ISL Sewer Modeling Report

Date November 06, 2012

Our Reference: 30387

Village of Pemberton
PO Box 100
7400 Prospect Street
Pemberton, BC V0N 2L0

Attention: Caroline Lamont, Manager of Development Services

Dear Madam:

Reference: Village of Pemberton Sanitary Sewer Forcemain Analysis

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1.0 Introduction

As requested, an analysis has been conducted on the Village of Pemberton's sanitary forcemain system and wastewater treatment plant. The purpose of the analysis was to determine if there is capacity in the existing sanitary forcemain and treatment plant to accept the proposed sanitary sewer flows anticipated from the proposed development. In particular, an analysis was conducted for the following scenarios

- The existing flow conditions of the Village of Pemberton forcemain system,
- The existing flow conditions plus the Sunstone Ridge Development Phase 1, and
- The existing flow conditions plus the Sunstone Ridge Development Phase 1 & 2 plus future developments in the area.

2.0 Design Criteria

The design criteria for the analysis were taken from the Village of Pemberton Subdivision and Control Bylaw 677 and the Master Municipal Construction Document (MMCD).

3.0 The Existing Sanitary System

The Village's sanitary system, as it relates to this analysis, consists of a sewage pump station located at industrial park and a forcemain running from the pump station to the treatment plant. The forcemain generally runs west from the industrial park along Highway #99 until a bend at Sturdy's Farm approximately 500m west of the intersection of Industrial Park and Highway #99. According to record drawings, there is a 200x200x200 HDPE Tee with 200mm blind flange immediately upstream of the bend at Sturdy's farm. From Study's Farm, the forcemain runs south to cross under the Lillooet River and into the Village treatment plant adjacent to Airport Road.

According to record information, the existing forcemain pipe characteristics are shown in the table below:

Pipe Section	Diameter, Type, Class	Length (m)	Pressure Rating (psi)
Industrial Park to River	200mm HDPE DR26	1120	64
River Crossing	200mm HDPE DR11	220	160
River to WWTP	200mm HDPE DR26	140	64

According to record information, the pump motors at the Industrial Park pump station is currently operating with Myers pumps identified as:

Manufacturer Myers
Model 4RCX
Type 20Hp, 3450 RPM, 3 phase 208 volts
Capacity 16 L/s @ 30m head

3.1 Capacity Review of Forcemain

The sanitary flows from the Industrial Park are 26 L/s including existing and future long term build-out capacities. An analysis was conducted on the existing forcemain using the 26 L/sec flow rate with the following summary of results;

Pipe Pressure Rating	**64 psi**
Normal Operating Pressure:	23 psi
Available capacity	64%
Short Term Pipe Rating (during surge occurrences)	**96 psi**
Surge Pressure:	39 psi
Total Pressure (operating + surge)	62 psi
Available capacity	35%

Based on the above analysis, the existing forcemain is sufficient for current and future flows anticipated from the Industrial Park pump station. The existing pumps will, however, need to be replaced or modified to meet long term build-out requirements.

3.2 Capacity Review of WWTP

The Village of Pemberton wastewater treatment plant, commissioned in 2005, was originally designed for a population of 5,000 people with the following design criteria:

- Average Dry Weather Flow (ADWF) 1,530 m^3/d
- Maximum Daily Flow (MDF) 3,060 m^3/d (or, 2*ADWF)
- Peak Wet Weather Flow (PWWF) 53 L/s

The Village maintains daily records of the flows received by the WWTP. Records indicate daily flows of up to 2,400 m^3/d.

Capacity constraints of the treatment plant needs to be reviewed further in order to access the affects of the proposed development on the existing system. High inflow and infiltration rates may have significant impacts to the available capacity at the existing treatment plant.

4.0 The Existing Sanitary System with Future Developments

4.1 Sunstone Ridge Development Phase 1

Phase 1 of the Sunstone Ridge Development (SRD) is located approximately 3 km east of the Village core, north of the CN railway. The SRD site will be the first of a number of developments in the Sunstone Ridge area and will consist of single family and multi-family units. The total demands identified for SRD were taken from the Delcan Technical Memorandum dated April 16, 2012 and are as follows:

- ADWF = 3.5 L/s
- I&I = 3.9 L/s
- PWWF = 15.3 L/s

The full Technical Memorandum can be found in Appendix B of this report.

With the development of the SRD site, a new pump station and forcemain is proposed. The forcemain tie-in is proposed at the existing forcemain on Highway #99 near Sturdy's Farm.

The analysis of the existing forcemain capacity as it relates to Phase 1 proposed development with existing flows from Industrial Park is summarized below:

Pipe Pressure Rating	**64 psi**
Normal Operating Pressure:	28 psi
Available capacity	56%
Short Term Pipe Rating (during surge occurrences)	**96 psi**
Surge Pressure:	61 psi
Total Pressure (operating + surge):	89 psi
Available capacity	7%

4.2 Sunstone Ridge Development Phase 1 & 2 plus Future Developments

Future development areas in addition to the SRD Phase 1 are outlined in Table 1 of Delcan's Technical Memorandum and include a school site, recreational facility, Biro site, commercial site, 22 SF site, and SRD Phase 2. The total demands from the Technical Memorandum are summarized in the following table.

Site	ADWF (L/s)	I&I (L/s)	PWWF (L/s)
SRD Site (Phase 1)	3.5	3.9	15.3
School Site	4.0	1.1	14.0
Recreation Facility	1.6	1.5	7.2
Biro Site	2.7	3.4	14.4
Commercial Site	0.1	0.1	0.5
22 SF Units	0.4	0.3	2.0
SRD Site (Phase 2)	2.5	5.6	13.9

The analysis of the existing forcemain capacity as it relates to Phase 1 & 2 and future developments with existing flows from Industrial Park is summarized below:

Pipe Pressure Rating	**64 psi**
Normal Operating Pressure:	64 psi
Available capacity	0%
Short Term Pipe Rating (during surge occurrences)	**96 psi**
Surge Pressure:	127 psi
Total Pressure (operating + surge)	191 psi
Available capacity *(capacity is exceeded)*	0%

5.0 Conclusions

The following conclusions are made based on the above:

- Phase 1 of the Sunstone Ridge Development may be accommodated with the existing forcemain.
- Only the portion of existing forcemain under the Lillooet River (160 psi pipe rating) can accommodate Phase 1 & 2 and future developments.
- The portion of the existing forcemain (64 psi pipe rating) cannot accommodate all flows anticipated from Phase 1 & 2 and future development.
- An evaluation of the treatment plant capacity needs to be completed to assess the effects of the proposed development. This may include completion of an inflow and infiltration study.

6.0 Recommendations

1. Although the first phase of SRD may be accommodated with the existing forcemain, it is recommended that that any proposed connection to the existing forcemain be made downstream of the transition between the existing DR 26 and DR 11 forcemain pipe. In addition, the forcemain section on the south of the Lillooet River requires upgrading or a second parallel pipe be installed to the treatment plant to accommodate build-out plans beyond Phase 1 of the Sunstone Ridge Development.

2. An evaluation of the treatment plant capacity is recommended to determine the affects of future development impacts.

3. An inflow and infiltration study may be required to determine the contribution of stormwater or groundwater to the sanitary sewer flows.

7.0 Closure

This report is prepared in response to the Draft Technical Memoradum prepared by Delcan dated April 16, 2012. Please contact the undersigned if you have any questions.

