



Enhancing our communities



# Camperdown Residential Development

## FUNCTIONAL SERVICING REPORT

Eden Oak (Raglan) Inc.

# Document Control

File:

117304

Date:



November  
3, 2021

Prepared by:

**Tatham Engineering Limited**  
115 Sandford Fleming Drive,  
Suite 200  
Collingwood, Ontario L9Y 5A6  
**T 705-444-2565**  
**tathameng.com**

Prepared for:

**Eden Oak (Raglan) Inc.**  
1443 Hurontario Street  
Mississauga, Ontario L5G 3H5

Authored by:	Reviewed by:
	
Andrew Schoof, B.A.Sc., M.A.Sc. Intern Engineer	Randy Simpson, B.A.Sc., P.Eng. Director, Manager - Land Development Engineering

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Issue	Date	Description
1	June 9, 2020	Draft Plan Submission
2	October 8, 2020	Draft Plan Submission
3	April 29, 2021	Draft Plan Submission
4	November 3, 2021	Draft Plan Submission

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Appendix A: Supporting Information
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### List of Drawings

DRAFT-1:	Conceptual Draft Plan of Subdivision
SS-1:	Site Servicing Plan
SAN-1:	Sanitary Servicing Plan
DE-1:	Details & Notes



# 1 Introduction

Tatham Engineering Limited has been retained by Eden Oak (Raglan) Inc. to provide engineering services in support of a proposed residential development located on Old Lakeshore Road and Camperdown Road in the Town of The Blue Mountains. Specifically, this report has been prepared to demonstrate the preferred site servicing strategy and provide information relating to stormwater management, municipal sanitary sewage disposal and potable water requirements for the proposed development.

## 1.1 SITE DESCRIPTION

The site is located on Old Lakeshore Road within the Craigleith Camperdown sub-watershed study area in the Town of The Blue Mountains. Currently, the site is zoned Residential Hold (R3-H), Public Open Space (OS1) and Hazard (H) in accordance with Town By-law 2006-22. It is legally described as Part Lot 26 Concession 6 in the former Collingwood Township. A portion of the proposed development resides within the Nipissing Ridge geological region of the Georgian Bay Peninsula. We have enclosed a Site Location Plan (Fig.1) for your reference.

## 1.2 GEOTECHNICAL INVESTIGATION & REPORTS

Based on the Soil Survey of Grey County Map No. 17 (North), the on-site soils are Tecumseth Sand Loam (TS), Waterloo Sand Loam (Wsl) and Dunedin Clay (Duc). The soil material is characterized as poorly sorted outwash sand and clay. Tecumseth Sand Loam, Waterloo Sand Loam and Dunedin Clay have hydrologic soil group classifications of 'AB', 'A' and 'D' respectively. Soils of this nature are categorized as having 'good to imperfect' drainage which results in moderate infiltration.

Background reports prepared by C.F. Crozier & Associates Inc. obtained from the Grey County and Town of The Blue Mountains website suggests that Peto MacCallum Ltd. completed five test pit investigations on site to review the existing soil conditions in June of 2004. The report suggests that a uniform layer of topsoil (0.10 m depth) generally covers the site with underlying subsurface soil material consisting of native silty-clay overlaying weathered bedrock at a depth of between 0.8 m to 2.0 m.

Further geotechnical investigations were completed on May 10, 2019 by Central Earth Engineering. The investigation included excavating 8 test pits across the site to provide recommendations for foundations, slab on grade, pavement structure, soil excavation, compaction and ground water control.

The test pits encountered a topsoil layer at the ground surface between 250 mm to 400 mm thick. Underlying the topsoil, the test pits encountered undisturbed native soils that extended down to



the bedrock surface. The undisturbed soil primarily consisted of silt and clay with trace sand extending to elevations ranging from 190.1 to 188.8 m). Bedrock was encountered beneath the overburden soils in each test pit at elevations ranging from 188.5 to 190.1 m. The upper 0.3 to 1.0 m of the bedrock is considered ripable, and the excavations were advanced until bucket refusal on bedrock at elevations of 189.5 to 188.2 m.

The geotechnical report has been submitted under separate cover.

### **1.3 EXISTING LAND USE**

The site is located at the base of the Nipissing Ridge formation on a flat plateau containing forested and open space areas with the land sloping from southwest to northeast between 2% and 5%.

### **1.4 PROPOSED LAND USE**

The current site plan prepared by Innovative Planning Solutions (IPS) illustrates the proposed development consisting of 33 residential lots, a 20.0 m ROW, open space (non-developable land) and a stormwater management block.



## 2 Sanitary Sewage System

The primary access to the development site fronts Old Lakeshore Road within the Camperdown Service Area. Old Lakeshore Road is not serviced with a sanitary sewer main, however, it connects to Camperdown Road which is fully serviced. Upon review of the 'As-Constructed' drawings for Camperdown Sewer Service project prepared by Drexler Construction and Skelton Brumwell & Associates Inc., the sanitary sewer on Camperdown Road is a 200 mm dia. PVC sewer installed at 0.75%.

### 2.1 CAMPERDOWN SERVICING AREA EXISTING SANITARY SEWER INFRASTRUCTURE

The 200 mm dia. sanitary sewer installed on Camperdown Road connects to a 375 mm dia. gravity sewer along Highway 26 and flows east to the Delphi pumping station on the north side of Highway 26, approximately 1.34 km east of Camperdown Road.

From the Delphi pumping station, the sewage is pumped south across Highway 26 and west through a 200 mm dia. PVC forcemain. The forcemain outlets into a sanitary maintenance structure located within the intersection of Highway 26 and Grey Road 40 approximately 0.91 km west of Camperdown Road. From this maintenance structure, the sewage continues to flow west through a 375 mm dia. PVC and 450 mm dia. gravity sewer to the Lakeshore Road pumping station approximately 2.78 km west of Camperdown Road.

In 2002, the Town of The Blue Mountains completed a Comprehensive Environmental Study Report for the Lora Bay, Clarksburg, Thornbury and Camperdown Service areas. This report recommended that the Town undertake upgrades to the Thornbury Wastewater Treatment Plant (WWTP) to accommodate the additional anticipated development of the study areas noted above.

### 2.2 PROPOSED SANITARY SEWER SYSTEM

The 200 mm dia. sanitary sewer servicing for the proposed development will be installed on Old Lakeshore Road to a sanitary maintenance structure installed at the west intersection of Old Lakeshore Road and the internal road Lane "A". This stretch of sanitary sewer has been designed to convey the sanitary flows for future development along Old Lakeshore Road (see the Special Policy Area as per the Town of the Blue Mountains Official Plan Schedule 'A-3' Camperdown, attached) as shown on the Sanitary Catchment Plan (SAN-1). Gravity conveyance of the development areas east of the site is impractical due to the lower elevation along Old Lakeshore Road. A pumping solution or alternative outlet should be investigated when those lots are developed. As recommended by the Municipality, a 100 mm dia. sanitary forcemain will be provided to the east extents of the property to convey future flows from the development areas



east of the site. The Special Policy Area continues north of Highway 26 and terminates at Georgian Bay. This section of land is described as Part Lot 26, Concession 6 – Blue Mountain Beach by the Town of the Blue Mountains Official Plan (June 2016) – Section B3.8.6.1. It may only be used for a private recreational beach club and associated uses that may include small scale accessory eating facilities, gift shop, service and maintenance facilities. Sanitary flows from Blue Mountain Beach should be conveyed to the existing sanitary sewer along Highway 26.

The 200 mm dia. sanitary sewer system internal to the development has been designed to maintain the full flow velocity of 0.6 m/s in accordance with Town Standards to allow for self-flushing of the system and will be reviewed and finalized during final design. Lots 17 – 21, 23 and 25 will be serviced by a low pressure forcemain complete with individual grinder pumps which will pump sewage up to SAN MH2 and then gravity flow via the proposed 200 mm dia. sanitary sewer down Lane “A” to Old Lakeshore Road.

We have calculated the allowable sanitary sewage flow from the external development areas based on the allowable developable area for each property provided by the Town’s planning department. We obtained the allowable unit densities from the Town of The Blue Mountains Official Plan for Residential/Recreation development areas (Section B3.7) with a maximum density per gross hectare of 10 units. The Sanitary Catchment Area Plan (SAN-1) is enclosed at the back of the report for reference.

The total sanitary sewage flow for the development (including the future external developments) directed to the existing sewer on Camperdown Road is anticipated to be 9.37 L/s (809.6 m<sup>3</sup>/day). We have included the Sanitary Sewer Design Sheet in Appendix A for reference.

