



Enhancing our communities



412 Miller Street

FUNCTIONAL SERVICING REPORT

Harry Littler

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Prepared by:

Tatham Engineering Limited

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
tathameng.com

Prepared for:

Harry Littler

12800 8th Concession
King City, Ontario L7B 1K4

Authored by:	Reviewed by:
	
Andrew Overholt, P.Eng. Engineer, Project Manager	Evan Lundquist, B.Eng., EIT Engineering Intern

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Issue	Date	Description
0	December 11, 2023	Draft Report
1	December 22, 2023	Draft Plan Submission

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1 Introduction

Tatham Engineering Limited was retained by Harry Littler to prepare a Functional Servicing Report in support of the draft plan of subdivision application for the proposed residential development to be located at 412 Miller Street in the Municipality of Meaford, Grey County.

1.1 SITE LOCATION

The location of the development site is shown on Figure 1 enclosed. The development site is 7.0 hectares (17.3 acres) and is located on the north side of Miller Street between Pearson Street and Gardiner Street. The development site is legally described as Plan 309 Lot 1,690 part of lots 1,687, 1,688, 1,689 and 1,691.

1.2 EXISTING SITE CONDITIONS

The development site is currently operated as a cash crop farm and includes an existing single family residence and two barns. The majority of the site is currently zoned “Development” with a small portion of the site at the north end, enclosing an existing unnamed watercourse, zoned “Environmental Protection”. The Municipality of Meaford Official Plan designates the majority of the development site’s land use as “Urban Living Area”, with the small area in the north designated “Environmental Protection”. The Grey County Official Plan designates the majority of the site as “Primary Settlement Area” with the environmental area identified previously as “Hazard Lands”. The “Environmental Protection” zoned lands are regulated by the Grey Sauble Conservation Authority (GSCA). Land use surrounding the development site is single family residential and zoned as “Development”.

1.3 PROPOSED DEVELOPMENT

The proposed development is illustrated on the Draft Plan of Subdivision enclosed as Appendix A for reference. The Draft Plan proposes:

- 18 single detached lots;
- 46 semi detached lots;
- 26 freehold townhouse units in 4 blocks; and
- a residential condominium block with an estimate 73 units.

The proposed development also includes an open space park block, stormwater management block and an environmental protection block for the watercourse at the north end of the development site. The development will include one new intersection connection to Miller Street and internal 20 meter rights of way, full urban section, local road network.



2 Wastewater Collection

2.1 EXISTING WASTEWATER INFRASTRUCTURE

There are no existing sanitary outlets fronting the development site, therefore, external works will be required to service the site for wastewater collection. To identify the preferred sanitary outlet, Tatham Engineering prepared an External Sanitary Sewer Servicing Options Memorandum dated October 3, 2023, which is enclosed with this report as Appendix B for reference. The memorandum evaluated 3 potential connection points and ultimately recommended extending a new gravity sanitary sewer west along Miller Street from the existing sanitary maintenance hole at the intersection of Miller Street and Owen Street to the development site as shown on Drawing ES-3 included in the memorandum. This project will include the installation of approximately 780 to 1,130 m of new gravity sewer along Miller Street. Further consultation with the Municipality will determine the limits of the sewer extension to service existing residential lots west of the subject site.

2.2 WASTEWATER FLOWS

A detailed wastewater flow calculation is enclosed with this report as Appendix C for reference. Based on the proposed unit count of 163 units, a population density of 2.4 persons per unit, a per day flow of 540 L/day/person and a serviced area of 4.7 ha, the site will generate the following wastewater flows:

- Average day flow 211 m³/day (2.45 L/s); and
- Peak flow 11.51 L/s.

2.3 INTERNAL WASTEWATER CONVEYANCE

The proposed servicing strategy is displayed on drawings CSP-1 and CSP-2 enclosed herein as Appendix D for reference. Wastewater will be collected from each of the single detached, semi-detached and freehold townhome lots by individual 125 mm service connections. The condominium block will be serviced by a 200 mm diameter service connection. New municipal sanitary sewer, generally following the internal road centreline in accordance with the Municipality of Meaford standard road cross section, will collect the wastewater flows from the service connections and drain to the external wastewater connection discussed in Section 2.1. A 200 mm diameter PVC sewer at 0.32% (full flow capacity of 19.36 L/s) can convey the peak flow from the development while maintaining a full flow self-cleansing velocity of 0.6 m/s.



2.4 MEAFORD WATER POLLUTION CONTROL PLANT CAPACITY

The Meaford Water Pollution Control Plant's rated capacity is 3,910 m³/day per the facility's Amended Environmental Compliance Approval (Number 9036-AZFPV6) issued October 10, 2018. We have reviewed the 2019, 2020, 2021 and 2022 Meaford Water Pollution Control Plant Annual Reports which show an average day flow of 2,941 m³/day, 2,889 m³/day, 2,690 m³/day and 2,335 m³/day respectively. Taking the most conservative of these annual flows, 2,941 m³/day in 2019, the wastewater treatment plant has sufficient reserve capacity to accommodate the additional 211 m³/day average day wastewater flow from the proposed development with a total average day flow of 3,152 m³/day.

2.5 DOWNSTREAM SEWER AND PUMPING STATION CAPACITY

Wastewater generated by the proposed development will drain by an existing 350 mm diameter gravity sewer west along Legion Road and Berry Street to Bayfield Street where it then drains south to the Bighead Pump Station (SPS 1). This station has published annual reports which show that the rated capacity of the pumping station is 160 L/s (13,824 m³/day). Maximum day flows to the pumping station in 2020, 2021 and 2022 were 9,670 m³, 9,935 m³, and 7,467 m³ respectively. Taking the most conservative of these values, 9,935 m³ (115 L/s) in 2021 and adding the proposed development's maximum day flow of 11.51 L/s, the total maximum day flow to SPS 1 will be 126.51 L/s which is within the pumping station's rated capacity.

The gravity sewer between the proposed development and SPS 1 will need to have its available capacity confirmed by including the proposed development in the Municipality's sewer model.



3 Water Supply

3.1 EXISTING WATER INFRASTRUCTURE

A new 200 mm diameter PVC watermain was installed along the south side of Miller Street in 2016. The development site is currently serviced with one 19 mm diameter water service to the existing residence on the property; this service will be decommissioned as part of the works for this development.

3.2 WATER DEMAND

A detailed water demand calculation and Fire Underwriter's Survey (FUS) fire flow demand calculations are enclosed with this report as Appendix C for reference.

The FUS fire demand was calculated for two scenarios; the first scenario is the building that requires the highest fire flow which is the 6 plex of townhouses in Block 43. The second scenario assumes that all the townhouse units will have a vertical fire wall with a minimum 2-hour fire resistance rating every 2 units. Assuming the fire wall allows for subdividing of the building for calculating fire flow giving a more realistic fire flow. The fire flow below has thus been provided as a range which is dependent on the vertical firewall configuration in the townhouse units.

Based on the proposed unit count of 163 units, a population density of 2.4 persons per unit and a per day flow of 450 L/day/person, the site will generate the following water demands:

- Average day demand 176 m³/day (2.04 L/s);
- Max Day Demand 528 m³/day (6.12 L/s);
- Peak hour demand 9.18 L/s;
- Required Fire Flow 67 - 150 L/s; and
- Max Day Plus Fire Flow 73.12 - 156.12 L/s.

3.3 INTERNAL WATER DISTRIBUTION

The proposed servicing strategy is displayed on drawings CSP-1 and CSP-2 enclosed herein as Appendix D for reference. A new connection will be made to the existing 200 mm diameter watermain on Miller Street and new watermain will be extended through the development generally following the road network in accordance with the Municipality of Meaford standard road cross section. Individual 25 mm diameter water services will be extended to each of the single detached, semi-detached and freehold townhome units. The residential condominium block will be serviced by a large diameter water service (150 mm diameter or larger). Internal



watermain sizing and sizing of the large diameter service to the condominium block will be confirmed during detailed design.

It is requested that the proposed development be incorporated into the Municipality's water distribution model to confirm available flow and pressure that can be supplied to the development from the municipal water distribution system.

Fire hydrants will be installed along the proposed roadways in accordance with Municipal standards to provide fire suppression supply.

3.4 MEAFORD WATER TREATMENT AND DISTRIBUTION SYSTEM

The Meaford Water Treatment Plant's rated capacity is 26,848 m³/day. Based on review of the 2020, 2021 and 2022 Meaford Water Treatment Plant Summary Reports, the average daily water demand at the plant was 1,402 m³/day, 1,420 m³/day and 1,501 m³/day respectively. Therefore, the plant has sufficient reserve capacity to supply the max day water demand of 528 m³/day from the proposed development.



4 Stormwater Management

A preliminary stormwater management report has been prepared by Tatham Engineering under separate cover which reviews the existing and proposed surface drainage conditions and outlines a stormwater management plan to mitigate drainage impacts from the development. The following is a summary of the report.

- Under existing conditions, the development site drains to 3 drainage outlets including:
 - Outlet 1 - an existing watercourse to the north;
 - Outlet 2 - overland to the east; and
 - Outlet 3 - overland to the south.
- A wetland end of pipe stormwater management facility (SWMF) outletting to Outlet 1 will provide post to pre peak flow matching, for the 1:2 through 1:100 year return frequency storm events, for the majority of the site's runoff which will be graded to drain to the SWMF. The reduced drainage areas to Outlets 2 and 3 will limit flows to existing condition levels under proposed conditions.
- Minor storm drainage, less than or equal to the 1:5 year return frequency storm, will be collected and conveyed to the SWMF via a storm sewer system with major drainage, greater than the 1:5 year return frequency storm, conveyed to the pond via overland flow generally following the internal road network.
- The SWMF will provide enhanced level water quality control, corresponding to 80% total suspended solids (TSS) removal, for site drainage.
- Strict adherence to erosion and sediment control best practices will be implemented during construction to limit sediment transport off site.



5 Site Grading

Concept grading plans, Drawings CSG-1 and CSG-2 are enclosed in Appendix E for reference. The internal roadway rights of way will be constructed to Municipality of Meaford standard drawing STD.DWG.No.1 enclosed in Appendix E for reference. Lot grading will be in accordance with Municipal Standards; yard areas are to be designed with 1% to 5% grades with a maximum grade of 30%. Rear and side yard swales shall be 1% to 5% with a preferred minimum grade of 2% where possible. The underside of footing for the proposed houses must be a minimum 0.3m above the seasonal high groundwater level.

Overall, the site will be graded to drain to the pond at the north extent of the property adjacent to Outlet 1. This will require raising the grade across the site, particularly on the eastern half of the site. To tie into existing grading along the north, west and south property lines, walk out and/or back split lots are required. In addition, a retaining wall will be required along the west property line as shown on Drawings CSG-1 and CSG-2.

The condominium block, Block 46 will have a detailed grading plan provided in support of site plan approval, following the subdivision process, under separate cover. In the interim, Block 46 will be graded to collect the upstream external drainage area and convey it, along with Block 46 runoff, to the SWMF.

To maintain the existing roadside ditch on the north side of Miller Street, a road crossing culvert will be required across the proposed entrance road.



6 Traffic

A traffic impact study has been prepared by Tatham Engineering under separate cover which reviews the background, future background and future (with the proposed development) traffic volumes and operations around the site. The study evaluated if any road infrastructure improvements are required due to the increased traffic associated with the development; the following is a summary of the study's findings.

- The report reviewed the traffic at the following intersections and found that under future conditions, they will provide good (level of service B or better) operating conditions through the 2038 horizon, so no intersection upgrades are required:
 - Miller & Gardiner Street;
 - Miller Street & Pearson Street;
 - Person Street & Nelson Street West (county); and
 - Pearson Street & Nelson Street West (local).
- The projected traffic volumes do not require exclusive left or right turn lanes at the site's proposed entrance.
- Sight lines and intersection spacing along Miller Street at the proposed site access were reviewed and found to exceed Ministry of Transportation Ontario (MTO) requirements.



