractor from the removal and re-use of the existing wood poles, bracket arms, and down guys will be supplied by the City. ~~This material is largely the material that will be removed by the contractor prior to civil work and track work (by others). Contractor is responsible for any~~The Contractor will notify the City promptly as soon as possible upon verifying the number of actual poles, bracket arms and down guys salvaged or salvageable for re-use by the Contractor and the City will supply sufficient additional poles, bracket arms and down guys to the Site within 10 Working Days on receipt of such notification and title and all risk of loss or damage to such

additional poles, arm and wires will vest in the Contractor upon delivery to the Site. The Contractor will supply and install any and all extensions necessary to the existing and additional City-supplied bracket arms to make them compatible with the new centerline of track.

All other Product (including without limitation and by way of example only, the insulated feeder cable, jumper cables, contact wire, supports and guy wires) necessary to complete the Work shall be provided by the ~~contractor.~~ Contractor. Existing guy wire from bracket arms, dead ends and down guys that have been removed may be salvaged and reused in the new installation provided that the wire is removed, transported and stored in a manner that maintains its structural properties, its historic look and its form, and material is first approved by the Engineer prior to its re-use. Existing guy wires from cross spans that are to be removed shall be discarded or recycled in accordance with SGC 13.0 [Existing OCS Salvage].

Despite any other term of this Contract, it will be the Contractor's responsibility to ensure that both new and re-used materials meet all of the Specifications of this Contract including the following:

- Insulated cable construction standards, definitions of terms and conductor insulation shall be in strict accordance with applicable publications of ICEA for the cable provided. Insulated feeder cables shall have Class C or G stranding. Conductors for insulated feeder cables shall be made of copper.

- Contact Wire: 2/0 hard drawn copper cable, solid grooved, conforming to ASTM B47.

- Parallel Feeder Cable: 250 kcmil insulated copper cable, 19-strand, conforming to ASTM B3 and ASTM B8, Class C, CSA and UL rated, 2kV insulation of high grade ethylene-propylene rubber compound.

- Equalizing Jumpers: 250 kcmil insulated copper cable, 37-strand, conforming to ASTM B3 and ASTM B8, Class G, CSA and UL rated, 2kV insulation of high grade ethylene-propylene rubber compound.

- Ground Wire: 4/0 annealed copper conductor, bare, Class B, 19-strand, conforming to ASTM B3 and ASTM B8 for substation grounding.

- Components, performance, materials and zinc-coating of guy wire shall be manufactured and tested in accordance with ASTM A475.

All feeder support assemblies, jumper and feed point hardware, pull-off and back bone assemblies shall be provided by the ~~contractor~~Contractor.

All rail bonding, terminations for traction power cables shall be provided by the ~~contractor~~Contractor.

All incidentals in completing the work of this contract shall be provided by the ~~contractor~~Contractor.

6.0 EXECUTION

6.1 GENERAL

All hardware shall be installed according to manufacturers' instructions. Complete installation shall be in accordance with good overhead line and cable installation practice. Bolts and nuts shall be properly torqued. All bolts shall be of sufficient length for a full thread beyond the nut. Where lock nuts are not used lock washers shall be provided.

6.2 TROLLEY WIRE AND PARALLEL FEEDER CABLE

Sufficient tension must be checked and maintained on all trolley wires, including the existing trolley wire, if applicable. During stringing the Contractor shall ensure the conductor is never dragged on the ground or track between support points. Splicing of trolley wire is permitted only in the locations shown on the ~~contract drawings~~Drawings. Splicing of parallel feeder cable is not permitted. Kinks in the wire shall be prevented and must be rectified to the satisfaction of the City if it occurs.

Trolley wire shall be installed at turnouts so it is compatible with the pantograph operation of the new demonstration vehicles (to be provided by ~~others). This will not be~~an Other contractor). As an isolated exception to making the OCS fit for its intended purpose for both types of vehicles, the Contractor is not required to make the trolley wire compatible with the trolley wheel of the existing historical vehicle (provided by the City).

