

Date: April 22, 2022

Portucana Holdings Limited

3175 Ashburn Avenue
Halifax, Nova Scotia, B3L 4B8
Attention: David Englehutt

RE: Servicing Review of the Lands Near the Research Drive, Dartmouth
DesignPoint Project #: 22-121

Introduction

The proposed development involves the construction of twelve (12) multi-unit residential buildings in the Mount Hope growth node with approximately 937 units. The development area of approximately 5.6 ha (13.73 acres) consists of the properties (PID 40305328) and portion of (PID 40003600). This land is bordered on the Southeast side by the Woodside Industrial Park. These lands currently contain office buildings and are serviced by the existing water and wastewater systems from the Woodside Industrial Park and the systems on the nearby Fenwick Street on the Northwest side of the site.



Wastewater Servicing

Through discussions with Portucana Holdings the downstream study area was identified and is shown on Figure SA01 and SA02 (attached). The attached table uses the following criteria to evaluate the projected sewage flows from the proposed development:

- Sewage generation rate 300 L/day/cap (based on Halifax Water Guidelines);
- Sewage generation rate for existing commercial and industrial land (based on Atlantic Canada Wastewater Guidelines section 2.3.4 and 2.3.5);
- Site populations; Single unit, Semi-detached, and townhouse dwellings 3.35 people/unit; and Multi-unit dwellings 2.25 people/unit;
- Infiltration and inflow allowance of 24 m³/day/ha (0.28 L/s/ha) (based on Halifax Water Guidelines);
- Total area for sewage calculation of 78.2 ha (193 acres);
- Peaking based on Harmon Peaking Factor; and
- Factor of safety 1.25 (based on Halifax Water Guidelines).

The site is anticipated to drain by gravity to the existing sanitary sewer on Neptune Crescent. The sanitary is then conveyed to Mount Hope Avenue, Estates Road, Atlantic Avenue, and Pleasant Street with pipe sizes ranging from 200 to 250 mm before connecting to a 750 mm concrete trunk sewer on Pleasant Street. The 750 mm sanitary trunk sewer is then conveyed to the 23 Melva Street Pumping Station.

Based on the calculations completed for this development using the assumed sewage generation rates, the existing system along the designated pipes in Figure SA01 (attached) currently has a capacity issue. Under existing conditions, the asbestos concrete pipe with a slope of 0.15% from manhole (MH) 10 to 9 is estimated to be at 152% capacity. When including the portion of Clayton Development's Mount Hope Development (Area C1) as shown in the attached Table 1, this asbestos concrete pipe is estimated to be at 170% capacity. Based on our calculations, with the addition of the proposed development to the analysis, several pipes (highlighted on Table 2 and Figure SA02) show the peak flows exceeding the full flow pipe capacity with the exceedances ranging from 111% to 315% of the capacity.

It is recommended that Portucana Holdings establish a plan with Halifax Water to install flow monitors at the connection points to the existing system. This data can be used to confirm the actual flows experienced by the existing system and if the system is capable of further upstream development. If it is found that the existing system does have capacity through this monitoring study, the development can then be built in phases with continued flow monitoring to confirm the wastewater loading from the apartment complexes. Through this process of development and flow monitoring, any cross connections or other I&I sources can be easily identified and corrected ensuring that the new system is tight. This monitoring could assist in better determining the timing for any required system upgrades.

Water Servicing

It is our understanding that as part of Clayton Development's Mount Hope Development that a capital project involving the installation of a 400 mm water main connecting the 600 mm Dartmouth Intermediate East pressure zone transmission main to the existing 350 mm water main in the Woodside Industrial Park is to be completed. This connection is shown on Figure W01 (attached). Through our initial investigation it was determined that adequate fire flows for the proposed development can be achieved with this new 400 mm connection.

The primary sources to the development will be the connection to existing water mains on Fenwick Street (250 mm) and Neptune Crescent (350 mm) with the sources for the model being the transmission main near Highway 111 (future connection to 600 mm) and the transmission main on Portland Street (600 mm).

It should be noted that an exhaustive review of the off-site infrastructure was not part of this work. Further discussions with Halifax Water may be required and additional review and modeling is expected for detailed design.

To understand the internal system requirements, a preliminary water model was developed using Bentley System's WaterCAD. Junctions were applied at various key locations throughout the proposed development. The hydraulic grade line (HGL) Dartmouth Intermediate East was assumed to be 105.2 m based on best available data.

Domestic Analysis

The following criteria were used to calculate the domestic flows to the project site. Unless stated otherwise these criteria were obtained from 2020 edition of the Halifax Water Design Guidelines:

- Average day water demand of 375 L/person/day for the proposed development;
- Site populations; Single unit, Semi-detached, and townhouse dwellings 3.35 people/unit; and Multi-unit dwellings 2.25 people/unit;
- Average water demand for proposed commercial land of 7.5 L/m²/day (based on Atlantic Canada Wastewater Guidelines section 2.3.4 and 2.3.5, assumes wastewater represents 80% of water demand).

