

Kelvin Grove Rem Lot 50 Servicing

**MASTER MUNICIPAL CONSTRUCTION DOCUMENTS - 2009
UNIT PRICE AND LUMP SUM CONTRACT**

File No. 18190
July 2018

CREUS Engineering Ltd

610-East Tower, 221 Esplanade W, North Vancouver, BC V7M 3J3
P: 604-987-9070 F: 604-987-9071 www.creus.ca

Civil Engineers & Project Managers

Owner: Village of Lions Bay

(NAME OF OWNER)

Contract: Kelvin Grove Rem Lot 50 Servicing

(TITLE OF CONTRACT)

Reference No. 18190

(OWNER'S CONTRACT REFERENCE NO.)

**The Owner invites tenders
for:**

- Erosion / Sediment Control
- Mobilization
- Bonding
- Traffic Management
- Sediment and Erosion Control and Temporary Drainage
- Earthworks including Clearing and Grubbing
- Stormwater Rerouting
- Hydrant decommissioning
- Water, Sanitary and storm servicing
- Hydro and Telus Service
- Shouldering and Asphalt Repairs
- Layout and As Constructed

**Contract Documents are
available during normal
business hours at:**

Creus Engineering Ltd

610 – East Tower, 221 Esplanade W

North Vancouver, BC

V7M 3J3

(LIST ADDRESSES FOR DOCUMENT PICKUP)

On payment of a non-refundable amount of \$0.00 including GST payable to:

(NAME THAT CHEQUE SHOULD BE PAYABLE TO)

**The Contract Documents
are available for viewing at:**

Arrange for pick up per above

(ADDRESS WHERE CONTRACT DOCUMENTS CAN BE VIEWED)

**A Pretender site
meeting is scheduled for:**

Date: Wednesday July 25

Time: 10am

Location: Top of North On Ramp from Kelvin Grove Way, East side of highway

**Tenders are scheduled to
close:**

Tender Closing Time: 2 : 00 , p m local time

Tender Closing Date: August 8th , 20 18

Address: Creus Engineering Ltd

**UNIT
PRICE & LUMP SUM
CONTRACT**

**KELVIN GROVE
REM LOT 50 SERVICING
INVITATION TO TENDERERS**

**INVITATION TO TENDERERS
PAGE 3 OF 32
JULY 2018**

610-East Tower, 221 Esplanade W

North Vancouver, BC

V7M 3J3

(ADDRESS WHERE TENDERS MUST BE SUBMITTED)

**NAME OF OWNER'S
REPRESENTATIVE**

Steve Williamson

swilliamson@creus.ca

(PHONE)

1.0 IntroductionIT - 1

2.0 Tender Documents.....IT - 1

3.0 Submission of TendersIT - 2

4.0 Additional Instructions to Tenderers.....IT - 3

THIS PAGE INTENTIONALLY LEFT BLANK

(FOR USE WHEN UNIT PRICES and Lump Sum FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

(TO BE READ WITH "INSTRUCTIONS TO TENDERERS - PART II"
CONTAINED IN THE EDITION OF THE PUBLICATION
"MASTER MUNICIPAL CONSTRUCTION DOCUMENTS" SPECIFIED IN ARTICLE 2.2 BELOW)

Owner: Village of Lions Bay
(NAME OF OWNER)

Contract: Kelvin Grove Rem Lot 50 Servicing
(TITLE OF CONTRACT)

Reference No. 18190
(OWNER'S CONTRACT REFERENCE NO.)

1.0 Introduction

1.1 These Instructions apply to and govern the preparation of tenders for this *Contract*. The *Contract* is generally for the following *Work*:

- Mobilization
- Bonding
- Traffic Management
- Sediment and Erosion Control and Temporary Drainage
- Earthworks including Clearing and Grubbing
- Stormwater Rerouting
- Hydrant decommissioning
- Water, Sanitary and storm servicing
- Hydro and Telus Service
- Shouldering and Asphalt Repairs
- Layout and As Constructed

Works specifically excluded from the *Contract* and will be on-going by others during the course of the *Contract*:

- Access on public roads and driveways
- Bus Operation
- Village Operations

1.2 Direct all inquiries regarding the *Contract*, to:
Steve Williamson

swilliamson@creus.ca

(NAME AND POSITION OF INDIVIDUAL WHO WILL ANSWER INQUIRIES)

Address: Creus Engineering Ltd

610-East Tower, 221 Esplanade W

North Vancouver, BC

Phone: 604 987 - 9070 Ext 304

Fax: 604 987 - 9071

2.0 Tender Documents

- 2.1 The tender documents which a tenderer should review to prepare a tender consist of all of the *Contract Documents* listed in Schedule 1 entitled "Schedule of *Contract Documents*". Schedule 1 is attached to the Agreement which is included as part of the tender package. The *Contract Documents* include the drawings listed in Schedule 2 to the Agreement, entitled "List of *Contract Drawings*".
- 2.2 A portion of the *Contract Documents* are included by reference. Copies of these documents have not been included with the tender package. These documents are the Instructions to Tenderers - Part II, General Conditions, Specifications and Standard Detail Drawings. They are those contained in the publication entitled "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings". Refer to Schedule 1 to the Agreement or, if not specified in Schedule 1, then the applicable edition shall be the most recent edition as of the date of the *Tender Closing Date*. All sections of this publication are by reference included in the *Contract Documents*.
- 2.3 Any additional information made available to tenderers prior to the *Tender Closing Time* by the *Owner* or representative of the *Owner*, such as geotechnical reports or as-built plans, which is not expressly included in Schedule 1 or Schedule 2 to the Agreement, is not included in the *Contract Documents*. Such additional information is made available only for the assistance of tenderers who must make their own judgment about its reliability, accuracy, completeness and relevance to the *Contract*, and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

3.0 Submission of Tenders

- 3.1 Tenders must be submitted in a sealed envelope, marked on the outside with the above *Contract* Title and Reference No., and must be received by the office of:

Village of Lions Bay
c/o Pam Rooke, Chief Financial Officer
(During normal operational hours)

(TITLE OF POSITION)

on or before:

Tender Closing Time: 2 : 00 , p m local time

Tender Closing Date: August 8th , 20 18

at

Address: Village of Lions Bay

400 Centre Road

Lions Bay, BC, V0N 2E0

Fax: 604 987 - 9071

3.2 Late tenders will not be accepted or considered, and will be returned unopened.

**Additional
Instructions
to Tenderers**

- 4**
- 4.1 The award of this *Contract* is subject to the availability of sufficient funds to complete the *Work*. The *Owner* also reserves the right to modify the scope of *Work* to meet the funding made available for the projects specified in these tender documents.
- The *Owner* reserves the right not to accept the lowest or any bid, and to accept the bid which it deems to be in the best interest of the *Owner*
- 4.2 The *Owner* will use the following, but not limited to, criteria in the award of this *Contract*:
- Company experience
 - Staff experience
 - Municipal experience
 - Total Price
 - Unit Rates
- 4.3 **Instruction to Tenders Part II- add 8.3** "It is imperative that, prior to bidding, the *Contractor* visit, inspect and familiarize themselves with the site and of everything and of every condition affecting the *Works* to be executed so that the execution of the contract by the *Contractor* is founded and based upon his own examination, knowledge and judgment. This shall include access, traffic management, storage, drainage management, temporary *Works* to perform *Works* and constructability of *Work*."
- 4.4 **Instruction to Tenders Part II- add 10.3** "Contractor to review Supplementary Specifications and Special Provisions to receive clarification on how items are paid as well as any conditions on *Owner's* right to remove items from *Works*"
- 4.5 Instruction to Tenders Part II add 15.1.6 "The *Owner* may, in its absolute discretion, reject a Tender submitted by the Tenderer if the Tenderer, or any officer or director of a corporate Tenderer, is or has been engaged, either directly or indirectly through another corporation or legal entity, in a legal action against the *Owner* and its elected and appointed officers and employees or any of them in relation to:
- a) any other contract or services; or
 - b) any matter arising from the *Owner's* exercise of its powers, duties or functions under the Local Government Act, the Community Charter or any other enactments; within five years of this Tender Offer.

For purposes of this section, the words “legal action” include, without limitation, a mediation, arbitration, hearing before an administrative tribunal or lawsuit filed in any court.

Without limiting the Owner’s sole discretion, in determining whether or not to reject a Tender pursuant to this clause, the Owner will consider such factors as whether the legal action is likely to affect the Tenderer’s ability to Work with the Owner and its employees, agents, Contract Administrators and representatives or any of them and whether the Owner’s past experience with the Tenderer in the matter that resulted in the legal action indicates that the Owner is likely to incur increased staff and legal costs or either of them in the administration of this contract if it is awarded to the Tenderer.”

- 4.7 **Bonding** may not be required. Owner may Delete Labour and Material and Performance Bonds from MMCD sections 4.1.2 and 5.1.1.a. with no charge and no payment under this item. A Bid Bond is still required with Tender.
- 4.8 **Tender Price** Payment for all work specified in the *Contract Documents*, and as shown on the drawings, will be made at the **TOTAL LUMP SUM TENDER** as shown in the Tender Form. This price shall be the total cost to the *Owner* for the completed works, and shall include any applicable Municipal permit fees; layout, utility locates, traffic management, project management, testing, supply of all materials, supervision, PST, labour, and equipment, except as explicitly excluded elsewhere; and allowances for overhead and profit.

Include costs for work and materials not expressly listed in the Schedule of Quantities and Prices, but included in the drawings and/or specifications by either direct mention or implication, in items to which they pertain most closely. All specifications shall apply to these works and referenced items below are additional direction to aid with review of contract documents

The lowest or any tender may not necessarily be accepted. The *Owner* unequivocally reserves the right to accept or reject any or all tenders, or part of any tender. The *Owner* will review the amount and balance of the lump sum and unit rate amounts as well as schedule of works and previous experience in evaluating the tenders. Award of the contract is contingent on meeting the budgetary requirements of the project.