7 Utilities

7.1 EXISTING INFRASTRUCTURE

7.1.1 Hydro One

Hydro One has existing primary and secondary aerial distribution lines on Miller Street fronting the site. A copy of the Hydro One plan showing the location of their infrastructure is enclosed in Appendix F.

7.1.2 Enbridge

Enbridge has existing transmission and distribution mains on Miller Street fronting the site. A copy of the Enbridge plan showing the location of their infrastructure is enclosed in Appendix F.

7.1.3 Bell

Bell has existing aerial lines on the south side of Miller Street fronting the site. A copy of the Bell Plan showing the location of their infrastructure is enclosed in Appendix F.

7.2 PROPOSED UTILITY SERVICING

At detailed design, the respective utility companies will be contacted to confirm their internal distribution designs to service the proposed development.



8 Summary

As outlined above, the proposed 412 Miller Street Development can be serviced as follows:

- External works will be required to extend a wastewater outlet to the development site. The preferred wastewater servicing option includes extending a gravity sewer west along Miller Street from an existing maintenance hole at the intersection of Miller Street and Owen Street to the entrance of the proposed development, or further west, depending on the Municipality's preference. Individual service connections will be extended to each lot along with a large diameter sewer stub to the condominium residential block. An internal sewer system will collect and convey wastewater to this new outlet.
- Water will be supplied by a new connection to the existing 200 mm diameter watermain on Miller Street. An internal distribution system will provide water services to each lot along with a large diameter service to the residential condominium block. Fire suppression flows will be provided by fire hydrants installed along the internal watermain.
- Post to pre peak flow matching for stormwater runoff from the 1:2 through 1:100 year return frequency storm events will be provided by a wetland end of pipe SWMF which will outlet to the existing watercourse at the north end of the site. This facility will also provide enhanced level water quality protection for site runoff. A storm sewer system will collect and convey minor flows to the SWMF with major flows draining overland to the facility.
- The traffic impacts surrounding the subject site have been reviewed to the 2038 horizon and no road upgrades are required to service the proposed development.
- Bell, Enbridge and Hydro One all have existing utility infrastructure on Miller Street and can be extended to service the site. Detailed servicing plans will be provided at detailed design.





412 MILLER STREET

Figure 1: Site Location



Appendix A: Draft Plan of Subdivision

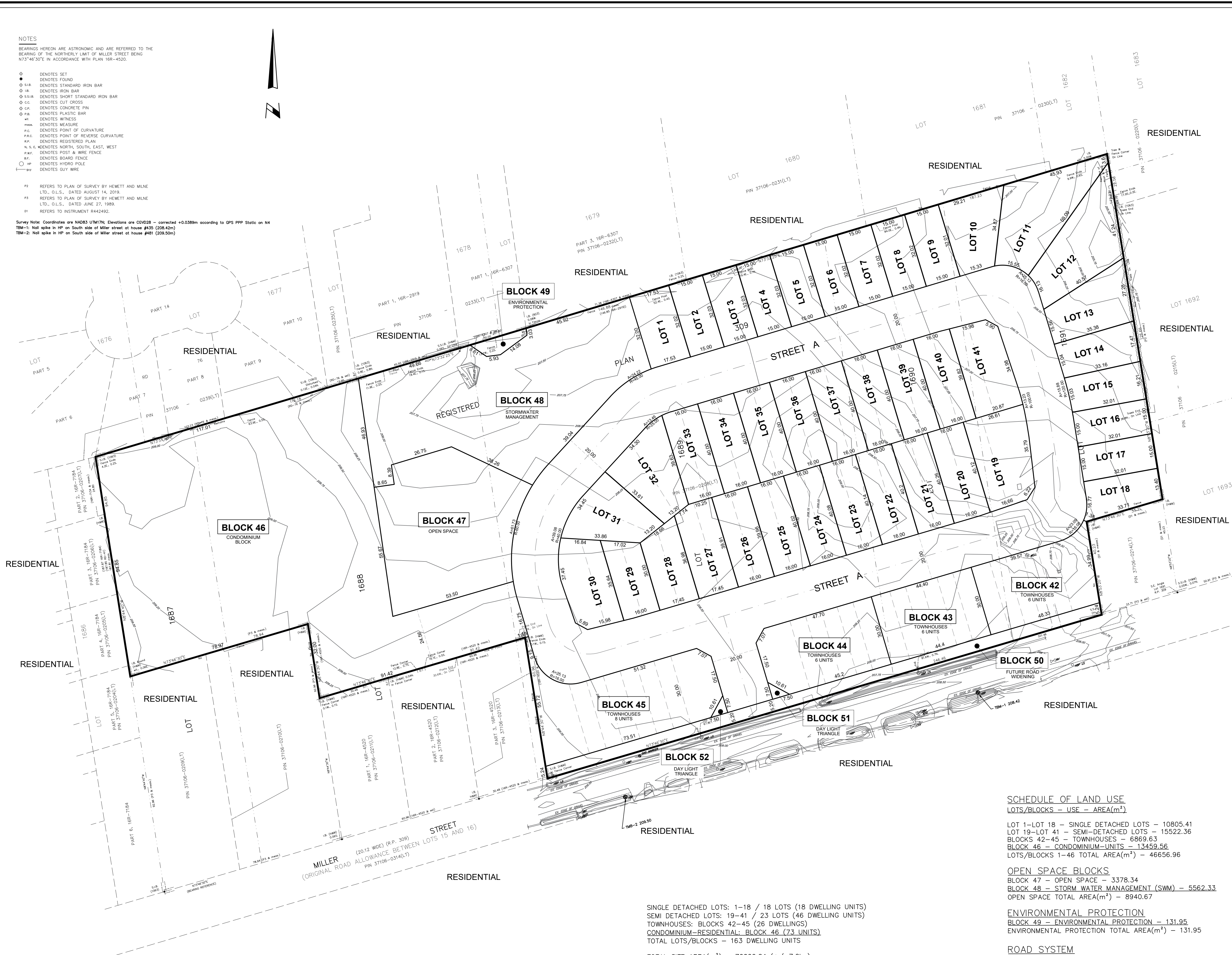
NOTES

BEARINGS HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE BEARING OF THE NORTHERLY LIMIT OF MILLER STREET BEING N73°46'30"E IN ACCORDANCE WITH PLAN 16R-4520.

- DENOTES SET
● DENOTES FOUND
○ S.I.B. DENOTES STANDARD IRON BAR
○ I.B. DENOTES IRON BAR
○ S.S.I.B. DENOTES SHORT STANDARD IRON BAR
○ C.C. DENOTES CUT CROSS
○ C.P. DENOTES CONCRETE PIN
○ P.B. DENOTES PLASTIC BAR
W1 DENOTES WITNESS
M1 DENOTES MEASURE
P.C. DENOTES POINT OF CURVATURE
P.R.C. DENOTES POINT OF REVERSE CURVATURE
R.P. DENOTES REGISTERED PLAN
N, S, E, W DENOTES NORTH, SOUTH, EAST, WEST
P.W.F. DENOTES POST & WIRE FENCE
B.F. DENOTES BOARD FENCE
H.P. DENOTES HYDRO POLE
G.W. DENOTES GUY WIRE

- P2 REFERS TO PLAN OF SURVEY BY HEWETT AND MILNE LTD., O.L.S., DATED AUGUST 14, 2019.
P3 REFERS TO PLAN OF SURVEY BY HEWETT AND MILNE LTD., O.L.S., DATED JUNE 27, 1989.
P1 REFERS TO INSTRUMENT R442492.

Survey Note: Coordinates are NAD83 UTM17N. Elevations are CGVD28 – corrected +0.0389m according to GPS PPP Static on N4
TBM-1: Nail spike in HP on South side of Miller street at house #435 (208.42m)
TBM-2: Nail spike in HP on South side of Miller street at house #491 (209.50m)



PLAN OF SURVEY BY ZYBEK, EMO, PATTEN & THOMSEN LTD. O.L.S. 2022
TOPOGRAPHIC SURVEY PLAN BY TATHAM ENGINEERING 2023

SINGLE DETACHED LOTS: 1-18 / 18 LOTS (18 DWELLING UNITS)
SEMI DETACHED LOTS: 19-41 / 23 LOTS (46 DWELLING UNITS)
TOWNHOUSES: BLOCKS 42-45 (26 DWELLINGS)
CONDOMINIUM-RESIDENTIAL: BLOCK 46 (73 UNITS)
TOTAL LOTS/BLOCKS – 163 DWELLING UNITS
TOTAL SITE AREA(m²) – 70066.24 (+/-7.0ha)
TOTAL NET DEVELOPMENT AREA(m²) – 46656.9 (+/-4.6ha)
(TOTAL SITE AREA LESS ROAD SYSTEM, ENVIRONMENTAL PROTECTION BLOCK, SWM BLOCK, AND OPEN SPACE BLOCK)
DENSITY: +/-35 DWELLING UNITS/HA
(TOTAL NUMBER OF DWELLING UNITS PER TOTAL NET DEVELOPMENT AREA)

SCHEDULE OF LAND USE
LOTS/BLOCKS – USE – AREA(m²)

LOT 1-LOT 18 – SINGLE DETACHED LOTS – 10805.41
LOT 19-LOT 41 – SEMI-DETACHED LOTS – 15522.36
BLOCKS 42-45 – TOWNHOUSES – 6869.63
BLOCK 46 – CONDOMINIUM-UNITS – 13459.56
LOTS/BLOCKS 1-46 TOTAL AREA(m²) – 46656.96

OPEN SPACE BLOCKS

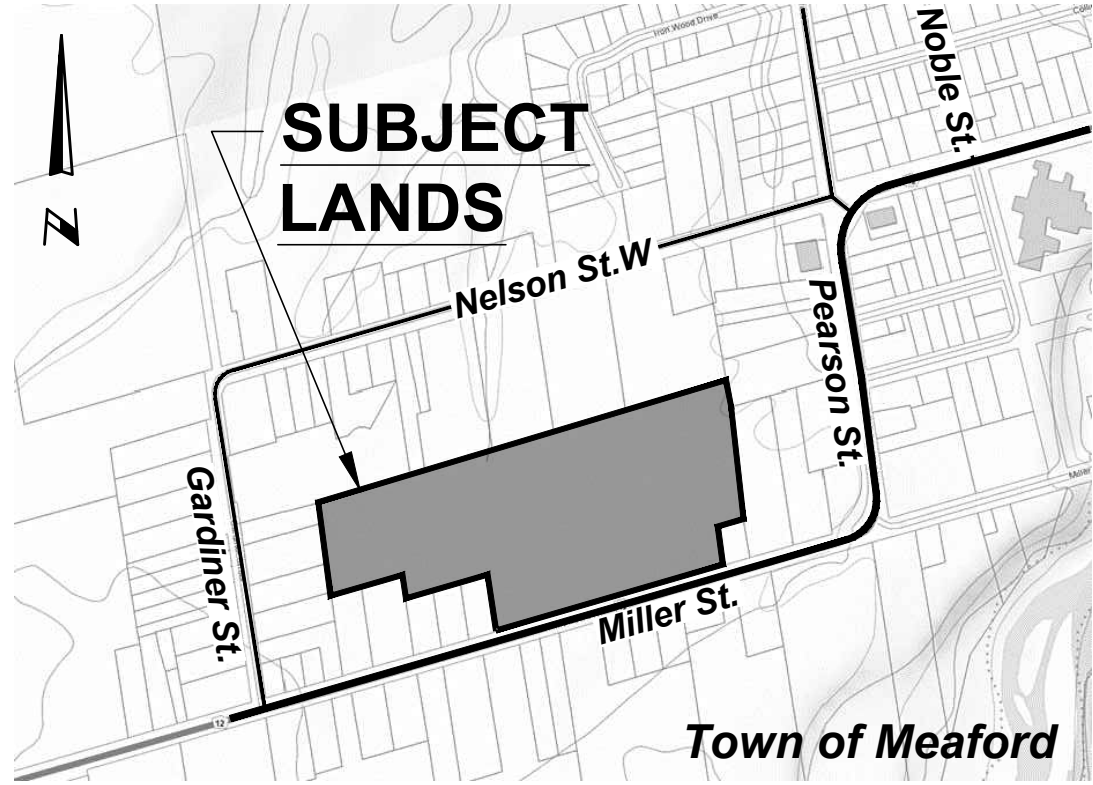
BLOCK 47 – OPEN SPACE – 3378.34
BLOCK 48 – STORM WATER MANAGEMENT (SWM) – 5562.33
OPEN SPACE TOTAL AREA(m²) – 8940.67

