902-420-9287
450 Cowie Hill Road
P.O. Box 8388 RPO CSC
Halifax, Nova Scotia
Canada B3K 5M1

July 20, 2023

VIA EMAIL (crystal.henwood@novascotia.ca)
Ms. Crystal Henwood, Regulatory Affairs Officer/Clerk of the Board
N.S. Utility and Review Board
3rd Floor, Summit Place, 1601 Lower Water Street
P. O. Box 1692, Postal Unit M
Halifax, NS B3J 3S3

Re: Port Wallace Transmission Main Highway 118 Crossing – Shubie Park to Dartmouth Crossing

Dear Ms. Henwood:

Halifax Water is currently seeking funding for the Port Wallace Transmission Main Highway 118 Crossing – Shubie Park to Dartmouth Crossing for an estimated total project cost of $10,390,000.

The Port Wallace Transmission Main – Highway 118 Crossing project is Phase 2 of Halifax Water's Infrastructure Master Plan project to twin the existing water transmission main from Main Street to the Burnside Industrial Park/Dartmouth Crossing.

Halifax Water's Infrastructure Master Plan recommends the twinning of the Burnside Transmission Main. The new transmission main will provide additional capacity and redundancy to the Burnside Industrial Park. This phase of the transmission main design and construction is being aligned with Port Wallace Holdings Limited's need for the Port Wallace plan area to connect to the wastewater collection system in Dartmouth Crossing.

This phase of the project involves approximately 1,500 metres of new 600 mm diameter water main starting at the intersection of Breeze Drive and Waverley Road, through Shubie Park, crossing highway 118, finally connecting to the existing 600 mm water main on Countryview Drive in Dartmouth Crossing.

The first phase of the Port Wallace Transmission main, from Main Street to Caledonia Road, was approved under M09721 and was completed at the end of 2020.

Funding in the amount of $120,000 for detailed design work for this phase was previously approved in April 2022.

This project has a 5% benefit to growth, as such 5% of the total project cost will be funded by the Water Regional Development Charge.

Funding in the amount of $8,037,000 including net HST is available within the 2023/2024 Capital Budget under:

- Highway 118 Crossing – Shubie Park to Dartmouth Crossing

Additional funding in the amount of $2,353,000 is to be included in the 2024/25 Capital Budget.

The proposed expenditure meets the "No Regrets – Unavoidable Needs" approach of the 2012 Integrated Resource Plan. The proposed work meets the NR-UN criteria, required to ensure infrastructure system integrity and growth-related infrastructure supported by pre-design level master plan.

Accordingly, we are now requesting approval from the Nova Scotia Utility and Review Board for the Port Wallace Transmission Main Highway 118 Crossing – Shubie Park to Dartmouth Crossing. If you have any questions with regard to this submission, or any aspect of the Commission's operation, please do not hesitate to contact me at 902-490-4840.

Respectfully submitted,

Digitally signed by Louis de Montbrun
Date: 2023.07.20 13:31:24 -03'00'

Louis de Montbrun, CPA, CA
Acting General Manager and CEO, Halifax Water

Attachments:
1. Port Wallace Transmission Main – Site Plan
2. Port Wallace Transmission Main – Cost Estimate
3. Port Wallace Transmission Main – Design Report & Engineer's Estimate

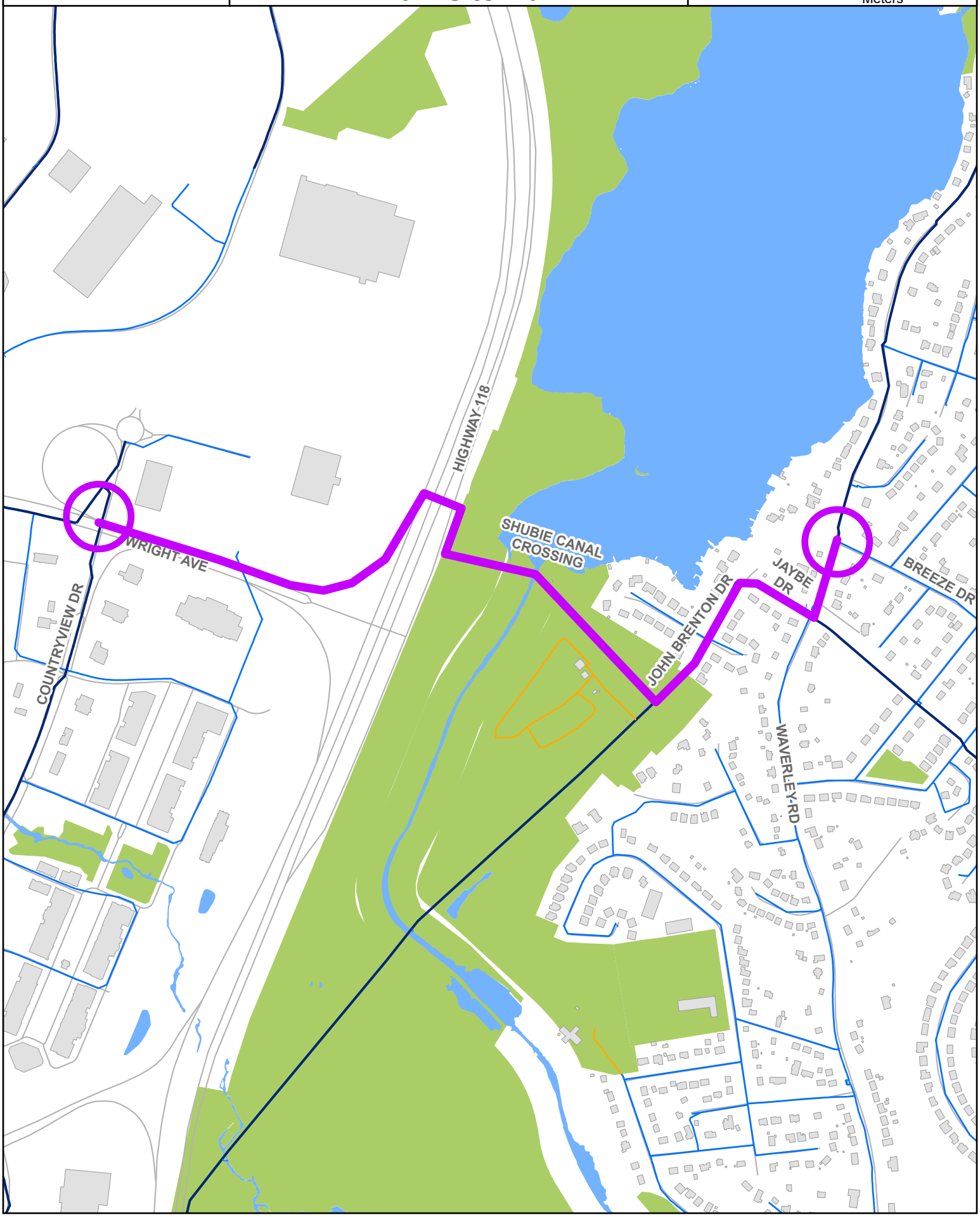
STRAIGHT from the SOURCE

Halifax Water

Port Wallace Transmission Main Site Plan

N

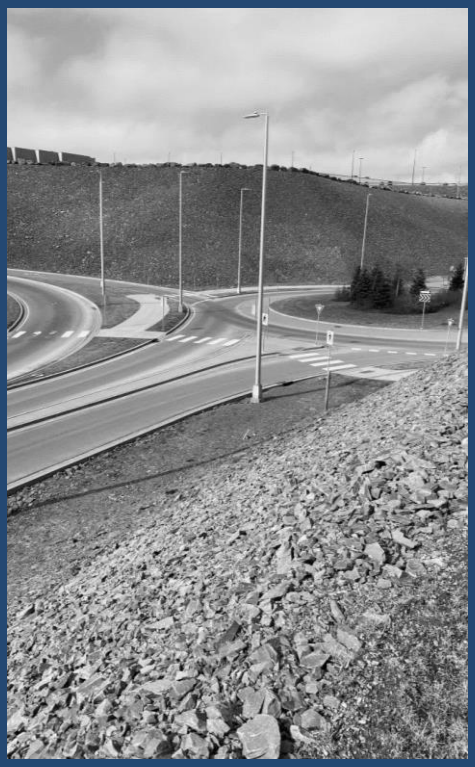
Scale
1:7,000
0 100 200
Meters



Port Wallace Transmission Main - Project Cost Estimate - June 16, 2023

Description	Total Cost
Construction Cost - Based on Engineer's Estimate	$7,059,450
Consulting Cost - Design & Tender Phase	$120,000
10% Consulting Cost - Construction Phase	$705,945
Sub-total	$7,885,395
25% Project Contingency	$1,971,349
25% Contingency was utlized due to project complexity. The 1,400 metres of transmission main is being installed in HRM right-of-way, HRM parkland, spanning the Shubie Canal, crossing the HWY 118 and conection to the existing sytem within Dartmouth Crossing.	
Halifax Water - Operations & Inspections	$75,000
Sub-total	$9,931,744
Net HST (4.286%)	$479,305.95
Halifax Water Overhead (1%)	$99,317.44
Total Project Cost Estimate	**$10,510,367**

Total Estimated Project Cost (Rounded)	$10,510,000
Subtract Approved Funding to Date	$120,000
Requested Funding (2022/2023)	**$10,390,000**

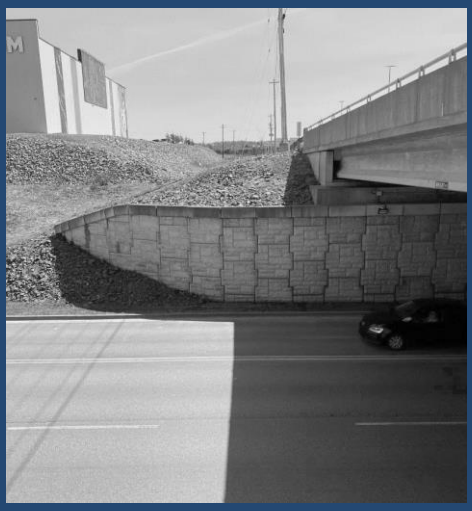


Design Report

June 16th, 2023

Port Wallace Transmission Main

DP Project #22-236 - Engineering Services



SUBMITTED BY:

DesignPoint Engineering & Surveying Ltd.

90 Western Parkway, Suite 500
Bedford, NS B4B 2J3

SUBMITTED TO:

Halifax Water

450 Cowie Hill Road
Halifax, NS B3P 2V3
Attention: Kevin Gray, Manager, Engineering Approvals

DESIGNPOINT
engineering • surveying • solutions

Halifax Water

designpoint.ca

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APPENDICES

1.0 INTRODUCTION

Halifax Water has retained DesignPoint to complete the detailed design of a water main extension from Breeze Drive at Waverley Road to Dartmouth Crossing Retail Business Park (Dartmouth Crossing) at Countryview Drive. This project is intended to fill a gap in the existing system and to provide additional supply to Burnside and the proposed development in the Port Wallace area. DesignPoint was hired to complete a topographic survey, engineering design, and tender support services, as well as provisional construction inspection and administration services.

Clayton Developments Ltd. (Clayton) is planning a large land development commonly known as “Port Wallace” serving approximately 13,000 people. To service this new development with municipal services, a utility corridor has been identified from Breeze Drive that extends to Countryview Drive. This corridor will include sewer, water, and gas utility services.

Halifax Water has plans to improve the water system connection from the Lake Major Water Supply Plant to Burnside by installing a new transmission main. This work is to be completed in three phases. To date, HRWC has completed the first phase of this connection in 2020, extending a 600mmø transmission main from Main Street to Avenue du Portage. The second phase of this transmission main will include this proposed utility corridor, with the third and final phase to follow. Due to the synergies of constructing all utilities at the same time along the utility corridor, Halifax Water has coordinated with Clayton for the installation of this 600mmø water connection along with the other utility work within this corridor.

The 600mmø water transmission extension is to be installed along Waverley Road from Breeze Drive to Jaybe Drive, along Jaybe Drive to John Brenton Drive, along John Brenton Drive to Shubie Park, through Shubie Park, over the Shubie Canal, to Highway 118, and under Highway 118 to Dartmouth Crossing to make a connection to the existing 600mmø water transmission main on Countryview Drive. Refer to Appendix A for a sketch of the project area.

The design of the project has been carried out during 2022/2023 with construction intended for the 2024 construction season. This report outlines the design process.

2.0 WORK PROGRAM

The following is a detailed breakdown of the work completed during the design of this project.

2.1 TOPOGRAPHIC SURVEY

A topographic survey was completed along the project route. This survey identified relevant surface features that were incorporated into a base plan for the detailed design. The road cross-section, existing water, sewer and storm sewer infrastructure and culverts were identified along with other relevant features. The Shubie Canal was also surveyed along with Highway 118 at the area of the proposed crossing.

Property lines along the project route have been included in the design based on provincial mapping information. The proposed water transmission main will be located in the HRM street Right of Way, the HRM Park and the NSDPW Highway Right of Way.

2.2 HALIFAX WATER CONSULTATION

Halifax Water was consulted throughout the project during regular meetings. Record drawings and GIS information of the existing systems were provided to DesignPoint along with lateral card information at select locations.

It was determined early in the project that ductile iron piping is to be used to provide consistency with the surrounding infrastructure. Given that existing residents along the project route are currently serviced by water infrastructure, new service laterals were not included as part of the scope of this project. In locations where laterals connect to the existing transmission main, the laterals may be reconnected to the new mains. As the existing transmission main along John Brenton Drive and Jaybe Drive is Hyprescon and other services are being installed in close proximity, the existing main will be replaced as part of this project.

2.2.1 Implications

The overall implications are summarized below:

1. A ductile iron water main has been specified.
2. The water main location will avoid existing infrastructure where possible.
3. The new transmission main will be 600mmø.
4. The existing Hyprescon along John Breton and Jaybe will be replaced.
5. Temporary water will be required with an equivalent hydraulic capacity.
6. The water transmission main will be installed on a bridge over the Shubie Canal.
7. The water transmission main will be installed under Highway 118 within a casing pipe using open-cut methodology.

2.3 HRM CONSULTATION

A meeting was held with HRM to review reinstatement requirements for the project. Several aspects of the work were discussed, including working hour restrictions, reinstatement requirements, and the potential for integrated HRM projects.

HRM indicated that there were no HRM projects taking place in the project area, and that work by Halifax Water would not be integrated with any HRM projects.

Waverley Road was noted as a Major Collector, which will require peak hour restrictions during construction, with no work between the hours of 7:00 am-9:00 am and 4:00 pm-6:00 pm. Provision for this requirement was made in the tender documents. In a previous project completed by HRM, peak-hour restrictions were enforced. The possibility of night work was discussed, and HRM was open to night work.

Wright Avenue is an arterial road. Two lanes of traffic must be maintained on the road at all times, and construction work is also subject to full peak hour restrictions. Jaybe Drive and John Brenton Drive are both local roads with no supplemental restrictions.

Highway 118 and its ramps are under provincial jurisdiction and all work will be subject to the Nova Scotia Temporary Traffic Control Manual and require a Work Within Highway Right-of-Way Permit. Coordination will be required with the province to develop the proposed work plan to mitigate traffic impacts during construction.

2.3.1 Implications

The project implications from this consultation are summarized below:

1. Reinstatement of Waverley Road must include superelevation. To facilitate this, a preconstruction survey will be required by the contractor. A survey of the road gravels will be completed at the same location as the preconstruction surveys completed by the contractor and DesignPoint to confirm superelevation before asphalt placement.
2. Peak-hour restrictions will be required while working on Waverley Road. Work may be completed between the hours of 9 am and 4 pm or overnight. This information will be included in the tender to allow the contractor to choose which option works best.
3. Peak-hour restrictions will be required while working on Wright Avenue. Work may be completed between the hours of 9 am and 4 pm or overnight and during these times are least two lanes of traffic must be maintained. This information will be included in the tender to allow the contractor to choose which option works best.
4. All work within the provincial ROW, including under Highway 118 and the off-ramp are subject to Nova Scotia Temporary Traffic Control Manual and will require a provincial Work Within Highway Right-of-Way Permit.

2.4 GEOTECHNICAL TESTING

A geotechnical program was completed on-site as detailed in Appendix B. This program included drilling sixteen (16) Auger Probes (AP01 and AP04 to AP18, inclusive), excavating three (3) test pits (TP01 to TP03, inclusive), and drilling nine (9) boreholes (BH02 to BH10, inclusive) between May 19 and August 10, 2022. The purpose of the investigation was to assess the subsurface conditions along the corridor alignment in addition to subsurface assessment and providing geotechnical foundation recommendations for a new pedestrian bridge over the Shubenacadie Canal in Shubie Park and a new pump station structure behind the existing pump station at 390 Waverley Road.

The auger probes were completed at regular intervals along the corridor. The test pits were dug along an isolated section on the corridor on Wright Avenue. The boreholes were completed at occasional intervals along the corridor, on each side of the Shubenacadie Canal within Shubie Park at the planned new pedestrian bridge, and in the yard area of the existing pump station at 390 Waverley Road.

In general, the geotechnical subsurface conditions encountered a comprised sequence of cobble and boulder rich overburden, varying from silty sand with gravel, sandy silt with gravel, silty gravel with sand, and sand with silt and gravel overlying quartzite bedrock. Surficial materials varied from exposed soils, asphalt pavement, concrete sidewalk, and sod/topsoil. Bedrock depth varied from 1.2 to greater than 9.4 metres. Refusal of some auger probe locations, inferred to be on a boulder or bedrock, varied from 2.1 to 5.5 metres.

2.5 OVERHEAD UTILITIES

Utility poles are situated on both sides of Waverley Road and the north side of Jaybe Drive. Various power poles along the route will need to be shored or moved during construction.

Nova Scotia Power recommended a 2-metre separation between the excavation site and the point where the guy anchor breaks the surface. Utility poles will be located in proximity to the proposed work, therefore certain poles will need to be moved and/or shored during construction.

2.6 COST ESTIMATION

A cost estimate was completed for the project based on the designed quantities and unit rates from previous tenders. It is noted that tender prices over the previous year have been highly volatile due to uncertainty surrounding supply shortages and increased construction demand. The construction cost for the project was estimated at $7.06M exclusive of HST and contingency. A full breakdown of the cost estimate can be found in Appendix C.

2.7 DESIGN CONSIDERATIONS

Based on the work program described in this section, the following considerations have been made during the completion of the project design.

2.7.1 Water Main Location

To minimize reinstatement costs, the water main has been located to avoid existing infrastructure where possible.

2.7.2 Reinstatement

Reinstatement requirements were reviewed with HRM. It was concluded that Jaybe Drive will require full street reconstruction.

3.0 CONCLUSIONS AND RECOMMENDATIONS

During the completion of the design and through consultation with relevant stakeholders, the following conclusions are provided with recommendations to follow.

3.1 CONCLUSIONS

1. A ductile iron water main is the appropriate water main for the construction of this project. The use of this material will provide consistency with the existing water mains in the surrounding area.
2. Peak-hour restrictions will be in place during the construction of this project. Both travel lanes must be maintained between the hours of 7:00 am-9:00 am and 4:00 pm-6:00 pm. Night work may be permitted for portions of the project.
3. Shoring or relocating utility poles will be required.
4. The existing streets are congested with underground services in certain locations. Some of this infrastructure will need to be replaced to accommodate new services, requiring complete road resurfacing and replacement.

3.2 RECOMMENDATIONS

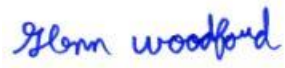
1. Install the 600mmø water transmission main in the existing streets, through Shubie Park, over the Shubie Canal and under Highway 118.
2. Provide polyethylene encasement around the water transmission main to protect against corrosion.
3. A temporary water main will be required for the Jaybe Drive area, this will need to have equivalent hydraulic capacity to the existing system.

4.0 CLOSURE

We trust that the information contained in this report adequately outlines the design process of this project. If you have any questions about the contents of the report or if we can be of any other assistance, please contact us.

Thank you,

DesignPoint Engineering & Surveying Ltd.



Glenn Woodford, P.Eng.
Senior Civil Engineer & Principal

5.0 APPENDIX A – PROJECT AREA

DARTMOUTH CROSSING

LAKE CHARLES

KEYSTONE VILLAGE

SHUBIE PARK

MONTEBELLO

HIGHWAY 118

WRIGHT AVENUE

COUNTRYVIEW DRIVE

WAVERLY ROAD

JOHN BRENTON DRIVE

JAYBE DRIVE

BREEZE DRIVE

EX. DARTMOUTH TRUNK SEWER

PROPOSED WATER TRANSMISSION MAIN EXTENSION

PROPOSED NATURAL GAS MAIN

PROPOSED SHUBENACADIE CANAL CROSSING

FUTURE STREET CONNECTION, EXTENTS OF NATURAL GAS MAIN

PS

390 WAVERLY ROAD

PROPOSED FORCEMAIN

PROPOSED NATURAL GAS MAIN

PROPOSED WATER TRANSMISSION MAIN EXTENSION

EX. 600 mm WATER TRANSMISSION MAIN

N

150 0 METRES 150 300

1:5000

NOTES

CLIENT

Clayton The Community Builder

CONSULTANT

DESIGNPOINT engineering • surveying • solutions

PROJECT DESCRIPTION

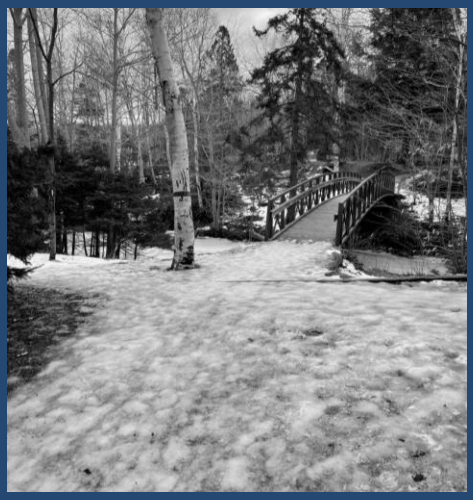
PORT WALLACE UTILITY CORRIDOR

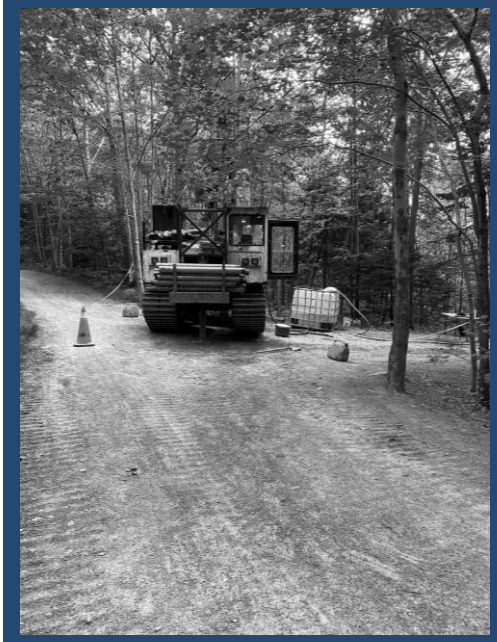
DARTMOUTH, NOVA SCOTIA

PROJECT NO.	DATE	DRAWING SCALE
22-106	DEC. 12, 2022	1:5000

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_SK01.dwg, Plot Date: 2023-Jun-13, Plot Size: ANSI FULL BLEED B (11.00 X 17.00 INCHES)

6.0 APPENDIX B - GEOTECHNICAL REPORT





GEOTECHICAL REPORT

September 12, 2022

Geotechnical Investigation – Port Wallace, Dartmouth, Nova Scotia

Project Number 22-106

SUBMITTED BY:

DesignPoint Engineering & Surveying Ltd.

222 Waterfront Drive, Suite 104
Bedford, NS B4A 0H3

SUBMITTED TO:

Clayton Developments Ltd.

TABLE OF CONTENTS

APPENDIX A

- Figure Showing General Utility Services Corridor Route
- Symbols and Terms used on Borehole and Test Pit Records
- Auger Probe, Test Pit, and Borehole Records
- Grain-Size Plots
- Test Locations Drawings

1.0 INTRODUCTION

DesignPoint Engineering & Surveying Ltd. (DesignPoint) was retained by Clayton Developments Limited to conduct a geotechnical investigation along a proposed utility services corridor extending between the intersection of Wright Ave. and Countryview Dr. in the Dartmouth Crossing Retail Business Park to an existing pump station located 390 Waverley Road in support of the planned Port Wallace land development project in Dartmouth, Nova Scotia. We understand that various buried utility services will be installed along the corridor including natural gas, water, sanitary pressure sewer, and storm sewer.

The purpose of the investigation was to assess the subsurface conditions along the corridor alignment in addition to subsurface assessment and providing geotechnical foundation recommendations for a new pedestrian bridge over the Shubenacadie Canal in Shubie Park and a new pump station structure behind the existing pump station at 390 Waverley Road.

The scope of the investigation comprised drilling sixteen (16) Auger Probes (AP01 and AP04 to AP18, inclusive), excavating three (3) test pits (TP01 to TP03, inclusive), and drilling nine (9) boreholes (BH02 to BH10, inclusive) along the planned corridor, and preparation of a geotechnical investigation report. This geotechnical investigation report presents the field work findings including laboratory testing and provides our geotechnical recommendations to assist with design.

2.0 SITE DESCRIPTION AND GEOLOGY

The utility services corridor is planned to extend from near the intersection of Country View Drive and Wright Ave, easterly along Wright Ave, across Highway No. 118, through Shubie Park including a pedestrian bridge crossing over the Shubenacadie Canal, along John Brenton and Jaybe Drives, and northerly along Waverley Road to the existing sewage pumping station at 390 Waverley Road. The route currently comprises a mixture of grass and gravel surfacing, treed parkland, and asphalt paved roads. A figure showing the proposed corridor route is appended.

Geologic mapping indicates the principal native overburden along the proposed corridor area comprises stony till plain overlying Goldenville Formation bedrock. Based on local experience, the till overburden typically varies from silty sand with gravel, silty gravel with sand, and sandy silt with gravel along with containing frequent cobbles and boulders. Bedrock characteristically comprises quartzite and greywacke.

3.0 PROCEDURES

The investigation comprised drilling sixteen (16) Auger Probes (AP01 and AP04 to AP18, inclusive), excavating three (3) test pits (TP01 to TP03, inclusive), and drilling nine (9) boreholes (BH02 to BH10, inclusive) between May 19 and August 10, 2022. The strata encountered at each test location are described on the appended Auger Probe, Test Pit and Borehole Records and summarized below in the Section 4.0.

The auger probes were completed at regular intervals along the corridor. The test pits were dug along an isolated section of the Wright Ave portion of the corridor. The boreholes were completed at occasional intervals along the corridor, on each side of the Shubenacadie Canal within Shubie Park at the planned new pedestrian bridge, and in the yard area of the existing pump station at 390 Waverley Road.

3.1 AUGER PROBES

The auger probes were completed with minimal to no sampling using a geotechnical drill-rig. Auger probe depths were initially targeted to be approximately 4 metres deep however, auger refusal was obtained at shallower depths at several locations inferred to be a boulder or bedrock. Therefore, at some auger probe locations where shallow refusal was obtained, coring was completed to further advance the probes to assess for bedrock depth. When taken, soil samples were stored in moisture-tight containers and bedrock core samples were organized in wooden core boxes. DesignPoint geotechnical representative was onsite to log the subsurface conditions encountered at the auger probes.

3.2 TEST PITS

A DesignPoint geotechnical representative was onsite to log the subsurface conditions encountered in each of the test pits. Bulk samples were taken of the various strata encountered in the test pits. The in-situ relative density of the soils was estimated based on observations of the excavator performance. The side walls of the test pits were observed for water seepage. Upon completion, the test pits were backfilled with the excavated material and lightly tamped with the excavator bucket. All soil samples were stored in moisture tight containers.

3.3 BOREHOLES

Overburden samples were taken at various depth intervals within the boreholes using a 50 mm diameter split-barrel sampler during performance of standard penetration tests (SPTs). N-values obtained from the SPTs were recorded. The N-value is the number of blows to hammer the split-barrel sampler 300 mm into the soil using a standard energy (hammer weight and fall height). N-values indicate soil compactness and can be used to estimate various other soil parameters. Bedrock was cored with an HQ-sized core barrel. The Rock Quality Designation (RQDs) and recovery of the core runs were measured and recorded. Soil samples were stored in moisture-tight containers and bedrock core samples were organized in wooden core boxes. A DesignPoint geotechnical representative was onsite to log the subsurface conditions encountered in each of the boreholes.

3.4 SURVEY

Locations and elevations of the boreholes were surveyed by DesignPoint; elevations are referenced to Geodetic Datum (CGVD28). The borehole locations are shown on the appended Test Locations drawing. Elevations are provided on the appended Borehole Records and incorporated within this report.

3.5 LABORATORY TESTING AND CLASSIFICATION

Laboratory testing consisting of moisture contents and sieve analyses was completed on selected soil samples from some boreholes to assist with soil classification. Symbols and Terms Used on Borehole and Test Pit Records provide a brief explanation of the terminology and graphics used in this report and are also appended. Soil classification was based on procedures described in ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) and ASTM D 2488 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure).

4.0 SUBSURFACE CONDITIONS

The geotechnical subsurface conditions encountered at the test locations are detailed on the appended Auger Probe, Test Pit, and Borehole Records and summarized herein.

The following Tables 1 to 4 provide a general summary of the overburden thickness and depth to bedrock and/or refusal inferred to be a boulder or bedrock.

Table 1 – Summary of Auger Probes Findings

AP No.	Ground Surface El., m	Thickness, m		Refusal Inferred to be Boulder or Bedrock, m		Bedrock, m	
		Asphalt	Overburden	Depth	El.	Depth	El.
AP01	49.74	- -	3.10	- -	- -	3.10	46.64
AP04	47.33	- -	5.20(1)	5.20	42.13	- -	- -
AP05	46.52	- -	5.50(1)	5.50	41.02	- -	- -
AP06	34.43	- -	> 9.40	- -	- -	> 9.40	< 25.03
AP07	40.91	- -	3.84	- -	- -	3.84	37.07
AP08	41.21	- -	2.49(1)	2.49	38.72	- -	- -
AP09	39.52	- -	4.57(1)	4.57	34.95	- -	- -
AP10	32.43	- -	> 9.40	- -	- -	> 9.40	< 23.03
AP11	34.22	0.15	5.64	- -	- -	5.64	28.58
AP12	36.27	0.15	5.10	- -	- -	5.10	31.17
AP13	35.00	0.2	2.18(1)	2.18	32.82	- -	- -
AP14	34.00	0.15	2.44(1)	2.44	31.56	- -	- -
AP15	33.40	0.2	2.08(1)	2.08	31.32	- -	- -
AP16	35.62	0.15	6.30	- -	- -	6.30	29.32
AP17	32.29	0.15	5.33	5.33	26.96	- -	- -
AP18	32.45	- -	> 9.14	- -	- -	> 9.14	< 23.31

(1) Inferred, may vary.

Table 2 – Summary of Test Pit Findings

BH No.	Ground Surface El., m	Thickness, m	Bedrock, m	
		Overburden	Depth	El.
TP01	51.30	1.52	1.53	49.78
TP02	51.51	1.22	1.22	50.29
TP03	49.29	2.29	2.29(1)	47.00

(1) Inferred, may vary.

Table 3 – Summary of Borehole Findings, Utility Service Corridor

BH No.	Ground Surface El., m	Thickness, m		Bedrock, m	
		Asphalt	Overburden	Depth	El.
BH06	40.32	0.3	7.16	7.16	33.16
BH07	31.24	0.08	3.99	3.99	27.25
BH08	35.16	0.18	6.58	6.58	28.58
BH09	34.37	- -	5.23	5.23	29.14
BH10	32.47	- -	4.65	4.65	27.82

Table 4 – Summary of Borehole Findings, Pedestrian Bridge

BH No.	Ground Surface El., m	Thickness, m		Native Till, m		Bedrock, m	
		Asphalt	Fill	Depth	El.	Depth	El.
BH02	31.48	- -	1.68	1.68	29.80	4.11	27.37
BH03	31.29	- -	0.61	0.61	30.68	4.44	26.85
BH04	32.24	- -	1.37	1.37	30.87	4.27	27.97
BH05	32.46	- -	0.91	0.91	31.55	3.48	28.98

In general, the geotechnical subsurface conditions encountered comprised a sequence of cobble and boulder rich overburden varying from silty sand with gravel, sandy silt with gravel, silty gravel with sand, and sand with silt and gravel overlying quartzite bedrock. Surficial materials varied from exposed soils, asphalt pavement, concrete sidewalk, and sod/topsoil. Bedrock depth varied from 1.2 to greater than 9.4 metres. Refusal of some auger probe locations, inferred to be on a boulder or bedrock, varied from 2.1 to 5.5 metres.

Quartzite bedrock was encountered at auger probes AP1, AP7, AP11, AP12, AP16, boreholes BH2 to BH10, and test pits TP1 and TP2. Refusal was observed at the bottom of auger probes AP4, AP5, AP8, AP9, AP13 to AP15, AP17, and test pit TP3. Refusal is inferred to be on a boulder or possibly bedrock. Where cored, the bedrock was slightly weathered and RQDs varied from of 0 to 82 percent ranging from very poor to good rock mass quality.

Boreholes BH02 to BH05, completed at the planned pedestrian bridge crossing over the Shubenacadie Canal, encountered fill materials overlying native undisturbed glacial till comprising silty sand with gravel to silty gravel with sand and containing cobbles and boulders, over quartzite bedrock. The fill thickness varied from 0.6 to 1.7 metres, till thickness varied from 2.4 to 3.8 metres, and the depth to bedrock varied from 3.5 to 4.4 metres.

Borehole BH10, completed in the yard area of the existing pump station at 390 Waverley Road, encountered a thin surficial layer of sod/topsoil overlying native undisturbed glacial till over bedrock. Bedrock was encountered at a depth of 4.7 metres. Grain size analyses and moisture contents were conducted on selected samples from the boreholes put down at the pedestrian bridge and the results are summarized below in Table 5 and appended on Figure 1 and 2.