## 2.3 SEWAGE CAPACITY

The proposed development will have an Average Day Flow (ADF) of 432.0 m<sup>3</sup>/day and Peak Flow (PF) of 809.6 m<sup>3</sup>/day based on a total equivalent population of 271.4 persons (118 units). As per the Town of The Blue Mountains *2020 Year End Water and Wastewater Capacity Assessment*, the Thornbury Wastewater Treatment Plant (WWTP) has a total built capacity of 3,580 m<sup>3</sup>/day which equates to 3,436 units. However, the Town has an Environmental Compliance Approval (ECA) to expand the capacity of the WWTP, via the planned Phase 1A upgrades, to 5,330 m<sup>3</sup>/day which equates to 5,115 units. The plan is to construct the upgrades when the monitored inflow reaches 80% of the plant’s current built capacity. Therefore, the proposed development can be serviced by the Thornbury WWTP, however, the Phase 1A plant upgrades may be required to do so.





### 3 Potable Water Requirements

A 200 mm dia. water main exists to service the properties along Old Lakeshore Road. It is anticipated that there is adequate capacity to service the proposed 33 residential lots.

In accordance with Town of The Blue Mountains standards, we have calculated the maximum daily design flow for the 33 lots to be 5.63 L/s and the peak hour demand to be 8.49 L/s, excluding fire flow.

The requirements for fire flow have been calculated based on the Fire Underwriters Survey of Canada (1999) in accordance with Town Standards. For this calculation, we have assumed the average house will be 2,500 ft<sup>2</sup> or 232 m<sup>2</sup>. For the proposed 33-lot development, it is anticipated that the Maximum Daily Flow plus Fire Flow will be 89.45 L/s.

The development will be serviced by a 200 mm dia. water main loop internal to the site complete with a backflow device and flow meter at both connections. Upon completion and testing of the water main (including curb stop valves and hydrants) internal to the site, the Town of The Blue Mountains will ultimately assume the system and complete future maintenance should it be required.

The 200 mm dia. water main will have sufficient capacity to provide potable water to the development including fire flow requirements in accordance with the Fire Underwriters insurance criteria. We have enclosed a copy of the water demand calculations in Appendix A and a copy of the Site Servicing Plan (SS-1) enclosed at the rear of this report for reference.



## 4 Stormwater Management

A *Stormwater Management Report (April 2021)* that reviews the existing and proposed stormwater conditions for the development has been completed by Tatham under separate cover and should be read in conjunction with this report.

### 4.1 STORMWATER MANAGEMENT CRITERIA

The Stormwater Management (SWM) Report demonstrates the development complies with the following design criteria:

- the SWM plan safely conveys the Regional Storm event to an existing intermittent watercourse;
- the SWM plan achieves Level 1 “Enhanced” stormwater runoff treatment including 80% removal of Total Suspended Solids (TSS) through the use of lot level controls and a SWM facility; and
- the SWM plan achieves post to pre-development peak flow rate matching through the use of minor and major systems culminating in an end-of-pipe stormwater management facility.

### 4.2 SILTATION AND EROSION CONTROLS

Siltation and erosion controls will be implemented for all construction activities, including vegetation clearing, topsoil stripping, material stockpiling, road construction activities and grading operations. The detailed sediment and erosion control measures proposed will be implemented during and after construction and will be provided during final design. Sediment and erosion controls may include the following:

- Heavy duty silt fence erected around the perimeter of the site prior to any grading operations to control sediment movement;
- A construction vehicle entrance will be constructed and maintained consisting of a stone mud mat to reduce off-site tracking of material; and
- Rock check flow dams and straw bale check flow dams will be installed prior to construction and will be maintained and inspected throughout the course of construction as required to prevent transportation of sediment and deleterious materials offsite.



## 5 Transportation

A Transportation Brief was completed by Tatham Engineering Limited and will be submitted under separate cover.



## 6 Utility Network

It has been acknowledged that the following utility regulators have services in the immediate area:

- Bell Canada;
- Union Gas;
- Hydro One; and
- Rogers Cable.

Each of these companies will be contacted in advance of the final design to ensure that sufficient capacity exists within the current installations to support the proposed development.



## 7 Summary

The proposed Functional Servicing Report demonstrates the development will meet the established criteria with respect to general servicing and stormwater management and can proceed without negatively impacting the existing infrastructure and the local drainage system. Water quality control in the form of 80% TSS removal and water quantity control in the form of post to pre-development peak runoff flow rate matching will be satisfied utilizing a stormwater management facility in accordance with the MECP Guidelines. Sediment and erosion control measures will be implemented during and after construction to prevent transport of deleterious materials downstream.

In conclusion, the proposed Functional Servicing Report supports the concept of an environmentally sustainable development and will mitigate stormwater impacts associated with the construction of the proposed development.





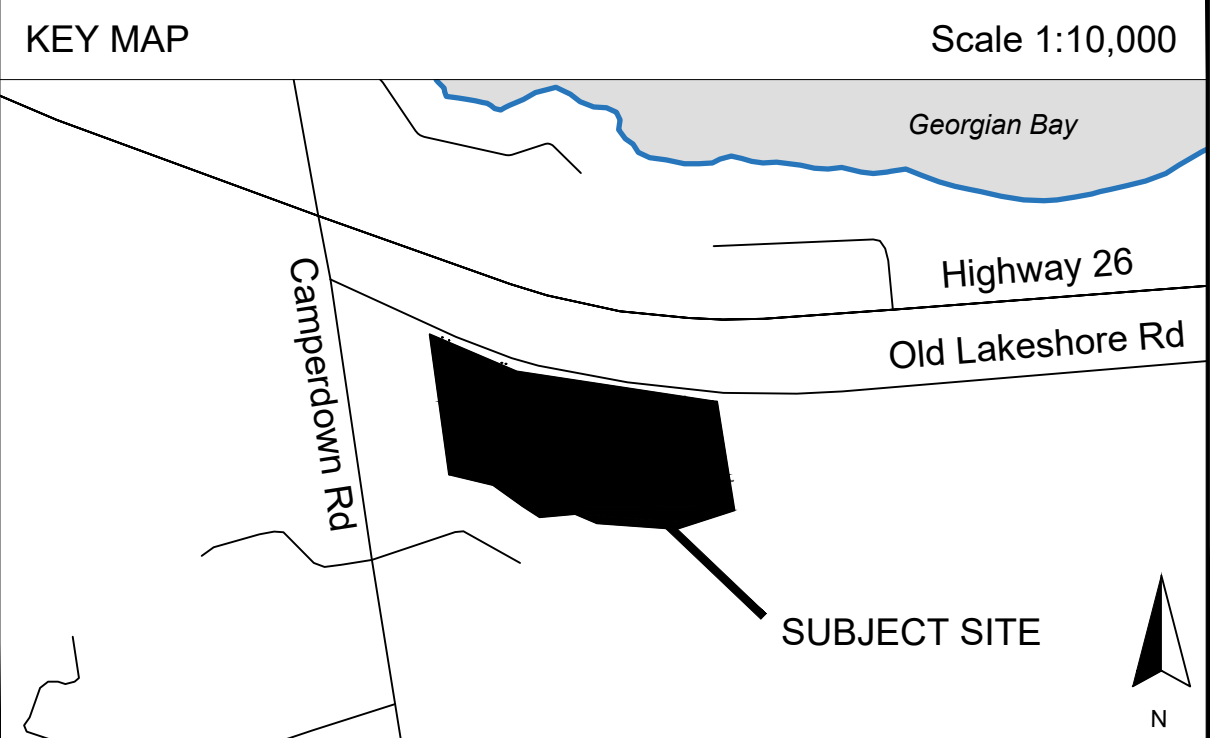
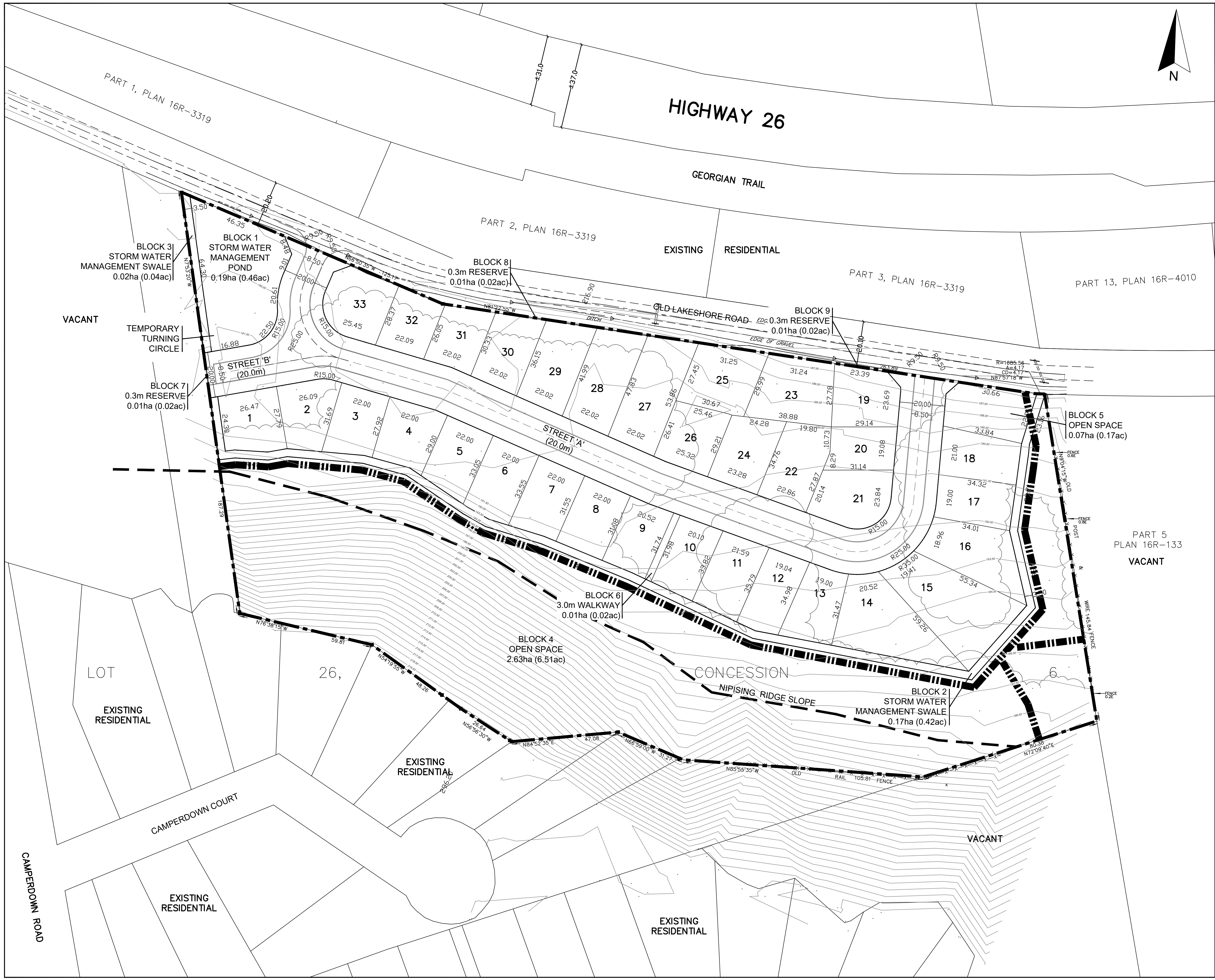
CAMPERDOWN CONDOMINIUMS  
SITE LOCATION PLAN