ENVIRONMENTAL PROTECTION

BLOCK 49 – ENVIRONMENTAL PROTECTION – 131.95
ENVIRONMENTAL PROTECTION TOTAL AREA(m²) – 131.95

ROAD SYSTEM

STREET A – 12998.88
BLOCK 50 – FUTURE ROAD WIDENING – 1281.54
BLOCK 51 – DAY LIGHT TRIANGLE – 28.12
BLOCK 52 – DAY LIGHT TRIANGLE – 28.12
ROAD SYSTEM TOTAL AREA(m²) – 14336.66



KEY MAP n.t.s

DRAFT PLAN OF SUBDIVISION OF
LOT 1690 AND PART OF LOTS
1687, 1688, 1689 AND 1691
REGISTERED PLAN 309
(FORMERLY TOWN OF MEAFORD)
MUNICIPALITY OF MEAFORD
COUNTY OF GREY

SURVEYOR CERTIFICATE:

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATION TO THE ADJACENT LANDS ARE ACCURATELY SHOWN ON THIS PLAN.

DATED THE ____ DAY OF _____ 2023
NAME: _____
ONTARIO LAND SURVEYOR

OWNER CERTIFICATE:

AS OF THE DATE ON THIS PLAN THE UNDERSIGNED BEING THE REGISTERED OWNERS OF THE SUBJECT LANDS HEREBY AUTHORIZE _____ TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION AND TO MAKE APPLICATION TO THE GREY COUNTY PLANNING DEPARTMENT FOR APPROVAL THEREOF.

DATED THE ____ DAY OF _____ 2023
NAME: _____
I HAVE THE AUTHORITY TO BIND THE CORPORATION

PLANNING ACT, SECTION 51(17)

- (a) As shown on draft plan
(b) As shown on draft plan
(c) As shown on draft plan
(d) See schedule of land use
(e) As shown on draft plan
(f) As shown on draft plan
(f) Not Applicable
(g) As shown on draft plan
(h) Piped municipal treated water
(i) Soil type "clayey silt"
(j) As shown on draft plan
(k) Municipal sanitary sewer
(l) As shown on draft plan

Revision#. Date D/M/Y	Description / Notes
1. 29/05/2023	ISSUED FOR 1ST SUBMISSION
2. 04/12/2023	REVISED FOR 1ST SUBMISSION

SCALE / METRIC (1:750)
0 5 10 20 30 50 m

ZUBER, EMO
PATTEN & THOMSEN
LIMITED
ONTARIO LAND SURVEYORS
200 MOUNTAIN ROAD
UNIT 4
COLLINGWOOD, ONTARIO L9Y 4V5
PHONE: (705) 445-4910

travis
travis & associates
planning consultants
approvals facilitators
development managers
PO Box 323
Thornbury, ON
N0H 2P0
T. 705-446-9917

File/CAD: 412MillerSt-DraftPlan.dwg
Date(d/m/y): 04/12/2023
Drafted by: D.C.
Checked by: C.T.

D-1

Appendix B: External Sanitary Sewer Servicing Options Memorandum

Memo

File	Recipient	Company
122076	Tori Perejmybida Harry Littler Leah Ambler	Municipality of Meaford
Date	Purpose	
October 3, 2023	412 Miller Street, Municipality of Meaford External Sanitary Sewer Servicing Options	

Message

Introduction The purpose of this memo is to review the external servicing options for the proposed residential development to be located at 412 Miller Street in the Municipality of Meaford. The proposed 412 Miller Street development will include the 163 units broken down as follows:

- 18 single detached units;
- 46 semi detached units;
- 26 townhouse units; and
- 73 condominium residential lots.

The proposed development will generate and wastewater average day flow of 2.45L/s and a peak wastewater flow of 11.12L/s (including extraneous flows). Detailed wastewater demand calculations are included with this memo.

Potential Sanitary Outlets

There is no existing sanitary sewer fronting the 412 Miller Street property so external works will be required to provide a wastewater Outlet for the development. We have reviewed the Municipality of Meaford Master Servicing Plan (MSP) prepared by Ainley & Associates dated April 2015. The MSP showed a future municipal sanitary sewer extending south along Pearson Street and west along Miller Street, to west of the of the subject site, from an existing maintenance hole on Pearson Street north of Trowbridge Street. This Outlet will henceforth be referred to as Outlet 1. Alternate wastewater Outlet points include existing maintenance holes on Trowbridge Street east of Pearson Street and Miller Street west of Owen Street, henceforth referred to as Outlet 2 and Outlet 3 respectively. A markup of the Meaford Servicing Master Plan – Wastewater System is included with this memo showing the existing sanitary system at the time of the report along with the planned wastewater works. All 3 outlets ultimately drain to Sewage Pumping Station 1.

We have reviewed the physical condition of the maintenance holes at Outlets 1, 2 and 3 and note that the of the 3 potential outlet maintenance holes, the maintenance holes at Outlet 1 and Outlet 3 are in good enough condition to be retained. The maintenance hole at Outlet 2 is brick and would have to be replaced if a connection were made to this Outlet. In addition, Outlet 2 offers no advantages over Outlet 1 and when the condition

of the structure is considered, this outlet is the least preferred Outlet option for the site. Pictures from our condition assessments are enclosed with this memo.

Option 1

Option 1 is shown on Drawing ES-1 enclosed with this report. Option 1 includes the construction of a gravity sewer that drains east along Miller Street towards Pearson Street. A municipal sewage pumping station would need to be constructed near the intersection of Miller Street and Pearson Street to pump the sewage north to Outlet 1 via a forcemain along Pearson Street. Advantages of this option are that the gravity sewer along Miller Street could service existing properties along Miller Street and sewers could be connected to the pumping station to service lots on Pearson Street which aren't already serviced and Miller Street east of Pearson Street. Disadvantages of this option are that land takings may be required to accommodate the pumping station which could trigger the need for an Environmental Assessment for the project.

Our preliminary plans show the proposed gravity sewer on Miller Street extended to the intersection of Miller Street and Gardiner Street. This option includes the installation of approximately 685m of gravity sewer, 245m of sanitary forcemain and a sewage pumping station. It is expected that in addition to servicing the 163 units proposed for the 412 Miller Street development, the sewer would also service at least 32 existing lots along Miller Street. Additional lots on Miller Street and Pearsons Street could also be serviced.

Option 2

Option 2 is shown on Drawing ES-2 enclosed with this report. Option 2 is similar to Option 1 in that the development will be serviced by gravity sewer that drains to a municipal sewage pumping station. The difference is that the location of the pumping station will be within the proposed development and a forcemain will have to be constructed east along Miller Street and north along Pearson Street to Outlet 1. Advantages of this strategy are that land takings, and therefore an Environmental Assessment, will not be required for the project. Disadvantages of this option are that it limits the number of external connections that can be made for existing houses along Miller Street.

This option would include the installation of approximately 770m of sanitary forcemain internal to the site, along Miller Street and Pearson Street and a municipal sewage pumping station.

Option 3

Option 3 is shown on Drawing ES-3 enclosed with this report. Option 3 includes construction of a gravity sewer east along Miller Street connecting to Outlet 3 west of the intersection of Miller Street and Owen Street. The advantage of this option is that it eliminates the need for a new municipal sewage pumping station and allows for service connections to all existing properties along Miller Street between Owen Street and Gardiner Street. The disadvantage of this approach is that Miller Street is a narrow road that has a steep section approaching 14% grade which may make restoration of the road a challenge.

Our preliminary plans show the gravity sewer extended to the intersection of Miller Street and Gardiner Street. This option includes the installation of approximately 1,130m of gravity sewer along Miller Street. It is expected that in addition to servicing the 163 units proposed for the 412 Miller Street development, the sewer would also service at least 47 existing properties along Miller Street.

**Preferred
Alternative**

Pending a downstream capacity analysis of the sewer system between Outlet 3 and Sewage Pumping Station 1, we recommend Option 3 as the preferred alternative. This option was chosen because it eliminates the need for a sewage pumping station which has significant up-front costs and ongoing maintenance costs. It also provides the opportunity to connect the greatest number of external units to the Municipal wastewater collection system.

From

Andrew Overholt and Kevin Sansom

PROJECT	412 Miller Street	FILE	122076
		DATE	Sept. 22, 2023
SUBJECT	Wastewater Demand Calculation	NAME	AO
		PAGE	1 OF 1

# of units	163 Units (from draft plan prepared by Travis & Associates Dated May 29, 2023)
Serviced Area	4.7 ha (from draft plan prepared by Travis & Associates Dated May 29, 2023)
Population Density Per Unit	2.4 persons/ unit (from Meaford Master Servicing Plan Prepared by Ainley & Associates Dated April 2015)
Flow Per Person	540 L/day/person (from Meaford Master Servicing Plan Prepared by Ainley & Associates Dated April 2015)
Extraneous Flow	0.28 L/s/ha (from Design Criteria for Sanitary Sewers, Storm Sewer and Forcemains Prepared by MECP Dated May 31, 2023)
Average Flow	211248 L/day = 211 m ³ /day = 2.45 L/s
Peaking Factor (Harmon)	4.0
Extraneous Flow	1.32 L/s
Total Peak Flow	11.12 L/s