Maximum Day demands and Peak Hour demands were determined based on ratios used in the Halifax Water Design Specifications 2020 Edition. The area demands applied to the model are shown in the following table:

Table 1. Water Servicing Demand Scenarios

Demand Scenario	Ratio from Average Day	Demand (L/unit/day)
Peak Hour	2.50	2110
Maximum Day	1.30	1097

The following table provides the domestic pressures to the development for the maximum peak hour scenario:

Table 2. Junction Elevation and Peak Hour Pressures

Label	Approximate Elevation (m)	Pressure (psi)
J-1	59.0	65
J-2	66.5	55
J-3	63.0	60
J-4	65.0	57
J-5	60.0	64

As shown in Table 2, pressure during the Peak Hour scenario are within the allowable range of 40-90 psi, as specified in the Halifax Water Design Specifications.

Fire Flow Analysis

In addition to the domestic demand analysis, a fire flow analysis was completed to check the capacity of the existing and proposed systems for the proposed development. The fire flow applies the fire demand to a junction, checks all the remaining junctions for residual pressure, and then repeats this process for each junction of interest until all the junctions have been analyzed. The fire flow requirements set forth by Halifax Water for new multi-unit / commercial buildings are as follows:

- Fire flow demand of 13,620 L/min (3,600 usgpm);
- Minimum residual and system pressure of 22 psi, and;
- Maximum pipe velocity of 2.4 m/s.

The results for the fire flow analysis to the proposed development for the various water supplies are shown in the table below:

Table 3. Fire Flow with Maximum Day Demand

Label	Available Fire Flow (L/min)	Residual/System Pressure (psi)	Maximum Pipe Velocity (m/s)
J-1	13,620	51	1.93
J-2	13,620	39	2.14
J-3	13,620	43	2.00
J-4	13,620	41	2.05
J-5	13,620	46	2.39

As shown by the results in the table, all junctions have the required fire flow of 13,620 L/min while maintaining the minimum residual/system pressure. In order to achieve these flows, water main within the development will need to be 300 mm in diameter, as shown in the attached Figure W01. During detailed design further investigation such as hydrant flow tests are recommended to confirm the results of the model.

Closing

The proposed development can be adequately serviced with domestic and fire flows once the Mount Hope Development transmission main is completed. The existing sanitary sewer system does not have adequate capacity to support the development without upgrades to the downstream sewer system based on the assumed flows from the analysis. Flow monitoring is recommended to observe the actual flow in the existing system in order to determine more accurately the existing flow that the sewer system experiences and the required upgrades for the proposed development. A continued monitoring program could be put in place to monitor flows as the property is developed to better determine the timing and scope of downstream required upgrades to the existing sewer infrastructure. We trust this information is satisfactory. Please feel free to contact us should you have any questions.

Thank you,

DesignPoint Engineering & Surveying Ltd.



Neil Fougere, P.Eng.

Senior Engineer, Principal

Enclosures (5): Wastewater System Review Tables (2); Figure SA01 - Existing Conditions Wastewater System Review; Figure SA02 - Proposed Conditions Wastewater System Review, Figure W01 - Water System Review