Any claim by the *Contractor* for extra payment on grounds that work performed or materials supplied in accordance with the drawings and/or specifications could not be properly charged to items listed in the Schedule of Quantities and Prices **will be rejected**.

The lump sum prices tendered for the various major components of the work will be used as a guide only in determining the amount of payment due to the *Contractor* as the work progresses. The *Contractor* is responsible for accounting for all works indicated within the payment items indicated.

The lump sum prices tendered for the various major components of the work will be used as a guide only in determining the amount of payment due to the *Contractor* as the work progresses. The *Contractor* is responsible for accounting for all works indicated within the payment items indicated.

4.9 **Payment Items** Refer to Tender Form - Schedule 1, Quantities and Prices. The Breakdown of the tender is for the convenience of the owner in comparing bids and assessing progress. The *Contractor* is responsible for including all costs within the categories supplied. The following is intended to aid the *Contractor* in allocating to portions of contract only.

Item 1 Mobilization/demobilization: Payment for mobilization will be made at the lump sum price bid. Payment shall be for all costs which are independent of the quantities of *Work* done and which are not paid for under other items, including gaining access to all areas of the *Work*. This payment shall include all cost for construction and maintenance of the temporary construction access to the site and traffic management requirements. *Contractor* is responsible for all staging areas and staff parking.

Contractor to arrange for BC one call and coordinate with Municipality and verify all adjoining services prior to commencing installation. *Contractor* to confirm existing utility locations prior to starting crossings of existing services.

Contractor to also include for mobilization of fire safety equipment as required by the Ministry of Forests "Extreme Measures on Job site in the Interface Zone" and *Work* according to those requirements. It is up to the *Contractor* to prepare a fire preparedness plan and obtain and maintain all necessary approvals from the Ministry of Forests in regards to fire protection and meet all requirements of the Fire Plan.

Payment of 25% of the lump sum will be authorized when the *Contractor* has provided a construction schedule and *Work* has commenced. Payment of 50% of the lump sum will be made as a series of monthly payments, calculated on the basis of the expected schedule. If the *Work* falls behind or gets ahead of schedule, these payments will be adjusted accordingly. Payment of the remaining 25% will be authorized when the *Work* is completed and the site is cleaned up, as built are submitted and *Works* are to the satisfaction of the *Engineer*.

The amount of this item is to not exceed 5% of the total value of *Works*.

Item 2 **Bonding:** Shall be priced to provide 50% labour and material and performance bond including warranty period. The owner reserves the right to delete this item from the contract at no cost to the owner. A Bid Bond however is required with a bid submittal.

Item 3 **Erosions/Sediment Control:** Payment for this item shall be all inclusive, including all labour, materials and equipment, required to install and continuously maintain erosion and sediment control features including but not limited to silt fence construction, protective fence, check dams, detention ponds and provide and maintain a wheel wash at the access point to project and clean and maintain adjoining roads as required, cleaning and continual maintenance of sediment traps and other features; and all other *Work* incidental thereto and as described in Section 01561 of the MMCD;

The Environmental Consultant should we change this to Engineer for this project? has the authority to stop *Work* on the site should the *Contractor* fail to comply with the EMP. The stop *Work* order will remain in effect until such time as the Environmental consultant approves. The *Contractor* shall be aware that the drainage *Works* tie into sensitive riparian areas and the *Contractor* shall isolate all *Works* from the Creek.

All *Work* is to be consistent with the requirement of DFO/MLWA requirements including but not limited to "Land Development Guidelines for the protection of Aquatic Habitat. The *Work* shall address all mitigative and protective requirements including but not limited to street sweeping, parking, fuelling, temporary access, sediment fencing, sediment ponds and surface protection.

The *Contractor* shall be responsible for the maintenance of all erosion and sediment control facilities throughout the term of the contract. In addition, the *Contractor* shall provide any temporary drainage facilities as necessary. Temporary drainage *Works* and sediment control facilities shall be regularly reviewed with the *Contract Administrator* and Environmental Consultant and any necessary adjustments shall be completed as directed. The drawings indicate minimal *Works* required prior to commencing earthworks. It is the responsibility to ensure sediment and erosion control *Works* are adequate and properly maintained. The *Contractor* shall suspend *Works* when heavy rainfall is expected, and sensitive areas shall be protected when *Work* is suspended.

The contractor will be required to divert flows around site during construction. Contractor to provide work plan for this work prior to proceeding. The work plan is to anticipate

changes in weather and have allowances for bypassing diversion during heavy rains including temporarily lined ditches/ oversize pipes etc. No deleterious materials shall be discharged back into creek downstream of mini span installation. *Contractor* to monitor weather and adjust contingency plans as required to avoid damage from overflow.

The *Contractor* shall be required to organize construction operations such that environmental impacts are minimized. The *Work* program shall be managed such that activities may be suspended when heavy rainfall is expected, and sensitive areas shall be protected when *Work* is suspended.

Payment of 50% of the lump sum will be authorized when the *Contractor* installed the sediment control *Works*. Payment of 40% of the lump sum will be made as a series of monthly payments, calculated on the basis of the expected schedule. If the *Work* falls behind or gets ahead of schedule, these payments will be adjusted accordingly. Payment of the remaining 10% will be authorized when the *Work* is completed and the site is cleaned up and decommissioned to the satisfaction of the *Contract Administrator*.

Item 4 **Traffic Control:** *Contractor* to submit Traffic Management Road Use Permit to the *Engineer* minimum 7 days prior to commencement of works for review prior to the *Contractor* submitting plan to MOTI for approval. The *Contractor* shall describe the works per the requirements in Creus Traffic Management Plan. Once reviewed the *Engineer* shall submit TMP to BCMOTI for approval and issuance of Permit to the *Contractor*. No works shall commence without TMP approval. The *Contractor* should allow for meeting and reviewing proposed traffic management requirements at regular site meetings as well as full walk through at start of each new change in TMP with Municipality, MOTI and *Engineer*. *Contractor* to ensure thru traffic at all times with no stoppages of more than 5min. Traffic cannot be allowed to back up onto Highway 99 at any time during construction. *Contractor* to manage staff to park in suitable locations as approved in the submitted TMP. District of West Vancouver bus operations must remain unaffected by works. Bus stop to be relocated to north side of intersection. *Contractor* to provide temporary directional signage to new location and relocate existing West Vancouver bus stop sign. *Contractor* to notify Creus 5 days in advance of relocating bus stop.

Item 5 **Earthworks:**

5.1 Clearing and Grubbing: This item includes all labour, equipment, and materials to remove all surplus

material, wood and debris from clearing and grubbing from the site, excluding the areas identified as tree preservation areas or any areas instructed by the Owner to remain.

5.2 Cut and Fill: This is for cut and fill of compactable, free draining fill as directed and approved by the *Engineer* to meet the requirements of design elevations indicated on the drawings including ditches. The in-place bank volume shall be derived by computation from the updated CAD survey of the backfilled surface with the requirements of the fill area per the sections to the widths indicated. *Contractor* is to allow for segregation of materials to optimize use of material within service and roadwork zones to meet BCMOTI/VOLB requirements.

Item 6 Water: Includes installation of water service connection on Kelvin Grove way which will include a wet tap as per Creus drawing details and VOLB standards. Existing hydrant to be removed and returned to VOLB. A Blind flange to be installed as per Creus drawings and observed under pressure for no leakage by *Engineer* prior to backfilling. *Contractor* to arrange for BC one call and verify all adjoining services prior to commencing installation. Waterworks to be constructed consistent with the requirements of item 16 Waterworks Supplementary Specifications. *Contractor* to obtain approval on use of water system prior to operating system. Cost to include all testing as required by the MMCD, *Engineer* and municipality.

Item 7 Storm: Includes all ditches, armouring, inlet and outlet structures, mains, services, manholes and CBs. *Contractor* to obtain approval on use of drainage system prior to operating, connecting to or draining to system. Storm and drainage works to be constructed consistent with the requirements of item 17 Supplementary Specifications. All headwalls to MOTI standards and not present a hazard to snow clearing. Cost to include all testing as required by MMCD, MOTI, the *Engineer* and municipality

Item 8 Sanitary: Includes all labour, equipment and materials to install mains, manholes, clean outs, tie-in to existing and all service connections up to property line, etc. *Contractor* to arrange for BC one call and verify all adjoining services prior to commencing installation. Core and saddle to be used to connect to live main. Sanitary Sewer to be constructed consistent with the requirements of item in item 18 Supplementary Specifications. *Contractor* to flush and air test, sanitary prior to connection to the main. Cost to include all testing as required by MMCD, the *Engineer* and municipality.

