



CONTRACT #: 2441-00531-00
WATER LOSS MANAGEMENT IMPLEMENTATION – INSTALLATION TENDER
DISTRICT OF ELKFORD, B.C

On Behalf Of
DISTRICT OF ELKFORD
TENDER #2018-02

Prepared By
McElhanney Consulting Services Ltd.
Unit 1 – 125 Industrial Road #3
SPARWOOD, BRITISH COLUMBIA
VOB 2G1



January 2018



NOTICE TO BIDDERS

Tender for: **WATER LOSS MANAGEMENT IMPLEMENTATION – INSTALLATION TENDER**

The District invites Contractors with proven expertise watermain and pressure reducing and/or metering stations construction experience to submit tenders.

General scope of the project is:

- Installation of seven (7) PRV and/or metering stations (supplied by others) and associated water main connections, temporary water serving, excavation and roadway rehabilitation.
- Approximately 800 linear meters of 300mm dia. PVC watermain installation and a roadway undercrossing.
- Completion date is the fall of 2018.

Tenders will be received in a sealed envelope, clearly marked with the name and address of the proponent and the name of the Project: “TENDER FOR: **WATER LOSS MANAGEMENT IMPLEMENTATION – INSTALLATION TENDER**” and be addressed to **JESSE HUISMAN, Project Manager** no later than **13:59:59 (MST), THURSDAY, February 15th, 2018** (the “Closing Deadline”), at the following address:

District of Elkford, Municipal Office
816 Michel Rd. Box 340
Elkford, BC V0B 1H0

Please note that Canada Post does not offer door-to-door express delivery service in Elkford and courier services typically take 2 days to deliver.

Tenders must submit a bid security in the amount of 10% of the tender price. Labour and Material, and Performance bonding, each in the amount of 50% of the tender price, are required by the successful tenderer.

Although the District of Elkford fully intends, at this time, to proceed with the complete project through this tender process, the District of Elkford is under no obligation to award a contract or to proceed and reserves the right to terminate the Tender process at any time. No compensation will be paid to contractors preparing tenders for this project.

As it is the purpose of the District of Elkford to obtain a Tender most suitable to the interests of the District of Elkford, the District has the right to waive any irregularity or insufficiency in a Tender submitted and to accept the Tender which is deemed most favorable to the interest of the District of Elkford.

Copies of the Tender Documents can be obtained online on BC Bid (www.bcbid.gov.bc.ca) on or before **January 15, 2018**.

Inquiries regarding this Project shall be directed to:

McElhanney Consulting Services Ltd. Unit #1 125 Industrial Rd. #3 Sparwood, BC V0B 2G1 Attention: KEVIN MOHR, P.ENG. PROJECT MANAGER	District of Elkford 816 Michel Rd. Box 340 Elkford, BC V0B 1H0 Attention: JESSE HUISMAN, PROJECT MANAGER
Phone: 250.425.5434 Direct Line: 250.425.0158 kmohr@mcelhanney.com www.mcelhanney.com	Phone: 250.865.4025 Direct Line: 250.865.4028 jhuisman@elkford.ca www.elkford.ca

1.0 Introduction.....IT - 1

2.0 Tender DocumentsIT - 1

3.0 Submission of TendersIT - 2

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

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(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.)

(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: District of Elkford
(NAME OF OWNER)

Contract: Water Loss Management Implementation – Installation Tender
(TITLE OF CONTRACT)

Reference No. 2441-00531-01
(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:
Installation of 7 pressure reducing and/or flow monitoring stations and approximately 800m of 300mm PVC water main.

(BRIEF DESCRIPTION OF THE WORK)

1.2 Direct all inquiries regarding the *Contract*, to:
Kevin Mohr, P.Eng.

McElhanney Consulting Services Ltd.

(NAME AND POSITION OF INDIVIDUAL WHO WILL ANSWER INQUIRIES)

Address: Unit #1 – 125 Industrial Rd
Sparwood, BC V0B 2G1
Kmohr@mcelhanney.com

Phone: 250 425 - 5434

Fax: 855 407 - 3895

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:

District of Elkford

(TITLE OF POSITION)

on or before:

Tender Closing Time: 1 : 59 , 59 m local time

Tender Closing Date: February 15 , 20 18

at

Address: 816 Michel Rd

Box 340

Elkford, BC V0B 1H0

Fax: 250 865 - 4001

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

4.0 **Additional
Instructions to
Tenderers**

Some work shall be completed by BC Hydro. Contractor shall coordinate with BC Hydro to ensure the Work is completed in a manner that minimizes disruption to the residents of the District of Elkford.

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: District of Elkford
(NAME OF OWNER)
Contract: Water Loss Management Implementation – Installation Tender
(TITLE OF CONTRACT)
Reference No. 2441-00531-01
(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 October 1st, 2018**

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 45 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)

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.

Summary Sheet

<i>Division</i>	<i>Title</i>	<i>Amount</i>
Div 03	Concrete	
Div 26	Electrical	
Div 31	Earthwork	
Div 32	Roads and Site Improvements	
Div 33	Utilities	

the sum of Div. 01-33	<u>Tender Price</u>	
	<u>GST</u>	
	<u>Tender Price plus GST</u>	

Item No.	Section	Para	Specification Title	Unit	Quantity	Unit Price	Amount
	03 20 01		Concrete Reinforcement				
		1.5.1	Concrete Reinforcement (to be included under 03 30 53)				
	03 30 20		Concrete Walks, Curb And Gutter				
		1.4.2	Granular Subbase, and granular base under curb & gutter to be under 31 11 23 Granular Base and 32 11 16.1 Granular Subbase	Note			
03.1		1.4.4	Hand Formed Curb and Gutter (Barrier Curb with Gutter to match existing)	Lineal Metre	20		
03.2		1.4.5	Concrete Sidewalk and Barrier Curb (To Match Existing)	Square Metre	20		
						Div 03 total	

Item No.	Section	Para	Specification Title	Unit	Quantity	Unit Price	Amount
Div. 26			Electrical at PRV Stations				
26.1	26 05 00 SS	-	Stn. 01 Kiosk & all electrical at this site Deerborne and Dorita, 2441-00531-E01 & details	Lump Sum	1		
26.2	26 05 00 SS	-	Stn. 02 Kiosk & all electrical at this site Alpine and Delta, 2441-00531-E02 & details	Lump Sum	1		
26.3	26 05 00 SS	-	Stn. 03 Kiosk & all electrical at this site Caribou and Balmer, 2441-00531-E03 & details	Lump Sum	1		
26.4	26 05 00 SS	-	Stn. 04 Kiosk & all electrical at this site Fording and Boivin, 2441-00531-E014 & details	Lump Sum	1		
26.5	26 05 00 SS	-	Stn. 05 Kiosk & all electrical at this site Galbraith and Michel, 2441-00531-E05 & details	Lump Sum	1		
26.6	26 05 00 SS	-	Stn. 06 Kiosk & all electrical at this site Fording and Michel, 2441-00531-E06 & details	Lump Sum	1		
26.7	26 05 00 SS	-	Stn. 07 Kiosk & all electrical at this site Bear Paw Crescent, 2441-00531-E07 & details	Lump Sum	1		
						Div 26 Subtotal	

Item No.	Section	Para	Specification Title	Unit	Quantity	Unit Price	Amount
	31 05 17		Aggregates and Granular Materials				
		1.4.1	Aggregates and Granular Materials	Note			
	31 22 01		Site Grading : Landscaping				
31.1		1.4.1	Topsoil Stripping and Reuse	Cubic Metre	1920		
	31 23 01		Excavating, Trenching and Backfilling Underground Utility				
31.2		1.10.1	Excavating, Trenching and Backfilling included under pipelaying	Note			
31.3		1.10.4	Removal and Disposal of Disused Pipes, Various Material Types	lm	85		
	31 24 13		Roadway Excavation, Embankment and Compaction				
31.4		1.8.4	Remove Existing Asphalt or Concrete Pavement, Curbs and Gutters, Sidewalks, Utility Strips, Driveways	Square Metre	640		
						Div 31 total	

Item No.	Section	Para	Specification Title	Unit	Quantity	Unit Price	Amount
	32 11 23		Granular Base				
32.1		1.4.2	Granular Base 100mm Thickness for Roads or Sidewalks	Square Metres	80		
						Div 32 total	

Item No.	Section	Para	Specification Title	Unit	Quantity	Unit Price	Amount
	03 30 53		Cast in Place Concrete				
03.3			Pipe Anchor Blocks Per MMCD Drawing G8	Each	23		
	33 11 01		Waterworks				
	1.8.2		Payment for watermain includes saw cutting, trench excavation, disposal of surplus excavated material, bedding, supply and installation of all pipe, bolts, gaskets and tie-rods, imported or native backfill as specified, cleaning, pressure and leakage testing, flushing, disinfection and surface restoration under 31 23 01	Note			
33.1	1.8.1, 1.8.2		Watermain PVC 150 mm diameter depth of main 3-4m Native Backfill	Lineal Metres	28		
33.2	1.8.1, 1.8.2		Watermain PVC 200 mm diameter depth of main 3-4m Native Backfill	Lineal Metres	6		
33.3	1.8.1, 1.8.2		Watermain PVC 250 mm diameter depth of main 3-4m Native Backfill	Lineal Metres	6		
33.4	1.8.1, 1.8.2		Watermain PVC 300 mm diameter depth of main 3-4m Native Backfill	Lineal Metres	790		
33.5	1.8.1, 1.8.2		Watermain PVC 300 mm diameter C900 Certa Lock Carrier Pipe, Includes Spacers, Insulation and End Seals	Lineal Metres	28		
33.6	1.8.1, 1.8.2		Watermain Galvanized Steel 50 mm diameter 0 - 3m depth of main Native Backfill	Lineal Metres	30		
33.7	1.8.3		In-line Gate Valves 300mm	Each	3		
33.8	1.8.3		In-line Gate Valves 350mm HxF	Each	1		
33.9	1.8.3		Tee D.I. 300mm X 300mm X 150mm	Each	1		
34.1	1.8.3		Bend 150mm diameter 45 Degree Bend PVC C900	Each	8		
34.2	1.8.3		Bend 200mm diameter 45 Degree Bend PVC C900	Each	2		
34.3	1.8.3		Bend 250mm diameter 45 Degree Bend PVC C900	Each	2		
34.4	1.8.3		Bend 300mm diameter 90 Degree Bend PVC C900	Each	3		
34.5	1.8.3		Bend 300mm diameter 45 Degree Bend PVC C900	Each	4		
34.6	1.8.3		Bend 300mm diameter 22.5 Degree Bend PVC C900	Each	1		
34.7	1.8.3		Bend 300mm diameter 11.25 Degree Bend PVC C900	Each	4		
34.8	1.8.3		Bend 300mm diameter 5 Degree Bend PVC C900	Each	6		
34.9	1.8.3		Robar Reducer Coupler 300mm X 250mm diameter PVC to PVC	Each	1		
35.0	1.8.3		Reducer 300mm X 250mm diameter PVC C900	Each	2		
35.1	1.8.3		Reducer 250mm X 200mm diameter PVC C900	Each	2		
35.2	1.8.3		Reducer 200mm X 150mm diameter PVC C900	Each	2		
35.4	1.8.3		Plug 150mm diameter PVC c/w Mechanical Restraints	Each	1		
35.8	1.8.5		Blow-Off Assembly Standard Drawing W8	Each	1		
36.0	SS - 1.8.19		Pressure Reducing and Flow Monitoring Chamber Fording and Boivin , 2441-00531-01	Lump Sum	1		
36.1	SS - 1.8.19		Pressure Reducing and Flow Monitoring Chamber Galbraith and Michel , 2441-00531-04	Lump Sum	1		
36.2	SS - 1.8.19		Pressure Reducing and Flow Monitoring Chamber Alpine and Delta , 2441-00531-07	Lump Sum	1		
36.3	SS - 1.8.19		Pressure Reducing and Flow Monitoring Chamber Caribou and Balmer, 2441-00531-10	Lump Sum	1		
36.4	SS - 1.8.19		Pressure Reducing and Flow Monitoring Chamber Fording and Michel , 2441-00531-13	Lump Sum	1		
36.5	SS - 1.8.19		Pressure Reducing and Flow Monitoring Chamber Deerborne and Dorita, 2441-00531-16	Lump Sum	1		
36.6	SS - 1.8.19		Flow Monitoring Chamber Bears Paw, 2441-00531-19 (Optional)	Lump Sum	1		

**FORM OF TENDER - APPENDIX - 6
ASSIGNMENT AND NOVATION AGREEMENT**

THIS ASSIGNMENT (the "Assignment") made as of the ____ day of _____, 20____ (the "Effective Date").

