

MEMORANDUM

Date: December 13, 2016
To: Phil Stewart – City of Nanaimo
cc: Jayson Walker – Urban Systems
From: Steve Brubacher/Greg Smith
File: 1296.0046.01
Subject: Nanaimo Multiplex – Front Street Roads and Utility Evaluation

As requested we have completed an evaluation of the proposed Front Street location for the Nanaimo Multiplex with a focus on:

1. Road improvements on Front Street
2. Relocation of the Regional District of Nanaimo Trunk Sanitary Sewer
3. Relocation of the Storm Sewer

The purpose for this memo is to outline our assumptions that feed into the drawings and cost estimates that have been attached.

1.0 Road Improvements

We have prepared an updated road layout based on the plan developed through Port Drive Master Plan work, allowing on-street transit stops in both directions along Front Street. While the ultimate road works fronting the site may differ, this concept width can accommodate a range of road cross section elements depending on requirements.

The Front Street corridor consists of 2 –3.4m lanes, a 3.2m centre left turn lane/median, 3.0m bus parking on each side, a 4.0m sidewalk on the north side, a 3.0m passenger landing area and 3.0m sidewalk on the south side. The plan includes a single lane roundabout where Front Street currently veers north. The roundabout facilitates traffic movements in all 4 directions however the attached cost estimate only includes allowances for the roundabout and the south leg. The south leg access to the dock ramp area consists of 2 – 3.4m lanes, a 3.2m flush centre median, 1.5m on-road bike lanes and 2.4m parking bays on both sides, a 3.0m sidewalk on the west side and a 5.0m multi-use path on the east side.

To establish boundaries for the site development, we have developed the Front Street layout by working off the existing Front Street road allowance. We have also assumed a 1.0m offset from back of sidewalk to define the Right of Way on the north and east sides of the development parcel. Access to the site has been provided via an entrance off of Front Street, just east of Esplanade. No access has been provided to the site via the south leg road. There have also been no allowances made for roadways on the south and west sides of the site. We have assumed that all internal site circulation will be the responsibility of the development and is not provided via dedicated City road allowance.

A conceptual plan layout as well as a conceptual profile for the South Leg roadway has been developed at this time. Grading impacts beyond the defined Right of Way have not been identified. Therefore, it is assumed at this time that all grading allowances necessary to match the road cross section at a location 1.0m beyond back of sidewalk will have to be accommodated within their site. We have also assumed that utilities will be located within the proposed Right of Way, either under the road pavement or below sidewalk. If designated utility corridors are required, the proposed Right of Way will have to be adjusted accordingly.

The cost estimate provided includes the following assumptions:

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- Full depth pavement reconstruction is required on Front Street to accommodate the revised road cross section and to allow for any re-profiling of the road to best suit the development site grading
- Full depth pavement consists of 75mm hot mix asphalt, 100mm – 25mm Well Graded Base, 250mm Select Subgrade Material
- Bus parking areas have the same pavement structure as the road and do not include concrete pads
- Multi-use path consists of 75mm hot mix asphalt and 150mm – 19mm Well Graded Base
- Allowances have been included for utility relocations and for new street lighting

2.0 RDN Trunk Sanitary Sewer

We have evaluated three routing alternatives for the trunk sewer relocation as shown on the attached figures. Two alignment options (1A and 1B) utility Front Street while Option 2 runs east of the site.

The existing RDN trunk sanitary sewer is a 1.1m x 1.5m box culvert that was installed in 1975. According to the record drawings the design capacity of this trunk sewer is 41.4 million gallons/day. What is not clear is if this imperial gallons (2178 l/s) or US gallons (1813 l/s) however for the purpose of this assignment we have assumed it is imperial gallons. The box culvert is installed at a slope of 0.044% and has been designed to operate surcharged at full capacity with a hydraulic grade line slope of 0.12%. The drop in elevation of the invert of this pipe is 0.05m between the two proposed tie in locations. Due to this minimal grade drop available it is necessary to install a box culvert with the same vertical height. With the proposed routes for relocation the pipeline length increases and this requires that a box culvert ~1.1m x 3.0m be installed in order to preserve a similar hydraulic capacity. Given the very limited grade changes it will be important to survey the actual inverts prior to proceeding further in order to confirm that the as built information is still correct.

A geotechnical report prepared by EBA on February 20, 2012 indicates that bedrock can be found at an elevation ranging between 0m and -2m. Since this report has not been prepared for a pipeline installation no recommendations are provided for bearing capacity for this type of sewer or of trench excavation slopes. For the purpose of this analysis we have assumed excavation to bedrock is required and trench slopes can be maintained at 1:1.

Nanaimo has also had environmental assessment work completed for this site and has advised for the purpose of this estimate to assume the material within the pipe zone and below the pipe should be removed and disposed of site and that the remainder of the trench zone can be assumed to be reused native material. We have included an assumed removal and disposal cost of \$125/tonne (\$200/m³) for the soil assuming it may be contaminated.

For Option 1A and 1B we have assumed that the existing City sewer will be intercepted and tied into the relocated trunk on Front Street. For the box culvert very minimal grade exists. Due to this minimal slope and the size of the box culvert we recommend that further consideration be given to a low flow notch in order to ensure cleansing velocities can be obtained on a daily basis. We have included the provision for lining the box culvert and manholes with PVC/HDPE to avoid hydrogen sulphide attack. Option 1A and 1B will likely undermine the existing water line and as such we have included the removal and replacement of this line and the installation of a temporary water line during the installation of the sewer line.

For Option 2 the cover is very minimal (~0.3m) in one location. Topographic survey will be needed if this option is pursued to confirm the ground elevations and also determine if additional cover can be added.

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Approximate excavation limits have been illustrated on the drawings.

3.0 Storm Sewer

For the storm sewer the existing pipe is understood to be a 450-600mm, however record drawings do not exist and grades cannot be confirmed. As such it would be good to survey the storm sewer line to confirm size and grade prior to moving forward with this site. We have assumed that the storm sewer will be replaced with a 525mm-600mm line however a catchment analysis is recommended to confirm the appropriate size for this pipe.

4.0 Cost Estimates

Attached please find conceptual Class D cost estimates that have been prepared for the purpose of assisting the City in evaluating alternative sites for the Multi Plex. They have been completed without survey or specific geotechnical investigations and as such carry a 30% contingency.

Sincerely,

URBAN SYSTEMS LTD.