Table 5 – Summary of Soil Laboratory Test Results

BH No.	Sa. No.	Depth (m)	ASTM Soil Classification	Moisture Content (%)	Percent Material Composition by Particle Size (%)		
					Gravel	Sand	Silt/Clay
BH2	SS2	1.0	Sand with silt and gravel	6.8	42	45	12
BH2	SS4	3.4	Silty gravel with sand	6.6	55	34	23
BH3	SS2	1.0	Silty sand with gravel	3.0	39	43	18
BH5	SS2	1.0	Silty gravel with sand	4.7	52	28	20

(1) ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System);

(2) The percent of silt and clay-sized particles are reported collectively as the percent fines.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 GENERAL

As previously noted, it is understood that the utility services corridor is planned to extend from near the intersection of Country View Drive and Wright Ave, easterly along Wright Ave, across Highway No. 118, through Shubie Park including a pedestrian bridge crossing over the Shubenacadie Canal, along John Brenton and Jaybe Drives, and northerly along Waverley Road to the existing sewage pumping station at 390 Waverley Road. Trench excavation depths for the corridor are understood to be in the 2 to 4 metres range. It is also understood that a new single span pedestrian bridge will replace the existing bridge and a new pump station will be implemented adjacent to the existing station. A figure showing the proposed corridor route is appended.

Based on the conditions encountered at the borehole locations, the following provides general geotechnical comments and recommendations to support planning of earthworks for service trenches and foundation support for the new pedestrian bridge and pump station.

5.2 EXCAVATION AND FILLING

5.2.1 Excavation

It is expected that excavation will encounter a combination of fills, glacial till, and bedrock along most of the alignment. Trench excavations adjacent to curbs/sidewalks and within asphalt pavements may create some undermining. Undermining should be avoided where possible, therefore shoring for support should be anticipated. Trench support can be achieved through temporary slopes and/or trench cages. Temporary slopes in overburden of no steeper than 1.5H:1V are recommended to limit the movement of the trench sides. Steeper slopes may cause some noticeable movement and/or undermining. Excavation for service trenches may encountered bedrock. Bedrock removal may require ripping and the use of hydraulic breakers to facilitate removal. For preliminary planning, rock slopes should be cut no steeper than 1H:4V and scaled to remove all loose materials. In all cases, trench excavations should meet the Nova Scotia Department of Labour requirements.

5.2.2 Filling

Pipe bedding and protection granular materials and compaction requirements should be in accordance with the municipal requirements. Trench backfill may consist of select portions of excavated site material and/or imported material. Cobbles and boulders were encountered throughout the proposed development area and will not be suitable for reuse. Oversized material should be sorted, broken down in size, or disposed of offsite. Material with elevated moisture content, organics, or other deleterious material, should be discarded. Material to be used should be inorganic and at a moisture content suitable for compaction. Excavated site soils should be protected from increases in moisture content to avoid rendering otherwise suitable soils, unsuitable. In this regard, excavated site material approved for re-use as fill should be excavated and placed in one operation. Optimum moisture content for compaction of silty sand with gravel material is generally in the order of 10 to 12 %, or less.

Trench backfill should be compacted to 98% of the maximum standard Proctor dry density within 300 mm of

the roadway subgrade and to 95% below that grade.

Lift thicknesses for fill placement must be compatible with compaction equipment to ensure that the required density is achieved throughout each entire lift. The use of larger or smaller compaction equipment may require that the lift thickness, or number of passes, be adjusted at the discretion of qualified geotechnical personnel.

It is recommended that monitoring by experienced geotechnical personnel should be carried out during the placement of fill to confirm that the required compaction is achieved.

5.2.3 Water Control

Groundwater was not measured in the boreholes; however, it typically fluctuates near the bedrock surface unless there are controlling factors such as gravel filled trenches (underground services) or foundation drainage systems nearby that could channel water into the excavations. Groundwater levels will also fluctuate seasonally, during specific precipitation events, and as a results of site use and alteration.

Temporary dewatering measures may be required during excavation. Control of surface water run-off and groundwater seepage should be established at the onset of construction, and throughout the duration of the work.

The amount of surface water run-off and groundwater seepage will depend in part on the time of year in which construction takes place. Typically, higher quantities of seepage and runoff can be anticipated in the Fall to Spring seasons relative to the drier summer season.

Diversion ditches, drainage swales and/or “French drains”, and possibly sandbag dams, up- gradient of work areas, should be provided to cut off and divert surface water run-off away from excavations at the beginning of the earthworks. Dewatering within the excavations can also be accomplished by pumping from sump pits dug below the base of the excavations.

Discharge water quality should be reviewed and monitored prior to off-site disposal to ensure compliance with applicable regulations.

5.3 PEDESTRIAN BRIDGE FOUNDATION DESIGN

We understand that a new pedestrian bridge will replace the existing bridge over the Shubenacadie Canal to facilitate crossing with the new utilities. We anticipate that the new bridge will consist of a single span structure supported by two abutments. It is understood that the new abutments may be shifted back away from the channel, increasing the span of the replacement bridge relative to the existing bridge. It is assumed that the new approaches will be maintained close to the existing grades.

The glacial till was encountered underlying the fill material in boreholes drilled at the proposed new abutment locations (BH02, BH03, BH04 and BH05). Bedrock was encountered at depths averaging approximately 3.9 and 4.2 m at the proposed east and west abutment locations, respectively.

Based on the findings at the borehole locations and the anticipated design concept for the new bridge, we recommend abutments supported on spread footing foundations on undisturbed native till or structural fill over till/bedrock. The following subsections provide geotechnical recommendations for site preparation and

foundation design. If pile foundations are preferred, additional design and recommendations will be made available upon request.

5.3.1 Subgrade Preparation

Site preparation should include removal of all fill materials and any other deleterious materials encountered down to undisturbed native till within the zone of influence of the new abutment foundation. The zone of influence is defined as the area of the foundation plus a horizontal distance beyond the outside edges of the foundation footprint to include a structural splay of 1H:1V.

Temporary excavation side slopes should be no steeper than 1.5H:1V and should be closely monitored during construction. Numerous cobbles and boulders were encountered throughout the native soils at the site. It is recommended to over-excavate a minimum of 300 mm below the elevation of the proposed spread footings and remove any potential boulders, followed by the placement of structural fill. Structural fill used to achieve footing subgrade elevation should consist of well-graded rock fill with a maximum particle size of 150mm and a fines content less than 10%, Nova Scotia Public Works (NSPW) Fill Against Structure, or NSPW Type 1 and 2 Gravel. Material proposed for use as structural fill should be inspected and approved prior to use. Structural fill should extend over the entire footing zone of influence.

Structural fill should be compacted to 100% of the Standard Proctor Maximum Dry Density (SPMDD) determined for the material. For rock fill where SPMDD is not applicable, the material should be compacted to at least 80% relative density. Structural fill should be placed within a range of moisture contents that allow compaction to the specified density.

Lift thickness for structural fill should be compatible with the compaction equipment used, to ensure that the required density is achieved over the entire lift. It is recommended that monitoring by experienced geotechnical personnel be carried out during the placement of any structural fill to assure that the required compaction is achieved.

5.3.2 Water Control

It is anticipated that footing bases will not be below the channel water level and the construction of cofferdams will be not required. If cofferdams are required, a supplemental report can be provided with recommendations of SSP sections or other systems, upon request.

Groundwater control from excavations may be required. Surface water flow should be directed away from excavations using ditches/swales. Discharge water from the site should meet regulatory requirements, especially in relation to erosion and sedimentation.

5.3.3 Spread Footing Design

Spread footings placed on undisturbed native till and/or bedrock would be suitable for the foundations of the abutments. The factored bearing resistance at Ultimate Limit States (ULS) was estimated in accordance with the Canadian Highway Bridge Design Code (CHBDC) Clause 6.6.2. Spread footings can be designed using a factored ULS bearing resistance of 300 kPa and includes a bearing resistance factor of 0.5 for shallow foundations. The geotechnical bearing resistance for the serviceability limit state (SLS) was estimated based on a maximum settlement of 25 mm to be 200 kPa.

It is anticipated the footings will be placed near permanent sloping ground. The toe of the footing should be set back from the channel bed to allow for a minimum 4H:1V slope projection to the channel bed. Footings should be placed a minimum of 1.2 m below the finished grade to provide frost protection. Scour protection is recommended in front of the footings to aid in preventing undermining of the foundations.

It is recommended that bearing surfaces be inspected by qualified geotechnical personnel at the time of construction to ensure the condition of the bearing surface is acceptable.

5.4 PUMP STATION FOUNDATION DESIGN

We understand that a new pump station will be implemented near the existing pump station. The specific details are currently unknown. We anticipate that the new pump station will comprise chambers, a control building and trench excavations. One borehole (BH10) was completed in the yard area of the existing pump station to assist with preliminary planning. As detailed design of the new pump station progresses, supplemental test locations may be required.

At borehole BH10, glacial till was encountered below surficial sod/topsoil and extended to a depth of 4.7 metres where bedrock was encountered. Based on the findings at the borehole location and the anticipated design concept for the pump station, structural elements can be supported on spread footing foundations on undisturbed native till and/or bedrock, or structural fill over till/bedrock.

Site preparation and spread footing foundation recommendations previously provided in Section 5.3 can be used for preliminary planning of the pump station.

5.5 SOIL PARAMETERS

The parameter values provided in the following Table 7 may be used for design.

Table 7 – Soil Parameters

Parameter	Undisturbed TIll	NSDPW Gravel Type 1 or 2	Sand and Gravel	Rockfill
Friction Angle, degree	34	38	34	38
Total Unit Weight k/Nm³	21	22	21	22
Submerged Unit Weight kN/m³	11	12	11	12
Active Earth Pressure Coefficient[2]	0.28	0.24	0.28	0.24
Passive Earth Pressure Coefficient[2]	3.57	4.17	3.57	4.17

(1) Material should be compacted to 95% SPMMD or greater.

(2) Earth pressure coefficients assume frictionless wall with a vertical back face and horizontal ground.

5.6 SEISMIC SITE CLASSIFICATION

Based on the findings at the borehole locations, the site classification for seismic site response, determined in accordance with Clause 4.1.8.4 of the National Building Code of Canada (NBCC, 2015), is Site Class C.

6.0 CLOSURE

This report was prepared by Brian T. Grace, P.Eng. and reviewed by Lee Fougere, P.Eng. This report is based on the subsurface geotechnical conditions encountered at the specific test locations at the time of the work and our current project understanding. The subsurface geotechnical conditions outside of the test locations may vary. If subsurface conditions are encountered that differ from those encountered at the test locations, we should be notified to reassess our recommendations.

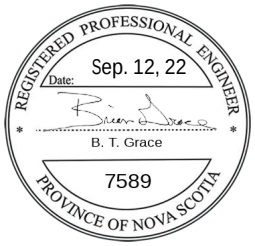
We trust that the information contained in this report is adequate for your present purposes. If you have any questions about the contents of the report or if we can be of any other assistance, please contact us at your convenience.

Thank you,

DesignPoint Engineering & Surveying Ltd.

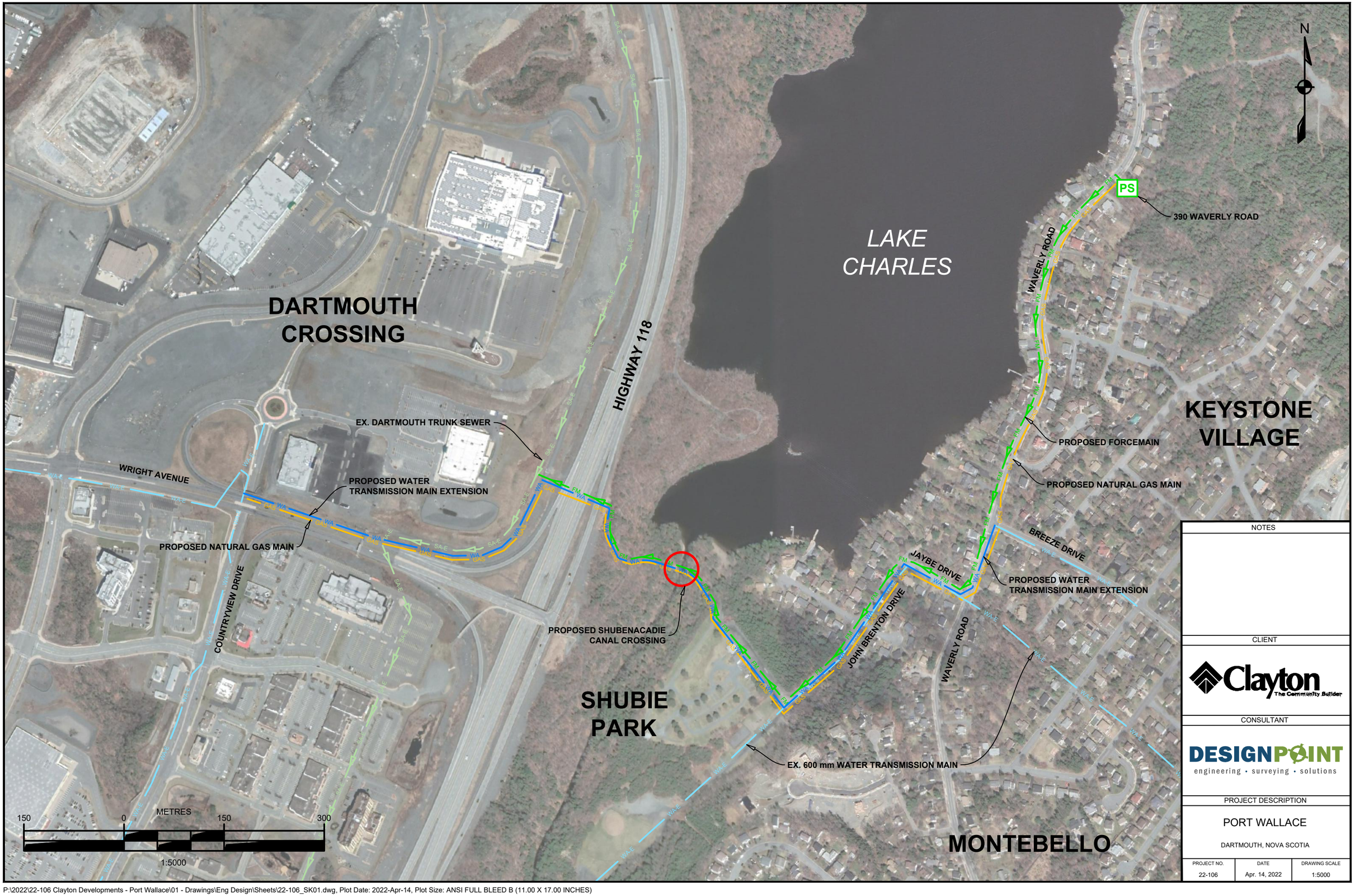
Brian T. Grace, P.Eng.

Project Engineer



APPENDIX A

- Figure Showing General Utility Services Corridor Route
- Symbols and Terms used on Borehole and Test Pit Records
- Auger Probe, Test Pit, and Borehole Records
- Grain-Size Plots
- Test Locations Drawings



NOTES

CLIENT

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The Community Builder

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PROJECT DESCRIPTION

PORT WALLACE

DARTMOUTH, NOVA SCOTIA

PROJECT NO.	DATE	DRAWING SCALE
22-106	Apr. 14, 2022	1:5000

P:\2022\22-106 Clayton Developments - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_SK01.dwg, Plot Date: 2022-Apr-14, Plot Size: ANSI FULL BLEED B (11.00 X 17.00 INCHES)

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

Terminology Describing Soil

The classification of soil types is made based on grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488). The classification excludes particles larger than 76 mm (3 inches). The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Particle Size

Soil Type	Millimeters
BOULDERS	> 300
COBBLES	75 to 300
GRAVEL (Coarse/Fine)	19 to 75/4.75 to 19
SAND (Coarse/Medium/Fine)	2 to 4.75/0.425 to 2/0.075 to 0.425
SILT/CLAY	< 0.075

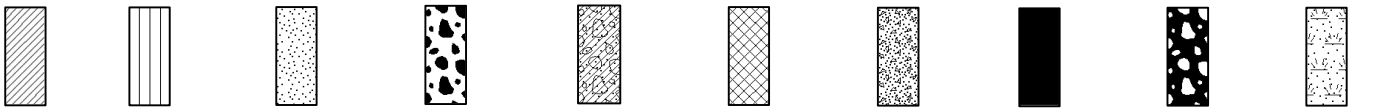
Terminology Describing Non-Matrix Materials (ie: boulders)

Trace, or occasional	< 10%
Some	10-20 %
Frequent	> 20%

Terminology Describing Soil Structure

Desiccated	Having visible signs of weathering by oxidation on clay minerals, shrinking cracks, etc.
Fissured	Having cracks and hence a blocky structure
Stratified	Composed of regular alternating successions of different soil types
Homogeneous	Consistent appearance and colour throughout
Varved	Comprised of regular alternating successions of silt and clay
Layer	>75 mm thick
Seam	2 mm to 75 mm thick
Parting	< 2 mm thick

Strata Plot



Recovery

For soil samples, the recovery is recorded as the length of sample recovered.

Standard Penetration Test (N-value)

The N-value is the number of blows from a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon one foot (305 mm) into the soil. If refusal is encountered, the number of blows are reported over the sampler penetration in millimeters (ie: 50/125). No corrections have been applied to the N-values presented on the logs.

Dynamic Cone Penetration Test (DCPT)

The dynamic cone penetration test is performed using a 60-degree cone penetrated into the soil by the same hammer and fall height described for the Standard Penetration Test. The number of blows of the hammer are recorded and reported every foot (305 mm).

Compactness of Cohesionless Soils

Term	SPT N-value
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

Consistency of Cohesive Soils

Term	Undrained Shear Strength (kPa)	Approximate SPT N-value
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	> 200	> 30

Sample Type

AS	Auger Sample
BS	Bulk sample
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube sample
WS	Wash sample

Other Tests

S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
γ	Unit weight
G_S	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation

Groundwater Measurement

Inferred

Measured from a standpipe, piezometer or monitor well

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

Terminology Describing Rock

Rock (also referred to as Bedrock) is described with respect to its geological classification or lithology, Rock Quality Designation (RQD), strength, weathering and discontinuity spacing.

Rock Quality Designation (RQD)

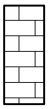
RQD is an indirect measurement of the number of fractures within a rock mass expressed as a percentage. The RQD is based on a modified core recovery percentage in which all pieces of sound core over 100 mm in length are summed and divided by the total length of core run.

RQD Classification	RQD (%)
Very Poor Quality	0 to 25
Poor Quality	25 to 50
Fair Quality	50 to 75
Good Quality	75 to 90
Excellent Quality	90 to 100

Terminology Describing Rock Weathering

Term	Description
Fresh	No visible sign of rock weathering. Minor discolouration on major discontinuity surfaces
Slightly Weathered	Discolouration indicates weathering of rock on discontinuity surfaces. All of the rock may have discolouration.
Moderately Weathered	Less than half of the rock is decomposed and/or disintegrated to a soil
Highly Weathered	More than half of the rock is decomposed and/or disintegrated to a soil
Completely Weathered	All of the rock is decomposed and/or disintegrated to a soil

Strata Plot


Sedimentary


Igneous


Metamorphic

Recovery

For rock core, the recovery is recorded as a percentage of the total length of core recovered over the length drilled on a per run basis.

Geological Classification of Rock

Sedimentary	Rocks formed by the accumulation and lithification of sediment (ie: sandstone, shale, mudstone)
Igneous	Rocks formed by the solidification of molten material (ie: granite, gabbro, basalt)
Metamorphic	Rocks formed by high heat and pressure (ie: slate, quartzite, gneiss)

Sample Type

RC (HQ, NQ, BQ, etc.)	Rock core samples obtained with the use of standard size diamond coring bits.

Other Tests

Q_u	Unconfined compression
I_p	Point Load Index (I_p on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm)

Terminology Describing Rock Mass

Spacing (mm)	Joint Classification	Bedding, Laminations, Bands
> 6000	Extremely Wide	-
2000 to 6000	Very Wide	Very Thick
600 to 2000	Wide	Thick
200 to 600	Moderate	Medium
60 to 200	Close	Thin
20 to 60	Very Close	Very Thin
< 20	Extremely Close	Laminated
< 6	-	Thinly Laminated

Terminology Describing Intact Rock Strength

Term	Unconfined Compressive Strength (MPa)
Extremely Weak	0.25 to 1
Very Weak	1 to 5
Weak	5 to 25
Medium Strong	25 to 50
Strong	50 to 100
Very Strong	100 to 250
Extremely Strong	> 250

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AP01

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-03** WATER LEVEL **N/A** BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	49.74	Brown to grey silty SAND with gravel -frequent cobbles and boulders							
	46.64	Poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	1	100	26%	
	45.12	End of Auger Probe							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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AUGER PROBE RECORD

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-26** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: REC. SOIL (mm) REC. ROCK (%)	SAMPLES: N VALUE RQD %	OTHER TESTS
	47.33								
		Grey to brown cobbles and boulders with sandy gravel matrix (ROCK FILL)							
	46.43								
1		Brown to grey silty SAND with gravel							
		-some cobbles and boulders							
2	44.73								
		Brown to grey sandy SILT with gravel							
3		-occasional cobbles and boulders							
4									
5	42.13								
		End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
6									
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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AP05

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-05-26** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: REC. SOIL (mm) REC. ROCK (%)	SAMPLES: N VALUE RQD %	OTHER TESTS
	46.52	Grey to brown cobbles and boulders with sandy gravel matrix (ROCK FILL)							
	45.62	Brown to grey silty SAND with gravel -some cobbles and boulders							
	41.02	End of Auger Probe (practical auger resual on boulder or inferred bedrock)							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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AP06

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-09** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	34.43	Brown silty SAND with gravel							
	31.53	Grey silty GRAVEL with sand -frequent cobbles							
	25.03	End of Auger Probe -no bedrock encountered							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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AP07

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-05** WATER LEVEL **N/A** BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	40.91								
0	40.76	GRAVEL with sand							
		Brown to grey silty SAND with gravel			SS	1	400	32	
					SS	2	300	50 (75mm)	
1		- some cobbles and boulders							
2									
3	37.07								
4		Very poor to fair quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	3	100	52%	
5					RC	4	100	13%	
6	34.81								
		End of Auger Probe							
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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AP08

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-05-24** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	41.21	Brown to grey silty SAND with gravel - some cobbles and boulders			SS	1	200	50 (125 mm)	
1									
2	38.72								
		End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
3									
4									
5									
6									
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80
>>●

NOTES:

App'd: LF

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AP09

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-05-20** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	39.52								
0		Dark brown to light brown and grey silty SAND with gravel -trace rootlets and topsoil			SS	1	250	50(50 mm)	
	39.01	Brown and grey silty SAND with gravel -some cobbles and boulders							
1									
2									
3									
4									
	34.95	End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
5									
6									
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80
>>●

NOTES:

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AP10

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-05-20** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
0	32.43	Brown silty SAND with gravel			SS	1	0	8	
3	29.53	Grey silty GRAVEL with sand -frequent cobbles							
9	23.03	End of Auger Probe (no bedrock encountered)							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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AP11

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-03** WATER LEVEL **N/A** BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	34.22								
0	34.07	ASPHALT							
		Brown to grey silty SAND with gravel -frequent cobbles and boulders							
1									
2									
3									
4									
5									
	28.58								
6		Very poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	1	100	0%	
7					RC	2	100	14%	
	26.57								
8		End of Auger Probe							
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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AP12

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-05** WATER LEVEL **N/A** BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	36.27								
	36.12	Asphalt							
		Brown and grey silty SAND with gravel			SS	1	475	54	
1		-occasional cobbles and boulders			SS	2	0	50 (125 mm)	
2									
3									
4									
5	31.17								
		Fair quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	3	100	71%	
6					RC	4	92	70%	
	29.47								
7		End of Auger Probe							
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80
>>

NOTES:

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AP13

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-19** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	35.00								
	34.80	Asphalt							
	34.55	Grey silty GRAVEL with sand							
1		Brown to light brown and grey silty SAND with gravel			SS	1	375	17	
		-occasional cobbles and boulders			SS	2	475	54	
2	32.82								
		End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
3									
4									
5									
6									
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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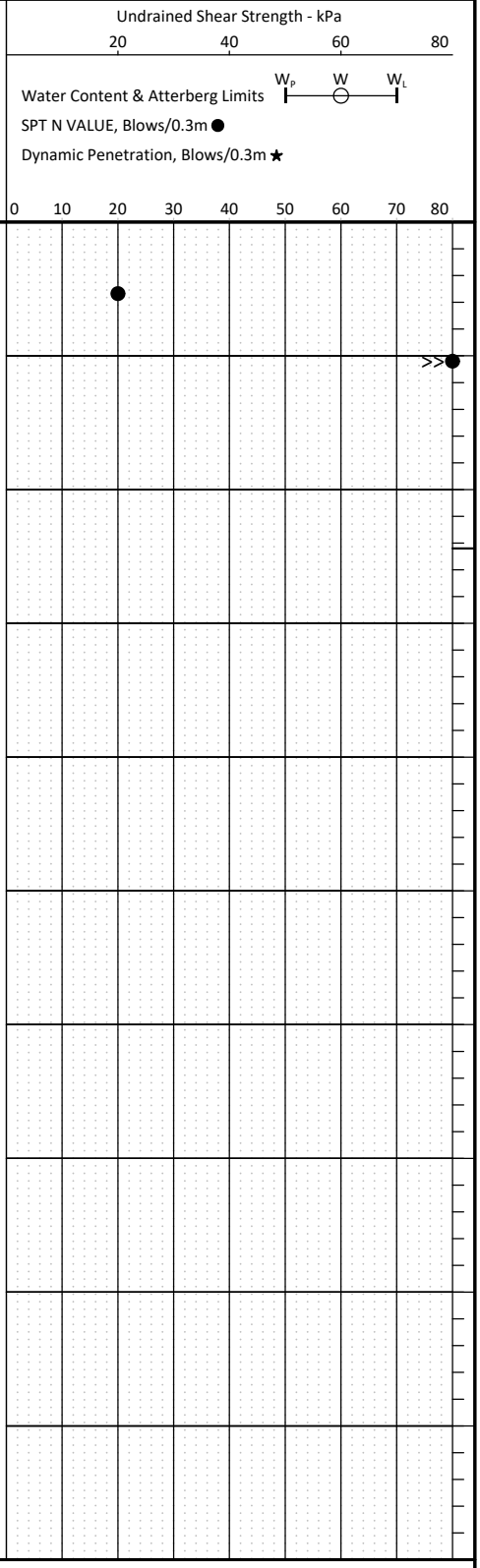
AUGER PROBE RECORD

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-19** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	34.00								
	33.85	Asphalt							
	33.70	Grey silty GRAVEL with sand			SS	1	275	20	
1		Brown and grey silty SAND with gravel - occasional cobbles			SS	2	275	50 (100 mm)	
2	31.56								
3		End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
4									
5									
6									
7									
8									
9									



NOTES:

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AP15

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-05-19** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	33.40								
	33.22	Asphalt							
		Grey silty SAND with gravel - occasional cobbles			SS	1	350	25	
1	32.38	Brown and grey silty SAND with gravel - occasional cobbles and boulders			SS	2	350	7	
2	31.32	End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
3									
4									
5									
6									
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-04** WATER LEVEL **N/A** BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	35.62								
	35.47	ASPHALT							
		Brown to grey silty SAND with gravel -frequent cobbles and boulders							
	29.32								
		Poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	1	100	38%	
	27.92								
		End of Auger Probe							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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AP17

AUGER PROBE RECORD

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-06-01** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	32.29								
	32.14	Asphalt							
		Brown and grey silty SAND with gravel			SS	1	425	43	
1		- trace asphalt millings - occasional cobbles			SS	2	450	28	
	30.77								
		Brown sandy SILT with gravel - occasional cobbles			SS	3	250	8	
2	30.16								
		Brown and grey silty SAND with gravel			SS	4	500	28	
3		-occasional cobbles and boulders							
4									
5	26.96								
		End of Auger Probe (practical auger resual on boulder or inferred bedrock)							
6									
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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AUGER PROBE RECORD

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: BORING **2022-08-09** WATER LEVEL **N/A** BH SIZE: **Auger**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	REC. SOIL (mm) REC. ROCK (%)	N VALUE RQD %	OTHER TESTS
0	32.45	Brown silty SAND with gravel							
4.6	27.78	Grey silty GRAVEL with sand -frequent cobbles							
9.1	23.31	End of Auger Probe (no bedrock encountered)			BS	1			

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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TEST PIT RECORD

TP01

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: DUG **2022-08-08** WATER LEVEL **2022-08-08**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	OTHER TESTS
	51.30						
	51.00	ROOTMAT/TOPSOIL					
1		Light brown to medium brown silty GRAVEL with sand - frequent cobbles and boulders					
	49.78						
2		Grey fractured QUARTZITE BEDROCK					
3				▼			
	47.44						
4		End of Test Pit on inferred bedrock - groundwater was encountered at approximately 3.35 meters below the ground surface					
5							
6							
7							
8							
9							

Undrained Shear Strength - kPa □
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

TEST PIT RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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TEST PIT RECORD

TP02

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: DUG **2022-08-08** WATER LEVEL **2022-08-08**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	OTHER TESTS
	51.51						
	51.36	ROOTMAT/TOPSOIL					
1		Light brown to medium brown silty GRAVEL with sand - frequent cobbles and boulders					
	50.29						
2		Grey fractured QUARTZITE BEDROCK					
	48.61						
3		End of Test Pit on inferred bedrock -no water seepage encountered					
4							
5							
6							
7							
8							
9							

Undrained Shear Strength - kPa □
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

TEST PIT RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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TEST PIT RECORD

TP03

CLIENT **Clayton Developments Limited** PROJECT No.: **22-106**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS** DATUM: **Geodetic (CGVD28)**
DATES: DUG **2022-08-08** WATER LEVEL **2022-08-08**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	OTHER TESTS
	49.29						
	49.24	ROOTMAT/TOPSOIL					
1		Light brown to medium brown silty GRAVEL with sand - frequent cobbles and boulders					
2	47.00						
		End of Test Pit on inferred bedrock -no water seepage encountered					
3							
4							
5							
6							
7							
8							
9							

Undrained Shear Strength - kPa □
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

TEST PIT RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

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BOREHOLE RECORD

BH02

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-08-09** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	31.48	FILL: loose to compact brown sand with silt and gravel			SS	1	100	19	
1					SS	2	200	9	S
	29.80	Compact to very dense grey silty gravel with sand to silty sand with gravel: TILL -frequent cobbles and boulders			SS	3	450	22	
3					SS	4	450	98	S
4	27.37	Very poor to fair quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	5	100	0%	
5					RC	6	100	53%	
6	25.38	End of Borehole -no standpipe installed							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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BOREHOLE RECORD

BH03

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-08-09** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	31.29								
	30.68	FILL: Compact brown silty sand with gravel			SS	1	200	38	
1		Dense to very dense light greyish brown silty sand with gravel to silty gravel with sand: TILL			SS	2	375	35	S
		-frequent cobbles and boulders			SS	3	200	50/50mm	
2									
3									
4					SS	4	0	50/75mm	
	26.85								
5		Fair to good quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	5	100	70%	
6					RC	6	100	76%	
	24.58								
7		End of Borehole -no standpipe installed							
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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BOREHOLE RECORD

BH04

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-08-08** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	32.24	FILL: Compact to very dense brown silty sand with gravel -occasional cobbles			SS	1	150	17	
					SS	2	50	10	
	30.87	Very dense light grey silty sand with gravel to silty gravel with sand: TILL -frequent cobbles and boulders			SS	3	250	50/100mm	
					SS	4	75	50/25mm	
	27.97								
	27.67	Poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	5	92	31%	
		End of Borehole -no standpipe installed							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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BOREHOLE RECORD

BH05

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-08-08** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	32.46	FILL: Compact to dense grey silty gravel with sand			SS	1	100	15	
	31.55	Dense to very dense grey silty gravel with to silty sand with gravel: TILL -frequent cobbles and boulders			SS	2	350	43	S
					SS	3	300	50/75mm	
	28.98	Fair to good quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	4	100	57%	
					RC	5	100	82%	
	26.34	End of Borehole -groundwater depth greater than 2.5 m							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

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BOREHOLE RECORD

BH06

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-24** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	40.32								
	40.02	ASPHALT							
	39.72	Compact grey silty GRAVEL with sand			SS	1	475	24	
1		FILL: Compact grey to brown silty sand with gravel - frequent cobbles and boulders - trace black asphalt millings			SS	2	225	14	
2					SS	3	100	10	
	37.88				SS	4	325	15	
3		Dense to very dense grey to brown silty sand with gravel: TILL - frequent cobbles and boulders			SS	5	300	50 (25 mm)	
4									
5									
6									
7	33.16								
		Very poor to poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	6	100	25%	
					RC	7	100	0%	
8					RC	8	80	0%	
					RC	9	78	44%	
9	31.10								
		End of Borehole -no standpipe installed							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

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NOTES:

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BOREHOLE RECORD

BH07

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-20** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	31.24								
	31.16	Asphalt							
0		Compact to very dense grey to brown silty sand with gravel: TILL			SS	1	500	39	
1		- some cobbles and boulders			SS	2	425	26	
					SS	3	375	28	
2					SS	4	375	74	
					SS	5	550	64	
3					SS	6	600	71	
	27.25				SS	7	400	50 (25 mm)	
4		Very poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	8	73	0%	
					RC	9	76	0%	
5					RC	10	94	0%	
	25.55								
6		End of Borehole -no standpipe installed							
7									
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

DESIGNPOINT
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BOREHOLE RECORD

BH08

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-30** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	35.16								
	34.98	Asphalt							
1		FILL: Loose to compact brown to grey silty sand with gravel - frequent cobbles and boulders			SS	1	375	17	
2					SS	2	400	9	
					SS	3	225	9	
3					SS	4	200	5	
	31.96								
		Compact to dense brown to grey silty sand with gravel: TILL - frequent cobbles and boulders			SS	5	100	24	
4					SS	6	200	50 (50 mm)	
5									
6									
	28.58								
7		Very poor to fair quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	7	76	-	
					RC	8	100	21%	
8					RC	9	40	0%	
					RC	10	92	53%	
9	25.81								
		End of Borehole -no standpipe installed							