Table 1: Existing Wastewater System Review

Research Drive

Project Number: 22-121

Date: April 22, 2022



Downstream Sewer from Research Dr

		TRIBUTARY AREAS	Total Area	Tot. Pop. "P"	Domestic Load	Average Dry Weather	Average Dry Weather	Harmon Peaking	Peak Commercial Load	Peak Commercial Load	Peak Dry Weather	Peak Dry Weather	Safety Factor	Peak Dry Weather incl SF	I/I Allowance	I/I Loading	Peak Wet Weather	Pipe Size	Approx. Upstream Elevation	Approx. Downstream Elevation	Length	Pipe Slope	Pipe Manning's	Pipe Capacity	Percent Full
U/S MH	D/S MH		(Ha)	People	(L/day)	(L/day)	(L/s)	Factor	(L/day)	(L/s)	(L/day)	(L/s)		(L/s)	(L/s/Ha)	(L/s)	(L/s)	(mm)	m	m	m	(%)	"n"	(L/s)	(%)
28	27	A1, B1	12.3	0	300	0	0.00	4.50	141307	1.64	141307	1.6	1.25	2.0	0.28	3.5	5.5	200	48.610	41.008	104.3	7.29%	0.01	115.2	5
27	26	A1, B1	12.3	0	300	0	0.00	4.50	141307	1.64	141307	1.6	1.25	2.0	0.28	3.5	5.5	200	41.008	40.471	51.892	1.03%	0.01	43.4	13
26	25	A1, A2, B1	13.5	0	300	0	0.00	4.50	146932	1.70	146932	1.7	1.25	2.1	0.28	3.8	5.9	250	40.471	39.944	48.78	1.08%	0.01	80.4	7
25	24	A1, A2, B1, B2	17.9	0	300	0	0.00	4.50	204593	2.37	204593	2.4	1.25	3.0	0.28	5.0	8.0	250	39.249	38.935	61.001	0.51%	0.01	55.5	14
24	23	A1, A2, A3, B1, B2	20.0	0	300	0	0.00	4.50	204593	2.37	204593	2.4	1.25	3.0	0.28	5.6	8.6	250	38.883	38.173	120.03	0.59%	0.01	59.5	14
23	22	A1, A2, A3, B1, B2	20.0	0	300	0	0.00	4.50	204593	2.37	204593	2.4	1.25	3.0	0.28	5.6	8.6	250	38.143	37.509	97.779	0.65%	0.01	62.3	14
22	21	A1, A2, A3, A4, B1, B2, B3, C1	41.0	237	300	71100	0.82	4.12	579386	6.71	872335	10.1	1.25	12.6	0.28	11.5	24.1	250	37.393	36.814	76.325	0.76%	0.01	67.4	36
21	20	A1, A2, A3, A4, B1, B2, B3, C1	41.0	237	300	71100	0.82	4.12	579386	6.71	872335	10.1	1.25	12.6	0.28	11.5	24.1	250	36.740	36.104	75.331	0.84%	0.01	71.1	34
20	19	A1, A2, A3, A4, B1, B2, B3, C1	41.0	237	300	71100	0.82	4.12	579386	6.71	872335	10.1	1.25	12.6	0.28	11.5	24.1	250	36.119	35.509	89.9	0.68%	0.013	49.0	49
19	18	A1, A2, A3, A4, B1, B2, B3, B4, C1	48.0	237	300	71100	0.82	4.12	695672	8.05	988621	11.4	1.25	14.3	0.28	13.5	27.8	250	35.260	34.480	92.383	0.84%	0.013	54.7	51
18	17	A1, A2, A3, A4, B1, B2, B3, B4, C1	48.0	237	300	71100	0.82	4.12	695672	8.05	988621	11.4	1.25	14.3	0.28	13.5	27.8	250	34.717	33.885	97.368	0.85%	0.013	55.0	50
17	16	A1, A2, A3, A4, B1, B2, B3, B4, C1	48.0	237	300	71100	0.82	4.12	695672	8.05	988621	11.4	1.25	14.3	0.28	13.5	27.8	250	33.885	33.290	45.786	1.30%	0.013	67.9	41
16	15	A1, A2, A3, A4, B1, B2, B3, B4, C1	48.0	237	300	71100	0.82	4.12	695672	8.05	988621	11.4	1.25	14.3	0.28	13.5	27.8	250	33.300	32.680	76.343	0.81%	0.013	53.6	52
15	14	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1	59.2	237	300	71100	0.82	4.12	853049	9.87	1145999	13.3	1.25	16.6	0.28	16.6	33.2	250	32.640	29.790	73.511	3.88%	0.013	117.2	28
14	13	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1	59.2	237	300	71100	0.82	4.12	853049	9.87	1145999	13.3	1.25	16.6	0.28	16.6	33.2	250	28.800	25.420	77.293	4.37%	0.013	124.5	27
13	12	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1	59.2	237	300	71100	0.82	4.12	853049	9.87	1145999	13.3	1.25	16.6	0.28	16.6	33.2	250	25.420	21.543	65.307	5.94%	0.013	145.0	23
12	11	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1	59.2	237	300	71100	0.82	4.12	853049	9.87	1145999	13.3	1.25	16.6	0.28	16.6	33.2	250	20.583	18.654	88.878	2.17%	0.013	87.7	38
11	10	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1	68.5	237	300	71100	0.82	4.12	1087748	12.59	1380697	16.0	1.25	20.0	0.28	19.2	39.2	250	18.580	18.066	89.319	0.58%	0.013	45.2	87
10	9	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1	68.5	237	300	71100	0.82	4.12	1087748	12.59	1380697	16.0	1.25	20.0	0.28	19.2	39.2	250	18.066	17.968	65.596	0.15%	0.013	23.0	170
9	8	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1	68.5	237	300	71100	0.82	4.12	1087748	12.59	1380697	16.0	1.25	20.0	0.28	19.2	39.2	250	17.968	17.587	88.706	0.43%	0.013	39.0	100
8	7	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1	68.5	237	300	71100	0.82	4.12	1087748	12.59	1380697	16.0	1.25	20.0	0.28	19.2	39.2	250	17.586	17.100	45.675	1.06%	0.013	61.4	64
7	6	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1	75.4	291	300	87300	1.01	4.08	1179686	13.65	1536226	17.8	1.25	22.2	0.28	21.1	43.3	250	17.040	16.550	16.789	2.92%	0.013	101.7	43
6	5	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1	75.4	291	300	87300	1.01	4.08	1179686	13.65	1536226	17.8	1.25	22.2	0.28	21.1	43.3	250	16.320	14.440	70.04	2.68%	0.013	97.5	44
5	4	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1	75.4	291	300	87300	1.01	4.08	1179686	13.65	1536226	17.8	1.25	22.2	0.28	21.1	43.3	250	14.370	13.650	75.764	0.95%	0.013	58.0	75
4	3	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1	75.4	291	300	87300	1.01	4.08	1179686	13.65	1536226	17.8	1.25	22.2	0.28	21.1	43.3	250	13.530	12.270	146.08	0.86%	0.013	55.3	78
3	2	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, B8, C1	77.4	291	300	87300	1.01	4.08	1185417	13.72	1541957	17.8	1.25	22.3	0.28	21.7	44.0	250	12.140	11.250	95.503	0.93%	0.013	57.5	77
2	1	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, B8, C1	77.4	291	300	87300	1.01	4.08	1185417	13.72	1541957	17.8	1.25	22.3	0.28	21.7	44.0	250	11.200	10.843	8.0623	4.43%	0.013	125.3	35