Greg Smith, P.Eng.
Transportation Engineer

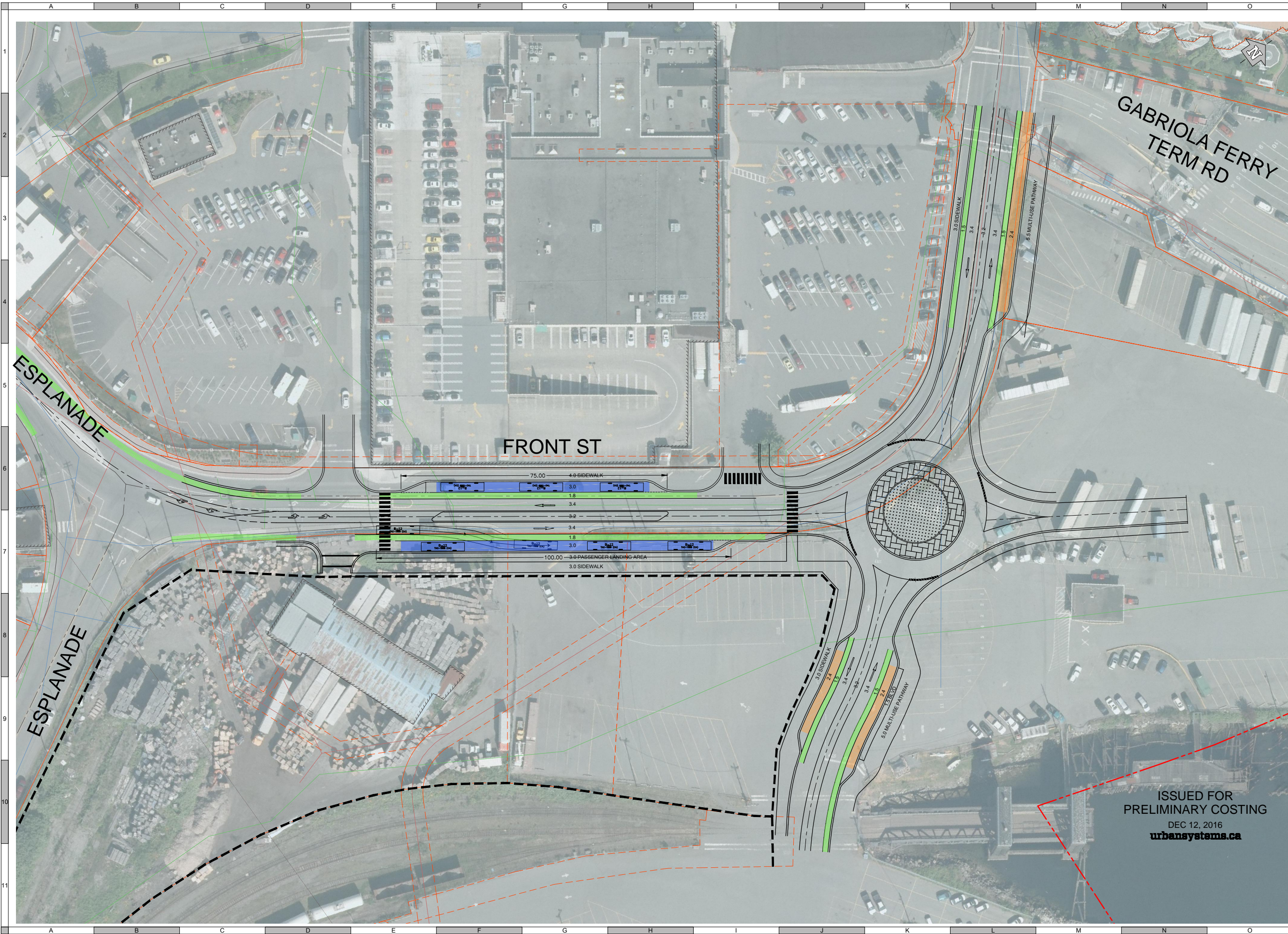


Steve Brubacher, P.Eng.
Water Engineer

/sb
Enclosure

cc: Jayson Walker – Urban Systems

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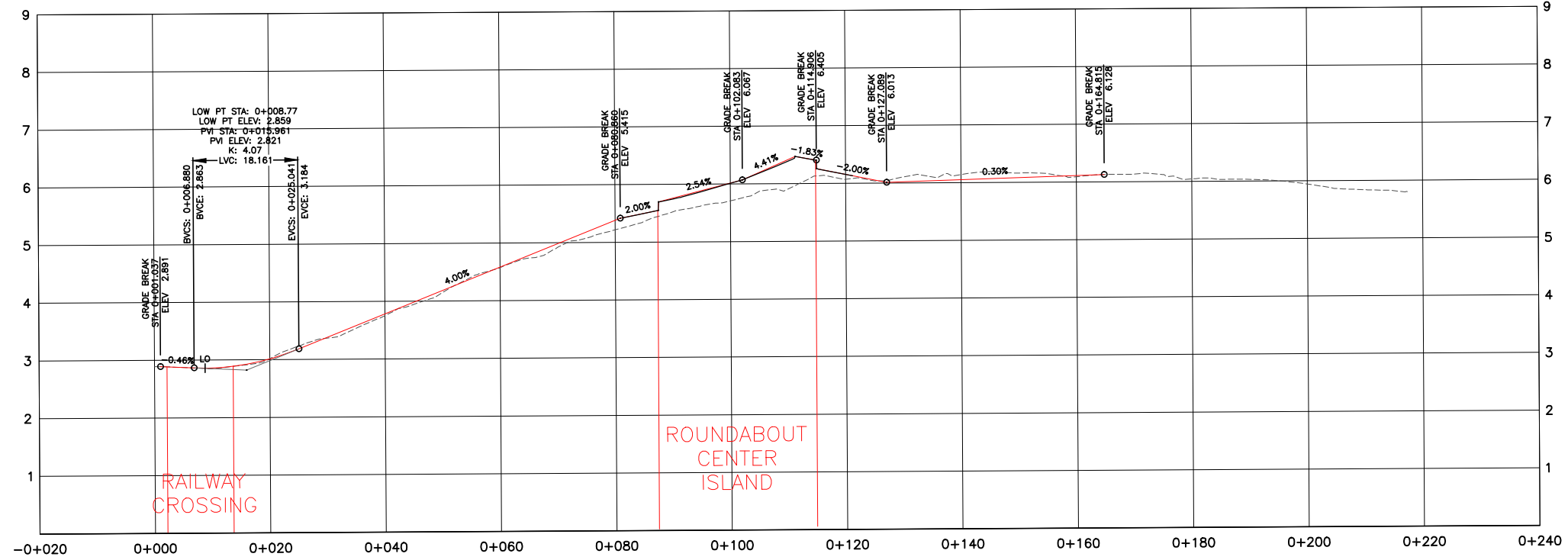
Quality Control by G.S.
Designed by R.M.
Drawn by M.N.

CITY OF NANAIMO
NANAIMO - PORT DRIVE
ROUNDABOUT - OPT 1 - DT TRANSIT HUB

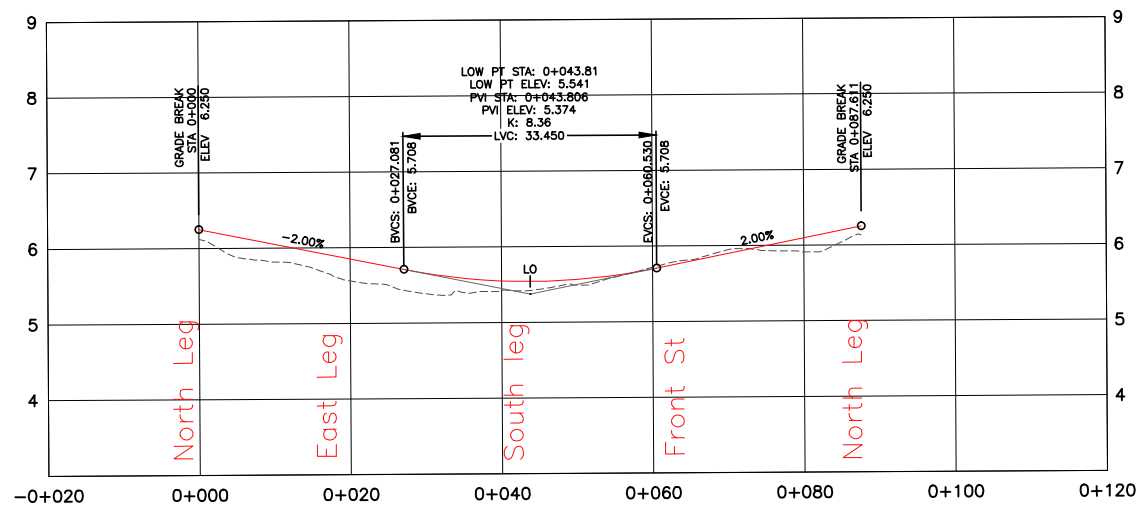
Sheet Number 1 of 2
Project Number Drawing Number Revision
1296.0046.01 R 01

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L200- ROUNDAABOUT INNER CURB



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Quality Control by	G.S				
Designed by	R.M				
Drawn by	M.N				

CITY OF NANAIMO
 NANAIMO - PORT DRIVE
 PROFILE

Sheet Number 2 of 2
 Project Number Drawing Number Revision
 1296.0046.01 R 02

CONCEPTUAL COST ESTIMATE
Schedule of Approximate Quantities and Unit Prices

FRONT ST

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
01	SECTION 1 - GENERAL				
01.01	Mobilization	L.S.	1	\$20,000	\$20,000
01.02	Traffic Management & Detour	L.S.	1	\$20,000	\$20,000
01.03	Quality Management	L.S.	1	\$15,000	\$15,000
01.04	Provisional Sum for Site Modifications	L.S.	1	\$15,000	\$15,000
02	SECTION 2 - GRADING				
02.02	Pavement Removal				
02.02.01	Pavement Cutting	m	200	\$8	\$1,600
02.02.02	Removal of Asphalt Pavement	m ²	2,400	\$10	\$24,000
02.02.03	Pavement Milling (50mm depth)	m ²	200	\$25	\$5,000
02.02.04	Removals	L.S.	1	\$20,000	\$20,000
02.03	Roadway and Drainage Excavation				
02.03.02	Type D Excavation	m ³	2,000	\$20	\$40,000
02.04	Granular Surfacing, Base and Sub-Base				
02.04.01	25mm Well Graded Base	m ³	400	\$65	\$26,000
02.04.02	Select Granular Subbase	m ³	900	\$55	\$49,500
03	SECTION 3 - PAVING				
03.01	Emulsified Primer & Tack Coat				
03.01.01	Supply Primer and Tack Coat	L	850	\$2.50	\$2,125
03.02	Asphalt Pavement				
03.02.01	Class 1 Medium Mix Asphalt	Tonne	650	\$250	\$162,500
03.03	Pavement Markings				
03.03.01	Painted Pavement Markings (White Solid and Continuity Lines)	L.S.	1	\$3,000	\$3,000
04	SECTION 4 - SIGNING				
04.01	Traffic Signs				
04.01.01	Perforated Square Steel Sign Post Structures	Each	20	\$300	\$6,000
05	SECTION 5 - CURB				
05.01	Median curb	m	140	\$110	\$15,400
05.02	Median concrete cap	m ²	185	\$75	\$13,875
05.03	Sidewalk	m ²	600	\$75	\$45,000
05.04	Curb and Gutter	m	375	\$70	\$26,250
06	SECTION 6 - LANDSCAPING				
06.01	Landscaping	LS	1	\$15,000	\$15,000
07	SECTION 7 - DRAINAGE				
07.01	Miscellaneous Storm Drainage	LS	1	\$10,000	\$10,000
08	SECTION 8 - SANITARY TRUNK SEWER				
08.01	See separate summary of options				\$0
09	SECTION 9 - UTILITY RELOCATION				
09.01	Utility relocates	LS	1	\$25,000	\$25,000
10	SECTION 10- ELECTRICAL				
10.01	Street lighting	LS	1	\$50,000	\$50,000
	Subtotal (rounded)				\$610,000.00
901.00	Contingency (30%)				\$ 185,000.00
902.00	Engineering (15%)				\$ 120,000.00
903.00	Materials Supplied by MoTI				\$ -
904.00	Miscellaneous				\$ -
	CONCEPTUAL COST ESTIMATE				\$915,000