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80
>>●

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

DESIGNPOINT
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BOREHOLE RECORD

BH09

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-08-04** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	34.37								
0	34.22	CONCRETE (sidewalk)							
		Brown to grey silty SAND with gravel -frequent cobbles and boulders							
5	29.14								
		Poor quality, slightly weathered, light grey QUARTZITE BEDROCK			RC	1	100	34%	
6					RC	2	100	46%	
7	27.31								
		End of Borehole							
8									
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

DESIGNPOINT
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BOREHOLE RECORD

BH10

CLIENT **Clayton Developments Limited**
LOCATION **Port Wallace Service Corridor, Dartmouth, NS**
DATES: BORING **2022-05-30 - 31** WATER LEVEL **N/A**

PROJECT No.: **22-106**
DATUM: **Geodetic (CGVD28)**
BH SIZE: **HW**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES REC. SOIL (mm) REC. ROCK (%)	SAMPLES N VALUE RQD %	OTHER TESTS
	32.47								
0	32.32	Sod/Topsoil			SS	1	475	21	
		Compact to very dense brown to grey silty sand with gravel: TILL			SS	2	450	53	
1		- frequent cobbles and boulders			SS	3	100	50 (100 mm)	
2					SS	4	375	54	
					SS	5	475	52	
3					SS	6	250	50 (50 mm)	
4					RC	7	600	-	
	27.82								
		Very poor quality, slightly weathered, light grey QUARTZITE BEDROCK			SS	8	0	50 (25 mm)	
5					RC	9	77	0%	
					RC	10	80	0%	
6					RC	11	64	18%	
7					RC	12	68	19%	
	24.62								
8		End of Borehole							
		-no standpipe installed							
9									

Undrained Shear Strength - kPa
20 40 60 80
Water Content & Atterberg Limits W_P W W_L
SPT N VALUE, Blows/0.3m ●
Dynamic Penetration, Blows/0.3m ★
0 10 20 30 40 50 60 70 80

NOTES:

App'd: LF

BOREHOLE RECORD BHLOGS.GPJ DESIGN POINT ENGINEERING.GDT 9/8/22

DESIGNPOINT
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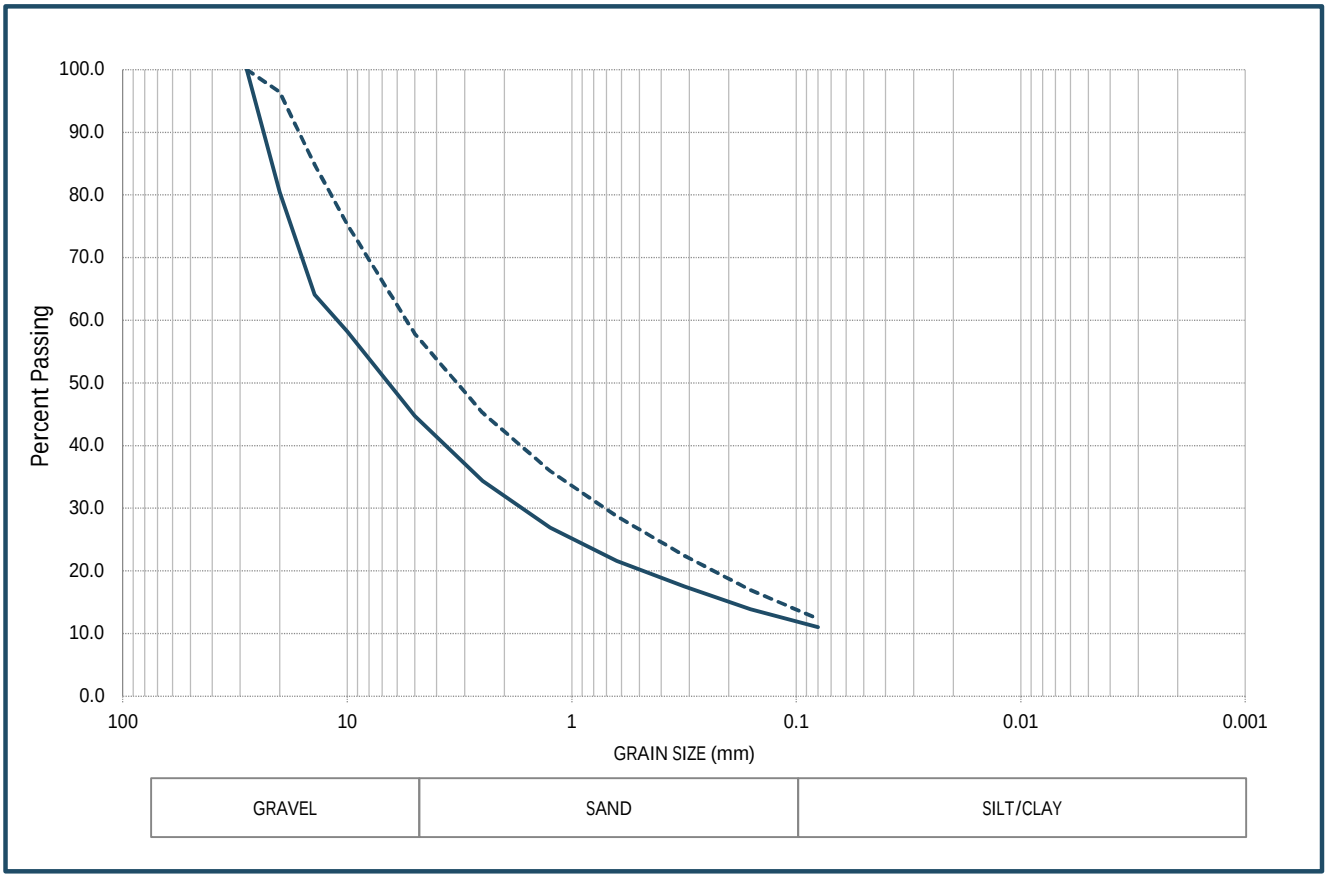
GRAIN SIZE

Project: Port Wallace, Dartmouth, NS
Client: Clayton Developments
Project #: 22-106

GRAIN SIZE DISTRIBUTION PLOT



SOIL CLASSIFICATION

Plot	Sample No	Depth, m	Gravel (%)	Sand (%)	Silt / Clay (%)	Moisture (%)	Soil Classification
- - - - -	BH2 - Sa.2	1.0 m	42	45	12	6.8	Sand with silt and gravel
———	BH2 - Sa.4	3.4 m	55	34	23	6.6	Silty gravel with sand

Figure 1

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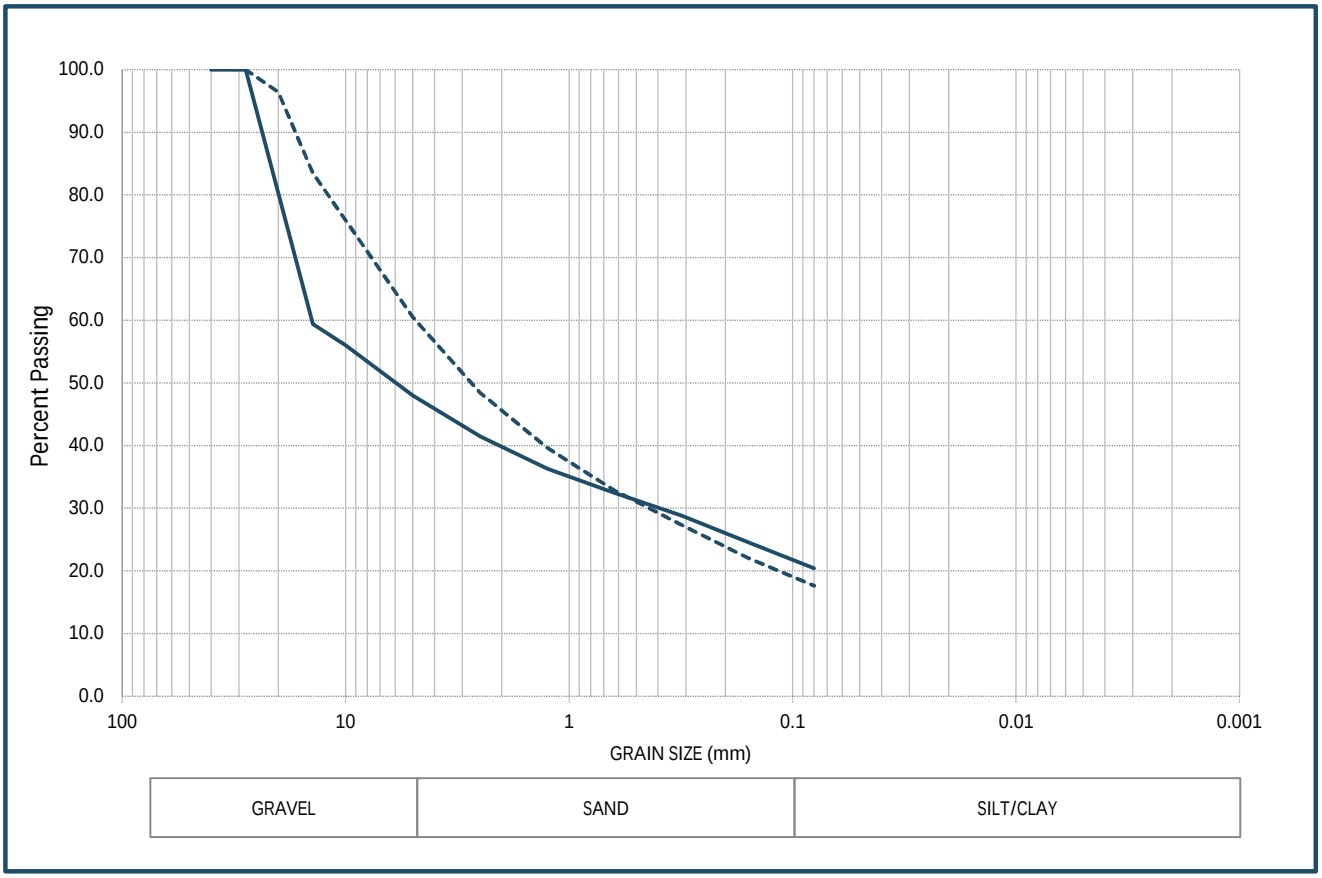
GRAIN SIZE

Project: Port Wallace, Dartmouth, NS
Client: Clayton Developments
Project #: 22-106

GRAIN SIZE DISTRIBUTION PLOT



SOIL CLASSIFICATION

Plot	Sample No	Depth, m	Gravel (%)	Sand (%)	Silt / Clay (%)	Moisture (%)	Soil Classification
- - - - -	BH3 - Sa.2	1.0 m	39	43	18	3.0	Silty sand with gravel
———	BH5 - Sa.2	1.0 m	52	28	20	4.7	Silty gravel with sand

Figure 2

BOREHOLE

AUGER PROBE

TEST PIT

ISSUE	DATE	DESCRIPTION
####	####	####
####	####	####
####	####	####
####	####	####
1	SEPT. 08, 2022	DRAFT

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CLIENT

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PROJECT DESCRIPTION

PORT WALLACE

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

TEST LOCATIONS

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	L. KING	22-106	SK01
Scale	Filename		1 of 3
1:500	22-106_Borehole Sketch_ATS77.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\22-106_Borehole Sketch_ATS77.dwg, Plot Date: 2022-Sep-8, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)

SKETCH A 2

BH05
BH04
BH03
BH02
AP18
AP06
AP07
AP08
BH06

CONTINUED ON SK01 SKETCH B1

CONTINUED ON SK02 SKETCH B2

John Brenton Dr

METRES
10 0 20 30
1:500

N

SKETCH B 2

BH07
AP10
AP11
AP09
BH06

CONTINUED ON SK03 SKETCH A2

CONTINUED ON SK02 SKETCH A2

Estella Dr

Jayna Dr

WAVERLEY ROAD

John Brenton Dr

METRES
10 0 20 30
1:500

N

BOREHOLE

AUGER PROBE

TEST PIT

####	####	####
####	####	####
####	####	####
####	####	####
1	SEPT. 08, 2022	DRAFT
ISSUE	DATE	DESCRIPTION

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CLIENT

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PROJECT DESCRIPTION

PORT WALLACE

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

TEST LOCATIONS

Drawn J. GALLANT	Engineer L. KING	Project No. 22-106	Drawing No. SK02
Scale 1:500	Filename 22-106_Borehole Sketch_ATS77.dwg		2 of 3

BOREHOLE

AUGER PROBE

TEST PIT

ISSUE	DATE	DESCRIPTION
####	####	####
####	####	####
####	####	####
####	####	####
1	SEPT. 08, 2022	DRAFT

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CLIENT

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PROJECT DESCRIPTION

PORT WALLACE

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

TEST LOCATIONS

Drawn	Engineer	Project No.	Drawing No.
J. GALLANT	L. KING	22-106	SK03
Scale 1:500	Filename 22-106_Borehole Sketch_ATS77.dwg		3 of 3

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\22-106_Borehole Sketch_ATS77.dwg, Plot Date: 2022-Sep-8, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)

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Bedford, Nova Scotia B4A 0H3

7.0 APPENDIX C – COST ESTIMATE

ESTIMATE OF PROBABLE COST

Port Wallace

Waverley, Nova Scotia

Project Number: 22-106

Date: June 16, 2023

Drawings: Port Wallace Utility Corridor Rev 2, Issued for 90% Review, Dated April 26, 2023 Sheets 1-26

Note: This estimate of probable cost is prepared for preliminary planning purposes only. The estimate is based on unit rates obtained from previous tenders of similar work and represents a budget only. The actual construction cost will be subject to various factors that are not known at the time of estimate preparation, including market conditions, industry workload, and changes to the design through the approval process. The actual cost cannot be known until the project is tendered and a contract is awarded. This estimate should be used with caution if using for business budgeting purposes.

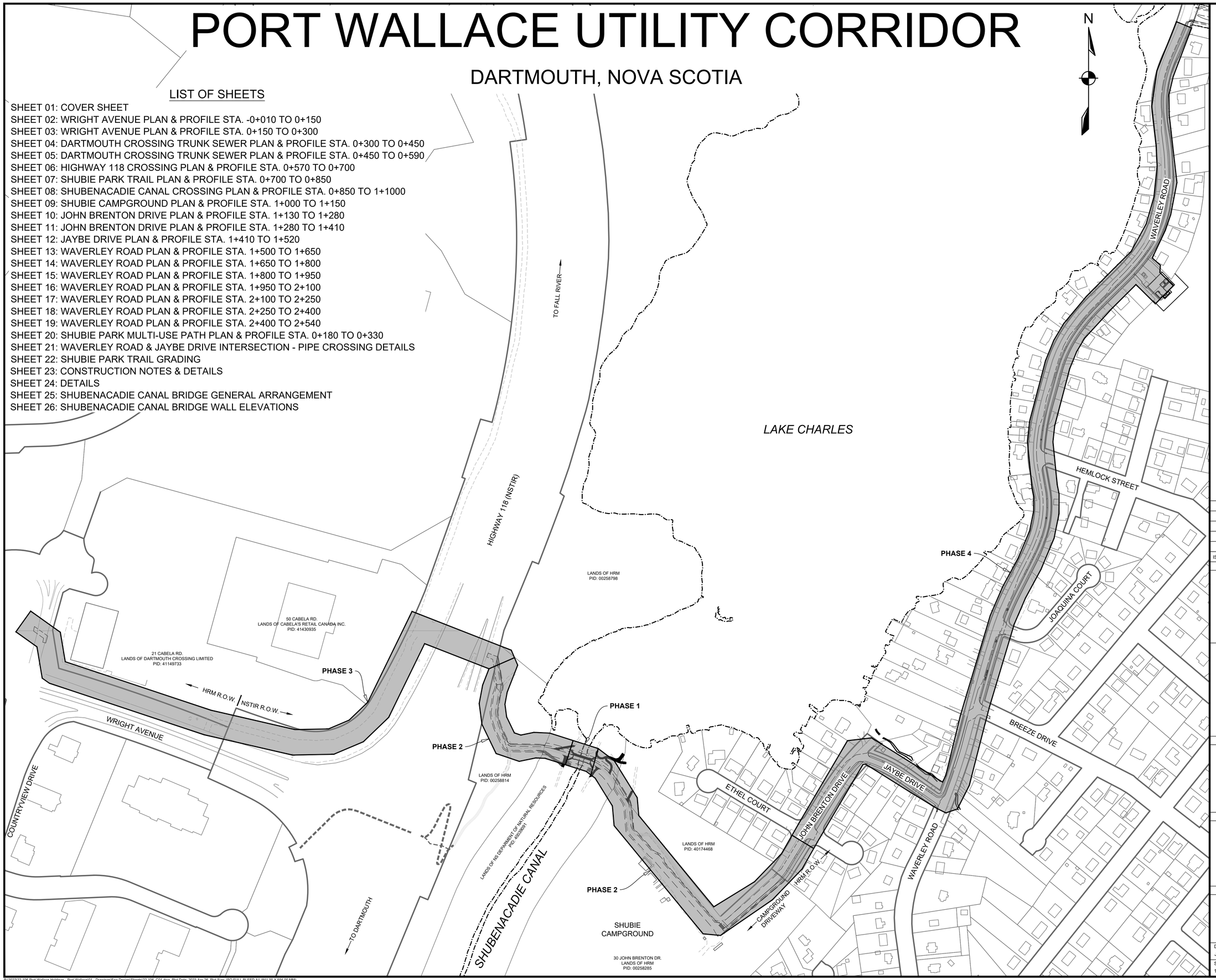
No.	Unit Description	Unit	Quantity	Unit Rate	Estimated Cost
1.00	**Wright Avenue**				
1.01	600mm DI CL52 Connection & Reinstatement (Sta 0+00 to 0+20)	LS	1	$ 100,000.00	$ 100,000.00
1.02	600mm DI CL52 Extension(Sta 0+20 to 0+190)	m	170	$ 2,150.00	$ 365,500.00
1.03	600mm DI CL52 Extension with Re-grading (Sta 0+190 to 0+205)	m	15	$ 3,300.00	$ 49,500.00
1.04	600mm DI CL52 Extension (Sta 0+205 to 0+568)	m	363	$ 2,400.00	$ 871,200.00
1.05	300mm waterline removal and connection to new 600mm (Sta 0+244)	LS	1	$ 47,500.00	$ 47,500.00
1.06	600mm DI CL52 Waterline Crossing exisitng 300mm Storm	LS	1	$ 5,000.00	$ 5,000.00
				Subtotal	**$ 1,438,700.00**
2.00	**Highway 118 Crossing to John Brenton**				
2.01	600mm DI CL52 with Sleeve (Sta 0+568 to 0+596)	m	28	$ 3,100.00	$ 86,800.00
2.02	600mm DI CL52 with Steel Sleeve (Sta 0+596 to 0+653)	m	57.4	$ 7,250.00	$ 416,150.00
2.03	600mm DI CL52 with Sleeve (Sta 0+596 to 0+758)	m	162	$ 3,600.00	$ 583,200.00
2.04	600mm DI CL52 with Insulation (Sta 0+758 to 0+771)	m	13	$ 3,150.00	$ 40,950.00
2.05	600mm DI CL52 Extension (Sta 0+771 to 0+797)	m	26	$ 4,200.00	$ 109,200.00
2.06	600mm DI CL52 with Steel Sleeve (Sta 0+797 to 0+818)	m	21	$ 5,800.00	$ 121,800.00
2.07	600mm DI CL52 with Insulation (Sta 0+818 to 0+930)	m	112	$ 3,300.00	$ 369,600.00
2.08	600mm DI CL52 with Insulation (Sta 0+930 to 0+983)	m	53	$ 3,150.00	$ 166,950.00
2.09	600mm DI CL52 Extension (Sta 0+983 to 1+130)	m	147	$ 3,300.00	$ 485,100.00
2.10	600mm DI CL52 Twin Extension (Sta 1+130 to 1+223)	m	93	$ 5,600.00	$ 520,800.00
2.11	Air Release Valve	each	1	$ 60,000.00	$ 60,000.00
				Subtotal	**$ 2,960,550.00**
3.00	**John Brenton to Breeze Intersection**				
3.01	600mm DI CL52 Twin Extension (Sta 1+223 to 1+392)	m	269	$ 5,600.00	$ 1,506,400.00
3.02	600mm DI CL52 Extension (Sta 1+392 to 1+528)	m	136	$ 3,300.00	$ 448,800.00
3.03	Air Release Valve	each	1	$ 85,000.00	$ 85,000.00
3.04	600mm Trunk Water Connection (10 M)	LS	1	$ 45,000.00	$ 45,000.00
3.05	600mm Trunk Water Connection (6 M)	LS	1	$ 22,500.00	$ 22,500.00
3.06	600mm Trunk Water Connection (6 M)	LS	1	$ 22,500.00	$ 22,500.00
3.07	28 Water Service Laterals	LS	1	$ 120,000.00	$ 120,000.00
3.08	Waterline Decommision (Waverly Road 350mm & Jaybe 100mm)	LS	1	$ 40,000.00	$ 40,000.00
3.09	Exisitng 600mm Waterline Decommision (Jaybe & JB)	LS	1	$ 85,000.00	$ 85,000.00
3.10	400mm Temporary Water	m	300	$ 850.00	$ 255,000.00
3.11	Temporary Water Connection to Exisitng	each	3	$ 10,000.00	$ 30,000.00
				Subtotal	**$ 2,660,200.00**
				Total	$ 7,059,450.00
			20%	**Engineering & Contingency**	$ 1,411,890.00
				15% HST	$ 1,270,701.00
				Total	**$ 9,742,041.00**

8.0 APPENDIX D – ENGINEERING DRAWINGS

PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

LIST OF SHEETS



ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
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ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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CLIENT

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

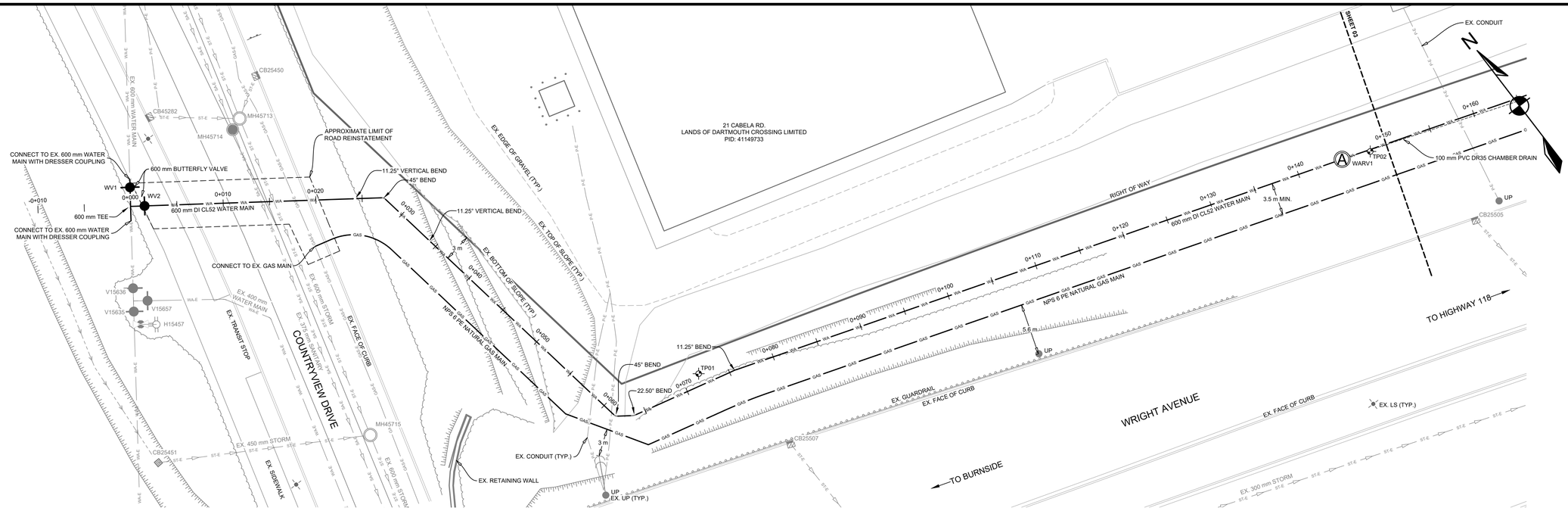
DARTMOUTH, NOVA SCOTIA

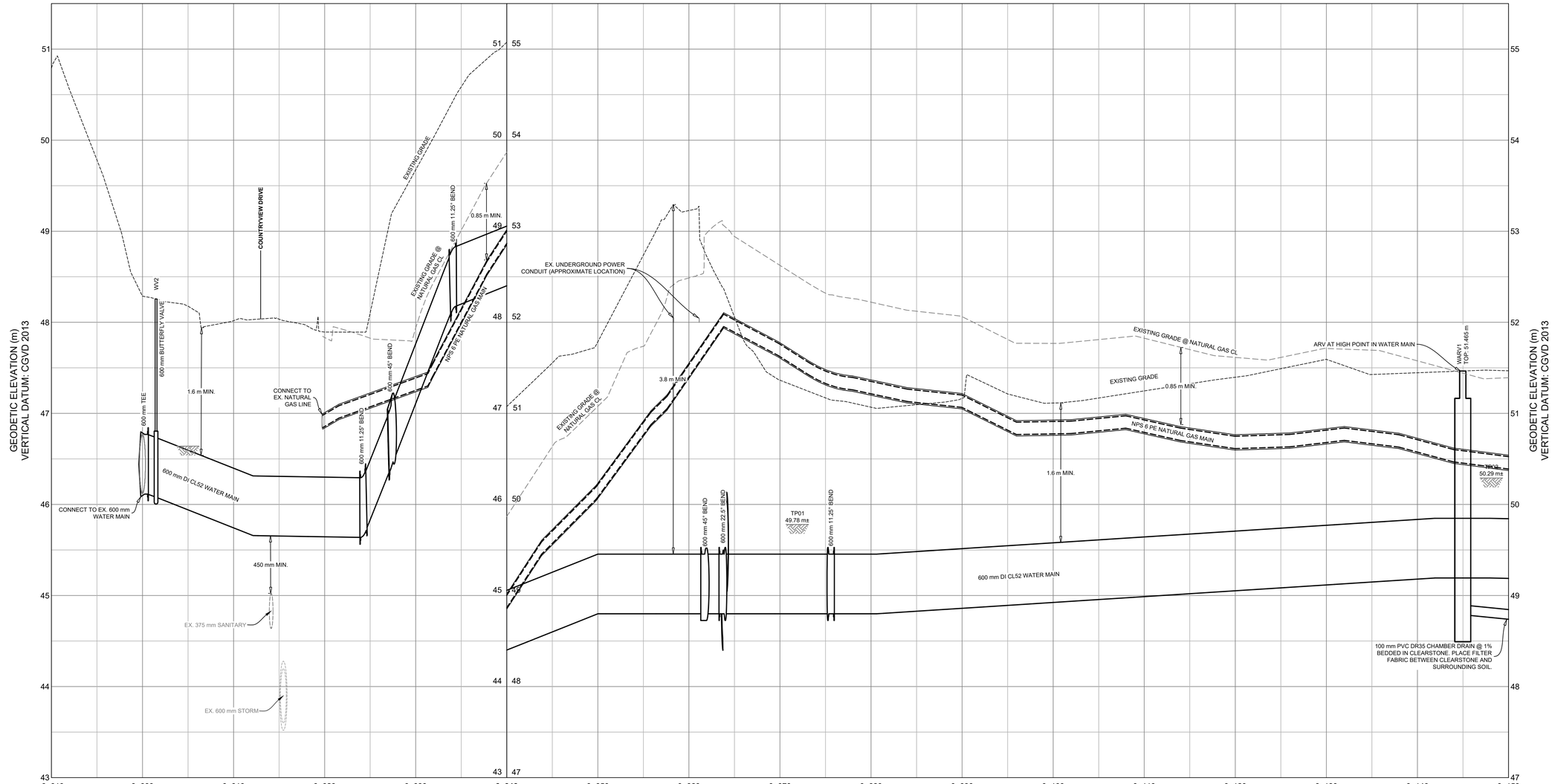
SHEET DESCRIPTION

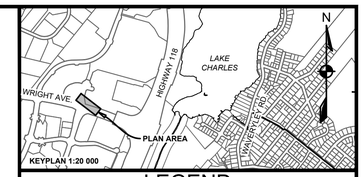
COVER SHEET

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-T01
Scale	Filename		01 of 27
1:2000	22-106_C01.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_C01.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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CLIENT

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

PLAN & PROFILE
WRIGHT AVENUE
STA. -0+010 TO 0+150

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP02
Scale	Filename		02 OF 27
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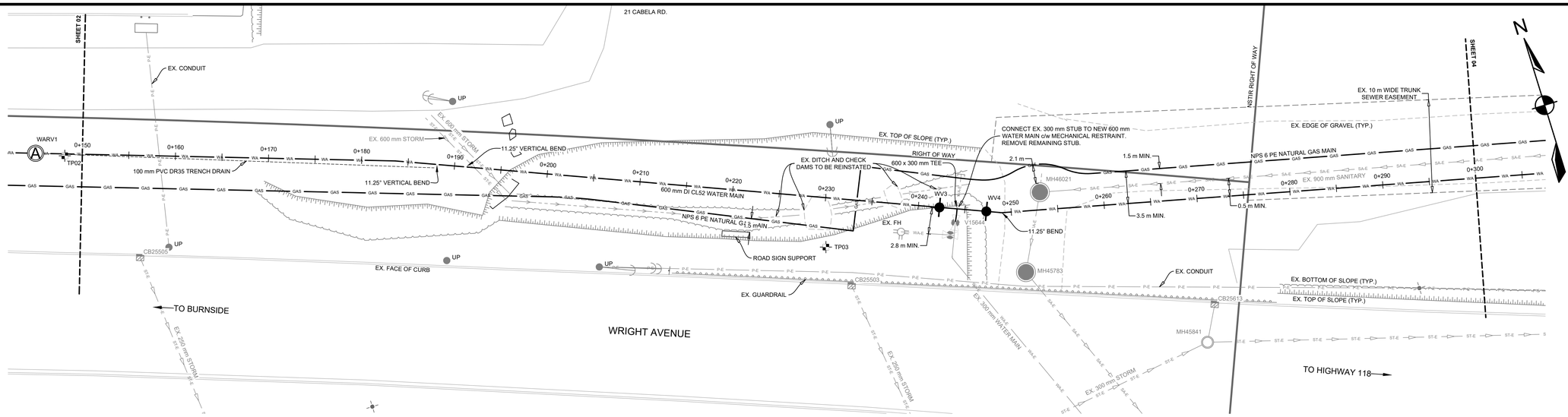

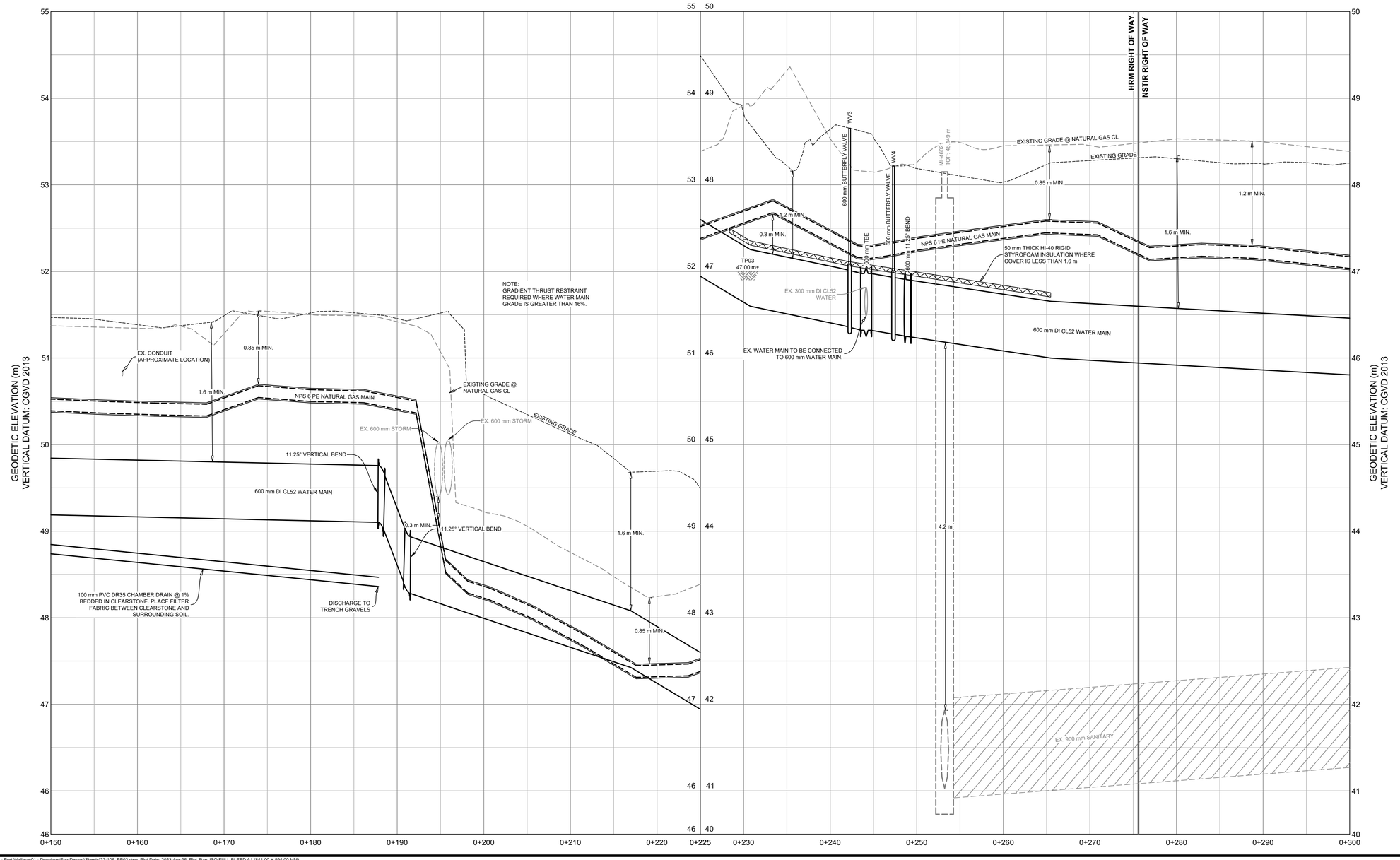

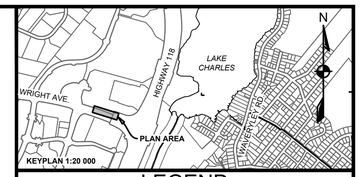

LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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CLIENT