Prepared by,

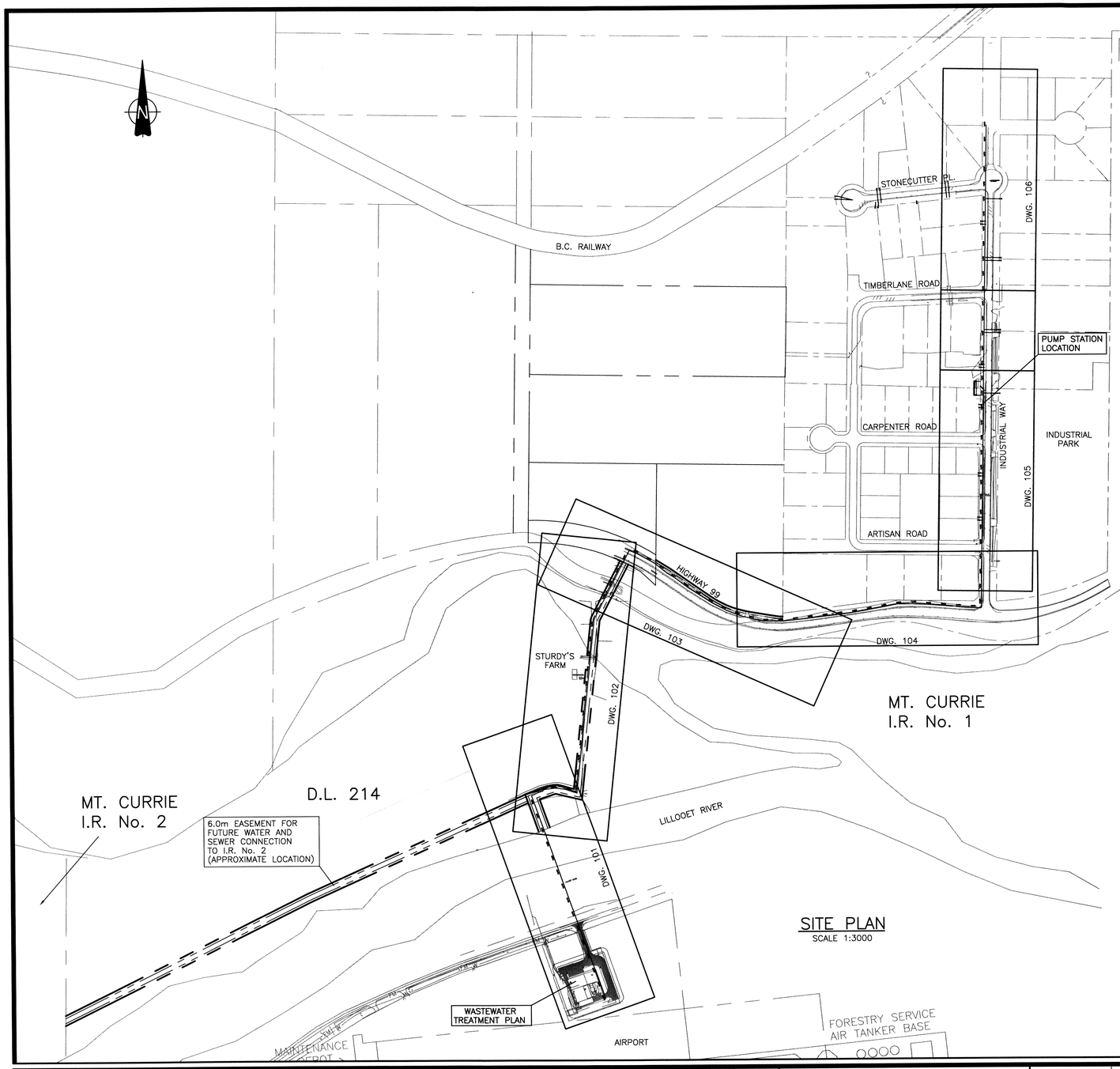
Richard Avedon-Savage, P.Eng.
Project Engineer

Reviewed by,

Graham Schulz, P.Eng.
Senior Project Engineer

Attachments

Appendix A – Record Drawings



SITE PLAN
SCALE 1:3000

MT. CURRIE
I.R. No. 10

LOCATION PLAN

100 KM 0 100 200 300 KM
SCALE

NO.	DATE	ENG.	BY	SUBJECT
				REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

0 ——— 20mm

IF NOT 20mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PRELIMINARY
NOT FOR CONSTRUCTION

Associated Engineering

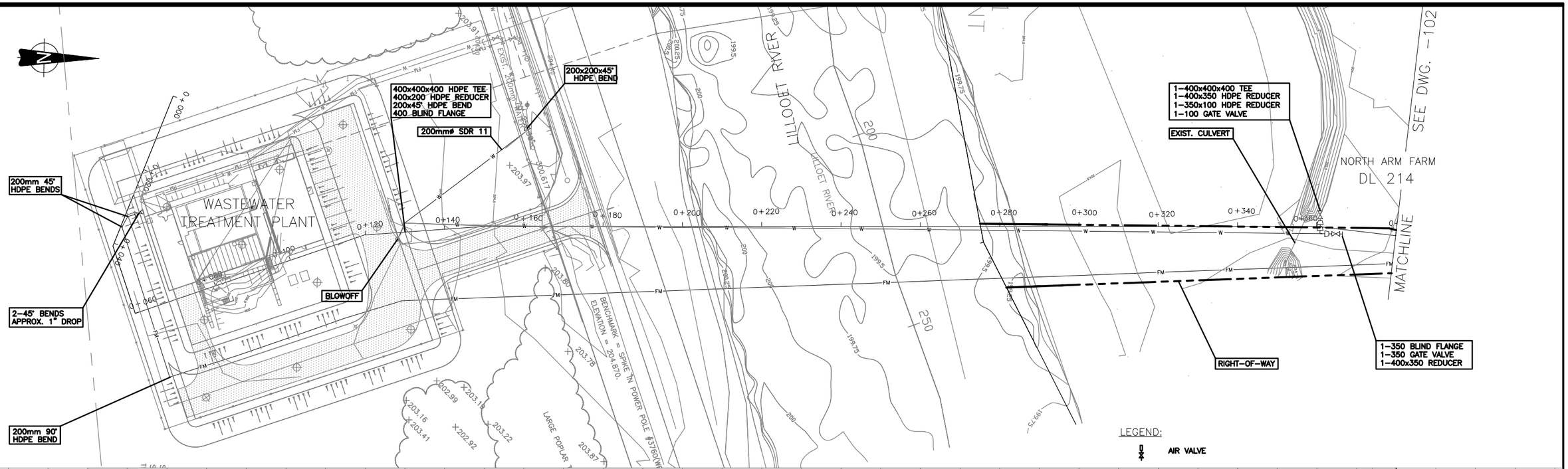
PROJECT No.	002035		
SCALE	AS NOTED		
DRAWN	C. L./J. W.		05/07/25
DESIGNED	D. D		05/07/25
CHECKED	D.D.		05/07/25
APPROVED	E.A.B.		05/07/25
DATE		INITIAL	

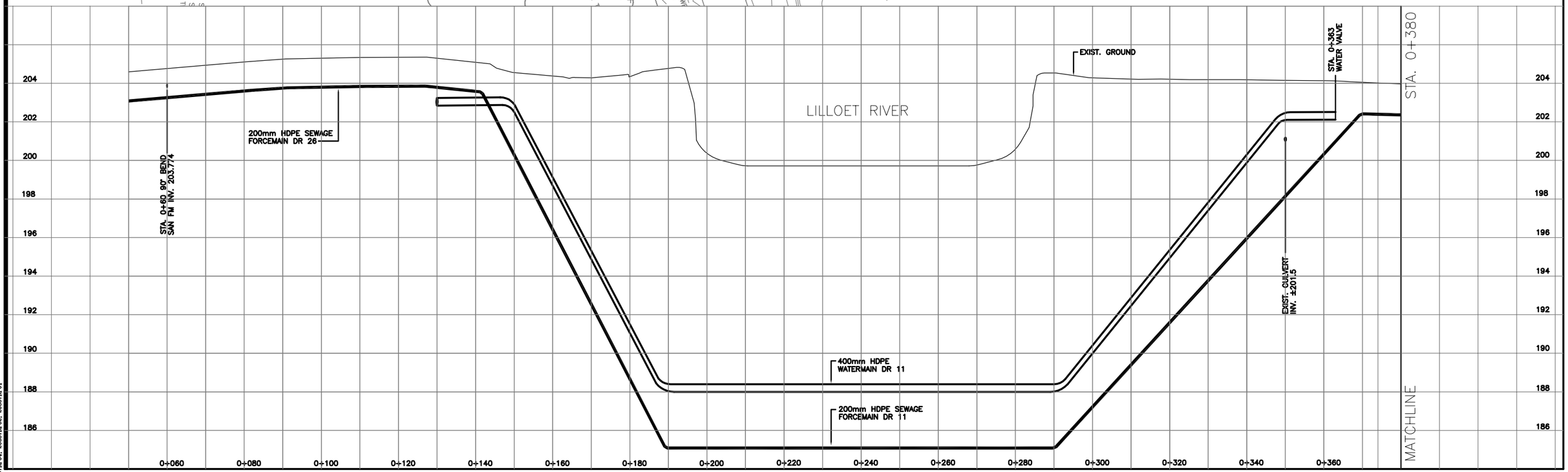
VILLAGE OF PEMBERTON

LOCATION PLAN AND SITE PLAN

INDUSTRIAL PARK
OFF-SITE WORKS

DRAWING NUMBER	REV. NO.	SHEET
002035-7-100		





NO.	DATE	ENG.	BY	SUBJECT
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3	07/07/28	D.D.	L.Y.	RECORD DRAWING
2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	D.D.	C.L.	ISSUED FOR TENDER

REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

0 ——— 20mm

IF NOT 20mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Associated Engineering

PROJECT No.	002035		
SCALE	HOR. 1:500 VERT. 1:100		
DRAWN	L.Y.		07/05/28
DESIGNED	D.D.		05/07/26
CHECKED	D.D.		05/07/26
APPROVED	E.A.B.		05/07/26
DATE		INITIAL	

VILLAGE OF PEMBERTON

INDUSTRIAL PARK
OFF-SITE WORKS

SANITARY FORCEMAIN
PLAN AND PROFILE - SHEET 1

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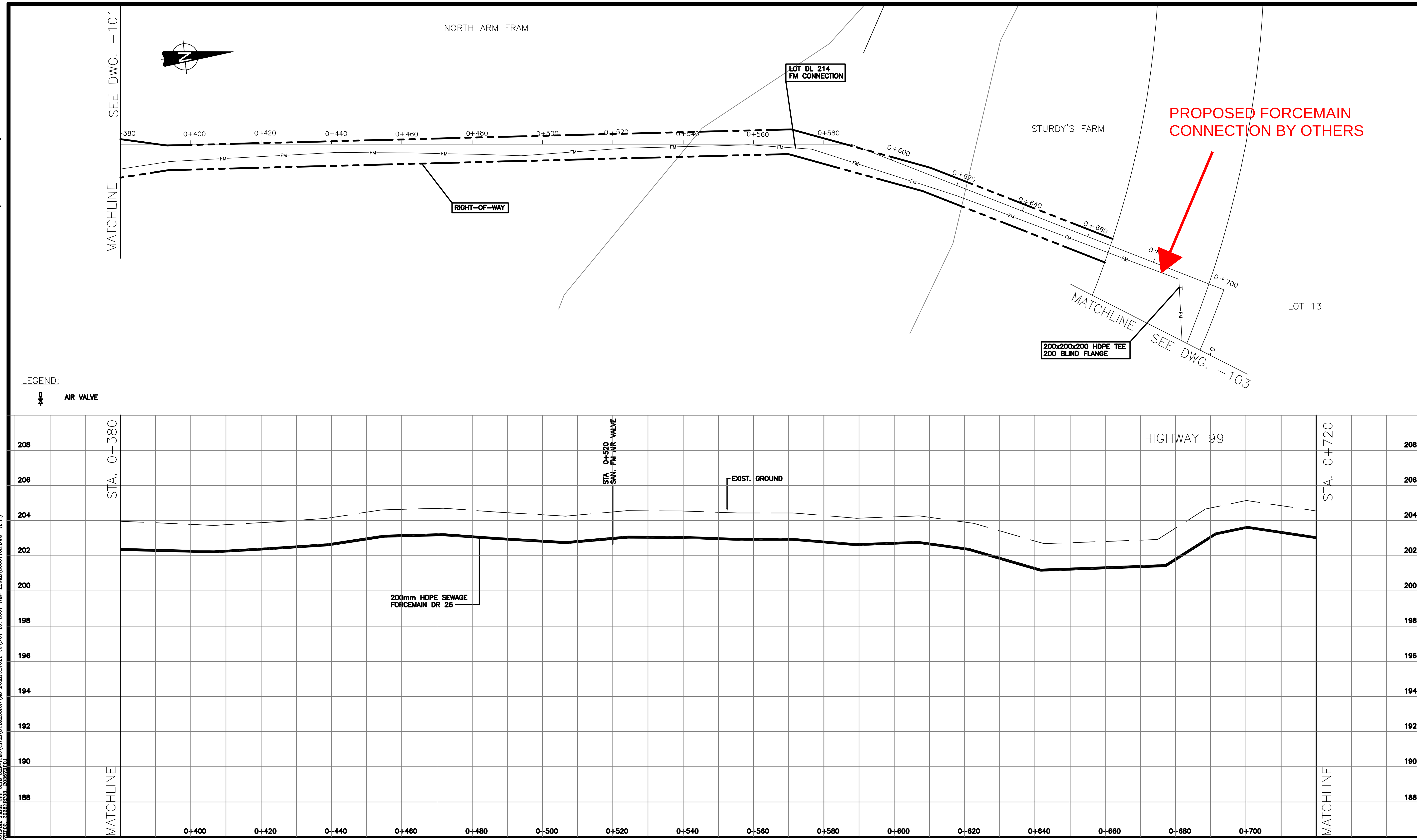
Xrefs: 2035710P04, 2035710P05, 2035710P03, 2035710P02, 2035710P01

This Drawing Is For The Use Of The Client And Project Indicated
No Representations Of Any Kind Are Made To Other Parties



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4	07/07/26	D.D.	L.Y.	RECORD DRAWING
3	06/09/27	D.D.	C.L.	PROFILE REVISED
2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	D.D.	C.L.	ISSUED FOR TENDER

REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

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IF NOT 20mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Associated Engineering

PROJECT No.	002035		
SCALE	HOR. 1:500 VERT. 1:100		
DRAWN	L.Y.		07/05/28
DESIGNED	D.D.		05/07/26
CHECKED	D.D.		05/07/26
APPROVED	E.A.B.		05/07/26
DATE		INITIAL	

VILLAGE OF PEMBERTON

INDUSTRIAL PARK
OFF-SITE WORKS

SANITARY FORCEMAIN
PLAN AND PROFILE - SHEET 2

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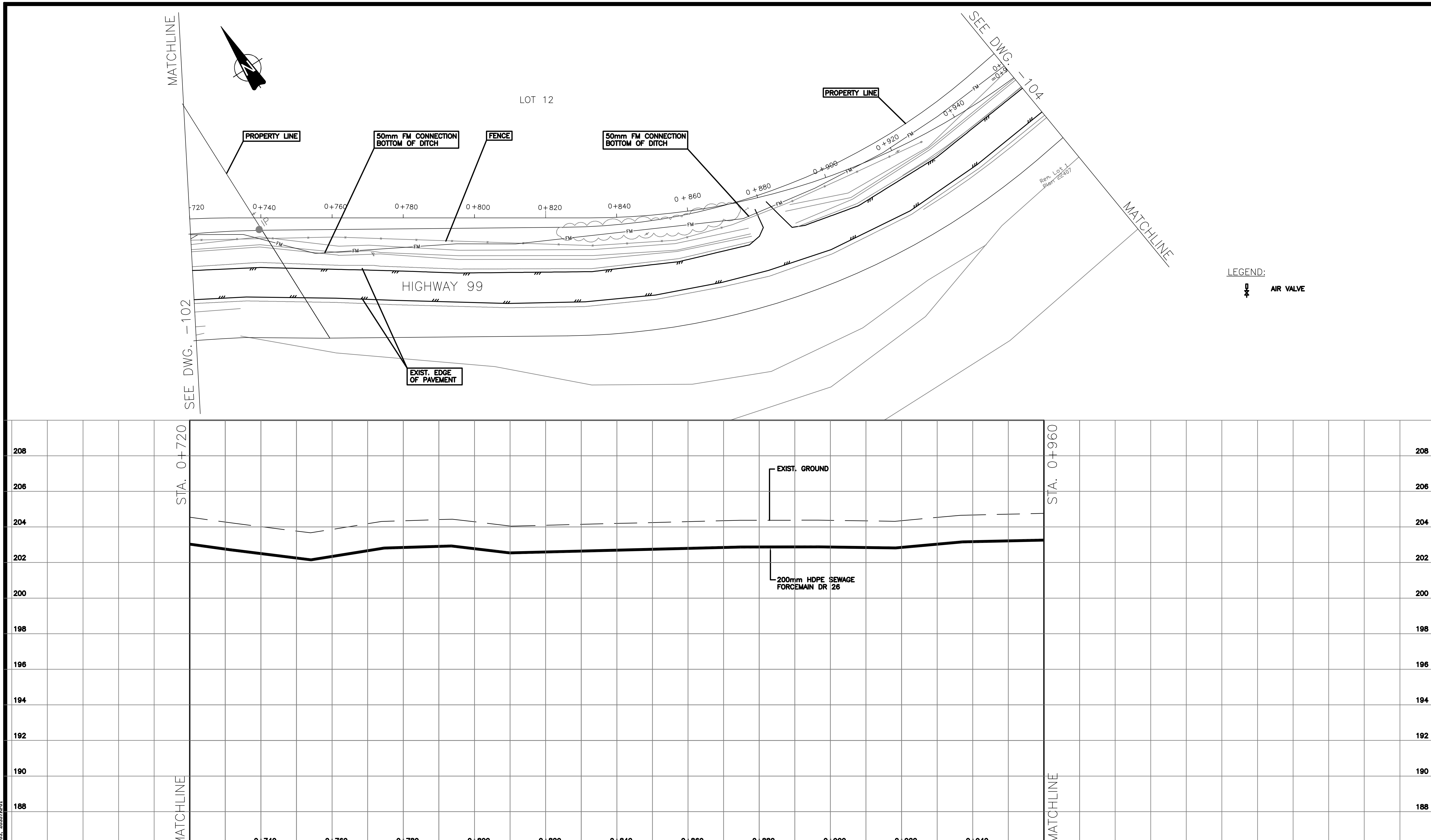
This Drawing Is For The Use Of The Client And Project Indicated
No Representations Of Any Kind Are Made To Other Parties



