NOVATECH

Engineers, Planners & Landscape Architects

Engineering

- Land / Site Development
- Municipal Infrastructure
- Environmental / Water Resources
- Traffic / Transportation
- Structural
- Recreational

Planning

- Land / Site Development
- Planning Application Management
- Municipal Planning Documents & Studies
- Expert Witness (OMB)
- Wireless Industry

Landscape Architecture

- Urban Design & Streetscapes
- Open Space, Parks & Recreation Planning
- Community & Residential Developments
- Commercial & Institutional Sites
- Environmental Restoration

35 Years

Boundary Road Distribution Centre

Stormwater Management Report

STORMWATER MANAGEMENT REPORT

BOUNDARY ROAD DISTRIBUTION CENTRE
OTTAWA, ONTARIO

Prepared For:

Boundary Road Development Inc.

16766 Transcanadienne, Suite 500
Kirkland, Québec
H9H 4M7

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

April 12, 2018

Novatech File: 117217
Report Number: R-2018-034

NOVATECH
Engineers, Planners & Landscape Architects

April 12, 2018

City of Ottawa
Planning and Growth Management Department
Infrastructure Approvals Division
110 Laurier Avenue West, 4th Floor
Ottawa, ON
K1P 1J1

Attention: Mr. Kevin Hall

Dear Sir:

Re: **Proposed Boundary Road Distribution Centre**
5371 Boundary Road, Ottawa ON
Stormwater Management Report
Novatech File No.: 117217

Please find enclosed the Stormwater Management Report for the proposed Boundary Road Distribution Centre at 5371 Boundary Road. This report is submitted in support of an application for Site Plan Approval.

If you require any additional information, please contact the undersigned.

Yours truly,

NOVATECH

Kallie Auld.

Kallie Auld, P.Eng.
Project Coordinator | Water Resources

cc: Matthew LeBlanc (South Nation Conservation)
Stephen Kapusta (Ministry of Transportation Ontario)

M:\2017\117217\DATA\REPORTS\SWM\20180402-BOUNDARYRDSWM.DOCX

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

List of Drawings

Enclosed CD

PCSWMM Modelling Files
Stormwater Management Report including drawings listed above (PDF)

1.0 INTRODUCTION

Novatech has been retained by Boundary Road Development Inc. to complete the stormwater management design for a new distribution centre near the eastern boundary of the City of Ottawa, located at 5371 Boundary Road. The proposed development consists of a single large distribution warehouse, distribution trucking lot, staff parking facility, and a stormwater management facility. Refer to the enclosed site plan for details. **Figure 1** – Key Plan shows the general site area.

This report addresses the stormwater management approach for the proposed development and is submitted in support of an application for Site Plan Approval. This report should be read in conjunction with the engineering drawings (enclosed).

1.1 Background

The subject property (38.9 ha) is located on the east side of Boundary Road and is bounded by Highway 417 to the north, and predominantly undeveloped land to the east and south. The site is approximately 1.6 km south of Carlsbad Springs.

1.2 Land Use

Under existing conditions, site consists of a mix of heavily forested / tree covered lands, agricultural lands, and vacant property. There is currently a Rogers Communications cell tower located on the site. Existing Conditions are shown on **Figure 2** – Existing Conditions.

1.3 Topography & Drainage Outlets

The site is relatively flat, with an average slope of 0.25% from west to east. Under existing conditions, stormwater runoff flows overland across the subject property into a man-made drainage ditch system. The drainage ditches direct runoff into a culvert crossing under the Highway 417, at the eastern end of the site.

The entire site is within the drainage area of the Regimbald Municipal Drain. The upper end of the municipal drain terminates just upstream of the culvert crossing under Highway 417. The Regimbald Municipal Drain Assessment map can be found in **Appendix A**.

Existing contours and drainage patterns are shown on the Pre-Development Drainage Areas Plan (**Figure 3**).

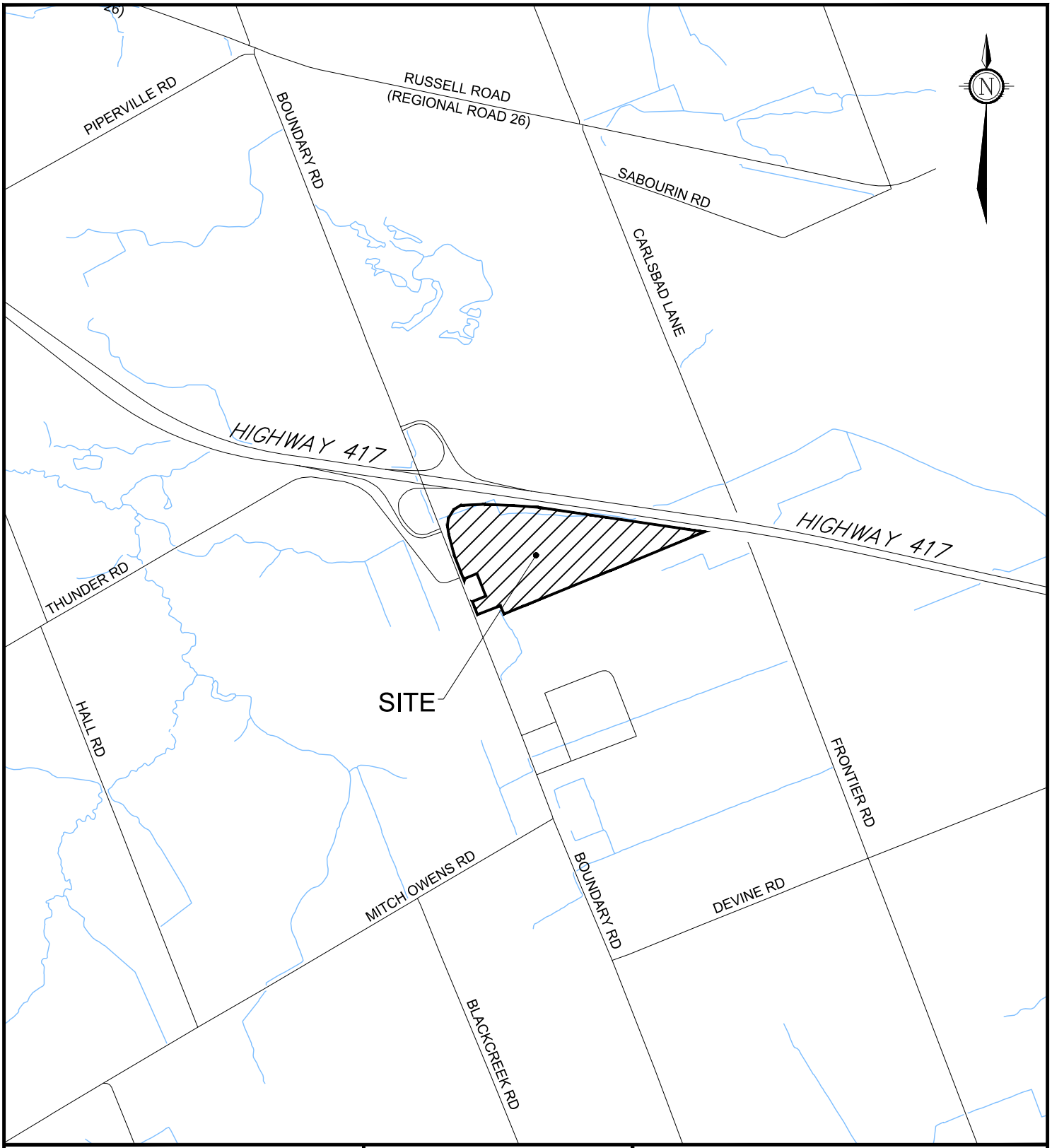
1.4 Subsurface Conditions

Paterson Group conducted a Preliminary Geotechnical Investigation of the site on July 15, 2014. The investigation consisted of and overall field survey and six (6) test pits dug to a maximum depth of 5.2m below the existing ground surface. In general, the soil consists of imported fill material and topsoil, underlain by silty sand and stiff to soft silty clay. The overall site is underlain by a firm to soft sensitive grey silty clay deposit. Based on the available geological mapping, the overburden thickness is between 25m to 35m.

During the geotechnical investigation, the groundwater levels were noted in each of the test pits. Based on observations during the investigation, groundwater levels range from 0.5m to 2.0m below the ground surface.

Fur further information, please refer to the following report:

- *Geotechnical Investigation - Proposed Warehouse Complex - Boundary Road, Ottawa, Ontario (Patterson Group, February 9, 2018, Report Number PG4366-1)*



NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

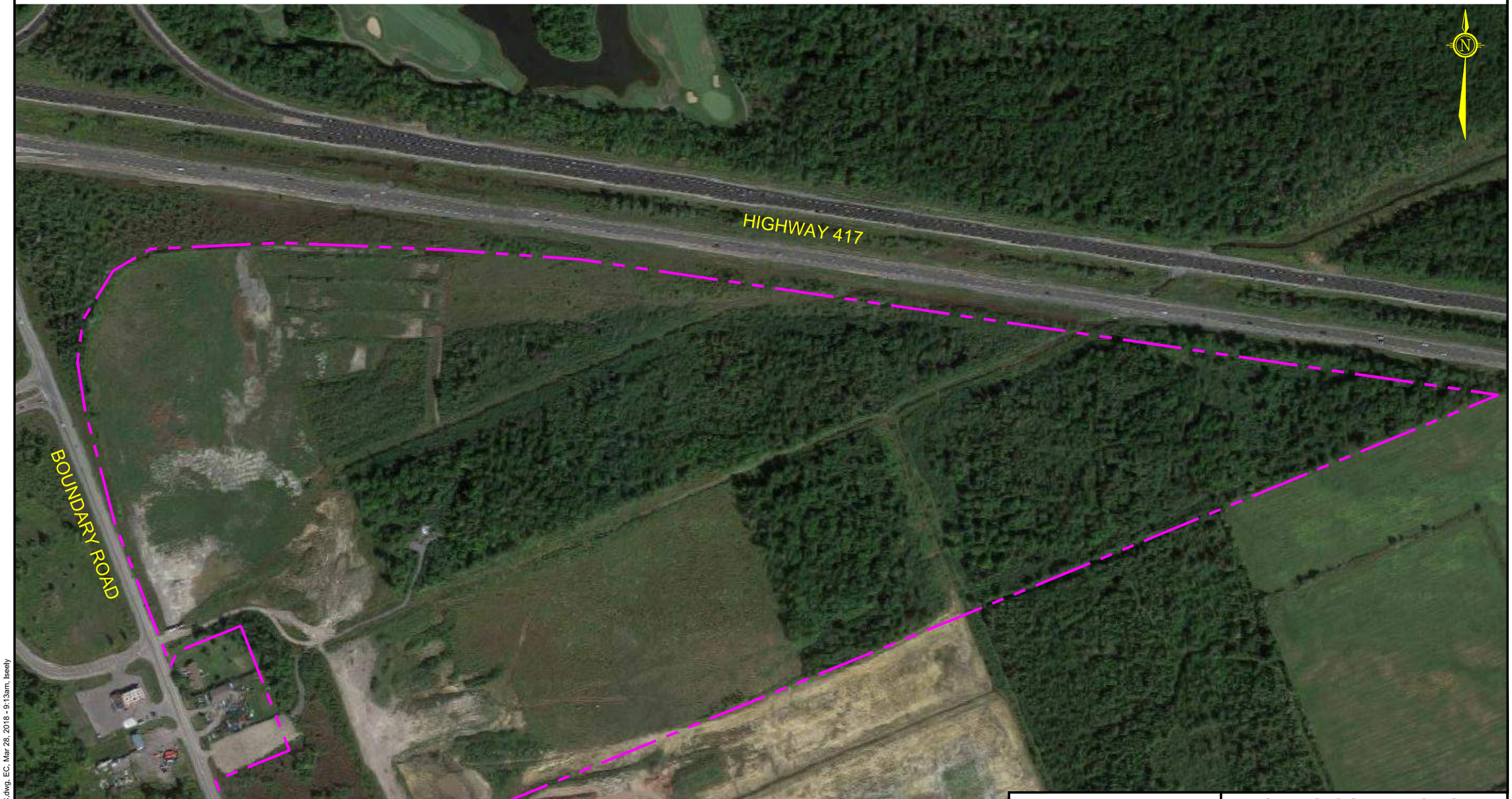
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

KEY PLAN

CITY OF OTTAWA

BOUNDARY ROAD DISTRIBUTION CENTRE

DATE	JOB	FIGURE
APR 2018	117217	FIG 1



NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

EXISTING CONDITIONS

CITY OF OTTAWA

BOUNDARY ROAD DISTRIBUTION CENTRE

DATE	JOB	FIGURE
APR 2018	117217	FIG 2

2.0 STORMWATER MANAGEMENT DESIGN CRITERIA AND OBJECTIVES

The subject site is located within the jurisdiction of the South Nation Conservation Authority (SNCA). As such, the following stormwater management criteria and objectives have been developed through consultation with the SNCA and the City of Ottawa Sewer Design Guidelines.

Stormwater Quantity

- Design a storm drainage system (a combination of storm sewers, ditches, and culverts) to convey post-development peak flows from the site to the proposed stormwater management facility;
- The proposed storm drainage system should not have any adverse impact on downstream properties or development;
- No ponding within the asphalt parking for storm events up to and including the 2-year event;
- Road crossing culverts are to be sized for the 5-year event, and to minimize the overflow onto the adjacent parking areas;
- Post-development peak flows are to be controlled to pre-development levels for all storm events, up to and including the 100-year event.

Stormwater Quality

- Implement lot level and conveyance Best Management Practices;
- Provide an 'Enhanced' level of stormwater quality control corresponding to a long-term removal rate of 80% Total Suspended Solids (TSS).

Erosion and Sediment Control

- Minimize the impact on the downstream receiving watercourses by minimizing the potential erosion and volume of sediment entering the watercourses on a temporary basis (during construction) and on a permanent basis.

3.0 PROPOSED DEVELOPMENT

The proposed Boundary Road Distribution Centre is approximately 38.9 ha and is to consist of a single large distribution warehouse, distribution trucking lot, staff parking facility, and a stormwater management facility. The proposed development is shown on the enclosed engineering plans listed below:

- 117217-GR – Overall Grading Plan, Rev 4
    - 117217-GR1 – Grading Plan, Rev 3
    - 117217-GR2 – Grading Plan, Rev 3
    - 117217-GR3 – Grading Plan, Rev 3
    - 117217-GR4 – Grading Plan, Rev 3
    - 117217-GRND – Grading Notes and Details, Rev 1
- 117217-GP – Overall Plan of Services, Rev 4
    - 117217-GP1 – General Plan of Services, Rev 3
    - 117217-GP2 – General Plan of Services, Rev 3
    - 117217-GP3 – General Plan of Services, Rev 3
    - 117217-GP4 – General Plan of Services, Rev 3
    - 117217-GPND – Servicing Notes and Details, Rev 1
- 117217-ESC – Erosion and Sediment Control Plan, Rev 1
    - 117217-ESND – Erosion and Sediment Control Notes and Details, Rev 1
- 117217-SWMF1 – Stormwater Management Facility – Plan, Rev 3
    - 117217-SWMF1 – Stormwater Management Facility – Sections, Rev 2
    - 117217-SWMF1 – Stormwater Management Facility – Details, Rev 2
- 117217-PRE – Pre-Development Storm Drainage Area Plan, Rev 1
- 117217-POST – Post-Development Storm Drainage Area Plan, Rev 1
- 117217-DR – Ditch Relocation Plan

Runoff from all storm events will be conveyed by a combination of storm sewers (minor system) and a ditch network throughout the property (overland flow path). The proposed SWM facility will be the outlet for both the storm sewers and the ditch network.

3.1 Storm Sewer Design (Minor System)

The proposed storm sewers have been designed using the Rational Method and the PCSWMM modeling software to convey peak flows associated with a 5-year storm event from the roof drains of the proposed warehouse building. Storm sewers have been matched invert-to-invert due to the grade restrictions on-site. Overflows from the storm sewers as a result of surcharging during large (100-yar) storm events are to be directed overland across the parking areas to the adjacent ditch network. The corresponding Storm Drainage Area Plan has been provided in **Appendix D**.

3.2 Ditch Design (Overland Flow Path)

To convey peak flows for all storm events from the parking areas and surrounding grassed areas, a network of ditches throughout the property have been proposed. Starting at the western parking lot, the ditches slope to the north and south, following along the boundary of the parking areas. For the southern portion of the site, the ditch network follows along proposed access roads. The geometry of the ditches varies throughout the site, with bottom widths ranging from 1.0m to 4.0m and depths from 0.30m to 0.45m. The side slopes of the proposed ditches are to be 3:1 (H:V) throughout. Refer to the Grading Plans (**117217-GR, GR1-4**) for details.

3.3 Stormwater Management Facility

The proposed grading and drainage design includes on-site quantity and quality control. Stormwater runoff from the proposed development will be directed to a wet pond SWM facility in the eastern corner of the site for water quality and quantity control. Outflows from the SWM facility will directed to the culvert crossing under Highway 417.

- **Quantity Control:** Post-development flows from the subject site will be controlled to pre-development levels by and pond outlet structure for all storms up to and including the 100-year storm event.
- **Quality Control:** The two forebays and permanent pool have been sized based on the MOECC criteria to provide up to 80% TSS removal.

Additional information on the SWM facility (including design criteria) is provided in **Section 0**.

3.4 Drainage Outlets

Under post-development conditions, the SWM facility will outlet to the existing ditch, and through the existing 1350mm culvert crossing under Highway 417.

3.4.1 Ditch Realignment

Under existing conditions, the ditch running north-south, located towards the eastern end of the site (reach “F3”), receives drainage from an adjacent property to the south. To accommodate the proposed stormwater management facility, the ditch has been realigned around the boundary of the SWM facility, and maintain the existing outlet at the 1350mm culvert crossing under the Highway 417.

Table 3.1 outlines the existing and proposed ditch parameters. Supporting calculations are provided in **Appendix D**, and details of the location of the ditch relocation have been provided on the Ditch Relocation Plan (**117217-DR**).

Table 3.1: Existing vs. Proposed Ditch Parameters

Parameter	Existing Ditch	Proposed Ditch
Bankfull Depth (m)	1.4	1.3 - 1.5
Bankfull Width (m)	6.0	5.7 - 6.5
Longitudinal Slope (%)	0.10%	0.10%
Side Slopes (H:V)	2:1	2:1
Capacity (m3/s)	2.9	2.7 - 3.8

As shown, the relocated ditch will provide sufficient capacity to convey the runoff from the upstream areas.

4.0 HYDROLOGIC & HYDRAULIC MODELING

The City of Ottawa Sewer Design Guidelines requires hydrologic modelling for all dual drainage systems. The performance of the proposed storm drainage system was evaluated using the PCSWMM hydrologic/ hydraulic model.

4.1 Deign Storms

The hydrologic & hydraulic analysis was completed using the following synthetic design storms and historical storms. The IDF parameters used to generate the design storms were taken from the *Ottawa Sewer Design Guidelines* (October, 2012).

4-Hour Chicago Storms:

25mm 4-hour Chicago Storm
2-year 4-hour Chicago Storm
5-year 4-hour Chicago Storm
100-year 4-hour Chicago Storm

12-Hour SCS Type II Storms:

2-year 12-hour SCS Type II Storm
5-year 12-hour SCS Type II Storm
100-year 12-hour SCS Type II Storm

The proposed drainage system has also been stress tested using a 4-hour Chicago design storm that has a 20% higher intensity and total volume compared to the 100-year event.

4.2 Model Development

The PCSWMM model has been developed to account for both minor and major system flows, including the routing of flows through the storm sewer network (minor system), and overland along the parking lots and through the proposed ditch network throughout the property. The results of the analysis were used to:

- Calculate the storm sewer gradeline for the 100-year storm event;
- Estimate overland flow depths and ponding volumes in the parking areas and ditch network during the 100-year event;
- Size the stormwater management facility; and
- Determine the total major and minor system runoff from the site.