CONCEPTUAL COST ESTIMATE
Schedule of Approximate Quantities and Unit Prices

ROUNDABOUT					
Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
01	SECTION 1 - GENERAL				
01.01	Mobilization	L.S.	1	\$18,000	\$18,000
01.02	Traffic Management & Detour	L.S.	1	\$18,000	\$18,000
01.03	Quality Management	L.S.	1	\$15,000	\$15,000
01.04	Provisional Sum for Site Modifications	L.S.	1	\$15,000	\$15,000
02	SECTION 2 - GRADING				
02.02	Pavement Removal				
02.02.01	Pavement Cutting	m	200	\$8	\$1,600
02.02.02	Removal of Asphalt Pavement	m ²	1,200	\$10	\$12,000
02.02.03	Pavement Milling (50mm depth)	m ²	200	\$25	\$5,000
02.02.04	Removals	L.S.	1	\$10,000	\$10,000
02.03	Roadway and Drainage Excavation				
02.03.02	Type D Excavation	m ³	1,000	\$20	\$20,000
02.04	Granular Surfacing, Base and Sub-Base				
02.04.01	25mm Well Graded Base	m ³	200	\$65	\$13,000
02.04.02	Select Granular Subbase	m ³	500	\$55	\$27,500
03	SECTION 3 - PAVING				
03.01	Emulsified Primer & Tack Coat				
03.01.01	Supply Primer and Tack Coat	L	450	\$2.50	\$1,125
03.02	Asphalt Pavement				
03.02.01	Class 1 Medium Mix Asphalt	Tonne	350	\$250	\$87,500
03.03	Pavement Markings				
03.03.01	Painted Pavement Markings (White Solid and Continuity Lines)	L.S.	1	\$2,500	\$2,500
04	SECTION 4 - SIGNING				
04.01	Traffic Signs				
04.01.01	Two post signs for roundabout	Each	4	\$2,500	\$10,000
04.01.02	Perforated Square Steel Sign Post Structures	Each	20	\$300	\$6,000
05	SECTION 8 - CURB				
05.01	Truck apron	m ²	310	\$250	\$77,500
05.02	Median curb	m	240	\$110	\$26,400
05.03	Splitter Island	m ²	200	\$75	\$15,000
05.04	Sidewalk	m ²	650	\$75	\$48,750
05.05	Curb and Gutter	m	360	\$70	\$25,200
06	SECTION 6 - LANDSCAPING				
06.01	Landscaping	LS	1	\$5,000	\$5,000
07	SECTION 7 - DRAINAGE				
07.01	Miscellaneous Storm Drainage: See separate summary for storm relocation	LS	1	\$10,000	\$10,000
08	SECTION 8 - TRUNK SANITARY SEWER				
08.01	See separate summary of options				
09	SECTION 9 - ELECTRICAL				
09.01	Street Lighting	LS	1	\$40,000	\$40,000
10	SECTION 10- UTILITY RELOCATION				
10.01	Utility relocates	LS	1	\$5,000	\$5,000
	Subtotal (rounded)				\$515,000.00
901.00	Contingency (30%)				\$ 155,000.00
902.00	Engineering (15%)				\$ 100,000.00
903.00	Materials Supplied by City of Nanaimo				\$ -
904.00	Miscellaneous				\$ -
	CONCEPTUAL COST ESTIMATE				\$770,000

CONCEPTUAL COST ESTIMATE
Schedule of Approximate Quantities and Unit Prices

SOUTH LEG

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
01	SECTION 1 - GENERAL				
01.01	Mobilization	L.S.	1	\$7,000	\$7,000
01.02	Traffic Management & Detour	L.S.	1	\$7,000	\$7,000
01.03	Quality Management	L.S.	1	\$5,000	\$5,000
01.04	Provisional Sum for Site Modifications	L.S.	1	\$5,000	\$5,000
02	SECTION 2 - GRADING				
02.02	Pavement Removal				
02.02.01	Pavement Cutting	m	50	\$8	\$400
02.02.02	Removal of Asphalt Pavement	m ²	1,000	\$10	\$10,000
02.02.03	Pavement Milling (50mm depth)	m ²	100	\$25	\$2,500
02.02.04	Removals	L.S.	1	\$5,000	\$5,000
02.03	Roadway and Drainage Excavation				
02.03.02	Type D Excavation	m ³	500	\$20	\$10,000
02.04	Granular Surfacing, Base and Sub-Base				
02.04.01	25mm Well Graded Base	m ³	125	\$65	\$8,125
02.04.02	Select Granular Subbase	m ³	250	\$55	\$13,750
03	SECTION 3 - PAVING				
03.01	Emulsified Primer & Tack Coat				
03.01.01	Supply Primer and Tack Coat	L	300	\$2.50	\$750
03.02	Asphalt Pavement				
03.02.01	Class 1 Medium Mix Asphalt	Tonne	200	\$250	\$50,000
03.03	Pavement Markings				
03.03.01	Painted Pavement Markings (White Solid and Continuity Lines)	L.S.	1	\$1,500	\$1,500
04	SECTION 4 - SIGNING				
04.01	Traffic Signs				
04.01.01	Perforated Square Steel Sign Post Structures	Each	6	300	\$1,800
05	SECTION 5 - Curb and Sidewalk				
05.01	MUP	m ²	350	\$45	\$15,750
05.02	Sidewalk	m ²	200	\$75	\$15,000
05.03	Curb and Gutter	m	175	\$70	\$12,250
06	SECTION 6 - LANDSCAPING				
06.01	Landscaping	LS	1	\$5,000	\$5,000
07	SECTION 7 - DRAINAGE				
07.01	Miscellaneous Storm Drainage: See separate summary for storm relocation	LS	1	\$25,000	\$25,000
08	SECTION 8 - TRUNK SANITARY SEWER				
	See separate summary of options				
09	SECTION 9 - UTILITY RELOCATION				
08.01	Utility relocates	LS	1	\$5,000	\$5,000
09	SECTION 10 - ELECTRICAL				
09.01	Street lighting	LS	1	25000	\$25,000
	Subtotal (rounded)				\$230,000.00
901.00	Contingency (30%)				\$ 70,000.00
902.00	Engineering (15%)				\$ 45,000.00
903.00	Materials Supplied by MoTI				\$ -
904.00	Miscellaneous				\$ -
	CONCEPTUAL COST ESTIMATE				\$345,000

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SANITARY REROUTING - OPTION 1
SCALE 1:500

- NOTES**
- TRENCH DAYLIGHT LINES FOR SANITARY SEWER BASED ON OVER EXCAVATION TO BEDROCK ASSUMED AT -1.0m. TRENCH SIDES ASSUMED 1:1.
 - SANITARY SEWER SIZING BASED ON MATCHING EXISTING RDN STATED CAPACITY OF 41.4 MGD.