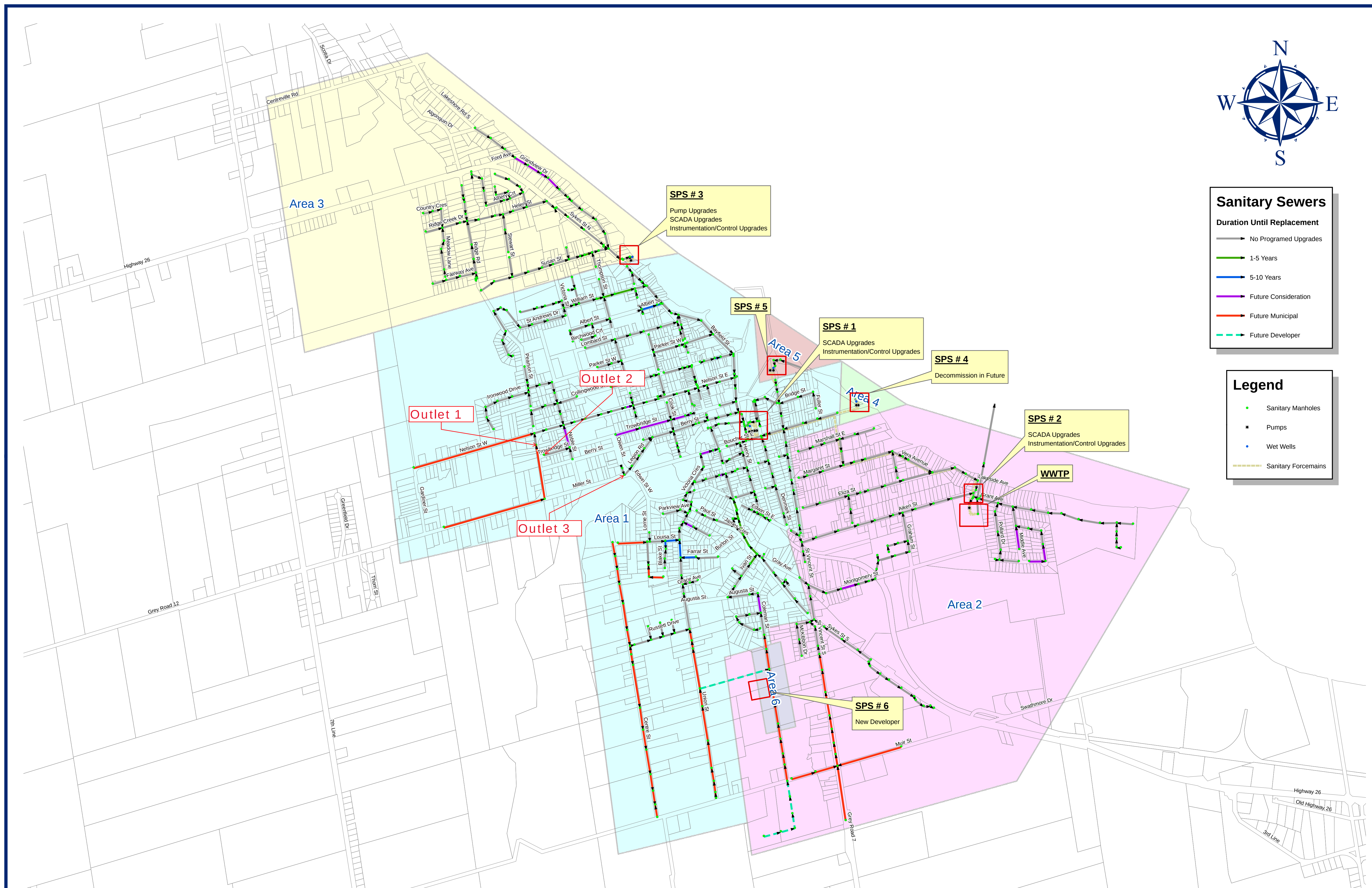
Sanitary Sewers

Duration Until Replacement

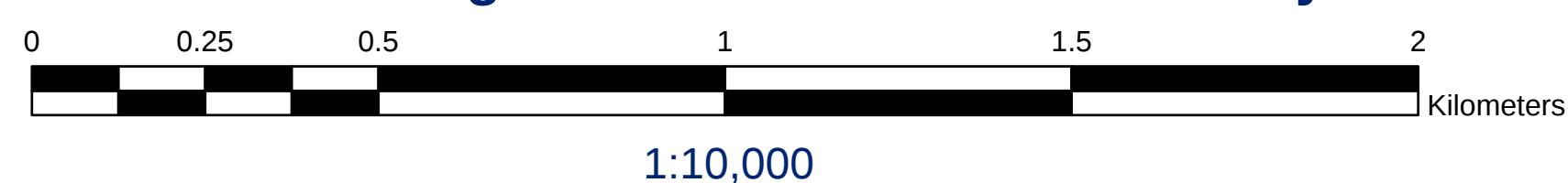
- No Programed Upgrades
- 1-5 Years
- 5-10 Years
- Future Consideration
- Future Municipal
- Future Developer

Legend

- Sanitary Manholes
- Pumps
- Wet Wells
- Sanitary Forcemains



Meaford Servicing Master Plan - Wastewater System





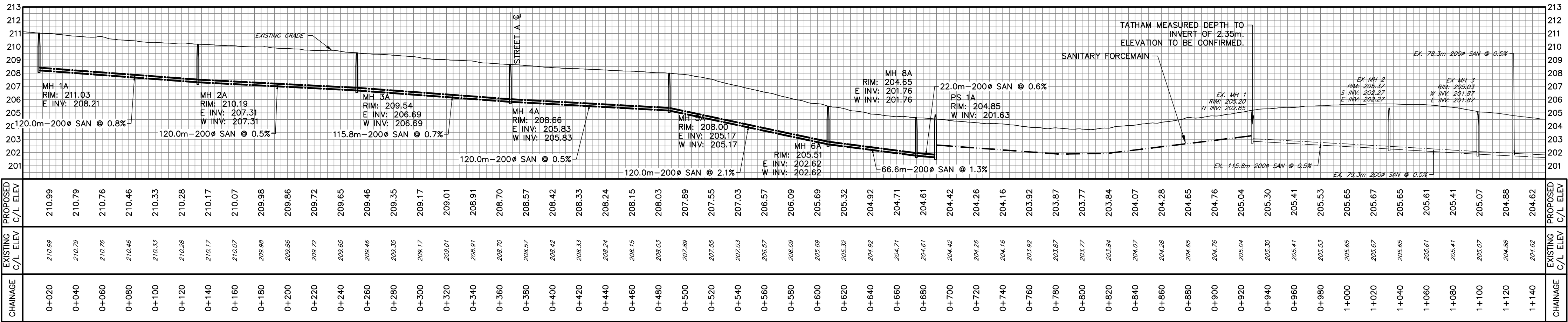
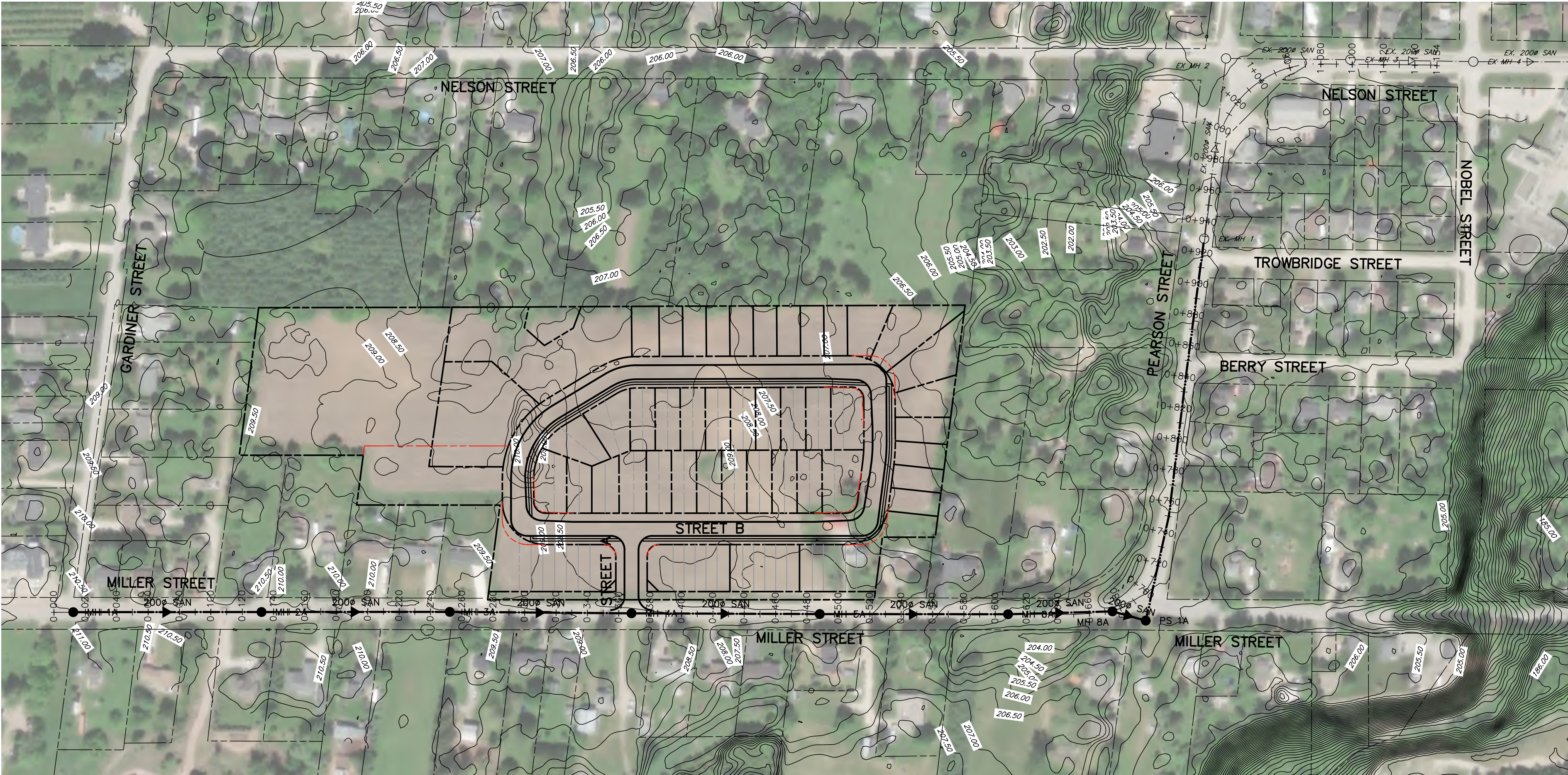
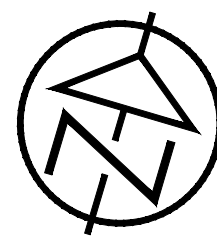
Outlet 1 Maintenance hole



Outlet 2 Maintenance hole



Outlet 3 Maintenance Hole



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BENCHMARKS

NOTES

ELEVATIONS ARE TAKEN FROM SOUTH WEST ONTARIO ORTHOPHOTOGRAPHY PROJECT (2015)

No.