The existing frog at the turnout for the storage hut shall be left in place and adjusted for the pantograph operation of the new demonstration vehicles (to be provided by ~~others~~an Other contractor). Runners shall be installed to assure a smooth transition of the pantograph over the assembly.

6.3 ASSEMBLIES

The type and standard design of assemblies and cantilevers to be installed on each pole are shown on the ~~contract drawings~~Drawings. They shall be installed according to the clearances shown. Cotter pins and nuts shall be located on the same side of the structure with uniformity along the line. Assemblies with pins, bolts and nuts shall be oriented where possible in such a manner as to lock together these components by gravity if the pin or bolt becomes detached. Hardware chosen shall maintain the historic integrity of the system.

All assemblies, whether existing or installed by the ~~contractor~~Contractor, must be checked to assure all fittings are tight and all galvanized or painted surfaces are touched up as shown on the ~~drawings~~Drawings. For bracket arms, all flanges on the lower end of the mast end cap shall be cut to be clear of the pantograph clearance envelope. Trolley wire clamps shall be adjusted to staggers shown on the ~~drawings~~Drawings at all bracket arms. Any damaged or depleted materials shall be replaced at no additional cost to the City.

6.4 FEEDER CABLES

Install positive and negative feeder cables from the substation to the trolley contact system in the locations shown on the ~~drawings~~Drawings. Cables shall be installed underground in the ducts ~~designed according to all applicable standards and~~which are to be installed by ~~others~~the Other

contractor retained to carry out the Trackworks. Make the positive feeder connection to the OCS as shown on the ~~drawing~~Drawing. Make the negative feeder connections to the tracks. Exothermic welds shall be made in accordance with applicable codes.

Install the surge arrester including the cable and grounding rod as shown on the ~~drawings~~Drawings. Contractor shall test each ground rod to ensure the ground resistance is 5 ohms or less. Should testing indicate the resistance is greater than 5 ohms, install additional rods until the final resistance is 5 ohms or less at no additional cost to the City.

6.5 RAIL BONDING

Install rail cross-bonds at locations shown on the ~~drawings~~Drawings. Install power bonds around the track switch as shown on the ~~drawing~~Drawings. Install rail head bonds at all rail joints in accordance with the ~~drawing~~Drawings. Exothermic welds shall be made in accordance with the ~~drawings~~Drawings. Rail head bonds shall be by ERICO or approved equal.

6.6 OCS INSTALLATION TOLERANCES

Installation tolerances shall be as follows:

Pole along track offset	+ 75 mm	
Contact Wire Locations	Lateral	Vertical
Road crossings	+ 0 mm, - 25 mm	- 0 mm, + 50 mm
Turn out locations	+/- 13 mm	+/- 13 mm
All others locations	- 25 mm, - 25 mm	+/- 50 mm

04403 TESTING AND COMMISSIONING

7.0 GENERAL

7.1 SUMMARY

This specification covers the complete testing and commissioning of the trolley contact system, feeder cables and bonding for the operation of the Vancouver Downtown Streetcar Demonstration Line in the City of Vancouver (the City) of British Columbia. The trolley contact system, feeders and bonding shall operate in conjunction with the two traction power substations being provided as part of this ~~contract~~Contract, the new demonstration vehicle (to be provided by ~~others~~an Other contractor) and the existing historical vehicle (provided by the City) to form a complete, operational trolley contact system.

7.2 STANDARD REFERENCES

Supply and installation shall conform to the Canadian Electrical Codes, Canadian Standards and all relevant local codes and regulations.

7.3 WORK OF THIS CONTRACT

Complete and perform integrated testing of the Trolley Contact System, Traction Power Substation, the existing historical vehicle (provided by the City) and the new demonstration vehicles (to be provided by ~~others~~an Other contractor).

Electrical testing and Live Run Test support for the existing historic vehicles is not part of this scope. Contractor need only assure that the system is tested for Acceptance Measurements, Visual Inspections and Clearance Envelope tests in regards to the existing historic vehicles.