Table 2: Existing Wastewater System Review

Research Drive

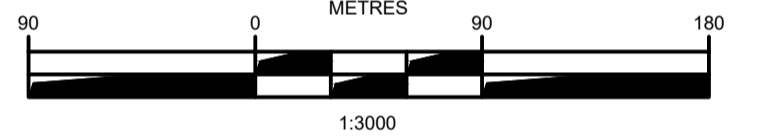
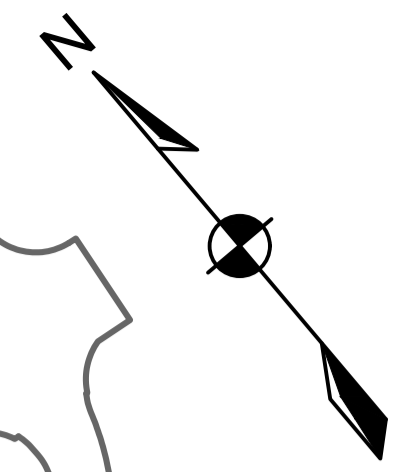
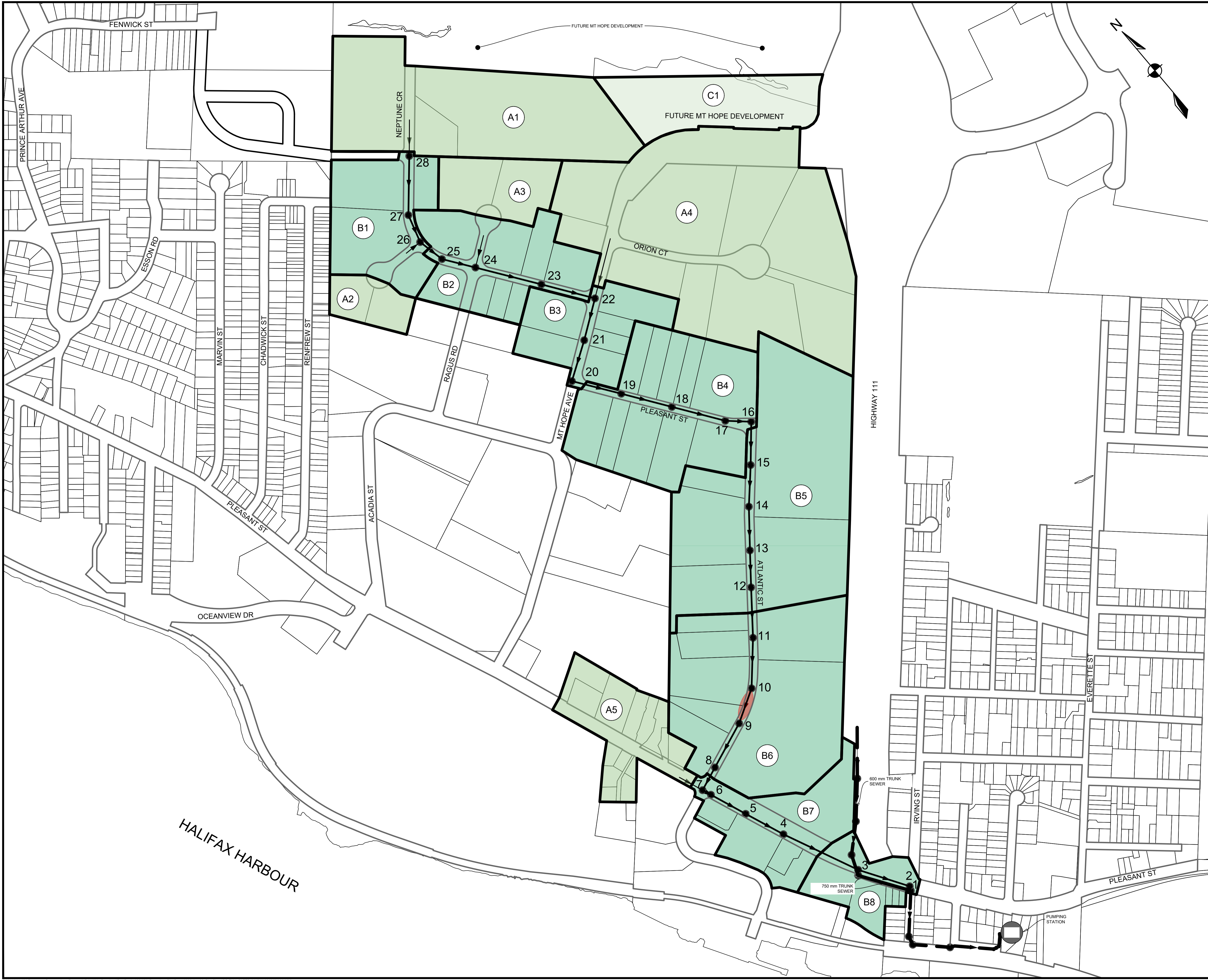
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Downstream Sewer from Research Dr