BETWEEN:

< Assignor >

a company incorporated under Provincial Laws of British Columbia,
(the "Assignor" or the "Owner")

OF THE FIRST PART

- and -

< Assignee >

a company incorporated under Provincial Laws of British Columbia
(the "Assignee" or the "Contractor")

OF THE SECOND PART

- and -

< Vendor >

a company incorporated under Provincial Laws of British Columbia
(the "Vendor")

OF THE THIRD PART

WHEREAS the Owner and Vendor are parties to an Equipment Supply Agreement dated _____ as attached in Schedule "A" (the "Agreement"), which Schedule is attached to and incorporated into this Assignment;

AND WHEREAS it is a term of the said Equipment Supply Agreement that the Owner shall hold the exclusive right to assign its rights under the said Agreement to a contractor of its selection, with the intention that such contractor will perform the Project (as defined in said Agreement);

AND WHEREAS the Owner has elected to assign to the Contractor, all of the Owner's rights and obligations in and to the Agreement;

NOW THEREFORE in consideration of the premises hereto and the mutual covenants and agreements herein set forth, the parties hereto agree as follows:

Assignment of Benefits to Assignee

1. The Assignor does hereby assign and novate, transfer, set over and convey unto the Assignee all of the interest of the Assignor in and under the said Agreement, and all benefit and advantage derived or to be derived therefrom, to have and to hold the same unto the Assignee absolutely, from and after the Effective Date, subject to the performance and observance by the Assignee of the terms, conditions and obligations contained in the said Agreement.

Assumption of Liabilities by Assignee

2. The Assignee hereby accepts the Assignment set forth in Paragraph 1 hereof and covenants and agrees with the Assignor and the Vendor that it shall, at all times, from and after the Effective Date, be bound by, observe and perform all the terms and provisions to be observed and performed by the Assignor under the said Agreement to the same extent as if the Assignee had been originally named as a party thereto in the place and stead of the Assignor.

Vendor Covenants

3. The Vendor does hereby:

- (a) consent to the Assignment by the Assignor to the Assignee of all of the interest and obligations of the Assignor in and under the said Agreement;
- (b) release and discharge the Assignor of and from the observance and performance of the covenants, agreements and obligations on the part of the Assignor to be observed and performed under the said Agreement from and after the Effective Date, however, nothing herein contained shall be construed as a release of the Assignor from any obligation or liability which may have accrued prior to the Effective Date; and
- (c) covenant and agree that from and after the Effective Date the Assignee shall be entitled to hold and enforce all of the privileges, rights and benefits of the Assignor under the said Agreement to the same extent as though and to the intent and purpose that the Assignee had been a party thereto in the place and stead of the Assignor.

Relationship Between Vendor and Assignee

4. Notwithstanding anything contained in this Assignment, the Assignor and Assignee agree that the Vendor shall, from and after the Effective Date, pay to the Assignee any refund or repayment of monies or refunds made under the Agreement.

Interim Time Period Between the Effective Date and Execution Date

5. The Assignee acknowledges that in all matters relating to the said Agreement subsequent to the Effective Date and prior to the execution of this Assignment by the Vendor, including but not limited to all accounting and conduct of operations thereunder, the Assignor has been acting as a trustee for and duly authorized agent of the Assignee, and the Assignee does hereby expressly ratify, adopt and confirm all acts or omissions of the Assignor in its capacity as trustee and agent to the end that all acts or omissions shall for the purposes be construed as having been made or done by the Assignee.

Further Assurances

6. The Assignor covenants and agrees with the Assignee that it shall and will, from time to time and at all times hereafter, at the request of the Assignee, execute such further assurances and do all such further acts as may be reasonably required for the purpose of vesting in the Assignee all of the interest of the Assignor in and under the said Agreement.

Term of Agreement

7. This agreement will come into effect on the _____ ("Effective Date") and terminate once Total Performance is achieved by the Assignee.

Assignee's Address

7. The address of the Assignee for notices under the said Agreement is:

Binding or Successors and Assigns

8. This Assignment shall ensure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

Counterparts

9. This Assignment may be executed in counterparts and will be deemed to be fully executed and accepted upon all parties having signed this Assignment in counterparts.

Assignor, < Assignor >

Per: _____ c/s

Assignee, < Assignee >

Per: _____ c/s

Vendor, < Vendor >

Per: _____ c/s

SCHEDULE "A"

Attached to and forming part of this Assignment dated as of the ____ day of _____, 20____, among
_____ (Assignor), _____ (Assignee), and _____ (Vendor).

EQUIPMENT SUPPLY AGREEMENT – AS ATTACHED

END OF DOCUMENT

(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: Water Loss Management Implementation
(TITLE OF CONTRACT)
Reference No. 2441-00531-01
(OWNER'S CONTRACT REFERENCE NO.)

BETWEEN:

The District of Elkford

(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 <i>Contractor</i> will perform all <i>Work</i> and provide all labour, equipment and material and do all things strictly as required by the <u><i>Contract Documents</i></u> . |
| | 1.2 | The <i>Contractor</i> will commence the <i>Work</i> in accordance with the <u><i>Notice to Proceed</i></u> . The <i>Contractor</i> will proceed with the <i>Work</i> diligently, will perform the <i>Work</i> generally in accordance with the construction schedules as required by the <u><i>Contract Documents</i></u> and will achieve <u><i>Substantial Performance</i></u> of the <i>Work</i> on or before October 1st, 2018 subject to

the provisions of the <u><i>Contract Documents</i></u> for adjustments to the <u><i>Contract Time</i></u> . |
| | 1.3 | Time shall be of the essence of the <i>Contract</i> . |

Article 2 Contract Documents

- 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.
- 3.2 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*:

District of Elkford

Fax: _____

Attention: Jesse Huisman, Project Manager

The *Contractor*:

Fax: _____

Attention: _____

The Contract Administrator:

McElhanney Consulting Services Ltd

Fax: _____

Attention: Kevin Mohr, P.Eng. kmohr@mcelhanney.com

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:

District of Elkford

(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

(AUTHORIZED SIGNATORY)

(AUTHORIZED SIGNATORY)

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 (if any, insert title and edition date);
- 8.3 General Conditions*;
- 8.4 Supplementary Specifications (if any, insert title and edition date);
- 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;, including Section 00 54 00 – Agreement Form – Novation Agreement
- 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 The following Addenda:

(ADDENDA, IF ANY)

(COMPLETE LISTING OF ALL DRAWINGS, PLANS AND SKETCHES WHICH ARE TO FORM A PART OF THE CONTRACT, OTHER THAN STANDARD DETAIL DRAWINGS AND SUPPLEMENTARY STANDARD DETAIL DRAWINGS.)

Schedule 2 List of Contract Documents

TITLE	DRAWING NO.	REVISION NO.	REVISION DATE
Key Plan	C-001	2	01/04/2018
Site Plan	C-002	2	01/04/2018
Watermain Plan Profile	C-500	2	01/04/2018
Watermain Plan Profile	C-501	2	01/04/2018
Watermain Plan Profile	C-502	2	01/04/2018
Road Crossing Plan Profile and Details	C-503	2	01/04/2018
Fording Dr and Boivin Rd PRV Station Civil Site Plan	244100531-01	3	12/13/2017
Fording Dr and Boivin Rd PRV Station Chamber Details	244100531-02	3	12/13/2017
Fording Dr and Boivin Rd PRV Supplementary Specifications	244100531-03	3	12/13/2017
Galbraith Dr and Michel Rd PRV Station Civil Site Plan	244100531-04	3	12/13/2017
Galbraith Dr and Michel Rd PRV Station Chamber Details	244100531-05	3	12/13/2017
Galbraith Dr and Michel Rd PRV Supplementary Specifications	244100531-06	3	12/13/2017
Alpine Way and Delta Cres PRV Station Civil Site Plan	244100531-07	3	12/13/2017
Alpine Way and Delta Cres PRV Station Chamber Details	244100531-08	3	12/13/2017
Alpine Way and Delta Cres PRV Supplementary Specifications	244100531-09	3	12/13/2017
Caribou Dr and Balmer Rd PRV Station Civil Site Plan	244100531-10	3	12/13/2017

Caribou Dr and Balmer Rd PRV Station Chamber Details	244100531-11	3	12/13/2017
Caribou Dr and Balmer Rd PRV Supplementary Specifications	244100531-12	3	12/13/2017
Fording Dr and Michel Dr PRV Station Civil Site Plan	244100531-13	3	12/13/2017
Fording Dr and Michel Dr PRV Station Chamber Details	244100531-14	3	12/13/2017
Fording Dr and Michel Dr PRV Supplementary Specifications	244100531-15	3	12/13/2017
Deerborne Dr and Dorita Cres PRV Station Civil Site Plan	244100531-16	3	12/13/2017
Deerborne Dr and Dorita Cres PRV Station Chamber Details	244100531-17	3	12/13/2017
Deerborne Dr and Dorita Cres PRV Supplementary Specifications	244100531-18	3	12/13/2017
Bearpaw Cres Flow Meter Station Civil Site Plan	244100531-19	3	12/22/2017
Bearpaw Cres Flow Meter Station Chamber Details	244100531-20	3	12/13/2017
Bearpaw Cres Flow Meter Station Supplementary Specifications	244100531-21	3	12/13/2017

Supplementary General Conditions

These Supplementary Specifications must be read in conjunction with the Master Municipal Specifications contained in the Master Municipal Construction Documents, Volume II, Platinum Edition 2009.

Reference No. 14602

Owner: District of Elkford
(NAME OF OWNER)

Contract: Water Loss Management Implementation – Installation Tender
(TITLE OF CONTRACT)

Reference No.: 2441-00531-00
(CONSULTANT CONTRACT REFERENCE NO.)

***Indicates amendment recommended by MMCD Board**

General Conditions #	Paragraph #	Title	Action
1.26	.1	Contractor	Add the following: "Contractor shall be synonymous with <i>Installation Contractor</i> "
1.79	.1	Hours of Work	The <i>Hours of Work</i> are to be confined to between 0700h and 1900 hrs, Monday to Saturday. No work shall be permitted on Sundays or Statutory Holidays without the expressed written consent of the District of Elkford.
1.80	.1	Vendor	The Vendor (or Supplier) shall be the party that the Contractor within this contract enters into the novation agreement with, provided in Appendix 6.
1.82	.1	Equipment Delivery	Equipment Delivery shall mean delivery to the Installation Contractor, in working order the equipment shown on the Contract Drawings, in accordance with the Approved Shop Drawings.
3.3	.5	Contract Administration	Delete GC3.3.5 and replace with: "The <i>Owner</i> shall provide the <i>Contractor</i> with survey control points at the <i>Place of the Work</i> , and relative coordinates of the major portions of the <i>Work</i> . The <i>Contract Administrator</i> may conduct survey checks of the <i>Work</i> at his discretion. The <i>Contractor</i> shall provide a survey assistant, at the <i>Contract Administrator's</i> request, for such survey checks. The <i>Contractor</i> shall protect and preserve such survey control points for so long as they are required for the <i>Work</i> and if any of them must be replaced because they are disturbed or destroyed by the <i>Contractor</i> , then the <i>Contractor</i> shall pay the costs of such replacement."