REVISION DESCRIPTION

DATE

ENGINEER STAMP

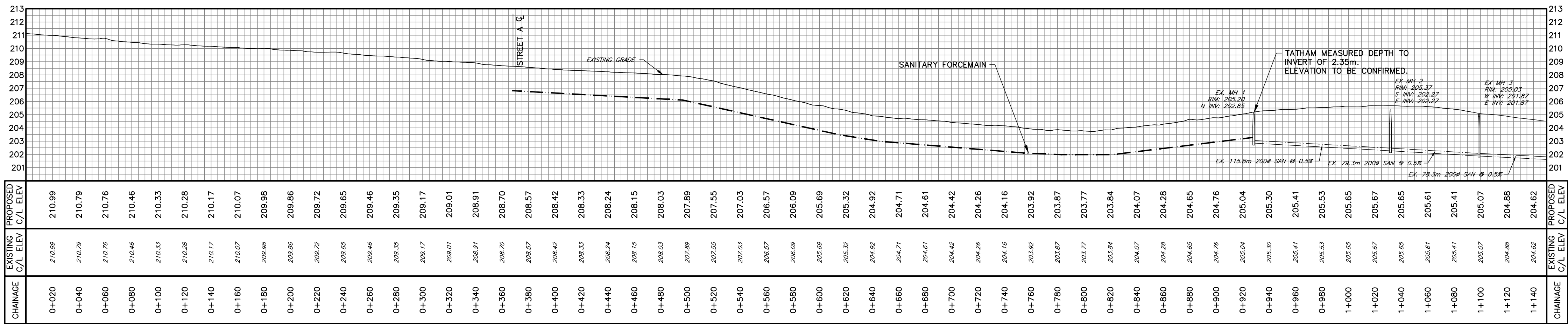
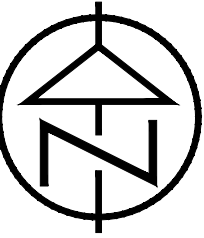
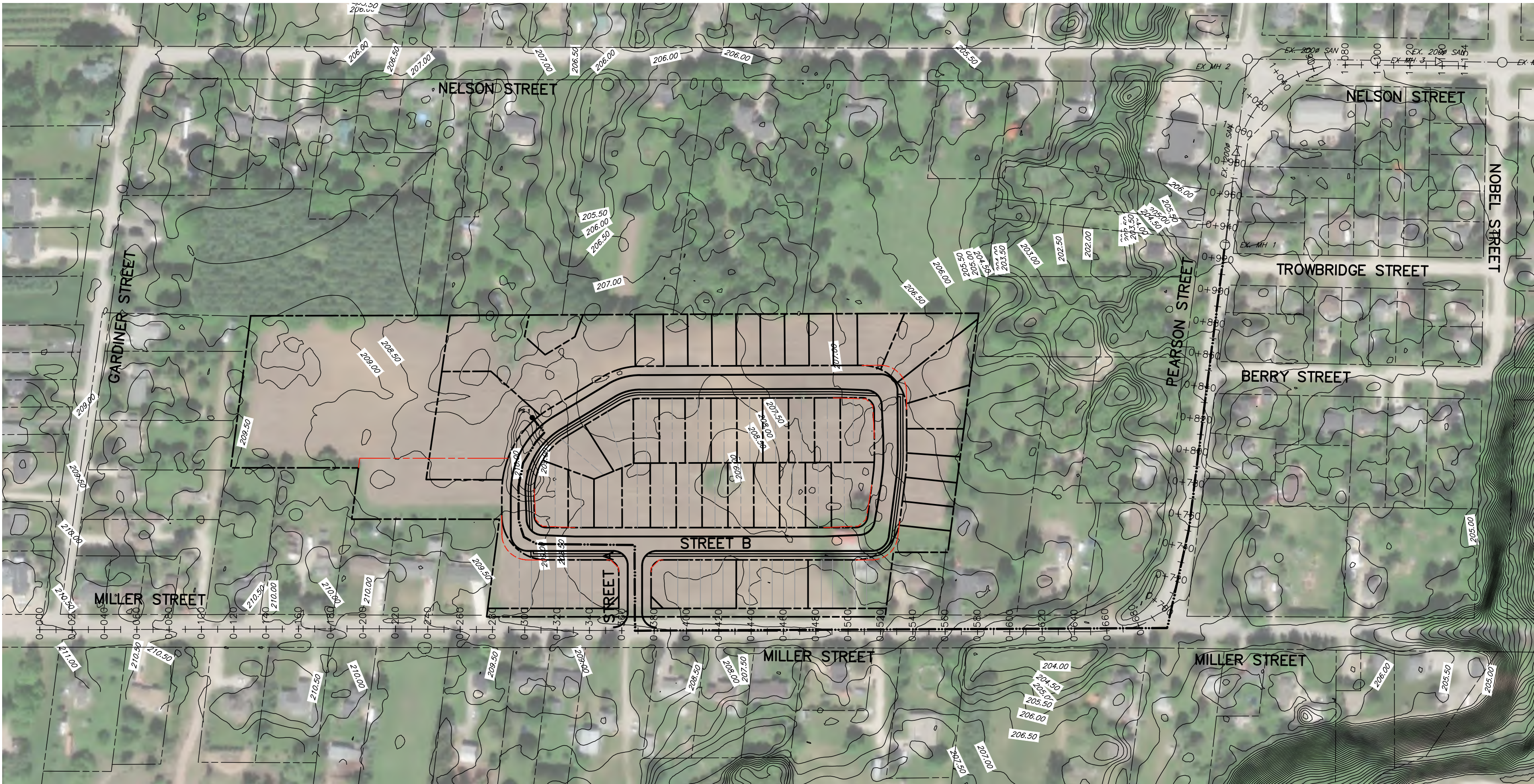
412 MILLER STREET
MUNICIPALITY OF MEAFORD



EXTERNAL SANITARY SERVICING
PLAN OPTION 1

DESIGN: AO	FILE: 122076	DWG:
DRAWN: AO	DATE: SEPT. 2023	
CHECK: KRS	SCALE: 1:2000H 1:200V	

ES-1



DISCLAIMER AND COPYRIGHT
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BENCHMARKS

NOTES
ELEVATIONS ARE TAKEN FROM SOUTH WEST ONTARIO ORTHOPHOTOGRAPHY PROJECT (2015)

No.	REVISION DESCRIPTION	DATE

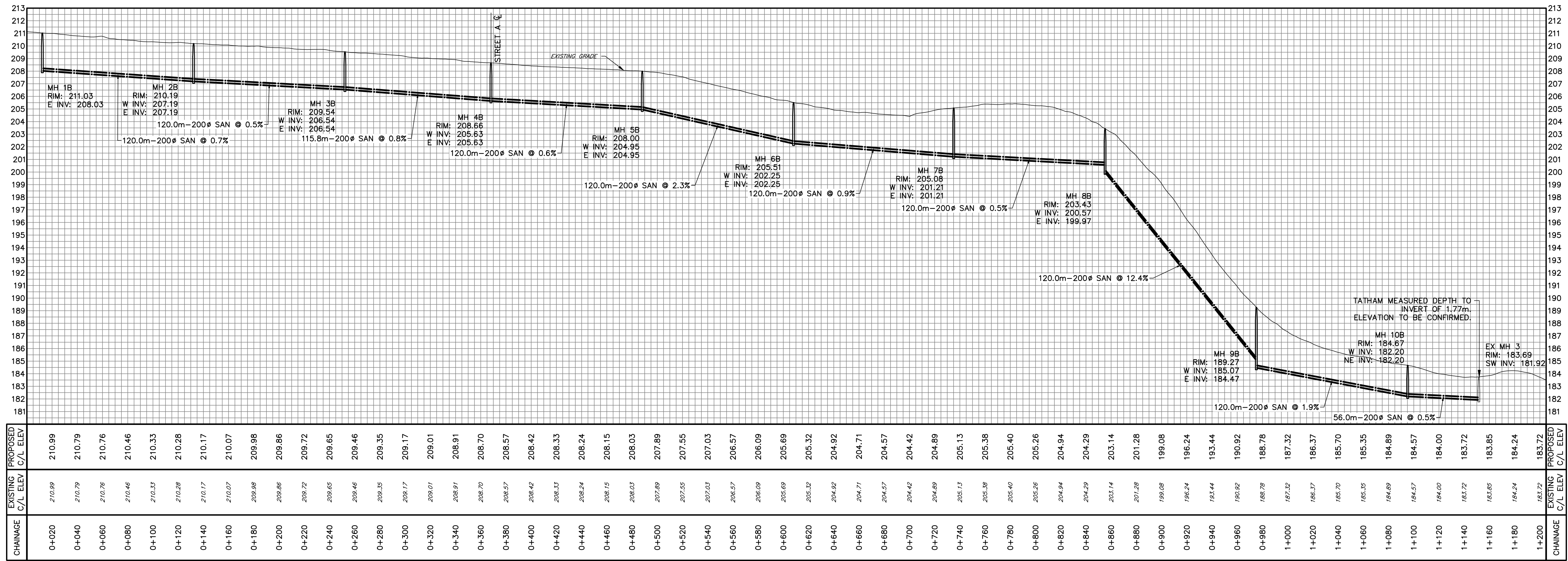
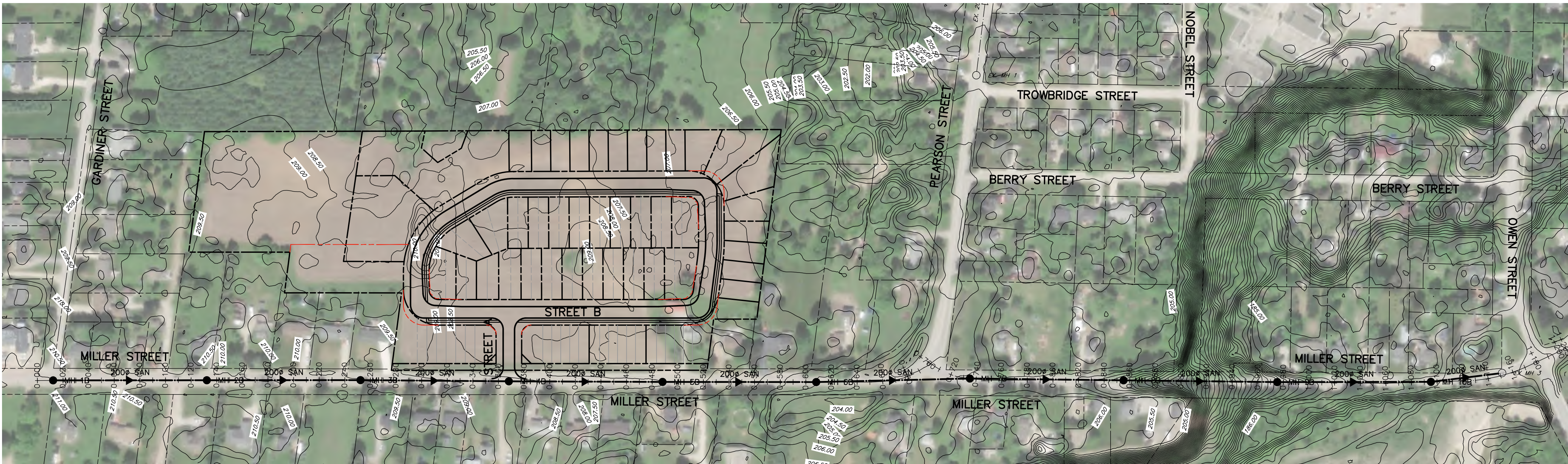
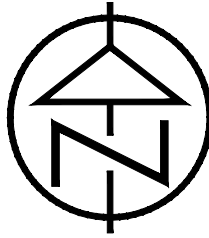
ENGINEER STAMP

412 MILLER STREET
MUNICIPALITY OF MEAFORD

EXTERNAL SANITARY SERVICING
PLAN OPTION 2



DESIGN: AO	FILE: 122076	DWG:
DRAWN: AO	DATE: SEPT. 2023	ES-2
CHECK: KRS	SCALE: 1:2000H 1:200V	



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EXTERNAL SANITARY CONNECTION OPTION 3								DESIGN: AO	FILE: 122076	DWG: ES-3
								DRAWN: AO	DATE: SEPT. 2023	
								CHECK: KRS	SCALE: 1:200H 1:200V	

Appendix C: Wastewater Flow and Water Demand Calculations

PROJECT	412 Miller Street	FILE	122076
		DATE	Dec. 21, 2023
SUBJECT	Wastewater Demand Calculation	NAME	AO
		PAGE	1 OF 1

# of units	163 Units (from draft plan prepared by Travis & Associates Dated May 29, 2023)
Serviced Area	6.1 ha (from draft plan prepared by Travis & Associates Dated May 29, 2023)
Population Density Per Unit	2.4 persons/ unit (from Meaford Master Servicing Plan Prepared by Ainley & Associates Dated April 2015)
Flow Per Person	540 L/day/person (from Meaford Master Servicing Plan Prepared by Ainley & Associates Dated April 2015)
Extraneous Flow	0.28 L/s/ha (from Design Criteria for Sanitary Sewers, Storm Sewer and Forcemains Prepared by MECP Dated May 31, 2023)
Average Flow	211248 L/day = 211 m ³ /day = 2.45 L/s
Peaking Factor (Harmon)	4.0
Extraneous Flow	1.71 L/s
Total Peak Flow	11.51 L/s



Project: 412 Miller Street

Date: Dec./23

File No.: 122076

Designed: AO

Subject: Required Fire Flows

Checked: EL

Required Fire Flow

Coefficient for Type of Construction (A) = 1.0 Ordinary Construction
 Total Floor Area = 165 sq m/unit (assuming 1,776 ft²/ townhouse unit)
 Total Units = 2 (Assumes a 2 hr rated fire wall every 2 units)
 Total Effective Floor Area (B) = 330 sq. m
Required Fire Flow = 220 C Area^{0.5} (Based on formula from PART II of 2020 Water Supply for Fire protection)
 = 3996 L/min
 Rounded to nearest 1000 (C) = 4000 L/min