- Item 9 Hydro and Telus: These items to include all labour, equipment and materials to supply and install Hydro/Telus servicing.**
- 9.1** Trenching, bedding and backfill with gravel per BC Hydro Specifications: This includes all labour, equipment and material for the installation of a Common Trench to accommodate Ducting including excavation, bedding and backfill with import gravel and warning tape.
 - 9.2 Supply and Place 50mm DBII in trench above** including layout, mandrilling, stringlines, caps and marking tape to satisfaction of Utility
 - 9.3 Supply and Place 75 mm DBII Duct in trench above:** This includes the supply and installation of a 75mm Trench to accommodate Hydro, Telus/Shaw layout, mandrilling, stringlines, caps and marking tape to satisfaction of Utility
 - 9.4 Supply and Place 100 mm DBII Duct in trench above:** This includes the supply and installation of a 3" duct in the trench to accommodate Hydro, Telus/Shaw layout, mandrilling, stringlines, caps and marking tape to satisfaction of Utility. This item may be deleted at no cost.
 - 9.5 Concrete Encasement:** Supply and place concrete per BC Hydro standards to encase ducts where shown on drawings if directed by Engineer. Note this item may be deleted at no cost..
- Item 10 Shouldering and asphalt patching: This item is** to include all labour, equipment and materials to construct the gravel shoulder and perform required asphalt patching. The *Contractor* to manage disturbance to existing asphalt under acknowledgement that they shall only be paid for the asphalt required to patch as per the design drawings and any additional damage to asphalt shall be replaced at the *Contractor's* expense. The works are to be constructed consistent with the requirements of item 15 Roadworks Supplemental Specifications and BCMOTI 2016 Standard Specifications for Highway Construction and shall include all layout, traffic control, supply of approved granular materials, placement and compaction. Mix design for asphalt to be submitted to *Engineer* minimum 5 working days prior to scheduled placement for approval. Density testing required. See Creus drawing R-1 for details for all asphalt patching requirements.
- Item 11 Layout and As Constructed Information:** Per the requirements of the Supplementary General Conditions. As built will be a requirement of substantial completion. As built are to be per **item 21** of the Supplementary Specifications including inverts and alignments of new/existing services and manholes.

4.10 **Schedule of Quantities** If additions or deletions are made to the *Work*, as directed by the *Contract Administrator* through the issuance of written Change Orders, the contract price may be adjusted upward or downward as the case may be, depending on the nature of the change in *Work*.

Unit prices tendered for additions and deletions **may** be used at the discretion of the *Contract Administrator* in valuation of Change Orders. These will be applied only where a change is duly authorized by the *Contract Administrator* and the unit rates are the approved method of payment.

Prices tendered for additions and deletions are excluded from the Total Lump Sum Tender Price but may be taken into consideration in the evaluation of tenders.

AD 1 Drilling and Blasting of Boulders outside of subgrade or trench work shown

This relates to *Work* outside of existing scope of *Work* for blasting of boulders of minimum volumes of 1.5 m³ and disposal of same.

AD 2 Supply and place 525 mm HDPE Boss 2000

This item is to pay for 525 mm HDPE Boss 2000 complete with trenching, bedding and backfill where not already shown on the design drawings. This price shall include the supply of all labour, materials and equipment to trench and install pipe and all other incidental work thereto.

AD 3 Remobilization including Traffic Control and ESC to complete Hydro and Telus works.

This item is a lump sum item to pay for additional costs for remobilization to site to perform the Hydro and Telus works at the unit rates above if approved drawings are not received prior to Substantial Completion of the Contract. This item is solely for the items mentioned in AD 3 and does not include any of the Hydro and Telus installation works.

AD 4 Supply and place Asphalt M2

This includes supply, place and compact 40 mm of compacted asphalt per specifications for works outside of scope indicated on drawings if directed to do at discretion of *Engineer* if other works arise at the same time as other paving is proceeding on site. This does not include damaged asphalt caused by Contractor which will be their responsibility.

AD 5 200 series Excavator

This item is to pay for machine and operator for a fuelled and maintained machine at discretion of *Engineer* if other works arise.

AD 6 135 series Excavator

This item is to pay for machine and operator for a fuelled and maintained machine at discretion of *Engineer* if other works arise.

AD 7 350 series wheel loader

This item is to pay for machine and operator for a fuelled and maintained machine at discretion of *Engineer* if other works arise.

AD 8 Pipelayer

All in cost for pipe layer including general pipe laying tools and access to site. All hourly rates not to exceed Provincial Blue book rates

AD 9 Foreman

All in cost for pipe layer including general pipe laying tools and access to site. All hourly rates not to exceed Provincial Blue book rates

AD 10 Labourer

All in cost for pipe layer including general pipe laying tools and access to site. All hourly rates not to exceed Provincial Blue book rates

(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

BETWEEN *OWNER* AND *CONTRACTOR*

This agreement made in duplicate this

_____ day of _____, 20_____.

Contract:

(TITLE OF CONTRACT)

Reference No.

(OWNER'S CONTRACT REFERENCE NO.)

BETWEEN:

The Village of Lions Bay

(NAME OF OWNER)

(the "*Owner*")

AND:

(NAME AND OFFICE ADDRESS OF CONTRACTOR)

(the "*Contractor*")

The *Owner* and the *Contractor* agree as follows:

**Article 1 The Work
Start /
Completion
Dates**

1.1 The *Contractor* will perform all *Work* and provide all labour, equipment and material and do all things strictly as required by the *Contract Documents*.

1.2 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* generally in accordance with the construction schedules as required by the *Contract Documents* and will achieve *Substantial Performance* of the *Work* on or before **25 working days of notice to proceed** subject to
(INSERT DATE OF SUBSTANTIAL PERFORMANCE)

the provisions of the *Contract Documents* for adjustments to the *Contract Time*.

Article 2 Contract Documents

- 1.3 Time shall be of the essence of the *Contract*.
- 2.1 The "*Contract Documents*" consist of the documents listed or referred to in Schedule 1, entitled "Schedule of *Contract Documents*", which is attached and forms a part of this Agreement, and includes any and all additional and amending documents issued in accordance with the provisions of the *Contract Documents*. All of the *Contract Documents* shall constitute the entire *Contract* between the *Owner* and the *Contractor*.
- 2.2 The *Contract* supersedes all prior negotiations, representations or agreements, whether written or oral, and the *Contract* may be amended only in strict accordance with the provisions of the *Contract Documents*.

Article 3 Contract Price

- 3.1 The price for the *Work* ("*Contract Price*") shall be the sum in Canadian dollars of the following
- 1.1.1 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 the unit prices listed in the *Schedule of Quantities and Prices*; plus
 - 1.1.2 all lump sums, if any, as listed in the *Schedule of Quantities and Prices*, for items relating to or incorporated into the *Work*; plus
 - 1.1.3 any adjustments, including any payments owing on account of *Changes* and agreed to *Extra Work*, approved in accordance with the provisions of the *Contract Documents*.

The *Contract Price* shall be the entire compensation owing to the *Contractor* for the *Work* and this 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*.

Article 4 Payment

- 4.1 Subject to applicable legislation and the provisions of the *Contract Documents*, the *Owner* shall make payments to the *Contractor*.
- 4.2 If the *Owner* fails to make payments to the *Contractor* as they become due in accordance with the terms of the *Contract Documents* then interest calculated at 2% per annum over the prime commercial lending rate of the Royal Bank of Canada on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

Article 5 Rights and Remedies

- 5.1 The duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

5.2 Except as specifically set out in the Contract Documents, no action or failure to act by the *Owner*, Contract Administrator or *Contractor* shall constitute a waiver of any of the parties' rights or duties afforded under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach under the *Contract*.

Article 6 Notices

6.1 Communications among the *Owner*, the Contract Administrator and the *Contractor*, including all written notices required by the Contract Documents, may be delivered by hand, or by fax, or by pre-paid registered mail to the addresses as set out below:

The *Owner*:

Village of Lions Bay

PO Box 141 – 400 Centre Road

Lions Bay, BC V0N 2E0

Fax: _____
Attention: _____

The *Contractor*:

Fax: _____
Attention: _____

The Contract Administrator:

Creus Engineering Ltd

610 – East Tower, 221 Esplanade W

North Vancouver, BC, V7M 3J3

Fax: 604-987-9071

Attention: Steve Williamson

6.2 A communication or notice that is addressed as above shall be considered to have been received

- 1.1.4 immediately upon delivery, if delivered by hand; or
- 1.1.5 immediately upon transmission if sent by fax and received in hard copy; or
- 1.1.6 after 5 Days from date of posting if sent by registered mail.

6.3 The *Owner* or the *Contractor* may, at any time, change its address for notice by giving written notice to the other at the address then applicable. Similarly if the Contract Administrator changes its address for notice then the *Owner* will give or cause to be given written notice to the *Contractor*.

6.4 The sender of a notice by fax assumes all risk that the fax is received in hard copy.

Article 7 General

7.1 This *Contract* shall be construed according to the laws of British Columbia.

7.2 The *Contractor* shall not, without the express written consent of the *Owner*, assign this *Contract*, or any portion of this *Contract*.

7.3 The headings included in the Contract Documents are for convenience only and do not form part of this *Contract* and will not be used to interpret, define or limit the scope or intent of this *Contract* or any of the provisions of the Contract Documents.

7.4 A word in the Contract Documents in the singular includes the plural and, in each case, vice versa.

7.5 This agreement shall ensure to the benefit of and be binding upon the parties and their successors, executors, administrators and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first written above.

Contractor:

(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

(AUTHORIZED SIGNATORY)

(AUTHORIZED SIGNATORY)

Owner:

Village of Lions Bay

(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

(AUTHORIZED SIGNATORY)

(AUTHORIZED SIGNATORY)

(INCLUDE IN LIST ALL DOCUMENTS INCLUDING, IF ANY, SUPPLEMENTARY GENERAL CONDITIONS, SUPPLEMENTARY SPECIFICATIONS, SUPPLEMENTARY STANDARD DETAIL DRAWINGS.)

Schedule 1 Schedule of Contract Documents

The following is an exact and complete list of the Contract Documents, as referred to in Article 2.1 of the Agreement.

NOTE: The documents noted with "*" are contained in the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings", edition dated 2009. All sections of this publication are included in the Contract Documents.