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2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	D.D.	C.L.	ISSED FOR TENDER

REVISIONS

VERIFY SCALES

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Associated Engineering

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DESIGNED	D.D.		05/07/26
CHECKED	D.D.		05/07/26
APPROVED	E.A.B.		05/07/26
DATE		INITIAL	

VILLAGE OF PEMBERTON

SANITARY FORCEMAIN
PLAN AND PROFILE - SHEET 3

INDUSTRIAL PARK
OFF-SITE WORKS

DRAWING NUMBER	REV. NO.	SHEET
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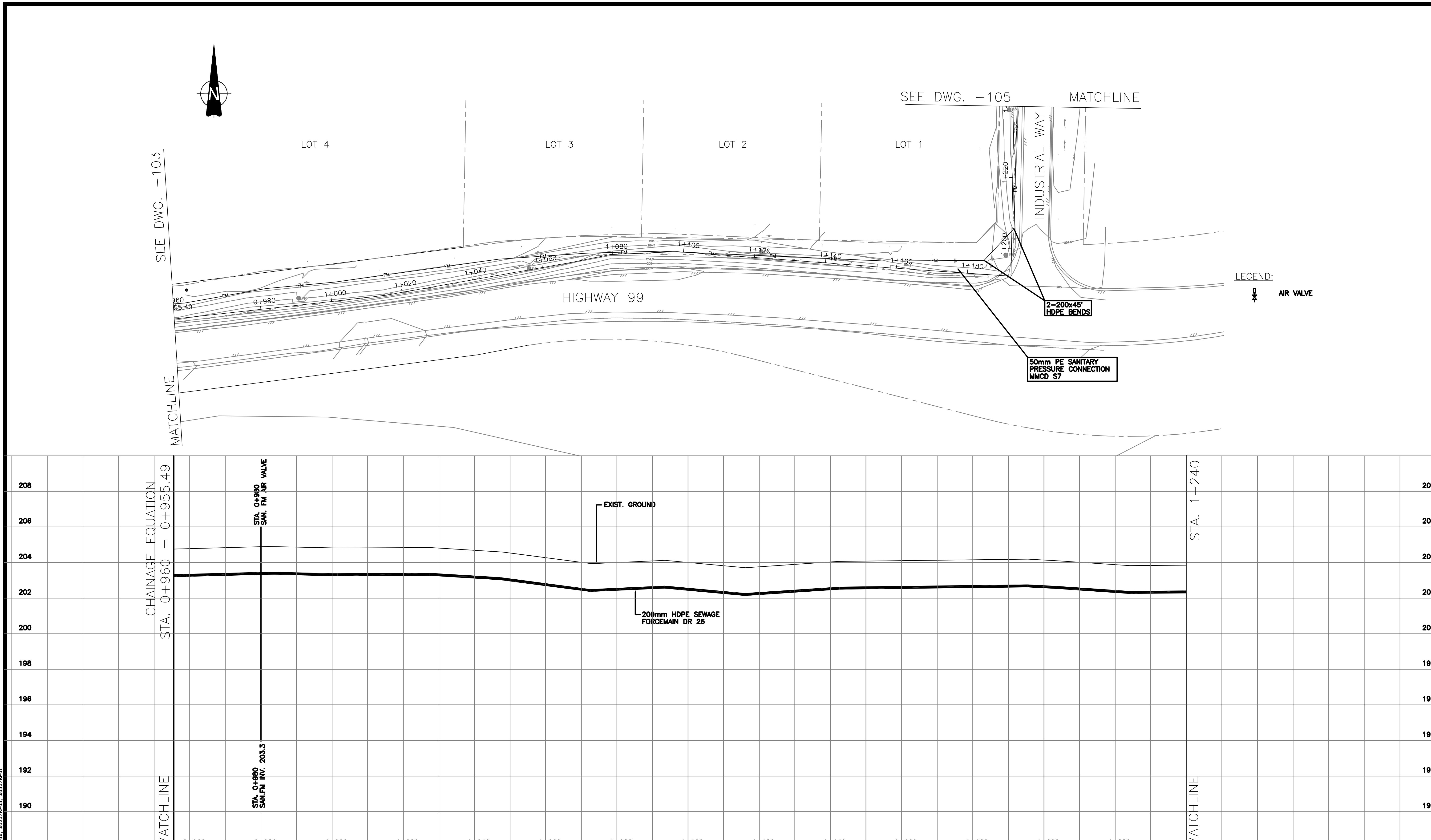
This Drawing Is For The Use Of The Client And Project Indicated
No Representations Of Any Kind Are Made To Other Parties



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1	06/04/07	D.D.	C.L.	ISSUED FOR TENDER
NO.	DATE	ENG.	BY	SUBJECT

REVISIONS

VERIFY SCALES

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Associated Engineering

PROJECT No.	002035		
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DRAWN	C.L./J.W.		07/05/26
DESIGNED	D.D.		05/07/26
CHECKED	D.D.		05/07/26
APPROVED	E.A.B.		05/07/26
DATE		INITIAL	