Type of Occupancy (D) = Limited Combustible 15% Decrease
 Sprinkling System (E) = No 0% Decrease

Exposure Adjustment

North = >30 m -
 East = >30 m -
 South = >30 m -
 West = 0-3 m 25%

Increase / decrease due to Occupancy (D) = -600 L/min

Sprinkler Reduction (E) = 0 L/min

Exposure Adjustment (F) = 1000 L/min

(C) + (D) + (E) + (F) = 4000 L/min (Rounded to the nearest 1000L/s)
 = 67 L/s
 = 420.0 m³ (1.75 Hours)

Assumptions

- A. Construction coefficient = 1.0 for Ordinary Construction.
- B. Total effective floor area = 165 m²/unit. Building subdivided with 2 hr fire wall every 2 units.
- C. Residential use, limited combustible contents.
- D. Building is assumed to not be constructed with a sprinkler system
- E. Exposure adjustment charges calculated based on aerial imagery (Grey GIS) and the Draft Plan



Project: 412 Miller Street

Date: Dec./23

File No.: 122076

Designed: AO

Subject: Required Fire Flows

Checked: EL

Required Fire Flow

Coefficient for Type of Construction (A) = 1.0 Ordinary Construction
 Total Floor Area = 165 sq m/unit (assuming 1,776 ft²/ townhouse unit)
 Total Units = 6
 Total Effective Floor Area (B) = 990 sq. m
Required Fire Flow = 220 C Area^{0.5} (Based on formula from PART II of 2020 Water Supply for Fire protection)
 = 6922 L/min
 Rounded to nearest 1000 (C) = 7000 L/min

Type of Occupancy (D) = Limited Combustible 15% Decrease
 Sprinkling System (E) = No 0% Decrease

Exposure Adjustment

North = >30 m -
 East = 0-3 m 25%
 South = >30 m -
 West = 0-3 m 25%

Increase / decrease due to Occupancy (D) = -1050 L/min

Sprinkler Reduction (E) = 0 L/min

Exposure Adjustment (F) = 3500 L/min

(C) + (D) + (E) + (F) = 9000 L/min (Rounded to the nearest 1000L/s)
 = 150 L/s
 = 1080.0 m³ (2 Hours)

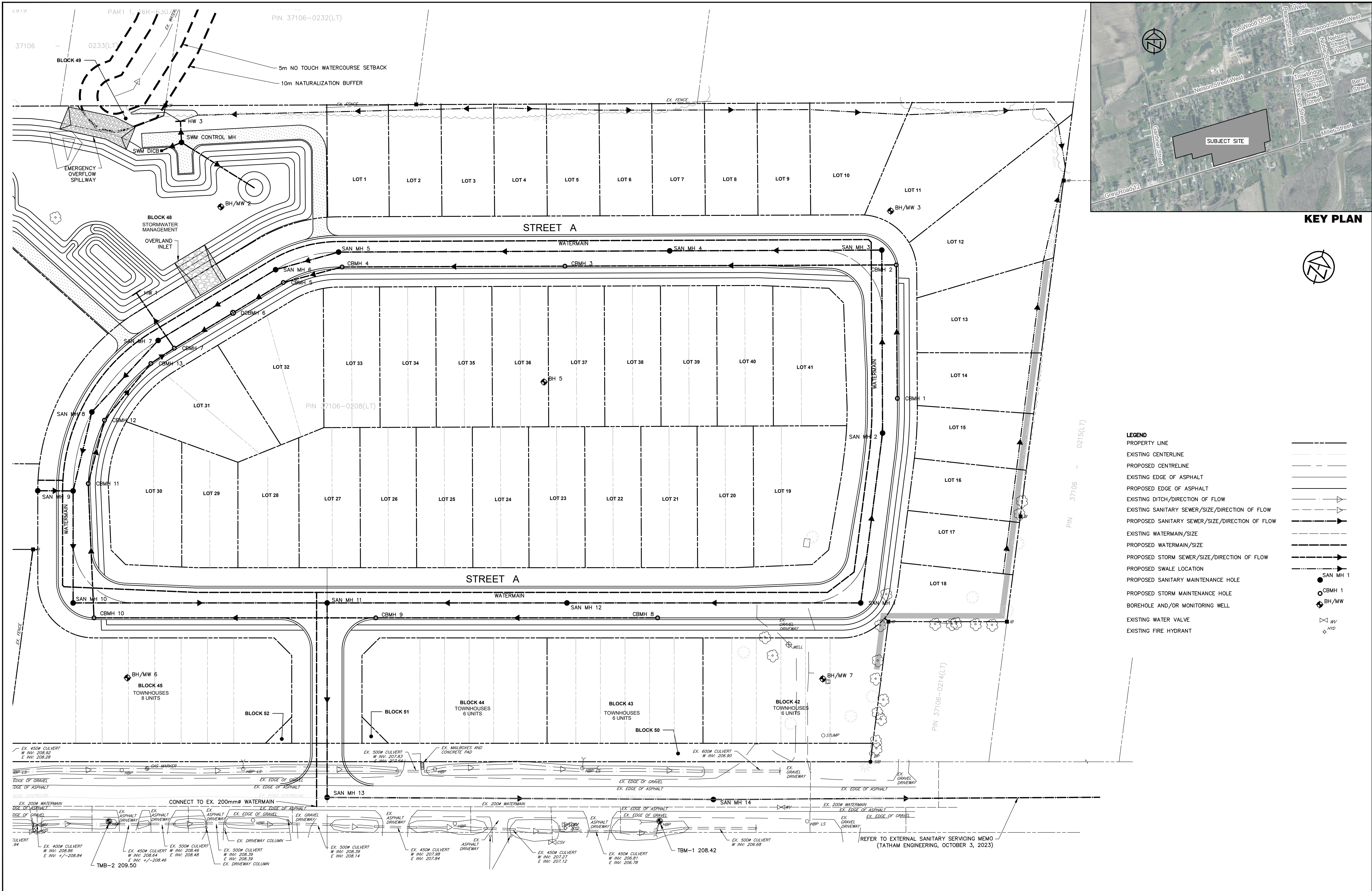
Assumptions

- A. Construction coefficient = 1.0 for Ordinary Construction.
- B. Total effective floor area = 165 m²/unit.
- C. F Residential use, limited combustible contents.
- D. Building is assumed to not be constructed with a sprinkler system
- E. Exposure adjustment charges calculated based on aerial imagery (Grey GIS) and the Draft Plan

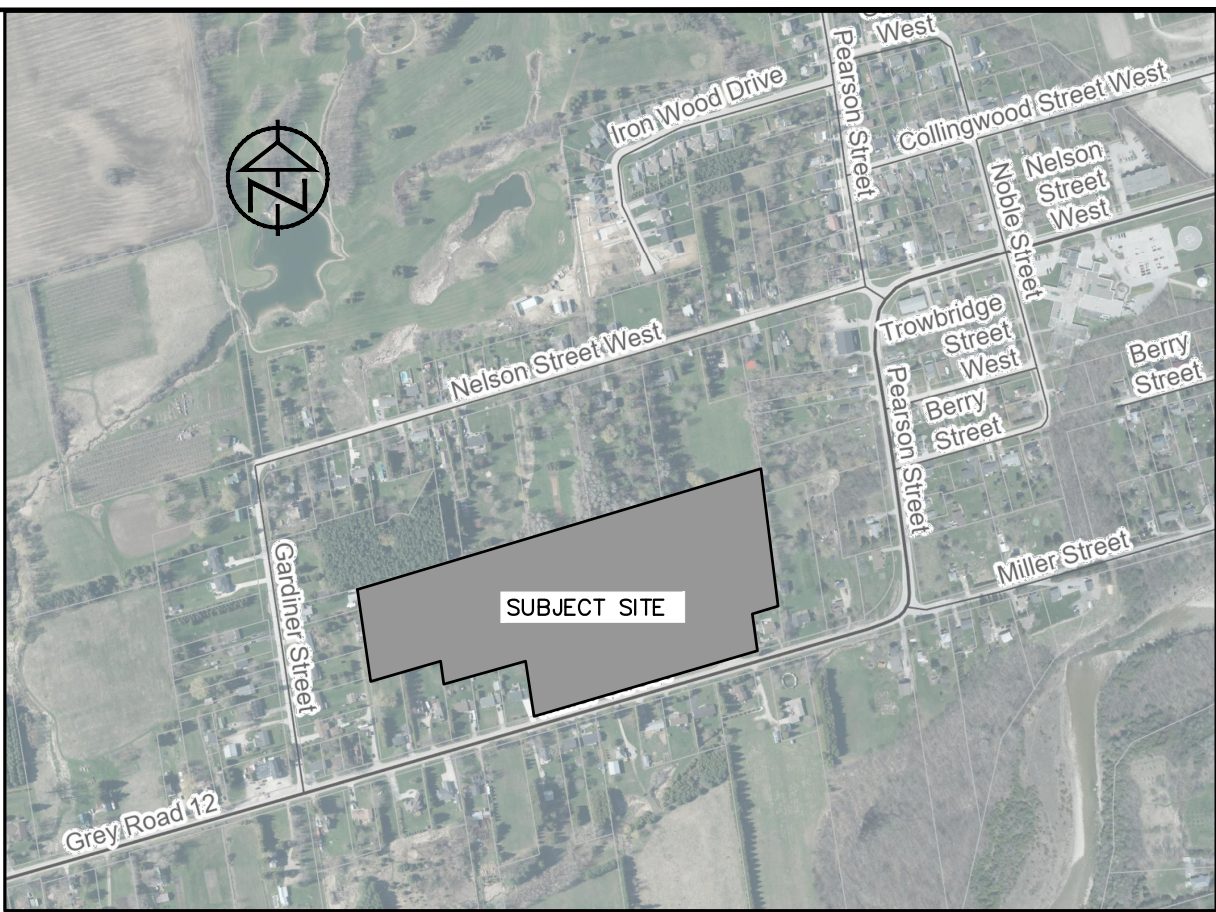
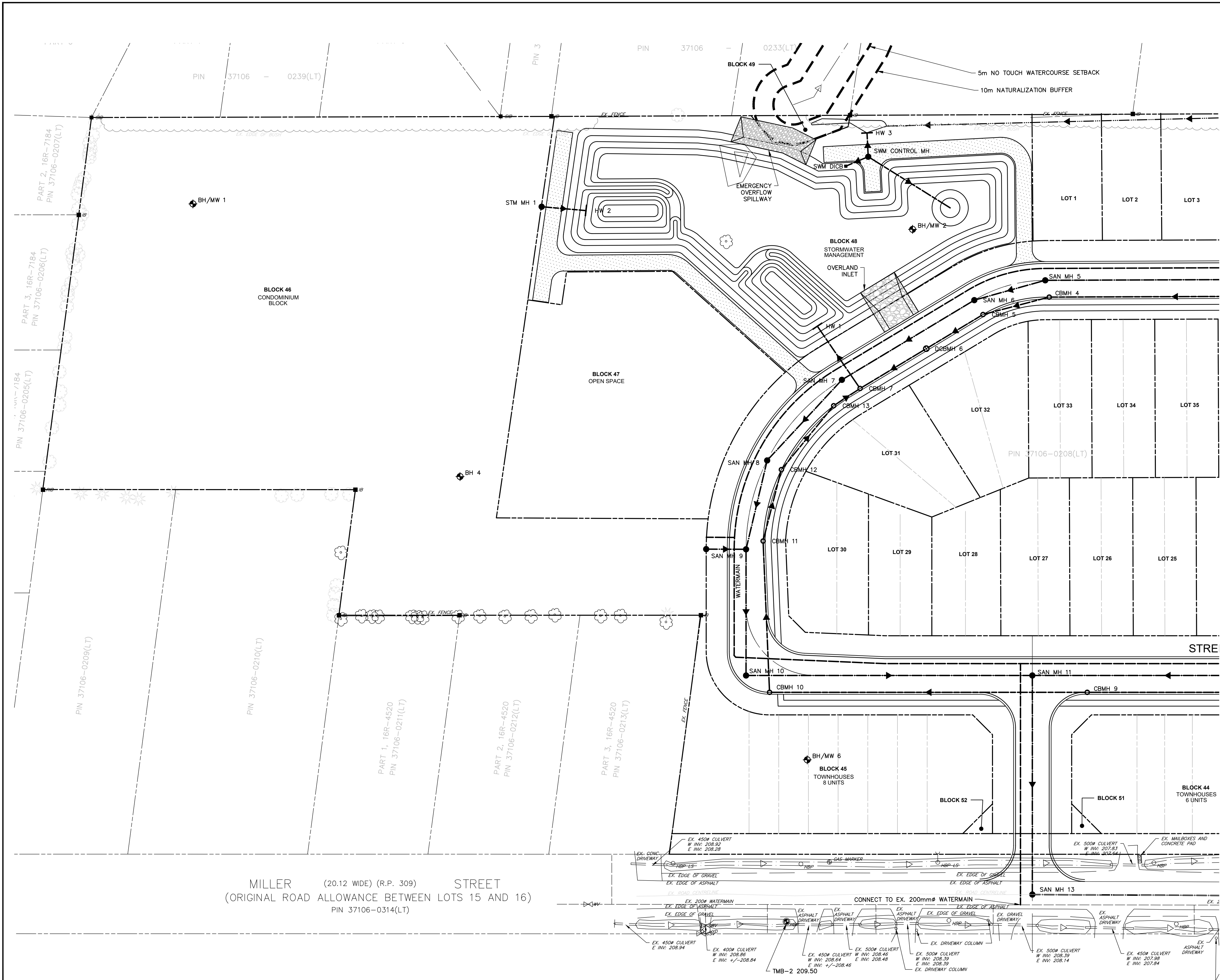
PROJECT	412 Miller Street	FILE	122076	
		DATE	Dec. 21, 2023	
SUBJECT	Water Demand Calculation	NAME	AO	
		PAGE	1	OF 1