4.2.1 Storm Drainage Areas

The site has been divided into subcatchments for both pre and post-development conditions. Pre-development drainage areas have been based on the existing conditions, topography, and overland flow paths. Post-development drainage areas have been based on the proposed storm drainage system. The catchment areas are shown on the following drawings:

- Pre-Development Storm Drainage Area Plan 117217-PRE
- Post-Development Storm Drainage Area Plan 117217-POST

4.2.2 Subcatchment Model Parameters

Hydrologic modeling parameters for each subcatchment area were developed based on soil type, existing and proposed land use, and topography. Modeling parameters were determined as follows:

- Soil types were identified based on test pit data from the geotechnical investigation (Paterson Group, 2015);

- Land use and ground cover were determined from satellite imagery (**Figure 2**);
- For pre-development conditions, SCS Curve Numbers (CN) and Initial Abstraction (IA) values were assigned for each subcatchment area based on the soil type and land use;
    - Pre-development conditions were modeled in PCSWMM using the *'Alternative Runoff Method'* Nash IUH runoff method;
- For post-development conditions, the percentage of impervious area was determined for each subcatchment based on the proposed road cross-section and proposed land use;
    - Post-development conditions are modeled in PCSWMM using the SWMM5 engine.

An overview of the model parameters is provided in **Table 4.1** and **Table 4.2**. Supporting calculations are provided in **Appendix B**.

Table 4.1: Pre-Development Model Parameters

Area ID	Area (ha)	Weighted CN	Weighted IA	Time to Peak (hrs)	Average Slope (%)
PreA	22.79	56	9	0.50	0.46%
PreB	4.12	71	5	0.35	0.14%
PreC	12.06	55	10	0.28	0.43%

Table 4.2: Post-Development Model Parameters

Area ID	Catchment Area (ha)	Runoff Coefficient (c)	Percent Impervious (%)	No Depression (%)	Equivalent Width (m)	Average Slope (%)
A-01	3.706	0.59	56%	0%	350	1%
A-02	1.519	0.69	70%	0%	150	1%
A-03	2.220	0.75	78%	0%	230	1%
B-01	2.234	0.51	44%	0%	180	1%
B-02	0.881	0.70	72%	0%	100	1%
B-03	0.793	0.77	82%	0%	85	1%
B-04	2.458	0.80	86%	0%	300	1%
B-05	3.002	0.56	51%	0%	150	1%
B-06	3.827	0.30	14%	0%	300	1%
R-01	1.300	0.90	100%	100%	87	2%
R-02	0.722	0.90	100%	100%	87	2%
R-03	0.720	0.90	100%	100%	87	2%
R-04	0.983	0.90	100%	100%	87	2%
R-05	1.027	0.90	100%	100%	87	2%
R-06	1.300	0.90	100%	100%	87	2%
R-07	0.706	0.90	100%	100%	87	2%
R-08	0.731	0.90	100%	100%	87	2%
R-09	0.978	0.90	100%	100%	87	2%
R-10	1.037	0.90	100%	100%	87	2%
POND	8.828	0.45	36%	0%	250	0%

Infiltration

Infiltration losses for all catchment areas were modeled using Horton's infiltration equation, which defines the infiltration capacity of the soil over the duration of a precipitation event using a decay function that ranges from an initial maximum infiltration rate to a minimum rate as the storm progresses. The default values for the City of Ottawa were used for all catchments.

Horton's Equation:
$f(t) = f_c + (f_o - f_c)e^{-k(t)}$

Initial infiltration rate: f_o = 76.2 mm/hr
Final infiltration rate: f_c = 13.2 mm/hr
Decay Coefficient: k = 4.14/hr

Depression Storage

The default values for depression storage in the City of Ottawa were used for all catchments. Residential rooftops were assumed to provide no depression storage.

- Depression Storage (pervious areas): 4.67 mm
- Depression Storage (impervious areas): 1.57 mm

Impervious Values

Impervious (TIMP) values for each subcatchment area were calculated based on the concept plan (Figure 2). The impervious values correspond to the Runoff Coefficients used in the Rational Method calculations using the equation:

$$C = 0.90(\%IMP) + 0.20(1-\%IMP)$$

4.2.3 Roof Drains

Runoff from the roof of the building will be captured by a series of roof drains along the perimeter of the building and conveyed to the proposed storm sewers. The model accounts for the capture rate of the roof drains on a per-catchment basis. Each roof drain has a capture rate of approximately 73 L/s, and the release rate from each of the roof drain outlets in the model has been calculated based on the number of roof drains within each roof catchment area – refer to **Table 4.3**. Flows which exceed the capacity of the roof drain will overflow through scuppers (represented as weirs in the model) and will be directed across the parking area to the proposed ditches.

Table 4.3: Roof Drain Capture Rates (L/s)

Catchment ID	Number of Roof Drains	Allowable Release Rate (L/s)
R-01	5	365
R-02	2	146
R-03	3	219
R-04	4	292
R-05	3	219
R-06	5	365
R-07	2	146
R-08	3	219
R-09	4	292
R-10	3	219

4.3 Model Results

The results of the analysis are summarized as follows. Supporting calculations have been provided in **Appendix B** and **C**, and PCSWMM model files have been provided on the enclosed CD at the back of this report.

4.3.1 Peak Flows

Pre- vs. Post-development peak flows are outlined in **Table 4.4**. The proposed SWM facility provides sufficient storage to attenuate post-development peak flows to pre-development levels for all storms up to and including the 100-year event.

Table 4.4: Pre- vs. Post-Development Peak Flows (L/s)

Storm Distribution->	**4hr Chicago**					**12hr SCS**		
Return Period->	**25mm**	**2yr**	**5yr**	**100yr**	**100yr+ 20%**	**2yr**	**5yr**	**100yr**
Pre-Development	64	162	347	1133	1637	234	457	1316
Post-Development	15	93	286	1089	1399	127	338	1127

For all storm events, the post-development peak flow is below the pre-development levels. As such, pond outflows should not have a noticeable impact on the downstream watercourse or MTO culvert.

As noted in **Section 3.4**, the outlet for the site is a 1350mm culvert which crosses Highway 417. The culvert has an approximate slope of 0.10%, which gives it a maximum capacity of approximately 1,760 L/s. Outflow from the pond for all storms up to and including the 100-year event will not exceed the available capacity of the MTO culvert. At most, the culvert will be flowing 83% full during the 100-year+20% storm event.

4.3.2 Storm Sewers (Minor System)

The storm sewers have been sized to convey the 5-year peak flows from the roof drains for the proposed warehouse facility. As this is a private site and the proposed warehouse facility is to consist of slab-on-grade construction, there is no requirement to maintain a 0.30m buffer between the 100-year HGL and the USF elevation. HGL elevations during the 100-year events (both Chicago and SCS Type II) are outlined in **Table 4.5**:

Table 4.5: 100-yeah HGL Elevations in Manholes

Manhole ID	MH Invert Elevation (m)	T/G Elevation (m)	HGL Elevation		T/G Clearance	
			Chicago 100yr 4hr (m)	SCS 100yr 12hr (m)	Chicago 100yr 4hr (m)	SCS 100yr 12hr (m)
STM101	74.85	76.42	75.54	75.41	0.88	1.01
STM103	74.76	76.42	75.46	75.36	0.96	1.06
STM105	74.67	76.35	75.29	75.28	1.06	1.07
STM107	74.55	76.42	75.27	75.28	1.15	1.14
STM109	74.42	76.42	75.27	75.27	1.15	1.15
STM111	74.85	76.41	75.55	75.42	0.86	0.99
STM113	74.76	76.38	75.47	75.37	0.91	1.01
STM115	74.67	76.41	75.30	75.28	1.11	1.13
STM117	74.55	76.30	75.27	75.27	1.03	1.03
STM119	74.42	76.17	75.27	75.27	0.90	0.90

4.3.3 Ditch Network (Overland Flow Path)

The ditch network throughout the site has been designed to store and convey runoff from the parking and grassed areas surrounding the warehouse facility. As described in the above section, flows which overflow from the roof drains through the scuppers will be directed across the parking areas and into the ditch system. During larger storm events, the ditches will overflow into the outer edges of the parking areas. The flow depth over the parking lot will be less than 0.30 m and will not encroach on the building perimeter.

Ditches vary in size from a triangular ditch with a depth of 0.30m, and trapezoidal ditches with depths ranging from 0.20 m to 0.45 m deep, bottom widths of 1.0 m to 4.0 m, all with side slopes of 3:1 (H:V). Refer to the Grading Plans for further details (**117217-GR, GR1-4**)

5.0 STORMWATER MANAGEMENT FACILITY

The proposed SWM facility has been sized to provide water quality and quantity control for a total tributary drainage area of 38.9 ha. The design of the SWM facility is shown on the following drawings (**Appendix D**):

- Stormwater Management Facility – Plan **117217-SWMF1**
- Stormwater Management Facility – Sections **117217-SWMF2**
- Stormwater Management Facility – Details **117217-SWMF3**

Supporting calculations for the stormwater management facility are provided in **Appendix C**.

5.1 Design Criteria

The proposed SWM facility has been designed to meet the following criteria:

- Provide an *Enhanced* level of water quality control (80% long-term TSS removal);
- Provide quantity control storage to limit post-development peak flows to pre-development levels;
- The SWM facility will have side slopes of 3:1 (H:V) or shallower;
- The forebays have been sized to provide sufficient storage for 10 years of sediment accumulation;
- A sediment management area has been provided within the SWM block to allow for storage and drying of material removed during maintenance/ cleanout;
- Guardrails conforming to City standards will be installed at the inlet and outlet structures of the SWM facility;
- Infiltration tests are to be performed on the native material during constriction to determine whether a liner will be required.

5.2 Pathways/ SWM Facility Access

Access to the inlet and outlet structures and the sediment storage area will be provided by pathways. The pathways will provide access from the north and south parking lots to both inlet structures, forebays, and the outlet structure. Details of the pathway are shown on **117217-SWMF3**.

5.3 Pond Inlet Structures

The inlets to the SWM facility will consist of 864mm x 1346mm storm sewers outletting to each of the north and south forebays via a concrete headwall. The ditch network to the north and south of the warehouse facility will also outlet directly to the north and south forebays. For both inlets, riprap will be placed around the inlet slightly above the normal water level to prevent erosion as per City of Ottawa specifications/ standards. For further details, refer to Drawing **117217-SWMF3**.

5.4 Sediment Forebays & Permanent Pool

The sediment forebays have been sized in accordance with the MOE SWM Planning and Design Manual (March 2003). The forebays will both be approximately 40m long and 15m wide. A submerged riprap berm set at 0.30m below the normal water level will separate the forebay from the main cell of the pond. The forebay berm will be constructed from 300mm riprap, with side slopes of 2:1 and a top width of 2.0 m.

The upstream drainage area to the SWM Facility (38.9 ha) has an average imperviousness of 62%. For an *Enhanced* level of protection (80% long-term TSS removal), the required permanent pool volume is approximately 6200 m^3. The proposed SWM facility will have a permanent pool volume of approximately 7700 m^3.

Annual sediment loading to the SWM facility from the upstream drainage area has been estimated at approximately 53 m^3/yr to the north forebay and 50 m^3/yr to the south forebay (see pond design calculations in **Appendix C**). If the SWM facility provides a long-term TSS removal rate of 80%, then sediment accumulation can be estimated at 0.80 x 53 = 42.4 m^3/yr for the north forebay and at 0.80 x 50 = 40 m^3/yr for the south forebay.

Each forebay has been designed to allow for a minimum of 10 years of sediment accumulation. At a sediment loading rate of 425 m^3/yr, this corresponds to a sediment volume of 402 m^3 over a period of 10 years. The north forebay provides a storage volume of approximately 755 m^3 at a depth of 1.5 m, and has a total volume of approximately 656 m^3 at the top of the submerged berm between the forebay and the main cell, at a depth of 1.2 m. The south forebay provides a storage volume of approximately 785 m^3 at a depth of 1.5 m, and has a total volume of approximately 689 m^3 at the top of the submerged berm between the forebay and the main cell, at a depth of 1.2 m.

5.5 SWM Facility Outlet Structure

Outflows from the SWM facility will be directed to an extension of an existing ditch, and then through the 1350mm culvert crossing under Highway 417. Details of the outlet structures are provided on Drawing **117217-SWMF3**. Supporting calculations have been provided in **Appendix C**.

5.5.1 Extended Detention

Extended detention will be provided for the first 1,600 m^3 of active storage to allow for settling of suspended sediment in the pond. Extended detention outflows will be conveyed to the outlet structure via a 250mm reverse slope pipe with an invert of 73.35 m at the bottom of the SWM facility permanent pool, sloping upwards at 12% to an invert of 74.85 m (normal water level) at the connection to the outlet structure. The extended detention volume will be released over a period of 24 hours through a 165mm slide-in orifice plate installed at the upstream end of the 250mm pipe outletting to the proposed ditch from the outlet structure.

5.5.2 Quantity Control & Overflow Spillway

Flows that exceed the extended detention storage will outlet through a 4.15 m wide by 0.28 m tall concrete weir located to the north-east of the extended detention outlet structure. This outlet structure will control peak flows for all storm events, up to and including the 100-year storm event. As the outlet for the SWM facility consists of a large weir spilling into a ditch, a separate overflow spillway has not been proposed. During extreme storm events (100-year+20%) flow depth over the crest of the weir will be 0.36 m, or 0.08 m above the 100-year water level and the top of the weir structure.

5.6 Stage-Storage-Discharge Table

The stage-storage curve for the proposed SWM facility is provided in **Table 5.1**. Supporting calculations are provided in **Appendix C**.

Table 5.1: Stage-Storage-Discharge Table

Stage	Elevation (m)	Area (m)	Volume		Outflow		
			Stage (m3)	Total (m3)	Orifice (L/s)	Weir (L/s)	Total (L/s)
Pond Bottom	73.35	4526	0	0	0		
	74.00	5108	1249	3129	0	0	0
	74.50	5571	1364	5799	0	0	0
Permanent Pool	74.85	8146	795	8259	0	0	0
Extended Detention	75.00	27946	2707	10966	15	0	15
2-year	75.07	28113	1962	12928	22	141	163
5-year	75.13	28256	1691	14620	26	358	384
100-year	75.28	28592	4264	18883	35	1131	1166
Top of Pond	75.58	29740	8750	27633	47	3373	3420

6.0 EROSION AND SEDIMENT CONTROL

6.1 Temporary Measures

The following erosion and sediment control measures will be implemented during construction and are as follows:

- Silt fences are to be installed along the perimeter of the site;
- Straw bales are to be installed in ditches and swales until construction is completed and until vegetation is established;

It is proposed that the SWM facility be used as a temporary sediment control pond during construction. The construction of the temporary sediment pond would include the following:

- Excavate and shape the ultimate pond footprint, including the sediment forebays;
- Construct temporary drainage ditches to convey storm runoff to the pond;
- Construct temporary berms to isolate the areas near the ultimate inlets and outlets;
- Install silt curtains in the forebays to provide additional sediment control during construction;
- Construct the outlet to the 1350mm culvert crossing Highway 417;
- Once the ultimate stormwater management facility has been approved, construct the ultimate inlets and remove the berm protecting the ultimate outlet.

Details and specific locations will be specified during the detailed design stage. The temporary erosion and sediment control measures are to be implemented prior to construction and are to remain in place throughout construction and should be inspected regularly.

6.2 Permanent Measures

Permanent erosion and sediment control measures are to include the following:

- Swales and ditches are to be constructed at minimum grade, where possible;
- Swales and ditches are to be vegetated to provide permanent erosion and sediment control.

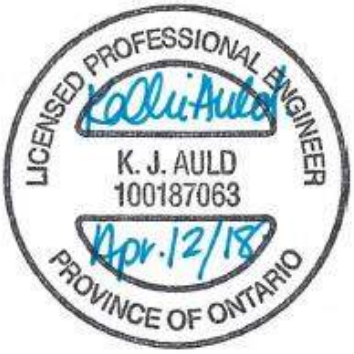
The proposed temporary erosion and sediment control measures shall be implemented prior to construction, shall remain in place throughout each phase of construction and shall be inspected regularly. No control measure shall be permanently removed without prior authorization from the Engineer.

7.0 CONCLUSIONS AND RECOMMENDATIONS

- The proposed development will consist of a single large distribution warehouse, distribution trucking lot, staff parking facility, and associated amenity spaces.
- The proposed development will be graded to direct stormwater runoff towards a proposed water quality and quantity wet pond which will ultimately discharge to an existing culvert crossing Highway 417.
- On-site stormwater quantity control will be provided by a wet pond equipped with a controlled outlet structure and an approximate pond volume of 21,706 m^3, including the permanent pool, which will be required in order to maintain pre-development flow rates for all storms up to and including the 1:100 year event prior to being discharged to the Highway 417 culvert.
- An Enhanced level of stormwater quality control corresponding to a long-term removal rate of 80% Total Suspended Solids (TSS) will be provided by the proposed wet pond.
- Erosion and sediment controls will be provided both during construction and on a permanent basis.

NOVATECH

Prepared By:



Kallie Auld, P. Eng.
Project Coordinator | Water Resources

Reviewed By:

Michael Petepiece, P.Eng.
Project Manager | Water Resources

Reviewed By:

J. Lee Sheets, C.E.T.
Director | Land Development & Public Sector

APPENDIX A

Regimbald Municipal Drain Assessment

PLAN
REGIMBALD
MUNICPAL DRAIN
TWP. OF CUMBERLAND

CITY OF GLOUCESTER

TOWNSHIP OF CUMBERLAND

LIMIT OF DRAINAGE AREA

A. Poirier
301-30100

Chabot
301-29800

Delmor Holding Ltd.
301-29700

L. Gauthier
301-55900

Delmor Holding Ltd.
301-30200

Delmor Holding Ltd.
301-10600

I. & T. Balint
301-10800

D. Proulx
301-10701

E. Desjardins
301-56200

J.G. Desjardins
301-56100

Delmor Holding Ltd.
301-30400

Delmor Holding Ltd.
301-30300

J.G. Desjardins
301-56400

Manfel Invest Corp. Ltd.
301-56300

Twp. of Cumberland
301-10900

G. & C. Desjardins
301-10703

K. Murchison
301-56500

R. Pomerleau
301-56401

N.C.C.
301-56600

Delmor Holding Ltd.
301-30500

Twp. of Cumberland
301-11000

R. Goyette
301-56601

Delmor Holding Ltd.
301-30601

D. Makow
301-56700

M. Brazeau
301-56800

M.N.R.
230-12800

Geocam Securities Ltd.
301-56900

Delmor Holding Ltd.
301-11200

Delmor Holding Ltd.
301-11100

Delmor Holding Ltd.
301-30700

Delmor Holding Ltd.
301-57100

G. Pagani
050-85200

J. Hodges
301-57000

Delmor Holding Ltd.
301-30900

Delmor Holding Ltd.
301-11500

Delmor Holding Ltd.
301-11300

TOWNSHIP OF OSGOODE

TOWNSHIP OF CUMBERLAND

CON II

CON II

CON 10

CON 9

ROAD 8

Devine Rd.

Highway 417

Shaws Creek

Carlsbad Springs

Boundary Rd.

Tradesman Rd.

Entrepreneur Cr.

Judcum Rd.

Sand Rd.