		TRIBUTARY AREAS	Total Area	Tot. Pop. "P"	Domestic Load	Average Dry Weather	Average Dry Weather	Harmon Peaking	Peak Commercial Load	Peak Commercial Load	Peak Dry Weather	Peak Dry Weather	Safety Factor	Peak Dry Weather incl SF	I/I Allowance	I/I Loading	Peak Wet Weather	Pipe Size	Approx. Upstream Elevation	Approx. Downstream Elevation	Length	Pipe Slope	Pipe Manning's	Pipe Capacity	Percent Full
U/S MH	D/S MH		(Ha)	People	(L/day)	(L/day)	(L/s)	Factor	(L/day)	(L/s)	(L/day)	(L/s)		(L/s)	(L/s/Ha)	(L/s)	(L/s)	(mm)	m	m	m	(%)	"n"	(L/s)	(%)
28	27	A1, B1, R1	18.1	2109	300	632700	7.32	3.57	141307	1.64	2398624	27.8	1.25	34.7	0.28	5.1	39.8	200	48.610	41.008	104.3	7.29%	0.01	115.2	35
27	26	A1, B1, R1	18.1	2109	300	632700	7.32	3.57	141307	1.64	2398624	27.8	1.25	34.7	0.28	5.1	39.8	200	41.008	40.471	51.892	1.03%	0.01	43.4	92
26	25	A1, A2, B1, R1	19.2	2109	300	632700	7.32	3.57	146932	1.70	2404249	27.8	1.25	34.8	0.28	5.4	40.2	250	40.471	39.944	48.78	1.08%	0.01	80.4	50
25	24	A1, A2, B1, B2, R1	23.6	2109	300	632700	7.32	3.57	204593	2.37	2461910	28.5	1.25	35.6	0.28	6.6	42.2	250	39.249	38.935	61.001	0.51%	0.01	55.5	76
24	23	A1, A2, A3, B1, B2, R1	25.7	2109	300	632700	7.32	3.57	204593	2.37	2461910	28.5	1.25	35.6	0.28	7.2	42.8	250	38.883	38.173	120.03	0.59%	0.01	59.5	72
23	22	A1, A2, A3, B1, B2, R1	25.7	2109	300	632700	7.32	3.57	204593	2.37	2461910	28.5	1.25	35.6	0.28	7.2	42.8	250	38.143	37.509	97.779	0.65%	0.01	62.3	69
22	21	A1, A2, A3, A4, B1, B2, B3, C1, R1	46.7	2346	300	703800	8.15	3.53	579386	6.71	3064421	35.5	1.25	44.3	0.28	13.1	57.4	250	37.393	36.814	76.325	0.76%	0.01	67.4	85
21	20	A1, A2, A3, A4, B1, B2, B3, C1, R1	46.7	2346	300	703800	8.15	3.53	579386	6.71	3064421	35.5	1.25	44.3	0.28	13.1	57.4	250	36.740	36.104	75.331	0.84%	0.01	71.1	81
20	19	A1, A2, A3, A4, B1, B2, B3, C1, R1	46.7	2346	300	703800	8.15	3.53	579386	6.71	3064421	35.5	1.25	44.3	0.28	13.1	57.4	250	36.119	35.509	89.9	0.68%	0.013	49.0	117
19	18	A1, A2, A3, A4, B1, B2, B3, B4, C1, R1	53.8	2346	300	703800	8.15	3.53	695672	8.05	3180707	36.8	1.25	46.0	0.28	15.1	61.1	250	35.260	34.480	92.383	0.84%	0.013	54.7	112
18	17	A1, A2, A3, A4, B1, B2, B3, B4, C1, R1	53.8	2346	300	703800	8.15	3.53	695672	8.05	3180707	36.8	1.25	46.0	0.28	15.1	61.1	250	34.717	33.885	97.368	0.85%	0.013	55.0	111
17	16	A1, A2, A3, A4, B1, B2, B3, B4, C1, R1	53.8	2346	300	703800	8.15	3.53	695672	8.05	3180707	36.8	1.25	46.0	0.28	15.1	61.1	250	33.885	33.290	45.786	1.30%	0.013	67.9	90
16	15	A1, A2, A3, A4, B1, B2, B3, B4, C1, R1	53.8	2346	300	703800	8.15	3.53	695672	8.05	3180707	36.8	1.25	46.0	0.28	15.1	61.1	250	33.300	32.680	76.343	0.81%	0.013	53.6	114