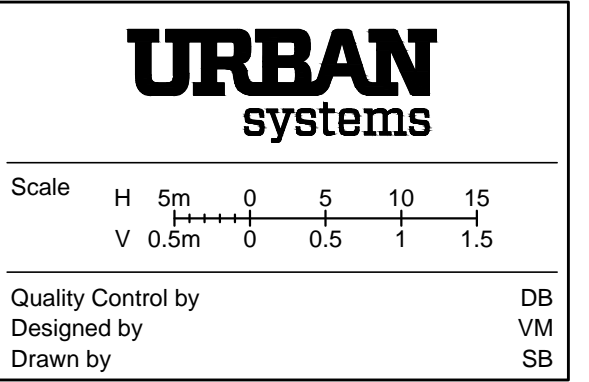
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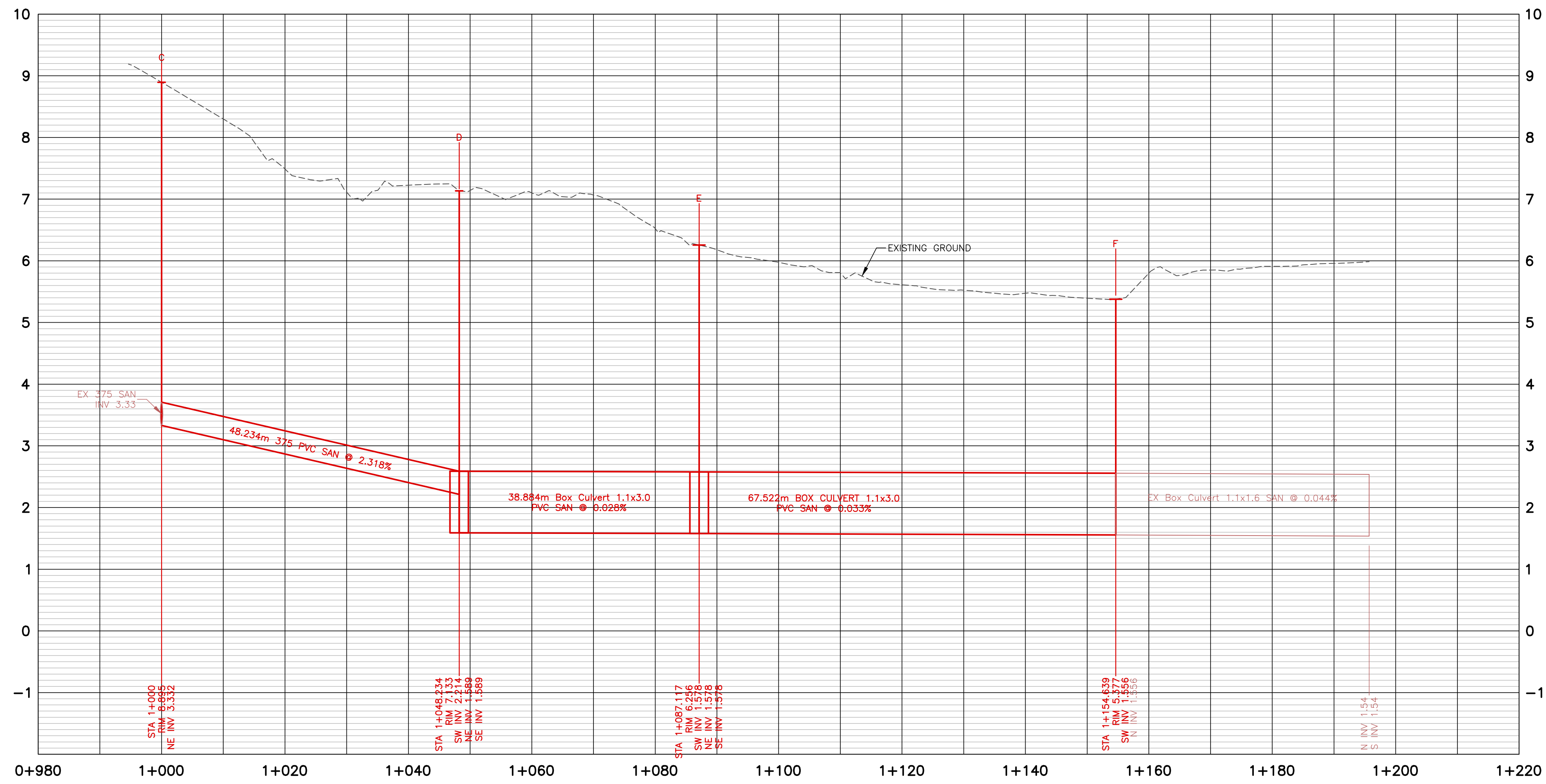
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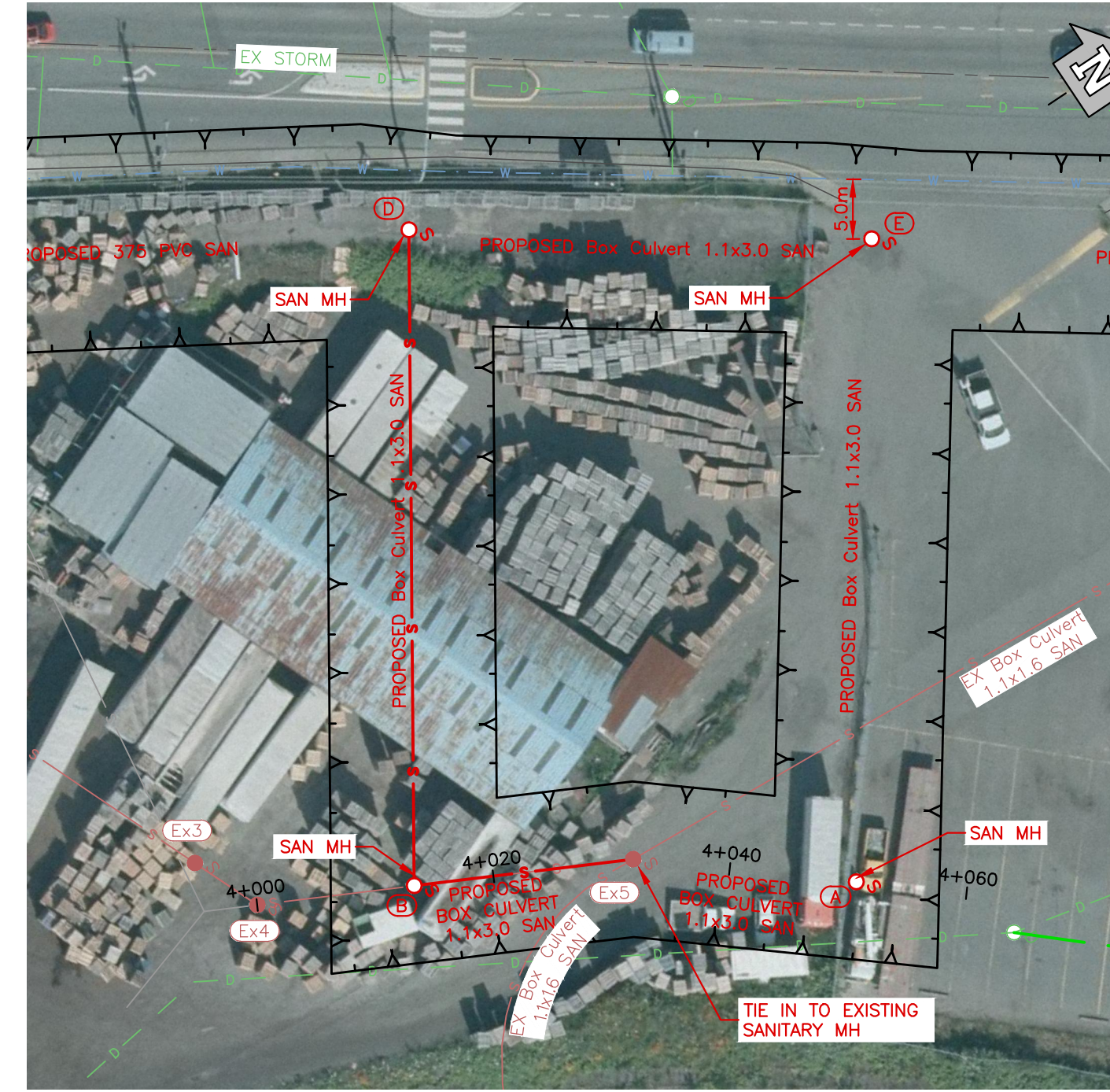
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City of Nanaimo - Multi-Plex
Servicing Review Evaluation
Sanitary and Storm Sewers