VILLAGE OF PEMBERTON

INDUSTRIAL PARK OFF-SITE WORKS

SANITARY FORCEMAIN
PLAN AND PROFILE - SHEET 4

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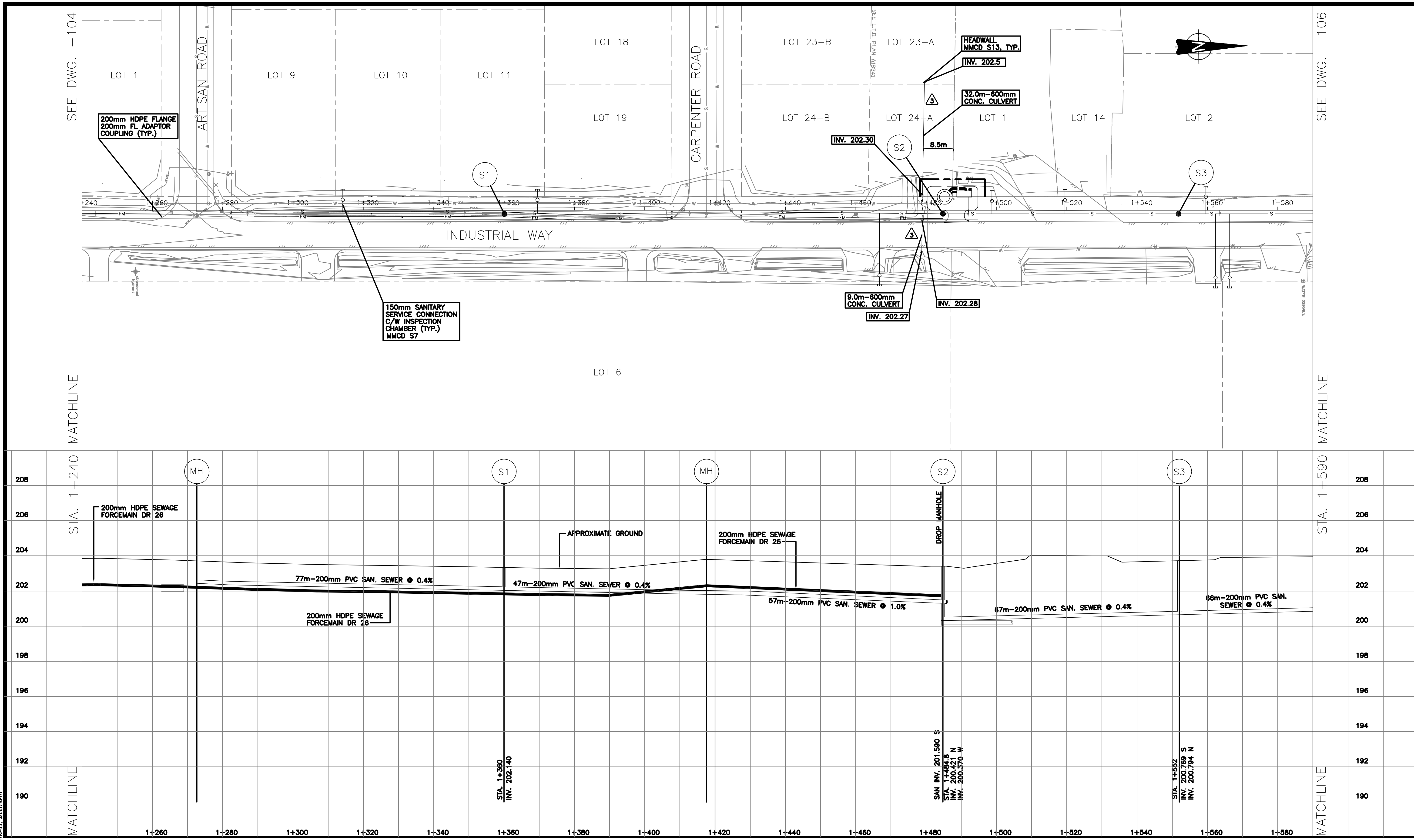
This Drawing Is For The Use Of The Client And Project Indicated
No Representations Of Any Kind Are Made To Other Parties



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2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	D.D.	C.L.	ISSUED FOR TENDER

REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

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Associated Engineering

PROJECT No.	002035		
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DESIGNED	D.D.		05/07/26
CHECKED	D.D.		05/07/26
APPROVED	E.A.B.		05/07/26
DATE		INITIAL	

VILLAGE OF PEMBERTON

SANITARY FORCEMAIN
PLAN AND PROFILE - SHEET 5

INDUSTRIAL PARK
OFF-SITE WORKS

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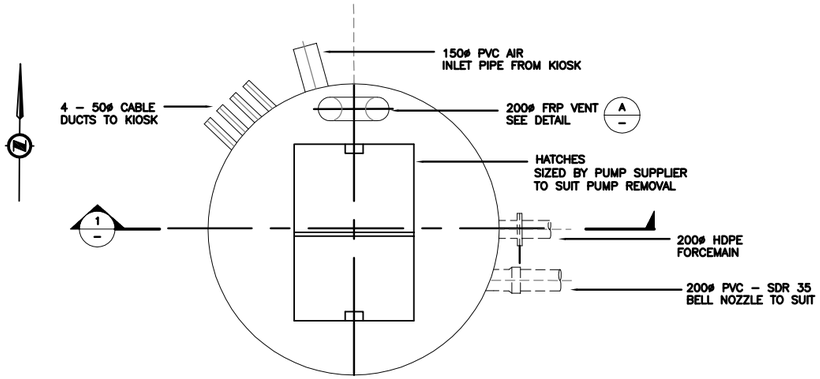
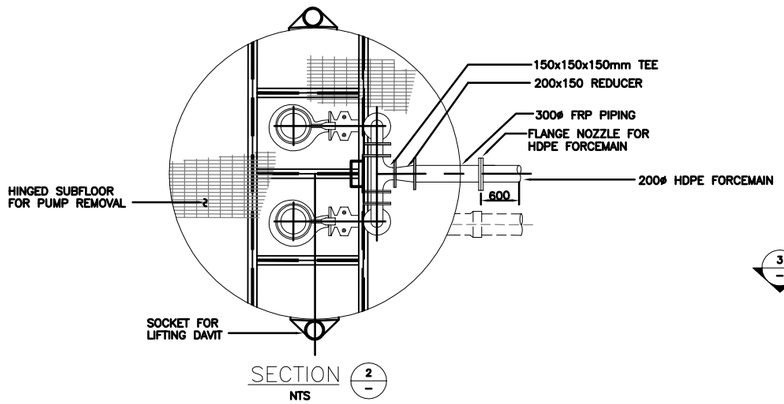


PLAN
NTS



SECTION 2 –
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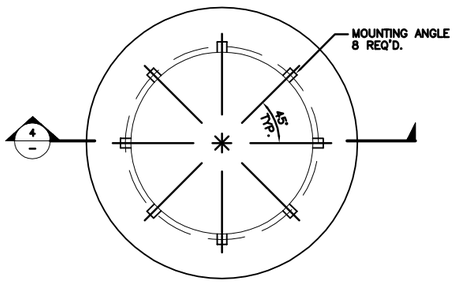

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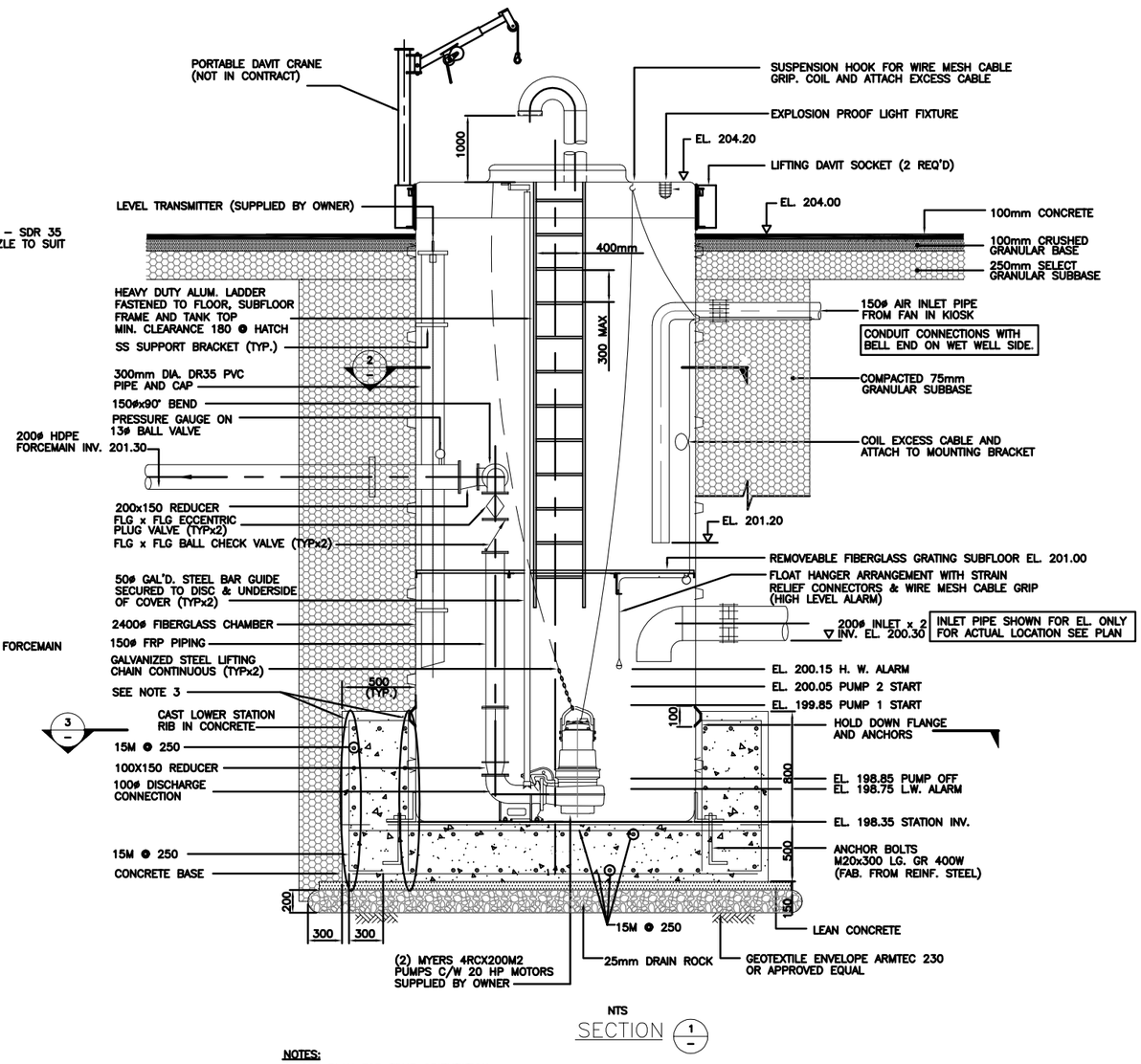