7.4 PAYMENT

The Contract Price paid shall be for the complete testing and commissioning and shall include full compensation for all equipment, tools and devices. Payment for all appurtenances, ~~labor~~labour, materials, tools, equipment, and incidentals required for the complete installation is to be included in the ~~price~~Contract Price.

The Contract Price shall include all documentation and record drawings.

- The Contract Price shall include all fees required to obtain all permits required including construction or ~~site~~Site permits.

8.0 PRODUCTS

8.1 MATERIALS
General:

- Contractor shall provide tools, instruments, calibration devices, meters, and other equipment necessary to connect, monitor and adjust during start-up and testing. Calibration of equipment shall be current and labelled on the device. Calibration shall be performed by a licensed technician or approved Calibration Company.

- Contractor shall provide spare parts as required to conduct the start-up and testing.

- Contractor shall furnish the height and stagger gauges and all other equipment and personnel services necessary to make Acceptance Measurements. Contractor shall also provide all the electrical equipment and personnel services required to perform the Traction Electrification System (TES) electrical tests. All measuring equipment will be as accepted by the City.

9.0 EXECUTION

9.1 TESTING

Prior to beginning the testing phase, the Contractor shall submit a schedule for approval of the tests to be performed. Contractor shall notify the City at least 3 ~~days~~Working Days in advance of conducting each test. All tests shall be witnessed by a representative from the City.

9.2 ACCEPTANCE MEASUREMENTS

Upon completion of each tension segment, Contractor shall measure the contact wire height, stagger, and other required dimensions and record the readings on an Acceptance Measurement Form, in the presence of the City. An Acceptance Measurements Table shall be prepared and shall include the following information:

- Wire run designation;

- Drawing numbers where the structures of the wire run are shown;

- Names of persons responsible for performing the acceptance measurements;

- Sheet number of a wire run set;

- Temperature of the conductor in degrees Celsius during the time of measurement;

- Weather condition during time of measurement (e.g., windy, raining);

- Date when measurement was made;

- Structure number identification;

- Station location of the structure in meters as indicated;

- Distance of the pole to the rail measured from the inside of the nearest rail to the face of the pole;

- Horizontal distance measured at the structure from the contact wire to the vertical or superelevated centerline of the track (referred to as stagger);

- The vertical distance between the contact wire at the structure measured from the top of the highest rail (referred to as contact wire height at the support);

- Horizontal distance between the contact wire and the vertical or superelevated centerline of the track measured at midspan (referred to as midspan offset);

- The vertical distance between the contact wire measured from the top of the highest rail measured at midspan (referred to as contact wire height at midspan);

- The rate of change of contact wire height between the structures. This is equal to the difference of contact wire heights at each structure divided by the span (referred to as gradient);

- The vertical distance between the underside of the bridge and the track at the vertical or super-elevated centerline of the track position;

- Electrical clearance from contact wire to underside of bridge, with uplift force of 220 N on the contact wire at the point of measurement; and

- Comments or remarks as required.

The City will use the Acceptance Measurements to determine compliance with the design and will inform Contractor of necessary corrections. Contractor shall execute corrections at no additional cost to the City. After execution of corrections, Contractor shall re-measure and record affected data and submit the results to the City. The work of this Section will not be complete until corrections are completed and accepted by the City. Completed Acceptance Measurement Tables shall be submitted in accordance with the requirements.

9.3 VISUAL INSPECTION OF THE COMPLETED OVERHEAD CONTACT SYSTEM

At contact wire level, Contractor shall make visual checks and remedy unsatisfactory conditions ~~uncovered~~observed therein.
From the Ground, Contractor shall make visual checks and remedy unsatisfactory conditions ~~uncovered~~observed therein.

9.4 CLEARANCE ENVELOPE TESTS FOR PANTOGRAPH AND VEHICLE

General: The purpose of these tests is to verify the mechanical and electrical clearances of the light rail vehicle (LRV) units on each section of the system. The tests shall be conducted after all installations are complete. Any section found to have insufficient clearance ~~should~~must be adjusted by the Contractor to provide the required clearance.