CNR

APPENDIX B

SWM Modeling Calculations & Files

5371 Boundary Road Distribution Centre
Pre-Development Model Parameters

NOVATECH
Engineers, Planners & Landscape Architects

Time to Peak Calculations

(Uplands Overland Flow Method)

Existing Conditions

Area ID	Overland Flow						Concentrated Overland Flow						Overall				
	Length (m)	Elevation U/S (m)	Elevation D/S (m)	Slope (%)	Velocity (m/s)	Travel Time (min)	Length (m)	Elevation U/S (m)	Elevation D/S (m)	Slope (%)	Velocity (m/s)	Travel Time (min)	Time of Concentration (min)	Time to Peak (min)	Time to Peak (min)	Time to Peak (hrs)	Average Slope (%)
PreA	100	77.98	76.58	1.4%	0.10	16.67	335	76.58	76.00	0.2%	0.2	27.92	45	30	30	0.50	0.46%
PreB	100	77.23	76.65	0.6%	0.10	16.67	263	76.50	76.57	0.0%	0.3	14.61	31	21	21	0.35	0.14%
PreC	100	76.39	76.02	0.4%	0.25	6.67	219	76.02	75.0	0.5%	0.2	18.25	25	17	17	0.28	0.43%

Weighted Curve Number Calculations

Soil type 'B'

Area ID	Land Use 1	Area	CN	Land Use 2	Area	CN	Weighted CN
PreA	Open Space (good)	65%	61	Forest (good)	30%	55	56
PreB	Open Space (fair)	90%	69	Gravel	10%	85	71
PreC	Forest	100%	55	-	0%	0	55

Weighted IA Calculations

Area ID	Land Use 1	Area	IA	Land Use 2	Area	IA	Weighted IA
PreA	Open Field (fair)	70%	8	Forest (good)	30%	10	9
PreB	Open Space (fair)	90%	8	Gravel/ Road	10%	85	5
PreC	Forest	100%	10	-	0%	0	10

5371 Boundary Road Distribution Centre
Post-Development Model Parameters

NOVATECH
Engineers, Planners & Landscape Architects

Area ID	Catchment Area (ha)	Runoff Coefficient (c)	Percent Impervious (%)	No Depression (%)	Equivalent Width (m)	Average Slope (%)
A-01	3.71	0.59	56%	0%	350	1%
A-02	1.52	0.69	70%	0%	150	1%
A-03	2.22	0.75	78%	0%	230	1%
B-01	2.23	0.51	44%	0%	180	1%
B-02	0.88	0.70	72%	0%	100	1%
B-03	0.79	0.77	82%	0%	85	1%
B-04	2.46	0.80	86%	0%	300	1%
B-05	3.00	0.56	51%	0%	150	1%
B-06	3.83	0.30	14%	0%	300	1%
R-01	1.30	0.90	100%	100%	87	2%
R-02	0.72	0.90	100%	100%	87	2%
R-03	0.72	0.90	100%	100%	87	2%
R-04	0.98	0.90	100%	100%	87	2%
R-05	1.03	0.90	100%	100%	87	2%
R-06	1.30	0.90	100%	100%	87	2%
R-07	0.71	0.90	100%	100%	87	2%
R-08	0.73	0.90	100%	100%	87	2%
R-09	0.98	0.90	100%	100%	87	2%
R-10	1.04	0.90	100%	100%	87	2%
POND	8.83	0.45	36%	0%	250	0.1%
TOTAL:	**38.97**					

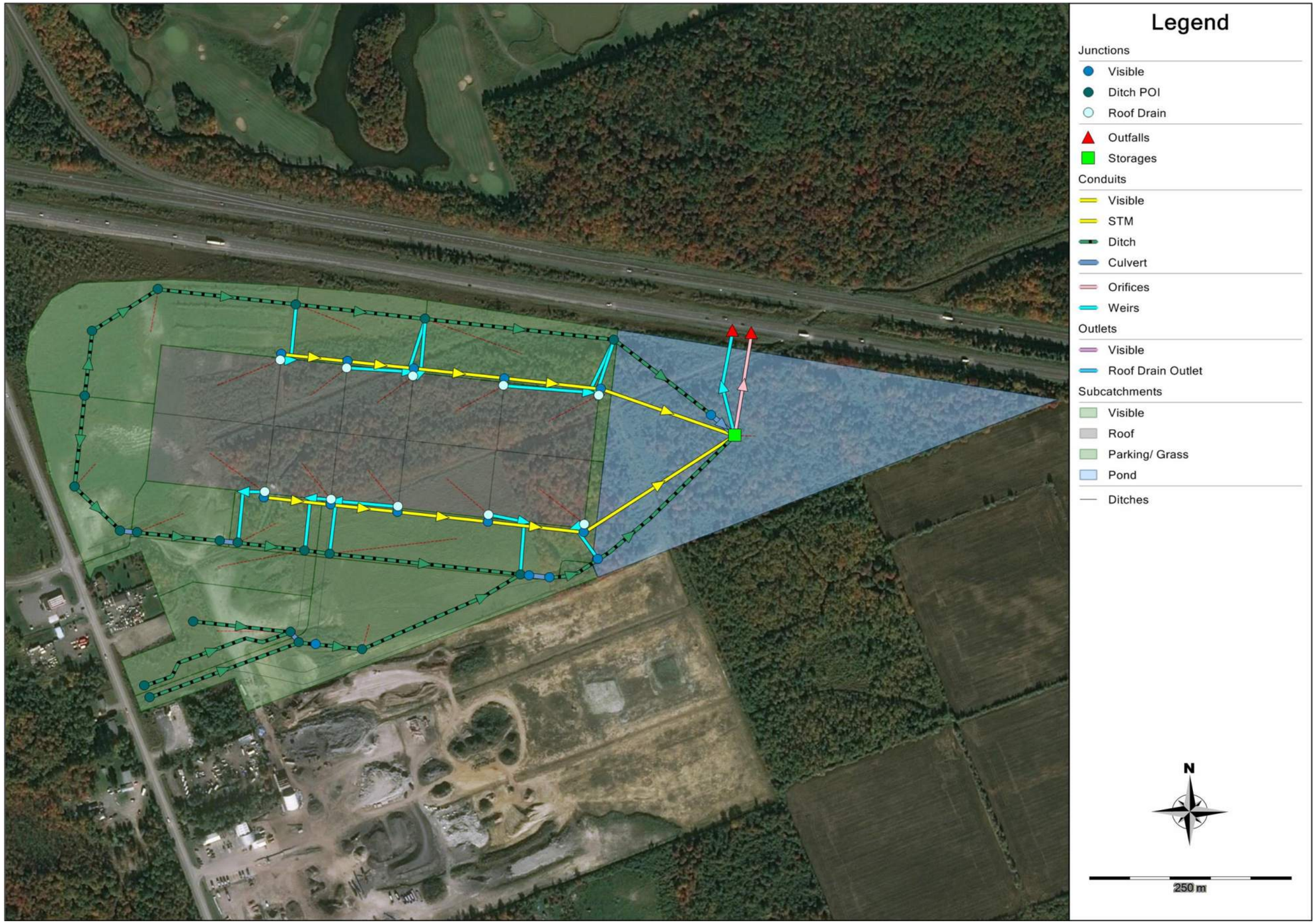
5371 Boundary Road Distribution Centre
Pre-Development Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

06/04/2018
PREPARED BY: NOVATECH

5371 Boundary Road Distribution Centre
Post-Development Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects



06/04/2018
PREPARED BY: NOVATECH

5371 Boundary Road Distribution Centre

Design Storm Time Series Data

4-hour Chicago Design Storms

NOVATECH
Engineers, Planners & Landscape Architects

C25mm-4.stm		C2-4.stm		C5-4.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0	0:00	0	0:00	0
0:10	1.34	0:10	1.98	0:10	2.49
0:20	1.49	0:20	2.23	0:20	2.77
0:30	1.69	0:30	2.58	0:30	3.14
0:40	1.96	0:40	3.06	0:40	3.62
0:50	2.33	0:50	3.81	0:50	4.31
1:00	2.91	1:00	5.1	1:00	5.37
1:10	3.91	1:10	7.91	1:10	7.19
1:20	6.1	1:20	19.04	1:20	11.14
1:30	14.53	1:30	76.81	1:30	26.25
1:40	58.72	1:40	23.64	1:40	104.19
1:50	17.11	1:50	11.91	1:50	30.86
2:00	8.32	2:00	7.98	2:00	15.15
2:10	5.5	2:10	6.03	2:10	10.07
2:20	4.13	2:20	4.87	2:20	7.58
2:30	3.32	2:30	4.1	2:30	6.11
2:40	2.79	2:40	3.55	2:40	5.14
2:50	2.41	2:50	3.14	2:50	4.45
3:00	2.12	3:00	2.82	3:00	3.93
3:10	1.9	3:10	2.57	3:10	3.53
3:20	1.73	3:20	2.35	3:20	3.21
3:30	1.58	3:30	2.18	3:30	2.94
3:40	1.46	3:40	2.03	3:40	2.72
3:50	1.36	3:50	1.9	3:50	2.53
4:00	1.27	4:00	1.79	4:00	2.37

5371 Boundary Road Distribution Centre
Design Storm Time Series Data
4-hour Chicago Design Storms

NOVATECH
Engineers, Planners & Landscape Architects

C100-4.stm		C100-4+20%.stm	
Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr
0:00	0	0:00	0
0:10	4.07	0:10	4.88
0:20	4.54	0:20	5.45
0:30	5.14	0:40	7.14
0:40	5.95	0:50	8.51
0:50	7.09	1:00	10.62
1:00	8.85	1:10	14.28
1:10	11.9	1:20	22.25
1:20	18.54	1:30	53.03
1:30	44.19	1:40	214.27
1:40	178.56	1:50	62.45
1:50	52.04	2:00	30.37
2:00	25.31	2:10	20.08
2:10	16.73	2:20	15.07
2:20	12.56	2:30	12.11
2:30	10.09	2:40	10.16
2:40	8.47	2:50	8.78
2:50	7.32	3:00	7.75
3:00	6.46	3:10	6.95
3:10	5.79	3:20	6.3
3:20	5.25	3:30	5.78
3:30	4.82	3:40	5.34
3:40	4.45	3:50	4.97
3:50	4.14	4:00	4.66
4:00	3.88		

5371 Boundary Road Distribution Centre
Design Storm Time Series Data
SCS Design Storms

NOVATECH
Engineers, Planners & Landscape Architects

S2-12.stm		S5-12.stm		S100-12.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0.00	0:00	0	0:00	0
0:30	1.27	0:30	1.69	0:30	2.82
1:00	0.59	1:00	0.79	1:00	1.31
1:30	1.10	1:30	1.46	1:30	2.44
2:00	1.10	2:00	1.46	2:00	2.44
2:30	1.44	2:30	1.91	2:30	3.19
3:00	1.27	3:00	1.69	3:00	2.82
3:30	1.69	3:30	2.25	3:30	3.76
4:00	1.69	4:00	2.25	4:00	3.76
4:30	2.29	4:30	3.03	4:30	5.07
5:00	2.88	5:00	3.82	5:00	6.39
5:30	4.57	5:30	6.07	5:30	10.14
6:00	36.24	6:00	48.08	6:00	80.38
6:30	9.23	6:30	12.25	6:30	20.47
7:00	4.06	7:00	5.39	7:00	9.01
7:30	2.71	7:30	3.59	7:30	6.01
8:00	2.37	8:00	3.15	8:00	5.26
8:30	1.86	8:30	2.47	8:30	4.13
9:00	1.95	9:00	2.58	9:00	4.32
9:30	1.27	9:30	1.69	9:30	2.82
10:00	1.02	10:00	1.35	10:00	2.25
10:30	1.44	10:30	1.91	10:30	3.19
11:00	0.93	11:00	1.24	11:00	2.07
11:30	0.85	11:30	1.12	11:30	1.88
12:00	0.85	12:00	1.12	12:00	1.88

5371 Boundary Road Distribution Centre

Design Storm Time Series Data

SCS Design Storms

NOVATECH
Engineers, Planners & Landscape Architects

S2-24.stm		S5-24.stm		S100-24.stm	
Duration	Intensity	Duration	Intensity	Duration	Intensity
min	mm/hr	min	mm/hr	min	mm/hr
0:00	0	0:00	0	0:00	0
1:00	0.72	1:00	0.44	1:00	0.6
2:00	0.34	2:00	0.44	2:00	0.75
3:00	0.63	3:00	0.81	3:00	1.39
4:00	0.63	4:00	0.81	4:00	1.39
5:00	0.81	5:00	1.06	5:00	1.81
6:00	0.72	6:00	0.94	6:00	1.6
7:00	0.96	7:00	1.25	7:00	2.13
8:00	0.96	8:00	1.25	8:00	2.13
9:00	1.3	9:00	1.68	9:00	2.88
10:00	1.63	10:00	2.12	10:00	3.63
11:00	2.59	11:00	3.37	11:00	5.76
12:00	20.55	12:00	26.71	12:00	45.69
13:00	5.23	13:00	6.8	13:00	11.64
14:00	2.3	14:00	2.99	14:00	5.12
15:00	1.54	15:00	2	15:00	3.42
16:00	1.34	16:00	1.75	16:00	2.99
17:00	1.06	17:00	1.37	17:00	2.35
18:00	1.11	18:00	1.44	18:00	2.46
19:00	0.72	19:00	0.94	19:00	1.6
20:00	0.58	20:00	0.75	20:00	1.28
21:00	0.81	21:00	1.06	21:00	1.81
22:00	0.53	22:00	0.68	22:00	1.17
23:00	0.48	23:00	0.63	23:00	1.07
0:00	0.48	0:00	0.63	0:00	1.07

5371 Boundary Road Distribution Centre
Ditch Relocation Manning's Calculations - 1.3m deep

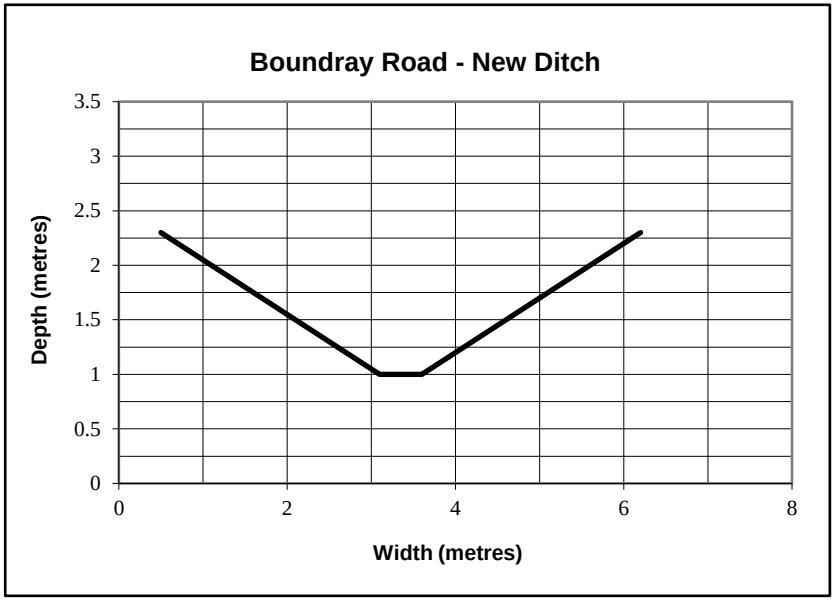
NOVATECH
Engineers, Planners & Landscape Architects

Location : **Boundary Road Distribution Centre**

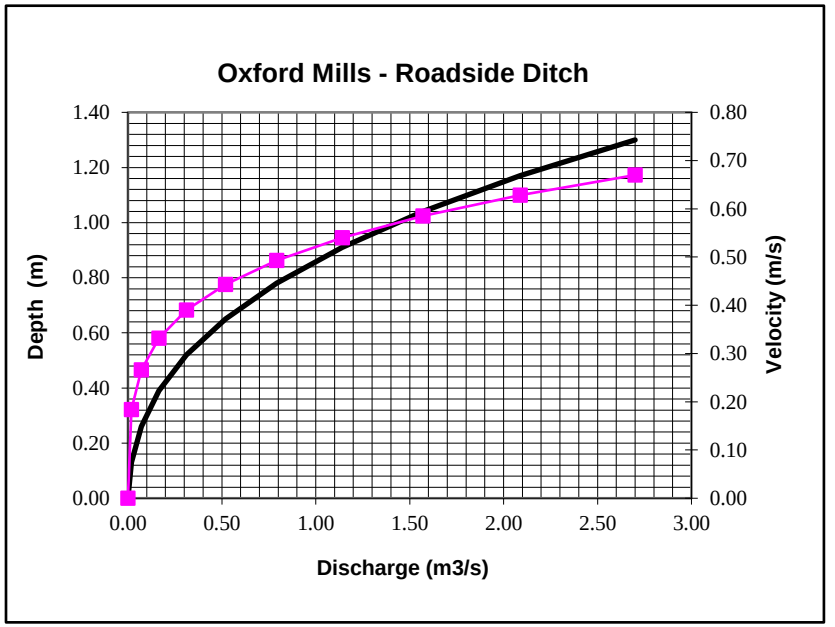
Description: New Ditch - Relocation

Dimensions:

Bottom width =	0.50	m
Right Side slopes =	2.0	:1
Left Side slopes =	2.0	:1
Slope =	0.10%	
Mannings n =	0.035	
Average depth =	1.30	m



Depth (m)	Area (m2)	Hydraulic Radius (m)	Velocity (m/s)	Flow (m3/s)
0.00	0.00	0.00	0.00	0.00
0.13	0.10	0.09	0.18	0.02
0.26	0.27	0.16	0.27	0.07
0.39	0.50	0.22	0.33	0.17
0.52	0.80	0.28	0.39	0.31
0.65	1.17	0.34	0.44	0.52
0.78	1.61	0.40	0.49	0.79
0.91	2.11	0.46	0.54	1.14
1.04	2.68	0.52	0.59	1.57
1.17	3.32	0.58	0.63	2.09
1.30	4.03	0.64	0.67	2.70



5371 Boundary Road Distribution Centre
Ditch Relocation Manning's Calculations - 1.5m deep

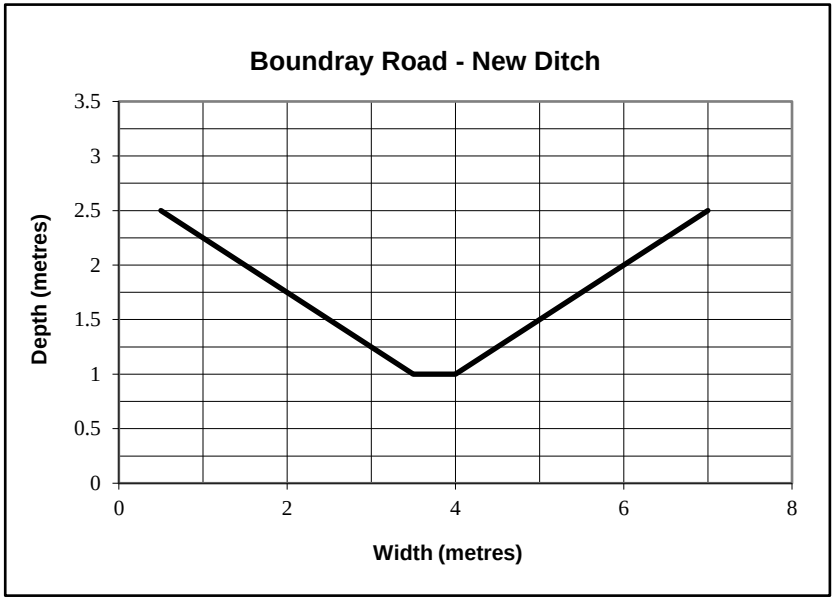
NOVATECH
Engineers, Planners & Landscape Architects

Location : **Boundary Road Distribution Centre**

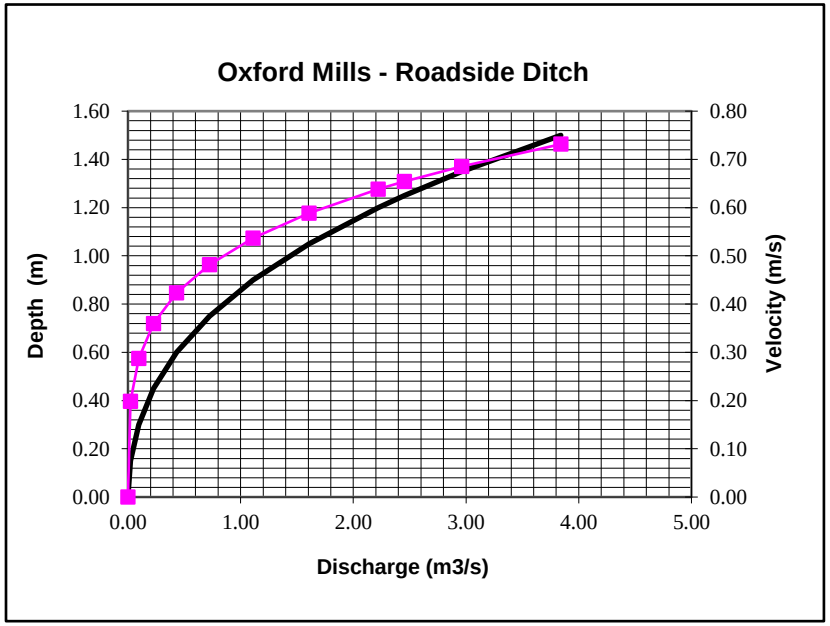
Description: New Ditch - Relocation

Dimensions:

Bottom width =	0.50	m
Right Side slopes =	2.0	:1
Left Side slopes =	2.0	:1
Slope =	0.10%	
Mannings n =	0.035	
Average depth =	1.50	m



Depth (m)	Area (m2)	Hydraulic Radius (m)	Velocity (m/s)	Flow (m3/s)
0.00	0.00	0.00	0.00	0.00
0.15	0.12	0.10	0.20	0.02
0.30	0.33	0.18	0.29	0.09
0.45	0.63	0.25	0.36	0.23
0.60	1.02	0.32	0.42	0.43
0.75	1.50	0.39	0.48	0.72
0.90	2.07	0.46	0.54	1.11
1.05	2.73	0.53	0.59	1.61
1.20	3.48	0.59	0.64	2.22
1.25	3.75	0.62	0.65	2.45
1.35	4.32	0.66	0.69	2.96
1.50	5.25	0.73	0.73	3.84



APPENDIX C

SWM Facility Supporting Calculations

5371 Boundary Road Distribution Centre
SWM Facility Design

NOVATECH
Engineers, Planners & Landscape Architects

Required Storage Volumes (Quality)

Drainage Area	**38.9**	ha
% Impervious:	**62%**	
Enhanced protection (80% TSS removal):		
Treatment Volume	199	m3/ha
Extended Detention Storage:	40	m3/ha required
	1,558	m3 required
	1600	m3 provided
	41.1	m3/ha provided
Perm Pool:	159	m3/ha required
	6191	m3 required
	7700	m3 provided
	197.7	m3/ha provided
Extended Detention:	37.04	L/s average
	92.59	L/s max (2.5 x avg)

(% impervious was calculated as the average imperviousness
for the drainage areas tributary to the SWM facility)

5371 Boundary Road Distribution Centre
SWM Facility Design

NOVATECH
Engineers, Planners & Landscape Architects

Required Forebay Length and width
North Forebay:

Parameters:

Length to width ratio of forebay, r =	5.0:1	
Peak outflow rate during 25 mm storm,	0.093	m^3/s (24hr ext. det)
Target particle size =	150	mm
Settling velocity, V_s =	0.0003	m/s

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

= 39 m

Check Dispersion Length, $Dist_2$

Desired velocity in forebay, V_f =	0.15	m/s
Inlet flow rate , Q_{5yr} =	0.540	m^3/s
Depth in forebay, d =	1.5	m

$$Dist_2 = \frac{8Q}{dV_f}$$

= 19 m

Therefore, the settling length of 39 m governs the design.