NTS
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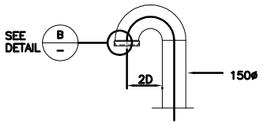

VENT DETAIL A –
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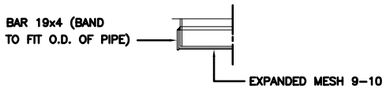

DETAIL B –
NTS

NOTES:

1. SEE PLAN FOR TRUE ORIENTATION
2. FIELD ROUTE TO KIOSK, MIN. BEND RADIUS 200mm
3. BARS BENT TO FORM CIRCLE

NO.	DATE	ENG.	BY	SUBJECT
4	07/07/26	D.D.	L.Y.	RECORD DRAWING
3	06/09/15	E.A.B.	C.L.	PUMPS AND LEVEL TRANSMITTER
2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	E.A.B.	C.L.	ISSUED FOR TENDER

REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

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Associated Engineering

PROJECT No.	002035		
SCALE	AS NOTED		
DRAWN	C.L.		05/09/09
DESIGNED	E.A.B.		05/09/09
CHECKED	E.A.B.		05/09/09
APPROVED	E.A.B.		05/09/09
DATE		INITIAL	

VILLAGE OF PEMBERTON

SANITARY SEWER LIFT STATION

INDUSTRIAL PARK
OFF–SITE SERVICES

DRAWING NUMBER	REV. NO.	SHEET
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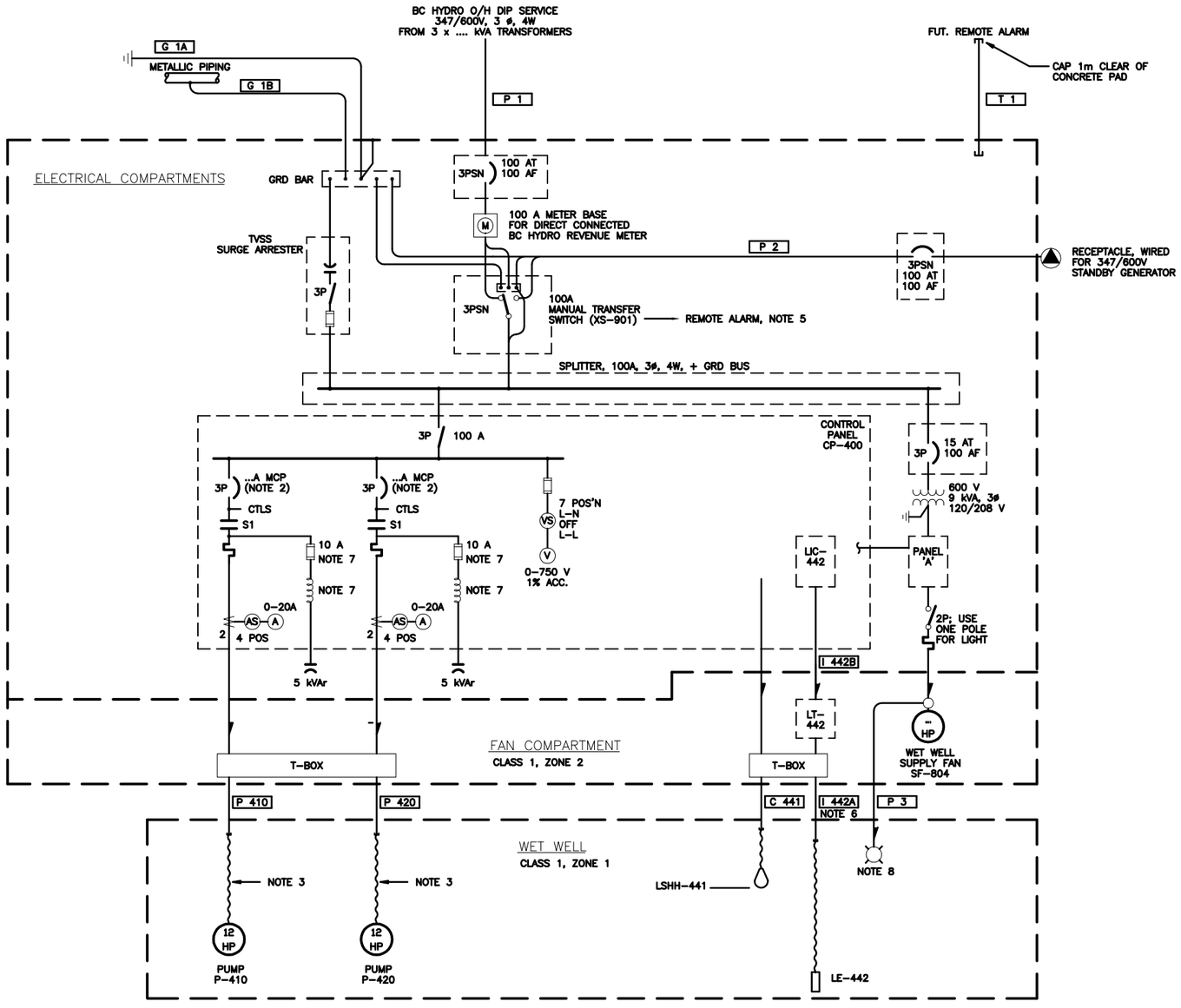


SINGLE LINE DIAGRAM

WIRING SCHEDULE (NOTE 4)		
P 1	78 DB2 C.O.	BC HYDRO SERVICE CONDUIT
P 2	35 RPVC, 3 #3 + #6 GRD	STANDBY GENERATOR RECEPTACLE
P 3	41 RPVC, 2 #12 + #14 GRD	WET WELL LIGHT
*P 410	53 RPVC, 3 PWR + GRD COND'S + 4 SENSOR LEADS FOR PUMP	PUMP P-410 POWER + SENSOR LEADS FLEXIBLE CABLE(S)
*P 420	53 RPVC, 3 PWR + GRD COND'S + 4 SENSOR LEADS FOR PUMP	PUMP P-420 POWER + SENSOR LEADS FLEXIBLE CABLE(S)
*C 441	41 RPVC, FLEXIBLE CABLE SUPPLIED WITH FLOATSWITCH	FLOAT-TYPE LEVEL SWITCH IN WET WELL
*I 442A	53 RPVC, SHIELDED CABLE / TUBE FACTORY-SUPPLIED	LEVEL TRANSDUCER IN WET WELL (NOTE 6)
I 442B	21 RA, 1 TPSH + #14 GRD	LEVEL TRANSMITTER
T 1	53 DB2 C.O.	FOR FUTURE TELUS SERVICE
G 1A	21 RPVC, #6 GRD	
G 1B	21 RPVC, #6 GRD	

* INSIDE WET WELL AND FAN COMPARTMENT CHANGE TO RA

PANELBOARD 'A'