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PROJECT DESCRIPTION

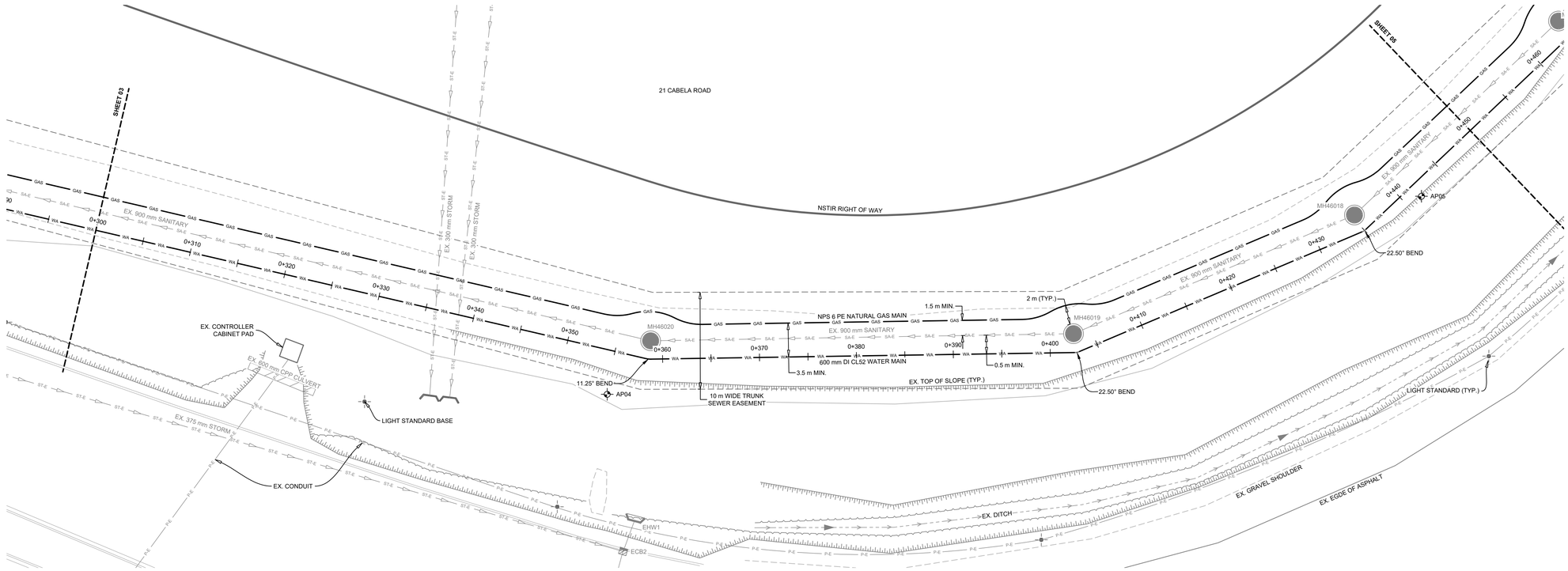
PORT WALLACE UTILITY CORRIDOR

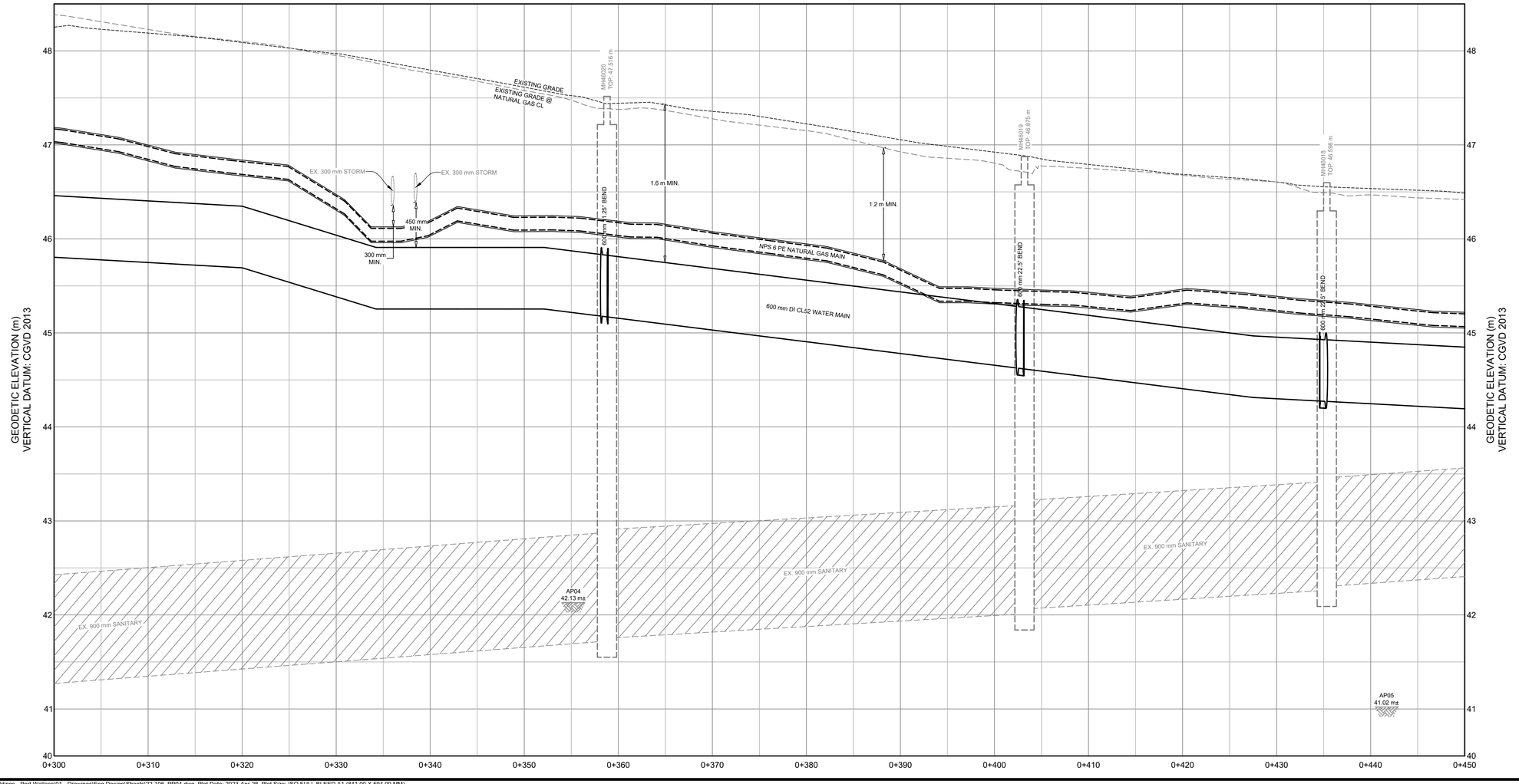
DARTMOUTH, NOVA SCOTIA

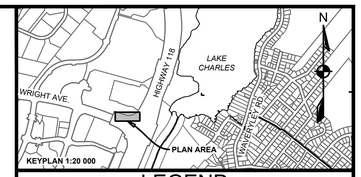
SHEET DESCRIPTION

PLAN & PROFILE WRIGHT AVENUE STA. 0+150 TO 0+300

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP03
Scale	Filename		03 OF 27
1:250 H, 1:25 V	22-106_PP03.dwg		







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

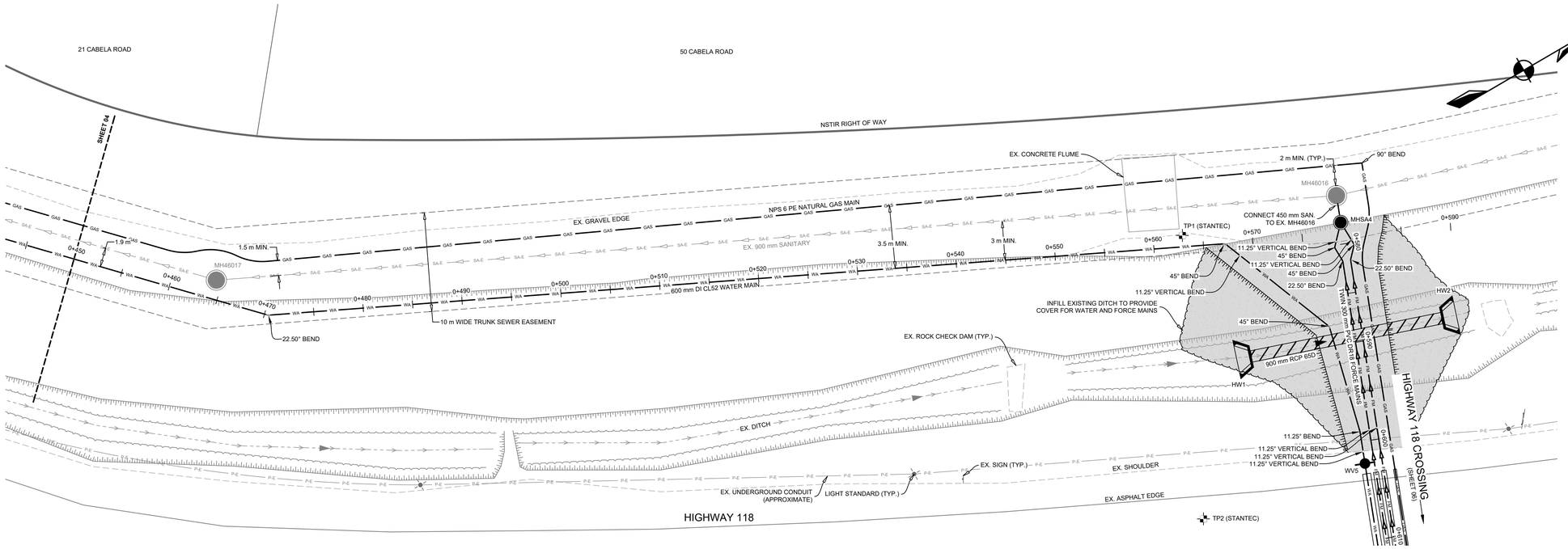
DARTMOUTH, NOVA SCOTIA

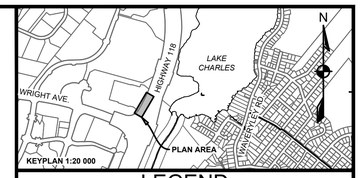
SHEET DESCRIPTION

PLAN & PROFILE
DARTMOUTH CROSSING TRUNK SEWER
STA. 0+300 TO 0+450

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP04
Scale	Filename		04 OF 27
1:250 H, 1:25 V	22-106_PP04.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_PP04.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES 5 0 10 15

1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

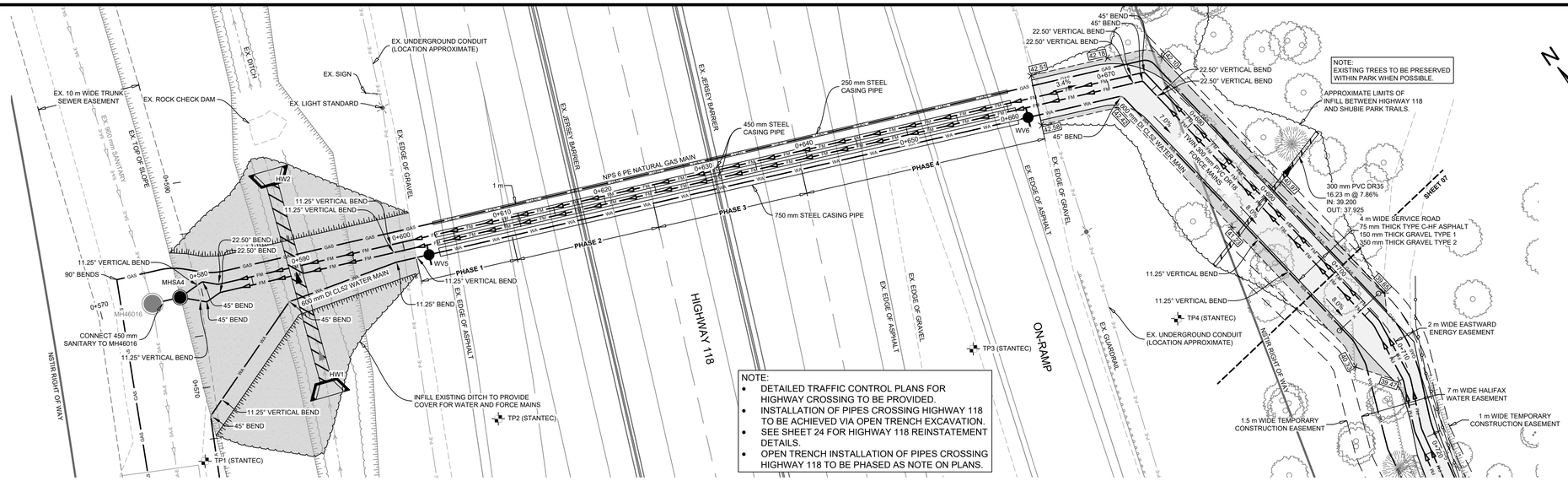
PORT WALLACE UTILITY CORRIDOR

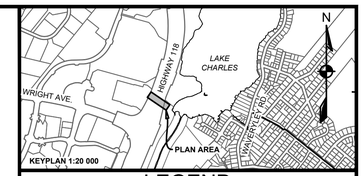
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

PLAN & PROFILE
DARTMOUTH CROSSING TRUNK SEWER
STA. 0+450 TO 0+590

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP05
Scale	Filename		05 of 27
1:250 H, 1:25 V	22-106_PP05.dwg		





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

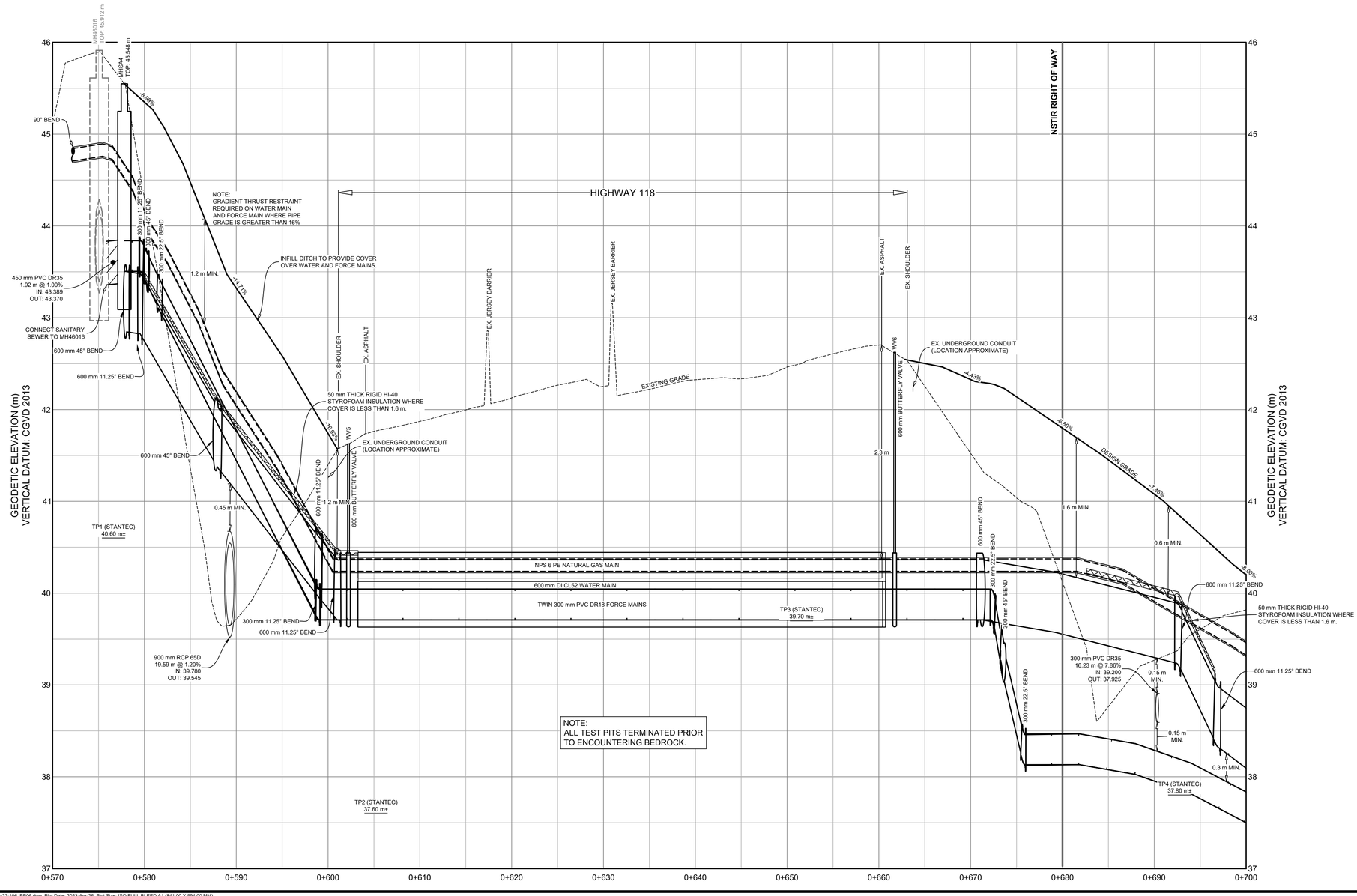
PORT WALLACE UTILITY CORRIDOR

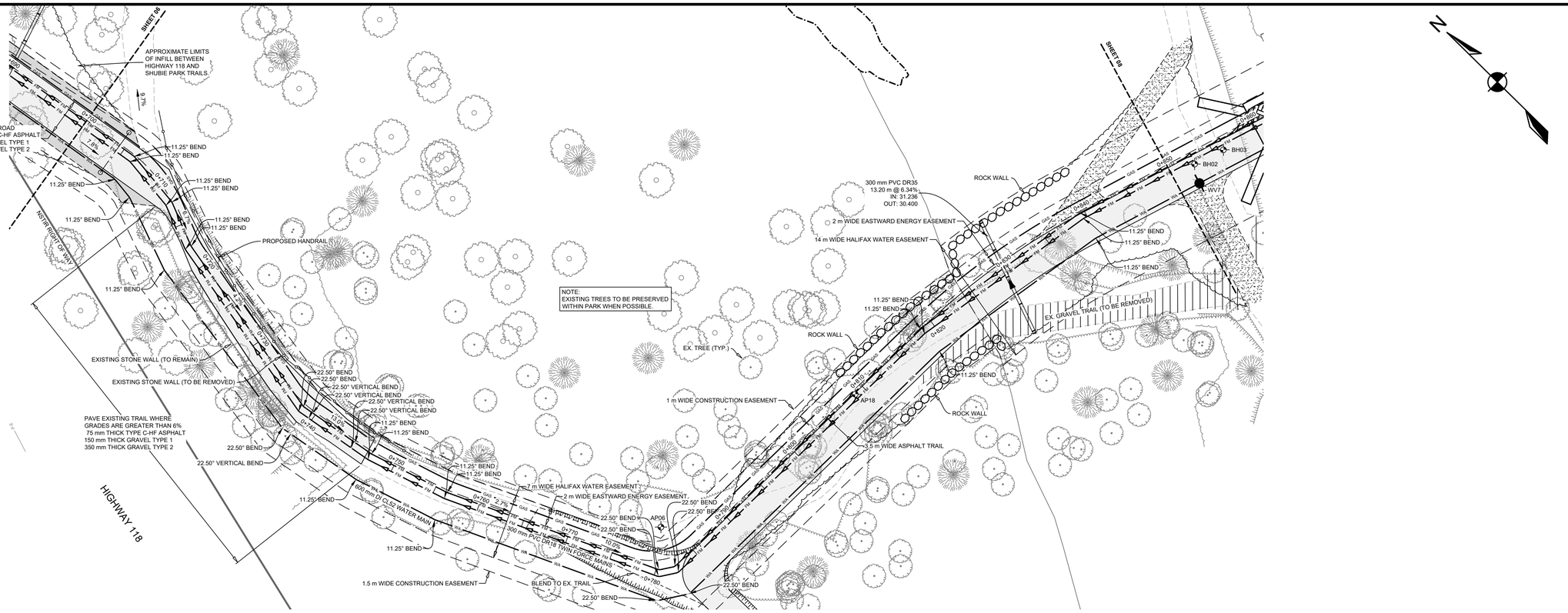
DARTMOUTH, NOVA SCOTIA

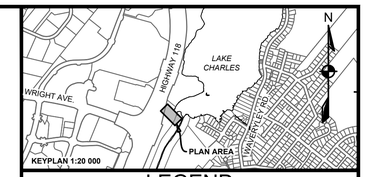
SHEET DESCRIPTION

PLAN & PROFILE
HIGHWAY 118 CROSSING
STA. 0+570 TO 0+700

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP06
Scale	Filename		06 of 27
1:250 H, 1:25 V	22-106_PP06.dwg		







LEGEND

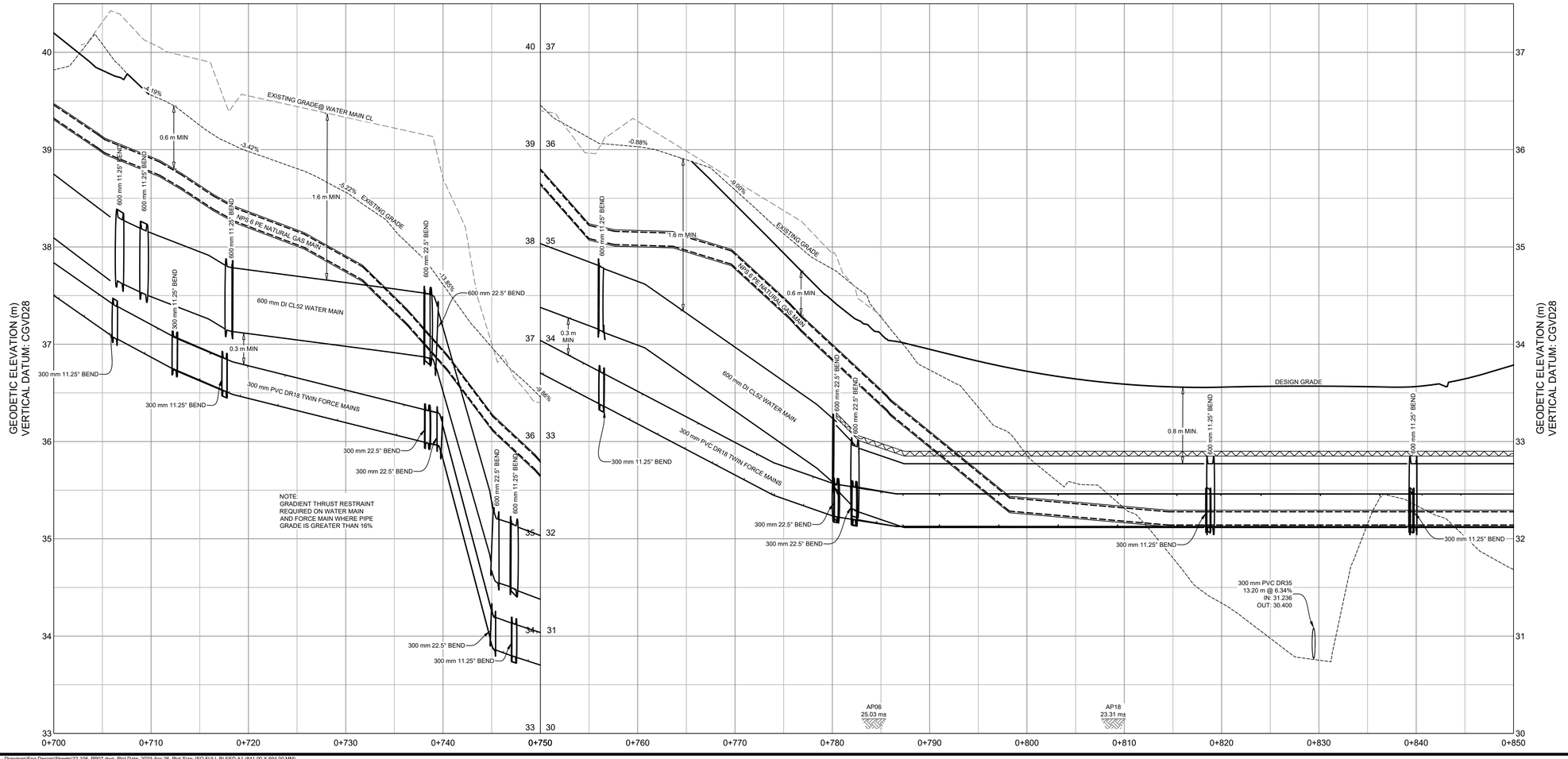
EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES 5 0 10 15

1:250



2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW
ISSUE	DATE	DESCRIPTION

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

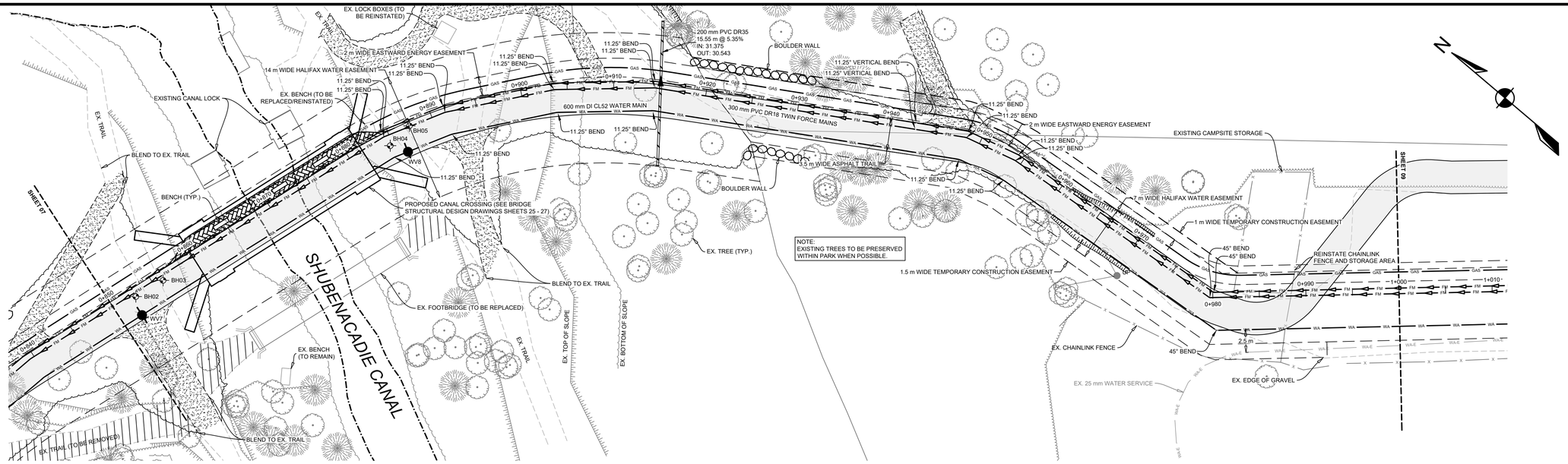
DARTMOUTH, NOVA SCOTIA

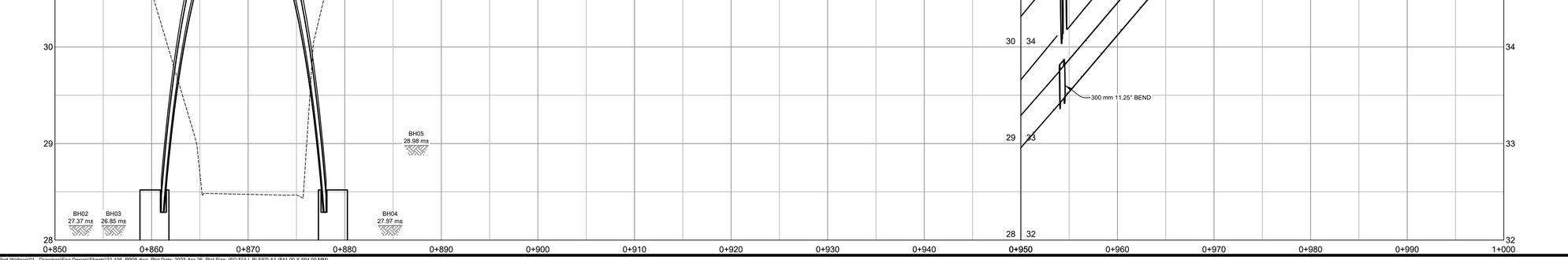
SHEET DESCRIPTION

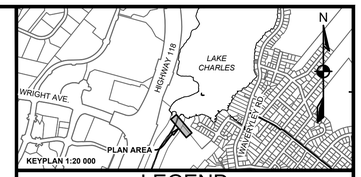
PLAN & PROFILE
SHUBIE PARK TRAIL
STA. 0+700 TO 0+850

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP07
Scale	Filename		07 OF 27
1:250 H, 1:25 V	22-106_PP07.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_PP07.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

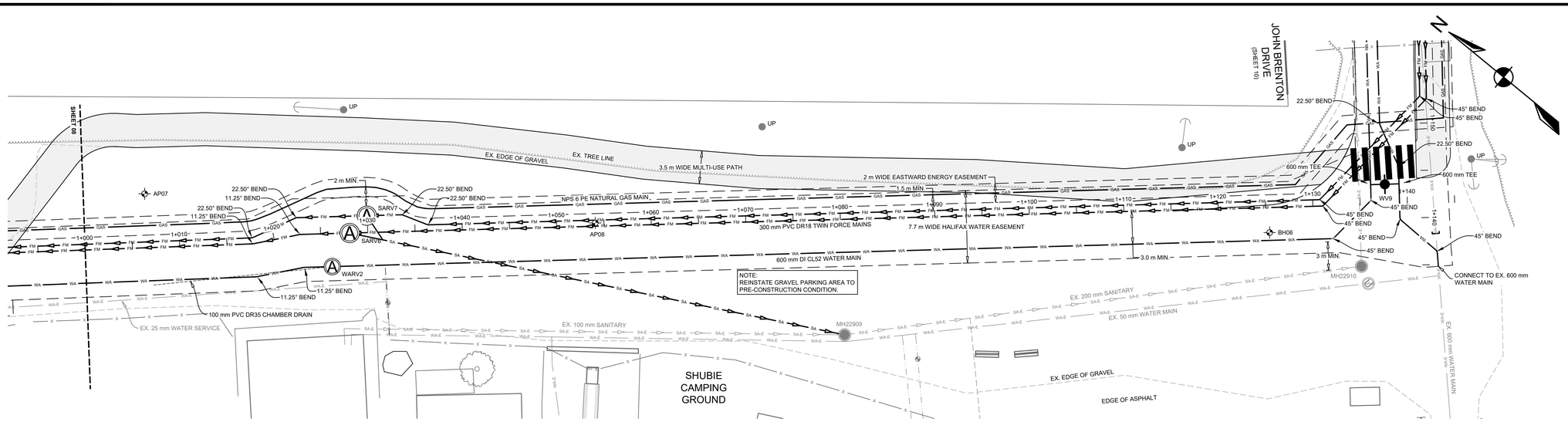
PORT WALLACE UTILITY CORRIDOR

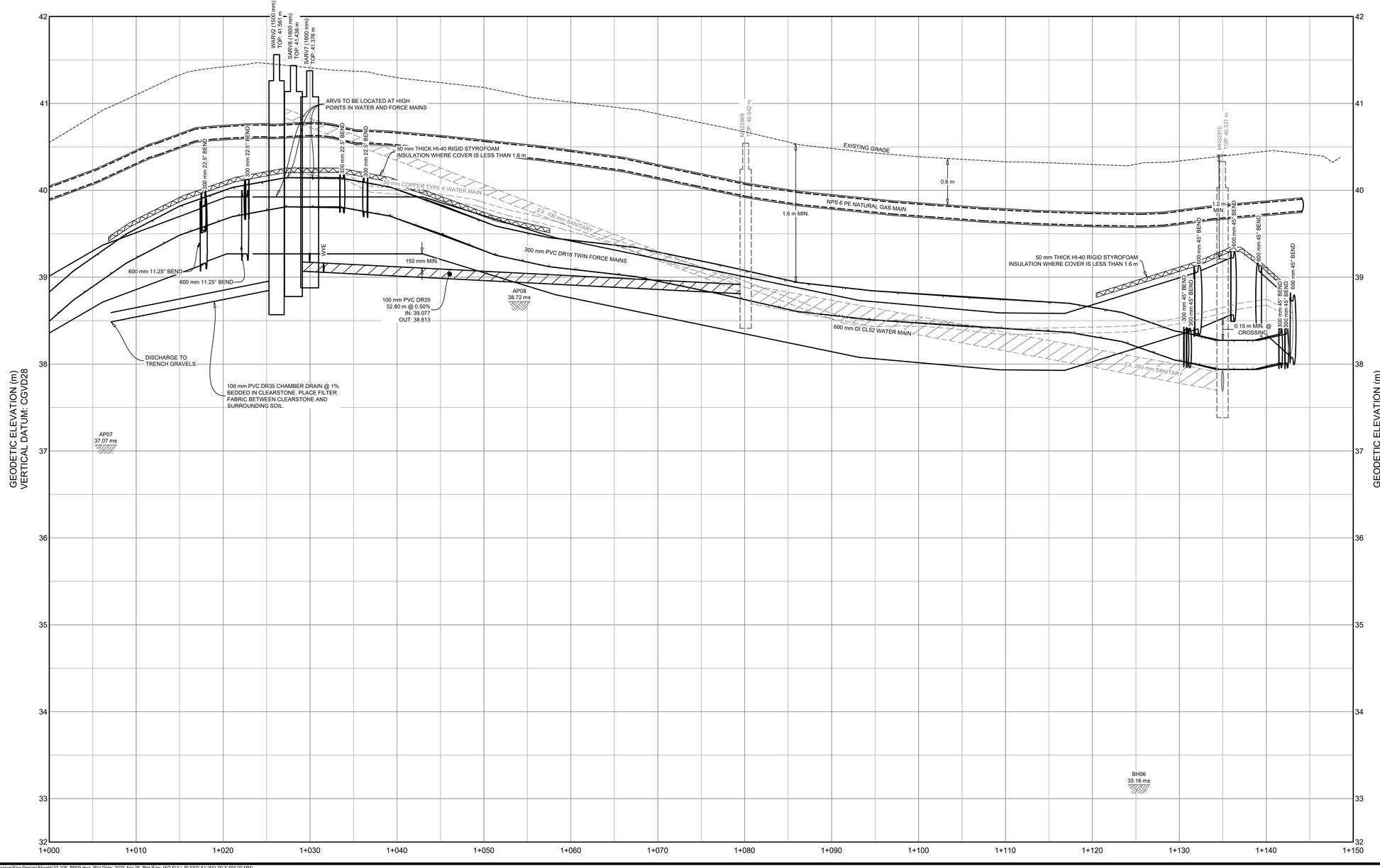
DARTMOUTH, NOVA SCOTIA

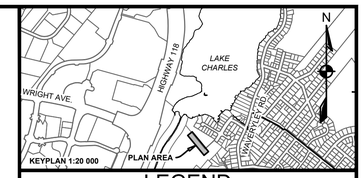
SHEET DESCRIPTION

PLAN & PROFILE SHUBENACADIE CANAL CROSSING STA. 0+850 TO 1+1000

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP08
Scale	Filename		08 OF 27
1:250 H, 1:25 V	22-106_PP08.dwg		