- 8.1 Agreement, including all Schedules;
- 8.2 Supplementary General Conditions (Creus: Supplementary General Conditions);
- 8.3 General Conditions*;
- 8.4 Supplementary Specifications (Creus: Supplementary Specifications and Basis of Payment);
- 8.5 Specifications*;
- 8.6 Supplementary Standard Detail Drawings (if any, insert title and edition date);
- 8.7 Standard Detail Drawings*;
- 8.8 Executed Form of Tender, including all Appendices;
- 8.9 Contract Documents listed in Schedule 2 to the Agreement –"List of Contract Documents";
- 8.10 Instructions To Tenderers - Part I;
- 8.11 Instructions To Tenderers - Part II;
- 8.12 Telus, BC Hydro and Shaw Specifications;
- 8.13 BCMOTI 2016 Standard Specifications for Highway Construction

The following Addenda:

(ADDENDA, IF ANY)

FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT - TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.

Owner: Village of Lions Bay
(NAME OF OWNER)

Contract: Kelvin Grove Rem Lot 50 Servicing
(TITLE OF CONTRACT)

Reference No. 18190
(OWNER'S CONTRACT REFERENCE NO.)

To Owner:

**WE, THE
UNDERSIGNED:**

1.1 have received and carefully reviewed all of the *Contract Documents*, including the Instructions to Tenderers, the specified edition of the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings" and the following Addenda:

(ADDENDA, IF ANY)

**ACCORDINGLY WE
HEREBY OFFER**

1.2 have full knowledge of the *Place of the Work*, and the *Work* required; and

1.3 have complied with the Instructions to Tenderers; and

2.1 to perform and complete all of the *Work* and to provide all the labour, equipment and material all as set out in the *Contract Documents*, in strict compliance with the *Contract Documents*; and

2.2 to achieve Substantial Performance of the *Work* on or before ____
25 working days of notice to proceed.
(WORK DURATION OR DATE)

2.3 to do the *Work* for the price, which is the sum of the products of the actual quantities incorporated into the *Work* and the appropriate unit prices set out in Appendix 1, the "*Schedule of Quantities and Prices*", plus any lump sums or specific prices and adjustment amounts as provided by the *Contract Documents*. For the purposes of tender comparison, our offer is to complete the *Work* for the "*Tender Price*" as set out on Appendix 1 of this Form of Tender. Our *Tender Price* is based on the estimated quantities listed in the *Schedule of Quantities and Prices*, and excludes GST.

- WE CONFIRM:** 3.1 that we understand and agree that the quantities as listed in the *Schedule of Quantities and Prices* are estimated, and that the actual quantities will vary.
- WE CONFIRM:** 4.1 that the following appendices are attached to and form a part of this tender:
- 4.1.1 the appendices as required by paragraph 5.3 of the Instructions to Tenderers – Part II; and
 - 4.1.2 the *Bid Security* as required by paragraph 5.2 of the Instructions to Tenderers – Part II.
- WE AGREE:** 5.1 that this tender will be irrevocable and open for acceptance by the *Owner* for a period of 60 calendar days from the day following the *Tender Closing Date and Time*, even if the tender of another tenderer is accepted by the *Owner*. If within this period the *Owner* delivers a written notice (“*Notice of Award*”) by which the *Owner* accepts our tender we will:
- 5.1.1 within 15 *Days* of receipt of the written *Notice of Award* deliver to the *Owner*:
 - .1 a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract Price, covering the performance of the *Work* including the *Contractor’s* obligations during the Maintenance Period, 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 *Owner*;
 - .2 a Baseline Construction Schedule, as provided by GC 4.6.1;
 - .3 a “clearance letter” indicating that the tenderer is in Worksafe BC compliance; and
 - .4 a copy of the insurance policies as specified in GC 24 indicating that all such insurance coverage is in place and;
 - 5.1.2 within 2 *Days* of receipt of written “*Notice to Proceed*”, or such longer time as may be otherwise specified in the *Notice to Proceed*, commence the *Work*; and
 - 5.1.3 sign the *Contract Documents* as required by GC 2.1.2.

WE AGREE:

- 6.1 that, if we receive written *Notice of Award* of this *Contract* and, contrary to paragraph 5 of this Form of Tender, we:
- 6.1.1 fail or refuse to deliver the documents as specified by paragraph 5.1.1 of this Form of Tender; or
- 6.1.2 fail or refuse to commence the *Work* as required by the *Notice to Proceed*,
then such failure or refusal will be deemed to be a refusal by us to enter into the *Contract* and the *Owner* may, on written notice to us, award the *Contract* to another party. We further agree that, as full compensation on account of damages suffered by the *Owner* because of such failure or refusal, the *Bid Security* shall be forfeited to the *Owner*, in an amount equal to the lesser of:
- 6.1.3 the face value of the *Bid Security*; and
- 6.1.4 the amount by which our *Tender Price* is less than the amount for which the *Owner* contracts with another party to perform the *Work*.

**OUR ADDRESS IS AS
FOLLOWS:**

Phone: _____
Fax: _____
Attention: _____

This Tender is executed this _____ day of _____, 20 _____.

Contractor:

(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

(AUTHORIZED SIGNATORY)

(AUTHORIZED SIGNATORY)

SCHEDULE OF QUANTITIES AND PRICES

See paragraph 5.3.1 of the Instructions to Tenderers – Part II

See paragraph 5.3.1 of the Instructions to Tenderers – Part II

All prices and Quotations including the Contract Price shall include all Taxes, but shall not include GST. GST shall be shown separately.

ITEM	DESCRIPTION	UNIT OF MEASURE	QTY	UNIT PRICE	AMOUNT
1.0	Mobilization/demobilization	I.s.	1		
2.0	Bonding including 50% Labour and Material and Performance Bond (this item may be deleted by the Owner at the Owner's discretion at no cost)	I.s.	1		
3.0	Erosion / Sediment Control	I.s.	1		
4.0	Traffic Control	I.s.	1		
5.0	Earthworks				
5.1	Clearing and Grubbing	I.s.	1		
5.2	Cut/Fill including offsite disposal	M3	650		
6.0	Water	I.s.			
7.0	Storm	I.s.			
8.0	Sanitary	I.s.			
9.0	Hydro, Telus, Shaw				
9.1	Trenching, bedding and backfill with gravel per BC Hydro Specifications	lm	40		
9.2	Supply and Place 50 mm duct in trench above	lm	40		
9.3	Supply and Place 75 mm DBII Duct in trench above	lm	40		
9.4	Supply and Place 100 mm DBII Duct in trench above	lm	40		
9.5	Concrete Encasement m ³	M3	3		
10.0	Shouldering and asphalt patching	M2	10		
11.0	Layout & As-constructed Information	I.s.	1		
A. Subtotal Tender					

TENDER PRICE	\$ _____
GST	\$ _____
TENDER PRICE Including GST	\$ _____

SCHEDULE OF UNIT RATE

(See paragraph 5.3.1 of the Instructions to Tender - Part II)

If additions or deletions are made to the *Work*, as directed by the Consultant through the issuance of written Change Orders, the *contract price* **may** be adjusted upward or downward as the case may be, depending on the nature of the change in *Work*.

Unit prices tendered for additions and deletions **may** be used at the discretion of the Consultant in valuation of Change Orders. These will be applied only where a change is duly authorized by the Engineer and the unit rates are the approved method of payment.

Prices tendered for additions and deletions are excluded from the Total Lump Sum Tender Price but may be taken into consideration in the evaluation of tenders.

(All prices and *Quotations* including the *Contract Price* shall include all *Taxes*, but shall not include *GST*. *GST* shall be shown separately.)

ITEM #	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
AD1	Drilling and Blasting of Rock outside of subgrade or trench work shown	m ³	
AD2	Supply and place 525 mm HDPE Boss 2000	lm	
AD3	Remobilization including Traffic Control and ESC to complete Hydro, Telus and Shaw works.	ls	
AD4	Supply and place Asphalt	m ²	
AD5	200 series Excavator	hr	
AD6	135 series Excavator	hr	
AD7	350 series wheel loader	hr	
AD8	Pipelayer	hr	
AD9	Foreman	hr	
AD10	Labourer	hr	

Appendix 2: PRELIMINARY CONSTRUCTION SCHEDULE

See paragraph 5.3.2 of the Instructions to Tenderers – Part II.

Indicate Schedule with bar chart with major item descriptions and time.

MILESTONE

DATES: _____

ACTIVITY	CONSTRUCTION SCHEDULE									
	1	2	3	4	5					
Weeks										
Mobilization										
Traffic Management Plan Approval										
Sediment and Erosion Control and Temporary Drainage										
Earthworks										
Stormwater Rerouting										
Hydrant Decommissioning										
Water, Sanitary and Storm Servicing										
Hydro and Telus Works										
Asphalt Repairs										
Demobilization										

Tenderer's Initials _____

Appendix 3: EXPERIENCE OF SUPERINTENDENT

See paragraph 5.3.3 of the Instructions to Tenderers – Part II.

Name: _____

Experience: _____

Dates: _____

Project Name: _____

Responsibility: _____

References: _____

Dates: _____

Project Name: _____

Responsibility: _____

References: _____

Dates: _____

Project Name: _____

Responsibility: _____

References: _____

Dates: _____

Project Name: _____

Responsibility: _____

References: _____

Tenderer's Initials _____

Appendix 4: COMPARABLE WORK EXPERIENCE
See paragraph 5.3.4 of the Instructions to Tenderers – Part II.

PROJECT	OWNER / CONTACT NAME PHONE and FAX	WORK DESCRIPTION	VALUE (\$)
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		
	Owner / Contract _____ Phone () _____ Fax () _____		

Tenderer's Initials _____

Appendix 5: SUBCONTRACTORS

See paragraph 5.3.5 of the Instructions to Tenderers – Part II.