Required Length	**= 39 m**
Provided Length	**= 40 m**

Minimum Forebay width:

Length of Forebay, L =	39	m
Minimum width, W =	5.0:1	
W =	7.9	m

Required Width	**= 7.9 m**
Provided Width	**= 15.0 m**

Required Forebay Length and width
South Forebay:

Parameters:

Length to width ratio of forebay, r =	5.0:1	
Peak outflow rate during 25 mm storm	0.093	m^3/s (24hr ext. det)
Target particle size =	150	mm
Settling velocity, V_s =	0.0003	m/s

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_P}{V_S}}$$

= 39 m

Check Dispersion Length, $Dist_2$

Desired velocity in forebay, V_f =	0.15	m/s
Inlet flow rate , Q_{5yr} =	0.558	m^3/s
Depth in forebay, d =	1.5	m

$$Dist_2 = \frac{8Q}{dV_f}$$

= 20 m

Therefore, the settling length of 39 m governs the design.

Required Length	**= 39 m**
Provided Length	**= 40 m**

Minimum Forebay width:

Length of Forebay, L =	39	m
Minimum width, W =	5.0:1	
W =	7.9	m

Required Width	**= 7.9 m**
Provided Width	**= 15.0 m**

5371 Boundary Road Distribution Centre
SWM Facility Design

NOVATECH
Engineers, Planners & Landscape Architects

SWM Facility - Outlet Calculations

Orifice

C	0.62	
Dia	165.00	mm
Area	0.0214	m^2
Invert	74.85	m
C/L	74.93	m

37.04

For Elevation = 075.28 m

Q orifice = $C \times A \times (2 \times g \times H)^{(1/2)}$

Q orifice = $1000\ L/m^3 \times 0.62 \times 0.0214\ m^2 \times (2 \times 9.81 \times (75.28\ m - 74.93\ m))^{(1/2)}$

Q orifice = 34.62 L/s

Suppressed Rectangular Weir

$Q\ (m^3/s) = C \times L \times H^{(3/2)}$

Weir Coefficeint	1.84
Bottom Width (m)	4.2
Bottom of Weir Elevation (m)	75.00

Water Level Elevation	Flow Rate Over Weir	
(m)	(m^3/s)	(L/s)
75.00	0.000	0
75.07	0.141	141
75.13	0.358	358
75.28	1.131	1131
75.58	3.373	3373

5371 Boundary Road Distribution Centre
SWM Facility Design

NOVATECH
Engineers, Planners & Landscape Architects

Sediment Loading Estimate - North

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m³)	Annual Loading (m³/ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	14.94	ha
% Impervious:	81%	
Annual Sediment Loading:	4,371	kg/ha/yr
	3.55	m^3/ha/yr
	53.1	m^3/yr

Sediment Removal Efficiency:	80%	
	42.48	m^3/yr

Sediment Accumulation:		
10yrs	425	m^3

Approx. Forebay Volume:	755	m^3
@ depth:	1.20	m

(Depth to top of Forebay Berm)

655.6

City of Ottawa-average precipitation and TSS data

Drainage Area:	14.9	ha
Runoff Coefficient:	0.77	
Estimate Influent TSS Level (max):	250	mg/L
(Long-term average):	150	mg/L
Sediment Density:	1,230	kg/m^3
Total Annual Precipitation:	907	mm
Total Annual Rain (Ice Free Period):	686	mm
Total Annual Runoff:	103,933	m^3
Runoff during Ice-free period:	78,609	m^3
Max Annual TSS Loading:	25,983	kg
(total precipitation)	21.1	m^3/yr
Max Annual TSS Loading:	19,652	kg
(precipitation during ice-free period)	16.0	m^3/yr
Average Annual TSS Loading:	15,590	kg
(total precipitation)	12.7	m^3/yr
Average Annual TSS Loading:	11,791	kg
(precipitation during ice-free period)	9.6	m^3/yr

Target 70% TSS Removal:		
Max:	14.8	m^3/yr
Min:	6.7	m^3/yr

Sediment Accumulation:		
10yrs	148	m^3

5371 Boundary Road Distribution Centre
SWM Facility Design

NOVATECH
Engineers, Planners & Landscape Architects

Sediment Loading Estimate - South

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m³)	Annual Loading (m³/ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	20.68	ha
% Impervious:	64%	
Annual Sediment Loading:	2,989	kg/ha/yr
	2.43	m³/ha/yr
	50.2	m³/yr

Sediment Removal Efficiency:	80%	
	40.20	m³/yr

Sediment Accumulation:		
10yrs	402	m³

Approx. Forebay Volume:	785	m³
@ depth:	1.20	m

(Depth to top of Forebay Berm)

689.4

City of Ottawa-average precipitation and TSS data

Drainage Area:	20.7	ha
Runoff Coefficient:	0.65	
Estimate Influent TSS Level (max):	250	mg/L
(Long-term average):	150	mg/L
Sediment Density:	1,230	kg/m³
Total Annual Precipitation:	907	mm
Total Annual Rain (Ice Free Period):	686	mm
Total Annual Runoff:	121,544	m³
Runoff during Ice-free period:	91,928	m³
Max Annual TSS Loading:	30,386	kg
(total precipitation)	24.7	m³/yr
Max Annual TSS Loading:	22,982	kg
(precipitation during ice-free period)	18.7	m³/yr
Average Annual TSS Loading:	18,232	kg
(total precipitation)	14.8	m³/yr
Average Annual TSS Loading:	13,789	kg
(precipitation during ice-free period)	11.2	m³/yr

Target 70% TSS Removal:		
Max:	17.3	m³/yr
Min:	7.8	m³/yr

Sediment Accumulation:		
10yrs	173	m³

5371 Boundary Road Distribution Centre
SWM Facility Design

NOVATECH
Engineers, Planners & Landscape Architects

SWM Facility - Stage-Storage

Stage	Elevation (m)	Area (m)	Volume		Outflow		
			Stage (m3)	Total (m3)	Orifice (L/s)	Weir (L/s)	Total (L/s)
Pond Bottom	73.35	4526	0	0	0		
	74.00	5108	1249	3129	0	0	0
	74.50	5571	1364	5799	0	0	0
Permanent Pool	74.85	8146	795	8259	0	0	0
Extended Detention	75.00	27946	2707	10966	15	0	15
2-year	75.07	28113	1962	12928	22	141	163
5-year	75.13	28256	1691	14620	26	358	384
100-year	75.28	28592	4264	18883	35	1131	1166
Top of Pond	75.58	29740	8750	27633	47	3373	3420

APPENDIX D

Drawings

GR1

GR2

GR3

GR4

BOUNDARY ROAD

WAREHOUSE
FFE=77.45

PROPOSED TOWER
RE-LOCATION AREA

SANITARY
PUMP STATION

SANITARY SEWAGE TREATMENT PLANT

SEDIMENT MANAGEMENT AREA
(AREA = 0.165Ha)

POND BOTTOM = 73.30m

ABOVE GROUND
STORAGE TANK

FIRE PUMP HOUSE
FFE=77.75

PAVEMENT STRUCTURES:

LIGHT DUTY (NEW PAVEMENT)
50mm SUPERPAVE 12.5
150mm GRAN "A"
300mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

HEAVY DUTY (NEW PAVEMENT)
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
450mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

LEGEND

- 75.65 — PROPOSED ELEVATION
- x 76.20 — EXISTING ELEVATION
- 75.45(D) — PROPOSED DITCH INVERT ELEVATION
- SWALE AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- 2.0% — SLOPE AND DIRECTION
- LEGAL LINES
- PROPOSED CULVERT
- DC — BARRIER CURB WITH DEPRESSION
- SANMH 100 — PROPOSED SANITARY MANHOLE
- STMMH 101 — PROPOSED STORM MANHOLE

NORTH

KEY PLAN
N.T.S.

THUNDER ROAD
HIGHWAY 417
CARLSBAD LANE
GR2
GR3
GR4
GR5
SITE
FRONTIER RD
BOUNDARY RD

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
6.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
5.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
3.	ISSUED FOR COORDINATION	MAR 26/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 14/18	LKS

SCALE
1:1000
1:1000
0 10 20 30 40

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
OVERALL GRADING PLAN

PROJECT No. 117217
REV REV # 6
DRAWING No. 117217-GR

C:\Temp\AcPublish_5796\117217-GR.dwg, GR, Apr 11, 2018 - 10:33am, lseely

4.0m - RIP-RAP LINED SWALE @ 0.1% (SEE DETAIL)

3.0m - GRASS SWALE @ 0.1% (SEE DETAIL)

3.0m - GRASS SWALE @ 0.25% (SEE DETAIL)

3.0m - GRASS SWALE @ 0.2% (SEE DETAIL)

BERM

SAN MH 100
T/G=76.36

SAN MH 102
T/G=76.36

SAN MH 104
T/G=76.36

STM MH 101 (1500mmØ)
T/G=76.43

STM MH 103
(1500mmØ)
T/G=77.35

5 RISERS
@ 0.15m

WOODED AREA

EX BOTTOM OF SLOPE

EX TOP OF SLOPE

EX DITCH

TOP OF SLOPE

BOTTOM OF SLOPE

Top of Pile
Elev. = 75.54

WAREHOUSE
FFE=77.45

PAVEMENT STRUCTURES:

LIGHT DUTY (NEW PAVEMENT)
50mm SUPERPAVE 12.5
150mm GRAN "A"
300mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

HEAVY DUTY (NEW PAVEMENT)
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
450mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

REFER TO DRAWING 117217-GRND FOR NOTES, DETAILS AND CROSS SECTION DETAILS

LEGEND

- 75.65 — PROPOSED ELEVATION
- x 76.20 — EXISTING ELEVATION
- 75.45(D) — PROPOSED DITCH INVERT ELEVATION
- SWALE AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX. (UNLESS OTHERWISE INDICATED)
- 2.0% — SLOPE AND DIRECTION
- LEGAL LINES
- PROPOSED CULVERT
- DC — BARRIER CURB WITH DEPRESSION
- SANMH 100 — PROPOSED SANITARY MANHOLE
- STMMH 101 — PROPOSED STORM MANHOLE

NORTH

KEY PLAN
N.T.S.

CARLSBAD LANE
HIGHWAY 417
THUNDER ROAD
GR1
GR2
GR3
GR4
SITE
BOUNDARY RD
FRONTIER RD

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

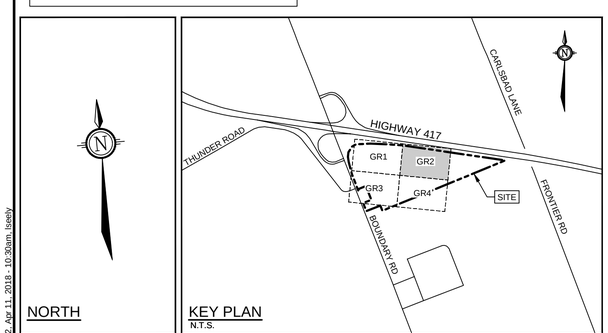
DRAWING NAME
GRADING PLAN

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GR1

C:\Temp\AcPublish_57\6\117217-GR.dwg, GR1, Apr 11, 2018 - 10:30am, tseely

WAREHOUSE
FFE=77.45

REFER TO DRAWING 117217-GRND FOR NOTES, DETAILS AND CROSS SECTION DETAILS



PAVEMENT STRUCTURES:

LIGHT DUTY (NEW PAVEMENT)
50mm SUPERPAVE 12.5
150mm GRAN "A"
300mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

HEAVY DUTY (NEW PAVEMENT)
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
450mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

LEGEND

- 75.65 — PROPOSED ELEVATION
- x 76.20 — EXISTING ELEVATION
- 75.45(D) — PROPOSED DITCH INVERT ELEVATION
- SWALE AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- 2.0% — SLOPE AND DIRECTION
- LEGAL LINES
- PROPOSED CULVERT
- DC — BARRIER CURB WITH DEPRESSION
- SANMH 100 — PROPOSED SANITARY MANHOLE
- STMMH 101 — PROPOSED STORM MANHOLE

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:
BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

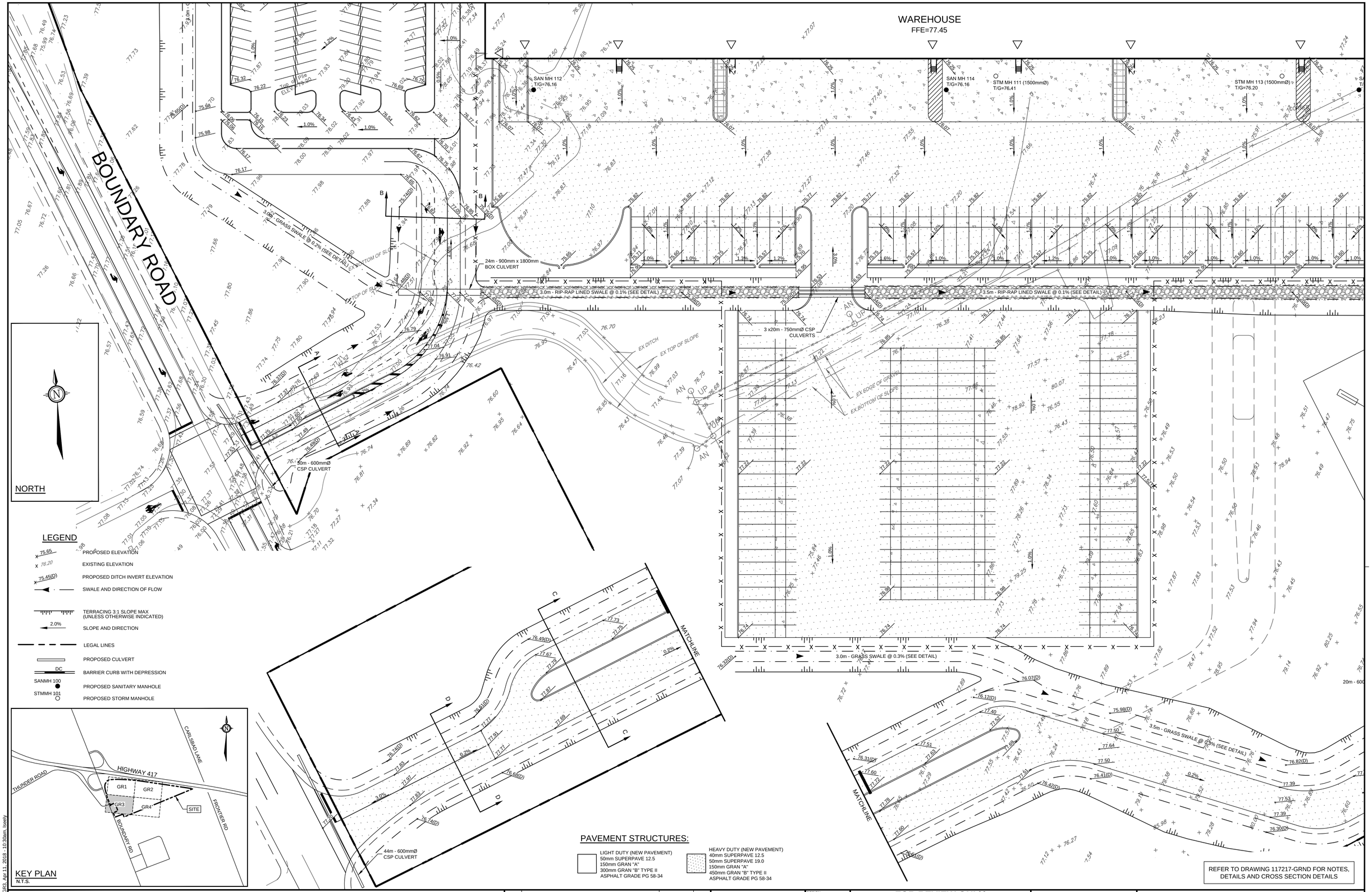
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GRADING PLAN

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GR2

C:\Temp\AcPublish_5796\117217-GR.dwg, GR2, Apr 11, 2018 - 10:30am, tseely



LEGEND

- PROPOSED ELEVATION (75.65)
- EXISTING ELEVATION (76.20)
- PROPOSED DITCH INVERT ELEVATION (75.45(D))
- SWALE AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- SLOPE AND DIRECTION (2.0%)
- LEGAL LINES
- PROPOSED CULVERT
- BARRIER CURB WITH DEPRESSION (DC)
- PROPOSED SANITARY MANHOLE (SANMH 100)
- PROPOSED STORM MANHOLE (STMMH 101)

KEY PLAN
N.T.S.