4.1	.1	Control of the Work	<p>Add: “The Contractor shall be solely responsible for all detailed field layout of the Work and recording all data required to complete record drawings. Payment for Survey layout shall be considered incidental to the work performed. All field layout shall be performed by qualified persons with recognized training in the field layout practices acceptable to the Contract Administrator.”</p> <p>Add Item 4.1.3:</p> <ol style="list-style-type: none"> 1. Resident and emergency services access during construction shall be maintained, including restoring driveway access suitable for passenger vehicles. (Residential parking will be restricted to driveways only) 2. Partial road closures are acceptable provided residents and emergency services have access up to either side of the closure. Section of closed road must be limited to 60m in length. In all cases the Contractor shall work closely with the District, residents and emergency services to ensure there is a plan in place to address residential access and emergency access. 3. Contractor shall work closely with the District and residents to ensure they are not without water or sanitary service during the work. <ol style="list-style-type: none"> a. If a service shutdown is unavoidable, the contractor shall request approval from the contract administrator prior to service disruption. The District and all affected water users including the fire department shall be notified in writing (and in person by door to door) by the Contractor 24 hours prior to the shutdown. b. Shutdown shall not exceed 12 hours. Once service is restored all affected parties shall be notified.
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4.3	.1	Protection of <i>Work</i> , Property and the Public	<p>Add:</p> <p>Within the terms of this clause, the <i>Contractor</i> is responsible for the protection of existing shallow utilities (Electrical/Gas/Communications) during the term of the <i>Contract</i>.</p>
	.4		<p>Delete GC 4.3.4 and replace with the following:</p> <p>Before commencing any <i>Work</i> at the <i>Place of the Work</i>, the <i>Contractor</i> shall be responsible to locate in three dimensions all underground utilities and structures indicated on the <i>Contract Documents</i> or made evident through BC one Call information as being at the <i>Place of the Work</i>. Found utilities shall be marked on the surface via reference markers or post, or PVC pipe installed on the exposed utility to allow for measurement and reference during construction. The <i>Contractor</i> shall also be responsible to consult with all utility corporations that provide electricity, communication, gas or other utility services in the area of the <i>Place of the Work</i>, to locate in three dimensions all underground utilities for which they have records. The <i>Contractor</i> shall also locate in three dimensions any other utilities or underground structures that are reasonably apparent in an inspection of the <i>Place of the Work</i>.</p> <p>The <i>Contractor</i> shall contact BC One Call at least 48 hours prior to excavating to advise of the <i>Work</i>.</p>
4.5	.4		<p>Add GC4.5.4:</p> <p>“If Additional Instructions are required to address any error, inconsistency, omission or incorrect, inaccurate or misrepresented facts, the Contractor’s inefficiencies or mismanagement, if any, shall not be taken into account when determining any impact of those Additional Instructions on the Contract Price or the Contract Time.”</p>
*4.6	.2	Construction Schedule	<p>Delete GC4.6.2 and replace with the following:</p> <p>“The <i>Contractor</i> shall update the <i>Baseline Construction Schedule</i> monthly to produce an adjusted <i>Baseline Schedule</i> (The “<i>Adjusted Baseline Schedule</i>”) that reflects any adjustments to the <i>Milestone Date(s)</i> or <i>Contract Time</i> as provided by the <i>Contract Documents</i>, including without limitation if the <i>Contract Administrator</i> issues a <i>Change Order</i> or other <i>Contract Document(s)</i> which adjusts any <i>Milestone Date(s)</i>. Each <i>Adjusted Baseline Schedule</i> will replace the previous <i>Baseline Construction Schedule</i>.”</p>

4.6	.6	Construction Schedule	Delete GC4.6.6 and replace with the following: “The time the performance of the <i>Work</i> shall commence on the date specified in the <i>Notice to Proceed</i> , or if not so specified, on the date the <i>Notice to Proceed</i> is issued. Subject to a contrary provision in the <i>Contract Documents</i> , the <i>Owner</i> shall issue the <i>Notice to Proceed</i> within 10 <i>Days</i> of receipt of the documentation required from the <i>Contractor</i> under paragraph 5.1.1 of the <i>Form of Tender</i> . Failure by the <i>Owner</i> to issue the <i>Notice to Proceed</i> within the 10 <i>Days</i> shall entitle the <i>Contractor</i> to a claim for delay under GC13.1.1.”
4.8	.2	Workers	Add GC 4.8.2 as follows: .2 The Contractor shall maintain respectful communication among the Contractor’s employees, Subcontractors, and the Public. Workers engaging in disrespectful or profane communication will be asked to be replaced by the Owner through the Contract Administrator.
4.12	.5	Tests and Inspections	GC4.12.2.5 (1) and (2) are amended by deleting “timely notice” and substituting “not less than two Days”.
4.16	.1	Notice of Disruption	Delete GC 4.16.1 and Replace with the following: .1 If in the performance of the <i>Work</i> the Contractor intends to interrupt any utility, service, traffic, or property access, then, without limiting any other provision of the <i>Contract Documents</i> , the Contractor shall give timely written notice to the Contract Administrator, Owner, and to any affected residence and place of business .2 For GC 4.16.1, timely written notice shall be given by the contractor with a minimum of 48 hours for any scheduled or non-emergency work. .3 Written Notices must include the Contractors name and phone number, Scheduled time for the service or access to resume, and any procedures that should be recommended once the service resumes; ie, flushing of water service. The contractor must submit an updated notice with the same information every week to affected properties, or if the disruption goes more than 2 days beyond the initial schedule, whichever comes first. .4 Disruptions that require District Staff to perform work (waterworks shut downs, electrical work, etc), must include a separate written request to the Owner detailing the location, duration and nature of the work required to be performed.

4.	.17	Contractor	<p>Add GC 4.17 (Survey Equipment) as follows: .17 The Contractor shall maintain a Builders level, Total Station, GPS RTK Equipment, or equivalent piece of survey equipment on site, referenced to site Survey Control, to maintain Quality Control during the installation of Utilities (Waterworks, Sanitary Sewers, Storm Sewers, Pipe Culverts Manholes and Catch Basins). Pipe or Rotary Lasers do not fulfill this requirement.</p> <p>Add GC 4.18 As follows: .18 The Contractor shall be responsible for providing and maintaining signs at all entrances to the jobsite unless otherwise approved by the Contract Administrator. All signs must clearly show contractor's name, contractors primary contact info (Name, Phone number and Email address). The signs must be in place for the entire duration of construction activity or traffic disruption for each work location, with a minimum sign dimension of 24" x 24".</p>
*7.1	.3	Changes	<p>Delete GC7.1.3 and replace with the following: "Additional work that the <i>Owner</i> may wish performed that does not satisfy the requirements of subparagraphs (a) and (b) of GC 7.1.1(1) is <i>Extra Work</i> ("<i>Extra Work</i>") and not a <i>Change</i>. Pursuant to GC8, <i>Extra Work</i> may be declined by the <i>Contractor</i> or may, upon agreement between the parties, be undertaken as <i>Extra Work</i>."</p>
7.4	.2	Optional Work	<p>Add GC 7.4.2: All items included in the <i>Schedule of Quantities and Prices</i> which are stated to be Optional Work shall be used only as directed and at the sole discretion of the <i>Contract Administrator</i>.</p>
	.3		<p>Add GC 7.4.3 All or any unused portion of these sums shall revert to the <i>Owner</i> and shall be deducted from the Contract Price before final payment is made. No claim for lost profit shall be made by the <i>Contractor</i> for the deletion of any or all of these optional items.</p>
*9.4	.1	Quantity Variations	<p>Delete GC9.4.1 and replace with the following: "If for any reason, including an addition or deletion under GC7.1.1.(1) or GC7.1.1.(2) respectively, the actual quantity of a unit price item varies by more than plus or minus the <i>Variance Threshold Percentage</i> from the estimated quantity that the unit price item as listed in the <i>Schedule of Quantities and Prices</i> (the "<i>Tender Quantity</i>") or as otherwise agreed to pursuant to these <i>Contract Documents</i>, then either the <i>Owner</i> or the <i>Contractor</i> may by written notice request the other party to agree to a revised unit price, considering the change in quantities. A party shall make a request for a revised unit price as soon as reasonably possible after the party concerned becomes aware of the quantity variation."</p>

9.5	.3	Adjustments of Contract Time	Delete 9.5.3 and replace with the following: “The Construction Schedule shall include allowance for all Optional Work unless specified otherwise in the Contract Documents. If the Contract Administrator authorizes Optional Work pursuant to GC 7.4.1 then the related Change Order shall not include any provision for adjustment to the Contract Time.”
11.1	.1	Concealed or Unknown Conditions Definition	GC 11.1.1(3) is deleted and the following substituted: “(3) differs materially and substantially from: i. the conditions of the Place of the Work that would have been evident to or reasonably foreseeable by a Contractor who was qualified to undertake the Work, and is experienced working in the area, and ii. any information in the Tender Documents or otherwise made available by the Owner with respect to any conditions of the Place of the Work that would not have been evident to or reasonably foreseeable by a contractor who was qualified to undertake the Work”.
*12.2	.2	Discovery of Hazardous Materials	Delete GC12.2.2 and replace with the following: “If the <i>Contract Administrator</i> observes any materials at the <i>Place of the Work</i> that the <i>Contract Administrator</i> knows or suspects may be <i>Hazardous Materials</i> then the <i>Contract Administrator</i> shall immediately give written notice to the <i>Contractor</i> and the <i>Contractor</i> shall immediately stop the <i>Work</i> or portion of the <i>Work</i> as required by GC12.2.1(1).”

*13.9	.1	Liquidated Damages for Late Completion	<p>Delete the last paragraph of GC13.9.1 and replace with the following: “If the <i>Contractor</i> fails to meeting the <i>Milestone Date</i> for <i>Substantial Performance</i> as set out in the <i>Form of Tender</i>, paragraph 2.2 as may be adjusted pursuant to the provisions of the <i>Contract Documents</i>, then the <i>Owner</i> may deduct from any monies owing to the <i>Contractor</i> for the <i>Work</i>:</p> <ul style="list-style-type: none"> (1) as a genuine pre-estimate of the <i>Owner’s</i> increased costs for the <i>Contract Administrator</i> and the <i>Owner’s</i> own staff caused by such delay an amount of \$1,000 per day or pro rata portion for each <i>Day</i> the actual <i>Substantial Performance</i> is achieved after the <i>Substantial Performance Milestone Date</i>; plus (2) all direct out-of-pocket costs for safety, security or equipment rental, reasonably incurred by the <i>Owner</i> as a direct result of such delay. <p>If the monies owing to the <i>Contractor</i> are less than the total amount owing by the <i>Contractor</i> to the <i>Owner</i> under (1) and (2) then any shortfall shall immediately, upon written notice from the <i>Owner</i>, and upon <i>Substantial Performance</i>, be due and owing by the <i>Contractor</i> to the <i>Owner</i>. The <i>Contractor</i> shall not be charged liquidated damages for work not completed, if the work is not completed it by fault of the <i>Vendor</i>.”</p>
18.2	.1	Supporting Documentation	<p>Add:</p> <p>The <i>Contractor</i> shall not work on the <i>Site</i> or deliver materials for which delivery slips submitted to the <i>Owner</i> are the basis of payment unless the <i>Site Inspector</i> is present. However, if the <i>Contract Administrator</i> deems these requirements inappropriate then this requirement may be waived.</p>

*18.4	.2	Holdbacks	Delete GC17.4.2 and replace with the following: “Defects and Deficiencies: In addition to other holdbacks as provided by the <i>Contract Documents</i> , when considering <i>Substantial Performance</i> , the <i>Owner</i> may hold back from payments otherwise due to the <i>Contractor</i> 200% of a reasonable estimate, as determined by the <i>Contract Administrator</i> , on account of deficient or defective <i>Work</i> already paid for. This holdback may be held, without interest, until all deficiencies and/or defects are remedied. The items of defect or deficiency and the amounts of related holdback shall be listed separately on the <i>Payment Certificate</i> .”
21.2	.1	Workers Compensation Regulations	Delete GC 21.2.1 and replace with the following: As part of the Work the Contractor shall, to the extent reasonably possible, perform on behalf of the Owner the obligations which the Owner must undertake as “Prime Contractor” by virtue of the Workers’ Compensation Act and Regulations, or other statutes. The Contractor shall have a safety program acceptable to the Workers’ Compensation Board and shall ensure that all Workers’ Compensation Board safety rules and regulations are observed during performance of this contract, not only by the Contractor but by all sub-contractors, workers, material personnel and others engaged in the performance of this contract. The Contractor shall indemnify the City of Cranbrook and hold harmless the City of Cranbrook from all manner of claims, demand, costs, losses, penalties and proceedings arising out of or in any way related to unpaid Workers’ Compensation Board assessments owing from any person or corporation engaged in the performance of this contract, or arising out of or in any way related to the failure to observe safety rules, regulations and practices of the Workers’ Compensation Board, including penalties levied by the Workers’ Compensation Board.”