PHASE A B

DESCRIPTION	LOAD	BRKR SIZE			BRKR SIZE	LOAD	DESCRIPTION
KIOSK LIGHTS	200 W	15A	1	2	15A	2 ⏚	KIOSK RECEPTACLES
KIOSK HEATER		15A	3	4	15A	150 VA	CONTROL PANEL CP-400
WASHDOWN COMP'T HEATER		15A	5	6	15A	... HP	WET WELL SUPPLY FAN SF-804
SPARE		15A	7	8			SPACE
SPACE			9	10			SPACE
SPACE			11	12			SPACE
SPACE			13	14			SPACE
SPACE			15	16			SPACE
SPACE			17	18			SPACE

2P 40 AT * *

* DENOTES GFCI BREAKER

• WITH PAD LOCK DEVICE IN ON / OFF POSITION

NOTES:

1. SERVICE SIZED FOR FULL PUMPING CAPACITY, PLUS ANCILLARY LOADS.
2. MCP SIZE AND TRIP RANGE TO BE SELECTED BY MANUFACTURER BASED ON MOTOR FLC; TRIP SETTING OF MCP AND OVERLOADS TO BE ADJUSTED ACCORDINGLY.
3. COMPOSITE CABLE OR SEPARATE POWER AND MONITOR CABLES, SUPPLIED WITH PUMP; CONFIRM WITH PUMP SUPPLIER.
4. SIZE INTERNAL KIOSK WIRING IN ACCORDANCE WITH THE RULES AND REGULATIONS.
5. PROVIDE ISOLATED 120 VAC CONTACTS, WIRED TO TERMINAL BLOCKS, FOR THE FOLLOWING FUTURE REMOTE ALARMS:
   - PUMP P-410 RUN (MS-410)
   - PUMP P-420 RUN (MS-420)
   - PUMP P-410 FAULT (ISH-410, TSH-410, ES-410)
   - PUMP P-420 FAULT (ISH-420, TSH-420, ES-420)
   - TRANSFER SWITCH IN EMERGENCY POSITION (XS-901)
   - INTRUSION
   - WET WELL HIGH LEVEL (LAHH-441B)
   - WET WELL LOW LEVEL (LAL-442)
6. MINIMUM CONDUIT RADIUS REQUIRED FOR TRANSDUCER CABLE IS 200 mm.
7. DUAL-ELEMENT TYPE FUSE; PROVIDE 10 COILED TURNS IN THE CAPACITOR LEADS.
8. COMPACT FLUORESCENT LUMINAIRE, CLASS I, ZONE 1, WITH 26W LAMP AND GUARD, NRL #ZM-F-26-G-**-C

NO.	DATE	ENG.	BY	SUBJECT
3	07/07/26	D.D.	L.Y.	RECORD DRAWING
2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	E.A.B.	C.L.	ISSUED FOR TENDER

REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

0 ——— 20mm

IF NOT 20mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Associated Engineering

PROJECT No.	002035		
SCALE	NONE		
DRAWN	J. THEILER		05/08/22
DESIGNED	J. THEILER		05/08/22
CHECKED	E.A.B.		05/08/22
APPROVED	E.A.B.		05/08/22
DATE		INITIAL	

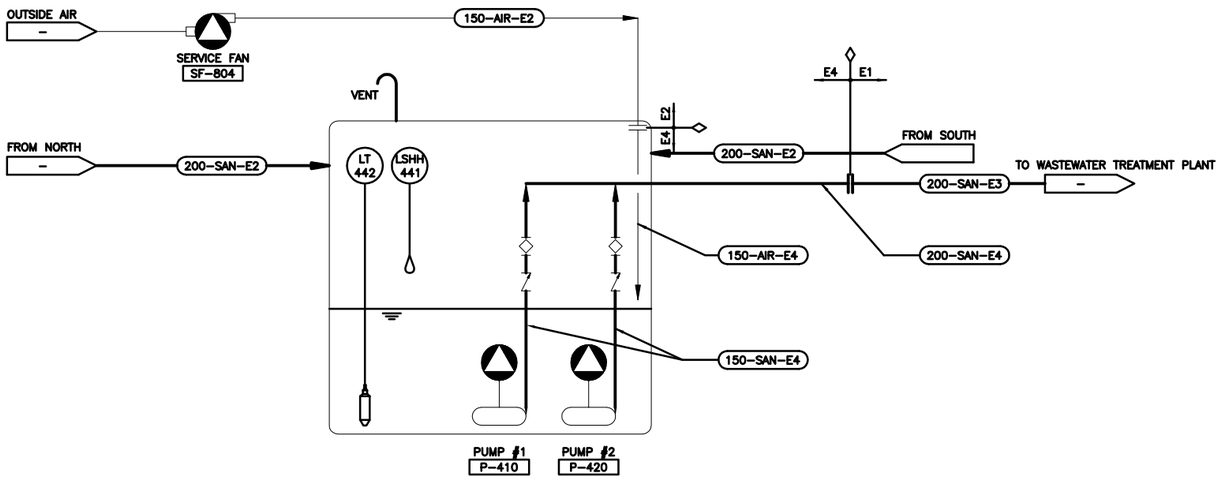
VILLAGE OF PEMBERTON

INDUSTRIAL PARK
OFF-SITE SERVICES

ELECTRICAL
PUMP STATION
SINGLE LINE DIAGRAM

DRAWING NUMBER	REV. NO.	SHEET
002035-7-601	3	17/18

Time: 8:37
Date: 2007/7/26
Plotted By: Lindsay Yuen (Paper Space)
AutoCAD File: Q:\002035\2005 INDUSTRIAL PARK OFF SITE SERVICES\CIVIL\SUBMISSION\AS BUILTS_JULY 26\002035701.DWG (L.Y.)



INDUSTRIAL PARK PUMP STATION

LEGEND

- FAN
- SUBMERSIBLE PUMP
- SUBMERSIBLE MIXER
- PLUG VALVE
- GATE VALVE
- BALL VALVE
- CHECK VALVE
- LEVEL SWITCH (LS)
- LEVEL TRANSMITTER (LT)
- BACKFLOW PREVENTER
- PRESSURE CONTROL VALVE (DOWN STREAM SENSING)
- BLIND FLANGE

300–SAN–E2

LINE CODE

MATERIAL
A1– STEEL PIPE, SCH 40, COAL TAR EPOXY LINED AND COATED
E1– PVC PIPE SCHED 80
E2– PVC PIPE
E3– POLYETHYLENE PIPE
H1– STAINLESS STEEL, SCH 40, SOCKET WELD

COMMODITY
AIR–SERVICE AIR
PW–POTABLE WATER
SAN–SANITARY WASTE

LINE SIZE (IN MILLIMETRES)

NO.	DATE	ENG.	BY	SUBJECT
3	07/07/26	D.D.	L.Y.	RECORD DRAWING
2	06/08/24	D.D.	C.L.	ISSUED FOR CONSTRUCTION
1	06/04/07	E.A.B.	C.L.	ISSUED FOR TENDER

REVISIONS

VERIFY SCALES

BAR IS 20mm ON ORIGINAL DRAWING

0 —— 20mm

IF NOT 20mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Associated Engineering

PROJECT No.	002035		
SCALE	AS NOTED		
DRAWN	C.L.		05/09/09
DESIGNED	E.A.B.		05/09/09
CHECKED	E.A.B.		05/09/09
APPROVED	E.A.B.		05/09/09
DATE		INITIAL	

VILLAGE OF PEMBERTON

PROCESS MECHANICAL
P & ID, LEGEND

INDUSTRIAL PARK
OFF–SITE WORKS

DRAWING NUMBER	REV. NO.	SHEET
002035–7–401	3	15/18

Appendix B – Delcan Technical Memorandum

DRAFT Technical Memorandum

To:	Cam McIvor, Project Manager	Date:	April 16, 2012
cc:	Grant Campbell, P.Eng		
From:	Colin Kristiansen, P.Eng Todd Bowie, P.Eng	Our Ref:	EB3766