TENDER ITEM	TRADE	SUBCONTRACTOR NAME	PHONE NUMBER
	Traffic Management		
	Layout		
	Servicing		
	Paving		

Tenderer's Initials _____

SUPPLEMENTARY GENERAL CONDITIONS

This contract is based on the 2009 MMCD Contract document but is a lump sum and unit rate contract as laid out in Table of Values.

SGC 24 Insurance

Add clause 24.1.7 “The contractor to issue a certificate listing the Owner, Municipality MOTI and Creus Engineering Ltd. as co-insured”.

SGC 3.3 Contract Administration (Survey Layout)

Delete the first sentence in Clause 3.3.5 in its entirety and substitute:

The *Contractor* will provide all layout surveys required for the *Work*. The *Contractor* shall protect and preserve survey monuments and control points as long as they are required for the *Work*.

SGC 4.2 Safety

Add Clause 4.2.2 Emergency Contact Numbers

Before commencing any *Work* at the *Place of the Work*, the *Contractor* shall provide the *Contract Administrator* with a list of at least three persons who have authority to act on behalf of the *Contractor* in an emergency. At least one of the persons shall be available outside normal working hours of the *Owner* (Monday to Friday, 8:30 a.m. to 4:30 p.m.).

Add Clause 4.2.3 Additional Safety Requirements

The *Owner* will require written certification of the following safety related items:

- .1 The successful *Contractor* will be designated the “*Prime Contractor*” for this project under the regulations of the Workers Compensation Act and Occupational Health and Safety Regulations and must fulfil all of the obligations required of a *Prime Contractor*. While on the designated sites of the *Work*, all persons at the *Work* sites must adhere to the *Contractor’s* safety requirements.
- 2 The *Contractor* shall designate, in writing, an authorized and qualified safety coordinator in charge of the *Contractor’s* safety program, plus designate an alternate should this individual not be available.
- .3 The *Contractor* shall provide written assurances that the *Contractor* has complied with Part 3, Rights and Responsibilities, Occupational Health and Safety Programs of the WCB, BC Regulation 296/97, as amended by BC Regulation 185/99. The assurances shall include the following:
 - a. The *Contractor* shall provide an Occupational Health and Safety Program in accordance with Part 3, Section 3.3 of the Occupational Health and Safety Regulations.
 - b. The *Contractor* shall ensure that all *Subcontractors* also comply with Part 3 of the Occupational Health and Safety Regulation. The *Contractor* shall coordinate the daily on-site safety activities of all *Subcontractors*.

- c. The *Contractor* shall provide copies to the *Contract Administrator* of Occupational Health and Safety Committee meeting minutes and any Accident Investigation Reports during the course of the *Contract*.
- .4 The *Contractor* shall provide first aid coverage for each and every site that a crew is working. An employee with Level 1 First Aid (the employee must have a valid card in possession) is required at each location where 2 or more employees are working, along with an approved Level 1 first aid kit. The *Contractor* shall ensure that all *Subcontractors* also meet these requirements.

SGC 4.3 Protection of Work, Property and the Public

“In the prosecution of the work, care shall be taken not to move without consent of the proper parties any structure, and in crossing or running parallel with said structures, they shall be secured in place until the work is completed. Any damage to structures of any kind caused by neglect to attend to such structures shall be paid for by the contractor. It is the contractor’s responsibility to determine the location of existing utilities.”

SGC 18.5 Payment

Revise the first paragraph of Clause 18.5.1 to read as follows:

On or before the 30th Day after the issuance of the *Payment Certificate*

Supplemental Specifications:

The following are clarifications of technical specifications and should be read in conjunction with the Municipal Specifications, MOTI specifications, MMCD specs, regulatory authority specifications, drawings, details and other contract documents. If discrepancy is noted by the Contractor, they are to seek resolution from the Engineer.

- 1. Technical Specifications**-A portion of the Contract Documents is included by reference. Copies of these documents have been referenced in the tender package. It is the Contractor's responsibility to ensure that current relevant copies of all contract documents are forwarded to surveyors, testing agencies, subcontractors, superintendents, estimators, project managers, site staff and any other relevant parties. Contractor confirms they have reviewed same prior to submitting tender.
- 2. Administration of the Contract** -Sub-Contractors shall not communicate or rely on communication with the Engineers or Owner directly on any contractual or technical issue. They shall direct their issues to the Contractor directly whose responsibility it to deal with these issues on their behalf with the Engineer.

Review and approval of any contractual matter including Progress Payment, Change Order, Payment of Holdback, Final Payment, Insurance and Warranty, etc. shall directed to the Engineer. Contractor must only take direction from the Engineer in regards to changes to design or extra works.

Contractor to review progress of project on a monthly basis with Engineer. A progress certificate, in a form approved by the Engineer, to be submitted for review by the Contractor to the Engineer on the 25th of the month and Contractor to provide invoice to match approved progress certificate by the 30th along with Work Safe BC clearance and update of certificate of insurance if required. Payment to be by the 30th of the following month. A statutory declaration will be required for all holdback release requests and invoices after the first draw.

Contractor shall initiate communication with the Regulatory Authority or other regulatory agencies directly only for required permits on the job and copy the Engineer on any correspondence to or from the regulatory agencies. If input is need from Regulatory Authority, the Contractor shall request same through the Engineer.

Review and approval of any technical matter shall be dealt with by Engineer.

The Engineer will provide drawings to the Contractor at initiation of contract and possibly for major changes to the design. Site Instruction may be issued from time to time that alter the drawings and contract requirements as well as clarifications in meeting minutes and emails. It is the Contractors responsibility to ensure that all survey and works reflect the most up to date drawings, specifications, site instructions and direction and that copies of the most current contract documents are forwarded to surveyors, testing agencies, subcontractors, superintendents and site staff and any other relevant parties.

For the purposes of Worksafe BC, the Contractor is to be considered prime contractor as detailed in GC 21.2. The contractor is to set up an orientation program and ensure all employees, subcontractors, suppliers, consultants and regulatory authorities attending the site are adequately orientated to the site. Contractor to have approved procedures for all work and

be able to demonstrate the workers are adequately trained to fulfill Work Safe requirements for doing works.

3. **Layout and Survey-** the Contractor shall layout on the ground whatever lines and grades are necessary to construct the work to the lines, elevations and grades shown on the drawings. A bench mark is noted on the drawings from which to base layout. Contractor to provide stakes on site with markings indicating station, offset and elevation. Engineer will provide digital baseplan upon request; however, it is Contractor's responsibility to coordinate baseplan with paper prints. It is the Contractor's responsibility to provide survey and coordinate with same. Contractor to include for all costs relating to survey for layout and as constructed works. The Engineer is not responsible for checking Contractor layout.

The Contractor shall take precautions to ensure the legal survey pins and posts are not disturbed during construction. The cost of replacement of willfully or carelessly disturbed legal survey pins or posts will be charged to the Contractor unless the Engineer had authorized their removal. The Contractor shall inform the Engineer of any legal survey markers disturbed and the Engineer shall arrange for their replacement.

4. **Drainage-** Drainage facilities must be maintained by the Contractor for the duration of the contract. Any damage caused to the owners of adjacent properties resulting from failure of the drainage system will be restored to its original condition at the expense of and by the Contractor. Contractor shall not alter existing drainage patterns without the approval of the Engineer.
5. **Inspections and Approvals-** the Contractor will construct ALL works to the satisfaction of the inspectors from the Regulatory Authority and the Engineer. If applicable additionally, the Telus works under the direction and to the satisfaction of the Telus inspector, hydro works to satisfaction of the BC Hydro inspector, Fortis BC works to satisfaction of the Fortis inspector, Shaw works to satisfaction of the Shaw inspector. The Contractor will forward to the Engineer certification of acceptance or approval from the above noted inspectors on completion of the work. Electrical works, if applicable to also be under permit with BC Electrical Safety Branch with a copy of permit and sign off to be forwarded to the Engineer. Contractor to give timely notice to relevant inspector to allow for inspection on works and update Engineer on same.
6. **Adjacent Properties-** the Contractor shall consult and cooperate with the owners of the adjacent properties whose driveways, gardens, fences etc. require alteration during construction. Under no circumstances shall the Contractor permit his forces, materials, and/or equipment to encroach on private properties without the express consent of the owner of the property and the Engineer. Contractor to provide Engineer copies of all correspondence with adjacent property owners. The area encroached upon will be restored to its original condition to the satisfaction of the owners of the properties affected.
7. **Approvals-** the Engineer has endeavored to obtain all approvals from the approving agencies involved in this project. No claims or penalties shall be made against the owner or Engineer for any delays occurring as a result of approvals not being received by the Engineer. The Contractor is responsible for obtaining all relevant permits except where noted otherwise.
8. **Order of Works-** Prior to commencing the work, the Contractor, after consultations with the Engineer, shall provide a progress schedule for review, input and approval by the Engineer and which may be revised during the course of the work only if agreed to in writing by the Engineer. The Contractor shall state for the consideration of the Engineer, the order in which he proposed

to execute the work and then at any future time when required to do so, provide revisions to and resubmittal of the progress schedule which will upon acceptance by the Engineer form part of the contract documents. The owner's critical items are indicated on the tender schedule. Contractor is expected to manage works to maximize ability to complete the works in timely manner in coordination with the owner.