Pantograph Clearance Envelope: Tests shall be performed initially with a rail mounted height and stagger gauge having the same profile as the vehicle pantograph. This gauge shall be used to verify the mechanical clearances between the pantograph and OCS components such as the heels of steady arms and contact wire clamps, and the electrical clearances between the

OCS/pantograph combination and civil structures such as over bridges. Following these tests, final tests shall be performed with an actual LRV to verify the initial simulated results.

LRV Clearance Envelope: Tests shall be performed with an LRV through each track section.

9.5 ELECTRICAL TESTS FOR THE TES INTERFACE

Proper Connections and Circuit Integrity: Contractor shall verify the connections and circuit continuity for all power and control cables between the OCS and the traction power substations. The tests shall comprise both visual inspection and ringing the circuit.

Loop Resistance Test:

- General: The purpose of this test is to obtain the DC loop resistance of each OCS section. This test checks both the OCS and the rail return system for electrical continuity and the absence of high resistance connections or inadvertent ground connections. The length of each OCS section shall be in accordance with the system-sectionalizing diagram for normal operations.

- Procedures: The test entails short circuiting a discrete section of the OCS by connecting the OCS to its rails at one end, and applying a DC voltage at the other end. The test shall be carried out in the following steps:

    - Feeders that are electrically common to the OCS, such as TPSS power feeders to the OCS section, shall be connected to the OCS. In such case, the measurement or short-circuiting shall be done from the TPSS;

    - A DC source is required which will provide a current of nominally 100 A with an applied voltage of 24 V (e.g., 2 car batteries in series);

    - Measurements shall be made of the DC voltage and DC current, the circuit resistance calculated from the measured values of voltage, and current shall be compared with the design value;

    - Any section having a discrepancy of more than 10 percent between the calculated design value and the measured value shall be rechecked to ensure that all electrical connections are correctly made, or that there are no inadvertent ground connections to the OCS which are reducing the total length of the loop. Contractor shall investigate the cause of any unusual discrepancy between the design and measured resistance values, and shall inform the City and remedy same accordingly; and

    - The following items shall be recorded for each section:

        - Length of section in kilometers.
        - DC volts.
        - DC amperes.
        - Ohms.
        - Ohms per kilometer.

Precautions: The tests required for the loop resistance require passing relatively high DC currents through the OCS and rails. Proper regard must be paid to safety. Test zones shall be clearly identified and coordinated with other parties working in the vicinity of the tests to provide a safe environment. All safety requirements established in the safety program concerning the public, work personnel, and equipment shall be strictly enforced. Personnel not directly associated with the tests shall stay clear of the tracks. The section of OCS and associated feeders under test shall be isolated from the adjacent sections of the system.

Hi-Potential Test for the OCS:

- General: DC Hi-pot tests shall be performed on the Overhead Contact System (OCS). The Hi-pot tests serve the following purposes:
    - Components such as insulators and jumper cables are checked for leakage;
    - The electrical withstand of minimum clearance areas, such as overhead bridges, are verified under static conditions; and
    - The electrical withstand of section insulators and disconnect switches are verified.
- The test provides a means of periodically checking for any reduction in the insulation level of the OCS sections, by comparing voltage and leakage current with previously measured values.
    - A nominal DC Hi-pot voltage of 2 x OCS rated voltage + 1 kV shall be used for the test. Hi-pot tests shall be carried out on the OCS sections as soon as possible after the continuity tests have been completed, to ensure that all of the section being tested is electrically continuous and is subjected to the test voltage. Leakage currents between 0 and 5 mA can be expected for section lengths of over 3 km.
    - Procedure: Feeder disconnect switches shall be set in the open position. The adjacent OCS sections that are electrically isolated from the section under test shall be grounded by connecting the OCS to the rails. All surge arresters shall be disconnected from the section under test. A DC test voltage shall be applied to each OCS section in 500V increments up to the top nominal test voltage. The test voltage shall be held for 30 seconds at each increment. Then hold the Hipot at the top Kv level for 3 minutes. The leakage current at each value shall be measured and recorded together with the weather conditions and temperature.
    - Precautions: The Hi-pot measurements require application of high voltage to the OCS. Proper regard must be paid to safety. Test zones shall be clearly identified and coordinated with other parties working in the vicinity of the tests to provide a safe environment. All safety requirements established in the safety program concerning the public, work personnel, and equipment shall be strictly enforced. Personnel not directly associated with the test shall be clear of the tracks. Sections of OCS and associated feeders under test shall be isolated from the adjacent sections of the system and all OCS sections adjacent to the section under test shall be grounded.
- High-Potential Test for the Feeder Cables:

- Contractor shall hi-pot the DC feeder cables after they have been installed in the underground ductbank and spliced, where required. For the hi-pot test, the ends of the feeder cable shall be disconnected from the equipment where they are normally terminated. The hi-pot field test of the feeder cable shall be in accordance with the instructions, methodology, and criteria furnished by the cable manufacturer to Contractor.

- Ground Resistance Measurement for each substation grounding grid:

  - Substation grounding grid resistance shall be measured using the Fall-of-Potential Method. Acceptable resistance value shall be 5 Ω or less.

  - Remedial Action: The measured resistance of the grounding system shall meet the specified criteria. Otherwise, remedial action is required on the part of Contractor, such as chemical treatment of the soil around the ground rods, or extension of the grounding system and the addition of extra ground rods at no additional cost to the City.

9.6 LIVE LINE RUN TESTING

The live line run testing is not the responsibility of the Contractor. The Contractor shall provide support during the performance of the test.

General: The purpose of these tests is to evaluate:

- The current collection performance between the LRV and the OCS; and

- The adequacy of the power supplied by the OCS for required vehicle performance.

If adjustments need to be made to the OCS, the ~~contractor~~Contractor shall carry out these adjustments at no additional cost to the City. If adjustments are made to the OCS or to track alignment after the initial tests, the tests shall be repeated on the affected sections at no cost to the City, and their results documented in the same manner as detailed in the preceding paragraphs.

10.0 MEASUREMENT AND PAYMENT

General

The Lump Sums and Unit Prices listed in the Form of Tender shall represent components of the Contract Price upon Contract Award, for all of the work included and necessary to complete all of the Work under this Contract. The Lump Sums and Unit Prices shall be composite prices for carrying out the work and no premium will be paid for special or complicated pieces of work.

The quantities shown for Unit Price items of Work in the Form of ~~tender~~Tender are approximate and the actual quantity required for the Work will be paid at the unit rate set out in the Form of Tender. The Contractor will proceed with the Work, regardless of whether the quantities required are greater or lesser than those set out in the Form of Tender and the Final Contract Price will be adjusted to reflect the actual quantities required to perform the Work under this Contract at the unit rates set out

in the Form of Tender. There shall be no other change to the Contract Price due to the change in quantities from those set out in the ~~form~~Form of ~~tender~~Tender to those actually required to carry out the Work. The actual quantities required will be confirmed by count and measurement to be agreed between the Owner and the Contractor.

No payment shall be made for rejected work, or for materials used or disposed of in a manner not called for under the Contract, or for any materials wasted.

Each Lump Sum and Unit Price shall make allowance for all costs to performing the ~~work~~Work under the Contract, and include but not be limited to all overhead costs and profit for providing all labour, materials, equipment, and services required to complete the Work and meet all the dates set out in the Contract Schedule. These costs shall include all costs incurred by meeting all the Contract and Specification requirements and all other Contract requirements for which payment is not specifically indicated.

Payment for the Work of the Contract will be made in accordance with the Contract Documents to the Contractor for the items of Work listed in the Lump Sums and Unit prices listed and described below. Payment for all other Work required and necessary to complete the Work necessary under this Contract, but not specifically listed for payment in the Form of Tender shall be considered to be included in the amounts paid for the Work of the Contract within the items listed, and no separate or additional payment will be made in respect thereof.