Sheet Number 1 of 3
Project Number 1296.0046.01
Drawing Number 001
Revision

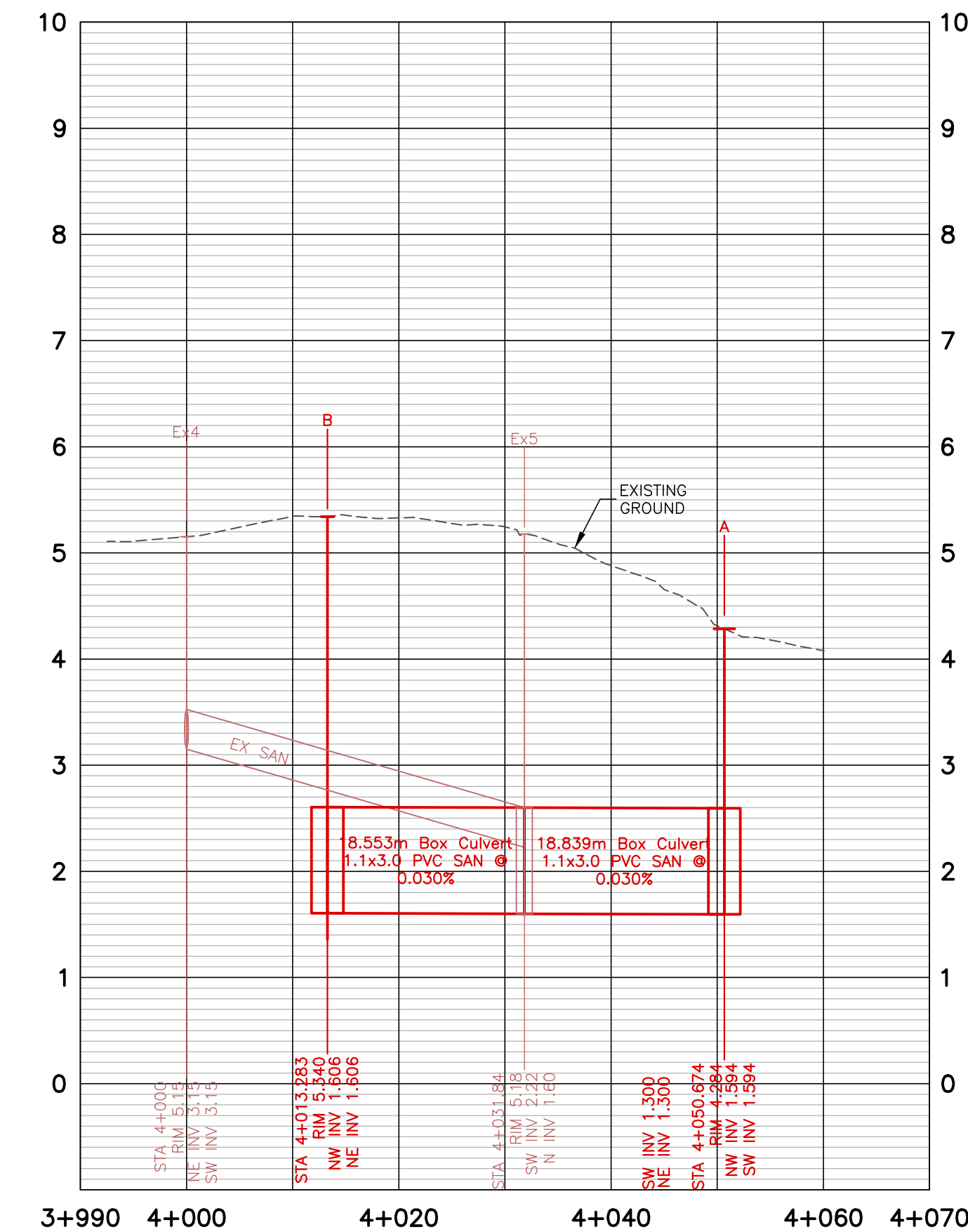
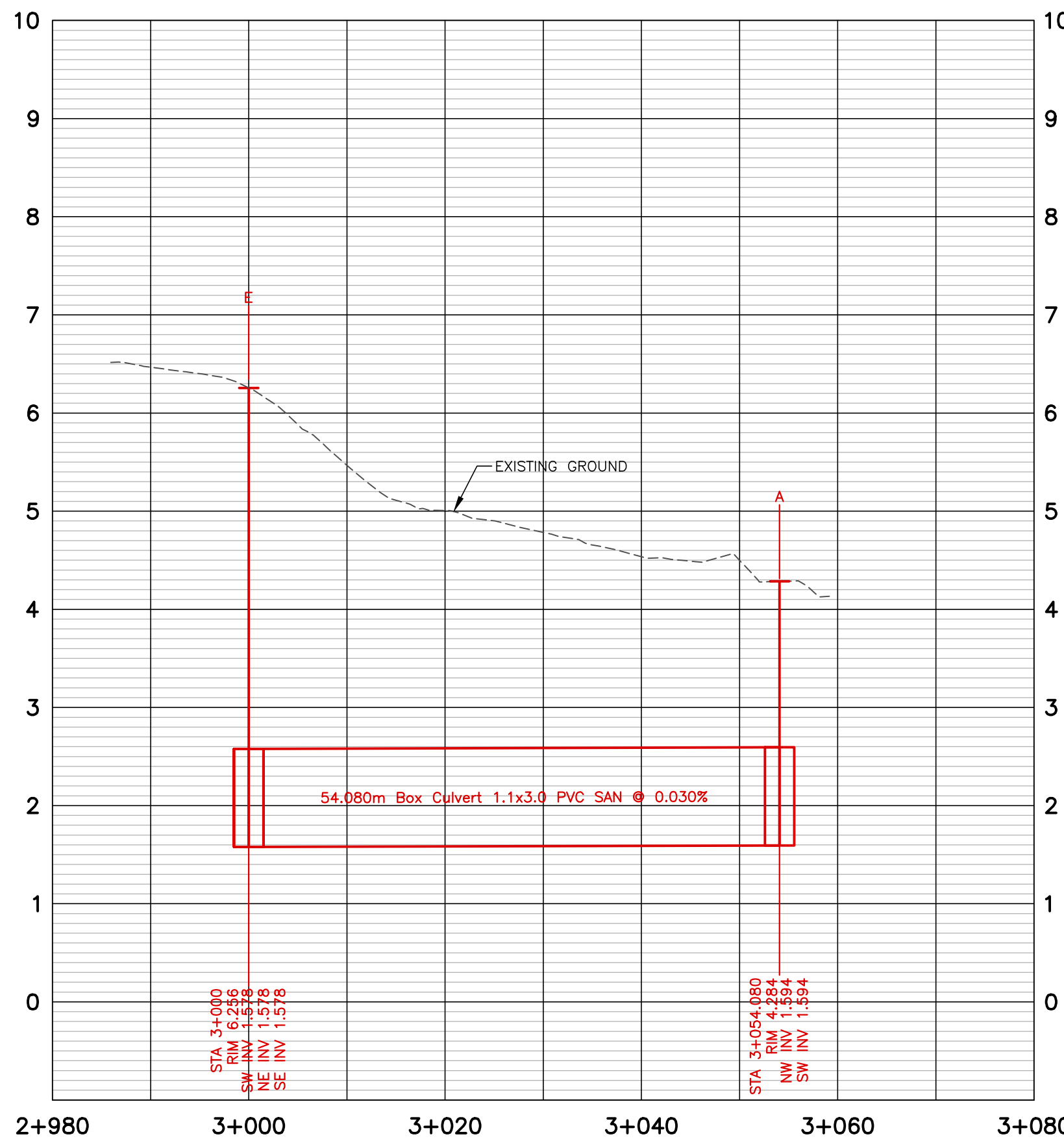
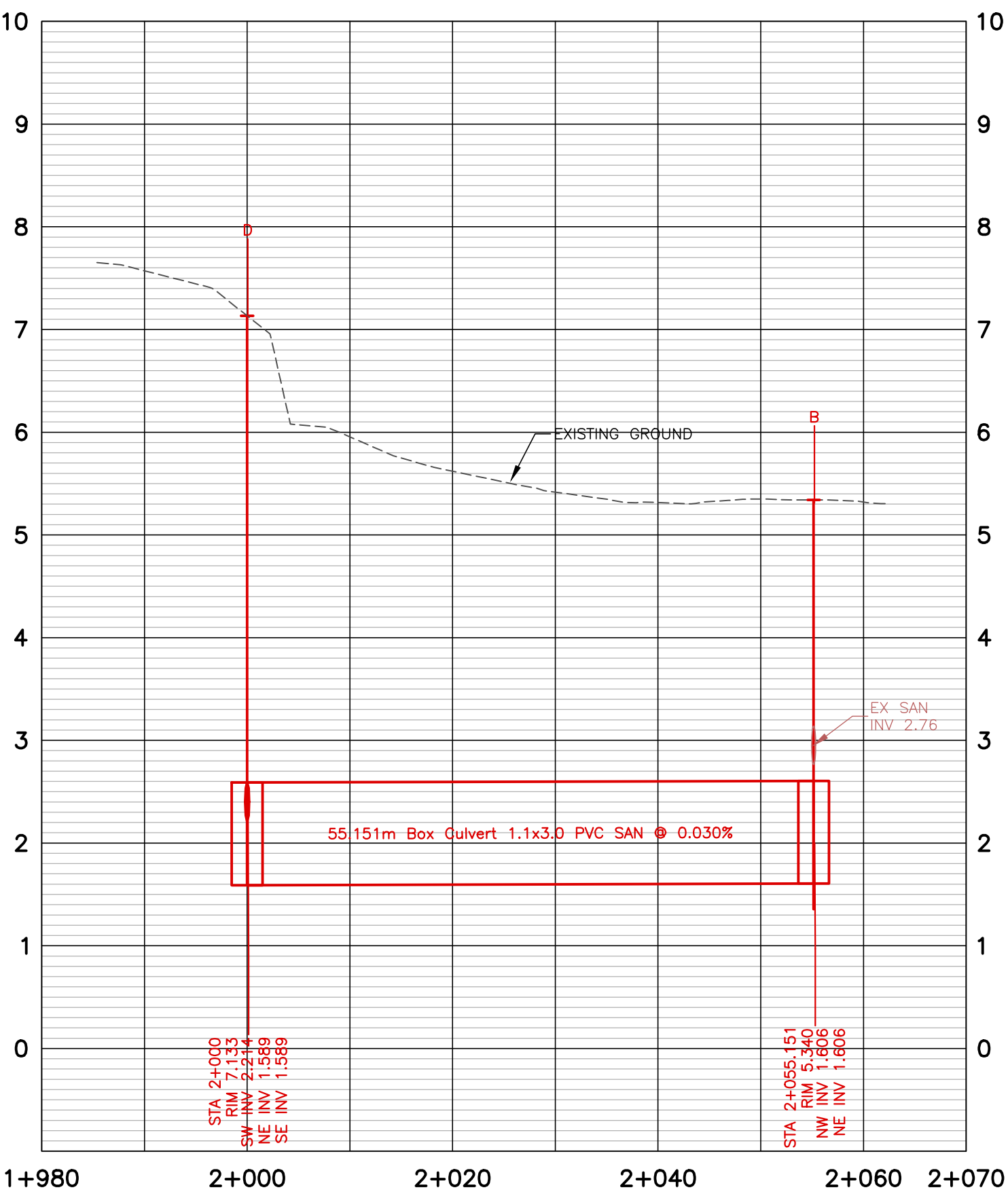