*24.1	.5	Required Insurance	Delete GC24.1.5 and replace with the following: “All policies referred to in this GC shall provide that thirty (30) days’ notice of cancellation will be given in writing to each insured, including the <i>Owner</i> , otherwise the policies to remain in full force and effect until the <i>Work</i> has been completed. Notwithstanding the foregoing, the Comprehensive General Bodily Injury and Property Damage Liability insurance referred to in GC24.1.1 (2) shall remain in full force and effect from the commencement of the performance of the <i>Work</i> for a period of not less than twelve (12) months following <i>Total Performance</i> , and with respect to completed operations coverage for a period of not less than 24 months following <i>Total Performance</i> .”
25.1	.2	Correction of Defects	Add to Clause: “Where in the opinion of the <i>Owner</i> , delay would cause serious loss or damage, repairs may be made without notice being sent to the <i>Contractor</i> and all expenses incurred will be charged to the <i>Contractor</i> .”
26.3	.1	Effect on Maintenance Period	Delete GC 26.3.1 and replace with the following: .1 “There will be no effect on the Maintenance Period if the <i>Owner</i> takes over and begins to use a portion of the <i>Work</i> before Substantial Performance is achieved. The Maintenance Period for all <i>Work</i> shall commence from the date of Substantial Performance of the Contract.”
27.1	.1	Novation Agreement	The contractor shall enter into the Novation Agreement in Appendix 6 and assume the role of the Contractor to observe and perform all the obligations, of the owner, expect for those financial as defined in the Novation Agreement.

Supplementary Specifications

These Supplementary Specifications must be read in conjunction with the Master Municipal Specifications contained in the Master Municipal Construction Documents, Volume II, Platinum Edition 2009.

Reference No. 14602

Owner: District of Elkford
(NAME OF OWNER)

Contract: Water Loss Management Implementation
(TITLE OF CONTRACT)

Reference No. 2441-00531-01
(CONSULTANT CONTRACT REFERENCE NO.)

Spec #	Paragraph #	Title	Action
01 51 01	1.5.3	Temporary Water	<p>Add Item 1.5.3: It is the responsibility of the contractor to provide temporary overland water servicing as required to ensure that water is supplied to all residences outside of the hours of 8:00AM to 5:00PM. Temporary water servicing to adhere to AWWA and Interior Health Guidelines for temporary water servicing. The contractor must provide written notification to residents 48 hours in advance of any service disruption. Copies of notification must be provided to the <i>Owner</i> and <i>Contract Administrator</i>.</p>
31 23 01	3.6.1.6.1	Base Material Thickness	<p>Add Item 3.6.1.6.1: Granular base material thickness – 150mm Granular subbase material thickness – 300mm</p>
33 11 01	1.8.19	Pressure Reducing and Flow Monitoring Stations	<p>Add Item 1.8.19: "Payment for Pressure Reducing and Flow Monitoring Stations shall be paid at the lump sum price shown on the Schedule of Quantities and Prices and shall include all labour, equipment and materials required to install the concrete chamber, pipes, fittings, valves, braces, hangers, gauges, components, and hardware as shown on the Contract Drawings. The PRV chambers shall be supplied by the <i>Vendor</i> with delivery scheduled on or before May 31st, 2018, at no cost to the <i>Contractor</i>. The Contractor shall coordinate directly with the Vendor and be ready to receive the Chambers upon delivery. Payment includes excavation, backfill, compaction, supply and installation of chamber and bollards and all applicable work described in 1.8.2 of this section. Rehabilitation of roadways, boulevards or landscaped areas shall be completed in accordance with Section 31 23 01 and be considered incidental to the work for which no separate payment shall be made. The <i>Contractor</i> shall be responsible for any damage to the Equipment, that may occur between <i>Equipment Delivery</i> and acceptance by the <i>Owner</i>"</p>

			<p>Replace paragraph 3.19.1 with the following: Pressure testing shall be coordinated with the <i>Vendor</i>. The <i>Vendor</i> shall be responsible for testing the <i>Equipment</i> as noted below: “Upon completion of manufacturing and assembly and prior to delivery to site, the Contract Administrator and The Installation Contractor to witness testing as per SGC 27.1. Provide a pressure test to in accordance with Section 33 11 01. All pressure reducing stations shall be tested to 135 PSI and the water metering station shall be tested to 205 PSI.” This testing shall not relieve the <i>Contractor</i> of his testing requirements for any work installed beyond the <i>Equipment</i> supplied by the <i>Vendor</i>.</p> <p>Additionally a factory pressure test, prior to <i>Equipment Delivery</i> shall be the responsibility of the <i>Vendor</i>. The <i>Contractor</i> may witness this testing.</p>
33 40 01	1.6.12 & 3.16	PRV and Metering Chamber Sump Connections	<p>Add Item 1.6.12:e “Payment for Sump Connections includes all the materials, work and components necessary to complete the connection as described in 3.16.”</p> <p>Add Item 3.16: “.1 Connect 75mm PVC type PSM DR 28 pipe to sump and extend outside chamber by 1.0m .2 Install 1x1x1m of drain rock wrapped in Nilex 4550 filter cloth at the outlet of the sump connection .3 Grout the hole in chamber wall”</p>

DIVISION 26 – ELECTRICAL

SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

Table of Contents

PART 1	GENERAL.....	1
1.01	Work Included	1
1.02	Work Not Included	2
1.03	Owner Supplied Equipment and Materials	2
1.04	Contract Drawings.....	2
1.05	Shop Drawings.....	3
1.06	As-Built Drawings.....	3
1.07	Operating and Maintenance Manuals and Spare Parts Lists	4
1.08	Guarantee	4
PART 2	PRODUCTS	4
2.01	Materials and Equipment	4
2.02	Equals and Substitutions	5
2.03	Names of Suppliers, Manufacturers & Distributors.....	5
PART 3	PART 3 EXECUTION	6
3.01	Site Inspection.....	6
3.02	Permits, Licenses and Fees.....	6
3.03	Codes	6
3.04	Safety	6
3.05	Excavation, Backfill, Cutting and Patching	7
3.06	Equipment Identification.....	7
3.07	Conduit and Cable Identification	7
3.08	Testing	7
3.09	Test Report	8
3.10	Startup.....	8
3.11	Startup Co-ordination	9
3.12	Special Areas	9
3.13	Making Good.....	9
3.14	Protection of Work.....	9
3.15	Clean-Up	9
3.16	Co-ordination.....	9
3.17	Workmanship	9
3.18	Supplier Responsibilities	10
3.19	Earthquake Restraint	10
3.20	Inspection of Work	10
3.21	Alternatives	11

PART 1 GENERAL

1.01 Work Included

- .1 Provide all labour, materials, equipment, services and supervision required to provide a complete electrical system as listed herein and shown on the drawings.
- .2 The new PRV stations are located in south eastern BC, near the Alberta border, in Elkford, BC and are as noted in the table below:

Stn. No.	PRV Location	Description
No. 01	Deerborne Dr./Dorita Cres.	Kiosk & Chamber (2 nd Flow & Control Valve)
No. 02	Alpine Way/Delta Cres.	Kiosk & Chamber
No. 03	Cariboo Dr. /Balmer Rd.	Kiosk & Chamber
No. 04	Fording Dr./ Boivin Rd.	Kiosk & Chamber (2 nd Flow & Control Valve)
No. 05	Galbraith Dr./Michel Rd.	Kiosk & Chamber
No. 06	Fording Dr./Michel Dr.	Kiosk & Chamber
No. 07	Bear Paw Crescent – Flow Stn.	S.C. No. 1 (existing) & Chamber – only flow

Refer to civil drawing C-001 the key plan for locations of the sites within the community.

- .3 This shall generally include work in the following areas:
 - a) At each of the sites noted above with an underground chamber to house the PRVs, piping and associated equipment. Plus, at each site except Station No. 07 there shall be a kiosk mounted at the road's edge housing an electrical power supply, instrumentation and a Scada panel.
- .4 This includes, but is not limited by the generality of the following:
 - a) Coordination with BC Hydro for services to each of the PRV locations, except Station No. 07 where there is an existing building and service.
 - b) At Station No. 03, work for BC Hydro to include ducts for 25kV feeders, a precast 3 phase vault, placement of the precast concrete pad for the LPT and S1 to the kiosk.
 - c) BC Hydro Metering on the outside of the kiosks.
 - d) Secondary Feeders and Ducts, with coordination with BC Hydro for a safety watch as required by BC Hydro's new Safety Practices Regulation Rule 520 regarding civil work.
 - e) Stabilizing poles at stations 04 to 06 while placing the pilasters.
 - f) Kiosks and Control Panels complete with a mast for an antenna.
 - g) Lighting.
 - h) Receptacles.

- i) Instrumentation.
- j) Process Alarm System.
- k) Electric Heating in the Kiosks.
- l) Work for Mechanical Trade.
- m) Testing and Commissioning.

1.02 Work Not Included

- .1 The following work will be done by others. The contractor shall co-ordinate his work with the following and co-operate where required.
 - a) BC Hydro will make the final connections for power at each of the 6 kiosks. BC Hydro's design drawings for each site will not be available until approximately mid-February. (Note that BC Hydro has reviewed the design drawings and the BC Hydro drawings will match these drawings, only be directed to the BC Hydro crews for their scope on the project).
 - b) Elkford's Scada Contractor will program each of the Scada control panels and test and commission communication with the existing Scada system.
 - c) The antenna and antenna cabling will be provided by others.

1.03 Owner Supplied Equipment and Materials

- .1 The contractor shall accept all Owner supplied equipment and materials within 48 hours of a request to do so by the Owner. The contractor shall inspect same prior to acceptance and any loss or damage after acceptance shall be made good at no cost to the Owner.
- .2 The Owner will supply the following equipment:
 - a) None on this project.

1.04 Contract Drawings

- .1 The electrical drawings do not show structural details.
- .2 Accurate dimensions shall be taken from structural or mechanical drawings or by measurement of the buildings. The electrical drawings show approximate location of apparatus, equipment and wiring. The arrangement is diagrammatic in some areas. The exact location of apparatus, equipment and wiring shall be determined in the field in accordance with good practice and shall be to the approval of the Engineer prior to installation.
- .3 Check the location of all items fed by conduit embedded in or below the slab. Ensure that the conduit is located correctly.
- .4 Ensure adequate clearance in front of all electrical panels and equipment.
- .5 Check all electrical equipment nameplates to ensure that the breakers, fuses, overload heaters and conductor is sized in accordance with Canadian Electrical

- Code requirements.
- .6 Check all equipment against the Single Line Diagram to ensure that the voltage and frequency are correct.
 - .7 The drawings show sufficient detail to indicate the scope of work. Minor changes may be made after award of contract, and after receipt of shop drawings. Changes made as a result of receiving the Contractor's shop drawings shall not be considered extra work.
 - .8 The Engineer reserves the right to change the location of equipment, switches, outlets, etc., to within 3000mm of points indicated on the drawings without involving an extra, providing the electrical trade is advised of the change in time to avoid removal of material already installed.
 - .9 Obtain ruling, prior to tender closing, from Engineer, on any discrepancy between specification and drawings. If this is not done, the expensive alternative will be assumed.
 - .10 Arrange wiring and apparatus to conform to architectural and structural details, in an approved manner.

1.05 Shop Drawings

- .1 Submit either an electronic copy in PDF format or six copies of shop drawings to the Engineer for review.
- .2 Shop drawings shall include catalogue sheets, manufacturer's bulletins, wiring diagrams, dimensional data and operating descriptions of all items listed under Part 2 Products, in each section of the Specification.
- .3 Shop drawings shall include an interconnection diagram showing terminal numbers, number of conductors between components and requirements of interwiring conductors. This shall include requirements for shielding, twisting of pairs, minimum and maximum resistance, capacitance, reactance, etc.
- .4 Submit breaker trip curves and fuse curves for all breakers or fuses of more than 50 ampere rating.
- .5 The Engineer will review shop drawings. Engineer's review of shop drawings does not relieve the Contractor from the requirement to provide equipment and systems in accordance with this specification and the contract drawings.
- .6 The Contractor shall also check manufacturer's shop drawings. He shall ensure that the shop drawings and equipment meet the requirements of the contract drawings and specifications.