# of units	163 Units (from draft plan prepared by Travis & Associates Dated May 29, 2023)			
Population Density Per Unit	2.4 persons/ unit (from Meaford Master Servicing Plan Prepared by Ainley & Associates Dated April 2015)			
Flow Per Person	450 L/day/persor (from Meaford Master Servicing Plan Prepared by Ainley & Associates Dated April 2015)			
Maximum Day Factor	3.0 (from MOE Design Guidelines for Drinking Water Systems 2008 Table 3-3 for drinking water systems servicing 150 dwelling units)			
Peak Hour Factor	4.5 (from MOE Design Guidelines for Drinking Water Systems 2008 Table 3-3 for drinking water systems servicing 150 dwelling units)			
Minimum Fire Flow	67 L/s (Assumes fire wall every 2 Townhome units. See FUS calculations for details.)			
Maximum Fire Flow	150 L/s (Assumes no fire walls. See FUS calculations for details)			
Average Day Demand	176040 L/day	=	176 m ³ /day	= 2.04 L/s
Maximum Day Demand	528120 L/day	=	528 m ³ /day	= 6.12 L/s
Peak Hour Demand	9.18 L/s			
Max Day + Fire Flow (Min)	73.12 L/s			
Max Day + Fire Flow (Max)	156.12 L/s			

Appendix D: Concept Servicing Plans



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			FOR FUNCTIONAL SERVICING REPORT DEC 22, 2023			CONCEPT SERVICING PLAN		DESIGN: AO	FILE: 122076	DWG:
			DRAWN: AO	DATE: DEC. 2023					CSP-1	
			CHECK: EL	SCALE: 1:500						

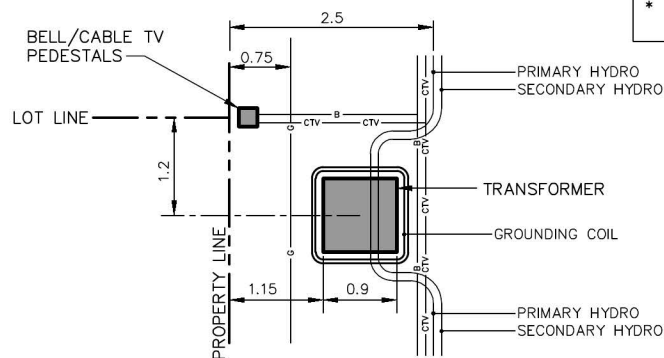
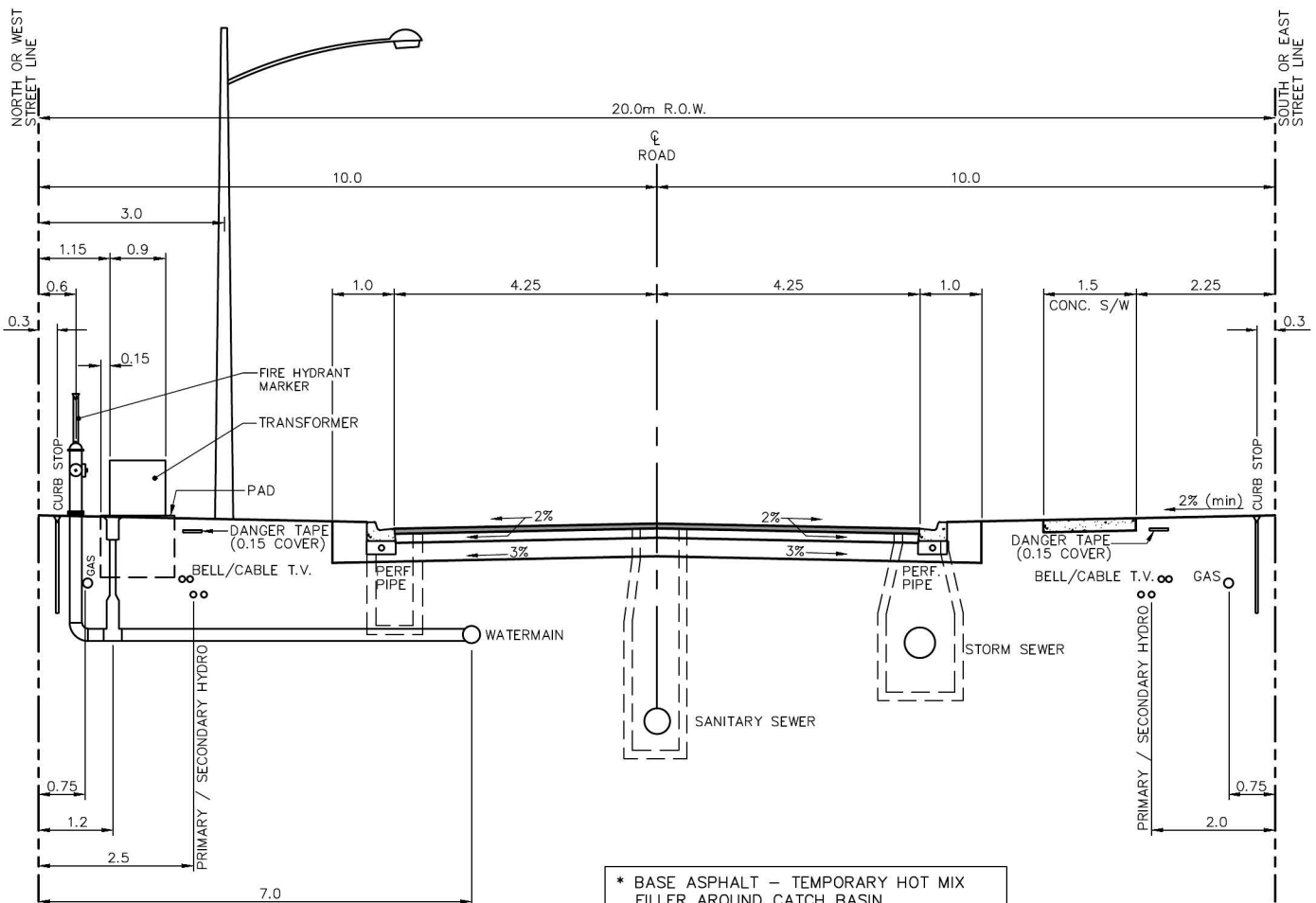


KEY PLAN

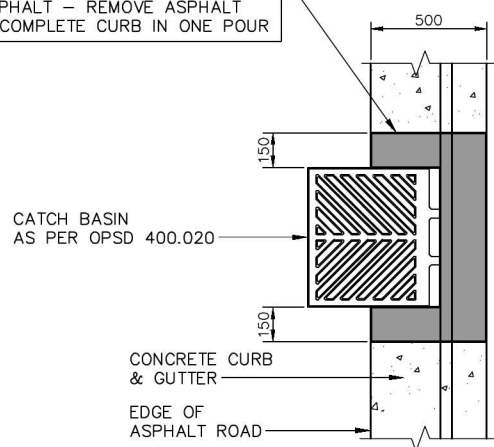
LEGEND	
PROPERTY LINE	---
EXISTING CENTERLINE	---
PROPOSED CENTRELINE	---
EXISTING EDGE OF ASPHALT	---
PROPOSED EDGE OF ASPHALT	---
EXISTING DITCH/DIRECTION OF FLOW	---
EXISTING SANITARY SEWER/SIZE/DIRECTION OF FLOW	---
PROPOSED SANITARY SEWER/SIZE/DIRECTION OF FLOW	---
EXISTING WATERMAIN/SIZE	---
PROPOSED WATERMAIN/SIZE	---
PROPOSED STORM SEWER/SIZE/DIRECTION OF FLOW	---
PROPOSED SWALE LOCATION	---
PROPOSED SANITARY MAINTENANCE HOLE	● SAN MH 1
PROPOSED STORM MAINTENANCE HOLE	○ CBMH 1
BOREHOLE AND/OR MONITORING WELL	◆ BH/MW
EXISTING WATER VALVE	⊠ WV
EXISTING FIRE HYDRANT	⬢ HYD

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Appendix E: Road Cross Section and Concept Grading Plans



PLAN
(AT PAD MOUNT TRANSFORMER)



PLAN
(AT CURB WITH CATCH BASIN)