SCALE: N.T.S.

DATE: NOV/19

DWG NO. FIG. 1





# DRAFT PLAN OF SUBDIVISION

PART OF LOT 26, CONCESSION 6  
(FORMER TOWNSHIP OF COLLINGWOOD)  
IN THE  
TOWN OF THE BLUE MOUNTAINS  
COUNTY OF GREY

Scale 1:750

LEGEND

SUBJECT SITE FUTURE TOWN TRAIL

LAND USE SCHEDULE

	BLOCKS	UNITS	ha	ac	%
RESIDENTIAL	1-33	33	2.60	6.42	39.3
STORMWATER MANAGEMENT	Block 1 - 3		0.38	0.94	5.7
OPEN SPACE	Block 4 & 5		2.70	6.67	40.8
3.0m WALKWAY	Block 6		0.01	0.02	0.2
0.3m EASEMENT	Block 7 - 9		0.03	0.06	0.5
20.0m STREET			0.89	2.22	13.5
TOTAL		33	6.61	16.33	100

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE INNOVATIVE PLANNING SOLUTIONS TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

DATE EDEN OAK (CAMPERDOWN) INC.  
ROMAS KARTAVICIUS, PRESIDENT

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE DINO R.S. ASTRI, O.L.S.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON PLAN	d) RESIDENTIAL & OPEN SPACE	g) SHOWN ON PLAN	j) SHOWN ON PLAN
b) SHOWN ON PLAN	e) SHOWN ON PLAN	h) MUNICIPAL WATER	k) ALL MUNICIPAL SERVICES
c) SHOWN ON PLAN	f) SHOWN ON PLAN	i) TECUMSETH SAND	l) NONE
f1) NONE			

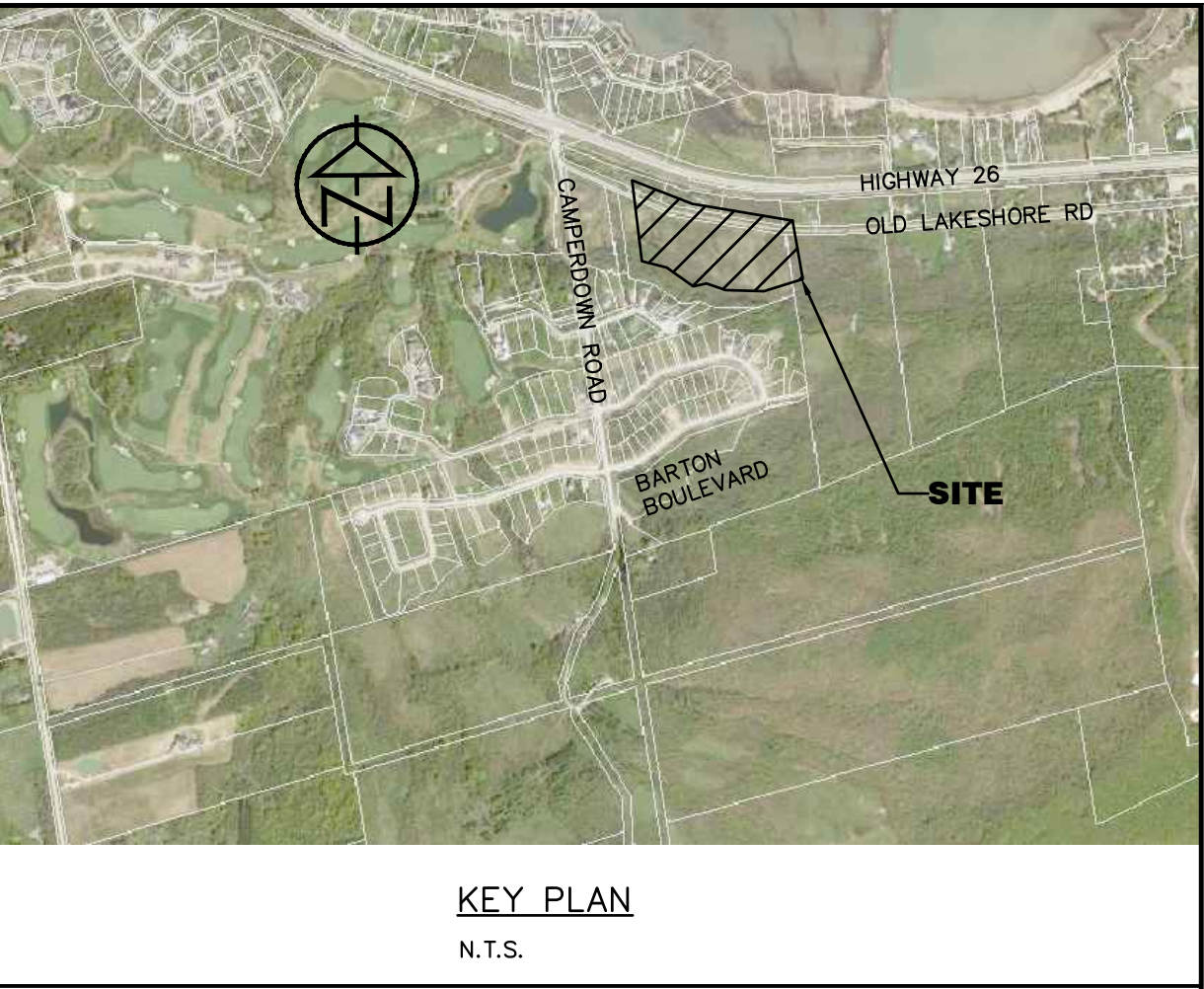
SCHEDULE OF REVISIONS

No.	Date	Description	By
7	Mar. 24, 2021	Increase SWM Pond size; Add ROW; Adjust lots; Remove Easement	AS
8	Apr. 1, 2021	Move Lane 'B' 1.0m North; Update Land Use Stats;	AS
9	Aug. 23, 2021	Revise DP based on town comments;	AS
10	Sept. 10, 2021	Revise DP based on comments;	JV