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES 5 0 10 15

1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

CONSULTANT

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

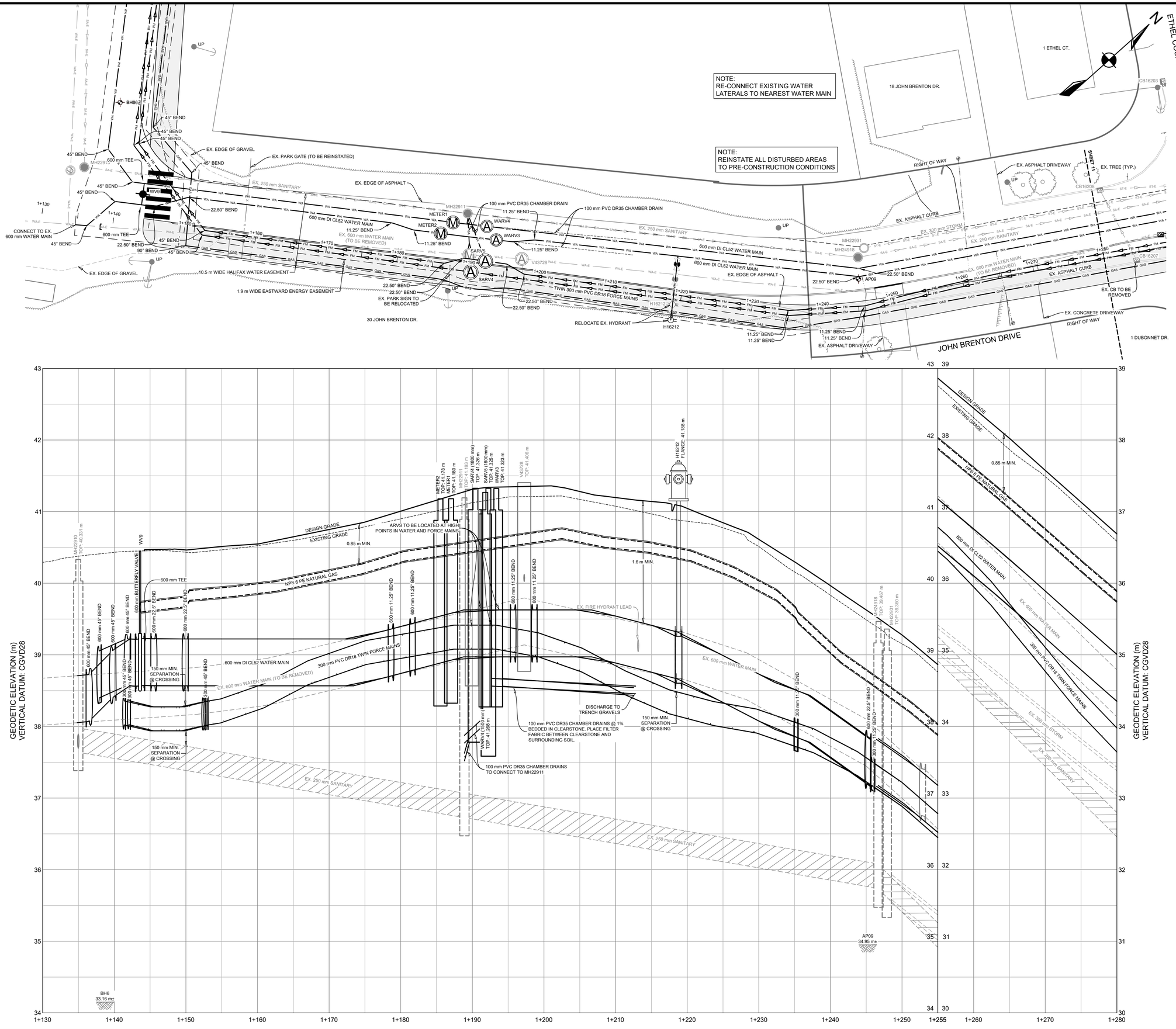
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

PLAN & PROFILE SHUBIE CAMPGROUND STA. 1+000 TO 1+150

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP09
Scale	Filename		09 OF 27
1:250 H, 1:25 V	22-106_PP09.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_PP09.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)



LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
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PROJECT DESCRIPTION

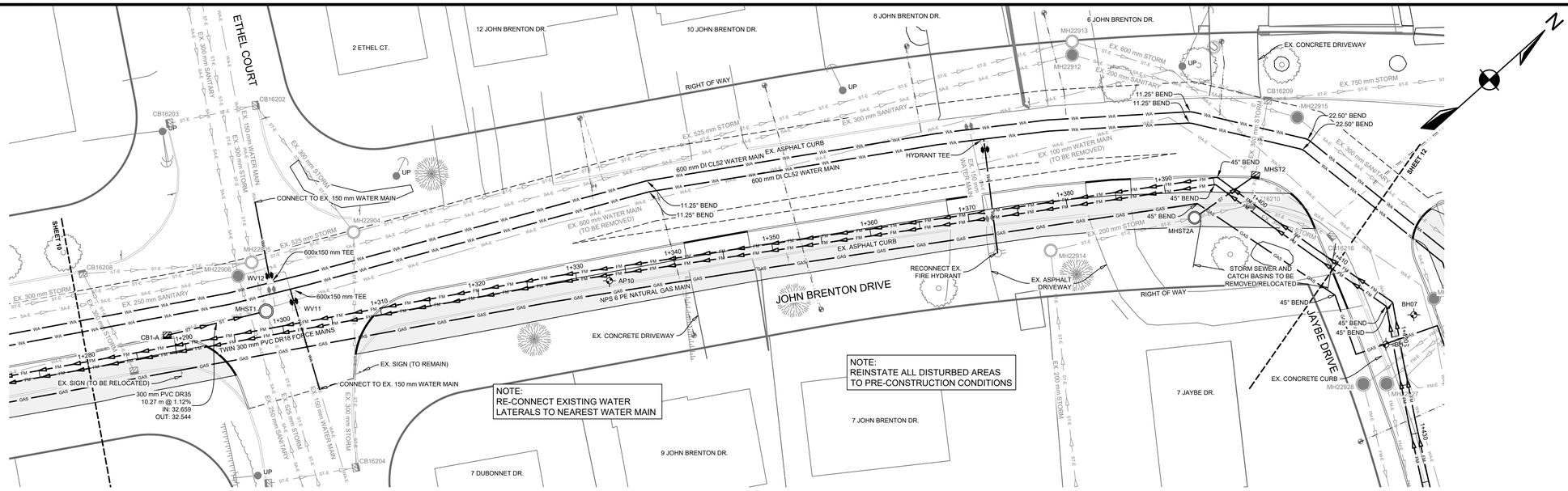
PORT WALLACE UTILITY CORRIDOR

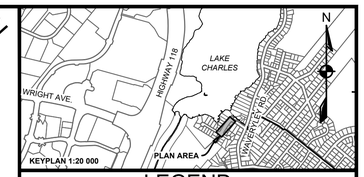
DARTMOUTH, NOVA SCOTIA

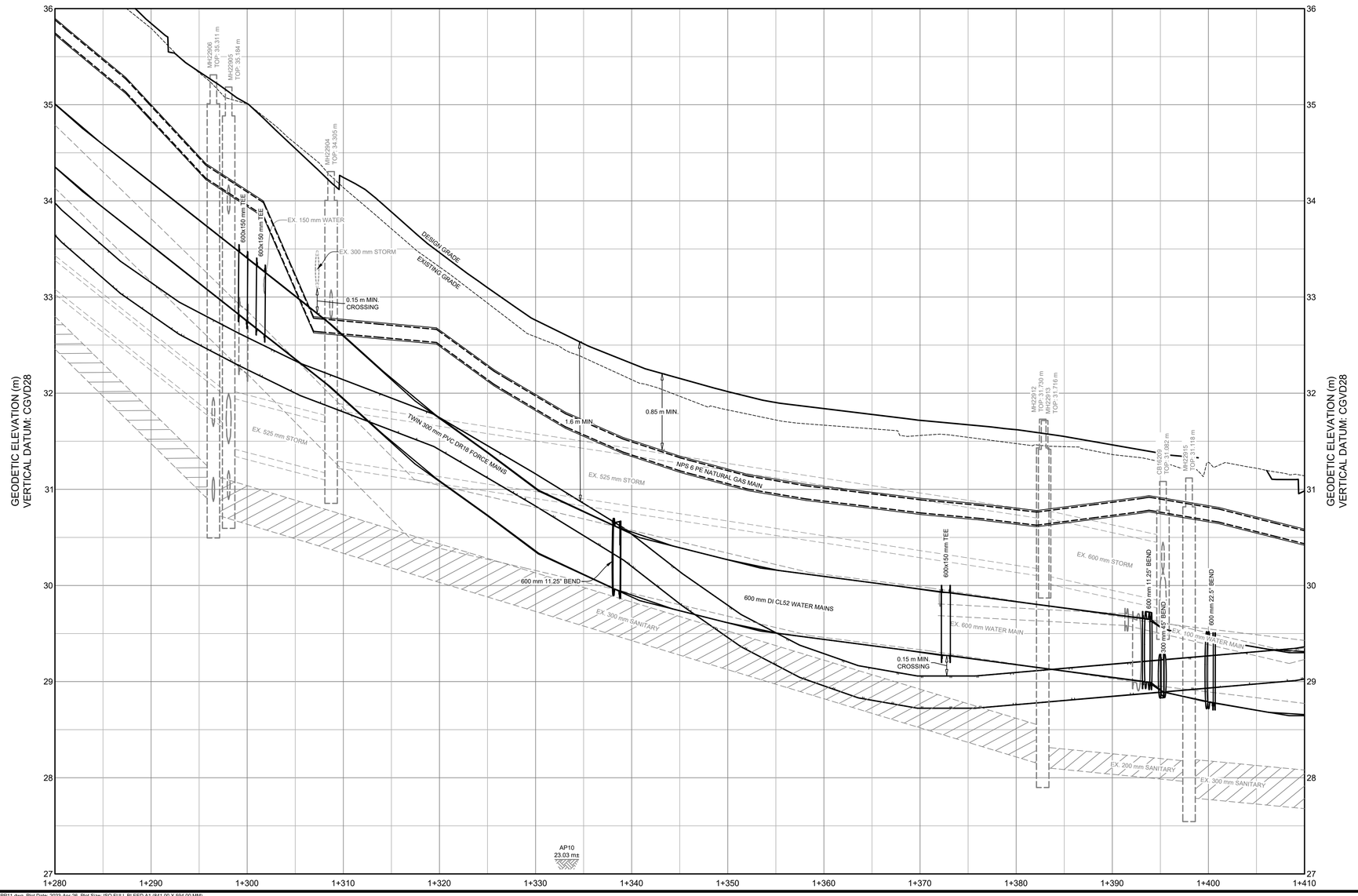
SHEET DESCRIPTION

PLAN & PROFILE
JOHN BRENTON DRIVE
STA. 1+130 TO 1+280

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP10
Scale	Filename		10 of 27
1:250 H, 1:25 V	22-106_PP10.dwg		







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

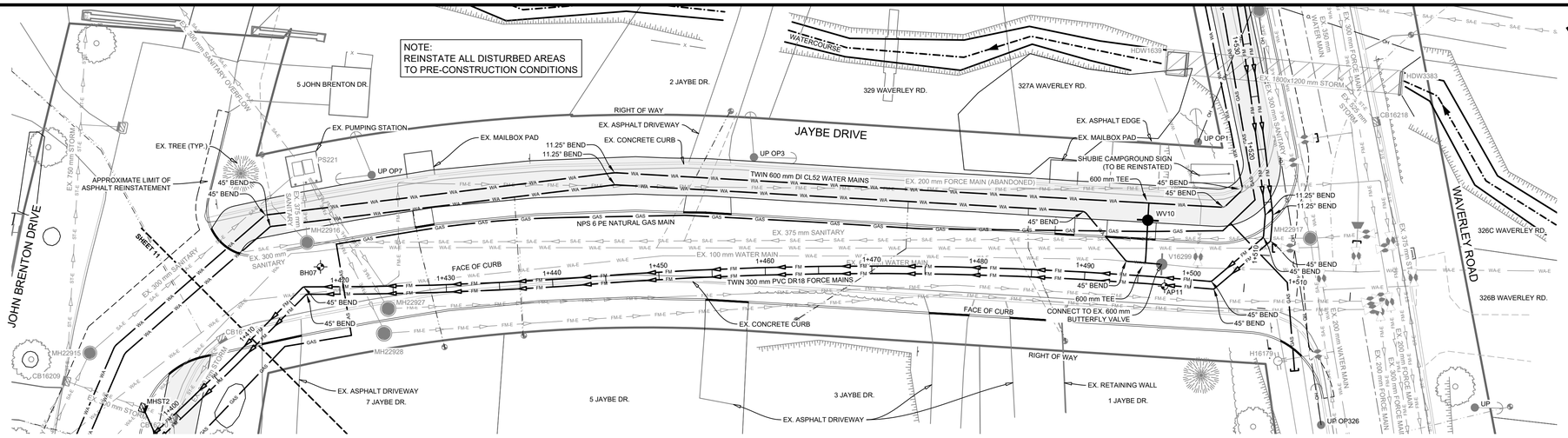
PORT WALLACE UTILITY CORRIDOR

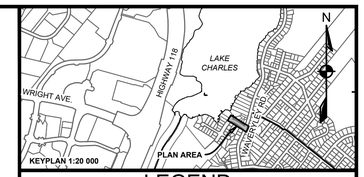
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

PLAN & PROFILE
JOHN BRENTON DRIVE
STA. 1+280 TO 1+410

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP11
Scale	Filename		11 of 27
1:250 H, 1:25 V	22-106_PP11.dwg		





LEGEND

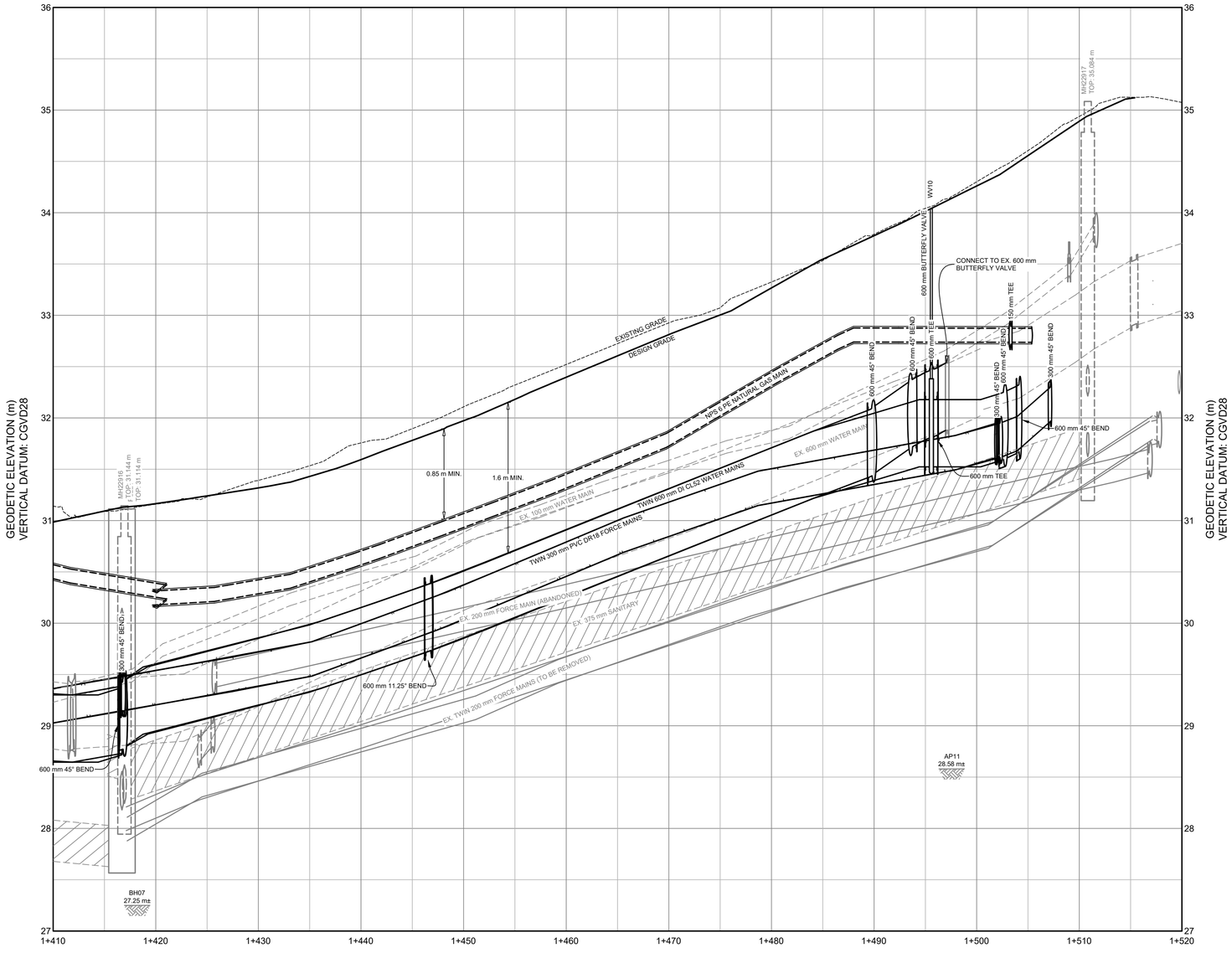
EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES 5 0 10 15

1:250



2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW
ISSUE	DATE	DESCRIPTION

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

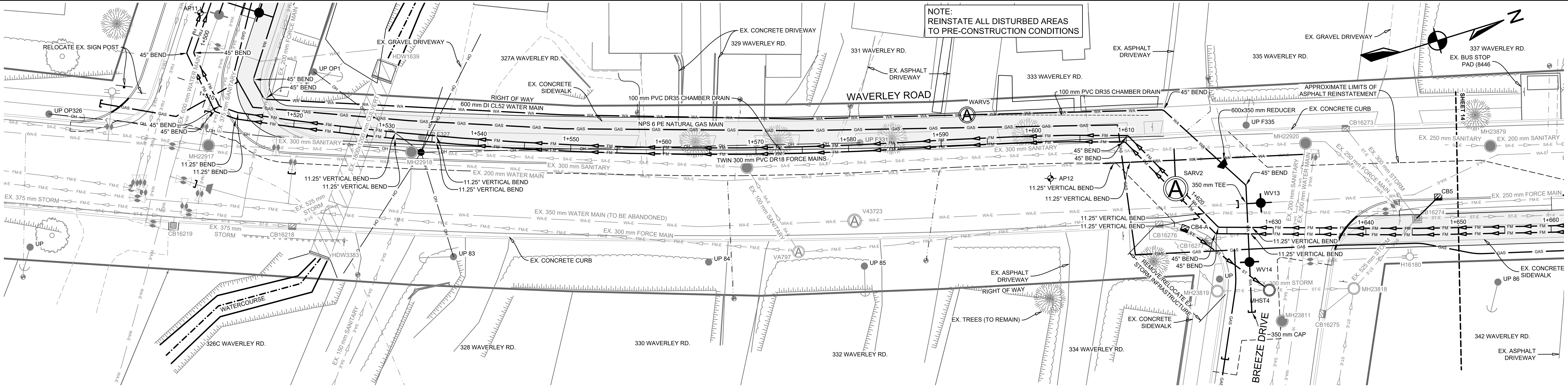
DARTMOUTH, NOVA SCOTIA

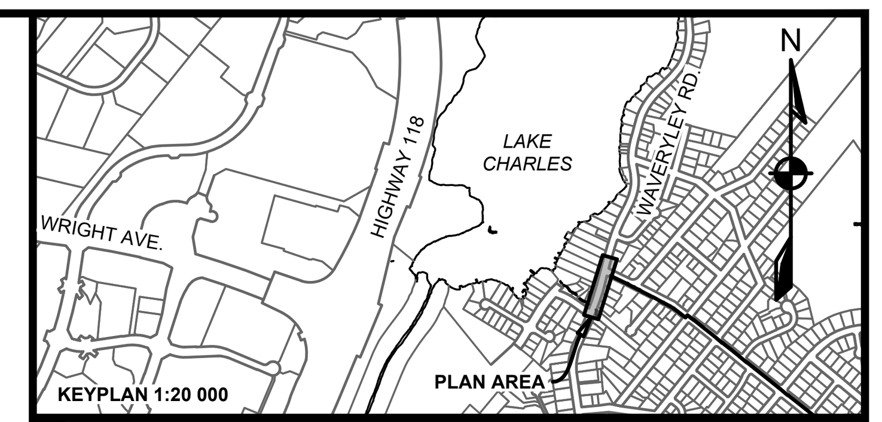
SHEET DESCRIPTION

PLAN & PROFILE
JAYBE DRIVE
STA. 1+410 TO 1+520

Drawn J. DWYER	Engineer L. KING	Project No. 22-106	Drawing No. C-PP12
Scale 1:250 H, 1:25 V	Filename 22-106_PP12.dwg		12 OF 27

NOTE:
REINSTATE ALL DISTURBED AREAS TO PRE-CONSTRUCTION CONDITIONS





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES 5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

CONSULTANT

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PROJECT DESCRIPTION

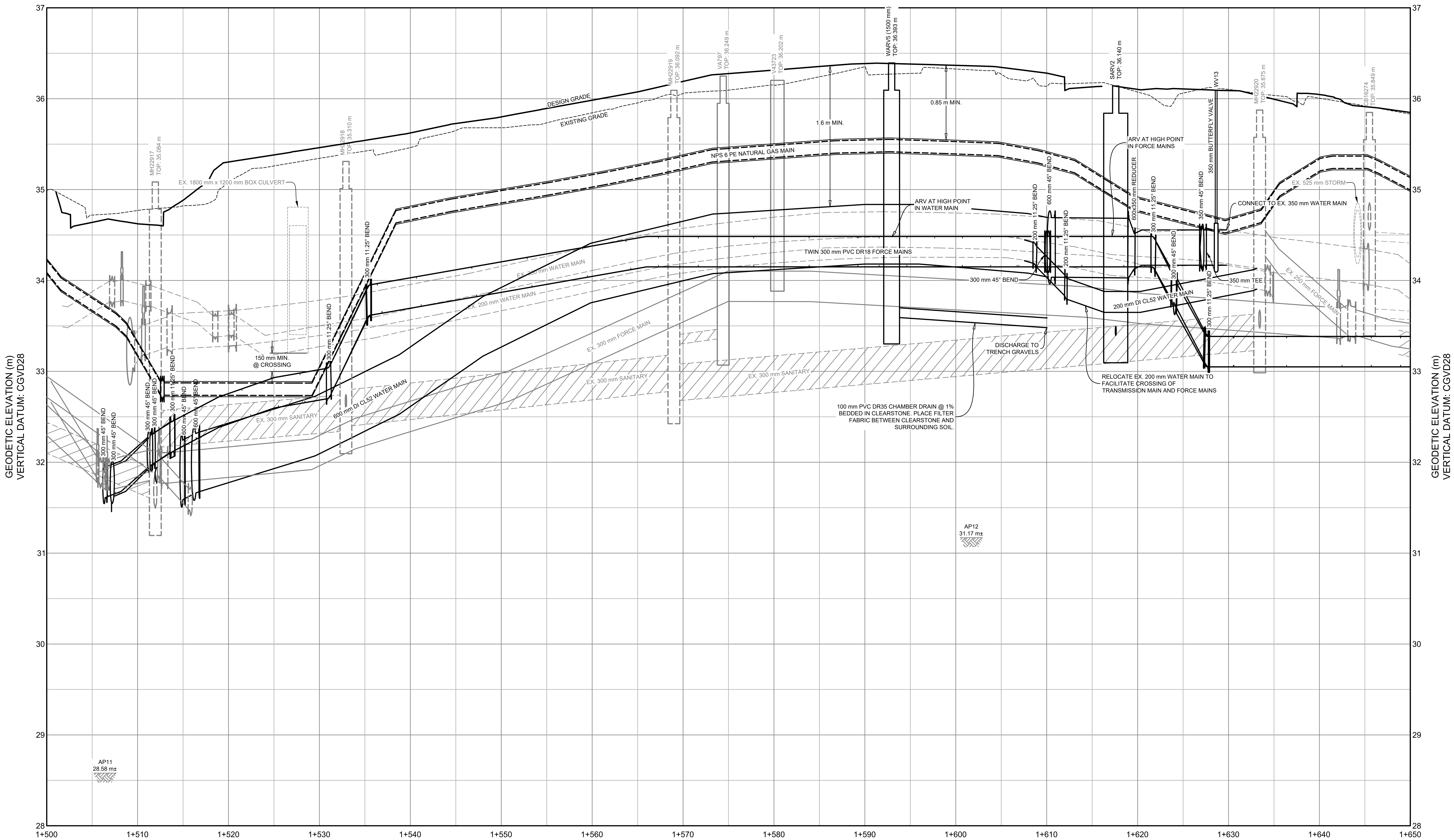
PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

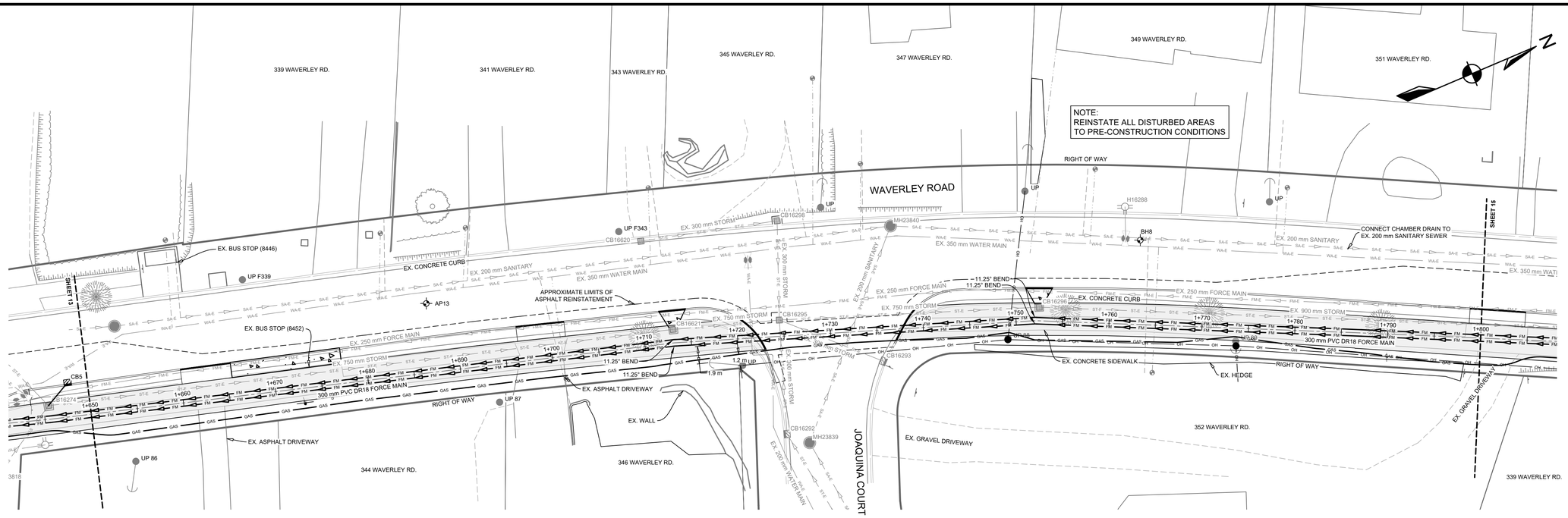
SHEET DESCRIPTION

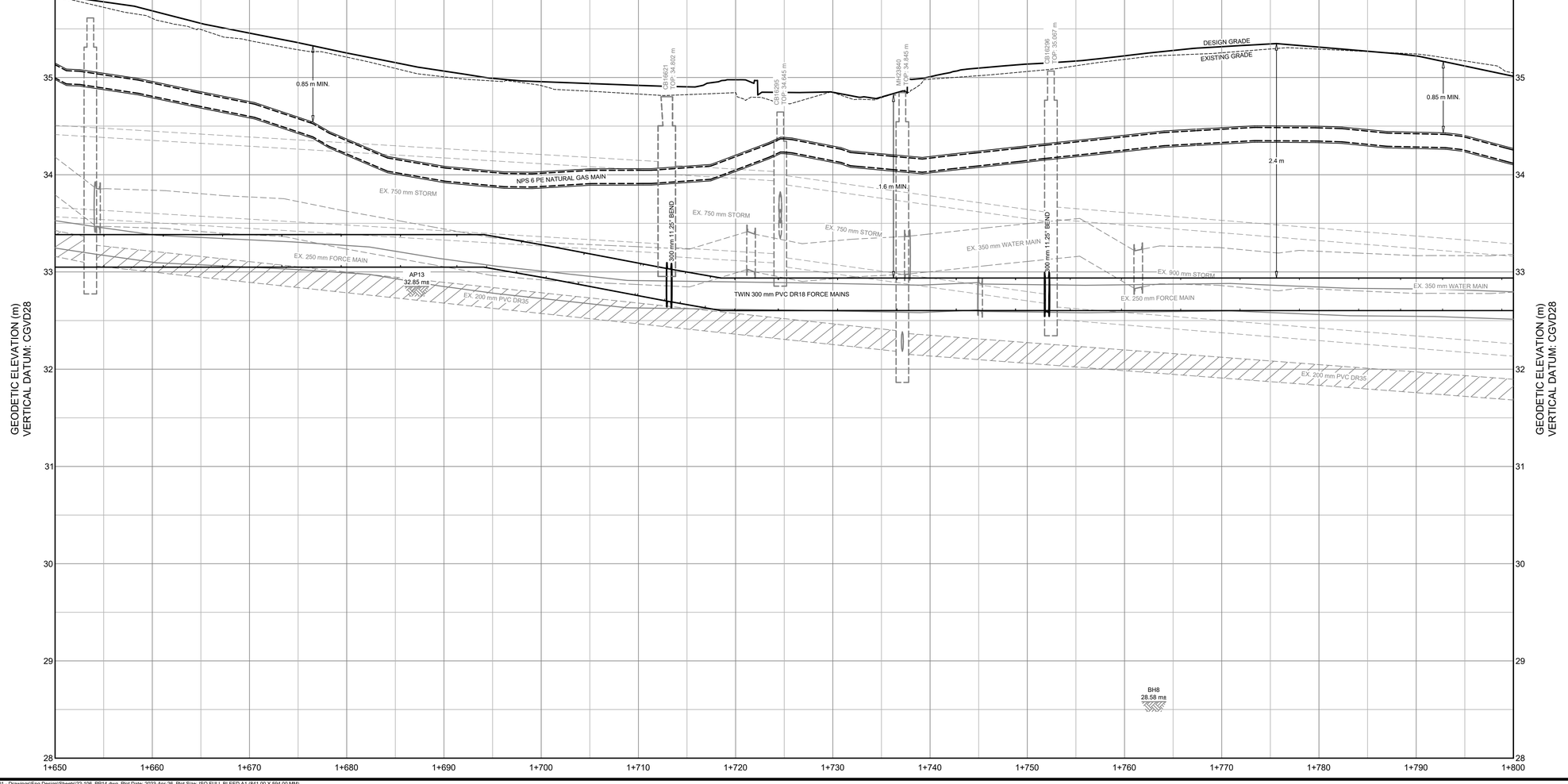
PLAN & PROFILE
WAVERLEY ROAD
STA. 1+500 TO 1+650

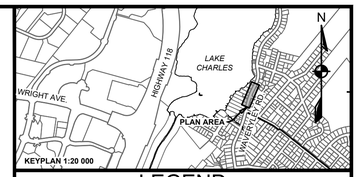
Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP13
Scale	Filename		
1:250 H, 1:25 V	22-106_PP13.dwg		13 of 27