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EXISTING ELEVATIONS	8.90	8.30	7.49	7.11	7.23	7.14	7.10	7.06	6.52	6.18	5.98	5.80	5.61	5.57	5.47	5.39	5.80	5.65	5.91	5.65
	8.395	8.299	7.488	7.113	7.225	7.140	7.101	7.065	6.522	6.178	5.975	5.804	5.611	5.523	5.474	5.393	5.799	5.650	5.910	5.656



SANITARY REROUTING – OPTION 1
SCALE 1:500

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NOV 29, 2016
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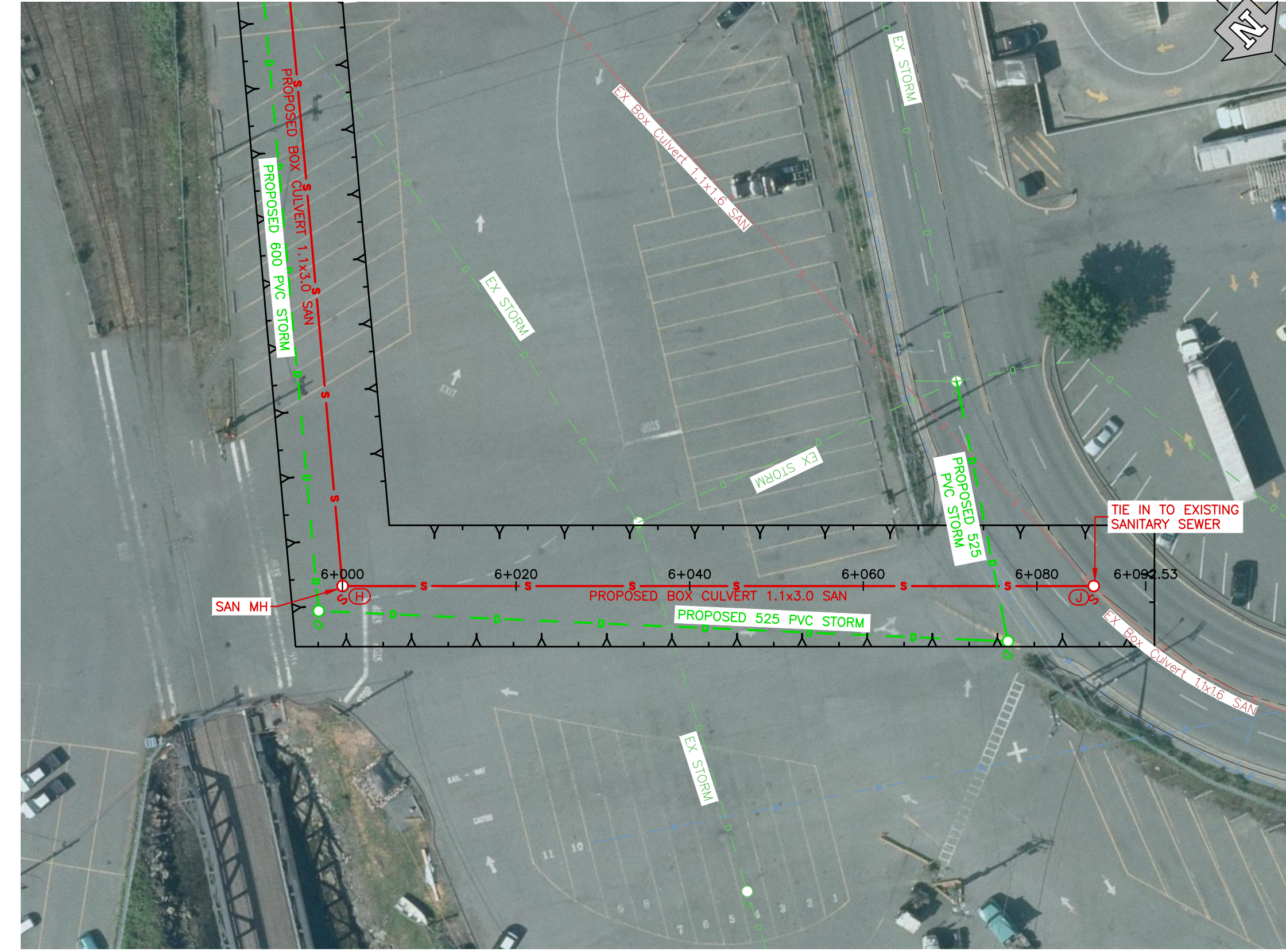


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Quality Control by DB
Designed by VM
Drawn by SB