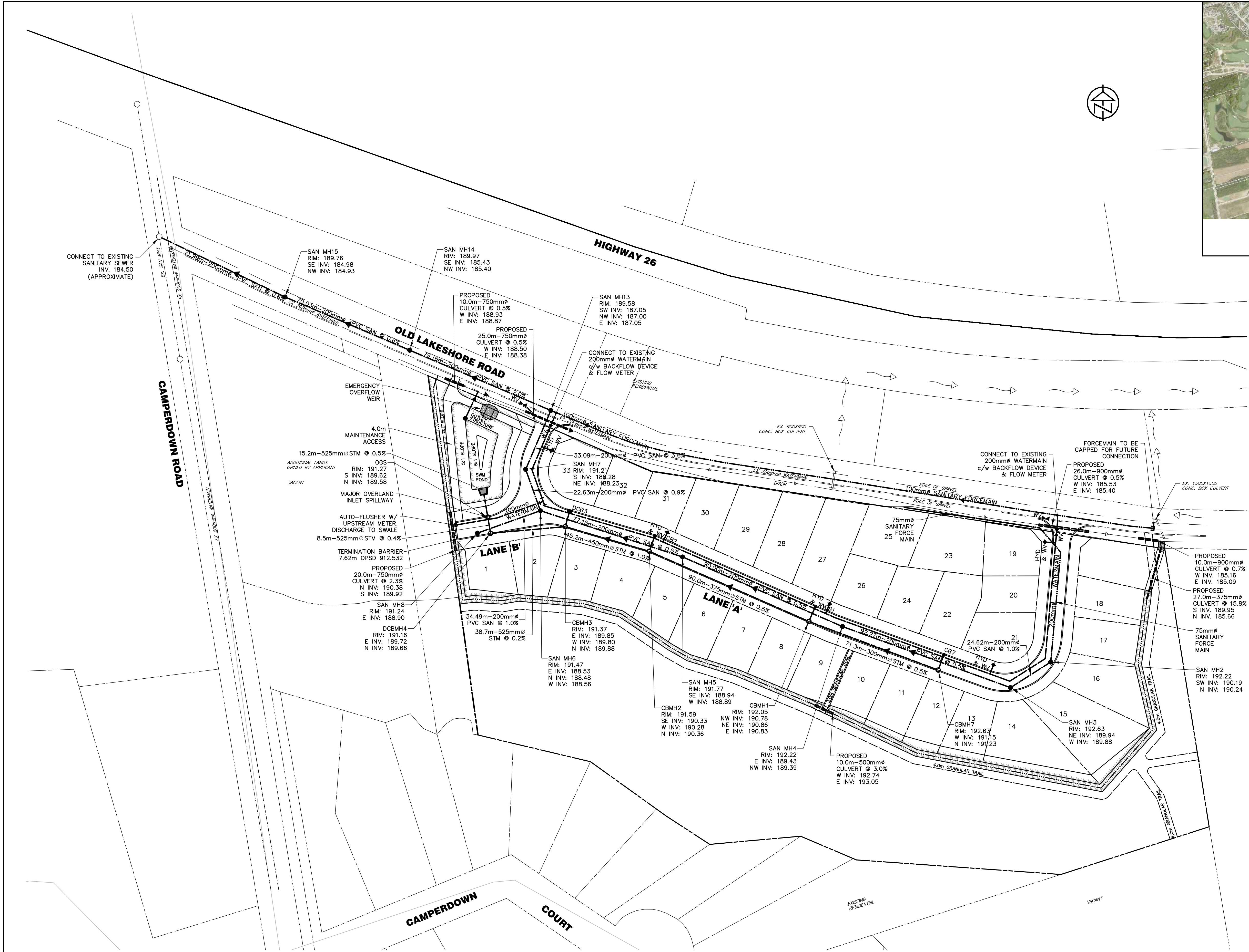
IPS INNOVATIVE PLANNING SOLUTIONS  
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS  
647 WELHAM RD., UNIT 9A, BARRIE, ONTARIO, L4N 0B7  
tel: 705 • 812 • 3281 fax: 705 • 812 • 3434 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date: January 11, 2019 Drawn By: AM  
File: 17-699 Checked By: DV





KEY PLAN  
N.T.S.



LEGEND

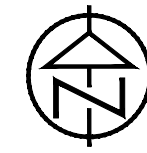
- PROPERTY LINE  
EXISTING CENTERLINE  
EXISTING EDGE OF ASPHALT  
EXISTING WATERMAIN  
EXISTING SANITARY SEWER  
EXISTING SANITARY MAINTENANCE HOLE  
PROPOSED WATERMAIN/SIZE  
PROPOSED WATER VALVE  
PROPOSED HYDRANT & VALVE  
PROPOSED STORM MAINTENANCE HOLE  
PROPOSED CATCH BASIN  
PROPOSED CATCH BASIN MAINTENANCE HOLE  
PROPOSED DOUBLE CATCH BASIN MH  
PROPOSED STORM SEWER/SIZE  
PROPOSED SANITARY MAINTENANCE HOLE  
PROPOSED SANITARY SEWER/SIZE

<b>DISCLAIMER AND COPYRIGHT</b>  CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.  TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.	<b>BENCHMARKS</b>  TBM1 – ELEVATION 211.950 TOP NUT FIRE HYDRANT LOCATED AT THE SOUTH WEST CORNER OF LOT 11.	<b>NOTES</b>  LEGAL SURVEY, TOPOGRAPHIC INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY ZUBEK, EMO, PATTEN & THOMSEN, WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.	<b>No.</b>	<b>REVISION DESCRIPTION</b>	<b>DATE</b>	<b>ENGINEER STAMP</b> 	<b>CAMPERDOWN CONDOMINIUMS</b> <b>TOWN OF THE BLUE MOUNTAINS</b>			
			2.	SUBMISSION FOR DRAFT PLAN APPROVAL	JUNE/2020					
			3.	TOWN COMMENTS	OCT/2020					
			4.	TOWN COMMENTS	FEB/2021					
			5.	DRAFT PLAN	MAY/2021			DESIGN: AS	FILE: 117304	DWG:
			6.	DRAFT PLAN	NOV/2021			DRAWN: RD/AC	DATE: DEC., 2017	<b>SS-1</b>
								CHECK: RS	SCALE: 1:1000	
<b>SITE SERVICING PLAN</b>										



TABLE 'A'		
AREA ID	AREA (ha)	RESIDENTIAL UNITS
101	0.50	5
102	0.46	4
103	0.09	1
104	0.86	8
105	2.00	20
106	1.74	17
107	0.56	5
108	1.69	0
109	0.45	4
111	0.23	0
112a	0.48	2
112b	0.34	2
TOTAL 'A'	9.40	68

TABLE 'B'		
AREA ID	AREA (ha)	RESIDENTIAL UNITS
120a	0.43	3
120b	0.38	2
121	0.30	3
122	0.29	0
123	1.25	12
TOTAL 'B'	2.22	17



KEY PLAN  
N.T.S.



**LEGEND**

PROPERTY LINE	---
EXISTING CENTERLINE	---
EXISTING EDGE OF ASPHALT	---
EXISTING SANITARY SEWER	200mm SAN
PROPOSED SANITARY SEWER/SIZE/FLOW	200mm SAN
EXISTING SANITARY MAINTENANCE HOLE	○ EX. SAN MH
PROPOSED SANITARY MAINTENANCE HOLE	● SAN MH2
PROPOSED AREA BOUNDARY	---
PROPOSED AREA ID	101
PROPOSED AREA (ha)	0.5
RESIDENTIAL UNITS	5

DISCLAIMER AND COPYRIGHT	BENCHMARKS	NOTES	No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP	CAMPERDOWN CONDOMINIUMS TOWN OF THE BLUE MOUNTAINS		TATHAM ENGINEERING		
CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.	TBM1 – ELEVATION 211.950 TOP NUT FIRE HYDRANT LOCATED AT THE SOUTH WEST CORNER OF LOT 11.	LEGAL SURVEY, TOPOGRAPHIC INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY ZUBEK, EMO, PATTEN & THOMSEN, WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.	2.	SUBMISSION FOR DRAFT PLAN APPROVAL	JUNE/2020		SANITARY CATCHMENT PLAN		DESIGN: AS	FILE: 117304	DWG: <b>SAN-1</b>
TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.			3.	TOWN COMMENTS	OCT/2020				DRAWN: RD/AC	DATE: DEC., 2017	
			4.	TOWN COMMENTS	FEB/2021				CHECK: RS	SCALE: 1:2000	
			5.	DRAFT PLAN	MAY/2021						
			6.	DRAFT PLAN	NOV/2021						



GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH TOWN OF THE BLUE MOUNTAINS STANDARDS AND OPSS. WHERE INCONSISTENCY OCCURS, TOWN STANDARDS GOVERN.
3. CLEAR STONE WRAPPED IN FILTER FABRIC MAY BE SUBSTITUTED FOR PIPE BEDDING MATERIAL IF APPROVED BY THE ENGINEER.
4. DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS-517 AND 518. THE OWNER IS RESPONSIBLE FOR OBTAINING DEWATERING PERMITS AS REQUIRED TO MAINTAIN DRY TRENCH CONDITIONS.
5. UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE HYDRO ONE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
6. HYDRO POLES TO BE SUPPORTED AND PROTECTED BY THE CONTRACTOR DURING CONSTRUCTION AS DIRECTED BY WASAGA DISTRIBUTION INC. AND BELL CANADA.
7. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH UTILITIES WHICH MAY ALSO BE UNDER CONSTRUCTION.
8. EXISTING GAS MAIN TO BE PROTECTED IN ACCORDANCE WITH ENBRIDGE GAS SPECIFICATIONS.
9. ALL EXISTING PAVED PRIVATE ENTRANCES TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE AND 150mm GRANULAR 'A' BASE TO LIMITS OF CONSTRUCTION.
10. ALL EXISTING GRAVEL OR GRASSED PRIVATE ENTRANCES TO BE REINSTATED WITH 150mm GRANULAR 'A' BASE TO LIMITS OF CONSTRUCTION AND 50mm HL3 TO 2.8m BEHIND CURB.
11. ALL COMMERCIAL ENTRANCES TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE, MATCH EXISTING ASPHALT BASE COURSE(S), 150mm GRANULAR 'A' BASE AND 150mm GRANULAR 'B' SUBBASE TO LIMITS OF CONSTRUCTION.
12. JOINTS WITH EXISTING ASPHALT TO BE SAW CUT PRIOR TO PLACING NEW ASPHALT; DENSO REINSTATEMENT TAPE SHALL BE USED AT THE JOINT. SURFACE ASPHALT JOINTS TO HAVE MIN. 0.5m WIDE LAP JOINT.
13. ALL BOULEVARDS AND DISTURBED AREAS TO HAVE 100mm SCREENED TOPSOIL AND NURSERY SOD UNLESS OTHERWISE NOTED.
14. PAVED BOULEVARD AREAS TO BE REINSTATED WITH 50mm HL3 SURFACE COURSE ASPHALT AND 150mm GRANULAR 'A' WHERE NOTED.
15. ACCESS TO BUSINESS AND RESIDENTIAL PROPERTIES MUST BE MAINTAINED AT ALL TIMES.
16. THE CONTRACTOR MUST GIVE MIN. 72 HOURS NOTICE (DURING COVID-19) TO THE TOWN OF THE BLUE MOUNTAINS PUBLIC WORKS DEPARTMENT THROUGH THE TOWN ENGINEER FOR OFFICIALS TO BE PRESENT FOR THE OPERATION OF VALVES, TESTING, DISINFECTION AND CONNECTION OF WATER MAIN AND TESTING OF SEWERS.
17. EARTH FILL MATERIAL UP TO AND INCLUDING SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD). GRANULAR BASE AND SUB-BASE TO BE COMPACTED TO 100% SPMDD. HOT-MIX ASPHALT TO BE COMPACTED TO 97% SPMDD.
18. MINIMUM VERTICAL SEPARATION TO MEET MECP GUIDELINES AT CROSSINGS.
19. TRENCH BACKFILL (TO OPSP - 802.010) TO BE SELECT NATIVE SAND OR IMPORTED SELECT SUBGRADE.
20. PIPE COVER TO BE SELECT NATIVE SAND OR IMPORTED SELECT SUBGRADE WITH NO AGGREGATE LARGER THAN 25mm.
21. ALL ENGINE DRIVEN PUMPS TO BE ADEQUATELY SILENCED, SUITABLE FOR OPERATION IN A RESIDENTIAL DISTRICT.
22. DISTURBED AREAS TO BE REINSTATED TO PREVIOUS CONDITION OR BETTER.
23. UNLESS OTHERWISE IDENTIFIED, ALL MANHOLES ARE 1200mm DIAMETER.
24. MANHOLE FRAMES AND COVERS ARE TO BE SET TO BASE COURSE HL8 ASPHALT ELEVATION AND RAISED BY ADDING PRE-CAST CONCRETE ADJUSTMENT UNITS PRIOR TO PLACING SURFACE COURSE HL3 ASPHALT. (OPSD 704.010).
25. TRENCHES FOR UTILITIES TO BE MINIMUM 600mm WIDE BACKFILLED WITH APPROVED NATIVE GRANULAR MATERIAL OR IMPORTED SELECT SUBGRADE AND COMPACTED ALL TO THE SATISFACTION OF WASAGA HYDRO AND THE ENGINEER.

SANITARY SEWER AND SANITARY FORCE MAIN:

1. ALL MATERIALS SHALL BE CSA CERTIFIED.
2. SANITARY SEWER TO BE SDR 35 PVC, SDR 28 PVC FOR DEPTHS GREATER THAN 8.0m.
3. BEDDING AND BACKFILL AS PER OPSP-802.010 (TYPE 3 SOIL) USING GRANULAR 'A' COMPACTED TO 95% MAXIMUM DRY DENSITY. SELECT NATIVE SAND MAY BE USED FOR BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY IF APPROVED BY THE ENGINEER.
4. 125mmø AND 150mmø SANITARY SERVICE LATERALS TO BE SDR 28 PVC PIPE. CLEANOUT TO BE INSTALLED AT ALL 125mmø SERVICES OVER 15m IN LENGTH AND AT ALL 150mmø SERVICE CONNECTIONS. 200mmø CLEANOUT CHAMBER AT PROPERTY LINE.
5. LOT SERVICE LOCATIONS TO BE VERIFIED BY CONTRACTOR.
6. MH'S PER OPSP-701.010 WITH FROST STRAPS PER OPSP 701.100 WITH 'QUICK ANCHORED' BOLTS.
7. FRAMES AND COVERS PER OPSP-401.010 TYPE 'A' CLOSED COVER.
8. MH BENCHING PER OPSP-701.021 AND STEPS PER OPSP-405.010 CIRCULAR ALUMINUM.
9. SANITARY SEWER TESTING SHALL INCLUDE INFILTRATION, EXFILTRATION, DEFLECTION (MANDREL) AND CCTV.
10. ALL WORK TO BE IN ACCORDANCE WITH OPSS 410.
11. SAFETY PLATFORM TO OPSP 404.020.

WATER MAIN:

1. ALL MATERIALS TO MEET NSF 60, 61 AND 372.
2. ALL WATER MAIN TO HAVE MINIMUM 1.7m COVER OR APPROVED EQUIVALENT FROST PROTECTION WITH INSULATION.
3. BEDDING AND BACKFILL IN ACCORDANCE WITH OPSS-701.
4. ALL WATER MAIN AND RELATED MATERIALS TO MEET THE TOWN'S NEW MATERIAL LIST.
5. PVC PIPE INSTALLATION TO INCLUDE 12AWG TWH SOLID PLASTIC COVERED TRACER WIRE, TWU 75°C 600V OR APPROVED EQUAL. TRACER WIRE CONTINUITY MUST BE TESTED BY THE CONTRACTOR AND CONNECTIVITY CONFIRMED BY THE TOWN.
6. CATHODIC PROTECTION TO BE PROVIDED IN ACCORDANCE WITH TOWN STANDARD AND TO INCLUDE ZINC CAPS ON ALL FASTENERS.
7. CLASS 'B' BEDDING AS PER OPSP-802.030 (RIGID PIPE) OR BEDDING AS PER OPSP-802.010 (FLEXIBLE PIPE) USING GRANULAR 'A'
8. THRUST PROTECTION SHALL BE PROVIDED USING MECHANICAL JOINT FITTINGS AND RESTRAINERS.
9. VALVES TO BE MUELLER '55' RESILIENT SEATED OR APPROVED EQUAL, LEFT HAND OPENING COMPLETE WITH SLIDE TYPE VALVE BOXES 125mm DIA. WITH LIDS MARKED WATER.
10. WATER SERVICES TO BE PE160 OR TYPE 'K' COPPER COMPLETE WITH MAIN STOP;  
MAIN STOP (CANADIAN BRASS 102 COMPRESSION, MUELLER H15008 OR EQUAL),  
19mmø CURB STOP (MUELLER H15008 COMPRESSION OR EQUAL), 25mmø CURB STOP (MUELLER MARK II ORISEAL), SERVICE BOXES (MUELLER A-728 AS PER OPSO-1104.010.)  
SERVICES TO INCLUDE TRACER WIRE TO PROPERTY LINE AND BROUGHT TO SURFACE ON THE OUTSIDE OF THE WATER VALVE.
11. WHERE RESIDENTIAL WATER SERVICES ARE TO BE ABANDONED, EXPOSE MAIN STOP, CLOSE AND DISCONNECT SERVICE PIPE, AND SALVAGE THE CURB STOP AND RETURN TO PUBLIC WORKS YARD.
12. ALL WATER MAINS AND SERVICES SHALL BE BACKFILLED WITH APPROVED SITE MATERIAL.  
ALL BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM DRY DENSITY AS PER OPSS 514.  
ALL GRANULAR ROAD BASE SHALL BE COMPACTED TO 100% MAXIMUM DRY DENSITY.
13. EXISTING SERVICE LOCATIONS TO BE VERIFIED IN THE FIELD.
14. HYDRANT TO BE CANADA VALVE 'CENTURY' TYPE AKV 2780, OR CLOW 'PREMIER D-67-M" WITH MECHANICAL JOINT ENDS WITH 2-50mm PORTS AND FACTORY INSTALLED STORZ FITTING PER OPSP-1105.010, INCLUDING GALVANIZED CHAIN CONNECTION FOR CAPS AND HAVE A FLEXSTAKE KYDRANT MARKER AS PER TOWN OF BLUE MOUNTAIN STANDARDS.
15. WATERMAIN COMMISSIONING TO CONFORM TO THE TOWN'S WATERMAIN COMMISSIONING PROTOCOL.
16. MINIMUM VERTICAL SEPARATION 500mm BETWEEN WATER MAINS AND SEWERS.  
MINIMUM HORIZONTAL SEPARATION OF 2.5m BETWEEN WATER MAINS AND SEWERS.
17. WATER MAINS SHALL BE SWABBED, FLUSHED, DISINFECTED AND TESTED IN ACCORDANCE WITH OPSS 701 WITH TOWN OFFICIALS PRESENT.
18. DISINFECTING OF WATER MAINS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C651-05 SPECIFICATIONS.
19. MIN. 50mmø BLOWOFF TO BE USED PER OPSP 1104.030. MECHANICAL THRUST RESTRAINERS SHALL BE USED AT ALL VALVES AND FITTINGS.
20. SERVICE CONNECTION TO OPSP 1104.010. CONCRETE SLAB UNDER CURB STOP TO BE MINIMUM 600x600mm AND INCLUDE 2"x4" MARKER PAINTED BLUE.
21. ALL PIPE JOINTS IN HYDRANT LEADS TO BE RESTRAINED.
22. ALL PVC WATER SERVICE PIPE JOINTS TO BE RESTRAINED.

STORM SEWER

1. ALL MATERIALS SHALL BE CSA CERTIFIED.
2. STORM SEWER SHALL BE CONCRETE 100-D, OR PVC 320 KPa PIPE STIFFNESS.
3. BEDDING AS PER OPSP-802.031 FOR RIGID PIPE OR BEDDING AS PER OPSP-802.010 (TYPE 3 SOIL) FOR FLEXIBLE PIPE. SELECT NATIVE SAND COMPACTED TO 95% MAXIMUM DRY DENSITY MAY BE USED FOR COVER MATERIAL IF APPROVED BY THE ENGINEER.
4. CATCHBASINS & MANHOLES TO BE BACKFILLED WITH SELECT NATIVE MATERIAL AND COMPACTED TO 95% MAXIMUM DRY DENSITY.
5. MH AND GBMH TO OPSP 701.010, 701.011, 701.012, 701.013, 701.030, 701.040, 701.050 OR 701.060.
6. GB'S TO OPSP 705.010 OR 705.020, WITH 600mm SUMP.
7. PIPE SUPPORT AT MH, GBMH AND GB TO OPSP 708.020.
8. PROTECTION DURING CONSTRUCTION TO OPSP 808.010.
9. STEPS AS PER OPSP-405.010 HOLLOW CIRCULAR ALUMINUM.
10. CATCHBASIN LEADS; - 300mm DIA. FOR SINGLE AND DOUBLE CATCHBASINS.
11. CATCHBASIN FRAMES AND COVERS PER OPSP 400.020.
12. STORM SEWER SHALL BE CCTV INSPECTED.
13. ALL WORK TO BE IN ACCORDANCE WITH OPSS 410.
14. DITCHES/SWALES CONSTRUCTED AT LESS THAN 1% SHALL HAVE MIN. 150mmø SUBDRAIN, BEDDED IN A 300x300mm CLEAR STONE TRENCH AND WRAPPED IN FILTER FABRIC. (SEE DETAIL ON DE-2).

SEDIMENT & EROSION CONTROL NOTES:

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. SEDIMENT AND EROSION CONTROL MEASURES THAT ARE DESIGNED TO CONTROL RUNOFF FROM SPECIFIC AREAS MUST BE INSTALLED PRIOR TO ANY DISTURBANCE OF THAT PART OF THE SITE.
2. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES MUST BE PRESENTED IN WRITING FOR APPROVAL OF THE TOWN ENGINEER AND THE GREY SAUBLE CONSERVATION AUTHORITY.
3. THE CONTRACTOR SHALL HAVE MATERIALS AVAILABLE ON-SITE TO REPAIR SEDIMENT AND EROSION CONTROL MEASURES IN THE EVENT OF UNFORESEEN CONDITIONS: HIGH WATER, EXTREME RAINFALL EVENTS, ETC.
4. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED BY THE ENGINEER BI-WEEKLY AND AFTER EACH MAJOR STORM EVENT. INSPECTION REPORTS TO BE FORWARDED TO THE TOWN ENGINEER BI-WEEKLY. AREAS THAT ARE UNDEVELOPED FOR AN EXTENDED PERIOD OF TIME SHALL BE RE-VEGETATED WITH TOPSOIL AND HYDRAULIC SEED AND MULCH AS DIRECTED BY THE TOWN.

ROADWAY:

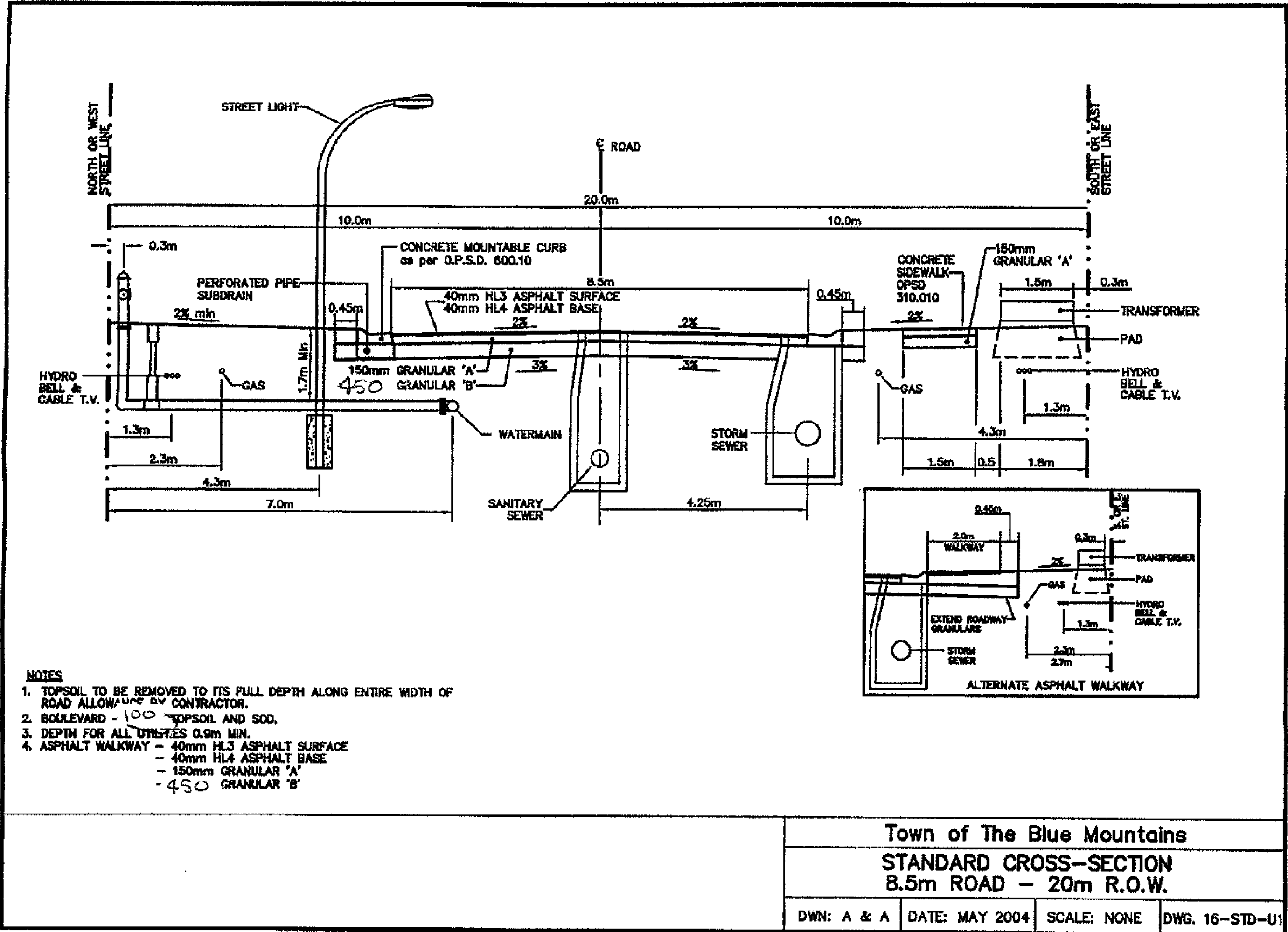
1. STOP SIGNS AND STREET SIGNS TO TOWN STANDARD. HIGH INTENSITY REFLECTIVE GRADE FINISH.
2. SUBGRADE TO BE COMPACTED TO A MINIMUM DRY DENSITY OF 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
3. GRANULAR 'A' AND 'B' BASE TO BE COMPACTED TO 100% OF MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
4. BOULEVARD COMPACTION TO 95% OF MATERIAL'S SPMDD.
5. ROAD SURFACES TO BE BUILT TO TOWN OF THE BLUE MOUNTAINS ENGINEERING STANDARDS.
6. CURBS TO OPSP 600.040.
7. ROAD CUTS AND SECTIONS MATCHING EXISTING ASPHALT TO HAVE DENSO REINSTATEMENT TAPE OR APPROVED EQUIVALENT AT SURFACE ASPHALT JOINT.
8. UTILITY PEDESTALS TO BE INSTALLED AT 300mm FROM PROPERTY LINE OR BESIDE HYDRO TRANSFORMERS AS APPLICABLE.
9. CONCRETE SIDEWALK TO OPSP 310.010.  
CONCRETE SIDEWALK RAMPS AT INTERSECTIONS TO OPSP 310.033 AND 310.039.