1.06 As-Built Drawings

- .1 Maintain one set of white prints on jobsite for recording of field changes to conduit runs, equipment locations, etc. As-built markups shall be done daily. Deliver set

to Engineer at job completion.

- .2 As-built markups shall be to the same standard and detail as the contract drawings. Markups shall be to scale, or dimensions shall be noted. They shall show all changes made by the Engineer, Owner and Contractor.
- .3 The Contractor shall submit as-built drawings to the Engineer for inspection, when the Engineer is on site to inspect the Contractor's work.
- .4 If the Engineer finds that the final as-built drawings do not accurately reflect the work done, he shall return them to the Contractor for revision. If the Contractor does not resubmit adequate and correct drawings within 7 days, the Engineer will mark up as-built prints to final and correct state. The Engineer's cost for this work will be deducted from the Contractor's final payment.

1.07 Operating and Maintenance Manuals and Spare Parts Lists

- .1 Four paper copies or an electronic copy of the manufacturer's maintenance instructions, operating manuals and spare parts lists shall be supplied by the Contractor to the Engineer on job completion showing each major piece of electrical equipment and/or equipment as designated by the Engineer. Instructions shall be complete with installation, operating and maintenance drawings and shall include one corrected copy of all shop drawings. Catalog details of all equipment actually installed, including schematic drawings, layouts and maintenance data as applicable shall be included in the maintenance instructions.
- .2 All four paper copies of maintenance instructions and operating manuals shall be bound in separate hard back cover folders, complete with index and tabs. Or if electronic by in PDF format.

1.08 Guarantee

- .1 The Contractor shall guarantee his work, equipment and materials supplied for a period of one year after completion. He shall repair, replace or otherwise make good the electrical installation should failure, malfunction or deficiency occur during the guarantee period. This work shall be done at no cost to the Owner.

PART 2 PRODUCTS

2.01 Materials and Equipment

- .1 Provide new and CSA approved equipment, free of defects. Factory seconds will not be accepted. Equipment shall carry an approval label.
- .2 Other agencies, acceptable to the BC Safety Authority, will be considered as equal to CSA. They include:
 - a) CGA - Canadian Gas Association

- b) ULC - Underwriter Laboratories of Canada
- c) ITS - Intertek Testing Services NA Ltd., (ITS - Canadian Divisions) formerly Warnock Hersey Professional Services Ltd. (label is still a stylized WH)
- d) ETL - Intertek Testing Services NA Inc., (ITS - US Division) formerly ETL Testing Laboratories (label is still ETL)
- e) cUL - Underwriters Laboratories Inc.
- f) cMET -MET Laboratories Inc.

The above labels should be affixed to the various components within a control panel, and the control panel itself should have an approval label.

If approval labels are missing the Contractor shall arrange for the BC Safety Authority to inspect and approve (usually at the job site) the equipment, under the SPECIAL INSPECTION PROGRAM. All costs shall be borne by the Contractor.

- .3 Install all materials and equipment in accordance with the manufacturer's recommendations.
- .4 All equipment and systems shall meet WorkSafe BC (WSBC) requirements.
- .5 Provide WHMIS data sheets on all equipment and material, where required by WCB.

2.02 Equals and Substitutions

- .1 Where equipment and materials is specified by manufacturer, "or approved equal" is implied unless specifically noted otherwise. Submit full technical data with request for approval of equals, a minimum of 5 days prior to tender closing.
- .2 Contractors who supply approved equals shall furnish revised wiring and mounting details where required. The Contractor shall pay for all additional Engineering costs related to installation of substituted equipment.
- .3 As-built drawings shall show complete installation information, including all wiring and mounting details.

2.03 Names of Suppliers, Manufacturers & Distributors

- .1 The Contractor shall provide, with his tender, a list of all manufacturers and their distributors or suppliers, who will supply equipment listed in the "Part 2 - Products," sections of this specification.
- .2 This list shall be detailed, item by item, or summarized in categories as follows:
 - a) Service Entrance and Distribution Equipment
 - b) Lighting Fixtures (as required)
 - c) Receptacles, Switches & Wiring Devices
 - d) Instrumentation Equipment

- e) Control Panels
 - f) Scada equipment
 - g) Electric Heating Equipment
 - h) Specialty Items (list)
- .3 Where items are omitted from this list and the material has not been given "approved equal" status, the Engineer or Owner may request that this material be changed, at any stage during construction, at no expense to the Engineer or Owner.
- .4 Contractors shall not change listed suppliers following tender close without written permission from the Engineer.

PART 3 **PART 3 EXECUTION**

3.01 **Site Inspection**

- .1 A formal site inspection is not scheduled, The Contractor may examine construction sites prior to submitting tender and ascertain all conditions affecting work. Base tender on site conditions. Advise Engineer of any potential problems observed during the site visit, within 24 hours of visit.

3.02 **Permits, Licenses and Fees**

- .1 Submit drawings to the appropriate inspection authorities for approval.
- .2 Apply and pay for all required permits, licenses and fees. Supply inspection certificates to the Owner at the end of the job. Provide one additional copy in each O&M Manual. Work shall not be considered complete until these certificates are submitted to the Owner.

3.03 **Codes**

- .1 Perform work in accordance with Canadian Electrical Code, current edition, and local and regional authorities having jurisdiction.
- .2 Perform work in accordance with WorkSafeBC requirements.

3.04 **Safety**

- .1 Contractor shall be responsible for the safety of all personnel affected by his work.
- .2 Contractor shall establish lock-out procedures and enforce these procedures.
- .3 Contractor shall provide training and instruction as required for all his personnel, and others working on the electrical equipment.
- .4 Contractor shall obtain assistance from outside agencies or specialists, where

required, to insure a safe operating workplace.

- .5 The workplace shall be kept neat and tidy during construction. Tools shall not be left exposed while not in use, and material shall not be allowed to accumulate in the work area.

3.05 Excavation, Backfill, Cutting and Patching

- .1 All excavation, backfill, cutting and patching required for electrical installation, will be by the General Contractor.
- .2 Any excavation for BC Hydro ducts or equipment shall be by a civil contractor that has reviewed the BC Hydro standards for civil work. Several areas have existing buried BC Hydro infrastructure, where within 2 meters of BC Hydro facilities, work must be done by BC Hydro crews and where in the close proximity, at minimum a BC Hydro safety watch must be coordinated and be on site.

3.06 Equipment Identification

- .1 All field components shall be clearly labeled with lamicoid labels. Labels shall have minimum 3mm white letters on black background. Dymo tape labels are not acceptable. Submit list for approval with shop drawings.

3.07 Conduit and Cable Identification

- .1 All conduits and cables for power and control, shall be clearly identified with cable numbers as shown on the drawings, at the starters, MCC or Control Panel(s) and at point of termination. Provide Electrovert "strap-on S markers" or T & B Tyrap or Raychem TM3 identification cable ties with indelible marking.
- .2 Conduits shall be labeled at least once on every building floor.

3.08 Testing

- .1 All electrical power, control and alarm systems shall be tested and calibrated by the Contractor to ensure that they are operating in accordance with the intent of the drawings and specifications. If the Contractor is in doubt as to the intent he shall obtain clarification prior to tender closing.
- .2 The Contractor shall supply all necessary instruments, meters, equipment and qualified personnel to make tests on electrical equipment and wiring during construction or after installation when requested by the Engineer.

The tests shall include:

- a) Insulation resistance tests in accordance with the Canadian Electrical Code before energization of any circuits or equipment.
- b) All tests as recommended in manufacturer's instructions.

- c) Phase rotation tests on circuits, motors, etc.
- d) Tests of adequacy of grounding system and connections.

Where tests are optional, it shall be presumed to be included unless this is highlighted in the tender, and approval to delete the test in question has been given.

- .3 The Contractor shall troubleshoot and replace all defective equipment, systems and wiring discovered during his testing program. He shall retain such competent personnel, suppliers, representatives or subcontractors as necessary to complete this work. He shall retest all systems where remedial action was necessary. After he is completely satisfied that everything is completely operational he shall inform the Engineer that he is ready for startup. He shall submit the test report at this time.

3.09 Test Report

- .1 The test report shall include confirmation of manufacturer's and supplier's recommended procedures. It shall also include all requested manufacturer's certificates of inspection. It shall include the following data on all instrumentation:
 - a) All calibration calculations
 - b) All calibration setpoints as left
 - c) All pressure gauge readings
 - d) All pressure switch settings
 - e) All flowmeter readings
 - f) All flow control setpoints
 - g) All thermostat settings
 - h) All level meter or gauge readings
 - i) Current levels at setpoints on current loops
 - j) All other relevant and similar data

3.10 Startup

- .1 The contractor shall completely test and demonstrate the system to the satisfaction of the engineer. This test shall include but not be limited by the generality of the following:
 - a) Instrumentation
 - i. All setpoints
 - ii. All control functions
 - iii. All pressure readings
 - iv. All flow readings
 - b) Alarm Systems
 - i. Each actuating device

3.11 Startup Co-ordination

- .1 The contractor shall co-ordinate the startup of the facilities in co-operation with the Owner, Engineer, other contractors on site and the various vender representatives on site.

3.12 Special Areas

- .1 The Contractor shall follow accepted practices and code regulations in hazardous locations, areas requiring weatherproof construction, and areas subject to extreme temperatures or vibrations.

3.13 Making Good

- .1 The Contractor shall make good all damage, physical and financial caused by him, to the Owner, the premises and other trades on this project.

3.14 Protection of Work

- .1 The Contractor shall properly cover and protect from damage and weather, all equipment and material related to his work.

3.15 Clean-Up

- .1 Upon completion of the work, the Contractor shall remove all tools, debris, and surplus material, and shall leave the area neat and clean to the Engineer's satisfaction.

3.16 Co-ordination

- .1 The Contractor shall co-ordinate the supply of information between all suppliers and manufacturers of electrical equipment to ensure that electricians in the field have correct and adequate information to install all equipment.
- .2 The Contractor shall arrange for and co-ordinate the work by the Electrical Utility.

3.17 Workmanship

- .1 Work shall be done in accordance with good practice and by tradesmen accredited and skilled in the performance of electrical work.
- .2 The Engineer shall determine whether workmanship is acceptable. Work approved by the Electrical Inspector or other authorities may still be rejected by the Engineer.
- .3 Grounds for rejection shall be any one of, but not limited by the following:

- a) Poor appearance.
- b) Poor quality materials.
- c) Conduit or wiring connections incompatible with standard of enclosures used.
- d) Insufficient support or fastenings.
- e) Materials installed in a manner or location that will impede other trades or make future maintenance awkward, costly or impossible.

3.18 Supplier Responsibilities

- .1 The Contractor shall be responsible for insuring that all his suppliers of equipment and material have sufficient information to determine whether their equipment and material is suitable for the intended use shown in these documents.
- .2 The Contractor shall notify his suppliers as follows:
 - a) All suppliers shall insure their equipment and material is suitable for the installation intended. If his equipment is found to be deficient, it shall be removed and replaced with suitable equipment, all at no cost to the Owner.
 - b) The supplier shall insure, when applying for "equal" status to specified equipment, that his equipment is truly equal. If his equipment is discovered to be deficient in this respect, it shall be removed and the specified equipment provided, all at no cost to the Owner or Engineer.

3.19 Earthquake Restraint

- .1 The Contractor shall provide restraint for all wall mounted equipment. Wall mounted equipment shall be firmly bolted to wall brackets. Supports, anchors and bracing shall prevent horizontal movement or tipping of wall mounted equipment during and after earthquakes.

3.20 Inspection of Work

- .1 On this project the Electrical Engineer, Owner and BC Safety Authority will be inspecting electrical work at various stages of construction.
- .2 The electrical contractor and/or general contractor shall notify the Electrical Engineer a minimum of two weeks prior to rough-in completion and wall boarding in order to schedule rough-in inspection. Failure to request rough-in inspection may result in the stopping of work on site by the local building inspector. This is due to the current BC Building Code requirement for field review by the Electrical Engineer.
- .3 Provide a minimum of two weeks' advance notice to the Engineer of request for substantial completion and final inspection.