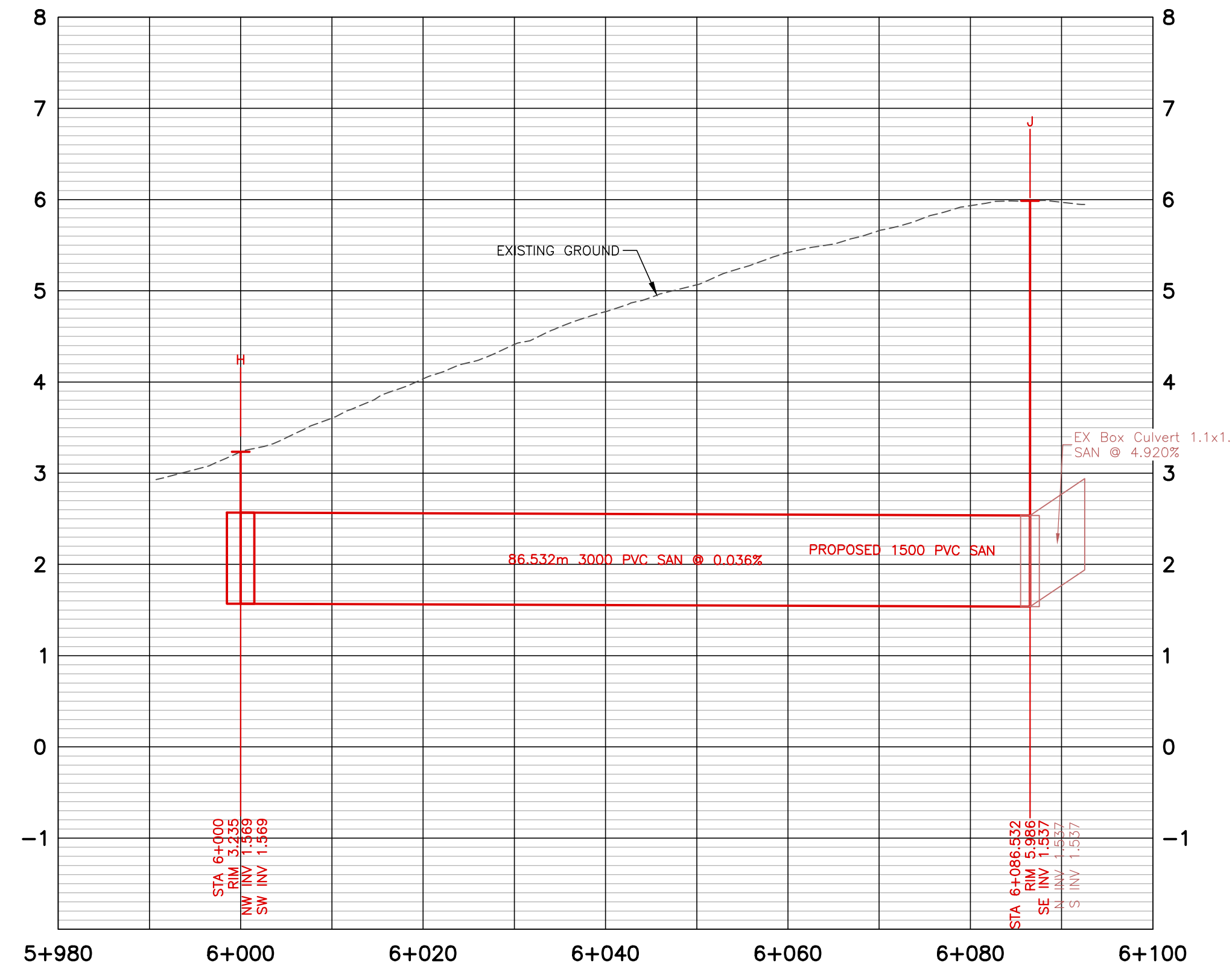
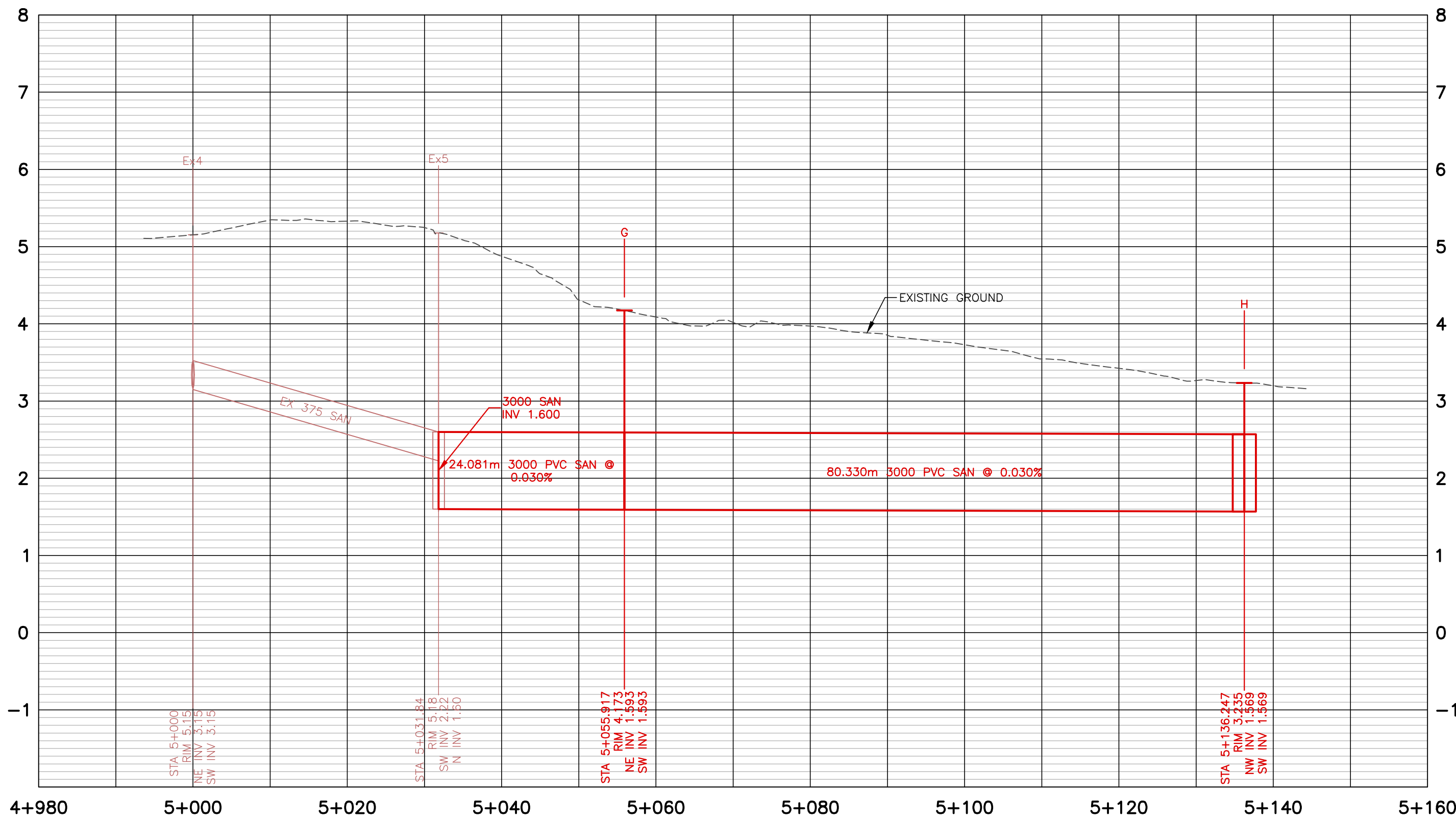
City of Nanaimo - Multi-Plex
Servicing Review Evaluation
Sanitary and Storm Sewers

Sheet Number 2 of 3
Project Number 1296.0046.01 Drawing Number 002 Revision



SANITARY REROUTING – OPTION 2
SCALE 1:500

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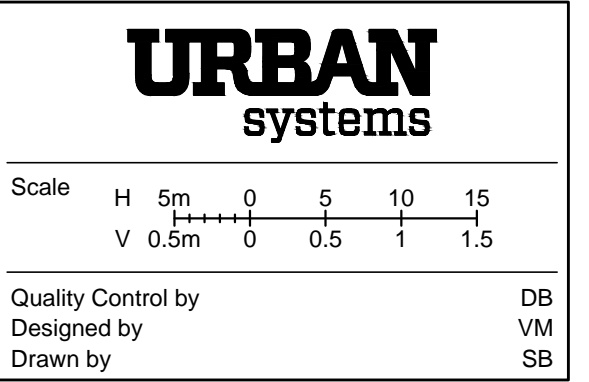


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#	Date	Issue / Revision	App



City of Nanaimo - Multi-Plex
Servicing Review Evaluation
Sanitary and Storm Sewers

Sheet Number 3 of 3
Project Number 1296.0046.01 Drawing Number 003 Revision

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CONCEPTUAL COST ESTIMATE
Schedule of Approximate Quantities and Unit Prices

Sanitary Sewer Relocation - Front Street Option 1a

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
01	SECTION 1 - GENERAL				
01.01	Mobilization, Insurance and Bonding	L.S.	1	\$100,000	\$100,000
01.02	Traffic Management & Detour (assumed concurrent with road works)	L.S.	0	\$0	\$0
01.03	Quality Management	L.S.	1	\$15,000	\$15,000
02	SECTION 2 - GRADING				
02.02	Pavement Removal				
02.02.01	Pavement Cutting (assumed concurrent with road works)	m			
02.02.02	Removal of Asphalt Pavement (assumed concurrent with road works)	m ²			
02.02.03	Pavement Milling (assumed concurrent with road works)	m ²			
02.02.04	Removals (assumed concurrent with road works)	L.S.			
02.03	Excavation				
02.03.02	Removal and Disposal of Assumed Contaminated Overex and Pipe Zone and Replacement	m3	2,030	\$270	\$548,208
02.04	Granular Surfacing, Base and Sub-Base				
02.04.01	25mm Well Graded Base (assumed concurrent with road works)	m ³			\$0
02.04.02	Select Granular Subbase (assumed concurrent with road works)	m ³			\$0
03	SECTION 3 - PAVING				
03.01	Emulsified Primer & Tack Coat				
03.01.01	Supply Primer and Tack Coat (assumed concurrent with road works)	L			
03.02	Asphalt Pavement				
03.02.01	Class 1 Medium Mix Asphalt (assumed concurrent with road works)	Tonne			
03.03	Pavement Markings				
03.03.01	Painted Pavement Markings (assumed concurrent with road works)	L.S.			
04	SECTION 4 - WATERMAIN REPLACEMENT				
04.01	Watermain				
04.01.01	Temporary Above Ground Water Main (if required)	L.S.	1	\$20,000	\$20,000
04.01.02	Removal and Replacement of Water Main (excluding surface restoration) - 300mm	m	200	\$600	\$120,000
05	SECTION 5 - STORM SEWER RELOCATION				
05.01	525mm PVC Storm Sewer (excluding surface restoration)	m	90	\$780	\$70,200
05.02	600mm PVC Storm Sewer (excluding surface restoration)	m	80	\$850	\$68,000
05.03	Manholes	L.S.	2	\$10,000	\$20,000
05.04	Tie-in to Existing Storm Sewer	L.S.	2	\$10,000	\$20,000
05.05	Removal of Existing Storm Sewer	L.S.	1	\$10,000	\$10,000
06	SECTION 6 -SANITARY TRUNK SEWER				
06.01	375 PVC Sanitary Sewer (excluding surface restoration)	m	50	\$400	\$20,000
06.02	1050mm PVC Lined Manholes	LS	5	\$15,000	\$75,000
06.03	1.1m x 3m Box Culvert with PVC/HDPE Liner and low flow benching (excluding surface restoration)				
06.03.01	Material Supply	m	185	\$5,885	\$1,088,642
06.03.02	Joint Sealing & Grout	m	185	\$400	\$74,000
06.03.03	Freight	m	185	\$385	\$71,225
06.03.04	Installation (assume 10m per day)	days	19	\$10,160	\$187,960
06.03.05	Tie-in to Existing Box Culvert Storm Sewer	LS	2	\$50,000	\$100,000
06.03.06	Bends	LS	2	\$15,000	\$30,000
06.04	Removal of Existing Box Culvert Sanitary Sewer	LS	1	\$100,000	\$100,000
	Subtotal (Rounded)				\$2,740,000
901.00	Contingency (30%)				\$ 822,000.00
902.00	Engineering (15%)				\$ 535,000.00
903.00	Materials Supplied by MoTI				\$ -
904.00	Miscellaneous				\$ -
	CONCEPTUAL COST ESTIMATE				\$4,097,000