P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_PP13.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

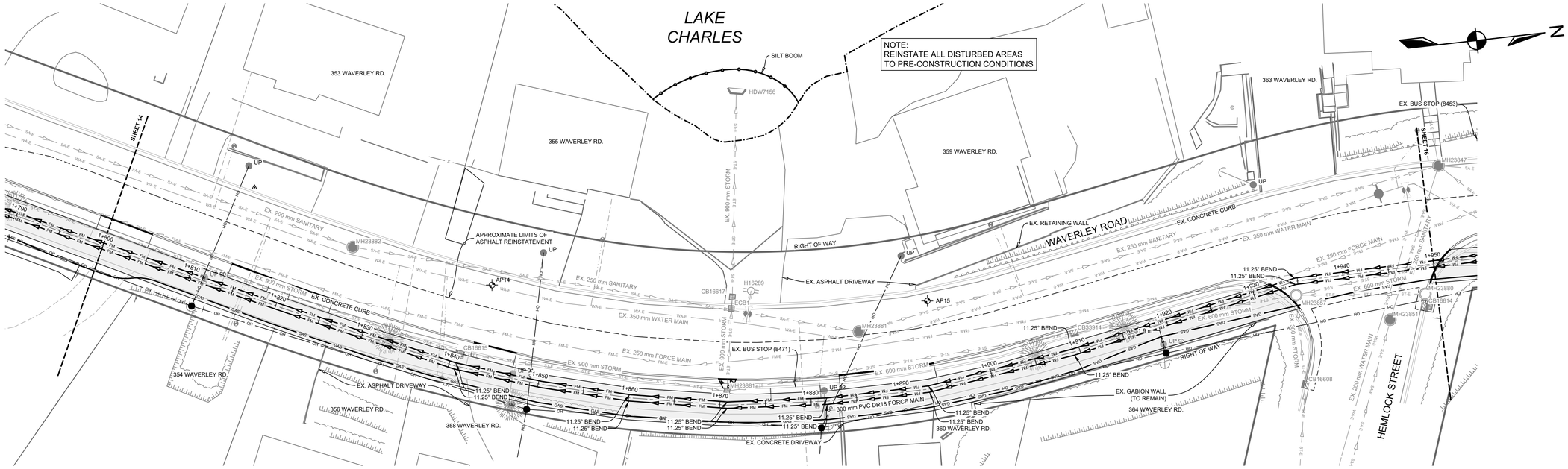
DARTMOUTH, NOVA SCOTIA

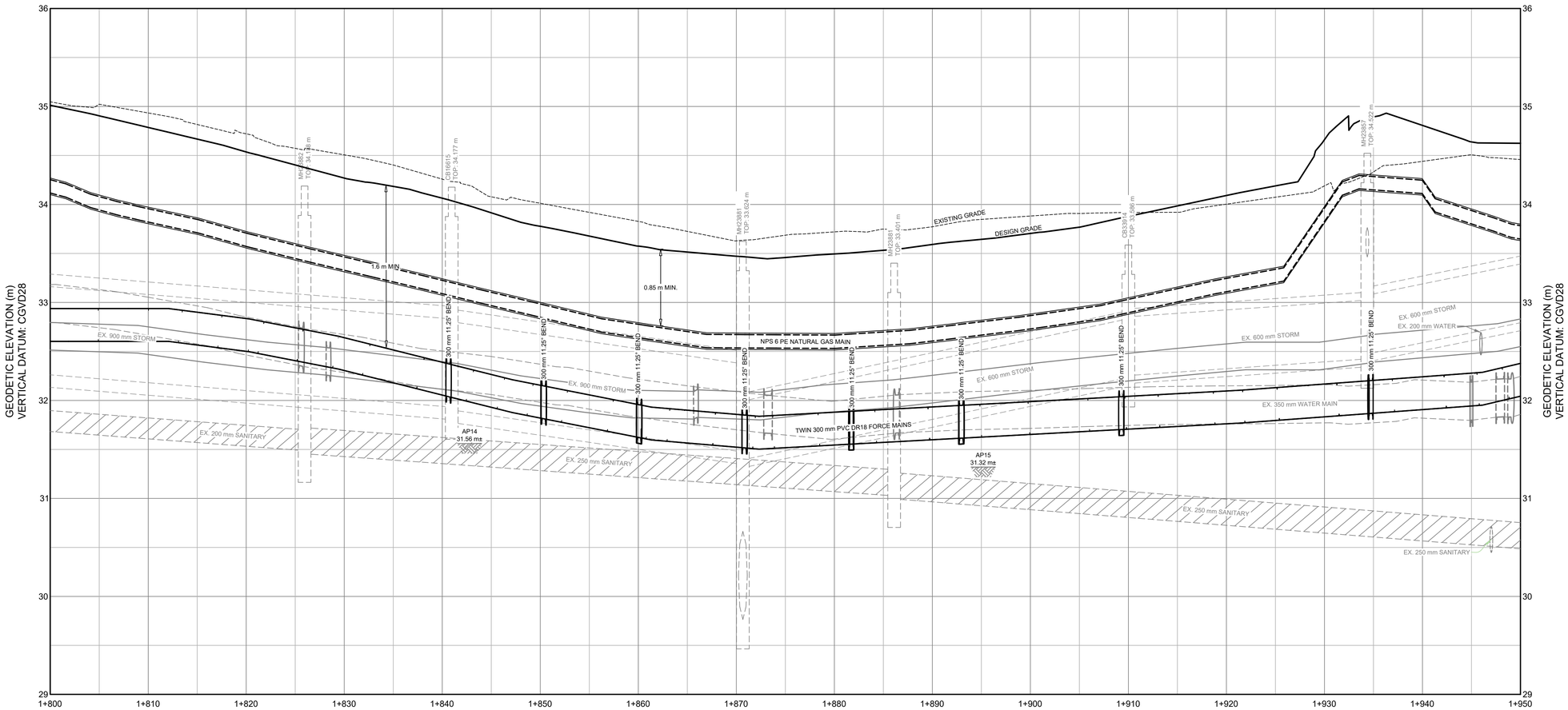
SHEET DESCRIPTION

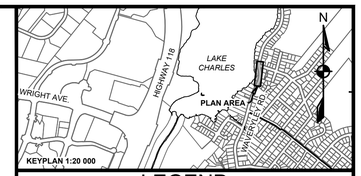
PLAN & PROFILE
WAVERLEY ROAD
STA. 1+650 TO 1+800

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP14
Scale	Filename		14 of 27
1:250 H, 1:25 V	22-106_PP14.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_PP14.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

CONSULTANT

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PROJECT DESCRIPTION

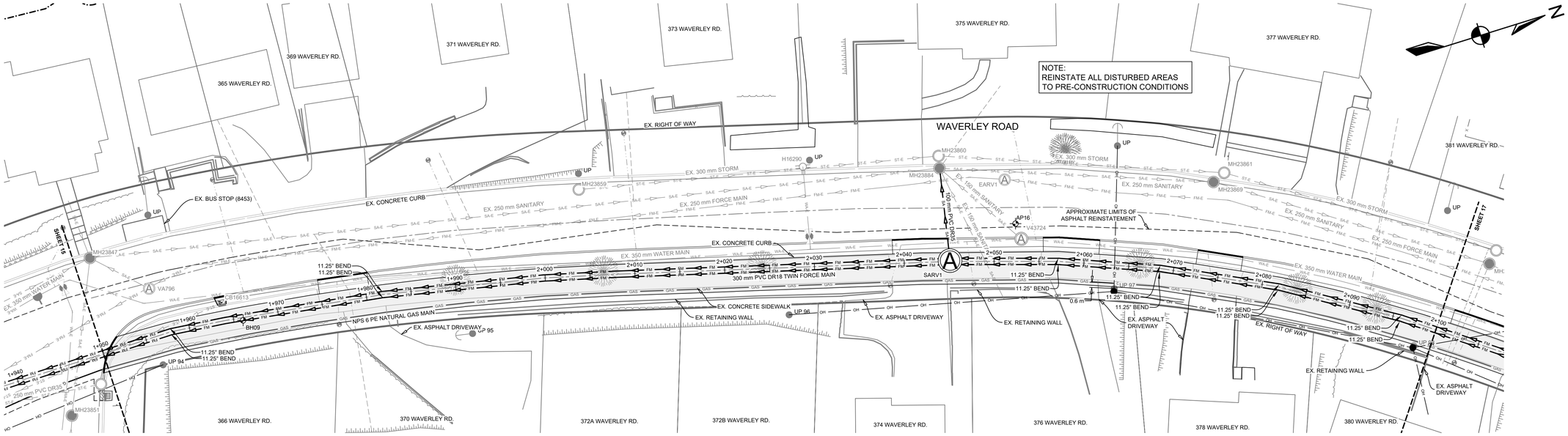
PORT WALLACE UTILITY CORRIDOR

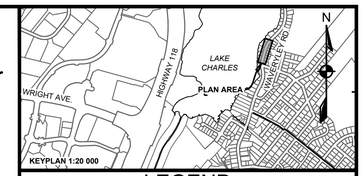
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

PLAN & PROFILE
WAVERLEY ROAD
STA. 1+800 TO 1+950

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP15
Scale	Filename		15 of 27
1:250 H, 1:25 V	22-106_PP15.dwg		





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

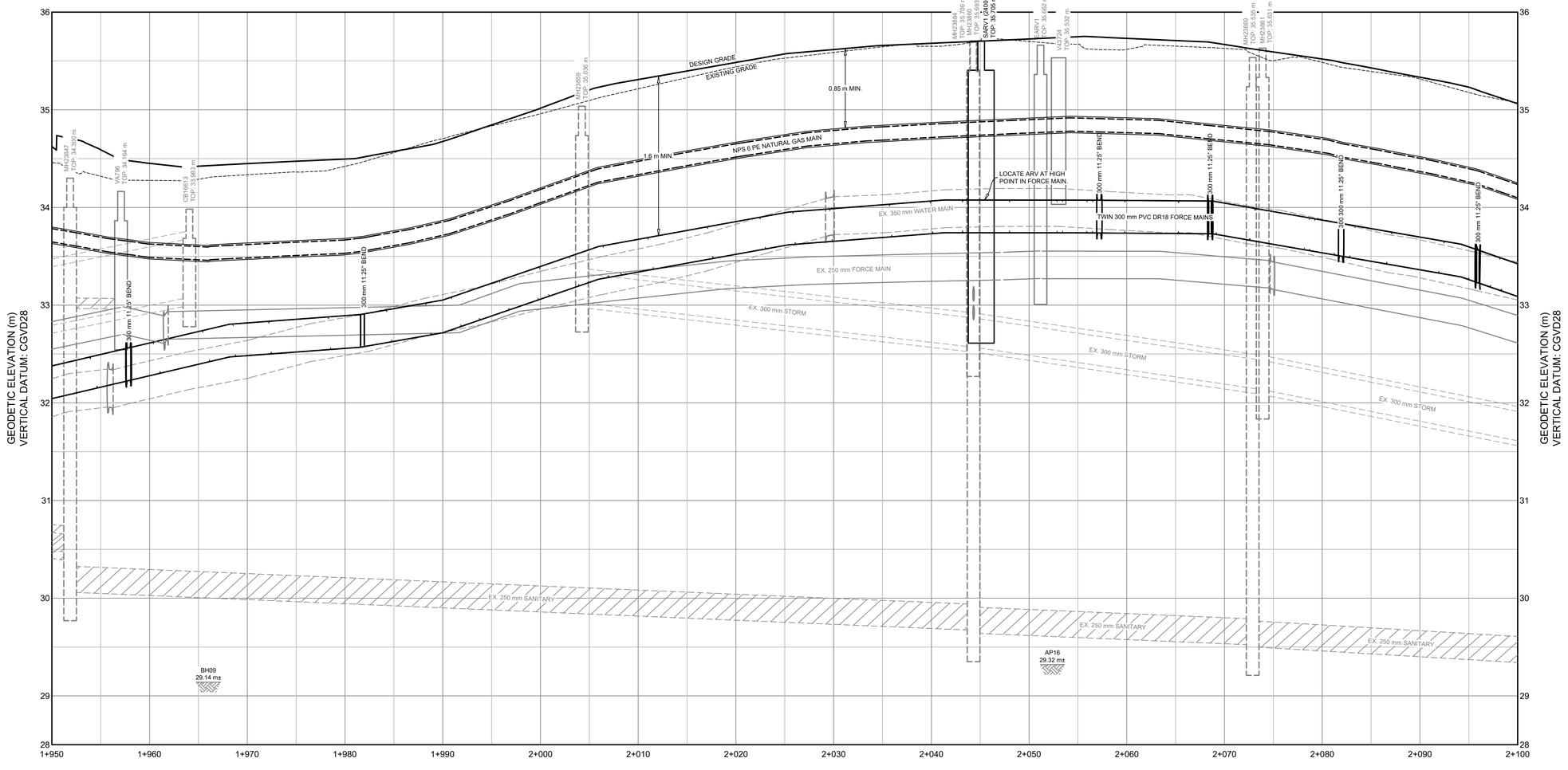
PORT WALLACE UTILITY CORRIDOR

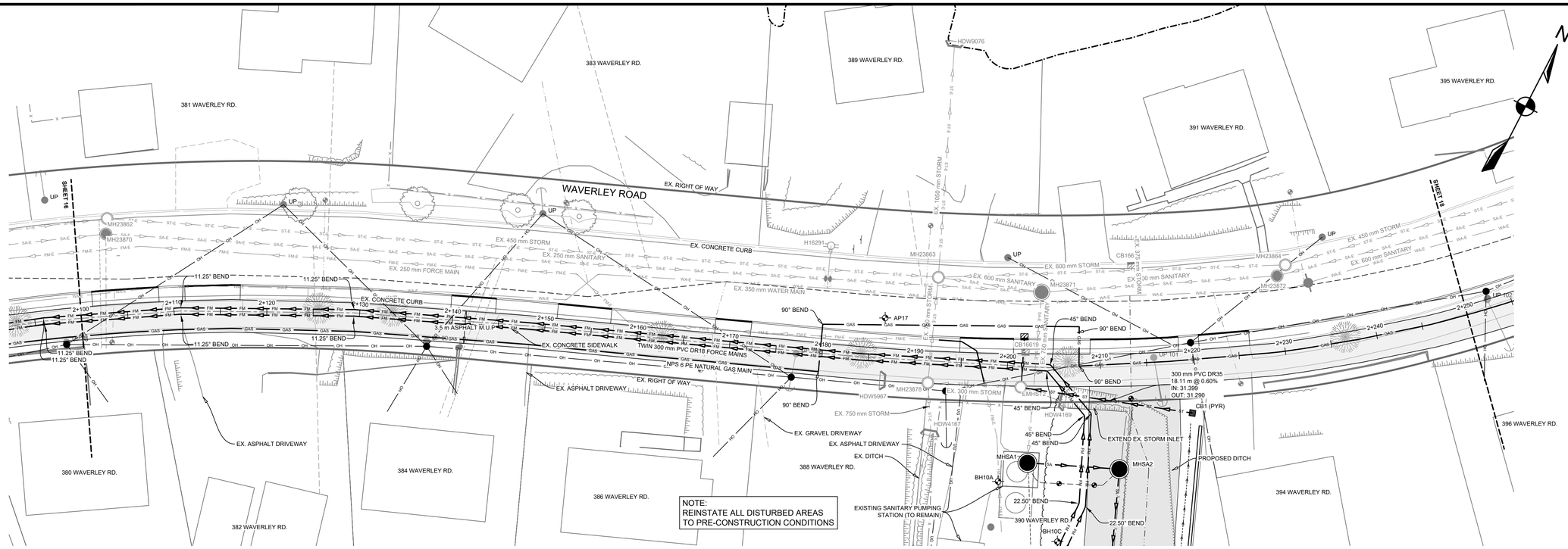
DARTMOUTH, NOVA SCOTIA

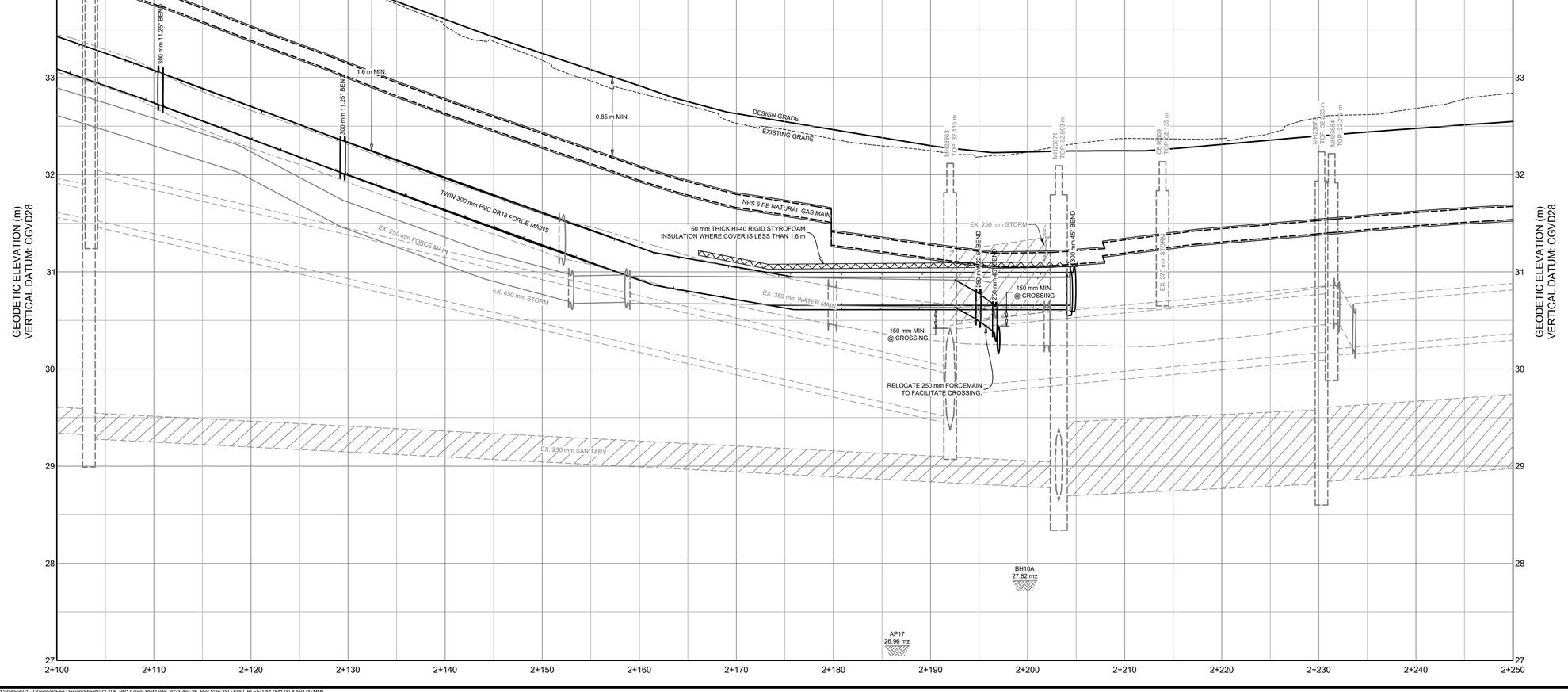
SHEET DESCRIPTION

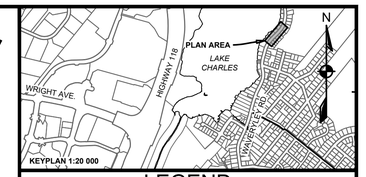
PLAN & PROFILE
WAVERLEY ROAD
STA. 1+950 TO 2+100

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP16
Scale	Filename		16 of 27
1:250 H, 1:25 V	22-106_PP16.dwg		









LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

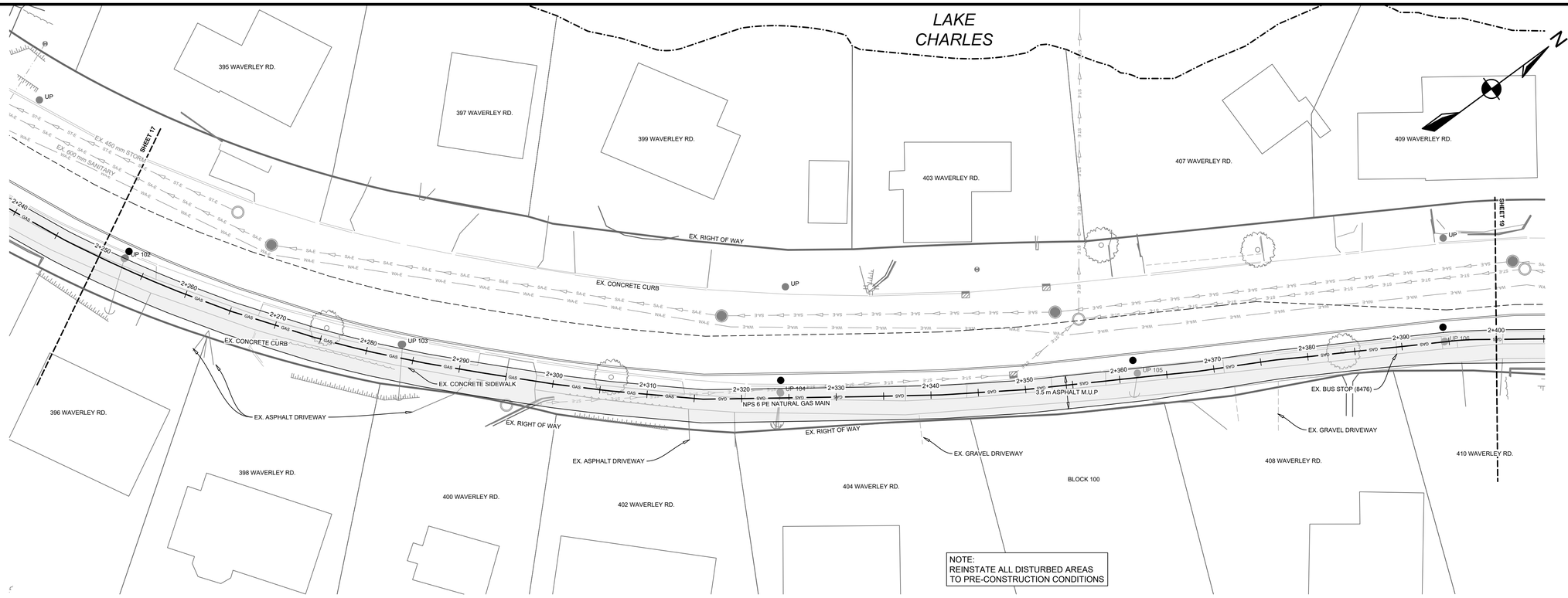
PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

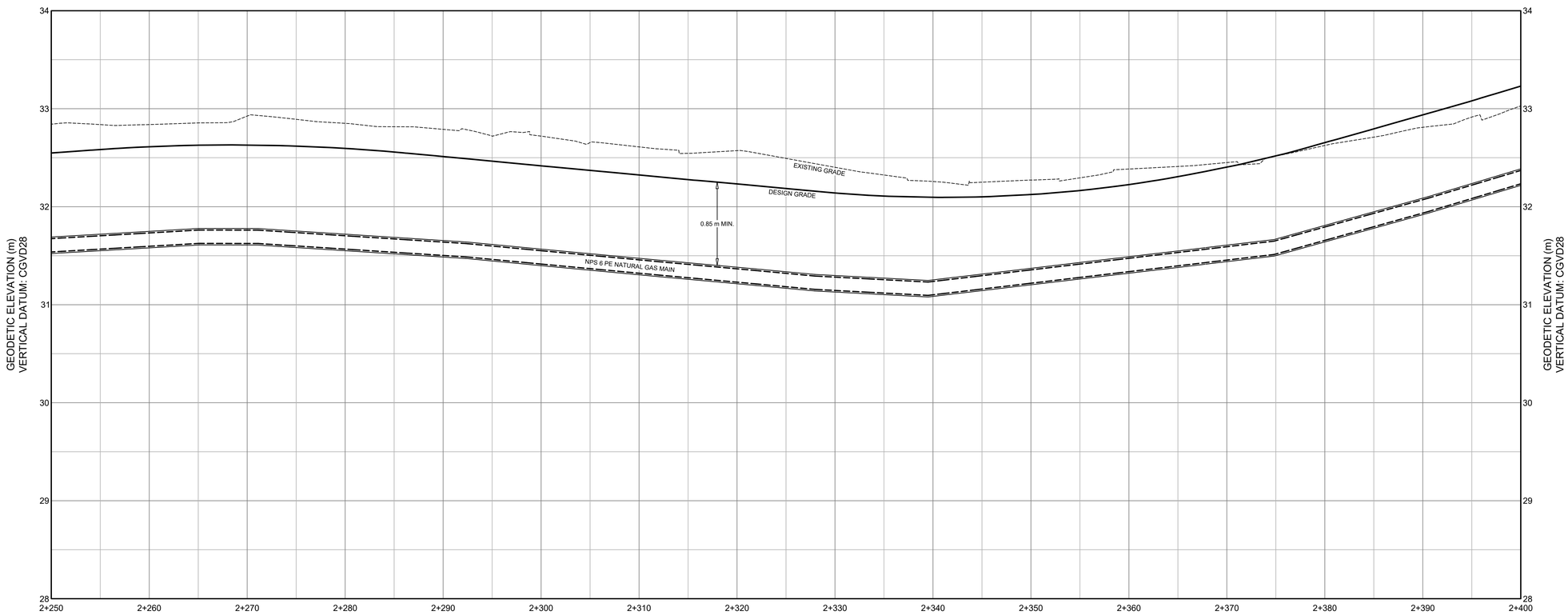
SHEET DESCRIPTION

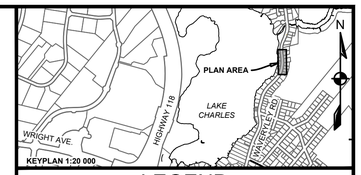
PLAN & PROFILE
WAVERLEY ROAD
STA. 2+100 TO 2+250

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP17
Scale	Filename		17 of 27
1:250 H, 1:25 V	22-106_PP17.dwg		



NOTE:
REINSTATE ALL DISTURBED AREAS
TO PRE-CONSTRUCTION CONDITIONS





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

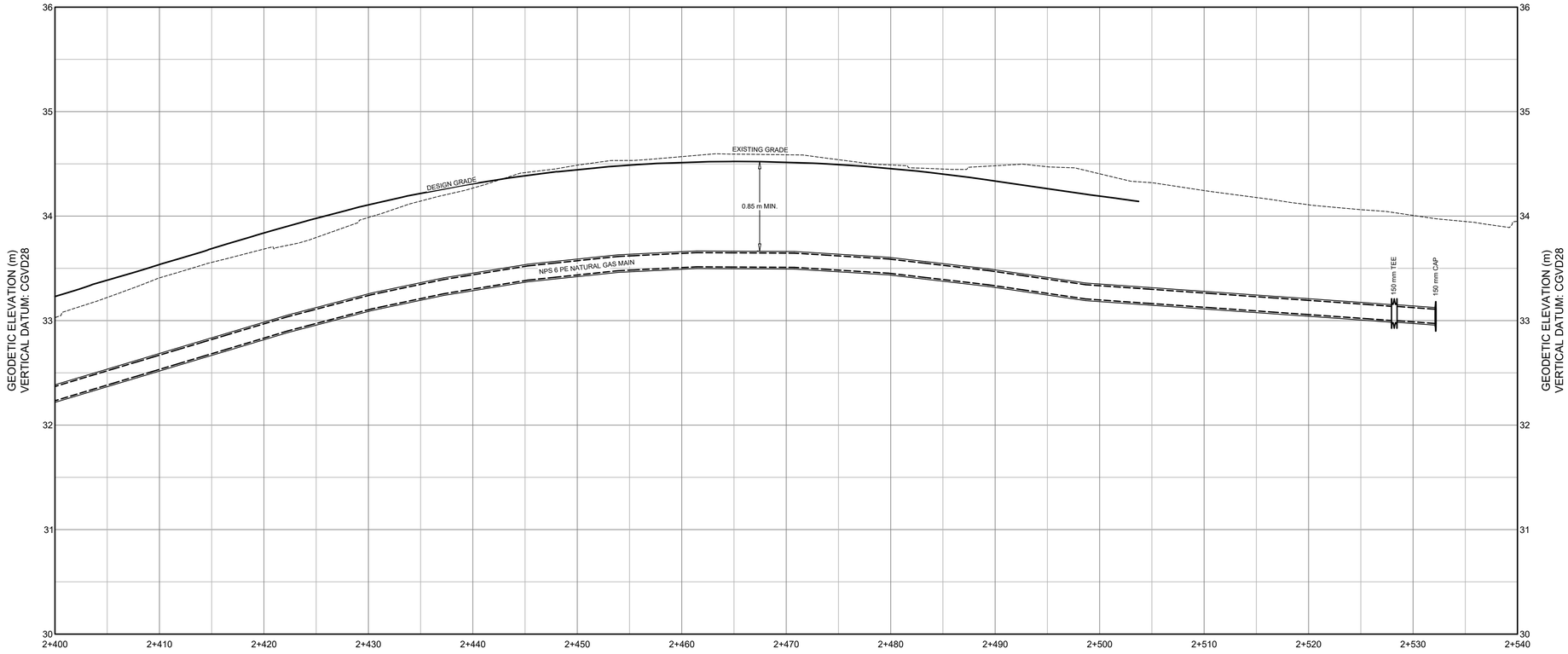
PORT WALLACE UTILITY CORRIDOR

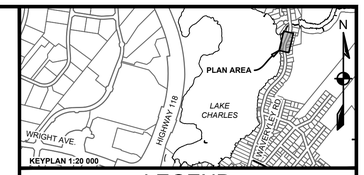
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

PLAN & PROFILE
WAVERLEY ROAD
STA. 2+250 TO 2+400

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP18
Scale	Filename		18 of 27
1:250 H, 1:25 V	22-106_PP19.dwg		





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES 5 0 10 15

1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

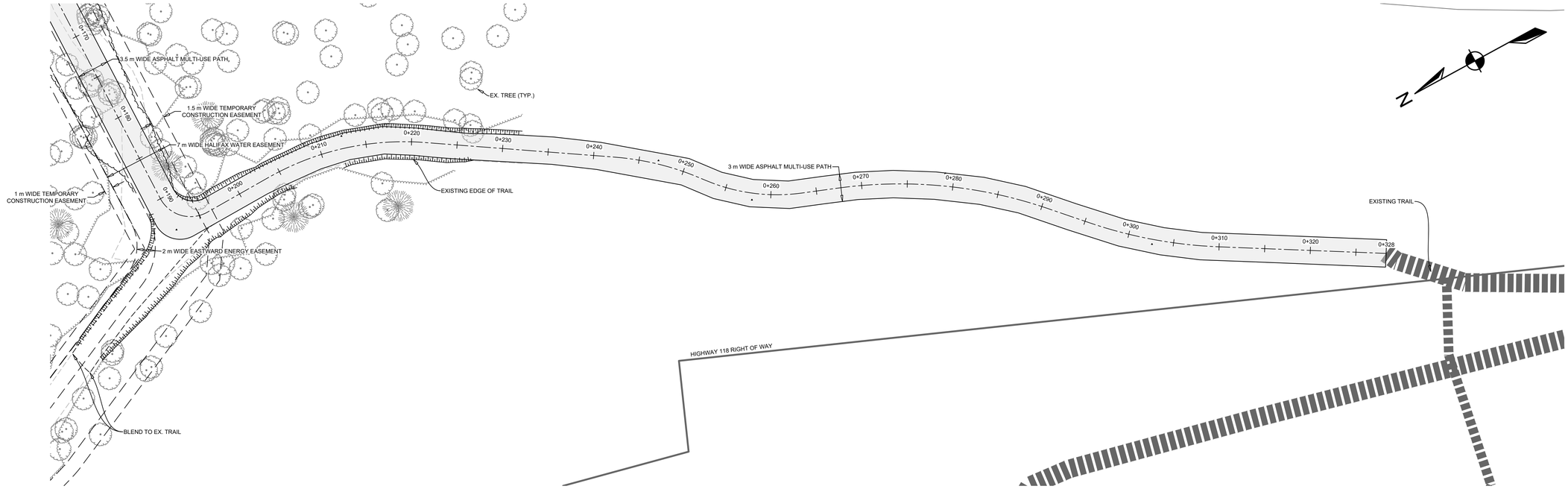
PORT WALLACE UTILITY CORRIDOR

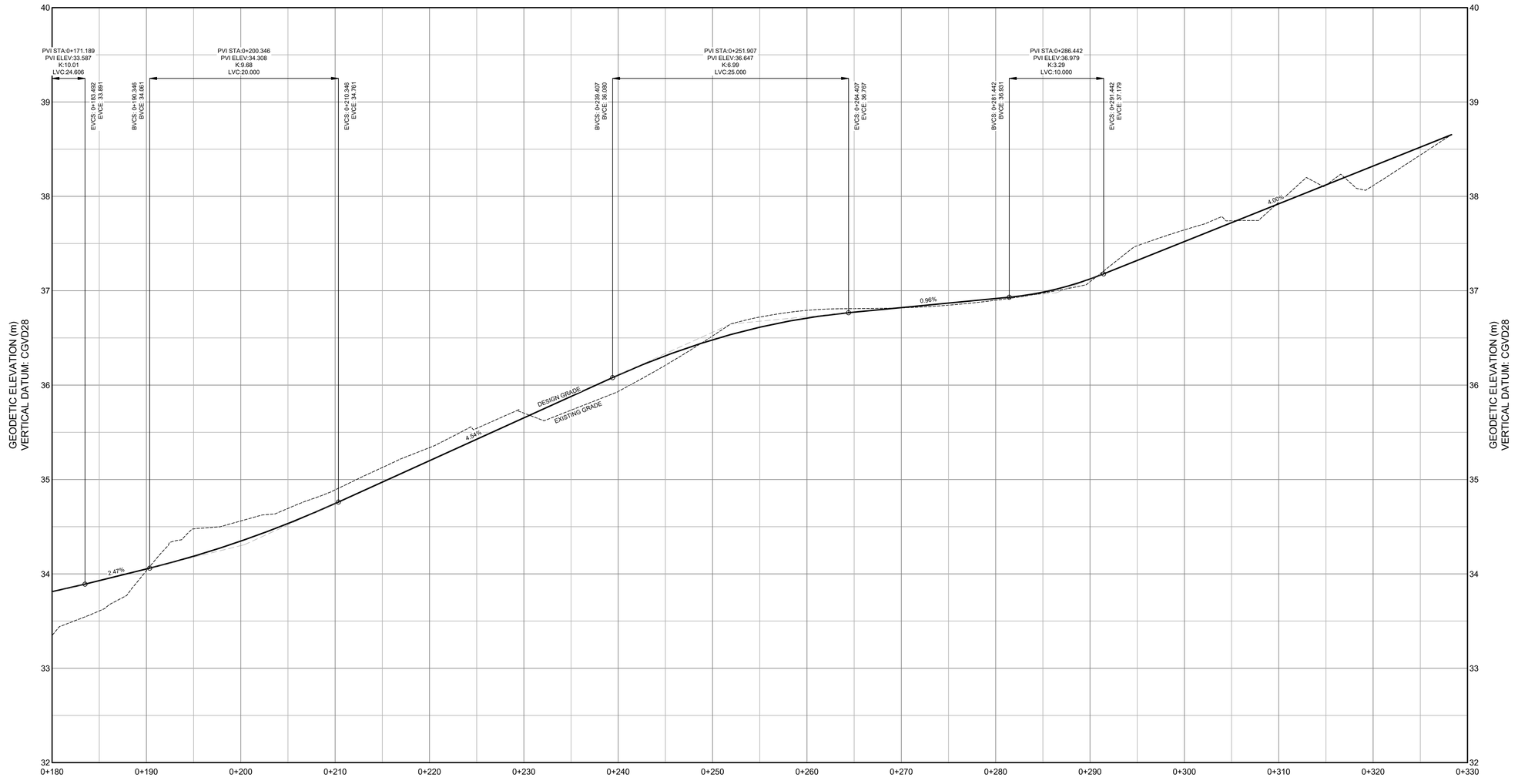
DARTMOUTH, NOVA SCOTIA

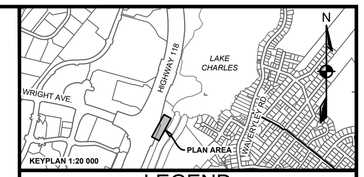
SHEET DESCRIPTION

PLAN & PROFILE WAVERLEY ROAD STA. 2+400 TO 2+540

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP19
Scale	Filename		19 OF 27
1:250 H, 1:25 V	22-106_PP20.dwg		







LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X	FENCELINE	X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
10 0 20 30
1:500

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

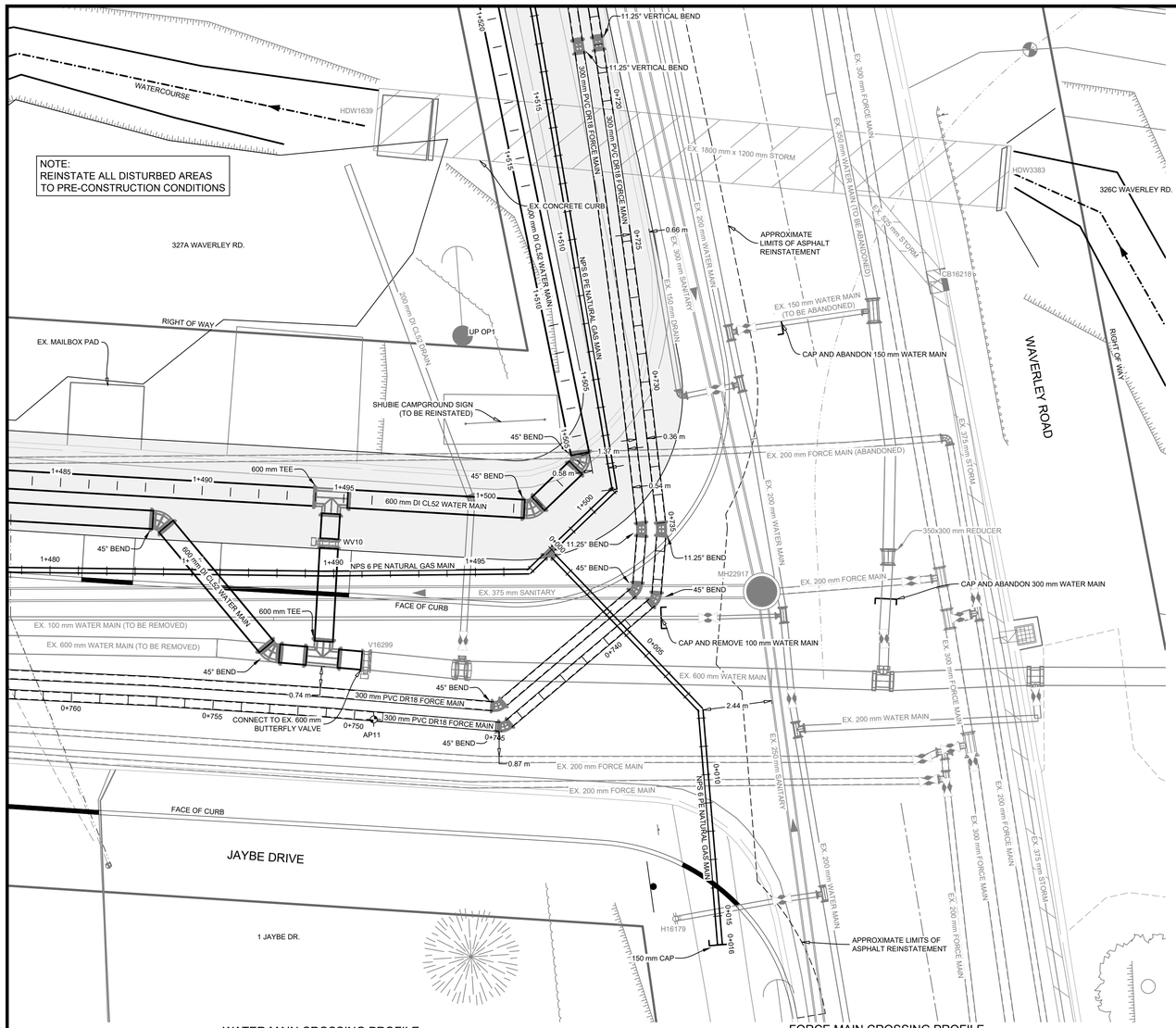
DARTMOUTH, NOVA SCOTIA

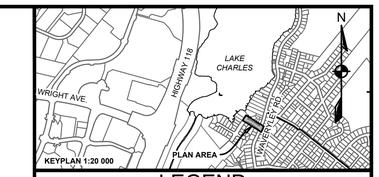
SHEET DESCRIPTION

PLAN & PROFILE
SHUBIE PARK MULTI-USE PATH
STA. 0+180 TO 0+330

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP20
Scale	Filename		20 of 27
1:250 H, 1:50 V	22-106_PP21.dwg		

P:\2022\22-106 Port Wallace Holdings - Port Wallace\01 - Drawings\Eng Design\Sheets\22-106_PP21.dwg, Plot Date: 2023-Apr-26, Plot Size: ISO FULL BLEED A1 (841.00 X 594.00 MM)





LEGEND

EXISTING		PROPOSED
	VERTICAL PROFILE	
	APPROXIMATE 1 IN 100 YEAR FLOOD LIMIT	100 YR
	EASEMENT	
WA-E	WATER PIPE	WA WA
SA-E	SANITARY PIPE	SA SA
ST-E	STORM PIPE	ST ST
GAS-E	NATURAL GAS MAIN	GAS
	WATER LATERAL	
	SANITARY LATERAL	
	STORM LATERAL	
	NATURAL GAS LATERAL	
	SIDEWALK	
	WALKWAY/A.T. TRAIL	
	GUARDRAIL	
	TOP OF SLOPE	
	BOTTOM OF SLOPE	
X X	FENCELINE	X X

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURB CUT/RAMP			AIR RELEASE VALVE		
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		
STREET SIGN			UTILITY POLE w/ GUY WIRE		
STREET TREE			GLB		
			URD		

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

METRES
5 0 10 15
1:250

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

CONSULTANT

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CLIENT

Clayton
The Community Builder

PROJECT DESCRIPTION

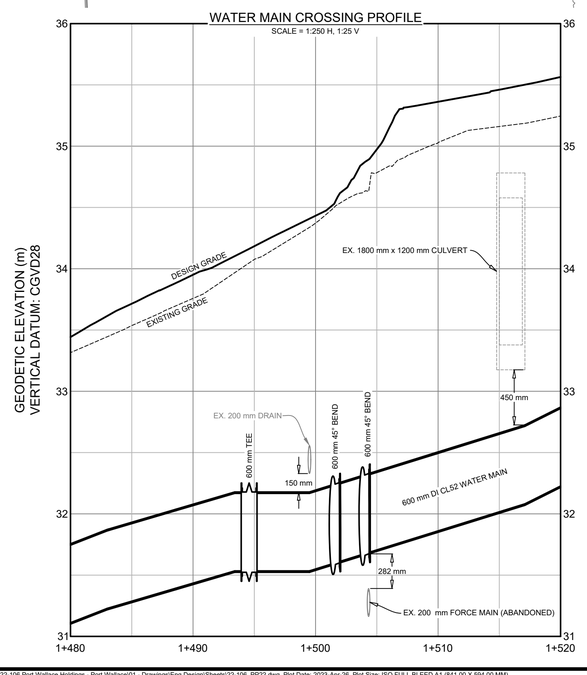
PORT WALLACE UTILITY CORRIDOR

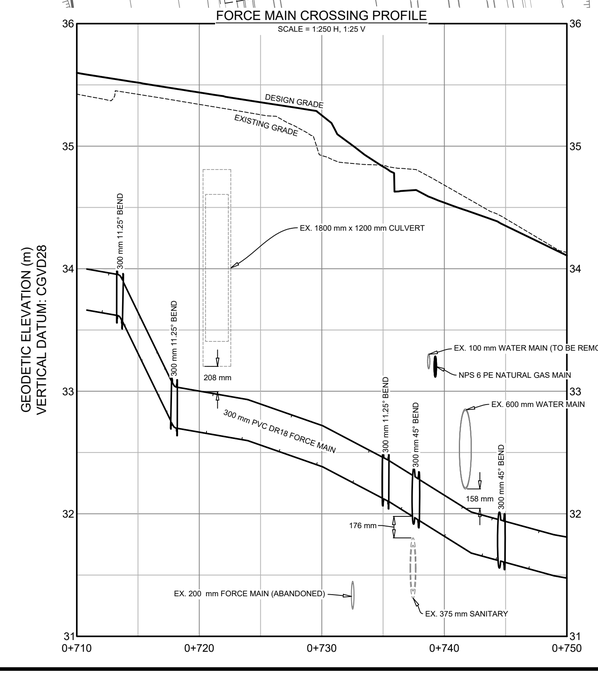
DARTMOUTH, NOVA SCOTIA

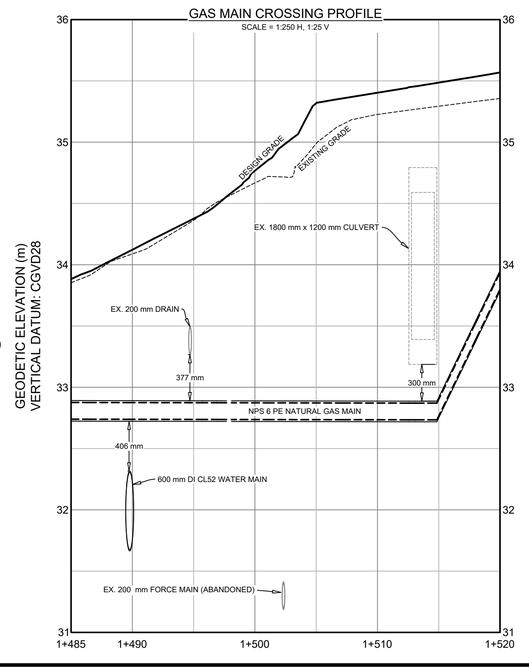
SHEET DESCRIPTION

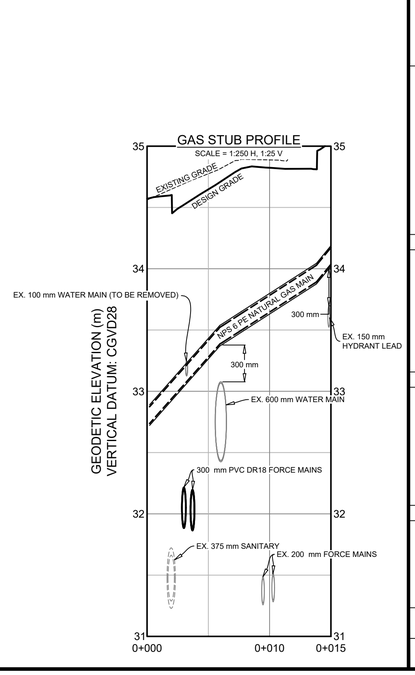
WAVERLEY ROAD & JAYBE DRIVE INTERSECTION - PIPE CROSSING DETAILS

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-PP21
Scale	Filename		21 of 27
1:100	22-106_PP22.dwg		









LAKE CHARLES

NOTE:
EXISTING TREES TO REMAIN UNLESS OTHERWISE NOTED (SEE TREE REMOVAL PLAN)

200 mm PVC DR35
11.50 m @ 2.77%
IN: 30.218
OUT: 29.899

EDGE OF EX. TRAIL (TYP.)

BOULDER WALL (TYP.)

PROP. HAND RAIL

BLEND TO EX. TRAIL

REINSTATE WITH NATIVE VEGETATION

PROP. CRUSHER DUST TRAIL

EX. LOCKBOXES (TO BE RELOCATED)

EX. CANAL LOCK (TO REMAIN)

EX. BENCH (TO BE RELOCATED)

EDGE OF GRAVEL

BH 5

BH 4

BH 2

AP 18

SIDE SLOPES TO BE GRASS SURFACED

1.0 m WIDE TEMPORARY CONSTRUCTION EASEMENT

2.0 m WIDE EASTWARD ENERGY EASEMENT

6.0 m WIDE HALIFAX WATER EASEMENT

1.5 m WIDE TEMPORARY CONSTRUCTION EASEMENT

200 mm PVC DR35
15.55 m @ 5.35%
IN: 31.375
OUT: 30.543

PROP. BRIDGE

REMOVE EX. TRAIL TO EX. BRIDGE

EX. BRIDGE (TO BE REMOVED)

EX. TREE (TYP.)

EX. BENCH (TO REMAIN)

REMOVE EX. TRAIL

EX. BOTTOM OF SLOPE (TYP.)

EX. TOP OF SLOPE (TYP.)

EDGE OF EX. TRAIL (TYP.)

SHUBENACADIE CANAL

PROPERTY LINE

LANDS OF HALIFAX REGIONAL MUNICIPALITY

LANDS OF HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF NOVA SCOTIA AND NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

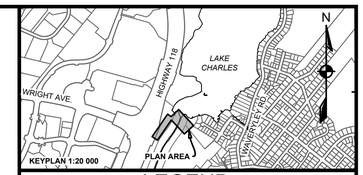
MATCH LINE

HIGHWAY 118 RIGHT OF WAY

EX TRAIL

METRES
6 0 6 12
1:200

METRES
5 0 5 15
1:250



KEYPLAN 1:20 000

LEGEND

EXISTING		PROPOSED
10	MAJOR CONTOUR	10
10	MINOR CONTOUR	10
	EASEMENT	
	RIGHT OF WAY	
	LOT LINE	

	EXISTING	PROPOSED		EXISTING	PROPOSED
PRECAST HEADWALL			CATCHBASIN		
SURFACE GRADE	0.00	0.00	FLOW ARROW		
SURFACE SLOPE		2.0%	CURB CUT		

NOTES:

1. ALL ELEVATIONS ARE METRIC AND GEODETIC. CONTOURS BASED ON LIDAR DATA AND TOPOGRAPHIC SURVEY CONDUCTED BY DESIGNPOINT BETWEEN MARCH 21 AND APRIL 12, 2022.
2. MINIMUM GRADE TO BE 2%.
3. MAXIMUM GRADE TO BE 3:1 (HORIZONTAL:VERTICAL). GRADES STEEPER THAN 3:1 ARE TO BE APPROVED BY PROJECT GEOTECHNICAL ENGINEER.
4. FENCE OR HANDRAIL REQUIRED FOR WALLS HIGHER THAN 1 m (AS PER HRM REQUIREMENTS).

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

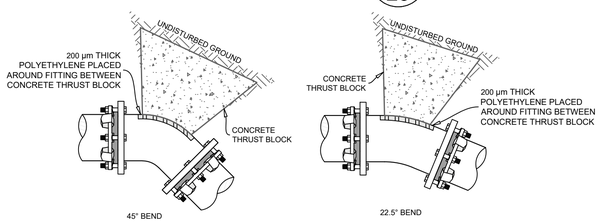
SHEET DESCRIPTION

SHUBIE PARK TRAIL GRADING

Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-G01
Scale	Filename		22 OF 27
	22-106_G01.dwg		

THRUST BLOCK DETAILS — A / 23

N.T.S



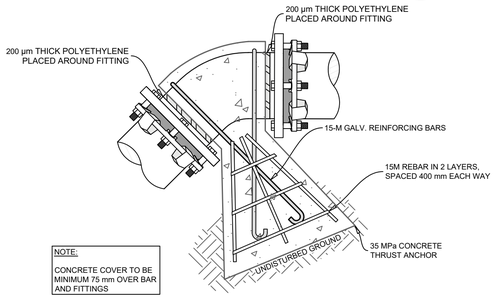
MINIMUM THRUST BLOCK CONTACT AREA (m²)

BASED ON SOIL BEARING CAPACITY OF 100 kPa AND INTERNAL PIPE PRESSURE OF 1035 kPa.

PIPE DIAMETER (mm)	CAP	TEE	45° BEND	22.5° BEND	11.25° BEND
100	0.12	0.12	0.09	0.05	0.02
150	0.27	0.27	0.21	0.11	0.05
200	0.49	0.49	0.37	0.19	0.10
250	0.76	0.76	0.58	0.30	0.15
300	1.10	1.10	0.84	0.43	0.22
350	1.49	1.49	1.14	0.58	0.29
400	1.95	1.95	1.49	0.76	0.38
600	4.39	4.39	3.36	1.71	0.86

VERTICAL THRUST ANCHOR DETAIL — D / 23

N.T.S



NOTE:

CONCRETE COVER TO BE MINIMUM 75 mm OVER BAR AND FITTINGS

MINIMUM THRUST BLOCK CONTACT AREA (m²)

BASED ON SOIL BEARING CAPACITY OF 200 kPa AND INTERNAL PIPE PRESSURE OF 1035 kPa.

PIPE DIAMETER (mm)	90° BEND	45° BEND	22.5° BEND	11.25° BEND
100	0.09	0.05	0.02	0.01
150	0.19	0.11	0.05	0.03
200	0.35	0.19	0.10	0.05
250	0.54	0.29	0.15	0.08
300	0.78	0.42	0.21	0.11
350	1.06	0.57	0.29	0.15
400	1.38	0.75	0.38	0.19
600	3.10	1.68	0.86	0.43

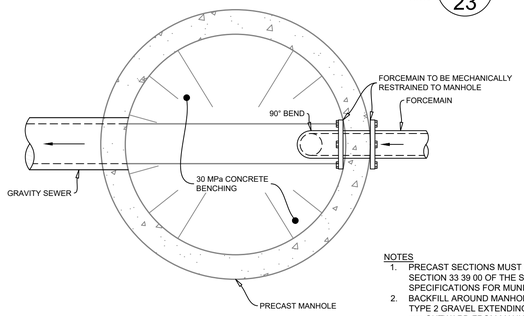
MINIMUM VOLUME OF CONCRETE (m³)

BASED ON INTERNAL PIPE PRESSURE OF 1035 kPa.

PIPE DIAMETER (mm)	45° BEND	22.5° BEND	11.25° BEND
150	0.80	0.40	0.20
200	1.40	0.70	0.35
250	2.10	1.10	0.55
300	2.38	1.21	0.61
400	4.23	2.16	1.08
600	9.51	4.85	2.44

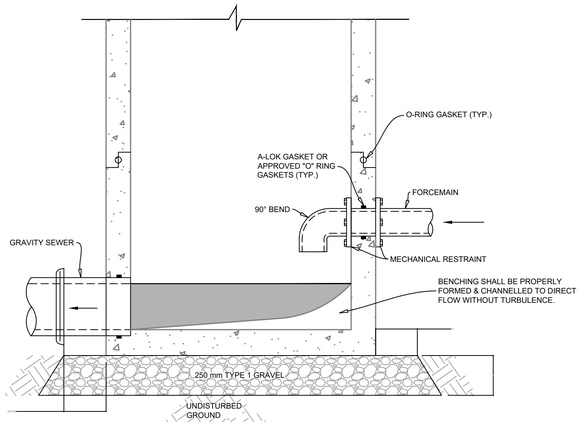
TYPICAL FORCEMAIN TO MANHOLE CONNECTION — B / 23

N.T.S



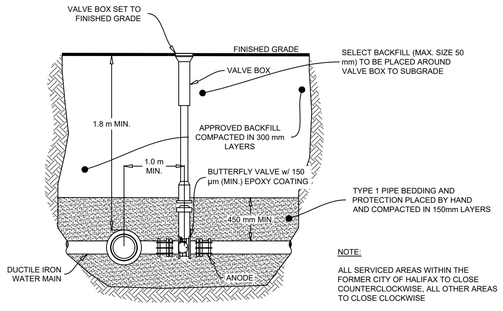
NOTES

1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. BACKFILL AROUND MANHOLES SHALL BE TYPE 2 GRAVEL EXTENDING A MIN. OF 300 mm OUTWARD FROM MANHOLE AND VERTICALLY FROM BEDDING MATERIAL TO UNDERSIDE OF ROADBED GRAVELS.



STANDARD BUTTERFLY VALVE CONNECTION — E / 23

N.T.S.



NOTE:

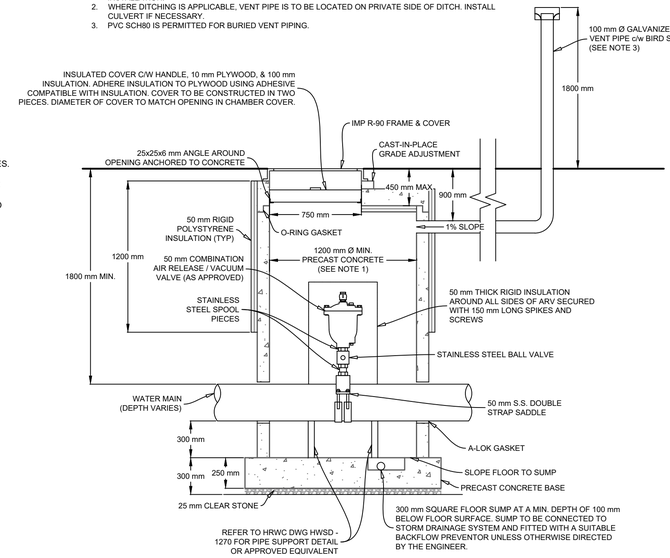
ALL SERVICED AREAS WITHIN THE FORMER CITY OF HALIFAX TO CLOSE COUNTERCLOCKWISE. ALL OTHER AREAS TO CLOSE CLOCKWISE

RESIDENTIAL AIR RELEASE VALVE CHAMBER (50mm) — C / 23

N.T.S.

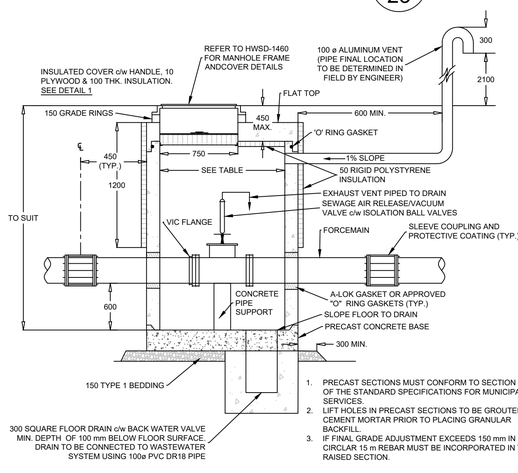
NOTES:

1. FOR WATER MAIN SIZES LARGER THAN 300 mm, CHAMBER DIAMETER SHALL BE 1500 mm. FOR WATER MAIN SIZES LARGER THAN 600 mm, THE CHAMBER WILL BE DESIGNED SPECIFICALLY FOR THE INSTALLATION.
2. WHERE DITCHING IS APPLICABLE, VENT PIPE IS TO BE LOCATED ON PRIVATE SIDE OF DITCH. INSTALL CULVERT IF NECESSARY.
3. PVC SCH80 IS PERMITTED FOR BURIED VENT PIPING.



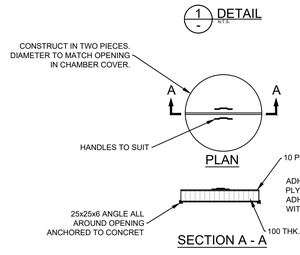
SANITARY AIR RELEASE CHAMBER DETAIL — F / 23

N.T.S.



1. PRECAST SECTIONS MUST CONFORM TO SECTION 33 39 00 OF THE STANDARD SPECIFICATIONS FOR MUNICIPAL SERVICES.
2. LIFT HOLES IN PRECAST SECTIONS TO BE GROUTED WITH CEMENT MORTAR PRIOR TO PLACING GRANULAR BACKFILL.
3. IF FINAL GRADE ADJUSTMENT EXCEEDS 150 mm IN HEIGHT, CIRCLAR 15 m REBAR MUST BE INCORPORATED IN THE RAISED SECTION.

1 / - DETAIL



FORCEMAIN SIZE	VALVE CHAMBER SIZE (MIN)
100 - 150	1500
200 - 300	1800
400 - 450	2100
500 -	CUTOM SIZED TO SUIT & AS APPROVED BY ENGINEER

GENERAL CONSTRUCTION NOTES:

1. **SAFETY IS PARAMOUNT AND THE CONTRACTOR MUST USE SAFE WORK PRACTICES IN ACCORDANCE WITH THE NOVA SCOTIA OCCUPATIONAL HEALTH AND SAFETY ACT.**
2. ALL WORKS TO BE IN ACCORDANCE WITH HALIFAX WATER DESIGN AND CONSTRUCTION SPECIFICATIONS AND HALIFAX REGIONAL MUNICIPALITY MUNICIPAL DESIGN GUIDELINES (CURRENT EDITIONS).
3. ALL WORKS TO BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATION FOR MUNICIPAL SERVICES" PREPARED JOINTLY BY THE NOVA SCOTIA ROADBUILDERS ASSOCIATION AND THE CONSULTING ENGINEERS OF NOVA SCOTIA (CURRENT EDITION).
4. ALL WORKS TO BE IN ACCORDANCE WITH REQUIREMENTS OF ALL PERMITS AND REGULATIONS AS ISSUED BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
5. CONTRACTOR TO NOTIFY DESIGNPOINT, HALIFAX REGIONAL MUNICIPALITY, AND HALIFAX WATER REGARDING CONSTRUCTION SCHEDULING 2 WEEKS PRIOR TO COMMENCING CONSTRUCTION.
6. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF NATURAL WATERCOURSES FROM DAMAGE DUE TO SILT LADEN RUNOFF FROM THE CONSTRUCTION SITE. ACCEPTABLE CONSTRUCTION PROCEDURES MAY BE OBTAINED FROM "EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION SITES" (CURRENT EDITION), BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
7. ALL DISTURBED AREAS NOT STABILIZED BY GRAVEL, ASPHALT, CONCRETE, OR SOD ARE TO BE STABILIZED WITH 100mm TOPSOIL AND HYDROSEEDED. HYDROSEEDED AREAS TO BE COVERED WITH HAY MULCH (MIN. 3000 kg/Ha). HYDROSEEDED AREAS THAT DO NOT SHOW ACTIVE GROWTH WITHIN THE FIRST GROWING SEASON TO BE RE-STABILIZED.
8. MATERIALS SHALL NOT BE SUBSTITUTED UNLESS PRIOR APPROVAL IS PROVIDED BY THE ENGINEER.
9. SHOP DRAWINGS TO BE PROVIDED FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
10. CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS REQUIRED TO PERFORM WORKS AND TO COMPLY WITH ALL PERMIT REQUIREMENTS AND CONDITIONS.
11. LOCATIONS OF EXISTING INFRASTRUCTURE IS BASED ON BEST AVAILABLE INFORMATION, INCLUDING RECORD INFORMATION. CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING INFRASTRUCTURE AND NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY. CONTRACTOR TO ALLOW A 1 WEEK REVIEW PERIOD BY THE ENGINEER.
12. CONTRACTOR TO VERIFY ALL EXISTING UTILITY LOCATIONS, SUCH AS HERITAGE GAS, NOVA SCOTIA POWER, BELL ALIANT, EASTLINK, AND HALIFAX WATER. CONTRACTOR TO VISIT CLICKBEFOREYOUDIG.COM TO REQUEST LOCATES PRIOR TO COMPLETING ANY EXCAVATION. CONTRACTOR SHALL ADHERE TO ALL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS FOR WORKING AROUND LIVE GAS MAINS.
13. ALL POWER AND COMMUNICATION INFRASTRUCTURE TO BE INSTALLED AS PER NSPI AND COMMUNICATION PROVIDER (I.E. BELL) SPECIFICATIONS. CONTRACTOR TO CONFIRM AND COORDINATE WITH UTILITIES AS REQUIRED.
14. PERMISSION FROM LANDOWNER(S) REQUIRED TO WORK ON PRIVATE PROPERTY.
15. CONTRACTOR TO NOTIFY PROPERTY OWNERS WHO WILL EXPERIENCE DISRUPTION DURING THE WORK (PROPERTY ACCESS, MUNICIPAL SERVICE LOSS, POWER/COMMUNICATION LOSS, ETC.) AT LEAST 48 HOURS PRIOR TO THE DISRUPTION.
16. ALL ELEVATIONS ARE METRIC AND GEODETIC. TOPOGRAPHICAL SURVEY COMPLETED BY DESIGNPOINT FROM MAR. 21 - APR. 12, 2022. CONTRACTOR TO CONTACT DESIGNPOINT FOR CONSTRUCTION LAYOUT CONTROL INFORMATION 2 WEEKS PRIOR TO CONSTRUCTION.
17. ALL EARTHWORK (INCLUDING SUBGRADE), TRENCH WORK, PIPE BEDDING, AND SURFACE TREATMENT (INCLUDING GRAVELS, ASPHALT, AND CONCRETE) TO BE REVIEWED AND CERTIFIED BY PROJECT GEOTECHNICAL ENGINEER.
18. DRAWINGS SUBJECT TO CONSTRUCTION APPROVAL BY THE APPLICABLE APPROVAL AGENCIES (e.g. HALIFAX WATER, NOVA SCOTIA DEPARTMENT OF ENVIRONMENT, HALIFAX REGIONAL MUNICIPALITY) PRIOR TO CONSTRUCTION.
19. CONTRACTOR RESPONSIBLE FOR ALL TRAFFIC CONTROL MEASURES REQUIRED FOR THE PROJECT. ALL TEMPORARY TRAFFIC CONTROL MEASURES TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NOVA SCOTIA TRANSPORTATION AND INFRASTRUCTURE RENEWAL TEMPORARY WORKPLACE TRAFFIC CONTROL MANUAL AND THE LATEST EDITION OF THE TRANSPORTATION ASSOCIATION OF CANADA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA.
20. INSULATION TO BE 50mm THICK HI40 RIGID STYROFOAM (ROAD AND TRAFFIC RATED).
21. CONTRACTOR MAY REQUEST GRADE ADJUSTMENTS SUBJECT TO REVIEW AND APPROVAL BY ENGINEER AND APPLICABLE APPROVAL AGENCIES. CONTRACTOR RESPONSIBLE FOR COSTS ASSOCIATED WITH DRAWING REVISIONS AND APPROVALS.
22. ALL TEMPORARY ROAD CLOSURES WILL REQUIRE A ROAD CLOSURES PERMIT.
23. ALL TESTING OF SEWERS TO BE IN ACCORDANCE WITH HALIFAX WATER SPECIFICATIONS, INCLUDING MANHOLE VACUUM TEST. PRESSURE TEST TO BE COMPLETED FOR ENTIRE PIPE LENGTH. TEMPORARY END CAPS TO BE INSTALLED AS REQUIRED TO FACILITATE TESTING.
24. ALL TESTING OF WATER MAINS TO BE IN ACCORDANCE WITH HALIFAX WATER SPECIFICATIONS, INCLUDING PRESSURE TEST AND CHLORINATION FOR ALL SERVICE LATERALS 100 mm Ø AND LARGER. BASE LIFT OF GRAVEL TO BE PLACED OVER WATER MAINS AND SERVICES PRIOR TO TESTING (PUBLIC AND PRIVATE INFRASTRUCTURE).
25. ANY FIELD MANHOLE CONNECTIONS (IF REQUIRED) TO BE MADE USING CORE DRILL AND KOR-N-SEAL (SUBJECT TO APPROVAL BY UTILITY AND ENGINEER).
26. ALL GRAVITY PIPE TO BE INSTALLED IN AN UPSTREAM DIRECTION. CONTRACTOR TO BEGIN PIPE INSTALLATION AT THE MOST DOWNSTREAM LOCATION. INSTALLING TEMPORARILY ORPHANED PIPE SECTIONS IS NOT ACCEPTABLE (UNLESS APPROVED BY THE UTILITY AND THE ENGINEER).
27. CONTRACTOR TO PROVIDE 24 HOURS NOTICE TO HALIFAX WATER AND THE ENGINEER OF PIPE AND MANHOLE TESTING, INCLUDING CCTV INSPECTION AND DEFLECTION TESTING.