9. Testing-

The Contractor will perform at his own cost all testing required by the Regulatory Authority, Municipality, MOTI, MMCD and the Engineer. Testing shall be done by an independent specialty testing firm. Contractor to give Engineer notice on all testing. Copies of tests to be forwarded directly by the testing firm to Engineer and Geotechnical Engineer by email. The testing shall include, but not be limited to the following:

- i Sieve test of SGSB and CBC including documentation of source material testing per Municipal requirement and per MOTI requirements for all works west Keith per above.
- ii compaction testing on road subgrade, subbase and base (at 20 metre intervals at various lane placements);
- iii Proof Roll of Subgrade: notice to be given to Geotech and Engineer 48 hours in advance
- iv compaction testing of trench backfill (at 20 metre intervals) at various elevations in the fill
- v Testing of asphalt during placement in accordance with the Master Municipal Specifications including density testing, Marshall testing and 100 mm core (two per lane in each direction per paving sequence and/or one per lane per 500 m, whichever is greater).
- vi Concrete Testing for foundation and slabs
- vii Pressure testing of sanitary and water mains. Contractor to give Engineer, and if required, the municipal authority, 48 hour notice of tests.
- viii Chlorine and bacteriological testing of the water system per MMCD. Contractor to give Engineer, and if required, the municipal authority, 48 hour notice of tests.
- ix Video inspection of sanitary and storm gravity sewer mains and services with manholes at each end. The Contractor will arrange and pay for the above noted inspection of all storm and sanitary sewer mains installed. ABC Pipe Cleaning Services Ltd. and Mar-Tech Municipal Pipe Services Ltd. are approved by the Engineer for this work. Should the Contractor wish to use another testing laboratory the Engineer's requirements for the video inspection report is as follows:
 - ◆ Supply of 2 copies of DVD disc showing video inspection of all sanitary and storm sewers installed during the contract.
 - ◆ Supply of a bound report complete with photos of pertinent items of interest i.e. broken pipes, ponding, pulled joints, cracks, etc. The report is to include the stations of all wye locations and problem areas. The report is to comment on the cleanliness, alignment, grade and general condition of the pipe.
 - ◆ If the report is not up to the above noted requirements, the Engineer will arrange for ABC Pipe Cleaning Services or Mar-Tech Municipal Pipe Services Ltd. to retest all of the sewer mains. All costs incurred during the retest will be paid for by the Contractor.

10. Stripping

This item shall be all inclusive, including excavation of all nonstructural fill encountered within the work on the site and as required to perform the Works, including separating, hauling and stockpiling within site area or removal as indicated elsewhere in contract documents; and all other incidental work thereto.

11. Rough Grading

This item shall be all inclusive, including all survey, layout, access, excavation, separating, hauling, stockpiling, placing, compacting and sieve, proctor and compaction testing of suitable excavated and filling of all types of material encountered on the and disposal on site as directed unsuitable or surplus materials; and all other incidental work thereto to achieve subgrade level.

Contractor to have detailed layout at commencement of rough grading and place and compact rockfill to required grades and specifications. Contractor to select materials to be 300 mm minus in upper metre of fill and ensure that materials are not gap graded leading to large voids in the fill. Vibratory compaction to be done to achieve compaction and integration of works. Contractor to arrange for a proofroll of subgrade.

This shall include all necessary slope protection works and water management required. All building areas to be compacted to 100% standard proctor. All roads and trails to be compacted to 95% modified proctor unless specified otherwise. Contractor to provide consistent testing on a layer by layer basis to confirm density levels. Contractor to provide finished survey stakes with elevations of corners of subgrade to confirm achieving required subgrade levels

12. Rock Stack

Rock stack walls are to be built according to the drawings, details and sections including Geotechnical Engineering Drawings with founding of the rock 0.5 metres below grade on competent subgrade. If the Contractor encounters conditions that do not allow for construction according to the cross sections, they are to notify the Engineer. The Contractor to provide survey information of the revised toe of any rock stack where the Engineer has confirmed the change is acceptable. Payment will not be made for work that is a change from the drawings, which is undertaken without the prior express direction of the Engineer.

Contractor to give 48 hours' notice of intent to start on Rock Stack works to Engineer and Geotechnical Consultant. A preconstruction meeting to be held with all 3 parties to review schedule, testing requirements, notifications for inspection and procedures. Compacting testing for rock stack to be consistent with section 9 above

13. Stockpile of merchantable stack rock and rip rap

The Contractor will stockpile separately rock stack and rip rap rock in the area as directed by the Engineer.

14. Blasting-

Blasting will be permitted only after securing the approval of the Engineer, the Regulatory Authority and only when proper precautions are taken for the protection of persons and property. The hours of blasting will be determined by the Regulatory Authority. Any damage caused by blasting shall be repaired by the Contractor at his own expense. Contractor may wish to do a preblast survey of adjoining building to confirm preexisting conditions to clarify preconditions otherwise Contractor to address all concerns brought forward. The Contractor's method shall conform to the Federal and Provincial Laws and Municipal Ordinances. The Contractor will be responsible for obtaining any permits required for blasting operations.

After stripping and removal of all soil that can be removed without drilling and blasting in excavation to subgrade, the Contractor shall notify the Engineer to review extent of Rock. The

Contractor to prepare a survey of the top of rock encountered and submit to the Engineer as a point file. The volume of rock required to meet subgrade will be calculated using AutoCAD.

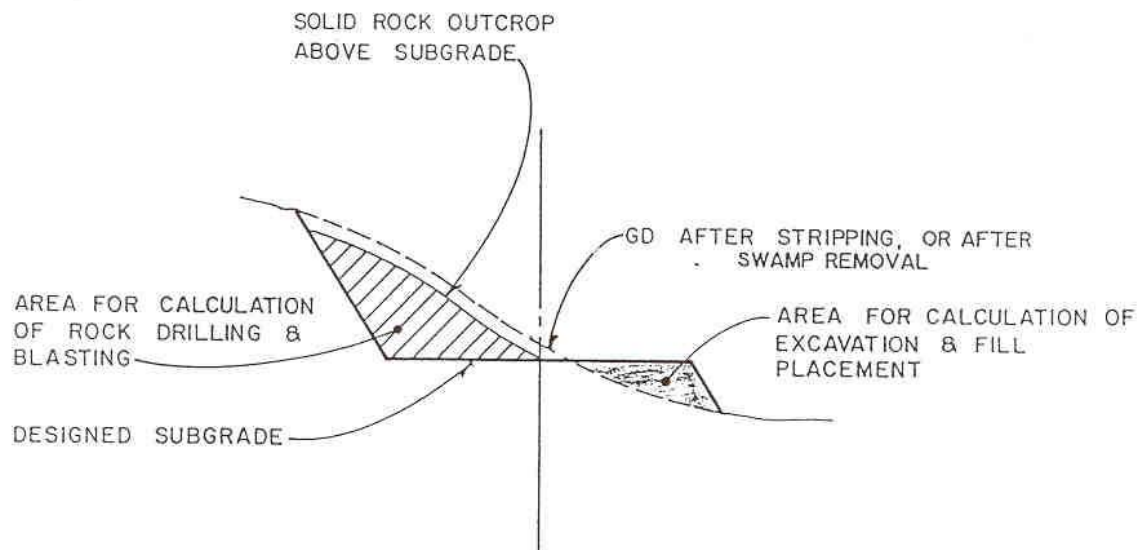
The Engineer recognizes that stripping, excavation prior to blasting, and drilling and blasting could be going on at the same time. The Contractor therefore must ensure that the surveys noted above are completed by the Engineer prior to proceeding to the next phase. **PAYMENT WILL NOT BE MADE FOR WORK THAT IS UNDERTAKEN WITHOUT THE REQUIRED SURVEYS.**

i Drilling & Blasting Subgrade

Work includes the drilling and blasting required to allow grading to designed subgrade of the road.

Measurement shall be by the end area method using the cross-sections noted in Supplementary General Condition No. 1. The area calculated at each section will be that lying between the solid rock outcrop above subgrade section and designed subgrade section for roads and driveways. (See Typical Sections below).

Payment will be made at the unit price bid per cubic metre as measured by the Engineer in the manner noted above. Overbreak should be kept to a minimum and no measurement of payment will be made for rock overbreak.



ii Drilling & Blasting Trench Rock

Work includes drilling and blasting of all rock found in the main and service trenches that occur below subgrade and extend one metre beyond all terminations. It also includes drilling and blasting for all appurtenances e.g. manholes, catchbasins, hydrants and streetlight bases.

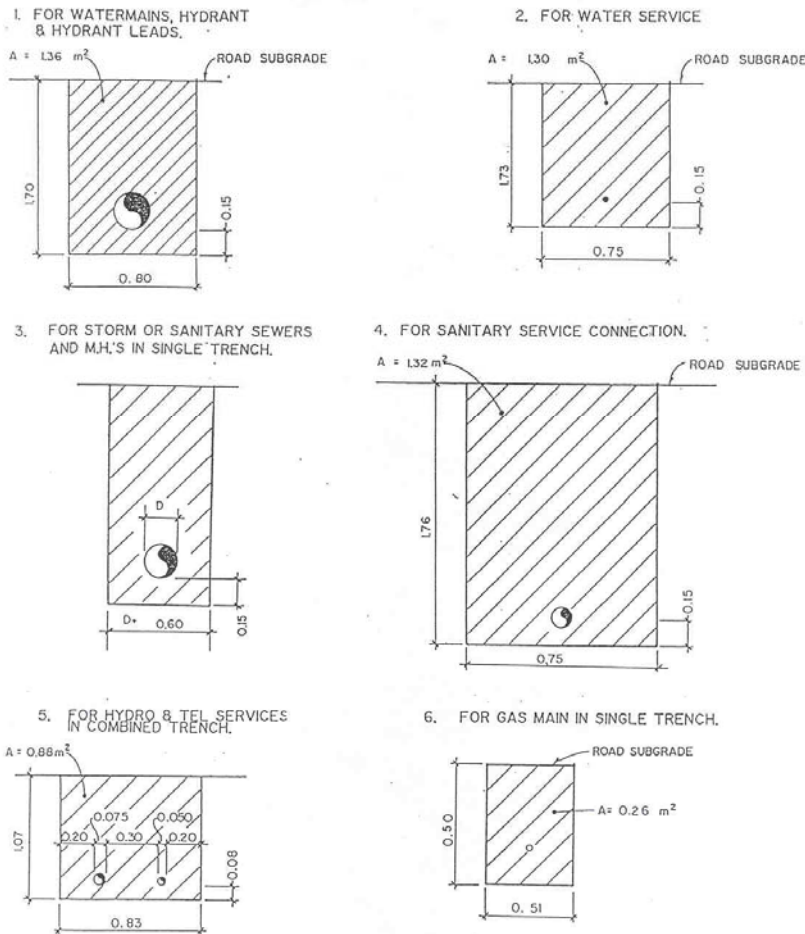
When rock is encountered during the servicing installation in service trenches outside the areas where rock outcrops above subgrade, the Contractor will notify the Engineer and they will review and determine the extent of rock required to clean lines to subgrade. Measurement will be made using the survey information using the end area method.