PAVEMENT STRUCTURES:

LIGHT DUTY (NEW PAVEMENT)
50mm SUPERPAVE 12.5
150mm GRAN "A"
300mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

HEAVY DUTY (NEW PAVEMENT)
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
450mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

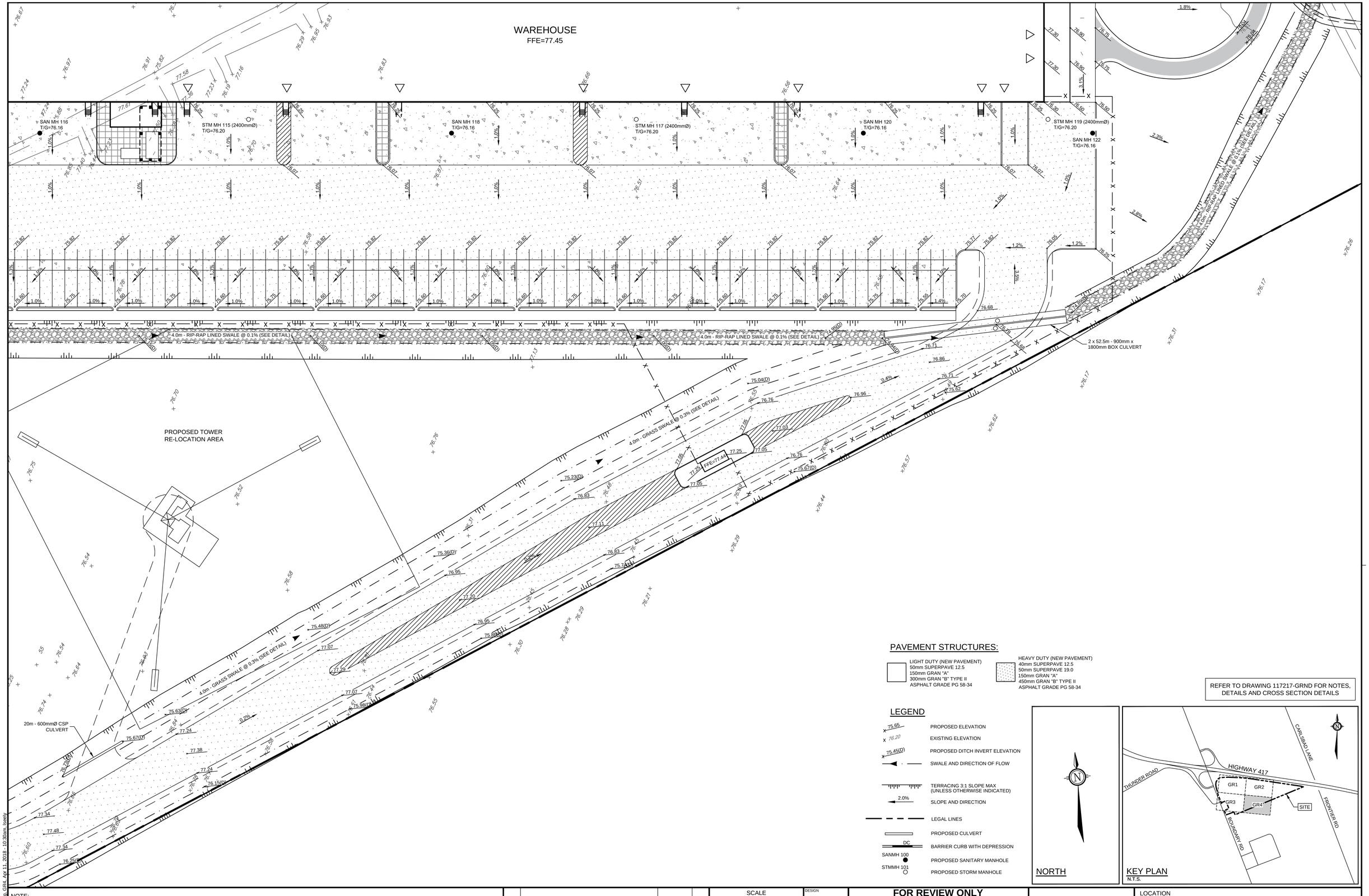
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GRADING PLAN

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GR3

C:\Temp\AcPublish_5796\117217-GR.dwg, GR3, Apr 11, 2018 - 10:39am, lseely



PAVEMENT STRUCTURES:

LIGHT DUTY (NEW PAVEMENT)
50mm SUPERPAVE 12.5
150mm GRAN "A"
300mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

HEAVY DUTY (NEW PAVEMENT)
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
450mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

REFER TO DRAWING 117217-GRND FOR NOTES, DETAILS AND CROSS SECTION DETAILS

LEGEND

- PROPOSED ELEVATION
- EXISTING ELEVATION
- PROPOSED DITCH INVERT ELEVATION
- SWALE AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX. (UNLESS OTHERWISE INDICATED)
- SLOPE AND DIRECTION
- LEGAL LINES
- PROPOSED CULVERT
- BARRIER CURB WITH DEPRESSION
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE: 1:500 (1:500 0 5 10 15 20)

DESIGN: MS
CHECKED: MS/JLS
DRAWN: LKS
CHECKED: MS/JLS
APPROVED: MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
APR 12/18
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GRADING PLAN

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GR4

C:\Temp\AcPublish_5796\117217-GR.dwg, GR4, Apr 11, 2018 - 10:30am, tseely

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00, INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT NO. PG4366-1 (DATED FEBRUARY 9, 2018) PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO THE STORMWATER MANAGEMENT REPORT (R-2018-034) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10 AND R25).

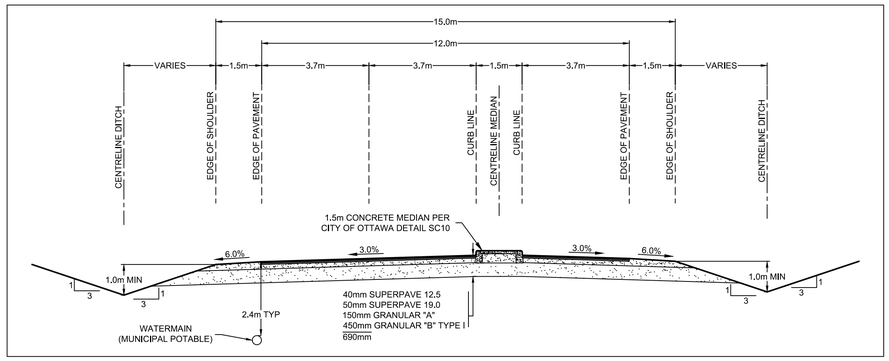
GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED BUILDING AND PAVED AREAS.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS.
3. THE PAVEMENT GRANULAR BASE AND SUBBASE SHOULD BE PLACED IN MAXIMUM 300mm THICK LIFTS AND COMPACTED TO A MINIMUM OF 98% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
4. GRADE AND/OR FILL BEHIND PROPOSED CURB AND BETWEEN BUILDINGS AND CURBS, WHERE REQUIRED TO PROVIDE POSITIVE DRAINAGE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
7. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
8. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING THE AS-BUILT ELEVATION OF EVERY DESIGN GRADE SHOWN ON THIS PLAN.

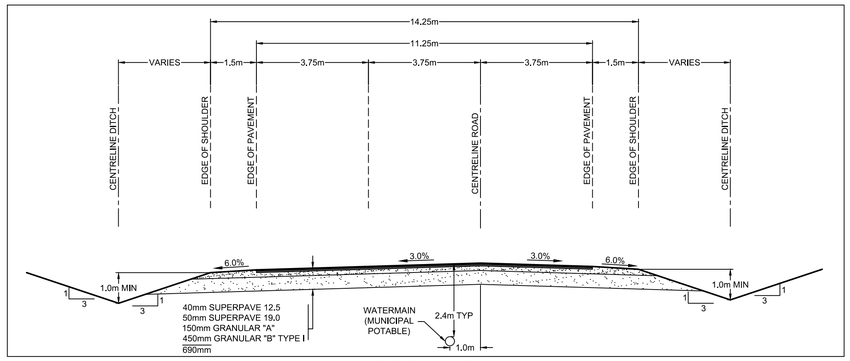
PAVEMENT STRUCTURES:

LIGHT DUTY (NEW PAVEMENT)
50mm SUPERPAVE 12.5
150mm GRAN "A"
300mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34

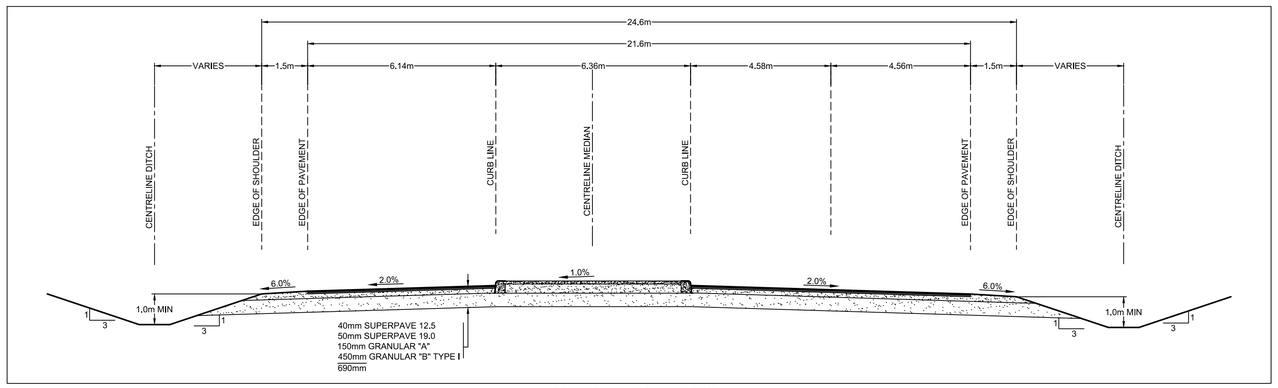
HEAVY DUTY (NEW PAVEMENT)
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
450mm GRAN "B" TYPE II
ASPHALT GRADE PG 58-34



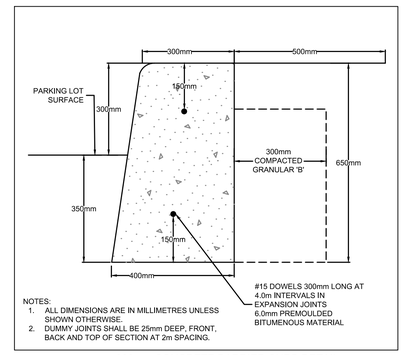
EMPLOYEE PARKING ACCESS ROAD
(HEAVY DUTY) CROSS-SECTION A-A
SCALE = 1:100



EMPLOYEE PARKING ACCESS ROAD
(HEAVY DUTY) CROSS-SECTION B-B
SCALE = 1:100

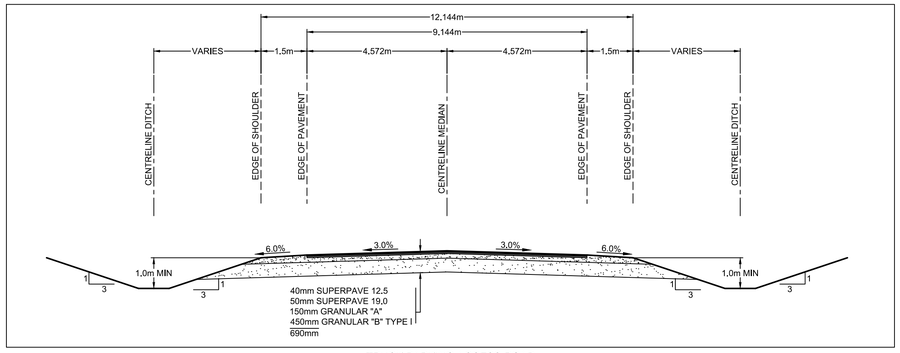


TRUCK PARKING ACCESS ROAD
(HEAVY DUTY) CROSS-SECTION C-C
SCALE = 1:100

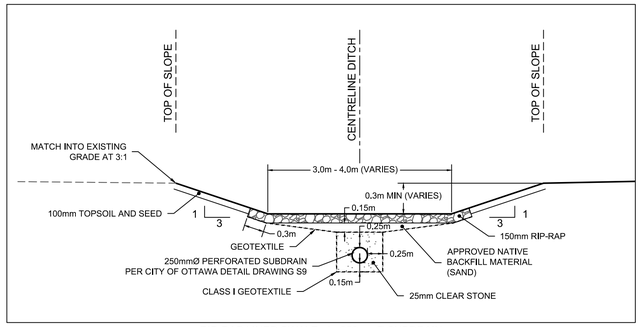


NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. DUMMY JOINTS SHALL BE 25mm DEEP, FRONT, BACK AND TOP OF SECTION AT 2m SPACING.

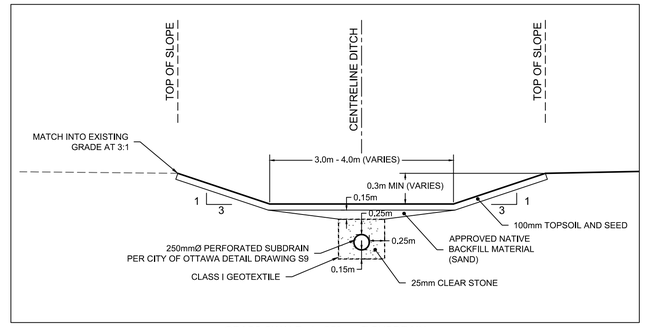
300mm CONCRETE BARRIER CURB DETAIL
SCALE = N.T.S.



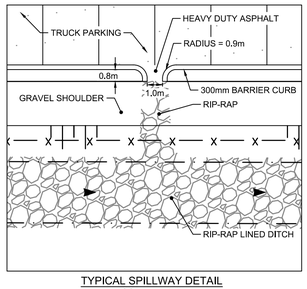
TRUCK PARKING ACCESS ROAD
(HEAVY DUTY) CROSS-SECTION D-D
SCALE = 1:100



RIP-RAP LINED SWALE c/w 250mmØ SUBDRAIN
TYPICAL CROSS-SECTION
SCALE = 1:50



GRASS SWALE c/w 250mmØ SUBDRAIN
TYPICAL CROSS-SECTION
SCALE = 1:50



TYPICAL SPILLWAY DETAIL
SCALE = 1:200

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:
BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
3.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
1.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS

SCALE: AS SHOWN

DESIGN: MS
CHECKED: MS/JLS
DRAWN: LKS
CHECKED: MS/JLS
APPROVED: MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
APR 12/18
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GRADING NOTES AND DETAILS

PROJECT No. 117217
REV REV # 3
DRAWING No. 117217-GRND

M:\2017\117217\CAD\Design\117217-GRND.dwg, GRND, Apr 11, 2018 - 10:41am, tkealy

GP1

GP2

GP3

GP4

BOUNDARY ROAD

WAREHOUSE
FF=77.45

PROPOSED TOWER
RE-LOCATION AREA

SANITARY
PUMP STATION

SANITARY SEWAGE TREATMENT PLANT

ABOVE GROUND
STORAGE TANK

FIRE PUMP HOUSE

INV.S=72.37
INV.N=72.34

LEGEND

	LEGAL LINES
	PROPOSED CULVERT
DC	BARRIER CURB WITH DEPRESSION
	SUBDRAIN AND DIRECTION OF FLOW
SANMH 100	PROPOSED SANITARY MH & SEWER
STMMH 101	PROPOSED STORM MANHOLE & SEWER
50mmØ WM (DOMESTIC)	PROPOSED WATERMAIN (MUNICIPAL POTABLE)
250mmØ WM (F.P.)	PROPOSED FIRE PROTECTION WATERMAIN
	PROPOSED CAP
HYD	PROPOSED HYDRANT
V&VB	PROPOSED VALVE
PIV	PROPOSED P.I.V. VALVE
	PROPOSED BEND
RD	PROPOSED ROOF DRAIN (APPROXIMATE LOCATION)
	THERMAL INSULATION

NORTH

KEY PLAN
N.T.S.

CARLSBAD LANE
HIGHWAY 417
THUNDER ROAD
GP1
GP2
GP3
GP4
SITE
FRONTIER RD
BOUNDARY RD

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
6.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
5.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
3.	ISSUED FOR COORDINATION	MAR 26/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 14/18	LKS

SCALE
1:1000
1:1000
0 10 20 30 40

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
APR 12/18
PROVINCE OF ONTARIO

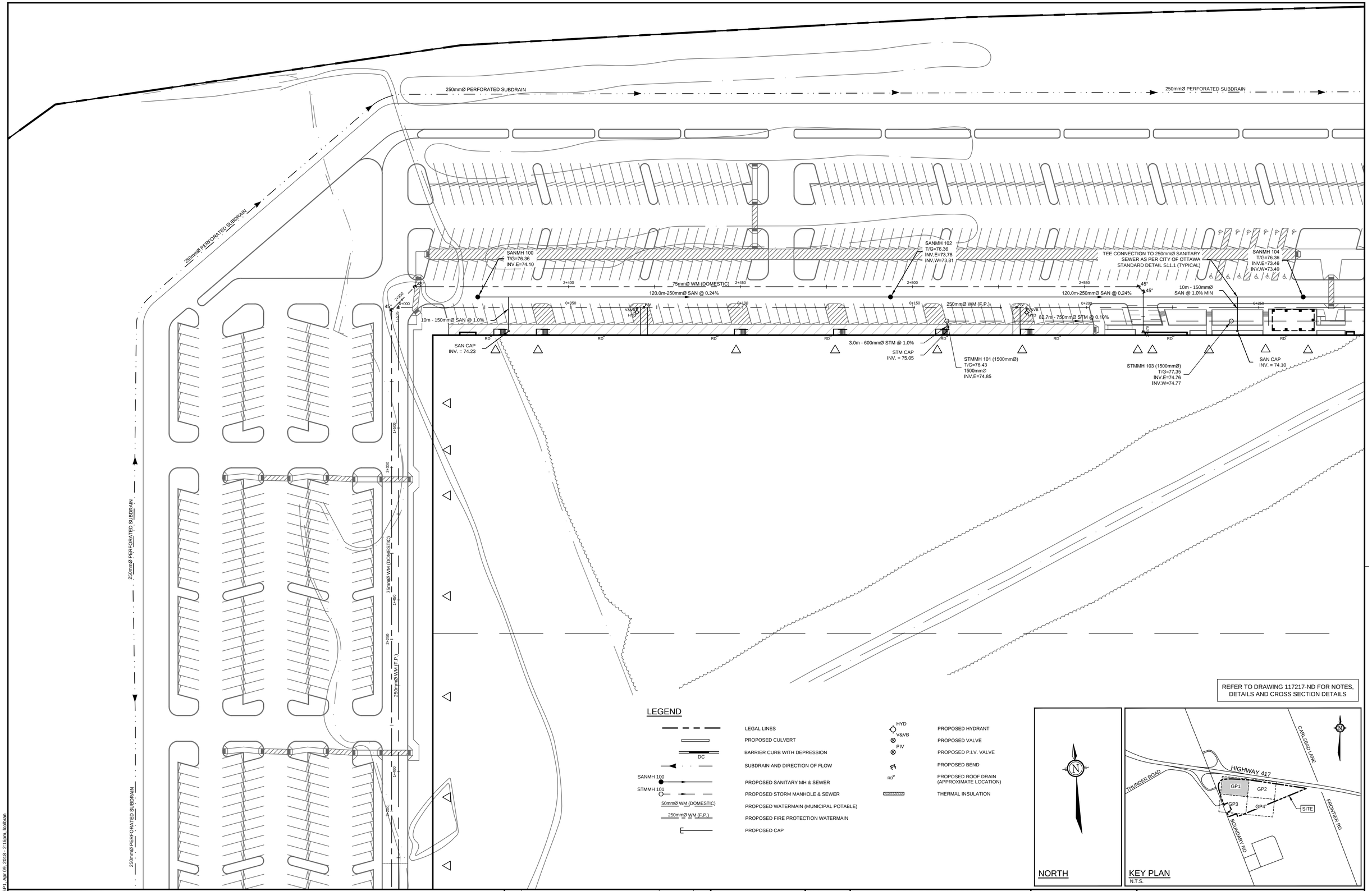
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
OVERALL PLAN OF SERVICES

PROJECT No. 117217
REV REV # 6
DRAWING No. 117217-GP

C:\Temp\AcPublish_57\961\17217-GP.dwg, GP, Apr 09, 2018 - 2:16pm, lcobran



NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GP1

C:\Temp\AcPublish_5796\117217-GP.dwg, GP1, Apr 09, 2018 - 2:16pm, lcotteran

250mmØ PERFORATED SUBDRAIN

EX POST AND WIRE FENCE

250mmØ PERFORATED SUBDRAIN

SANITARY PUMP STATION

SANITARY SEWAGE TREATMENT PLANT

44.6m-250mmØ SAN @ 0.24%

SANMH 106
T/G=76.36
INV.E=73.14
INV.W=73.17

SANMH 108
T/G=76.36
INV.E=72.82
INV.W=72.85

SANMH 110
T/G=76.36
INV.NE=72.05
INV.W=72.66
INV.S=72.11

CONNECTION TO 864mm x 1346mmØ
STORM SEWER AS PER CITY OF OTTAWA
STANDARD DETAIL S11.2 (TYPICAL)

TEE CONNECTION TO 250mmØ SANITARY
SEWER AS PER CITY OF OTTAWA
STANDARD DETAIL S11.1 (TYPICAL)

10m - 150mmØ
SAN @ 1.0% MIN

120.0m-250mmØ SAN @ 0.24%

120.0m-250mmØ SAN @ 0.24%

67.9m-250mmØ SAN @ 0.24%

9m - 150mmØ SAN @ 1.0% MIN

82.7m - 750mmØ STM @ 0.10%

3.0m - 375mmØ STM @ 1.0%

113.5m-864mm x 1346mmØ STM @ 0.10%

250mmØ WM (F.P.)