MATERIALS:

1. ALL MATERIALS TO BE CSA CERTIFIED.
2. SANITARY SEWER - SDR-35 PVC, SDR-28 PVC DEPTHS GREATER THAN 8.0m.
3. SANITARY SERVICES - SDR28 PVC 0.7m 200mmø CLEANOUT CHAMBER AT PROPERTY LINE AS PER TOWN OF THE BLUE MOUNTAINS STANDARDS.
4. SANITARY FORCEMAIN - 350mmø PE DR11, 150mmø PE DR11.
5. STORM SEWER - PVC DR35 OR CONCRETE CLASS 100-D.  
- CSP CULVERTS - 2mm THICKNESS
6. WATERMAIN - DR18 PVC INCLUDING 12 AWG TWH TRACER WIRE TO MEET NSF 60, 61 & 372.
7. WATERMAIN SERVICES - 19mmø PE-160.
8. VALVES - RESILIENT SEAT "OPEN LEFT" WITH MECHANICAL JOINT ENDS WITH CAN VAL SSL 1.2m SLIDING VALVE BOX FOR VALVES LESS THAN 450ø.
9. HYDRANTS ARE TO BE CANADA VALVE - CENTURY TYPE.
10. HYDRANTS TO BE PAINTED YELLOW BARREL WITH SILVER TOP AND CONNECTION CAPS.
11. STREET AND TRAFFIC SIGNS TO TOWN STANDARD. HIGH INTENSITY REFLECTIVE GRADE FINISH.
12. PERFORATED PIPE SUBDRAINS - BIG-O WITH GEOTEXTILE FILTER SOCK.
13. FILTER FABRIC - TERRAFIX 270 R FOR SLOPE STABILIZATION.  
- TERRAFIX 240 R FOR WRAP ON PERFORATED PIPE SUBDRAINS.
14. WATERMAIN SERVICES CURB STOPS - MUELLER H15219 OR H15217.

MECHANICAL RESTRAINT:

1. ALL TEES, BENDS, DEAD ENDS, VALVES AND REDUCERS ARE TO BE RESTRAINED WITH MECHANICAL JOINT RETAINER GLANDS AND BELL RESTRAINT HARNESSSES, FIELD LOCK GASKETS OR OTHER ENGINEER APPROVED METHODS IN ACCORDANCE WITH TABLE 1.
2. THRUST BLOCKS AS A METHOD OF RESTRAINT WILL BE USED ONLY AT THE DIRECTION OF THE ENGINEER. UNLESS DIRECTED OTHERWISE, ALL RESTRAINED JOINTS SHALL BE MECHANICAL.
3. TABLE 1 (SEE DE-1) HAS BEEN DEVELOPED BASED ON THE FOLLOWING CRITERIA:
  - INTERNAL PRESSURE: 1035 kPa (150 PSI)
  - PIPE DEPTH: 1.7m DEPTH
  - BEDDING MATERIAL: SAND
  - SAFETY FACTOR: 1.5
  - TRENCH TYPE: S
4. SEE FIGURES 1 THROUGH 5 (SEE DE-1) FOR GRAPHIC DEFINITION OF THE LETTER 'R' (LENGTH OF PIPE RESTRAINT) VALUE GIVEN IN TABLE 1.
5. PIPE RESTRAINT FOR VALVES SHALL BE A MINIMUM OF THE FOLLOWING:
  - RESTRAINED TO THE NEAREST FITTING (BEND, TEE OR CROSS)
  - RESTRAINED TO A DISTANCE EQUAL TO THAT FOR A DEAD END (IF REQUIRED TO WITHSTAND TEST PRESSURE)
  - RESTRAINED TO A DISTANCE 1/2 (50%) OF THAT FOR A DEAD END FOR VALVES THAT ARE NOT TO BE TESTED AGAINST. (BASED ON AN INTERNAL DESIGN PRESSURE OF 75 PSI)
  - RESTRAINED TO THE LIMITS OF THE PROJECT



NOTES

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF ROAD ALLOWANCE BY CONTRACTOR.
2. BOULEVARD - 100% TOPSOIL AND SOD.
3. DEPTH FOR ALL OTHERS 0.6m MIN.
4. ASPHALT WALKWAY - 40mm HL3 ASPHALT SURFACE  
- 40mm HL4 ASPHALT BASE  
- 150mm GRANULAR 'A'  
- 450 GRANULAR 'B'














DISCLAIMER AND COPYRIGHT	BENCHMARKS	NOTES	No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP	CAMPERDOWN CONDOMINIUMS TOWN OF THE BLUE MOUNTAINS			
							DETAILS & NOTES			
CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.  TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.	TBM1 - ELEVATION 211.950 TOP NUT FIRE HYDRANT LOCATED AT THE SOUTH WEST CORNER OF LOT 11.	LEGAL SURVEY, TOPOGRAPHIC INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY ZUBEK, EMO, PATTEN & THOMSEN, WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.	2.	SUBMISSION FOR DRAFT PLAN APPROVAL	JUNE/2020		DESIGN: AS FILE: 117304 DWG: DE-1			
			3.	TOWN COMMENTS	OCT/2020					
			4.	TOWN COMMENTS	FEB/2021					
			5.	DRAFT PLAN	MAY/2021					
			6.	DRAFT PLAN	NOV/2021					

## **Appendix A: Supporting Information**



# The Blue Mountains Official Plan Schedule 'A-3' Camperdown

## Designations

- |   |                                       |   |                               |
|---|---------------------------------------|---|-------------------------------|
|  | Niagara Escarpment Plan Boundary      |  | Major Open Space              |
|  | Special Study Area Subject to B3.13.5 |  | Recreational Commercial Area  |
|  | Agricultural                          |  | Recreational Ski              |
|  | Escarpment                            |  | Residential Recreational Area |
|  | Future Secondary Plan Area            |  | Rural                         |
|  | Hazard                                |  | Special Agricultural          |
|  | Institutional Area                    |   |                               |