Lump Sums and Unit Prices

Mobilization

The Lump Sum Price listed for mobilization will cover all costs related to setting up the ~~site~~Site, and paying for all services and fees required to commence the Work. Regardless of the actual cost the maximum amount payable under this item shall be 5% of the total Contract Price. Any costs associated with this Lump Sum in excess of the maximum amount payable under this item will be paid for as part of the other Lump Sums and Unit Prices as set out in the Form of Tender.

The Lump Sum Price listed for Take Down Existing OCS System and Set Aside for Re-Use or Dispose As Required for the Work shall include, but not be limited to, all work necessary to take down the existing OCS system, setting aside material to be re-used in the new system and removing and disposing of all material not required including obtaining all necessary permits together with removal and disposal of the material to approved and authorized disposal sites.

The Lump Sum Price listed for the Complete OCS System shall cover, but not be limited to, all work to construct the new OCS system, including the use of materials set aside and providing new materials as required together with all installation, OCS pole foundations and all other work to complete the system.

The Lump Sum Price listed for Sub-Station shall cover, but not be limited to, all work necessary to supply, install and connect the sub-stations on foundations (which foundations will be constructed ~~under a separate contract~~by the Other contractor retained to supply the Trackworks) and providing all other material to complete the installation.

FINANCIAL SERVICES GROUP
Supply Management
Purchasing Services

Invitation to Tender No PS08153
SUPPLY AND INSTALLATION OF POWER SYSTEM (OCS / SUB-STATION)

To acknowledge your intent to attend the Informational Meeting being held as per Part A, Introduction, 3.1, and to ensure that you receive the required information, please submit this form to the person identified below before close of business day, **Tuesday, September 23, 2008.**

Donna Lee
Administrative Assistant
City of Vancouver Materials Management
Fax: 604.873.7057
Email: purchasing@vancouver.ca

Your details:

Proponent's Name: _____
"Proponent"

Address: _____

_____

Telephone: _____ Fax: _____

Key Contact Person: _____

E-mail: _____ Incorporation Date: _____

Our company WILL / WILL NOT attend the informational meeting for "ITT No. PS08153 Supply and Installation of Power Systems (OCS / Sub-Station)"

_____
Authorized Signatory and Name of Company (Please print)

_____
E-mail Address (Please print)

_____
Date

FINANCIAL SERVICES GROUP
Supply Management
Purchasing Services

Invitation to Tender No. PS08153
SUPPLY AND INSTALLATION OF POWER SYSTEM (OCS / SUB-STATION)

To acknowledge your intent to submit a proposal, and to ensure that you receive the required information, please submit this form to the person identified below on or before Friday, September 26, 2008

Donna Lee
Administrative Assistant
City of Vancouver
Fax: (604) 873-7057
Email: purchasing@vancouver.ca

Your details:

Proponent's Name: _____
"Proponent"

Address:

_____

_____

Telephone:_____ Fax: _____

Key Contact Person:_____

E-mail: _____ Incorporation Date: _____

Our company WILL ○ / WILL NOT ○ submit a tender for
"ITT No. PS08153– Supply and Installation of Power Systems (OCS / Sub-Station) "
by the closing date of ~~Friday~~Tuesday, October ~~3,~~7, 2008 at 3:00:00 P.M.

_____
Authorized Signatory and Name of Company (Please print)

_____
E-mail Address (Please print)

_____
Date

Refer to C.D. provided as part of the package for this ITT.

Refer to Example BC Hydro Application Form pdf

Refer to BC Hydro Drawings pdfs

Document comparison by Workshare Professional on October 1, 2008 3:06:40 PM

Input:	
Document 1 ID	pcdocs://docs/116509/1
Description	#116509 v1 - DOWNTOWN STREETCAR Overhead Control System Installation ITT PS08153
Document 2 ID	pcdocs://docs/116509/5
Description	#116509 v5 - DOWNTOWN STREETCAR Overhead Control System Installation ITT PS08153
Rendering set	standard

Legend:	
Insertion	
~~Deletion~~	
~~Moved from~~	
Moved to	
Style change	
Format change	
~~Moved deletion~~	
Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

Statistics:	
	Count
Insertions	356
Deletions	293
Moved from	5
Moved to	5
Style change	0
Format changed	0
Total changes	659