15	14	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, R1	65.0	2346	300	703800	8.15	3.53	853049	9.87	3338085	38.6	1.25	48.3	0.28	18.2	66.5	250	32.640	29.790	73.511	3.88%	0.013	117.2	57
14	13	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, R1	65.0	2346	300	703800	8.15	3.53	853049	9.87	3338085	38.6	1.25	48.3	0.28	18.2	66.5	250	28.800	25.420	77.293	4.37%	0.013	124.5	53
13	12	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, R1	65.0	2346	300	703800	8.15	3.53	853049	9.87	3338085	38.6	1.25	48.3	0.28	18.2	66.5	250	25.420	21.543	65.307	5.94%	0.013	145.0	46
12	11	A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, R1	65.0	2346	300	703800	8.15	3.53	853049	9.87	3338085	38.6	1.25	48.3	0.28	18.2	66.5	250	20.583	18.654	88.878	2.17%	0.013	87.7	76
11	10	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1, R1	74.3	2346	300	703800	8.15	3.53	1087748	12.59	3572783	41.4	1.25	51.7	0.28	20.8	72.5	250	18.580	18.066	89.319	0.58%	0.013	45.2	161
10	9	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1, R1	74.3	2346	300	703800	8.15	3.53	1087748	12.59	3572783	41.4	1.25	51.7	0.28	20.8	72.5	250	18.066	17.968	65.596	0.15%	0.013	23.0	315
9	8	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1, R1	74.3	2346	300	703800	8.15	3.53	1087748	12.59	3572783	41.4	1.25	51.7	0.28	20.8	72.5	250	17.968	17.587	88.706	0.43%	0.013	39.0	186
8	7	A1, A2, A3, A4, B1, B2, B3, B4, B5, B6, C1, R1	74.3	2346	300	703800	8.15	3.53	1087748	12.59	3572783	41.4	1.25	51.7	0.28	20.8	72.5	250	17.586	17.100	45.675	1.06%	0.013	61.4	118
7	6	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1, R1	81.1	2400	300	720000	8.33	3.52	1179686	13.65	3716166	43.0	1.25	53.8	0.28	22.7	76.5	250	17.040	16.550	16.789	2.92%	0.013	101.7	75
6	5	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1, R1	81.1	2400	300	720000	8.33	3.52	1179686	13.65	3716166	43.0	1.25	53.8	0.28	22.7	76.5	250	16.320	14.440	70.04	2.68%	0.013	97.5	78
5	4	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1, R1	81.1	2400	300	720000	8.33	3.52	1179686	13.65	3716166	43.0	1.25	53.8	0.28	22.7	76.5	250	14.370	13.650	75.764	0.95%	0.013	58.0	132
4	3	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1, R1	81.1	2400	300	720000	8.33	3.52	1179686	13.65	3716166	43.0	1.25	53.8	0.28	22.7	76.5	250	13.530	12.270	146.08	0.86%	0.013	55.3	138
3	2	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, B8, C1, R1	83.2	2400	300	720000	8.33	3.52	1185417	13.72	3721898	43.1	1.25	53.8	0.28	23.3	77.1	250	12.140	11.250	95.503	0.93%	0.013	57.5	134
2	1	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, B8, C1, R1	83.2	2400	300	720000	8.33	3.52	1185417	13.72	3721898	43.1	1.25	53.8	0.28	23.3	77.1	250	11.200	10.843	8.0623	4.43%	0.013	125.3	62