3.21 Alternatives

- .1 Bidders are encouraged to make alternative proposals where they feel that an alternative would be of advantage to the Owner.

DIVISION 26 – ELECTRICAL

SECTION 26 05 20 – WIRE AND BOX CONNECTORS

Table of Contents

PART 1	GENERAL	1
1.01	Wiring Method	1
1.02	Ground Conductor	1
PART 2	PRODUCTS	1
2.01	Conduit	1
2.02	Flexible Conduit	1
2.03	Secondary Distribution Duct	2
2.04	Wire	2
2.05	Teck Cable	2
2.06	Instrumentation Wire	2
2.07	Connectors	2
2.08	Waterstop Sealant	2
2.09	Duct Seal	3
2.10	Flame Stop Sealant	3
PART 3	EXECUTION	3
3.01	Conduit	3
3.02	Rigid Steel Conduit to PVC Conduit Adaptor	3
3.03	Duct	3
3.04	Waterstop Sealant Installation	3
3.05	Control Panel Wiring	3
3.06	Spare Conductors	4
3.07	Direct Buried Conduit and Teck Cable	4
3.08	Instrumentation Cable	4
3.09	Equipment Mounting	4

PART 1 GENERAL

1.01 Wiring Method

- .1 Wiring method shall be surface run conduit and wire, except where specifically noted otherwise herein or on the drawings.
- .2 All conduit and wiring is not shown on the drawings. The Contractor shall provide conduit and wiring as per circuit numbers shown. He shall install this in accordance with good practice with no conflicts with other trades.
- .3 Interior control panel wiring shall be "TY-RAP'ed" bundles, secured to rear mounting panel, or installed in "Panduit" type wiring trough.

1.02 Ground Conductor

- .1 Provide separate ground conductor in all non-metallic conduit and duct.

PART 2 PRODUCTS

2.01 Conduit

- .1 Provide galvanized steel electrometallic tubing in all areas, except where direct buried or exposed to mechanical damage.
- .2 Provide rigid PVC duct (DB2) CSA 22.2 No. 211.1 - M1984 where direct buried or encased in concrete. Use approved jointing cement. Run ground conductor.
- .3 Provide BC Hydro approved duct for ducts that will contain BC Hydro feeders.
- .4 Provide rigid PVC conduit CSA 22.2 No. 211.2 - M1984 where rigid PVC is surface run. Use approved jointing cement. Run ground conductor.
- .5 Provide rigid hot dipped galvanized steel in areas where exposed to mechanical damage.
- .6 Areas where conduit is exposed to mechanical damage are as follows:
 - a) Surface mounted outdoors, from 600mm below ground to 1600mm above ground.
 - b) Stubbed up through floor to motors and control pilot devices.
 - c) Where noted on drawings.
- .7 All conduit shown is 21mm diameter unless otherwise noted, or where the code calls for a larger size because of conduit fill.
- .8 Provide flexible conduit for last 500mm of connection to motors, solenoid valves, pressure switches and similar devices.

2.02 Flexible Conduit

- .1 Provide flexible liquid tight conduit for connections to instrumentation.
- .2 Flexible conduit shall be Hydrotite or Sealtight with extruded PVC Jacket.
- .3 Non-metallic flexible conduit is acceptable, provided a ground wire is included.

2.03 **Secondary Distribution Duct**

- .1 Provide 78 mm PVC where direct buried or encased in concrete.
- .2 Adapt to rigid galvanized steel where exposed to mechanical damage.

2.04 **Wire**

- .1 Provide stranded copper conductor unless otherwise noted.
- .2 Provide solid copper conductor for lighting and receptacle circuits.
- .3 Provide extra flexible switchboard wire #16 AWG for all control panel wiring.
- .4 Provide minimum #12 AWG for lighting, heating and receptacle circuits.
- .5 Provide RW90 X-LINK polyethylene insulated wire unless otherwise noted.
- .6 Wiring at 120/240 volts shall be 300 volt insulated.
- .7 Wiring at 600 volts shall be 600 volt insulated.

2.05 **Teck Cable**

- .1 Teck cable shall be aluminum armoured copper conductor with X-link insulation complete with fire retardant PVC jacket overall. Voltage rating shall be minimum 600 volt for #10 AWG and smaller, 1000 V for #8 AWG and larger.
- .2 Provide appropriately sized PVC duct in concrete for Teck cable entrances to buildings. Seal with duct seal.

2.06 **Instrumentation Wire**

- .1 Control cabling for discrete signals at 24 vdc to 120 vac installed in conduit between boxes or to instruments when installed in conduit shall be #16 awg, 300 vac rated, instrumentation cable, unshielded with overall PVC grey coloured jacket, rated for use in Canada. Provide Belden or equal.
- .2 Unarmoured CSA instrumentation cable with #16 awg individually shielded twisted pairs and overall foil shielding and grey PVC outer jacket shall be Belden or equal. Provide number of pairs as indicated on the drawings. An example is 6pair #16awg cable would be Belden part number 22630 or equal.
- .3 Armoured CSA instrumentation cable with #16 awg individually shielded twisted pairs and overall foil shielding, aluminum interlocking armour and grey PVC outer jacket shall be Belden or equal. An example is 1pair #16awg cable would be Belden part number 23501 or equal.

2.07 **Connectors**

- .1 Teck connectors shall be raintight. Provide Thomas & Betts "Spin on 2" connectors.
- .2 EMT connectors shall be bushed steel.
- .3 Connectors shall match the EEMAC standard of the box, fitting or enclosure they enter.

2.08 **Waterstop Sealant**

- .1 Provide GE RTV 108 general purpose silicone rubber adhesive sealant.

2.09 **Duct Seal**

- .1 Provide Iberville Duct Sealant DUCT-1.

2.10 **Flame Stop Sealant**

- .1 Provide Thomas & Betts flame-safe firestop compound.

PART 3 **EXECUTION**

3.01 **Conduit**

- .1 Exposed conduit shall be parallel or perpendicular to building lines.
- .2 Provide expansion joints where required.
- .3 Provide thermal breaks where required.
- .4 Support conduit to eliminate visible deflection.
- .5 All G.F.I. protected circuits shall be in rigid PVC conduit.
- .6 Conduit installed in areas where building finish is painted, shall be painted to match, with two coats of same colour, type and quality.
- .7 Conduit entering, or passing through an electrical enclosure or kiosk shall have locknut and washer on both sides of the enclosure or kiosk panel. Connection shall be to standard of the enclosure.
- .8 Holes in enclosures, for conduit, shall be made with a knockout.
- .9 Seal with fire stop sealant all points where wiring or conduit passes through fire separations.
- .10 Flexible conduit shall only be used where flexibility is required for future equipment changes or small equipment movement.

3.02 **Rigid Steel Conduit to PVC Conduit Adaptor**

- .1 Provide PVC female adapter fitting. Rigid Steel conduit shall be threaded into female adapter at points of transition.

3.03 **Duct**

- .1 Connections shall be watertight.
- .2 Slope to provide drainage.
- .3 Provide drainage tapoffs complete with check valves as required by Electrical Utility.

3.04 **Waterstop Sealant Installation**

- .1 After all instruments and controls have been tested, seal cable entry between the following areas:
 - a) Electrical Room and Outside
- .2 Apply with pump or gun.

3.05 **Control Panel Wiring**

- .1 Identify wiring at each end with tubular markers. Identification numbers shall

- match terminal numbers.
- .2 Provide wire numbers for all wires and terminals where numbers are not designated.
 - .3 Colour code wiring -
 - "Red" for 120 VAC
 - "Blue" for 24 VDC
 - "Yellow" for 12 VDC

3.06 Spare Conductors

- .1 Unused wiring in conduits or cable shall be clearly identified as spare with each conductor numbered individually.

3.07 Direct Buried Conduit and Teck Cable

- .1 Bury all wiring to minimum depths noted in Canadian Electrical Code unless otherwise noted.
- .2 Mark location with warning tape 'Danger - Buried Cable' in trench half way between grade and conduits or cables.

3.08 Instrumentation Cable

- .1 Ground shield at one end, unless recommended otherwise by the equipment supplier.
- .2 Test continuity of shield prior to connecting instruments.
- .3 Provide adequate lightning and surge protection on all instrumentation cables entering a building or where noted herein and on the drawings.
- .4 Terminate armour in approved connector.
- .5 Instrumentation teck cable may be used in lieu of instrumentation cable in liquid tight flexible conduit shown in the chambers, at the Contractor's option.

3.09 Equipment Mounting

- .1 Use 19mm good one side (G1S), exterior grade plywood where required to mount electrical equipment.
- .2 Paint plywood with three coats minimum, one primer and two base colour. Base colour shall match the surrounding wall or be white if the wall is unpainted.

DIVISION 26 – ELECTRICAL

SECTION 26 05 28 – GROUNDING

Table of Contents

PART 1	GENERAL	1
1.01	Scope of Work	1
PART 2	PRODUCTS	1
2.01	Ground Conductor - Electrode and Interconnections	1
2.02	Ground Rods	1
2.03	Ground Connections	1
2.04	Ground Conductor - Conduit and Ducts	1
PART 3	EXECUTION	2
3.01	Station Electrode and Ground Pad	2
3.02	Connections	2
3.03	Buried Ground Conductor	2
3.04	Branch Circuit Grounding Conductor	2

PART 1 GENERAL

1.01 Scope of Work

- .1 Establish station ground electrode at Stations 1 to 6.
- .2 Connect to existing system at Station 7.
- .3 Ground all equipment in accordance with the Canadian Electrical Code.
- .4 Ensure any distribution and control transformer neutrals are grounded as required. Artificial neutrals and/or surge suppressors shall be grounded per manufacturer's instructions.
- .5 Ensure all metal enclosures for electrical equipment are bonded to ground.
- .6 Bond all metallic handrails, guard rails, kiosks, ladders, building columns, gas piping, water piping, flow meter grounding rings, etc. to ground.

PART 2 PRODUCTS

2.01 Ground Conductor - Electrode and Interconnections

- .1 Provide #6 AWG bare stranded copper ground conductor.

2.02 Ground Rods

- .1 Provide copperclad steel, 19mm diameter, 3m long.
- .2 Provide Slater No. 22109 ground electrode box with each ground rod.

2.03 Ground Connections

- .1 Provide Burndy Hyground compression connections, conductor to conductor, conductor to rods.
- .2 Use approved mechanical connector, conductor to equipment.

2.04 Ground Conductor - Conduit and Ducts

- .1 Provide appropriately sized stranded copper ground conductor in all non-metallic and flexible conduits and ducts.

PART 3 EXECUTION

3.01 Station Electrode and Ground Pad

- .1 Establish a ground electrode in accordance with Canadian Electrical Code. If soil conditions are such that ground rods cannot be installed, upon receiving a written request, the Engineer may permit the use of a plate electrode.
- .2 Incoming water line must be minimum 600mm below the finished grade and the underground portion must extend not less that 3m beyond the building extremities.

3.02 Connections

- .1 Use Penetrox "E" joint compound on all connections.
- .2 Make connections with Burndy Hyground compression fittings.
- .3 Ground all non-current carrying metal parts of electrical equipment.

3.03 Buried Ground Conductor

- .1 Bury ground conductor 300mm below final grade.

3.04 Branch Circuit Grounding Conductor

- .1 Circuits that are installed in conduit, or in direct buried conduit, shall have a ground conductor installed.
- .2 Where metallic conduit system is used as a grounding conductor, it shall have bonding jumpers where required and shall be continuously conductive.