December 7, 2016

CONCEPTUAL COST ESTIMATE
Schedule of Approximate Quantities and Unit Prices

Sanitary Sewer Relocation - Front Street Option 1b

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
01	SECTION 1 - GENERAL				
01.01	Mobilization, Insurance and Bonding	L.S.	1	\$100,000	\$100,000
01.02	Traffic Management & Detour (assumed concurrent with road works)	L.S.	0	\$0	\$0
01.03	Quality Management	L.S.	1	\$15,000	\$15,000
02	SECTION 2 - GRADING				
02.02	Pavement Removal				
02.02.01	Pavement Cutting (assumed concurrent with road works)	m		\$8	
02.02.02	Removal of Asphalt Pavement (assumed concurrent with road works)	m ²		\$10	
02.02.03	Pavement Milling (assumed concurrent with road works)	m ²		\$25	
02.02.04	Removals (assumed concurrent with road works)	L.S.		\$20,000	
02.03	Excavation				
02.03.02	Removal and Disposal of Assumed Contaminated Overex and Pipe Zone and Replacement	m3	1,685	\$270	\$454,896
02.04	Granular Surfacing, Base and Sub-Base				
02.04.01	25mm Well Graded Base (assumed concurrent with road works)	m ³		\$65	\$0
02.04.02	Select Granular Subbase (assumed concurrent with road works)	m ³		\$55	\$0
03	SECTION 3 - PAVING				
03.01	Emulsified Primer & Tack Coat				
03.01.01	Supply Primer and Tack Coat (assumed concurrent with road works)	L		\$2.50	
03.02	Asphalt Pavement				
03.02.01	Class 1 Medium Mix Asphalt (assumed concurrent with road works)	Tonne		\$250	
03.03	Pavement Markings				
03.03.01	Painted Pavement Markings (assumed concurrent with road works)	L.S.		\$3,000	
04	SECTION 4 - WATERMAIN REPLACEMENT				
04.01	Watermain				
04.01.01	Temporary Above Ground Water Main (if required)	L.S.	1	\$20,000	\$20,000
04.01.02	Removal and Replacement of Water Main (excluding surface restoration) - 300mm	m	200	\$600	\$120,000
05	SECTION 5 - STORM SEWER RELOCATION				
05.01	525mm PVC Storm Sewer (excluding surface restoration)	m	90	\$780	\$70,200
05.02	600mm PVC Storm Sewer (excluding surface restoration)	m	80	\$850	\$68,000
05.02	Manholes	L.S.	2	\$10,000	\$20,000
05.03	Tie-in to Existing Storm Sewer	L.S.	2	\$10,000	\$20,000
05.04	Removal of Existing Storm Sewer	L.S.	1	\$10,000	\$10,000
06	SECTION 6 -SANITARY TRUNK SEWER				
06.01	375 PVC Sanitary Sewer (excluding surface restoration)	m	70	\$400	\$28,000
06.02	1050mm PVC Lined Manholes	LS	5	\$15,000	\$75,000
06.03	1.1m x 3m Box Culvert with PVC/HDPE Liner and low flow benching (excluding surface restoration)				
06.03.01	Material Supply	m	125	\$5,885	\$735,569
06.03.02	Joint Sealing & Grout	m	125	\$400	\$50,000
06.03.03	Freight	m	125	\$385	\$48,125
06.03.04	Installation (assume 10m per day)	days	13	\$10,160	\$127,000
06.03.05	Tie-in to Existing Box Culvert Storm Sewer	LS	4	\$50,000	\$200,000
06.03.06	Bends	LS	2	\$15,000	\$30,000
06.04	Removal of Existing Box Culvert Sanitary Sewer	LS	1	\$100,000	\$100,000
	Subtotal (Rounded)				\$2,292,000
901.00	Contingency (30%)				\$ 688,000.00
902.00	Engineering (15%)				\$ 447,000.00
903.00	Materials Supplied by MoTI				\$ -
904.00	Miscellaneous				\$ -
	CONCEPTUAL COST ESTIMATE				\$3,427,000

CONCEPTUAL COST ESTIMATE
Schedule of Approximate Quantities and Unit Prices

Sanitary Sewer Relocation - East Alignment - Option 1

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
01	SECTION 1 - GENERAL				
01.01	Mobilization, Insurance and Bonding	L.S.	1	\$100,000	\$100,000
01.02	Traffic Management & Detour (assumed concurrent with road works)	L.S.	0	\$0	\$0
01.03	Quality Management	L.S.	1	\$15,000	\$15,000
02	SECTION 2 - GRADING				
02.02	Pavement Removal				
02.02.01	Pavement Cutting (assumed concurrent with road works)	m		\$8	
02.02.02	Removal of Asphalt Pavement (assumed concurrent with road works)	m ²		\$10	
02.02.03	Pavement Milling (assumed concurrent with road works)	m ²		\$25	
02.02.04	Removals (assumed concurrent with road works)	L.S.		\$20,000	
02.03	Excavation				
02.03.02	Removal and Disposal of Assumed Contaminated Overex and Pipe Zone and Replacement	m3	1,685	\$270	\$454,896
02.04	Granular Surfacing, Base and Sub-Base				
02.04.01	25mm Well Graded Base (assumed concurrent with road works)	m ³		\$65	\$0
02.04.02	Select Granular Subbase (assumed concurrent with road works)	m ³		\$55	\$0
03	SECTION 3 - PAVING				
03.01	Emulsified Primer & Tack Coat				
03.01.01	Supply Primer and Tack Coat (assumed concurrent with road works)	L		\$2.50	
03.02	Asphalt Pavement				
03.02.01	Class 1 Medium Mix Asphalt (assumed concurrent with road works)	Tonne		\$250	
03.03	Pavement Markings				
03.03.01	Painted Pavement Markings (assumed concurrent with road works)	L.S.		\$3,000	
04	SECTION 4 - WATERMAIN REPLACEMENT				
04.01	Watermain				
04.01.01	Temporary Above Ground Water Main (if required)	L.S.	0	\$20,000	\$0
04.01.02	Removal and Replacement of Water Main (excluding surface restoration) - 300mm	m	0	\$600	\$0
05	SECTION 5 - STORM SEWER RELOCATION				
05.01	525mm PVC Storm Sewer (excluding surface restoration)	m	90	\$780	\$70,200
05.02	600mm PVC Storm Sewer (excluding surface restoration)	m	80	\$850	\$68,000
05.02	Manholes	L.S.	2	\$10,000	\$20,000
05.03	Tie-in to Existing Storm Sewer	L.S.	2	\$10,000	\$20,000
05.04	Removal of Existing Storm Sewer	L.S.	1	\$10,000	\$10,000
06	SECTION 6 - SANITARY TRUNK SEWER				
06.01	375 PVC Sanitary Sewer (excluding surface restoration)	m	0	\$400	\$0
06.02	1050mm PVC Lined Manholes	LS	3	\$15,000	\$45,000
06.03	1.1m x 3m Box Culvert with PVC/HDPE Liner and low flow benching (excluding surface restoration)				
06.03.01	Material Supply	m	195	\$5,885	\$1,147,487
06.03.02	Joint Sealing & Grout	m	195	\$400	\$78,000
06.03.03	Freight	m	195	\$385	\$75,075
06.03.04	Installation (assume 10m per day)	days	20	\$10,160	\$198,120
06.03.05	Tie-in to Existing Box Culvert Storm Sewer	LS	2	\$50,000	\$100,000
06.03.06	Bends	LS	1	\$15,000	\$15,000
06.04	Removal of Existing Box Culvert Sanitary Sewer	LS	1	\$100,000	\$100,000
	Subtotal (Rounded)				\$2,517,000
901.00	Contingency (30%)				\$ 755,000.00
902.00	Engineering (15%)				\$ 491,000.00
903.00	Materials Supplied by MoTI				\$ -
904.00	Miscellaneous				\$ -
	CONCEPTUAL COST ESTIMATE				\$3,763,000