3.0m - 375mmØ STM @ 1.0%

120.0m - 864mm x 1346mmØ STM @ 0.10%

0+300 0+350 0+400 0+450 0+500 0+550

PIV V&VB HYD

RD

SAN CAP
INV. = 74.10

3.0m - 600mmØ STM @ 1.0%

STM CAP
INV. = 75.00

STMMH 105 (2400mmØ)
T/G=77.37
INV.E=74.67
INV.W=74.68

STM CAP
INV. = 74.97

STM CAP
INV. = 74.97

3.0m - 375mmØ STM @ 1.0%

STM CAP
INV. = 74.97

3.0m - 375mmØ
STM @ 1.0%

STM CAP
INV. = 74.97

STMMH 107 (2400mmØ)
T/G=76.43
INV.E=74.55
INV.W=74.56

STM CAP
INV. = 74.97

3.0m - 375mmØ
STM @ 1.0%

STM CAP
INV. = 74.97

3.0m - 375mmØ STM @ 1.0%

STM CAP
INV. = 74.97

SAN CAP
INV. = 74.10

STMMH 109 (2400mmØ)
T/G=76.43
INV.SE=74.42
INV.W=74.43

42.3m - 965mm x 1524mmØ STM @ 0.10%

2 x15m - 900mm x 1200mm
BOX CULVERT
INV.N=74.72
INV.S=75.70

INV. = 74.37
SEE POND DRAWINGS
FOR DETAILS

4m WIDE ACCESS ROAD

3:1

POND BOTTOM = 73.35m

3:1

ELEV = 73.35m

ELEV = 74.15m

ELEV = 74.95m

SEDIMENT MANAGEMENT AREA
(AREA = 0.165ha)

0+650

SANMH 124
T/G=77.30
INV.S=72.37
INV.N=72.34

250mmØ WM (F.P.)

4m WIDE ACCESS ROAD

ABOVE GROUND
STORAGE TANK

0+700

PIV

FIRE PUMP HOUSE

ABOVE GROUND
STORAGE TANK

3:1

POND BOTTOM = 73.35m

3:1

95.9m-250mmØ SAN @ 0.24%

CONNECTION TO 864mm x 1346mmØ
STORM SEWER AS PER CITY OF OTTAWA
STANDARD DETAIL S11.2 (TYPICAL)

79.7m - 965mm x 1524mmØ STM @ 0.10%

INV. = 74.33
SEE POND DRAWINGS
FOR DETAILS

WAREHOUSE
FFE=77.45

REFER TO DRAWING 117217-ND FOR NOTES, DETAILS AND CROSS SECTION DETAILS

NORTH

KEY PLAN
N.T.S.

CARLSBAD LANE

HIGHWAY 417

THUNDER ROAD

GP1

GP2

GP3

GP4

SITE

BOUNDARY RD

FRONTIER RD

LEGEND

	LEGAL LINES	HYD	PROPOSED HYDRANT
	PROPOSED CULVERT	V&VB	PROPOSED VALVE
DC	BARRIER CURB WITH DEPRESSION	PIV	PROPOSED P.I.V. VALVE
	SUBDRAIN AND DIRECTION OF FLOW		PROPOSED BEND
SANMH 100	PROPOSED SANITARY MH & SEWER	RD	PROPOSED ROOF DRAIN (APPROXIMATE LOCATION)
STMMH 101	PROPOSED STORM MANHOLE & SEWER		THERMAL INSULATION
50mmØ WM (DOMESTIC)	PROPOSED WATERMAIN (MUNICIPAL POTABLE)		
250mmØ WM (F.P.)	PROPOSED FIRE PROTECTION WATERMAIN		
	PROPOSED CAP		

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
APR 12/18
PROVINCE OF ONTARIO

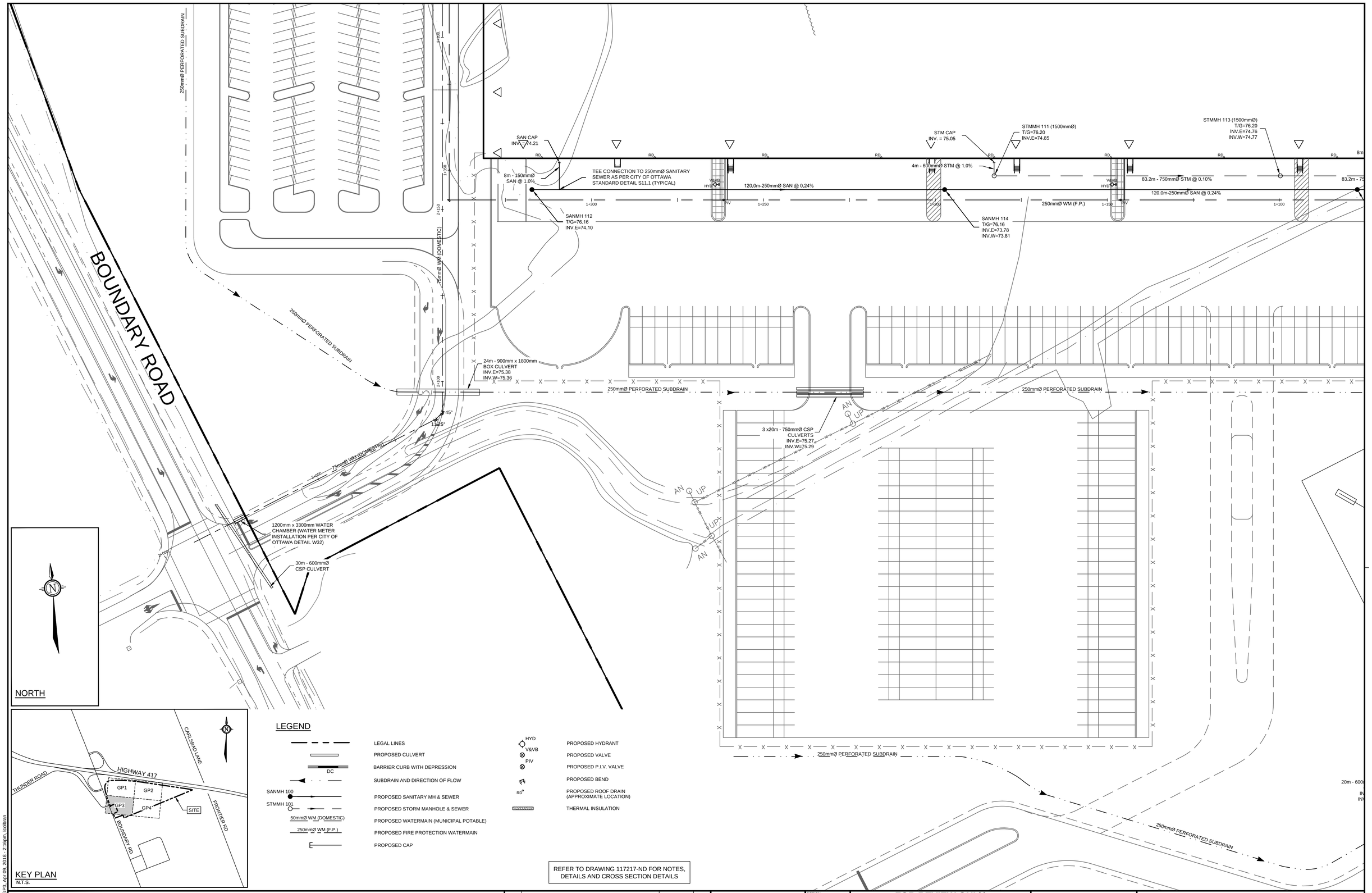
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GP2

C:\Temp\Acl\Publish_57901\117217-GP.dwg, GP2, Apr 09, 2018 - 2:16pm, lcobran



LEGEND

	LEGAL LINES
	PROPOSED CULVERT
DC	BARRIER CURB WITH DEPRESSION
	SUBDRAIN AND DIRECTION OF FLOW
SANMH 100	PROPOSED SANITARY MH & SEWER
STMMH 101	PROPOSED STORM MANHOLE & SEWER
50mmØ WM (DOMESTIC)	PROPOSED WATERMAIN (MUNICIPAL POTABLE)
250mmØ WM (F.P.)	PROPOSED FIRE PROTECTION WATERMAIN
	PROPOSED CAP
HYD	PROPOSED HYDRANT
V&VB	PROPOSED VALVE
PIV	PROPOSED P.I.V. VALVE
	PROPOSED BEND
RD	PROPOSED ROOF DRAIN (APPROXIMATE LOCATION)
	THERMAL INSULATION

REFER TO DRAWING 117217-ND FOR NOTES, DETAILS AND CROSS SECTION DETAILS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

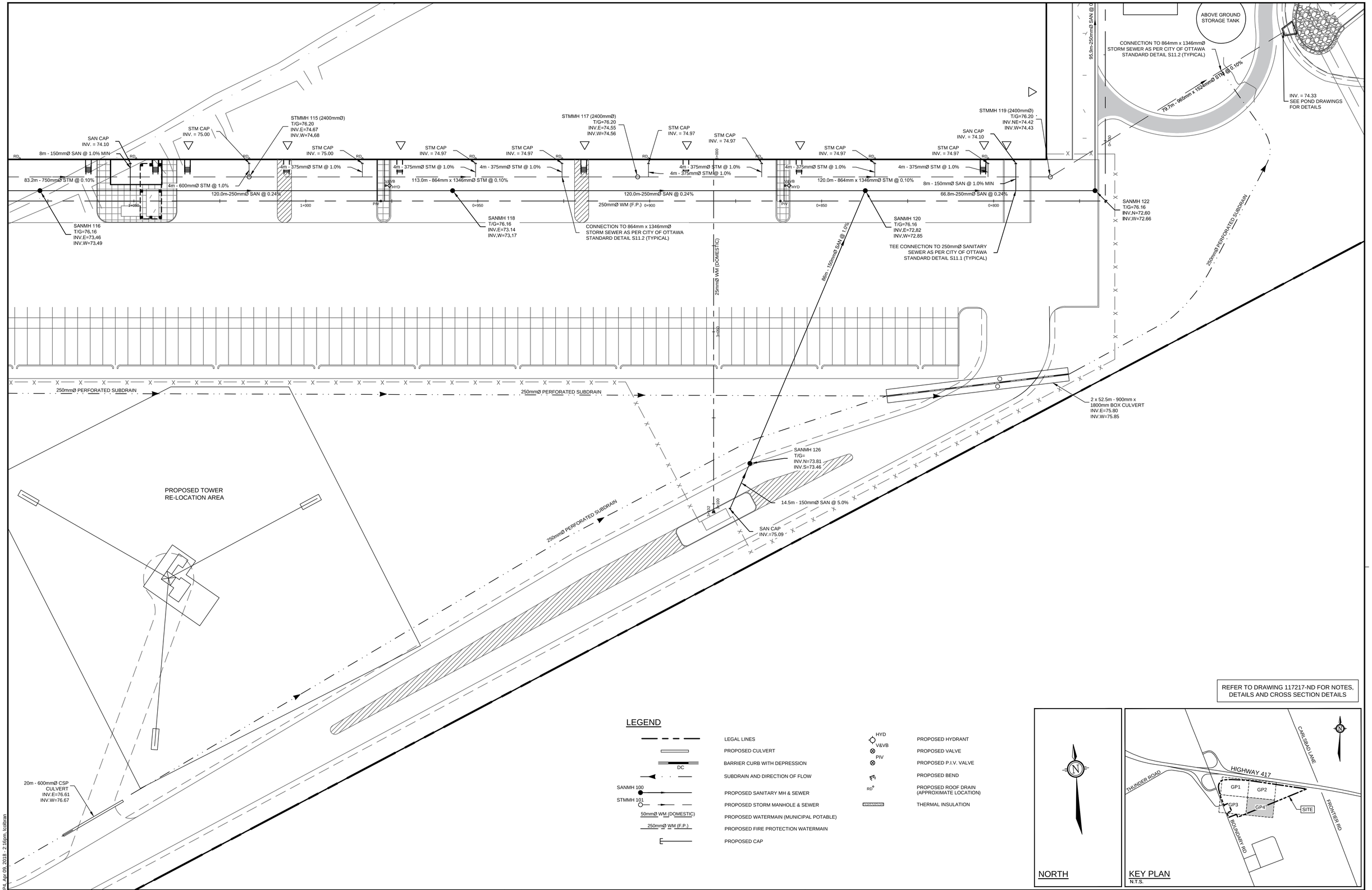
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GP3

C:\Temp\ACPublish_5796\117217-GP.dwg, GP3, Apr 09, 2018 - 2:16pm, lcollran



REFER TO DRAWING 117217-ND FOR NOTES, DETAILS AND CROSS SECTION DETAILS

LEGEND

	LEGAL LINES	HYD	PROPOSED HYDRANT
	PROPOSED CULVERT	V&VB	PROPOSED VALVE
DC	BARRIER CURB WITH DEPRESSION	PIV	PROPOSED P.I.V. VALVE
	SUBDRAIN AND DIRECTION OF FLOW		PROPOSED BEND
SANMH 100	PROPOSED SANITARY MH & SEWER	RD	PROPOSED ROOF DRAIN (APPROXIMATE LOCATION)
STMMH 101	PROPOSED STORM MANHOLE & SEWER		THERMAL INSULATION
50mmØ WM (DOMESTIC)	PROPOSED WATERMAIN (MUNICIPAL POTABLE)		
250mmØ WM (F.P.)	PROPOSED FIRE PROTECTION WATERMAIN		
	PROPOSED CAP		

NORTH

KEY PLAN
N.T.S.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
5.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
4.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
2.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS
1.	ISSUED FOR COORDINATION	MAR 12/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
APR 12/18
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 117217
REV REV # 5
DRAWING No. 117217-GP4

C:\Temp\AcPublish_5796\117217-GP-dwg, GP4, Apr 09, 2018 - 2:16pm, lcobran

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT NO. PG4366-1 (DATED FEBRUARY 9, 2018) PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO THE STORMWATER MANAGEMENT REPORT (R-2018-034) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10 AND R25).

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
SANITARY/STORM/CATCHBASIN MANHOLE (1200Ø)	701.010	OPSD
STORM MANHOLE (1500Ø)	701.011	OPSD
STORM MANHOLE (1800Ø)	701.012	OPSD
STORM MANHOLE (2400Ø)	701.013	OPSD
STORM/CATCHBASIN MH FRAME AND COVER	401.010 - TYPE 'B' OPEN	OPSD
CATCHBASIN (600x600)	705.010	OPSD
CATCHBASIN FRAME AND COVER	400.020	OPSD
STORM SEWER (375mmØ)	PVC DR 35	
STORM SEWER (750mmØ)	PVC DR 35	
STORM SEWER (864mm x 1346mm)	CONC. CLASS HE-II	
STORM SEWER (965mm x 1524mm)	CONC. CLASS HE-II	
SANITARY SEWER	PVC DR 35	
SEWER TRENCH - BEDDING (GRANULAR 'A') COVER (GRANULAR 'A')		

3. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
4. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
5. ALL STORM MANHOLES MANHOLES WITH PIPE SIZES LESS THAN 900mm ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED. ALL STORM MANHOLES WITH PIPE SIZES 900mm AND LARGER ARE TO BE BENCHED.
6. CONTRACTOR TO TELEVISE ALL PROPOSED SEWERS 200mm OR GREATER IN DIAMETER TO ENSURE THAT THEY ARE CLEAN AND OPERATIONAL. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES, OBTAIN APPROVAL FROM THE CITY'S SEWER OPERATIONS, PROVIDE THE CCTV INSPECTION AND REPORT TO THE ENGINEER FOR REVIEW AND APPROVAL.
7. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL APPLICABLE SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS AND ANY ALIGNMENT CHANGES, ETC.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.

WATERMAIN NOTES:

1. SUPPLY AND CONSTRUCT ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
THERMAL INSULATION BY OPEN STRUCTURES	W23	CITY OF OTTAWA
75mmØ WATER SERVICE	HDPE DR17	
25mmØ WATER SERVICE	TYPE 'K' COPPER	

3. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARD AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
5. PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

WATERMAIN NOTES ARE APPLICABLE FOR DOMESTIC SERVICES ONLY. REFER TO NOTES AND SPECIFICATIONS PREPARED BY CIVELEC CONSULTANTS INC. FOR FIRE PROTECTION WATERMAIN REQUIREMENTS.