0 250 500 750 1,000 Metres



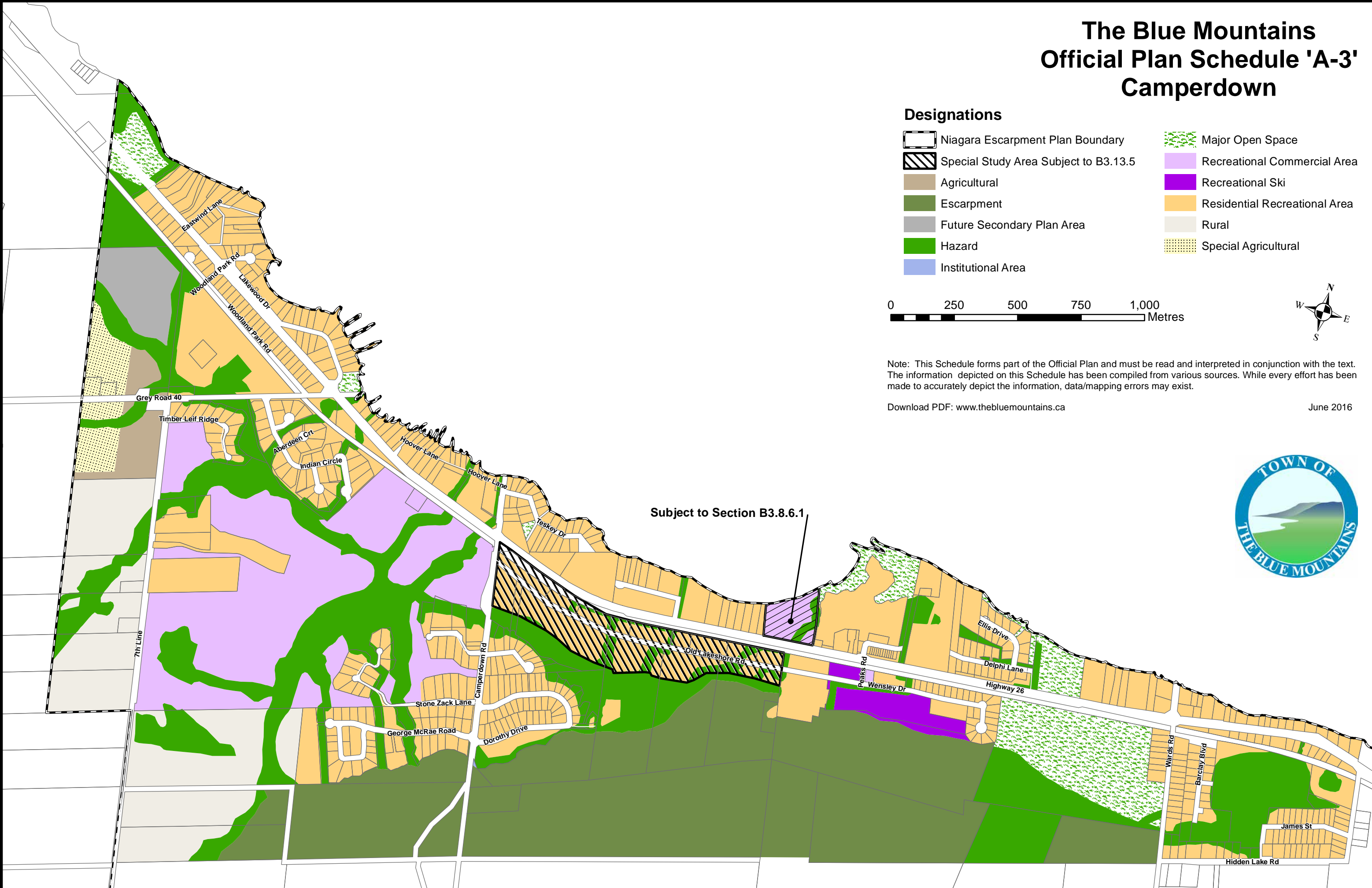
Note: This Schedule forms part of the Official Plan and must be read and interpreted in conjunction with the text. The information depicted on this Schedule has been compiled from various sources. While every effort has been made to accurately depict the information, data/mapping errors may exist.

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June 2016



Subject to Section B3.8.6.1



# SANITARY SEWER DESIGN SHEET

Approved:



## FLOW CRITERIA

Average Flow Rate: 450 l/cap/d  
Infiltration Rate: 0.23 l/s/ha  
Population: 2.3 cap/unit  
  
Peaking Factor: (Harmon)

Project Name: Camperdown Condominiums  
Project Number: 117304  
Municipality: Town of Blue Mountains  
Designed By: AS  
Date: March 2018  
Revised By: AS  
Date: June 2018  
Revised By: AS  
Date: November 2021  
Checked By: RS  
Date: November 2021

LOCATION OF SECTION	AREA LABEL	UPSTREAM MAINTENANCE HOLE	DOWNSTREAM MAINTENANCE HOLE	NO. UNITS	POPULATION	ACCUMULATED POPULATION	PEAKING FACTOR	AREA	ACCUMULATED AREA	AVERAGE FLOW			PEAK FLOW			PROPOSED FLOW					
										RESIDENTIAL	INFILTRATION	TOTAL	RESIDENTIAL	INFILTRATION	TOTAL	LENGTH OF PIPE	PIPE DIAMETER	GRADE	FULL FLOW CAPACITY	FULL FLOW VELOCITY	PEAK FLOW VELOCITY (ZERO INFILTRATION)
		MH No.	MH No.	No.	cap.	cap.		ha	ha	l/s	l/s	l/s	l/s	l/s	l/s	m	mm	%	l/s	m/s	m/s
External Catchment Area 'A'	'A'	-	SAN MH13	68	156.4	156.4	4.19	9.40	9.40	0.81	2.16	2.98	3.41	2.16	5.57	0.00	200	1.00%	32.80	1.04	0.65
Condo Road 'A'	110	SAN MH1	SAN MH2	9	20.7	20.7	4.38	0.89	0.89	0.11	0.20	0.31	0.47	0.20	0.68	12.45	200	2.00%	46.38	1.48	0.49
Condo Road 'A'	113	SAN MH3	SAN MH17	8	18.4	39.1	4.34	0.67	1.56	0.20	0.36	0.56	0.88	0.36	1.24	85.00	200	0.60%	25.40	0.81	0.38
Condo Road 'A'	114	SAN MH4	SAN MH5	9	20.7	59.8	4.30	0.91	2.47	0.31	0.57	0.88	1.34	0.57	1.91	91.88	200	0.60%	25.40	0.81	0.42
Condo Road 'A'	115	SAN MH5	SAN MH6	5	11.5	71.3	4.28	0.47	2.94	0.37	0.68	1.05	1.59	0.68	2.27	61.78	200	0.60%	25.40	0.81	0.44
Condo Road 'A'	116	SAN MH6	SAN MH7	2	4.6	75.9	4.27	0.24	3.18	0.40	0.73	1.13	1.69	0.73	2.42	17.65	200	1.12%	34.71	1.10	0.56
Condo Road 'A'	117	SAN MH7	SAN MH13	0	0.0	75.9	4.27	0.33	3.51	0.40	0.81	1.20	1.69	0.81	2.50	40.00	200	2.95%	56.33	1.79	0.80
External Catchment Area	120a	SAN MH13	SAN MH14	3	6.9	239.2	4.12	0.45	13.4	1.25	3.07	4.32	5.13	3.07	8.20	79.14	200	2.00%	46.38	1.48	0.94
External Catchment Area 'B'	'B'	SAN MH14	SAN MH15	14	32.2	271.4	4.10	2.22	15.6	1.41	3.58	5.00	5.79	3.58	9.37	70.00	200	0.60%	25.40	0.81	0.62
External Catchment Area		SAN MH15	EX.SAN MH3	0	0.0	271.4	4.10	0.00	15.6	1.41	3.58	5.00	5.79	3.58	9.37	72.00	200	0.60%	25.40	0.81	0.62

## Notes:

1. Refer to SANITARY PLAN SAN-1 prepared by Tatham Engineering Limited.

**Fire Underwriters Survey of The Insurance Bureau of Canada**  
**Potable Water Supply & Fire Flow Calculations**

**Design Criteria:**

Population Density	=	2.30	ppl/unit	Town Standards (Section 4.4)
Average Daily per cap. Flow	=	450	L/cap./d	MOECC, 2008
Maximum Day Factor	=	7.12		Table 3-3, MOECC, 2008
Peak Hour Factor	=	10.74		Table 3-3, MOECC, 2008

**Residential Development:**

Number of Units	=	33		
Equivalent Population	=	75.90	ppl	
Average Daily Demand	=	34.16	cu.m/day	

**Fire Flow Calculations - Fire Underwrites Survey of the Insurance Bureau of Canada (1999)**

Construction Coefficient ( C )	=	1.50	(Wood Framed Construction)	
Average Dwelling Area (A)(sq.m)	=	232.25	(Assumed construction of	2500.00 sq.ft)
Required Fire Flow (F)(L/min	=	5,029.12		
Required Fire Flow (L/s)	=	83.82		

$$F = 220C\sqrt{A}$$

**Design Flow Calculations:**

Maximum Daily Demand	=	243.18	cu.m/day	or	<b>5.63 L/s</b>
Peak Hour Demand	=	366.82	cu.m/day	or	<b>8.49 L/s</b>
Max Daily plus Fire Flow	=	<b>89.45</b>	<b>L/s</b>		