ISSUE	DATE	DESCRIPTION	CONSULTANT
2	APR. 22, 2022	ISSUED FOR REVIEW	
1	APR. 14, 2022	ISSUED FOR CLIENT REVIEW	

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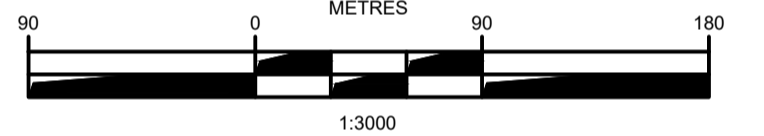
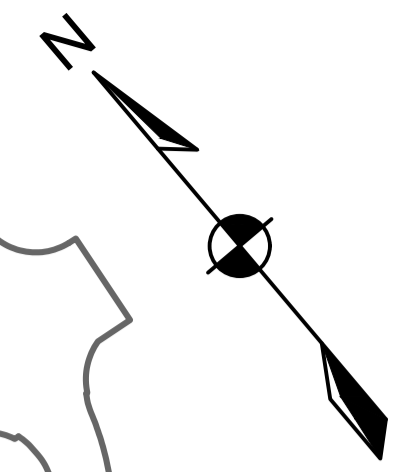
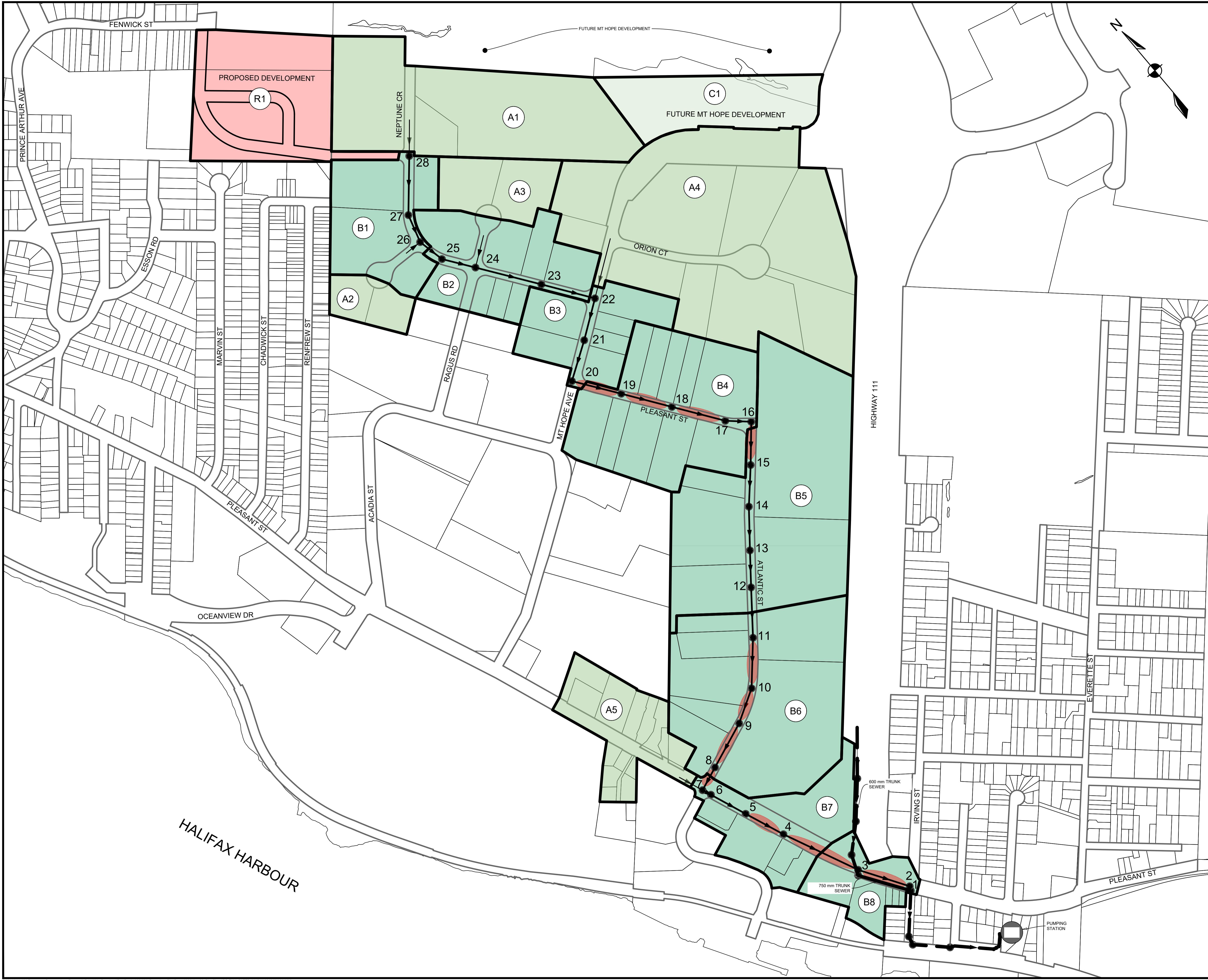
PROJECT DESCRIPTION

RESEARCH DRIVE

DARTMOUTH, NOVA SCOTIA
 SHEET DESCRIPTION

EXISTING CONDITIONS WASTEWATER
 SYSTEM REVIEW

Drawn M. WHITEHOUSE	Engineer N. FOUGERE	Project No. 22-121	Drawing No. SA01
Scale 1:3000	Filename 22-121_Base.dwg		01 of 03