The volume of trench rock for all mains and services and appurtenances except storm and sanitary mains and manholes will be calculated as follows.

In areas where solid rock is present above the road subgrade, the depth below the subgrade and the width shown on the typical trench section will be multiplied by the horizontal distance shown on the design drawings;

In areas where rock is present below the road subgrade or below ground level outside the road R.O.W. the width shown on the typical trench section will be multiplied by the area enclosed by the surveyed profile of the top of trench rock and the designed bottom of trench profile.

TRENCH DETAILS



iii Boulders

If boulders are encountered during excavation to subgrade or trenching that are in excess of 1.5 m³, Contractor to notify Engineer. Boulders are to be split or removed as resolved by

Engineer and Contractor and removed to location designated elsewhere in these documents. Compensation is based on volume of boulder and shall include restitution of excavation and replacement fill.

15. Roadworks

Roadworks shall be constructed as per MMCD or MUNICIPALITY as further indicated in the contract documents. Payment for this item shall be all inclusive, including all labour, materials and equipment, layout, utility locates, traffic control etc. required to construct the subbase, base sidewalks, curbs and paving to the limits indicated. The breakdown is strictly for the evaluation of works and the Contractor is to ensure that the total value for this item covers all costs associated with these works.

- i Subbase, Base, Curb
Roadworks shall be constructed as per Municipal specifications. Contractor is to give Engineer 48 hrs. notice prior to performing a proofroll on the subgrade surface. This item shall be all inclusive, including all labour, materials and equipment required to complete the subbase, base, curb and sidewalk subgrade for the lump sum price bid.
- ii Roadworks- Prime and First Lift Asphalt
Roadworks asphalt shall be constructed as per Municipal specifications. This item shall be all inclusive, including all labour, primer, materials and equipment required to complete the first lift of asphalt paving and prime coat for the lump sum price bid. Scheduling of paving will be as approved by the engineer.
- iii Roadworks – Second Lift Asphalt Paving
Roadworks asphalt shall be constructed as per Municipal specifications.
- iv Signage and Linepainting. Contractor to provide shop drawings for all signs and bases. Sign installation to be per drawings, details and Municipal requirements unless referenced otherwise. For line painting materials, refer to Linepainting notes. Contractor to ensure surfaces are clean of all deleterious material prior to applying lines. Layout for line painting to be per drawings, any deviations or issues to be reviewed with Engineer for approval prior to painting. Contractor to address all traffic control and protection of works. Contractor to clean up layout lines as required.
- v Barrier installation to be per design, details and Municipal requirements. All barriers to be new, clean and free from defects or damage after installation installed. Contractor to layout extents of barrier and review with engineer prior to proceeding with installation. Contractor to review with Engineer the number of barriers with scuppers after layout and prior to ordering units. Units to be from an approved supplier, Contractor to provide shop drawings for review and approval.
These items shall be all inclusive, including all labour, materials and equipment required to complete the second lift of asphalt paving and prime coat for the lump sum price bid.
Pavement markings shall be included in this pay item.

16. Waterworks

- i Waterworks are to be built per the more onerous of the drawings, general notes, details, municipal regulatory authority and MMCD requirements.
- ii Testing per item 9 **Testing-**
- iii Contractor to protect and maintain operations of existing watersystem during works
- iv Works outside of road ROW to also be consistent with BC Building Code requirements.
- v All works to be consistent with Ministry of Health requirements.
- vi Contractor to install, test, flush, chlorinate, achieve residual chlorine levels, achieve successful bacteriological tests for watermain per dates included in milestones.

17. Drainage

- i Storm and drainage works are to be built per the more onerous of the drawings, general notes, details, municipal regulatory authority and MMCD requirements.
- ii Testing per item 9 **Testing-**
- iii Contractor to protect and maintain operations of existing storm system during works
- iv Contractor to install, test, flush, per dates included in milestones.
- v The Contractor must maintain drainage facilities for the duration of the contract. The Contractor will restore any damage caused to the owners of adjacent properties resulting from failure of the drainage system to its original condition at the expense of the Contractor and to the satisfaction of the Engineer.
- vi Contractor to install all infiltration, exfiltration, bioswales and storm management devices included within the work area indicated.
- vii Contractor to schedule work in regards to outlets and work close to sensitive areas in conjunction with the Environmental Consultant.

18. Sanitary System

- i Sanitary system is to be built per the more onerous of the drawings, general notes, details, municipal regulatory authority and MMCD requirements.
- ii Testing per item 9 **Testing-**
- iii Contractor to protect and maintain operations of existing sanitary system during works
- iv Works outside of road ROW to also be consistent with BC Building Code requirements.
- v Contractor to install, test, flush, per dates included in milestones.

19. Hydro and Telus and Shallow Utilities

- iv Construction of standard BC Hydro, Shaw and Telus underground systems are considered inclusive within the phase per the Hydro, Telus and Shaw Drawings. Work is to be to the approval of BC Hydro, Telus, Shaw and Fortis BC. The Contractor shall load and transport to the job site all materials supplied by BC Hydro, Telus, Shaw or Fortis BC.
- v Contractor to immediately contact appropriate utilities to obtain PIC numbers and coordinate works in a timely manner. Contractor to coordinate and update utilities so that work by utilities can be coordinated with works.
- vi Hydro will be supplying concrete vaults, lids and risers, Telus to provide concrete vaults, lids and risers as well as 1 duct along the Broadwell Road Section. Shaw will provide all duct, vaults and service boxes
- vii A warning tape must be brightly colored yellow and marked with, "CAUTION BURIED ELECTRIC LINE BELOW" shall be installed as per Utility requirements.
- i If indicated, preducting of gas mains at road crossings is to be performed by the Contractor. Carrier pipe to be P.V.C. with minimum 0.6 metre cover. Ends of ducts are to extend one metre minimum beyond gutter line and marked with 2' x 4's designating end of gas crossing.

20. Layout and As Constructed Information

1. The provision of accurate and complete as-constructed information by the Contractor is of prime importance. This shall include all operation and maintenance manuals. Supply four sets of operating and maintenance manuals and one PDF version saved on FOB. 50% of the value for this item will be maintained until delivery and acceptance of 3 prints and one PDF copy of the As Builts and O&M manual.
Operating and maintenance manuals shall be supplied by the applicant in an indexed PDF format. Contents to include:

- Title sheet, labeled "Operation and Maintenance Manual", and include the project name and date;
- List of contents;
- Reviewed shop drawings of all equipment;
- Equipment list showing all model and serial numbers;
- All equipment manufacturers' manuals;
- As-built drawings of all mechanical, electrical, control and alarm installations;
- Full description of system operation including: design points, design pump and system curves, ultimate capacity, area served and any relevant design criteria relevant to the operation of the system;
- Full description of the entire mechanical, electrical and alarm system operation;
- Names, addresses and telephone numbers of all major sub-contractors, suppliers, and consultants;
- Testing and conditioning reports showing pressures, flows, and current draw for all possible operating conditions; and
- Electronic and printed copies of control logic programming.

i The Contractor's approved surveyor will record as-constructed information on a clean copy of the relevant design drawings as follows and as an additional DWG plan:

- ◆ Road centerline & gutter grades & locations at 20 m intervals
- ◆ Extents of rock stack
- ◆ Tie in points to existing services
- ◆ Inverts and extents of stormwater features
- ◆ Location, invert and diameters of all pipes running in and out of the manholes.
- ◆ Location, invert and diameter of service connections at mains
- ◆ Location, invert and diameter of all service connection locations at property line and termination points
- ◆ Locations & inverts of inlet/outlet structures
- ◆ Catchbasins - the distance from the downstream manhole to the catchbasin lead wye. (e.g. wye 0+103.5)
- ◆ The horizontal location and inverts of the watermain at changes in grade.
- ◆ The location of hydrants, blow-offs & air valves
- ◆ Location and invert of all ducts
- ◆ Location including lid rim elevation and invert of all junction boxes, service boxes, PMTs, LPTs, MH and other utility appurtenances.

ii The successful tenderer will be issued two sets of relevant design drawings together with an example of how the as-constructed information is to be recorded on the design drawings following contract award. The Contractor's approved surveyor will prepare the drawings immediately following substantial completion and certify each drawing as to its completeness and accuracy.

iii As built to be provided as .dwg and paper mark up

•

21. Shop Drawings

Manufacturers' shop drawings shall be submitted by the contractor and reviewed by the Contractor and Consultant before construction is commenced on the significant mechanical, control and electrical equipment. After the Contractor has reviewed and placed his approval on the drawings, four copies shall be submitted to the Consultant for review. Review of shop drawings shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents.

Shop drawings for significant sized equipment such as distribution centres, motor control centres, generators, etc. shall include mounting and fastening details necessary to comply with British Columbia Building Code Seismic Requirements. Details shall show locations and forces of required supports. Equipment fastening details or support materials are not required to be detailed.