PROPOSED WATERMAIN (250mm FIRE PROTECTION) TABLE

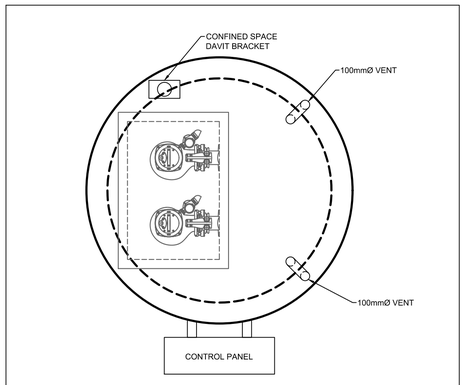
STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+031,9	76,39	73,65	CROSS BELOW 150mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
0+050,0	76,39	73,77	-
0+069,2	76,39	73,77	HYDRANT CONNECTION
0+070,2	76,39	73,77	250mm x 250mm x 250mm TEE
0+071,3	76,39	73,77	PIV
0+072,3	76,39	73,77	250mm x 250mm x 250mm TEE
0+100,0	76,39	73,77	-
0+150,0	76,39	73,77	-
0+200,0	76,39	73,77	-
0+208,9	76,55	73,77	250mm x 250mm x 250mm TEE
0+209,9	76,55	73,77	PIV
0+211,0	76,55	73,77	250mm x 250mm x 250mm TEE
0+212,8	76,39	73,77	HYDRANT CONNECTION
0+216,5	76,39	73,77	CROSS ABOVE 75mmØ WM (±0.30m CLEARANCE)
0+243,8	76,55	73,52	CROSS BELOW 150mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
0+250,0	76,55	73,77	-
0+300,0	76,55	73,77	-
0+320,9	76,55	73,52	CROSS BELOW 150mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
0+350,9	76,55	73,77	250mm x 250mm x 250mm TEE
0+351,9	76,39	73,77	PIV
0+352,9	76,39	73,77	250mm x 250mm x 250mm TEE
0+353,9	76,39	73,77	HYDRANT CONNECTION
0+400,0	76,39	73,77	-
0+450,0	76,39	73,77	-
0+494,2	76,39	73,77	250mm x 250mm x 250mm TEE
0+495,2	76,39	73,77	PIV
0+496,3	76,39	73,77	250mm x 250mm x 250mm TEE
0+497,3	76,39	73,77	HYDRANT CONNECTION
0+547,7	76,55	73,53	CROSS BELOW 150mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
0+570,8	76,39	73,77	CROSS ABOVE 250mmØ SAN (±1,11m CLEARANCE)
0+573,8	76,30	73,68	90° HORIZONTAL BEND
0+587,4	76,65	73,76	CROSS BELOW 956mm x 1524mm STM AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
0+600,0	76,65	74,25	-
0+650,0	76,80	74,40	-
0+697,9	76,71	74,31	250mm x 250mm x 250mm TEE
0+702,3	76,72	74,32	PIV
0+706,8	76,71	74,31	250mm x 250mm x 250mm TEE
0+750,6	76,27	73,76	CROSS BELOW 956mm x 1524mm STM AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
0+767,5	75,94	73,54	90° HORIZONTAL BEND
0+800,0	76,13	73,73	-
0+850,0	76,13	73,73	-
0+860,9	76,13	73,73	250mm x 250mm x 250mm TEE
0+862,0	76,13	73,73	PIV
0+863,0	76,13	73,73	250mm x 250mm x 250mm TEE
0+900,0	76,13	73,73	-
0+950,0	76,13	73,73	-
0+977,1	76,13	73,73	250mm x 250mm x 250mm TEE
0+978,2	76,13	73,73	PIV
0+979,2	76,13	73,73	250mm x 250mm x 250mm TEE
1+000,0	76,13	73,73	-
1+050,0	76,28	73,73	-
1+100,0	76,13	73,73	-
1+110,4	76,13	73,73	CROSS ABOVE 25mmØ WM (±0.30m CLEARANCE)
1+111,4	76,13	73,06	CROSS BELOW 250mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
1+120,2	76,13	73,73	250mm x 250mm x 250mm TEE
1+121,3	76,13	73,73	PIV
1+122,3	76,13	73,73	250mm x 250mm x 250mm TEE
1+150,0	76,13	73,73	-
1+200,0	76,28	73,73	-
1+250,0	76,13	73,73	-
1+260,5	76,13	73,73	250mm x 250mm x 250mm TEE
1+261,6	76,13	73,73	PIV
1+262,6	76,13	73,73	250mm x 250mm x 250mm TEE
1+300,0	76,13	73,73	-
1+341,4	76,76	74,36	90° HORIZONTAL BEND
1+350,0	76,80	74,40	-
1+400,0	76,79	74,39	-
1+450,0	76,91	74,51	-
1+500,0	76,72	74,32	-
1+535.1	76,50	73,88	90° HORIZONTAL BEND

PROPOSED WATERMAIN (25mm DOMESTIC) TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
3+001,0	76,24	73,84	CAP 1,0m FROM BUILDING FACE
3+005,0	76,20	73,80	CROSS BELOW 864mm x 1346mm STM AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
3+009,0	76,16	73,76	CROSS ABOVE 250mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
3+012,0	76,13	73,15	CROSS BELOW 250mmØ WM (±0,30m CLEARANCE)
3+025,0	76,00	73,60	-
3+050,0	75,75	73,35	-
3+075,0	77,00	74,60	-
3+100,0	77,03	74,63	-
3+102,0	77,20	74,80	CAP 1,0m FROM BUILDING FACE

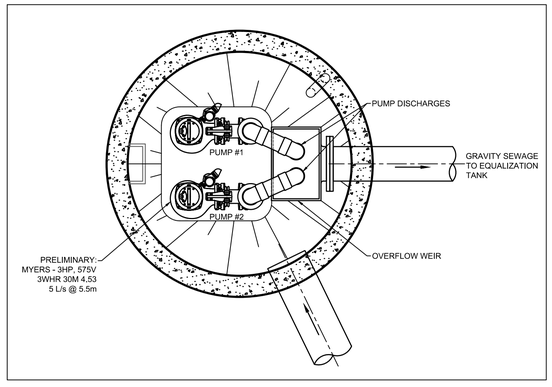
PROPOSED WATERMAIN (75mm DOMESTIC) TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
2+009,5	77,55	75,15	TEE CONNECTION TO EX. 75mmØ WM
2+026,2	77,35	74,95	VALVE CHAMBER
2+0,50,0	77,15	74,75	-
2+075,0	76,86	74,46	-
2+088,2	77,16	74,76	11,25° HORIZONTAL BEND
2+091,0	77,21	74,81	45° HORIZONTAL BEND
2+097,0	77,28	74,66	CROSS BELOW BOX CULVERT (±0.50m CLEARANCE), INSULATE PER CITY OF OTTAWA STANDARD W21
2+125,0	77,02	74,62	-
2+150,0	76,73	74,33	-
2+175,0	76,86	74,46	-
2+200,0	76,82	74,42	-
2+225,0	76,73	74,33	-
2+250,0	76,83	74,43	-
2+275,0	76,84	74,44	-
2+300,0	76,73	74,33	-
2+325,0	76,64	74,24	-
2+345,8	76,50	74,10	45° HORIZONTAL BEND
2+355,3	76,38	73,71	45° HORIZONTAL BEND
2+375,0	76,33	73,71	-
2+400,0	76,33	73,71	-
2+425,0	76,33	73,71	-
2+450,0	76,33	73,71	-
2+475,0	76,33	73,71	-
2+500,0	76,33	73,71	-
2+525,0	76,33	73,71	-
2+550,0	76,33	73,71	-
2+565,7	76,33	73,71	45° HORIZONTAL BEND
2+567,7	76,35	73,73	45° HORIZONTAL BEND
2+569,3	76,36	73,09	CROSS BELOW 250mmØ SAN AS PER CITY OF OTTAWA STANDARD W25 (±0,50m CLEARANCE)
2+572,3	76,39	73,19	CROSS BELOW 250mmØ WM (±0,30m CLEARANCE)
2+576,3	76,43	73,81	CROSS BELOW 750mmØ STM (±0.95m CLEARANCE)
2+579,3	77,44	73,84	CAP 1,0m FROM BUILDING FACE



2400mmØ SANITARY PUMP STATION WET WELL - PLAN VIEW

SCALE: N.T.S.



2400mmØ SANITARY PUMP STATION WET WELL - PLAN VIEW

SCALE: N.T.S.

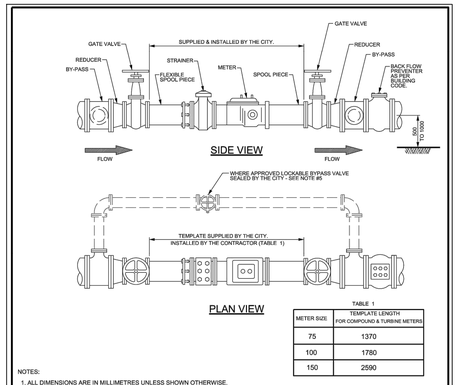


TABLE 1

METER SIZE	TEMPLATE LENGTH FOR COMPOUND & TURBINE METERS
75	1370
100	1780
150	2590

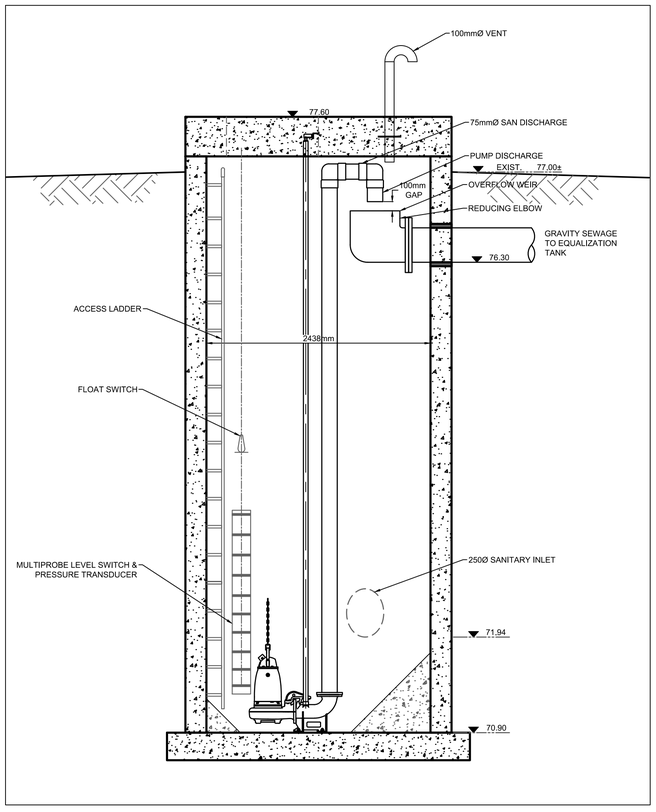
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. METER TYPE AND SIZE AS DETERMINED BY CITY - CITY TO SUPPLY TEMPLATE TO CONTRACTOR.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PIPING & VALVES AND PROVIDE FLANGED ENDS TO MATCH CITY TEMPLATE.
4. METER SHALL BE INSTALLED HORIZONTALLY.
5. ALL VALVES SHALL BE VISIBLE & ACCESSIBLE. BYPASS VALVE SHALL BE LOCKABLE.
6. ALL INSTALLATIONS SHALL HAVE THE RADIO BASED ENDPOINT LOCATION APPROVED BY THE CITY. ENDPOINT SHALL BE MIN 150 BELOW OBSTACLES TO ENABLE READING OF SERIAL NUMBER. ENDPOINT SHALL NOT BE INSTALLED MORE THAN 90m FROM THE WATER METER.
7. ELSEWHERE 1000mm TO 1200mm ABOVE GROUND. NOT TO BE INSTALLED WITHIN 3000mm OF ADJACENT STRUCTURES TO ENABLE ADEQUATE SIGNAL SCATTER.
8. FOR ACCESS, INSTALL ENDPOINT ON BUILDING ON STREET SIDE OF FENCING.
9. ALL METERS INSTALLED BY CONTRACTOR SHALL BE INSPECTED BY CITY PRIOR TO TURN ON OF WATER.
10. THE DIAMETER OF THE BYPASS SHALL BE MINIMUM 50mm OR HALF THE DIAMETER OF THE MAIN LINE, WHICHEVER IS GREATER.
11. GATE VALVES SHALL NOT BE SUBSTITUTED WITH BUTTERFLY VALVES. FULL PIPE FLOW IS NECESSARY FOR ACCURATE METER REGISTRATION.
12. A FREE AND UNOBSTRUCTED PASSAGEWAY MUST BE PROVIDED AND MAINTAINED WITH NO PARTITION OR STORED MATERIAL WITHIN 500mm OF THE METER.
13. INSTALL A CONTINOUS CONDUIT FROM THE WATER METER TO THE ENDPOINT DEVICE. RUN THE WATER METER READER WIRE AND ONE DRAW STRING THROUGH THE CONDUIT.
14. ALL MATERIALS SHALL BE IN ACCORDANCE WITH MW-19.15.
15. REFER TO MW-19.6 FOR ADDITIONAL REQUIREMENTS.

N.T.S.

Ottawa

TYPICAL WATER METER INSTALLATION 75mm AND LARGER

DATE:	MAY 2001
REV. DATE:	MARCH 2016
DWG. No.:	W32



2400mmØ SANITARY PUMP STATION WET WELL - SECTION

SCALE: N.T.S.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
3.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
1.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS

SCALE: AS NOTED

DESIGN: MS
CHECKED: MS/JLS
DRAWN: LKS
CHECKED: MS/JLS
APPROVED: MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER M. SAVIC 100102651 APR 12/18 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
SERVICING NOTES AND DETAILS

PROJECT No. 117217
REV REV # 3
DRAWING No. 117217-GPND

M:\2017\117217\CAD\Design\117217-GPND.dwg GPND, Apr 11, 2018 - 10:37am, tlasely

TRANS CANADA HIGHWAY

TEMPORARY

PERMANENT

TEMPORARY

TEMPORARY SEDIMENT POND

TEMPORARY

PERMANENT

WAREHOUSE
FFE=77.45

BOUNDARY ROAD

M M

SITE ACCESS

THUNDER ROAD

INSTALL MUD MAT AT CONSTRUCTION ACCESS - PER MUD MAT DETAIL

SITE TRUCK ACCESS

M M

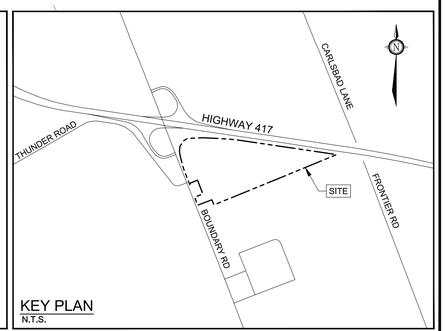
LEGEND

- LIGHT DUTY SILT FENCE PER OPSD 219.110
- TEMPORARY SWALE
- ROCK FLOW CHECK DAM PER OPSD 219,210
- M M — MUD MAT (SEE DETAIL)

REFER TO DRAWING 117217-ESND FOR NOTES AND DETAILS

NORTH

KEY PLAN
N.T.S.



NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
3.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
1.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS

SCALE
1:1500
1:1500
0 15 30 45 60

DESIGN MS
CHECKED MS/JLS
DRAWN LKS
CHECKED MS/JLS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
APR 12/18
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 117217
REV REV # 3
DRAWING No. 117217-ESC

M:\2017\117217\CAD\Design\117217-ESC.dwg, ESC, Apr 09, 2018 - 2:22pm, lcobran

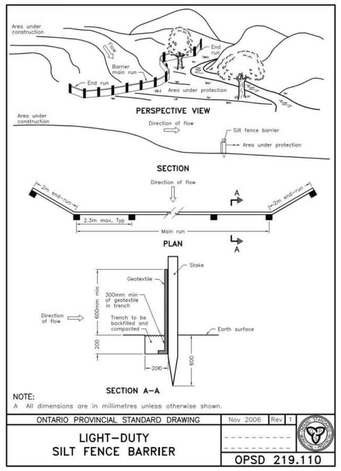
GENERAL NOTES:

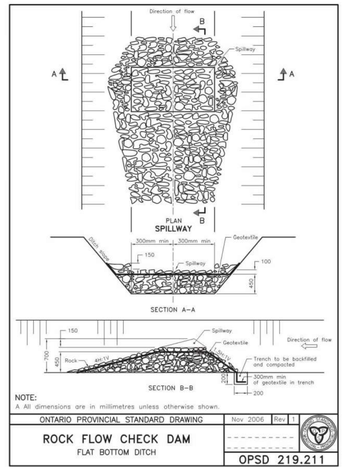
1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT NO. PG4366-1 (DATED FEBRUARY 9, 2018) PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO THE STORMWATER MANAGEMENT REPORT (R-2018-034) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10 AND R25).

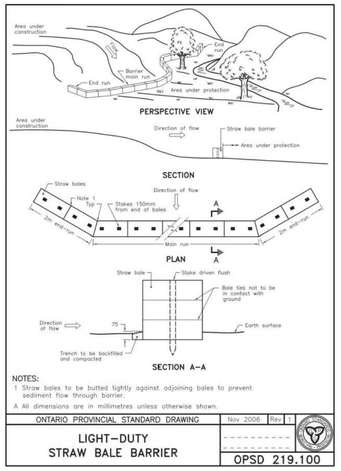
EROSION AND SEDIMENT CONTROL NOTES :

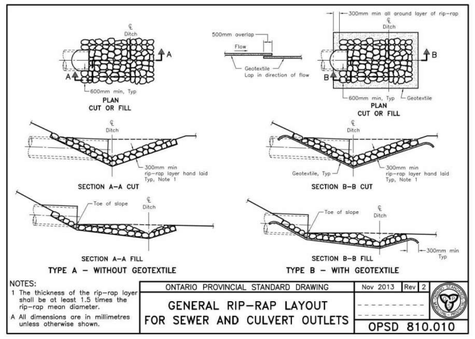
THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

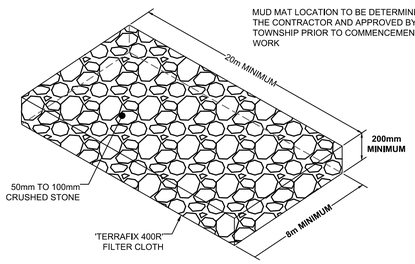
1. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA, THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
2. EROSION AND SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED DURING CONSTRUCTION IN ACCORDANCE WITH THE "GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES" (GOVERNMENT OF ONTARIO, MAY 1987). THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY AGENCY REQUIREMENTS.
3. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER CLOTH WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
4. TO LIMIT EROSION: MINIMIZE THE AMOUNT OF EXPOSED SOILS AT ANY GIVEN TIME, RE-VEGETATE EXPOSED AREAS AND SLOPES AS SOON AS POSSIBLE AND PROTECT EXPOSED SLOPES WITH NATURAL OR SYNTHETIC MULCHES.
5. FOR MATERIAL STOCKPILING: MINIMIZE THE AMOUNT OF EXPOSED MATERIALS AT ANY GIVEN TIME; APPLY TEMPORARY SEEDING, TARPS, COMPACTION AND/OR SURFACE ROUGHENING AS REQUIRED TO STABILIZE STOCKPILED MATERIALS THAT WILL NOT BE USED WITHIN 14 DAYS.
6. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
7. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
8. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
9. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE REPRESENTATIVE OF THE MUNICIPALITY.
10. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS. MONITOR DUST LEVELS DURING SITE PREPARATION/EXCAVATION, AND CONSTRUCTION ACTIVITIES, AND WHEN DUST LEVELS BECOME VISUALLY APPARENT SPRAY WATER TO MINIMIZE THE RELEASE OF DUST FROM GRAVEL, PAVED AREAS AND EXPOSED SOILS. USE CHEMICAL DUST SUPPRESSANTS ONLY WHERE NECESSARY ON PROBLEM AREAS











MUD MAT DETAIL
NTS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:
BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
3.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
1.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS

SCALE: AS SHOWN

DESIGN: MS
CHECKED: MS/JLS
DRAWN: LKS
CHECKED: MS/JLS
APPROVED: MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
PROVINCE OF ONTARIO
APR 12/18

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

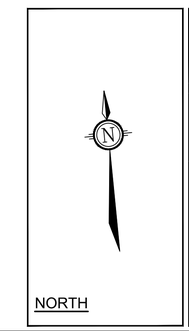
DRAWING NAME
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

PROJECT No. 117217
REV REV # 3
DRAWING No. 117217-ESND

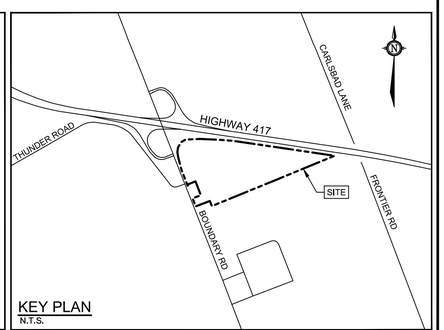
M:\2017\117217\CAD\Design\117217-ESC.dwg, ESND, Apr 09, 2018 - 2:52pm, lcolbran

TRANS CANADA HIGHWAY

BOUNDARY ROAD



NORTH



KEY PLAN
N.T.S.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS

SCALE
1:1500
1:1500
0 15 30 45 60

DESIGN -
CHECKED -
DRAWN LKS
CHECKED -
APPROVED -

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
K. J. AULD
100187063
Apr. 12/18
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
BOUNDARY ROAD DISTRIBUTION CENTRE - YOW1

DRAWING NAME
PRE-DEVELOPMENT
STORM DRAINAGE AREA PLAN

PROJECT No. 117217
REV REV # 1
DRAWING No. 117217-PRE

M:\2017\117217\CAD\Design\SWM\117217-STM.dwg, PRE, Mar 29, 2018 - 9:52am, lseely

TRANS CANADA HIGHWAY

BOUNDARY ROAD

WAREHOUSE

SWM FACILTY

3.71 ha	A-01	0.59
1.52 ha	A-02	0.69
2.22 ha	A-03	0.75
2.23 ha	B-01	0.51
0.88 ha	B-02	0.70
0.79 ha	B-03	0.77
2.46 ha	B-04	0.80
1.17 ha	B-05	0.56
1.84 ha	B-06	0.56
3.83 ha	B-07	0.30
1.30 ha	R-01	0.90
0.72 ha	R-02	0.90
0.72 ha	R-03	0.90
0.98 ha	R-04	0.90
1.03 ha	R-05	0.90
1.30 ha	R-06	0.90
0.71 ha	R-07	0.90
0.73 ha	R-08	0.90
0.98 ha	R-09	0.90
1.04 ha	R-10	0.90
8.83 ha	POND	0.45

NORTH

KEY PLAN
N.T.S.