DIVISION 26 – ELECTRICAL

SECTION 26 24 01 – SERVICE AND DISTRIBUTION

Table of Contents

PART 1	GENERAL.....	1
1.01	Service - General	1
1.02	Approved Manufacturers.....	1
1.03	Service Drawings	1
1.04	Inspection of Service Installation	1
1.05	Work by Electrical Utility	2
1.06	BC Hydro Safety Practices Regulation – Rule 520.....	2
PART 2	PRODUCTS	2
2.01	Secondary Duct.....	2
2.02	Drainage.....	2
2.03	S1, to BC Hydro	3
2.04	Pilaster	3
2.05	Panels	3
2.06	P3, to Chambers and 120 vac Work in the Chambers	3
2.07	Backfill Materials	4
PART 3	EXECUTION	4
3.01	Panel Boards.....	4

PART 1 GENERAL

1.01 Service - General

- .1 Provide service in accordance with requirements and standards of the electrical power utility (the Utility). On this project, this is BC Hydro.
- .2 All materials and equipment shall be approved by the above-named Utility.
- .3 Co-ordinate all work by the Utility.
- .4 Provide a 60 Amp, 120 / 240 Volt, single phase, 3 wire, DIP or underground service at each of 6 PRV stations. Station No. 7 has an existing service.
- .5 Provide all civil work for underground service including trenching, backfilling, pull boxes, junction boxes, drainage, concrete pads and mechanical protection of duct where required. Provide secondary duct, pilasters where required, service disconnect switches, meter bases, secondary conductor and all associated accessories where required.

1.02 Approved Manufacturers

- .1 All distribution equipment shall be of one approved manufacturer.
Approved manufacturers are: Eaton
 Schneider
 Square D
 Siemens
 Or approved equal.

1.03 Service Drawings

- .1 The scope of work is outlined in the tender drawings. The Utility may issue detail drawings to the Contractor. He shall do the work in accordance with these detailed drawings and the standard requirements of the Utility. If the Contractor is unfamiliar with their standards he shall acquire these standards prior to tender close, and base his price on these standards.
- .2 BC Hydro design drawings will be available approximately mid-February.
- .3 The list of BC Hydro project numbers for the various stations is Nos. 4062418, 4062439, 4062443, 4062452, 4062459 & 4062463.

1.04 Inspection of Service Installation

- .1 The Utility will inspect the service work to insure compliance with their standards.

1.05 Work by Electrical Utility

- .1 The Utility will supply and install:
 - a) Civil work and trenching as noted on the drawings.
 - b) Pad mount transformer if required at any locations.
 - c) Primary service conductor.
 - d) Utility meters.
 - e) Underground HV duct on public property.
- .2 The Utility will supply for installation by Contractor:
 - a) Fibreglass form for pilaster.
 - b) Precast concrete JB type 832 at Station No. 03.
 - c) Precast concrete pad for LPT at Station No. 03.

1.06 BC Hydro Safety Practices Regulation – Rule 520

- .1 Below is a copy of BC Hydro SPR Rule 520, written in late 2017 and implemented January 1, 2018 in the East Kootenays.

520 Civil infrastructure

These rules will only apply to new or existing civil infrastructure containing conductors or electrical equipment either energized or de-energized on BC Hydro's power system.

- 1 *BC Hydro workers shall only be assigned to, and carry out work for which they are qualified and authorized to perform.*
- 2 *Only BC Hydro qualified and authorized civil contractors may conduct work on BC Hydro civil infrastructure.*
- 3 *Work will be overseen by a Qualified Electrical Journeyman, whose responsibility will be to act as a safety watcher.*

Note: For work on Power Cables and Duct Banks refer to SPR 517.

PART 2 PRODUCTS

2.01 Secondary Duct

- .1 See section 26 05 20.

2.02 Drainage

- .1 Provide drainage of duct system in accordance with Utility standards.

2.03 S1, to BC Hydro

- .2 Provide 3 underground services as shown on the drawings to Stations 1, 2 and 3.
- .3 Provide 3 DIP services from BC Hydro overhead lines as shown on the drawings to Stations 4, 5 and 6.

2.04 Pilaster

- .1 Pour concrete pilaster at Primary Dip Pole. The Utility will supply fibreglass form for pilaster. Concrete shall be as described in previous civil section of the specification and to BC Hydro standards (ES54 Section M).
- .2 Run rigid steel conduit 150 mm up pole from pilaster. Cap and seal conduit. Utility will do all other work on the DIP pole.
- .3 Provide certified line contractor to support the poles while the pilaster is being placed.

2.05 Panels

- .1 Provide surface mounted 364 mm wide panelboards, complete with circuit breakers with characteristics as noted on panel schedules. Panels shall be as small as possible to maximize the available space in the kiosks.
- .2 Panels shall be complete with main breakers as noted on panel schedules.
- .3 Acceptable Panel manufacturers are:
 - Eaton
 - Siemens
 - Square D
- .4 Breakers shall be minimum 10,000 AIC bolt on type or stab-lock type.
- .5 Provide a surge protective device with the panel Square D SDSA1175.
- .6 Provide typed, as-built panel schedule inside panel door.

2.06 P3, to Chambers and 120 vac Work in the Chambers

- .1 From each station (Stns. No. 1 to 7) there is 120 vac power required for the sump pump receptacle and the light, plus a ground wire for bonding in the Chamber. Provide these circuits, P3, as indicated on the drawings between the stations and the Chambers.
- .2 Provide PJB2 as detailed on the drawings in each of the 7 Chambers.
- .3 Provide a 20 amp "T" duplex receptacle and wiring from PJB2 in Stations 1 to 7 for connection of the sump pumps. Include final connection and testing of the sump pump.
- .4 Provide a light and wiring from PJB2 in each of the 7 chambers. The light shall be "Type B" a Standard LED vapour tight luminaire, order code 63370. The luminaire has a frosted polycarbonate lens, 120vac rated, 6800 lumen output, 75 watt input, suitable for wet locations and have an average life of 50,000 hours.

2.07 Backfill Materials

- .1 Trench backfill materials shall consist of granular material, which is free from stones larger than 150 mm, and relatively free from organic material. It shall contain no frozen soil, roots, or other objectionable material in quantities that might cause damage, excessive settlement or inadequate compaction.
- .2 Where native material is unacceptable for backfill purposes, the Engineer will direct the Contractor to dispose of the unsuitable material in designated on-site disposal areas, and to provide imported granular backfill. This imported backfill shall be an acceptable pitrun material free from stones larger than 150 mm organic, stumps, logs, peat, clay, silt and any material which cannot be compacted.
- .3 All duct, conduit and cable shall have a minimum of 75 mm of screened sand above and below.

PART 3 EXECUTION

3.01 Panel Boards

- .1 Provide spare circuit breakers as noted for future use.
- .2 Ensure the circuit breakers are a reasonable height within the kiosk to be readily operated.
- .3 There is an existing panelboard at Station No. 7, manufacturer's information is provided on the drawings to allow for purchase of 2 new GFCI breakers.

DIVISION 26 – ELECTRICAL

SECTION 26 27 16 – KIOSK

Table of Contents

PART 1	GENERAL	1
1.01	General	1
1.02	Co-ordination.....	1
1.03	Dimensions	1
1.04	Shop Drawings.....	1
1.05	Standards.....	2
PART 2	PRODUCTS	2
2.01	Construction Materials	2
2.02	Fabrication	3
2.03	Kiosk Construction	3
2.04	Finishes – Shop Coating.....	4
2.05	Kiosk Equipment	5
PART 3	EXECUTION	6
3.01	General	6
3.02	Junction Boxes.....	6
3.03	Equipment Shipped Loose.....	6

PART 1 GENERAL

1.01 General

- .1 This section includes the supply, delivery, installation and testing of the complete kiosk.
- .2 The kiosk shall be manufactured by a CSA Certified and approved panel shop. Steelwork shall be done by a fabricating shop with experience in manufacturing similar equipment.
- .3 All equipment and wiring shall be CSA approved.

1.02 Co-ordination

- .1 The contractor shall use a cardboard template for the kiosk, showing locations of anchor bolt holes and conduits, for positioning by the installation contractor.
- .2 The contractor shall co-ordinate delivery times, dates and location with the Engineer and installation contractor.

1.03 Dimensions

- .1 Dimensions shown on the drawings are minimum dimensions. The contractor may supply a larger kiosk where the increased size is required to fit equipment contained therein.
- .2 The kiosks are located in residential areas the kiosks have been designed to be as compact as possible and still include a practical amount of equipment mounting space.

1.04 Shop Drawings

- .1 Provide complete shop drawings of the structure and all components to be mounted therein.
- .2 Clearly indicate outside dimensions, size and location of all openings and banding.
- .3 Shop drawings shall include at least the following information items under this section:
 - a) steel gauge thickness
 - b) dimensions
 - c) coating
 - d) mounting details

1.05 Standards

- .1 Unless specified otherwise herein, the following standards (most recent editions) apply to the fabrication work:
- a) Welding Qualification Code, CSA W47, performed only by qualified operators.
 - b) Electrodes to appropriate CSA W48.
 - c) CSA S136 - Design of Light Gauge Steel Structural Members.

PART 2 PRODUCTS

2.01 Construction Materials

- .1 General
- a) All materials shall be new.
 - b) Replace steel which is rust pitted, bent or otherwise defective without extra cost.
 - c) All steel shall be cleaned prior to galvanizing in accordance with CSA S16 and Steel Structures Painting Council Manual. (Where galvanizing is required.)
- .2 Steel
- a) Conforming to CSA Standard G40.21M - Grade 350W.
 - b) Hot rolled steel sheet shall be to ASTM A570.
 - c) Cold rolled steel sheet shall be to ASTM A611.
- .3 Miscellaneous Fasteners
- a) Where anchors, lifting hooks, screws, bolts, nuts, washers, hangers and other fasteners are not specifically shown or specified, provide such items with at least the strength and corrosion resistance properties of the metal fabrication for which they are required.
 - b) Welding Materials to CSA W48.1.
 - c) Rubber for fastening to metal pipe support clamps and other uses shall be hard neoprene (40-50 Durometer).
 - d) Bond rubber to various items, as required, with Acro Bond adhesive.
 - e) Shear studs: ASTM A108.
 - f) Anchor bolts to ASTM A328.
- .4 Heavy Duty Stainless Steel Expansion Anchors
- a) Anchors (sizes M8 through M20): Heavy duty expansion anchor complete with compatible nut and washers; 316 stainless steel; minimum yield strength 450MPa, Hilti HSL Heavy Duty Anchors or approved equal.
- .5 High Strength Mild Steel Bolts
- a) Bolts: high strength to ASTM A325M.
 - b) Nuts: heavy hexagonal to ASTM A563M, Grade C3 or DH3. Imperial

- bolts may be substituted for metric bolts.
- c) Washers for bolted connections: hardened steel washers conforming to ASTM F436.
 - d) Galvanizing: where indicated bolts, nuts and washers shall be hot-dip galvanized in accordance with ASTM A153. Galvanized bolts shall be Type 1 with a minimum zinc coating of 50 microns (2 mils).
 - e) Bolts or studs used as anchors: provide 75 x 75 x 10mm steel plate welded to the bolt head or stud.

2.02 Fabrication

.1 General

- a) Verify all dimensions prior to preparing shop drawings or to proceeding with shop work fabrication.
- b) Supply components required for proper anchorage of all metal fabrication
- c) Wherever overlapping or contacting surfaces cannot be avoided, completely seal weld these surfaces. Rusting or deterioration of finish in such areas will require remedial seal welding and refinishing.
- d) Fabricate the work true to dimensions, plumb and square. Accurately fit members with hairline joints, and join using adequate fastening.
- e) Construct finished work free from distortion and defects detrimental to appearance and performance.
- f) File or grind exposed welds smooth and flush. Do not leave grinding marks. Construct internal and external corners with sharp lines. Provide continuous welds unless otherwise approved by the Engineer in writing.
- g) Remove weld spatter and slag. After finish grinding and smoothing welds, passivate welds with pickling paste.
- h) Preheat members thicker than 19mm before welding.
- i) Band all holes for piping, valve access, etc.
- j) Countersink exposed fastenings, where such are approved in writing, and make as inconspicuous as possible with bolts cut off flush with nuts. Construct fastenings of the same material and finish as the base material on which they occur.