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SHEET DESCRIPTION

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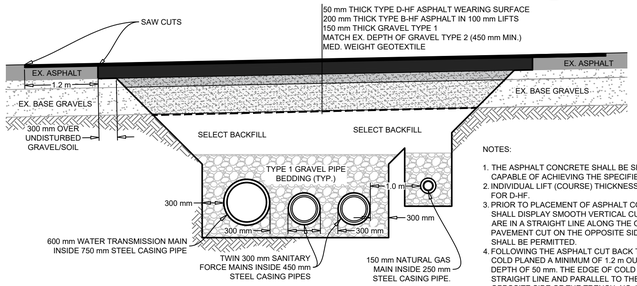
Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-D01
Scale	Filename		23 of 27
N.T.S.	22-106_D1.dwg		

HIGHWAY 118 REINSTATEMENT DETAILS

A 24

N.T.S.

STA. 0+600 TO 0+665



NOTES:

1. THE ASPHALT CONCRETE SHALL BE SPREAD BY A MECHANICAL SELF-POWERED PAVER CAPABLE OF ACHIEVING THE SPECIFIED GRADE, LINE, AND CROWN.
2. INDIVIDUAL LIFT (COURSE) THICKNESSES SHALL NOT EXCEED 100 mm FOR B-HF AND 50 mm FOR D-HF.
3. PRIOR TO PLACEMENT OF ASPHALT CONCRETE THE EDGES OF THE EXISTING ASPHALT SHALL DISPLAY SMOOTH VERTICAL CUTS (FULL DEPTH ASPHALT CUT IS REQUIRED) WHICH ARE IN A STRAIGHT LINE ALONG THE OUTSIDE OF THE TRENCH AND PARALLEL TO THE PAVEMENT CUT ON THE OPPOSITE SIDE OF THE TRENCH. NO JOGS OR IRREGULAR EDGES SHALL BE PERMITTED.
4. FOLLOWING THE ASPHALT CUT BACK THE EXISTING SURFACE LIFT OF ASPHALT SHALL BE COLD PLANED A MINIMUM OF 1.2 m OUTSIDE OF THE CUT BACK PERIMETER AND TO A DEPTH OF 50 mm. THE EDGE OF COLD PLANNING SHALL DISPLAY A VERTICAL FACE IN A STRAIGHT LINE AND PARALLEL TO THE CUT BACK EDGES AND COLD PLANED EDGE ON THE OPPOSITE SIDE OF THE TRENCH. NO JOGS OR IRREGULAR EDGES SHALL BE PERMITTED.
5. ASPHALT CUTS OR MILLED KEYWAYS ARE NOT TO END AT MANHOLES, VALVES, AND SHALL BE A MINIMUM OF 1 m FROM THESE STRUCTURES.
6. THE ASPHALT EDGES AND SURFACES SHALL BE CLEAN AND DRY PRIOR TO APPLYING A UNIFORM APPLICATION OF TACK COAT WHICH SHALL BE ALLOWED SUFFICIENT TIME TO CURE PRIOR TO THE PLACEMENT OF ASPHALT CONCRETE.
7. THE SURFACE OF THE ASPHALT PATCH SHALL CONFORM TO THE CROSS-SECTION OF THE HIGHWAY SURFACE TO LESS THAN OR EQUAL TO 5 mm WHEN CHECKED WITH A 3 m STRAIGHTEDGE PLACED IN ANY DIRECTION. THERE SHALL BE NO NOTICEABLE PAVEMENT MARKS, NON-UNIFORMITY, CHATTER, OR ANY OTHER DISTORTIONS OR DISTRESSES CAUSED BY ROLLING AND COMPACTION OF THE ASPHALT.
8. ASPHALT CONCRETE SHALL BE COMPACTED TO A MINIMUM OF 92.5% OF THE MAXIMUM THEORETICAL DENSITY.

NATURAL GAS PROJECT NOTES

1.) GENERAL NOTES LISTED HERE APPLY TO ALL DRAWINGS. NOTES ON INDIVIDUAL DRAWINGS ARE PROVIDED TO THE CONTRACTOR FOR SITE SPECIFIC WORK.

2.) DO NOT SCALE DRAWINGS, USE DIMENSIONS ONLY.

3.) DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CSA Z662, CURRENT EDITION AND HERITAGE GAS TECHNICAL SPECIFICATIONS & STANDARD DRAWINGS.

4.) PIPELINE MOP: 690kPa. PRESSURE TEST IN ACCORDANCE WITH IS-2-7040. PROJECT ENGINEER TO BE CONTACTED TO VERIFY TEST PARAMETERS, IF REQUIRED FOR CLARIFICATION, PRIOR TO COMMENCEMENT OF PRESSURE TESTING.

5.) CONTRACTOR TO CHECK ALL DIMENSIONS AND ELEVATIONS ON SITE AND SHALL REPORT ANY DISCREPANCIES OR OMISSIONS TO ENGINEER PRIOR TO CONSTRUCTION.

6.) CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND TO CONFIRM LOCATION OF UTILITIES AND INFRASTRUCTURE PRIOR TO COMMENCEMENT OF CONSTRUCTION.

7.) ALL LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE FOR REFERENCE ONLY. EXACT LOCATIONS OF NEW AND EXISTING UTILITIES AND INFRASTRUCTURE SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR IN CONJUNCTION WITH HERITAGE GAS.

8.) ADJUSTMENTS TO ALIGNMENT REQUIRE APPROVAL OF HERITAGE GAS ENGINEERING DEPARTMENT.

9.) THE CONTRACTOR SHALL RESTORE DISRUPTED AREAS RESULTING FROM CONSTRUCTION TO THE SAME OR BETTER PRECONSTRUCTION CONDITION AS SOON AS POSSIBLE INCLUDING GRAVELED SURFACES, ASPHALT, CONCRETE, SIDEWALKS, CURBS AND GUTTERS, DITCHES, CULVERTS AND LANDSCAPED SURFACES, UNMAINTAINED AND MAINTAINED AREAS ETC. ALL SURFACES SHALL BE REINSTATED AS SPECIFIED AND IN ACCORDANCE WITH 1S-2-1065 AND STANDARD DRAWINGS SD-5-1015, SD-5-1016, AND SD-5-1017.

10.) THE CONTRACTOR IS RESPONSIBLE FOR CLEARING AND REMOVING WASTE MATERIAL FROM THE SITE TO AN APPROVED LOCATION.

11.) ALL MATERIALS TO BE INSTALLED ACCORDING TO THE HGL PROJECT SPECIFICATIONS AND MANUFACTURER'S INSTRUCTIONS.

12.) ALL SURVEY MONUMENTS AND SURVEY PINS, IF DISTURBED, ARE TO BE RESTORED BY A LICENSED SURVEYOR AT THE COST OF THE CONTRACTOR.

13.) PROPERTY MAPPING IS APPROXIMATE ONLY AND IS OBTAINED FROM THE PROVINCE OF NOVA SCOTIA- DEPT OF MUNICIPAL AFFAIRS PROPERTY MAPPING.

14.) ALL DETECTOR LOOPS AND STREET LIGHT CONDUITS, IF DAMAGED, SHALL BE IMMEDIATLEY REPORTED TO HRM TRAFFIC AND RECONSTRUCTED TO AS DIRECTED BY THE HRM RESPRESENTITIVE ON SITE TO HRM STANDARDS.

15.) CONTRACTOR TO ADHERE TO THE NSTIR TEMPORARY WORKPLACE TRAFFIC CONTROL MANUAL AND AGREED UPON TRAFFIC CONDITIONS STATED ON HRM PERMITS.

16.) NO SIGNAGE IS TO BE REMOVED WITHOUT PRIOR WRITTEN APPROVAL FROM THE TRAFFIC AUTHORITY. ALL STREET SIGNS DISTURBED OR REMOVED DURING CONSTRUCTION IS TO BE REINSTATED IMMEDIATELY.

17.) ALL TRAFFIC MARKINGS SHALL BE INVENTORIED AND TO BE RESTORED TO ORIGINAL CONDITIONS AND LOCATION WITHIN ONE WEEK AFTER REINSTATEMENT OF SURFACE.

18.) PROPERTY CIVIC NUMBERS HAVE BEEN EXTRACTED FROM DATABASE PROVIDED BY NOVA SCOTIA DEPARTMENT OF MUNICIPAL AFFAIRS.

19.) HIGHWAY RIGHT-OF-WAY BOUNDARIES SUPPLIED BY PROVINCE OF NOVA SCOTIA, DEPT. OF MUNICIPAL AFFAIRS AND ARE A GRAPHICAL REPRESENTATION ONLY AND ARE NOT TO BE CONSTRUED AS LEGAL PROPERTY BOUNDARIES.

20.) HORIZONTAL CLEARANCES FROM STREET FURNITURE & OTHER UTILITY PLANT TO GAS PIPE.

HORIZONTAL CLEARANCE (m)	MEASUREMENT DESCRIPTION	STRUCTURE
1.5	FROM CENTERLINE TO CENTERLINE	SEWER
1.5	FROM CENTERLINE TO CENTERLINE	WATER VALVES
1.5	FROM CENTERLINE TO CENTERLINE	FIRE HYDRANT
1.5	FROM CENTERLINE TO CENTERLINE	TRAFFIC LIGHT STANDARD
1.5	FROM CENTERLINE TO CENTERLINE	GUY WIRES
1.5	FROM CENTERLINE TO CENTERLINE	CURB STOPS
1.5	FROM CENTERLINE TO CENTERLINE	SIGN POSTS
2.0	FROM CENTERLINE TO CENTERLINE	WATER PIPES LESS THAN 355mm OR 14"Dia.
2.0	FROM CENTERLINE TO CENTERLINE	WATER PIPES GREATER THAN 355mm OR 14"Dia.
2.0	FROM CENTERLINE TO CENTERLINE	MANHOLES
1.8	FROM CENTERLINE TO CENTERLINE	POWER/COMMUNICATION POLES
1.7	FROM CENTERLINE OF GAS PIPE TO FACE OF CURB (WHEN GAS IS IN STREET)	CATCH BASINS
1.3	FROM CENTERLINE OF GAS PIPE TO FACE OF CURB (WHEN GAS IS BEHIND CURB)	CATCH BASINS
1.5	FROM CENTERLINE OF GAS PIPE TO EDGE OF PLANT	ELECTRICAL CONCRETE ENCASED DUCT BANK OR AN ELECTRIC CONCRETE VAULT
0.3	FROM CENTERLINE OF GAS PIPE TO EDGE OF PLANT	COMMUNICATION CONCRETE ENCASED DUCT BANK OR A COMMUNICATION CONCRETE VAULT
2.0	FROM CENTERLINE OF GAS PIPE TO EDGE OF CONCRETE PAD	ELECTRICAL TRANSFORMER CONCRETE PAD

21.) PIPE STUBS INSTALLED FOR FUTURE CONNECTIONS SHALL BE 2.0m IN LENGTH (MIN.) TO ALLOW A SQUEEZE OFF AND TIE-IN CONNECTION. REFER TO IS-2-3085 AND SD-5-3000.

22.) WHEN WORKING WITHIN 30m OF EXISTING M&NP FACILITIES, CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH M&NP PERSONNEL TO ENSURE PROTECTION OF M&NP FACILITIES.

23.) TREES AND SHRUBS DISTURBED DURING CONSTRUCTION WILL BE MONITORED FOR ONE YEAR AND WILL REQUIRE REPLACEMENT AT THE CONTRACTORS EXPENSE IF DAMAGE RESULTING FROM CONSTRUCTION IS DISCOVERED.

24.) ALL SERVICE STUBS SHALL INCLUDE BURIED LOCATE BALL AND PENCIL ANODE AS SHOWN IN DWG SD-5-5001.

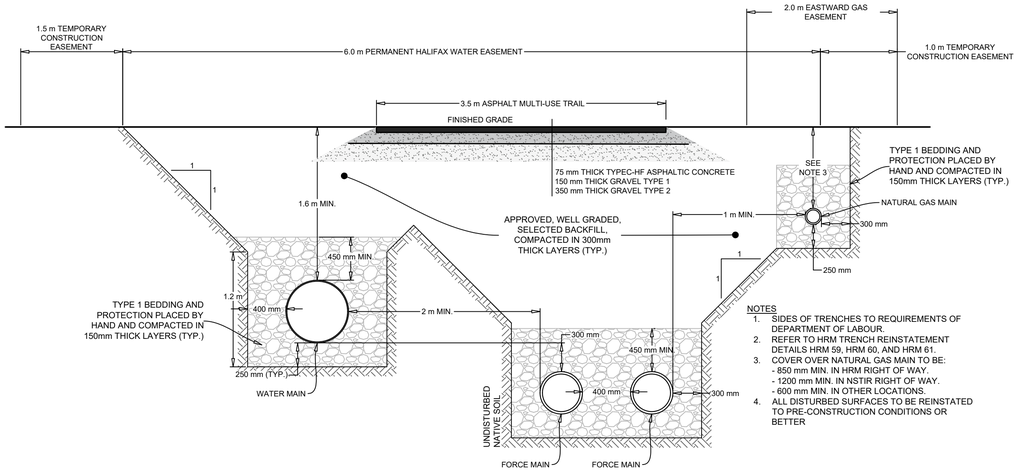
25.) THE CONTRACTOR IS RESPONSIBLE TO IDENTIFY ANY ENVIRONMENTAL SENSITIVITIES THAT HAVE NOT BEEN ADDRESSED ON THE DRAWINGS BY WAY OF NOTES AND OR AN ATTACHED ENVIRONMENTAL CONSTRUCTION PLAN (ECP). CONTRACTOR SHALL REFER TO THE LATEST VERSION OF THE HERITAGE GAS ENVIRONMENTAL PROTECTION PLAN (EPP) FOR ENVIRONMENTAL PROTECTION MEASURES REQUIRED DURING CONSTRUCTION.

TYPICAL TRENCH THROUGH SHUBIE PARK

B 24

N.T.S.

STA. 0+665 TO 0+990



NOTES

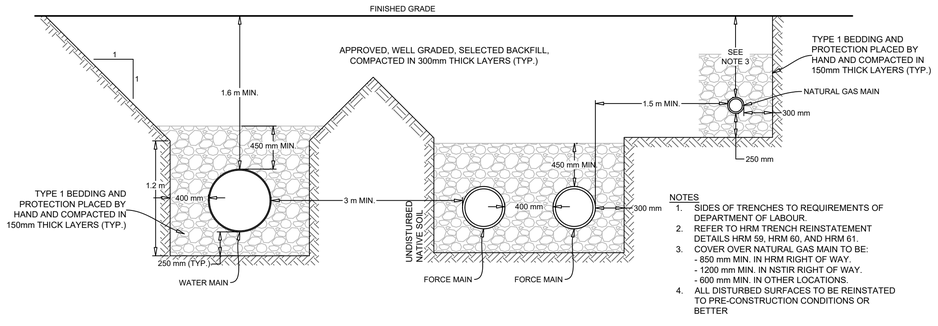
1. SIDES OF TRENCHES TO REQUIREMENTS OF DEPARTMENT OF LABOUR.
2. REFER TO HRM TRENCH REINSTATEMENT DETAILS HRM 59, HRM 60, AND HRM 61.
3. COVER OVER NATURAL GAS MAIN TO BE:
   - 850 mm MIN. IN HRM RIGHT OF WAY.
   - 1200 mm MIN. IN NSTIR RIGHT OF WAY.
   - 600 mm MIN. IN OTHER LOCATIONS.
4. ALL DISTURBED SURFACES TO BE REINSTATED TO PRE-CONSTRUCTION CONDITIONS OR BETTER

TYPICAL TRENCH THROUGH CAMPGROUND PARKING LOT

C 24

N.T.S.

STA. 0+990 TO 1+130



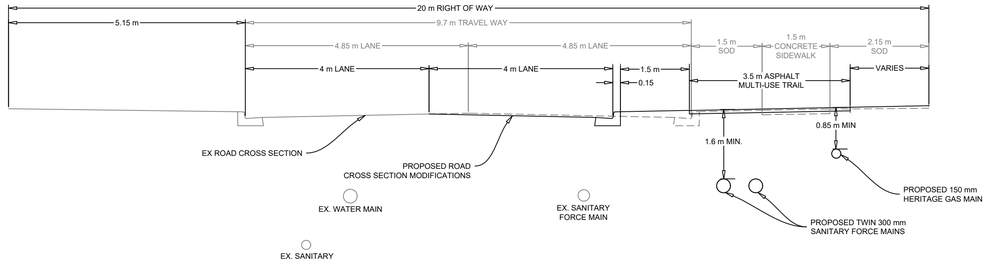
NOTES

1. SIDES OF TRENCHES TO REQUIREMENTS OF DEPARTMENT OF LABOUR.
2. REFER TO HRM TRENCH REINSTATEMENT DETAILS HRM 59, HRM 60, AND HRM 61.
3. COVER OVER NATURAL GAS MAIN TO BE:
   - 850 mm MIN. IN HRM RIGHT OF WAY.
   - 1200 mm MIN. IN NSTIR RIGHT OF WAY.
   - 600 mm MIN. IN OTHER LOCATIONS.
4. ALL DISTURBED SURFACES TO BE REINSTATED TO PRE-CONSTRUCTION CONDITIONS OR BETTER

WAVERLEY ROAD CROSS SECTION

D 24

N.T.S.



ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
1	DEC. 02, 2022	ISSUED FOR 60% REVIEW

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CLIENT

Clayton The Community Builder

PROJECT DESCRIPTION

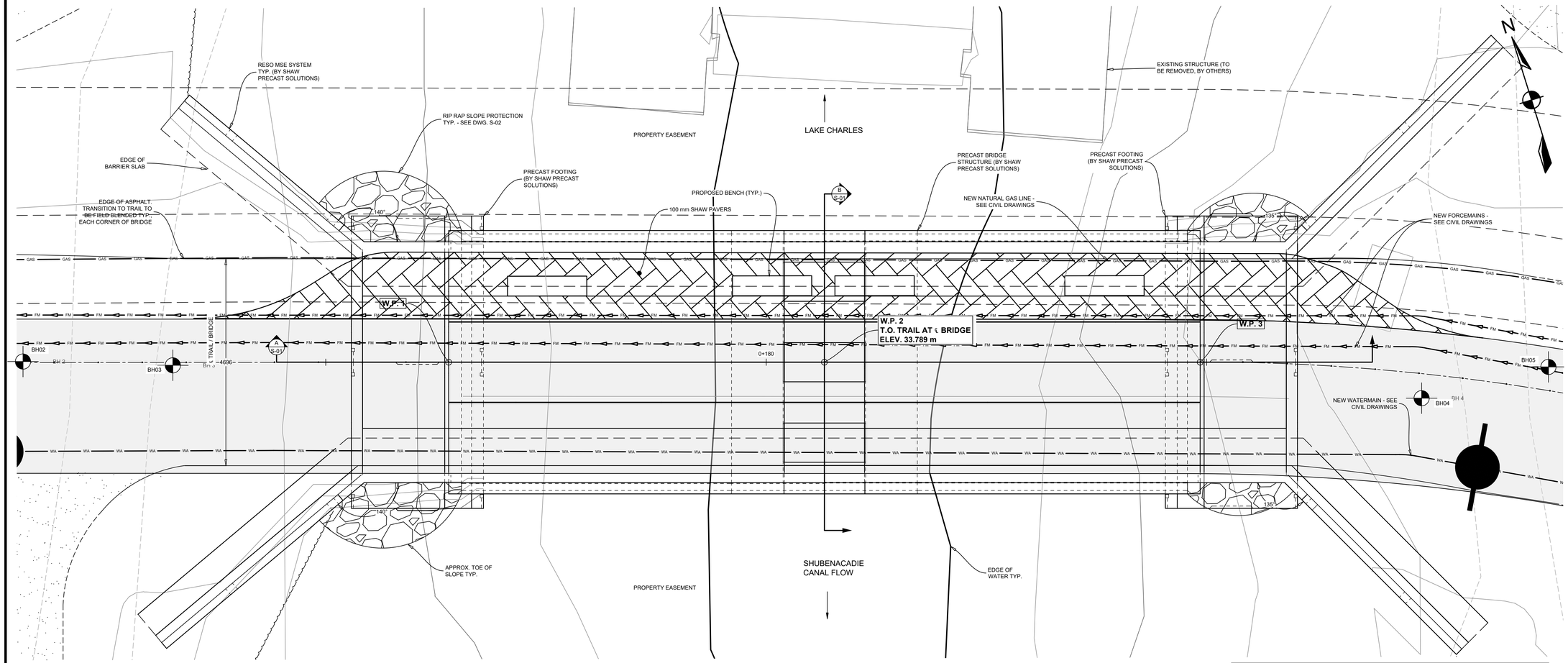
PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

DETAILS

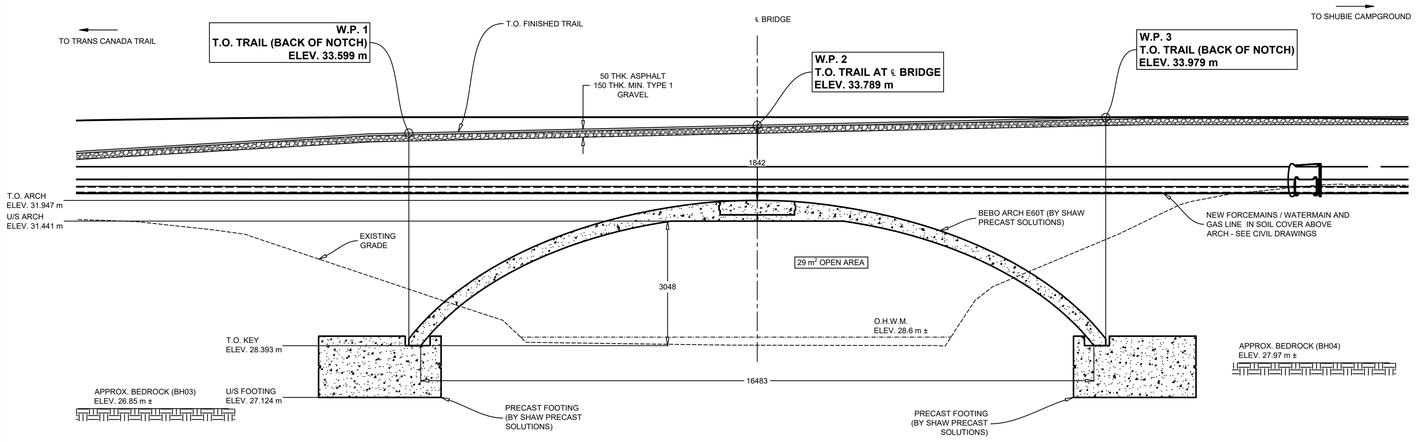
Drawn	Engineer	Project No.	Drawing No.
J. DWYER	L. KING	22-106	C-D02
Scale	Filename		24 of 27
N.T.S.	22-106_D1.dwg		



BRIDGE PLAN

SCALE: 1:50

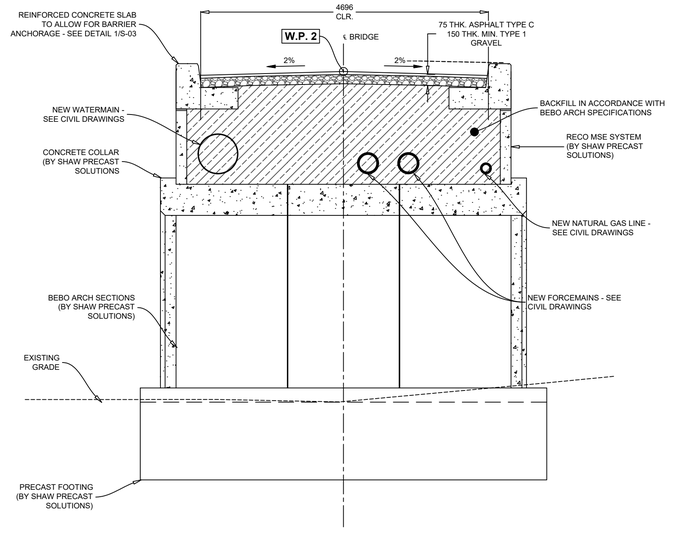
WORK POINT SCHEDULE			
W.P.	NORTHING	EASTING	STATION
W.P.1	49524448.901	5574929.156	0+172.790
W.P.2	4952446.336	5574937.293	0+181.322
W.P.3	4952443.771	5574945.430	0+189.854



SECTION - THROUGH CENTERLINE

SCALE: 1:75

A S-01



SECTION

SCALE: 1:50

B S-01

GENERAL NOTES:

1. THIS DRAWING IS INTENDED TO SHOW THE GENERAL ARRANGEMENT AND CONFIGURATION OF THE STRUCTURE, VERTICAL AND LATERAL CLEARANCES AND STRUCTURAL CONCEPT ONLY.
2. STRUCTURES SHALL BE AS SHOWN ON THIS DRAWING, MANUFACTURED BY SHAW PRECAST SOLUTIONS OR PRECAST CONCRETE EQUIVALENT. EQUIVALENCY AND ACCEPTANCE WILL BE AT THE ENGINEER'S SOLE DISCRETION.
3. THE CONTRACTOR IS RESPONSIBLE FOR DETAILED DESIGN AND SHALL PROVIDE THE ENGINEER WITH DESIGN/SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
4. DESIGN TO BE IN ACCORDANCE WITH CAN/CSA S6-19, CANADIAN HIGHWAY BRIDGE DESIGN CODE, LATEST EDITION. LIVE LOAD: CL-625 (TO ACCOMMODATE VEHICLES DURING CONSTRUCTION).
5. ALL WORKS AND SERVICE INSTALLATION TO BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE FOLLOWING:
   - MANUFACTURER'S STANDARDS AND SPECIFICATIONS;
   - NOVA SCOTIA PUBLIC WORKS STANDARD SPECIFICATION;
   - STANDARD SPECIFICATION FOR MUNICIPAL SERVICES PUBLISHED BY THE JOINT COMMITTEE ON CONTRACT DOCUMENTS (2021 EDITION);
   - THE REQUIREMENTS OF THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT AND LABOUR; AND
   - THE OCCUPATIONAL HEALTH AND SAFETY ACT.
6. THE SHOWN LAYOUT IS BASED ON TOPOGRAPHIC SURVEY COMPLETED BY DESIGNPOINT, BASED ON THE HORIZONTAL REFERENCE FRAME ATS77. ALL ELEVATIONS REFERENCED TO CGVD28.
7. BOREHOLE INFORMATION BASED ON GEOTECHNICAL REPORT PREPARED BY DESIGNPOINT, PROJECT NUMBER 22-106, DATED SEPTEMBER 12, 2022. DETAILED DESIGN OF FOUNDATIONS BY SHAW PRECAST SOLUTIONS.
8. HYDRAULIC/HYDROLOGIC ANALYSES BY OTHERS. OWNER TO VERIFY REQUIRED HYDRAULIC OPENING AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
9. REQUIRED EXCAVATION EXTENTS (AND ROCK TRENCHES) TO BE CONFIRMED BY RECO MSE WALL AND BEBO ARCH DESIGNER (SHAW PRECAST SOLUTIONS).
10. ALL DIMENSIONS IN MILLIMETRES (mm). ALL STATIONS AND ELEVATIONS IN METRES (m), UNLESS NOTED OTHERWISE.
11. CONTRACTOR SHALL PROVIDE EROSION AND SEDIMENT CONTROL PLAN TO THE OWNER FOR REVIEW PRIOR TO PROCEEDING WITH CONSTRUCTION.

CONCRETE NOTES:

1. CONCRETE MATERIALS AND METHODS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH CAN/CSA A23.1, AND METHODS OF TEST FOR CONCRETE SHALL COMPLY WITH CAN/CSA A23.1, LATEST REVISIONS.
2. ALL REINFORCED CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 45 MPa.
3. ALL ANCHOR BOLTS SHALL BE HOT DIPPED GALVANIZED.

REINFORCING NOTES:

1. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA G30.18, LATEST EDITION.
2. REINFORCING STEEL SHALL BE GRADE 400W, WELDABLE.
3. CLEAR COVER TO REINFORCING STEEL SHALL BE 70 mm UNLESS NOTED OTHERWISE.

ISSUED FOR REVIEW, NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION
2	APR. 26, 2023	ISSUED FOR 90% REVIEW
A	OCT. 13/22	ISSUED FOR REVIEW

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PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

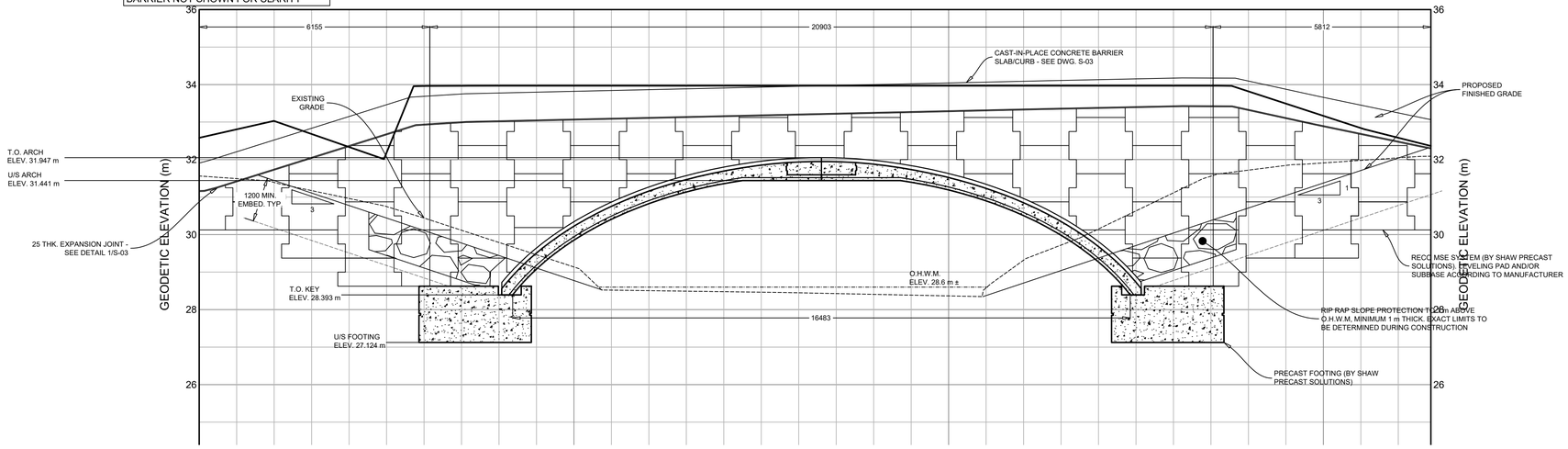
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

SHUBENACADIE CANAL BRIDGE GENERAL ARRANGEMENT

Drawn	Engineer	Project No.	Drawing No.
STAFF	B. MANTHA	22-106	S-01
Scale	Filename		25 of 27
AS NOTED	22-106_Bridge_BMM.dwg		

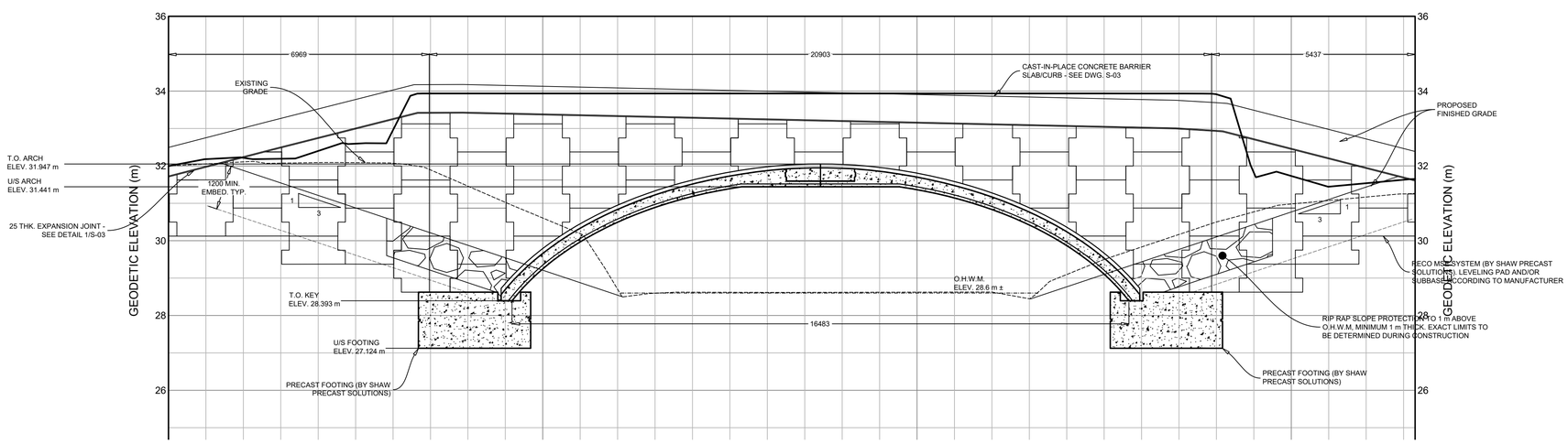
NOTE: BARRIER DETAILS NOT FINALIZED.
BARRIER NOT SHOWN FOR CLARITY



ELEVATION - DOWNSTREAM WALL

SCALE: 1:75

NOTE: BARRIER DETAILS NOT FINALIZED.
BARRIER NOT SHOWN FOR CLARITY



ELEVATION - UPSTREAM WALL

SCALE: 1:75

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2	APR. 26, 2023	ISSUED FOR 90% REVIEW
A	OCT. 13/22	ISSUED FOR REVIEW

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CLIENT

Clayton
The Community Builder

PROJECT DESCRIPTION

PORT WALLACE UTILITY CORRIDOR

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

SHUBENACADIE CANAL BRIDGE WALL ELEVATIONS

Drawn	Engineer	Project No.	Drawing No.
STAFF	B. MANTHA	22-106	S-02
Scale	Filename		26 of 27
AS NOTED	22-106_Bridge_BMM.dwg		