RE: Sunstone Ridge Development – Sanitary Loading Assessment

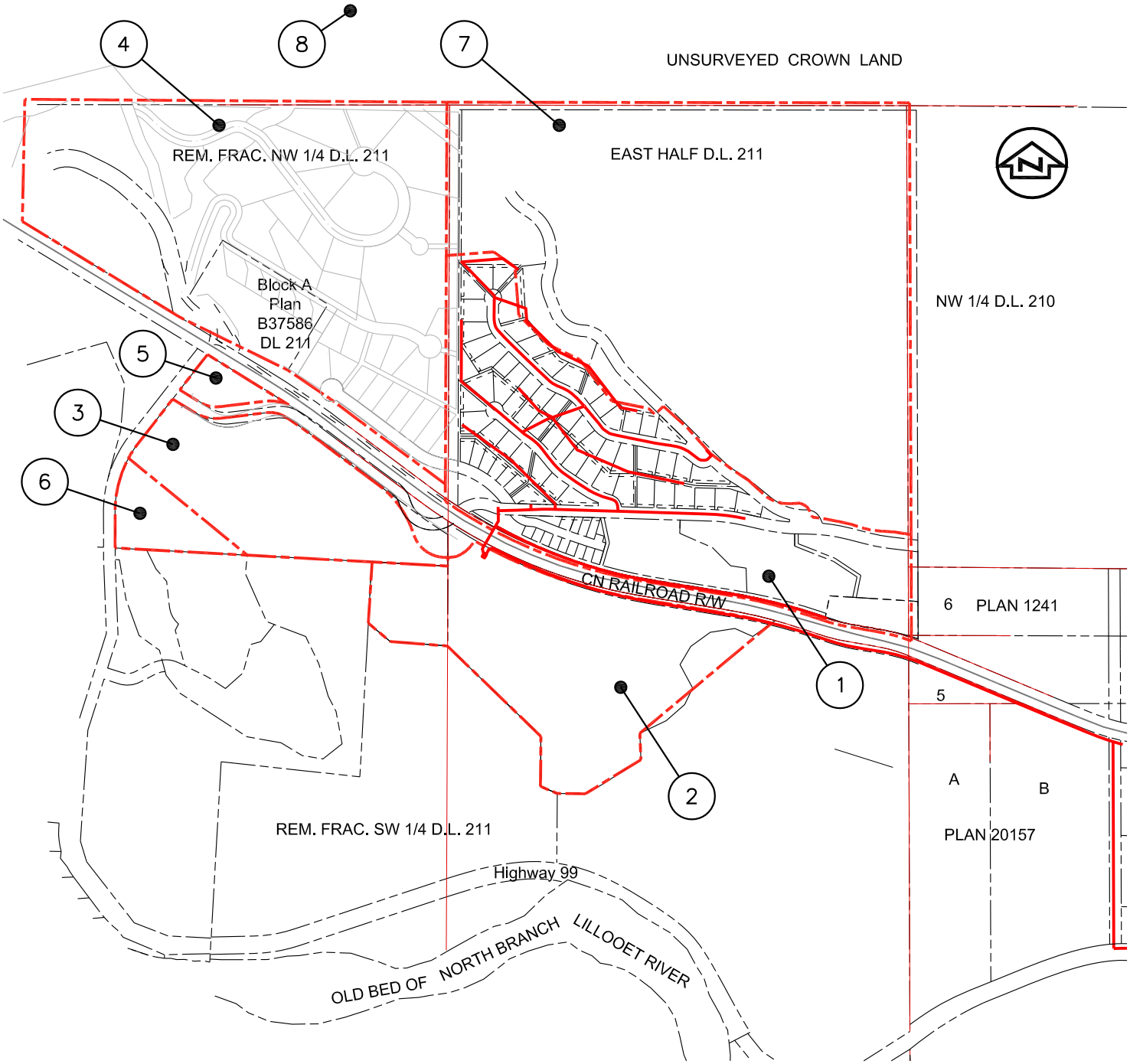
Delcan has been retained to provide engineering services for the development of Phase 1 of the Sunstone Ridge Development (SRD), located in the Village of Pemberton, 3 km east of the Village Centre.

The purpose of this Technical Memorandum is to present the design basis for the sanitary flow assessment, identify the sanitary sewer loadings for the SRD site and other surrounding potential short term development sites.

Development Plan

The SRD site is anticipated to be the first phase of a number of developments in the Sunstone Ridge area. The location of the SRD site and proposed surrounding developments are shown in **Figure 1**. Details on the development plans are as follows:

1.	Sunstone Ridge Development Site (Phase 1)	78 single-family units 142 multi-family units
2.	School Site	1200 student school building 800 student boarding building
3.	Recreation Facility Site	30,000 ft^2 ice arena building 12,000 ft^2 swimming pool building
4.	Biro Site	31 single-family units 77 multi-family units Resort Hotel
5.	Commercial Site	100,000 ft^2 neighbourhood commercial
6.	22 SF Site	22 single-family units
7.	Sunstone Ridge Development Site (Phase 2)	130 units



SHORT TERM DEVELOPMENT SITES

1. SUNSTONE RIDGE SITE
2. SCHOOL SITE
3. RECREATION FACILITY
4. BIRO SITE
5. COMMERCIAL
6. 22 SF UNITS

LONG TERM DEVELOPMENT SITES

7. SUNSTONE RIDGE (FUTURE)
8. LIL'WAT DEVELOPMENT (FUTURE)

Figure 1: Development Sites Layout

Design Parameters

The following documents were referenced to predict the sanitary sewer loads of the SRD site and surrounding short-term development sites:

Village of Pemberton Subdivision and Development Control Bylaw #677, 2011

Squamish Lillooet Regional District (SLRD) Subdivision and Development Servicing Bylaw #741, 2002.

MMCD Design Guideline Manual, 2005.

Sewerage System Standard Practice Manual (SSSPM) Version 2, 2007.

Key parameters used in the assessment are summarized below:

Parameter	Value	Reference
Population per Dwelling	Single Family = 4 people/unit Multi Family = 3 people/unit	SLRD Bylaw #741
Per Capita Demand	Average Dry Weather Flow = 410 litres/capita/day	Pemberton Bylaw #677
Other Demands	Students = 70 L/student/day Boarders = 400 L/boarder/day Arena = 85,000 L/day Swimming Pool = 50 L/m^2 Shopping Center = 0.1 L/m^2 Restaurant = 125 L/seat	MMCD MMCD MMCD SSSPM MMCD SSSPM
Peaking Factor	$PF = 6.75P^{-0.11}$	MMCD Design Guidelines
Infiltration	I = 0.17 L/s/ha	Pemberton Bylaw #677

Sanitary Loading Assessment

Two preliminary servicing designs are being developed for the SRD site, one for servicing only the SRD site, and one for servicing all of the short term potential development sites. This will establish the difference in facilities and costs associated with the SRD site and the neighbouring properties, and may form the basis for cost sharing arrangements such as latecomers' fees. Predicted sanitary sewer loadings from each of the individual sites are summarized in **Table 1.**

Table 1: Summary of Sanitary Loading Predictions

Site	ADWF (L/sec)	I&I (L/sec)	PWWF (L/sec)
1. SRD Site (Phase 1)	3.5	3.9	15.3
2. School Site	4.0	1.1	14.0
3. Recreation Facility	1.6	1.5	7.2
4. Biro Site	2.7	3.4	14.4
5. Commercial Site	0.1	0.1	0.5
6. 22 SF Units	0.4	0.3	2.0
7. SRD Site (Phase 2)	2.5	5.6	13.9

* assumed incl. 50 seat restaurant

Servicing Arrangement 1 - SRD Site Only

The first servicing arrangement is limited to only the SRD site. The arrangement would involve a sanitary pump station and forcemain to pump sewage to the existing 200 mm forcemain at Highway 99 that conveys sewage from the industrial park to the Pemberton Wastewater Treatment Plant. The pump station and forcemain would need to be sized to accommodate 15.3 L/sec.

Servicing Arrangement 2: All Short Term Development Sites

The second servicing arrangement includes the SRD site and the surrounding short term development sites. The overall servicing arrangement would be the same as arrangement 1. The pump station and forcemain for this arrangement would need to be sized to accommodate 59.1 L/sec

Conclusions

To proceed with preliminary design of the sanitary pump station and forcemain required for the SRD development, we require confirmation that there is available capacity in the existing 200mm forcemain servicing the industrial park for an additional sanitary loading scenarios of 15.3 L/sec or 59.1 L/sec. If capacity is available, boundary conditions for the tie-in to the village forcemain for each scenario are required.