Shop drawings shall include all information necessary for the Consultant to clearly identify and understand the system being provided. This shall include:

- a. - Data information sheets of all equipment and devices.
- b. - Block or schematic diagram of system interconnections.
- c. - Detailed wiring diagram of the complete system as it relates to this particular project.
- d. - Operational instructions of system set-up, modifications and operations.
- e. - Maintenance and repair data sheets.
- f. -

All materials and workmanship shall be in accordance with the best standard practice and shall in all cases be in accordance with the local by-laws or Provincial Regulations. If no special regulations exist, then materials and workmanship shall be in accordance with the BC Electrical Code Regulations.

All goods and materials shall be new and conform to the specifications of the Canadian Standards Association.

All repetitive items such as switches, plates, receptacles, breakers and electrical system devices etc., shall be of the same type and manufacture throughout the building. Trademarks and other manufacturer's emblems shall not be displayed on visible exterior surfaces of equipment.

All shop drawings shall include details of seismic restraint and bracing. It is the equipment manufacturer's responsibility to design strength and anchorage of internal components that exceed the force level required to restrain and anchor the unit to the supporting structure. Manufacturer's equipment shop drawings shall certify that equipment construction complies with requirements of BC Building Code section 4.1.9. (Similar to National Building Code 4.1.9.) Submitted shop drawings shall indicate support point locations, loads and hanger types. On conduit and cable tray runs requiring seismic restraint longitudinal and transverse bracing connection point locations, loads and connection types shall be indicated on submitted drawings.

The amount of this item is to not exceed 5% of the total value of works.

22 Mechanical

This is for all equipment, piping, process equipment and materials other than those equipment and material indicated in electrical equipment below including required seismic restraints required by code. A maximum of 5% of the supplier value of this equipment will be allowed at time of confirmed committed order. A further 10% when it has arrived at contractors shop. A further 15% will released when equipment is to site. Documentation may be requested at that time to confirm supplier values. This breakdown is purely for benefit of contract manager.

The installation shall comply with all the by-laws applying to plumbing and mechanical installations in effect locally and with the regulations of the plumbing code, building code, BC Department of Labour, Workers Compensation Act, Factories Act, where such regulations do not conflict with those by-laws. The Contractor shall obtain all permits and pay all fees required. After completion of the work, the Contractor shall furnish to the Consultant for the Owner, a Certificate of Final Inspection and approval from the local inspection department. Installation is to be consistent with all requirements of NFPA.

Waterworks to be constructed consistent with the requirements of item 16 above:
Waterworks above

Contractor to obtain approval on use of water system prior to operating system.

Storm and drainage works to be constructed consistent with the requirements of item 17 above

Contractor to obtain approval on use of drainage system prior to operating, connecting to or draining to system.

Engraved lamicoid nameplates to be placed on each pump, gauge and valve and arrows affixed to piping to indicate direction and destination of flow.

Storm and drainage works to be constructed consistent with the requirements of item 18 above

Contractor to protect existing system as it ties into Sewage Treatment System.

1. **Water:** tie in to watermain inlet and outlet as installed by Civil.
2. **Sanitary:** tie in to sewer main through slab as installed by Civil. Building contractor to install p trap, drain cover and piping for trap primer. Contractor to tie in trap primer per plumbing code.
3. **Hydro and Tel:** Tie into ducts provided adjacent to building for communication. Primary power from specified generator.

23 Electrical

This is for all equipment, piping, process equipment and materials other than those equipment and material indicated in electrical equipment below including required seismic restraints required by code. This breakdown is purely for benefit of contract manager. A maximum of 5% of the supplier value of this equipment will be allowed at time of confirmed committed order. A further 10% when it has arrived at contractor's shop. A further 15% will be released when equipment is to site. Documentation may be requested at that time to confirm supplier values.

The installation shall comply with all the by-laws applying to electrical installations in effect locally and with the regulations of the Canadian Electrical Code and BC Department of Labour, Workers Compensation Act, Factories Act, where such regulations do not conflict with those by-laws. The Contractor shall obtain all permits and pay all fees required. After completion of the work, the Contractor shall furnish to the Consultant for the Owner, a Certificate of Final Inspection and approval from the local inspection department.

Installation of primary and distribution panels and wiring including but not limited to Grounding, - Electrical Equipment Wiring, Motor Wiring, Lighting, Lighting Controls, Fire Alarm, Emergency Generator and Distribution, Exit Lights, HVAC Motor Power Supply, Telus System, Supply and installation of conduit, and boxes for communication systems wiring and all similar systems shown on drawings or specifications.

Installation of all electrical panel, wiring, lighting, receptacles, emergency signage as required by drawing and code. Supply all necessary forms, diagrams and drawings,

requested by BC Hydro and Telus. Underground ducts installed for utility services shall be inspected and approved by utility inspectors prior to backfilling. Submit to the Electrical Inspection Department all requested forms, diagrams, drawings and test reports.

Engraved lamicoid nameplates with the name of each section and breaker load shall be mounted on the trim adjacent to the corresponding breaker. Shop drawings shall be submitted for review. All sections shall have dripshield. The distribution centre shall consist of a surface mounted enclosure with circuit breakers and neutral section arranged in a wall mounted enclosure of code gauge sheet steel, with dripshield and removable trim, without door. Access door to wiring compartments shall be hinged. The breakers shall be removable, interchangeable, dead front and be equivalent to Cutler Hammer frame and rating indicated on the drawing. Wiring space between breakers and distribution tub shall be minimum 200mm. All breakers shall have visible trip indication. All breakers shall have provisions for lockout. In order to obtain ground fault protection and to avoid nuisance operation of ground fault protective equipment, the neutral must be kept free of all grounds on the downstream side of ground fault equipment. Where current limiting fuses or solid state trip plugs have been specified a complete set of spare fuses or solid state plugs shall be supplied for each rating. Dimensions of distribution equipment shall be verified to ensure installation of equipment

meets all Code Requirements relative to working clearances. Approved Manufacturers:

1. - Cutler Hammer Type 1 Pow-R-Line C
2. - Federal Pioneer #CDP
3. - Square D #QMB
4. Controls to meet attached schedule

24 Installation and Commissioning

Per the requirements of the Supplementary General Conditions, As built and O & M manuals will be a requirement of substantial completion. The Contractor is to commission and test equipment including all necessary bacteriological and pressure testing as well as operational testing to confirm all alarm conditions, stops, starts etc. and will program in alarm panel numbers and alarm codes.

This section provides a detailed description of the step-by-step procedure the operator must follow to properly operate each portion of each system involved. This section, in particular, must be written in clearly detailed terms. It can be assumed that operators have a basic knowledge and training, but not necessarily on this particular system or layout. This section is intended as a guide for operators faced with conditions that are new or seldom encountered. Data sheets of all system tests or verifications shall be provided. This shall include factory, as well as, site testing and commissioning. All adjustable devices shall have a data sheet recording equipment, adjustment range and final settings. All inspector and manufacturer's certificates shall be included. Where equipment or systems are provided that have long-term warranties from the manufacturer, they shall be included in this section. Original copy should be retained in #1 copy with photo copies inserted in other copies of the manual.

During "final performance" inspection of the work, the Contractor, together with the Consultant, Subcontractor, and other Contractors designated by the Consultant, shall instruct the Owner's operating personnel in the proper operation and maintenance of all systems and equipment installed under the Contract. It shall be this Contractor's responsibility to have the specified equipment and operator's manuals prepared, previously approved by the Consultant, and ready for presentation to the Owner at this

meeting. The Contractor shall be responsible for convening the meeting at the time called for as the final performance inspection. The arrangements shall include written notices to the parties concerned. Should the Contractor not have the equipment manuals, operator's manuals, system installation complete and operable at the proper time, he shall then convene the operating instruction meeting at a later date.

FULL DEPTH PATCHES

Full depth patches remove damaged pavement and base materials, and then reconstruct the base and pavement removed. They should be used to permanently repair pavement failures where the cause is determined to be in the base below the asphalt i.e. distortions: shoving, rutting, and potholes. Perform a full depth patch after the causes of base and pavement damage have been determined and fixed.

Procedure:

1. Begin by marking the outline of the damaged area with a lumber crayon or spray paint. Then mark a cutline on pavement 30 cm (one foot) out from damage area ensuring a smooth transition between the existing asphalt surface and the new patch material
2. Using a pavement saw cut the pavement out on the cutline. Edges should be smooth and vertical; ragged edges will result in pavement failures around the new patch.
3. Remove the cut pavement and all underlying base material as deep as necessary to reach firm support. If water in the structure is the cause of the failure, adequate drainage should be installed or existing drainage repaired so that the failure does not reoccur.
4. Level and compact the base material. If the depth of excavation warrants, additional good granular material may be added and compacted in 15 cm or 6 inch layers to raise the base level. Compaction of the underlying base material (with the use of water to aid compaction) is necessary to ensure that it provides proper support for the pavement layers.
5. A tack coat of emulsified asphalt is then applied to the vertical faces of the cut. The purpose of the tack coat is to provide an adhesive and waterproof asphalt bond between the patch and the surrounding pavement.
6. Patch the area with hot mix asphalt. The asphalt patch should be placed in several layers of not more than 75mm because single deep layers cannot be compacted properly.
7. Careful raking and trimming of the asphalt surface, especially in the top layer of the patch, should be done to provide a smooth and even surface finish. The uncompacted mix is left high enough to leave a compacted patch that is flush with the surrounding surface. Quick and thorough compaction of the joint area helps make a strong, watertight bond between old and new pavement. If the mix is allowed to cool prior to placing, proper compaction cannot be achieved. . Start compacting from the outside edges working towards the centre.