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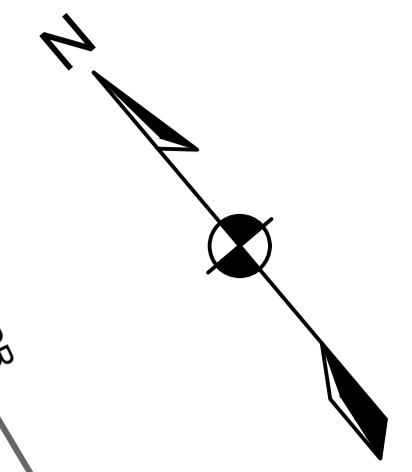
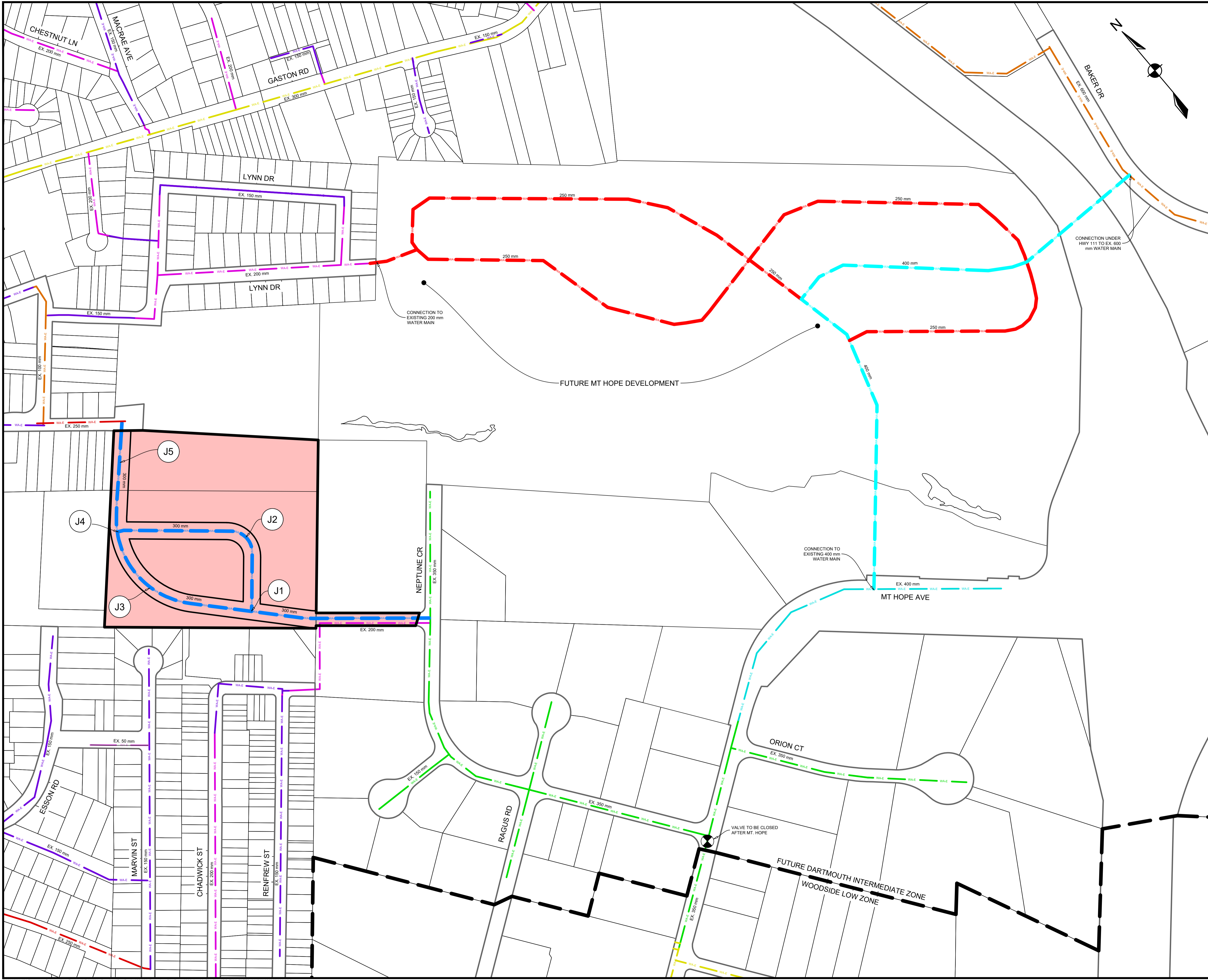
PROJECT DESCRIPTION

RESEARCH DRIVE

DARTMOUTH, NOVA SCOTIA
 SHEET DESCRIPTION

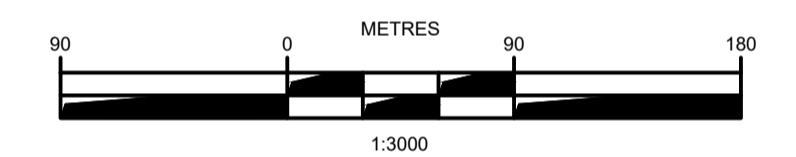
PROPOSED CONDITIONS
 WASTEWATER SYSTEM REVIEW

Drawn M. WHITEHOUSE	Engineer N. FOUGERE	Project No. 22-121	Drawing No. SA02
Scale 1:3000	Filename 22-121_Base.dwg		02 of 03



LEGEND

PROPERTY BOUNDARY	---
PRESS. ZONE BOUNDARY	---
PROPOSED 250 mm PIPE	---
PROPOSED 300 mm PIPE	---
PROPOSED 400 mm PIPE	---
EXISTING 50 mm PIPE	---
EXISTING 100 mm PIPE	---
EXISTING 150 mm PIPE	---
EXISTING 200 mm PIPE	---
EXISTING 250 mm PIPE	---
EXISTING 300 mm PIPE	---
EXISTING 350 mm PIPE	---
EXISTING 400 mm PIPE	---
EXISTING 600 mm PIPE	---



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PROJECT DESCRIPTION

RESEARCH DRIVE
DARTMOUTH, NOVA SCOTIA
SHEET DESCRIPTION

WATER SYSTEM REVIEW

Drawn M. WHITEHOUSE	Engineer N. FOUGERE	Project No. 22-121	Drawing No. W01
Scale 1:3000	Filename 22-121_Base.dwg		03 of 03