2.03 Kiosk Construction

- .1 Kiosk shall be 12 gauge sheet steel welded construction with bracing as required and with edges and welds ground smooth.
- .2 Kiosk shall be free standing. Provide heavy duty formed steel angle and channel framing. Kiosk shall be mounted on a formed steel channel base on all four sides complete with:

- a) pre-drilled 16mm holes for anchor bolts (eight required, provide 10mm Hilti Kwik bolts to suit).
 - b) drainage holes to ensure that water cannot accumulate within the channel.
 - c) The kiosk shall be provided with a minimum of 25.4mm of rigid insulation on all interior surfaces, including behind the kiosk's back panel. The insulation shall be fire proof and have a clean exterior surface such as foil that prevents shedding of particles to contaminate the interior of the kiosk.
- .3 Doors shall have minimum three hinges, concealed inside when doors are closed. There shall be 2 doors closing in the center at a center support.
 - .4 Doors shall be suitable for padlocking in the closed position. Locking hasps shall be vandal resistant and recessed, so that hasps and locks cannot be struck by a vertical swing and cannot be cut with a standard hacksaw.
 - .5 Kiosk doors shall be gasketed for dust resistance.
 - .6 Kiosk shall be weatherproof. Provide minimum 75mm overhang on the slightly peaked or sloped steel roof. Provide gutters over all doors and openings.
 - .7 Kiosk shall be suitable for bottom entry of conduits and both sides shall have a ground lug. Ground lugs shall be connected to the system ground and ground rods.
 - .8 Kiosk shall be complete with rear mounting panels.
 - .9 Kiosk shall be sandblasted, degreased, primed and painted as described below under Finishes - Shop Coating.

2.04 **Finishes – Shop Coating**

- .1 Rough Edges and Mill Scale
Following completion of fabrication of any item, grind rough edges straight and finish smooth. Remove mill scale and rust.
- .2 Shop Coating NOTE: DFT = Dry Film Thickness
 - a) - apply using acceptable low loss method
 - commercially sandblast all surfaces to SSPC SP6 prior to application
 - one base coat of epoxy zinc rich primer. DFT=1.5 to 2 mils
 - one intermediate coat of polyamide high build epoxy. DFT=4 to 6 mils
 - one top coat of aliphatic polyurethane. DFT=2 to 3 mils
 - b) Colours - green outside, white inside.
- .3 Provide green and white touch-up paint of same type as above.
- .4 Alternate coating systems may be used upon approval by the Engineer.

2.05 Kiosk Equipment

Provide a complete kiosk as shown on the drawings complete with equipment as listed below:

- .1 Provide NEMA 12 / 13 Enclosure - Hammond Cat. No. as indicated on the Bill of Materials on sheet E11 for the Control Panel. The control panels for Stations 1 to 6 shall be provided by the Contractor.
 - a) The Control Panel at Station No. 7 is existing and the Contractor connects field wiring into the existing panel.
- .2 Kiosk heater shall be a Chromalox 500 watt, 120 vac pump house heater complete with built-in thermostat set at 3 degrees C. Provide model CPHH-50011 or approved equal.
- .3 Kiosk luminaire "Type A" shall be a Standard LED striplight, order code 65034 or equal. The luminaire shall be 120 vac rated, 2600 lumen output, 20 watt input, suitable for surface mounting and low temperatures and have an average life of 100,000 hours.
- .4 Meter base shall be Thomas & Betts Microelectric Cat. No. BS2-TCVBC or equal, approved for use with a BC Hydro service. The services will be 60 amp, 120/240vac, single phase 3 wire, in a 78mm duct from underground.
- .5 Provide a load centre as described on the drawings and other sections of Division 26.
- .6 Provide a 20 amp duplex T slot receptacle in the kiosk. Provide Leviton or Hubbell commercial grade.
- .7 Provide Leviton or Hubbell commercial grade light switches for the kiosk and chamber lights.
- .8 Provide junction boxes PJB1 and CJB1 as described on the drawings.
- .9 Flow indicating transmitters shall be installed in each of the kiosks. There shall be an FIT1 in each of the 6 kiosks and in Station No. 1 and 4 there will be a second FIT2. (Include the equipment cost for the flow indicating transmitters with the pricing for the flowmeter, as described in other sections of these documents).
- .10 Provide ventilation openings on each side at the top and bottom for some natural cooling during the summer. Provide removable covers for these vents that can be replaced in the winter to reduce cold air influx.
- .11 Provide integral mounting brackets on the side of the kiosk for an antennae mast.
- .12 Provide an antennae mast at each of the 6 kiosks, the mast shall be a 6 meter long section of schedule 40 rigid steel pipe. (The antennae and mounting will be by others).

PART 3 EXECUTION

3.01 General

- .1 Obtain exact dimensions of all equipment to go into kiosk. Prepare shop drawings and submit for approval.
- .2 Do not begin kiosk construction until shop drawings are approved.

3.02 Junction Boxes

- .1 Label all power and control conductors in junction boxes. Use tubular plastic markers or other approved marking system.

3.03 Equipment Shipped Loose

- .1 The contractor shall ship the following items loose:
 - a) anchors
 - b) touch up paint
- .2 The contractor shall package the equipment above in one container and ship with the kiosk. (One kiosk per container, or if multiple are shipped together then each shall be individually protected from damage).
- .3 All components subject to damage from handling or exposure to weather shall be suitably packaged.

DIVISION 26 – ELECTRICAL

SECTION 26 70 00 – CONTROLS AND INSTRUMENTATION

Table of Contents

PART 1	GENERAL	1
1.01	Scope of Work	1
1.02	General Requirements	1
1.03	Standards	2
PART 2	PRODUCTS	2
2.01	C2 and C3 between the Stations and Chambers	2
2.02	Control Panel	2
2.03	Pressure Transmitters	3
2.04	Magnetic Flow Meter	3
2.05	Sump Pump Station Flood Alarm	4
2.06	PRV Position Indication	4
2.07	Control Valve Solenoid and Limit Switches	4
PART 3	Execution	5
3.01	Controls and Instrumentation in the Chambers	5
3.02	Flow Meter	5
3.03	Testing and Commissioning	5

PART 1 GENERAL

1.01 Scope of Work

- .1 The Contractor shall supply and install the following equipment and systems:
 - a) Control panel & accessories
 - b) Pressure transmitters & accessories
 - c) Flow meters & accessories
 - d) Sump pump station flood alarm
 - e) PRV position indication
 - f) Control Valve solenoid and position limit switches
 - g) All associated junction boxes with terminals and wiring.

1.02 General Requirements

- .1 All devices shall be designed for continuous operation. Field located devices shall be suitable for continuous operation in a wet atmosphere.
- .2 Provide, except where otherwise specified, the materials of construction necessary for satisfactory operation on the service specified. Any changes from specified materials must be approved by the Engineer in writing.
- .3 All instruments shall be factory calibrated to values stated in the documents, or as determined from process requirements.
- .4 All instruments and devices on panel fronts and all devices in the panel rear shall be identified by a lamoid legend plate or nameplate.
- .5 All process equipment packages which include control devices must provide interconnection and termination systems between all devices and equipments of the vendor's supply. This shall include, but not be limited to interconnecting tubing, piping and fittings, terminal strips for field connections, bulkhead plates for cable and piping terminations, local controls, block or isolation valves and all other control accessories as would normally be required on such an installation. Such installations must comply with applicable codes of good practice to ensure sound, reliable operation when installed. The supplier shall provide detailed installation instructions to the Contractor. This shall include wiring and mechanical drawings showing equipment installation in pipe.
- .6 The Contractor shall provide complete sets of internal and external wiring diagrams, trouble-shooting data and calibration manuals for each device supplied.
- .7 All instruments requiring AC power supply shall be for 120 Volts, 1 phase, 60 Hertz.

- .8 All instruments requiring 24vdc will be powered from a power supply in the control panel.

1.03 Standards

- .1 Equipment shall be CSA approved where standards have been established by that agency.

PART 2 PRODUCTS

2.01 C2 and C3 between the Stations and Chambers

- .1 C2 and C3 shall be 2 x 78 mm ducts complete with wiring as indicated on the drawings and for Stations 1 and 4 there is a second flow meter with a dedicated cable running to the FIT2 in the kiosk plus a solenoid control valve with limit switches. Provide C2 and C3 as indicated.
- .2 C2 and C3 at Stations 2, 3, 5 and 6 shall be 2 x 78 mmm ducts complete with the wiring indicated on the drawings. The Contractor shall provide C2 and C3 as indicated.
- .3 Station 7 is a flow metering station, provide C2 as indicated on the drawings.
- .4 The Contractor shall ensure the dedicated flow meter cables between the flow element and flow indicating transducers are of sufficient length. Connect control cables in the kiosk and at CJB2 as indicated on the drawings.

2.02 Control Panel

- .1 Complete Bill of Materials and dimensions for the panel are on the contract drawings for Stations 1 to 6. Contractor shall be responsible for checking wiring and dimensional details of actual components supplied to insure proper assembly and wiring.
- .2 The control panel in Station No. 7 is existing, the Contractor shall provide field wiring as indicated to the control panel.
- .3 All instrument wiring shall be shielded.
- .4 Provide separate overcurrent protection for control power going to or from the SCADA.
- .5 Shop drawings shall show any changes required to comply with .1.

2.03 Pressure Transmitters

- .1 Pressure transmitters shall provide an operating range of 0-150PSI.
- .2 Input and Output characteristics shall be as follows:
 - Supply voltage of 24 volts DC
 - Maximum supply voltage effect of .005% for each 1 volt change within the specified supply voltage requirements.
 - Maximum external load resistance of 500 ohms at 24 VDC.
 - 4 to 20 mA output
 - Complete with field indicator.
- .3 Approved models include:
 - Rosemount model 2088G2S22A1M5C6
 - 2088: Pressure Transmitter
 - G: Transmitter Type: Gauge
 - 2: Pressure Range: -14.7 to 150 PSI
 - S: Material Construction: 316L SST / Silicone Fill
 - A: Process Connection: ½-14 NPT Female
 - 1: Conduit Thread: 1/2-14 NPT
 - M5: LCD Display, Configured for Engineering Units
 - C6: CAS Explosion Proof: Intrinsically Safe, and Non-Incendive
 - Approved equal

2.04 Magnetic Flow Meter

- .1 Details of each flow meter required is provided as ITEM 4 on the supplementary specification drawings. (See civil drawing 1 to 21 for each station with item 4 on the site plan providing general details and the following sheet of each station providing further details).
- .2 Each flow meter shall be set for a 0-200L/s operating range.
- .3 Provide the following accessories:
 - a) Component Cable Kit

The component cable shall be run from the transmitter in the kiosk to the element in the chamber. A length of 150 feet for stations 01 to 06 has been specified (Station 01 and 04 will require 2 cables, one for each flow element). Confirm 150 feet is adequate at each station prior to placing order.
Cable kit model number: Qty (150) 08732-0065-0001

For Station 7, the Bear Paw Cres. station a length of 100 meters (330 feet) will be required

Cable kit model number: Qty (330) 08732-0065-0001

- .4 Complete dimensional prints, electrical schematics and technical literature for the magnetic flow meter, transmitter and associated components shall be submitted for the Engineer's approval prior to manufacture.
- .5 Supplier of the flow meter shall provide an experienced field technician for start-up and calibration of the flow meter and associated instrumentation.
- .6 Bond the grounding system to the flow meter grounding rings per manufacturers' instructions.

2.05 Sump Pump Station Flood Alarm

- .1 Approved models include:
 - The sump pump station flood alarm shall be provided by Coast Water Systems and shall be part number 20MANWENO.
 - Approved equal

2.06 PRV Position Indication

- .1 Approved models include:
 - The PRV position indicators shall be provided by Spartan Controls and shall be model X117D.
 - Approved equal

2.07 Control Valve Solenoid and Limit Switches

- .1 The Solenoid shall be powered by 24VDC.
2. Approved models include:
 - The limit switches shall be provided by Spartan Controls and shall be part number X105L2W.
 - The solenoid shall be provided by Spartan Controls and shall be model 8320G136.
 - Approved equal

PART 3 Execution

3.01 Controls and Instrumentation in the Chambers

- .1 The Contractor shall provide all controls and instrumentation in the Chambers as indicated on the drawings including all interconnecting wiring.
- .2 Ensure all accessories for monitoring, controls and alarms are included as part of the instrumentation and monitoring equipment called up on the civil drawings.

3.02 Flow Meter

- .1 Flow element shall be installed in the chamber with the transmitter installed in the kiosk.
- .2 The component cable shall be run from the transmitter in the kiosk to the element in the chamber.
- .3 Contactor shall ensure the new flowmeter device and piping is grounded per the manufacturer's installation instructions.

3.03 Testing and Commissioning

- .1 Provide testing and commissioning reports as indicated in other sections of the specification.