HIGHWAY 417
CARLSBAD LANE
THUNDER ROAD
SITE
FRONTIER RD
BOUNDARY RD

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS

SCALE
1:1500
1:1500
0 15 30 45 60

DESIGN -
CHECKED -
DRAWN LKS
CHECKED -
APPROVED -

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
K. J. AULD
100187063
Apr. 12/18
PROVINCE OF ONTARIO

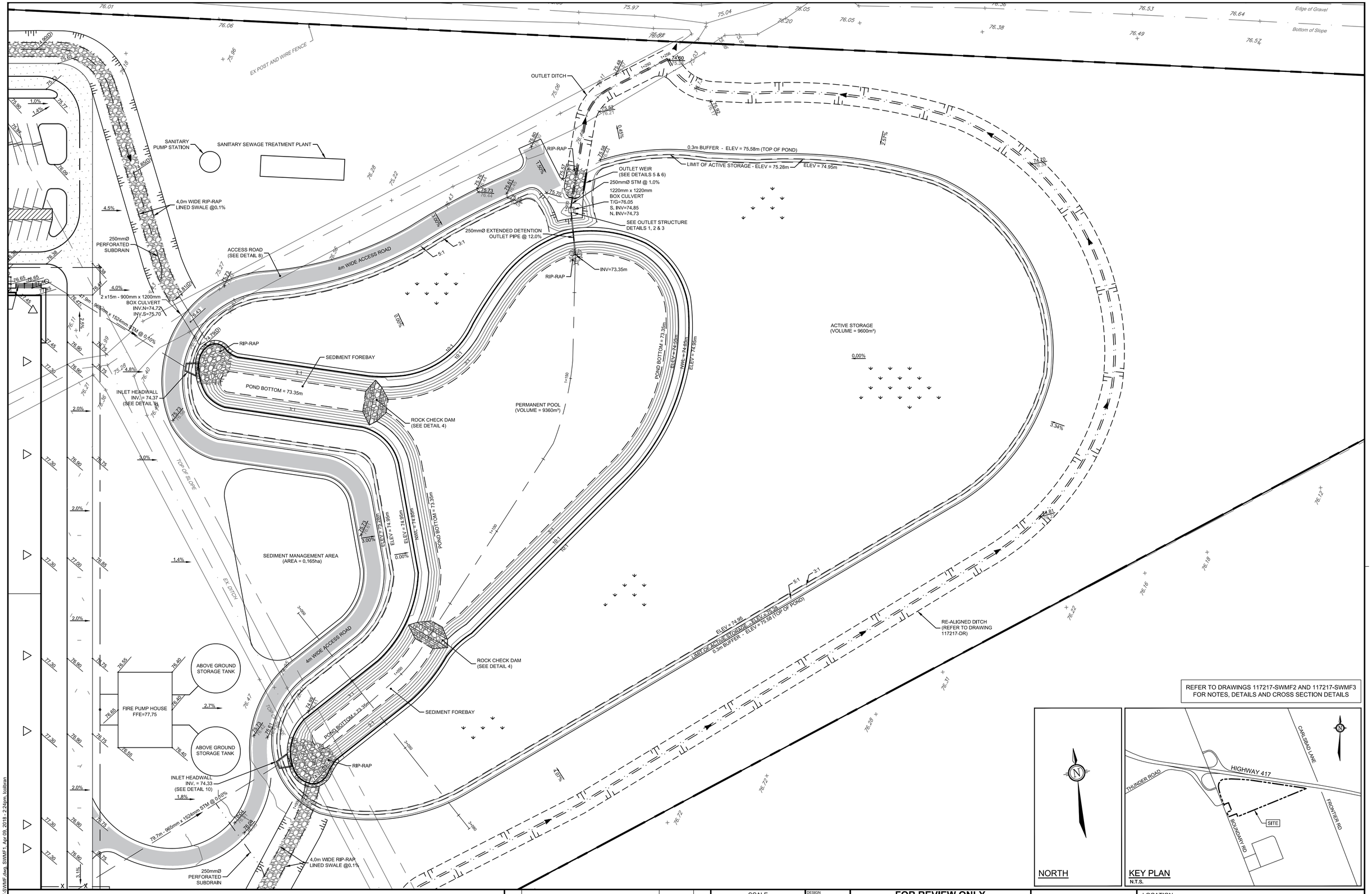
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
BOUNDARY ROAD DISTRIBUTION CENTRE - YOW1

DRAWING NAME
POST-DEVELOPMENT
STORM DRAINAGE AREA PLAN

PROJECT No. 117217
REV REV # 1
DRAWING No. 117217-POST

M:\2017\117217\CAD\Design\SWM\117217-STM.dwg, POST, Mar 28, 2018 - 9:52am, lseely



REFER TO DRAWINGS 117217-SWMF2 AND 117217-SWMF3 FOR NOTES, DETAILS AND CROSS SECTION DETAILS

NORTH

KEY PLAN
N.T.S.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
4.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
1.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS

SCALE
1:500
1:500
0 5 10 15 20

DESIGN LKS/KA
CHECKED MP
DRAWN LKS
CHECKED KA/MP
APPROVED KA/MP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
K. J. AULD
100187063
Apr. 12/18
PROVINCE OF ONTARIO

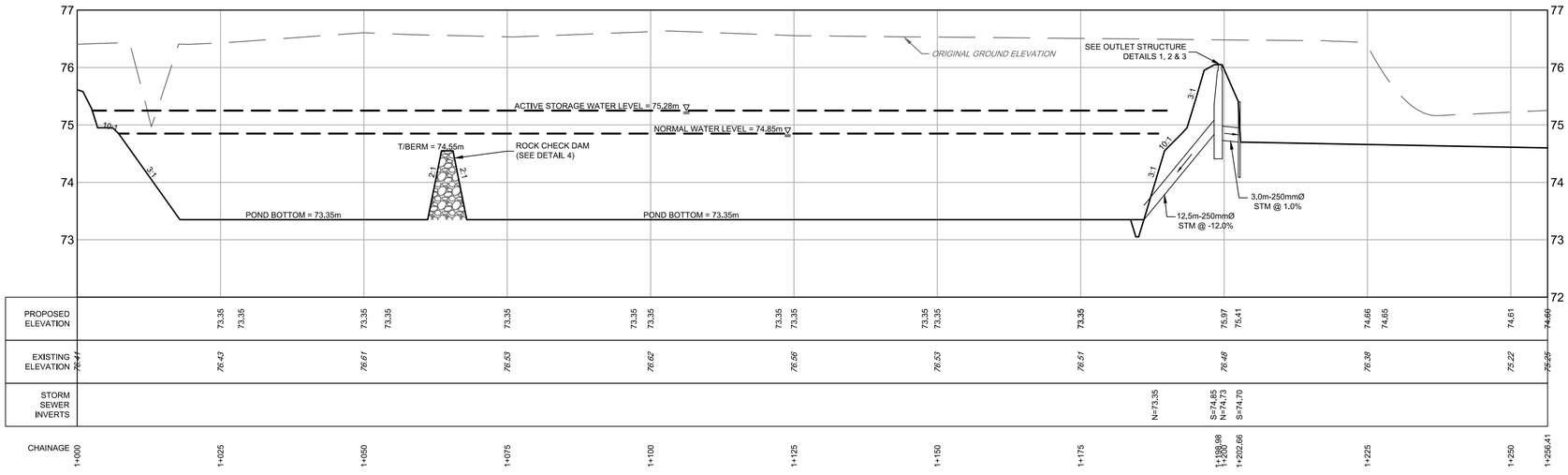
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
STORMWATER MANAGEMENT FACILITY - PLAN

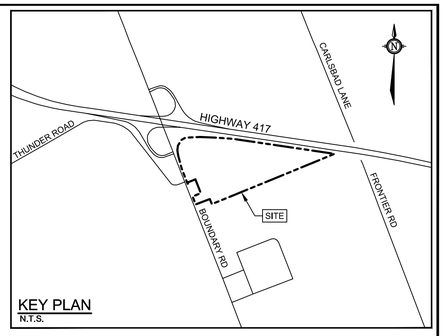
PROJECT No. 117217
REV REV # 4
DRAWING No. 17217-SWMF1

M:\2017\117217\CAD\Design\SWM\117217-SWMF.dwg, SWMF1, Apr 09, 2018 - 2:24pm, lcobran



POND FLOW PATH SECTION

POND FOREBAY SECTION



KEY PLAN
N.T.S.

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT NO. PG4366-1 (DATED FEBRUARY 9, 2018) PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO THE STORMWATER MANAGEMENT REPORT (R-2018-034) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10 AND R25).

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
SANITARY/STORM/CATCHBASIN MANHOLE (1200Ø)	701.010	OPSD
STORM MANHOLE (1500Ø)	701.011	OPSD
STORM MANHOLE (1800Ø)	701.012	OPSD
STORM MANHOLE (2400Ø)	701.013	OPSD
STORM/CATCHBASIN MH FRAME AND COVER	401.010 - TYPE 'B' OPEN	OPSD
CATCHBASIN (600x600)	705.010	OPSD
CATCHBASIN FRAME AND COVER	400.020	OPSD
STORM SEWER (750mmØ)	PVC DR 35	
STORM SEWER (864mm x 1346mm)	CONC. 65-D	
STORM SEWER (965mm x 1524mm)	CONC. 65-D	
SANITARY SEWER	PVC DR 35	
SEWER TRENCH - BEDDING (GRANULAR 'A') COVER (GRANULAR 'A')		

3. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
4. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL), THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
5. ALL STORM MANHOLES MANHOLES WITH PIPE SIZES LESS THAN 900mm ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED, ALL STORM MANHOLES WITH PIPE SIZES 900mm AND LARGER ARE TO BE BENCHED.
6. CONTRACTOR TO TELEVISE ALL PROPOSED SEWERS 200mm OR GREATER IN DIAMETER TO ENSURE THAT THEY ARE CLEAN AND OPERATIONAL, UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES. OBTAIN APPROVAL FROM THE CITY'S SEWER OPERATIONS. PROVIDE THE CCTV INSPECTION AND REPORT TO THE ENGINEER FOR REVIEW AND APPROVAL.
7. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL APPLICABLE SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN, AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS AND ANY ALIGNMENT CHANGES, ETC.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED BUILDING AND PAVED AREAS.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS.
3. THE PAVEMENT GRANULAR BASE AND SUBBASE SHOULD BE PLACED IN MAXIMUM 300mm THICK LIFTS AND COMPACTED TO A MINIMUM OF 98% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
4. GRADE AND/OR FILL BEHIND PROPOSED CURB AND BETWEEN BUILDINGS AND CURBS, WHERE REQUIRED TO PROVIDE POSITIVE DRAINAGE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
7. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
8. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING THE AS-BUILT ELEVATION OF EVERY DESIGN GRADE SHOWN ON THIS PLAN.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:
BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
4.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
1.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS

SCALE
1:500 HORIZONTAL (0 5 10 15 20)
1:50 VERTICAL (0 0.5 1.0 1.5 2.0)

DESIGN LKS/KA
CHECKED MP
DRAWN LKS
CHECKED KA/MP
APPROVED KA/MP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER K. J. AULD 100187063 Apr. 12/18 PROVINCE OF ONTARIO

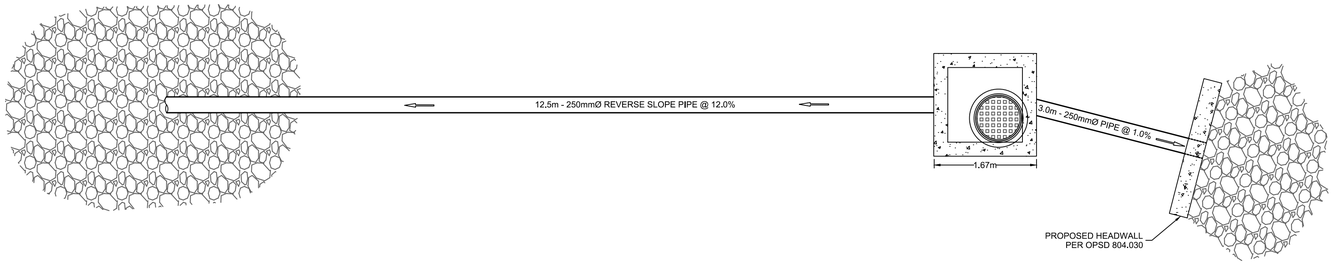
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

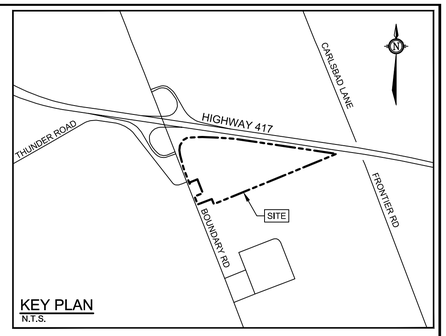
DRAWING NAME
STORMWATER MANAGEMENT FACILITY - SECTIONS

PROJECT No. 117217
REV REV # 4
DRAWING No. 117217-SWMF2

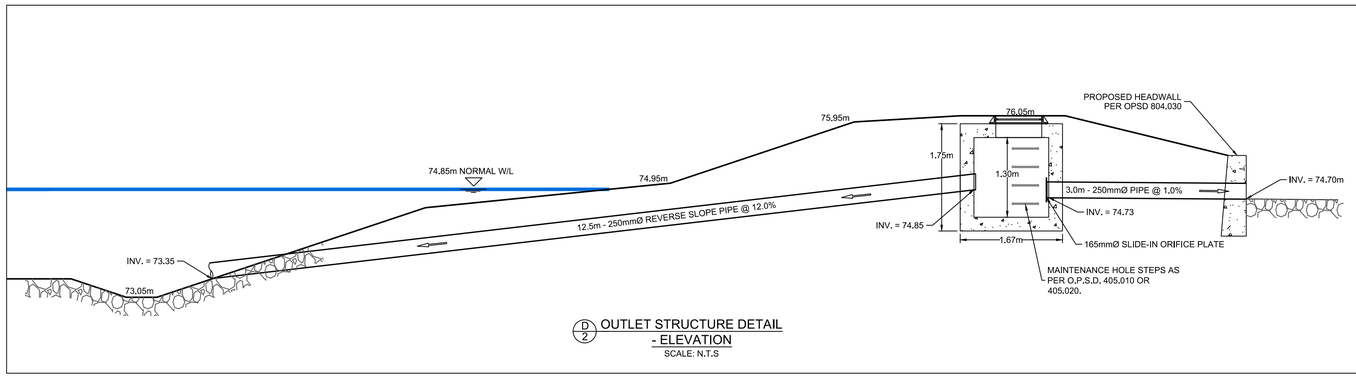
M:\2017\117217\CAD\Design\SWM\117217-SWMF.dwg, SWMF2, Apr 09, 2018 - 2:24pm, lcolbran



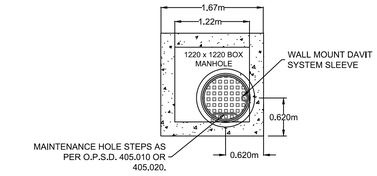
D 1 OUTLET STRUCTURE DETAIL
- PLAN VIEW
SCALE: N.T.S



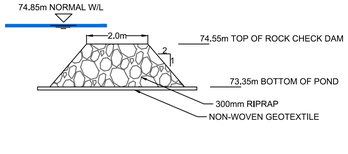
KEY PLAN
N.T.S.



D 2 OUTLET STRUCTURE DETAIL
- ELEVATION
SCALE: N.T.S



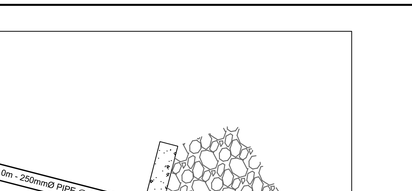
D 3 OUTLET STRUCTURE DETAIL- PLAN VIEW
SCALE: N.T.S



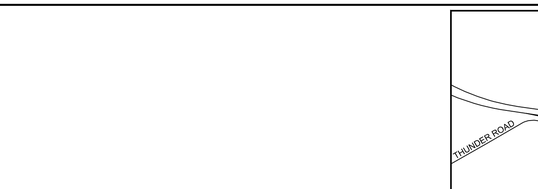
D 4 FOREBAY CHECK DAM DETAIL
SCALE: N.T.S

D 5 OUTLET WEIR DETAIL
- ELEVATION
SCALE: N.T.S

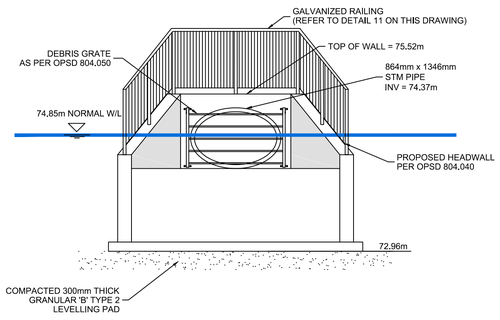
D 6 OUTLET WEIR DETAIL
- CROSS-SECTION
SCALE: N.T.S



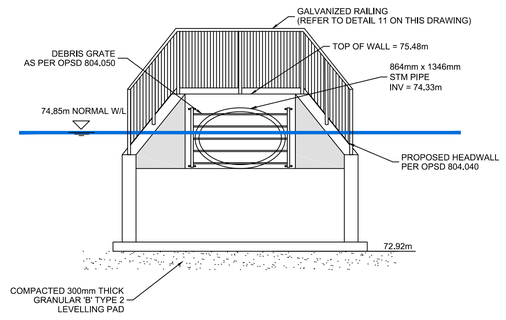
D 7 HEADEWALL DETAIL
- ELEVATION
SCALE: N.T.S



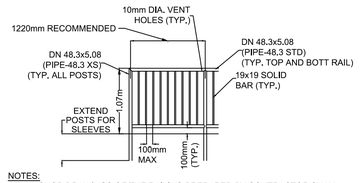
D 8 4m ACCESS ROAD DETAIL
SCALE: N.T.S



D 9 NORTH POND INLET HEADWALL
DETAIL - ELEVATION
SCALE: N.T.S



D 10 SOUTH POND INLET HEADWALL
DETAIL - ELEVATION
SCALE: N.T.S



NOTES:
1. SHOP DRAWINGS OF THE RAILING PREPARED BY CONTRACTOR SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. RAILING TO BE DESIGNED AND MANUFACTURED TO FIELD DIMENSIONS OF COMPLETED STRUCTURES.
3. PIPE FOR RAILING TO ASTM A33-GRADE 240 MPa ELECTRODES E 410 X.
4. RAILING TO BE HOT DIP GALVANIZED UPON FABRICATION TO CSA G184-M94.
5. MINIMUM TENSILE WORKING LOAD FOR ANCHORS IS 14 kN.
6. CHANGE TO GEOMETRY AND MEMBERS SIZES REQUIRE ENGINEER APPROVAL
7. VENT HOLES REQUIRED IN ALL MEMBERS

D 11 GALVANIZED RAILING DETAIL
SCALE: N.T.S

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER/APPLICANT INFORMATION:

BOUNDARY ROAD DEVELOPMENT INC.
16766 TRANSCANADIENNE, SUITE 500
KIRKLAND, QUÉBEC H9H 4M7

No.	REVISION	DATE	BY
4.	ISSUED FOR SITE PLAN APPLICATION	APR 12/18	LKS
3.	ISSUED FOR FINAL COORDINATION	APR 9/18	LKS
2.	ISSUED FOR FINAL COORDINATION	APR 2/18	LKS
1.	PRELIMINARY DESIGN PACKAGE	MAR 16/18	LKS

SCALE: AS NOTED

DESIGN: LKS/KA
CHECKED: MP
DRAWN: LKS
CHECKED: KA/MP
APPROVED: KA/MP

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
K. J. AULD
100187063
Apr. 12/18
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
5371 BOUNDARY ROAD - YOW1

DRAWING NAME
STORMWATER MANAGEMENT
FACILITY - DETAILS

PROJECT No. 117217
REV REV # 4
DRAWING No. 117217-SWMF3

M:\2017\117217\CAD\Design\SWM\117217-SWMF-D.dwg SWMF3, Apr 09, 2018 - 2:25pm, lcolbran