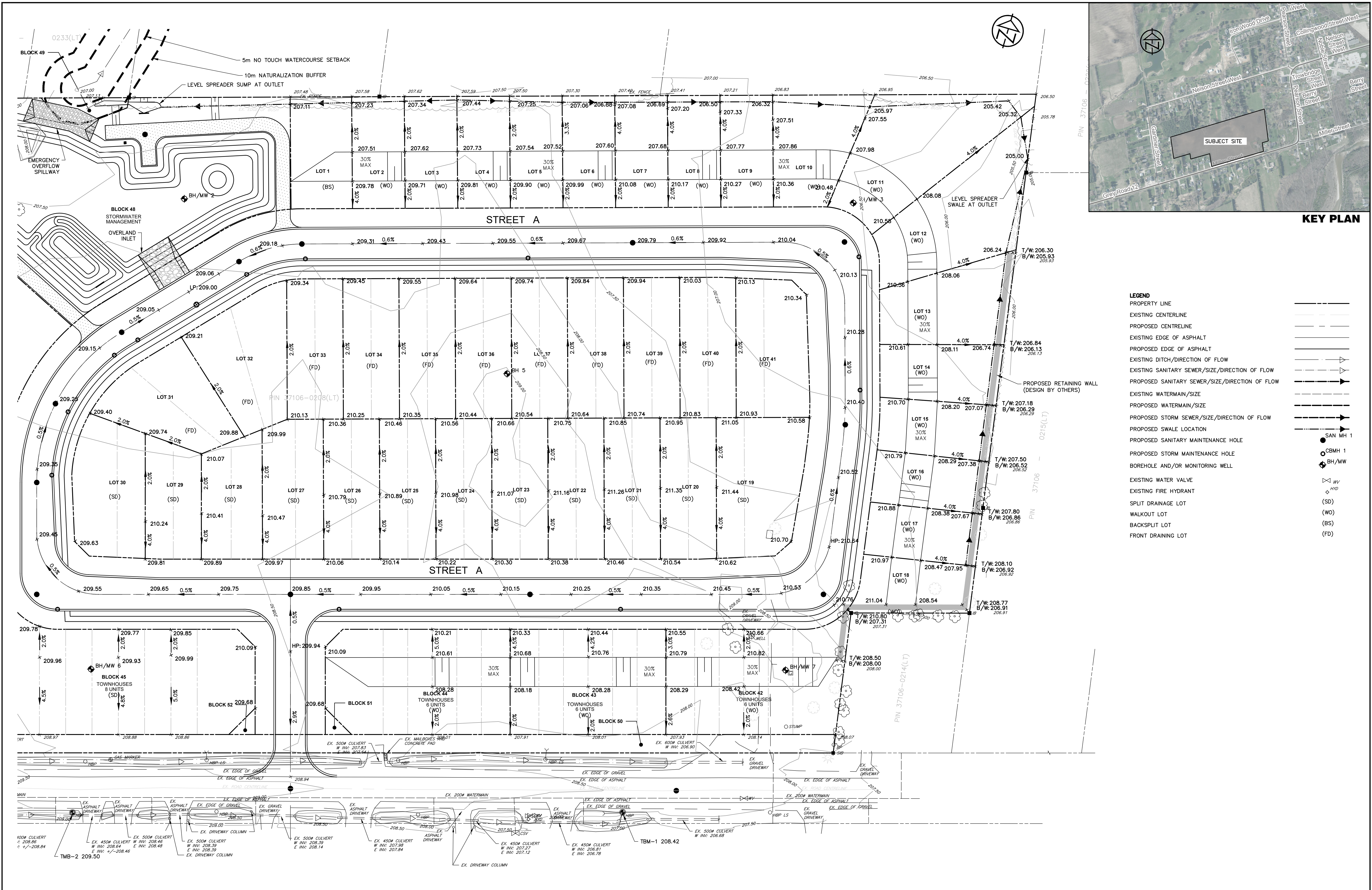
NOTES:

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF RIGHT-OF-WAY
2. ORGANIC MATERIAL WITHIN 1.2m OF TOP OF PAVEMENT TO BE REMOVED.
3. BOULEVARDS TO BE FULLY SODDED AS SPECIFIED (100mm TOPSOIL AND SOD).
4. ROAD BASE:
 - 40mm HL3 ASPHALT SURFACE COURSE
 - 50mm HL4 ASPHALT BASE COURSE
 - 150mm GRANULAR 'A'
 - 300mm GRANULAR 'B'
5. CONCRETE CURB AND GUTTER PER OPSD 600.040 AND 600.070 IN NEW DEVELOPMENT
6. CONCRETE SIDEWALK PER OPSD 310.010
7. MINIMUM DEPTH OF COVER :
 - SANITARY SEWER - 2.75m
 - STORM SEWER - 1.5m
 - WATERMAIN - 1.7m
 - HYDRO - 1.2m
 - CABLE - 0.9m
 - BELL - 0.9m
 - GAS - 0.6m
 - GAS AT CROSSING ROAD - 1.0m

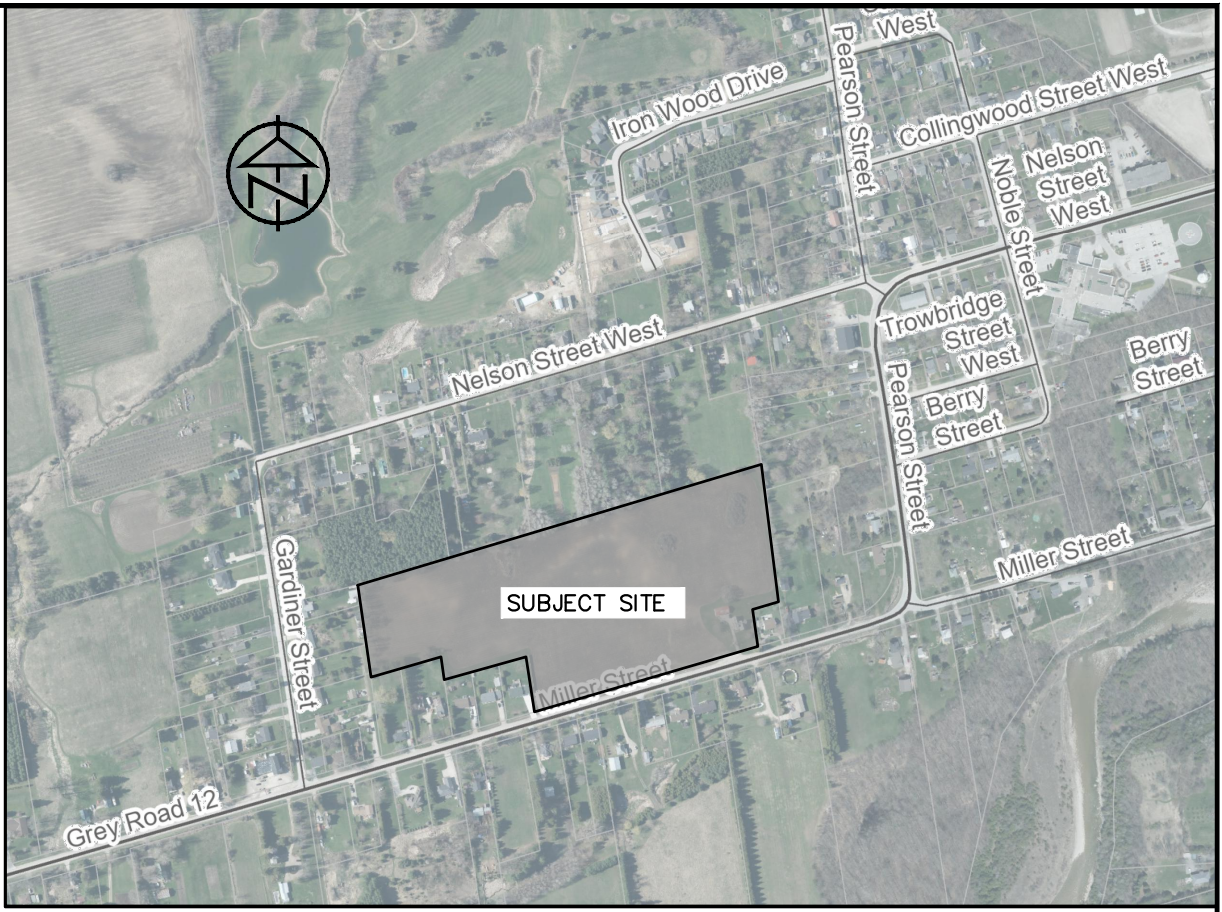
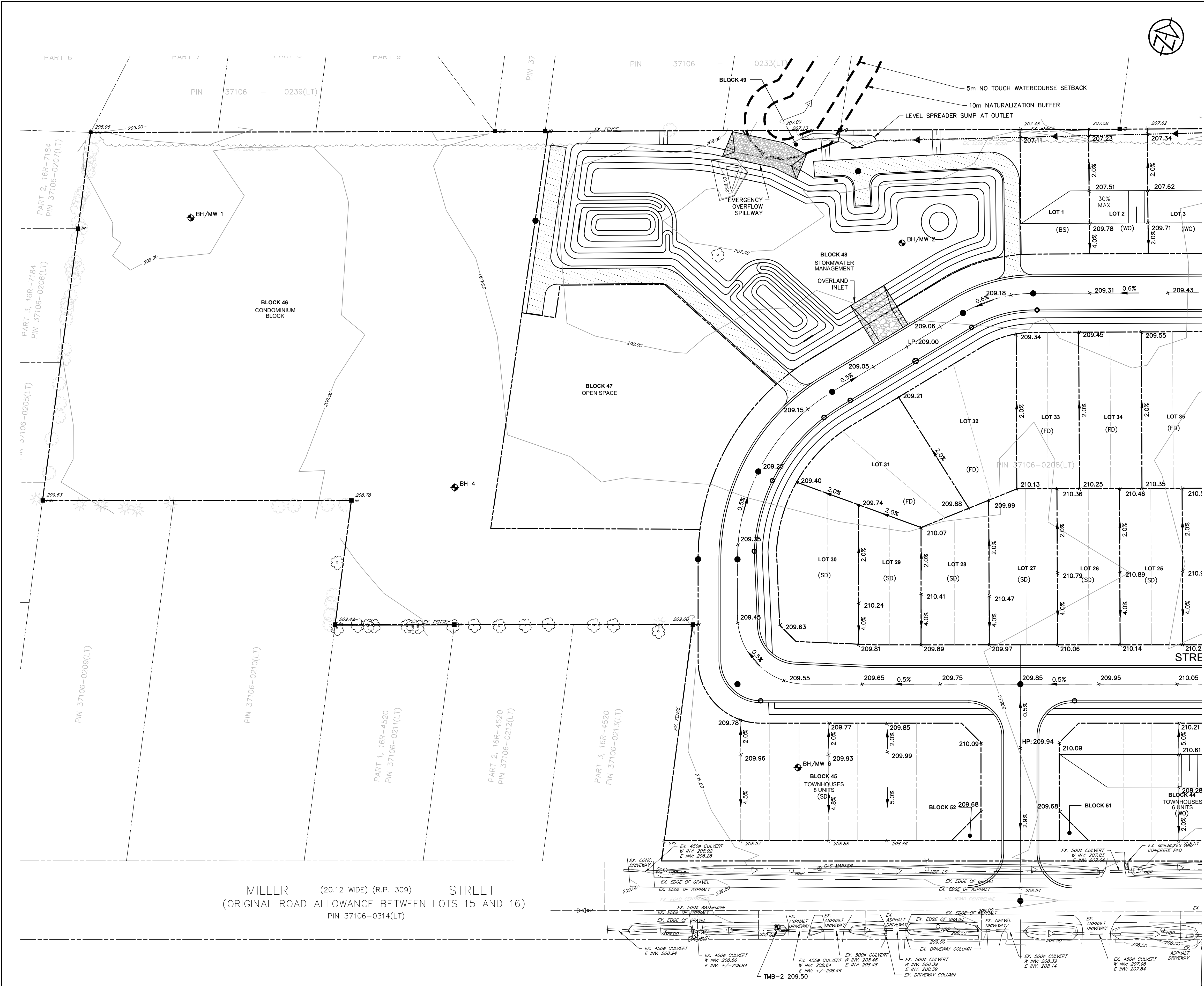
MUNICIPALITY OF MEAFORD

**TYPICAL
ROAD CROSS-SECTION
AND SERVICE LOCATIONS**

DRAWN: J.M.M.	SCALE: N.T.S.	
DESIGN: P.M.K.	PLOT: 1=1	
CHECKED: R.C.J.	DATE: NOV. 2015	STD.DWG.No.1



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			FOR FUNCTIONAL SERVICING REPORT DEC 22, 2023						CONCEPT SITE GRADING PLAN		DESIGN: AO	FILE: 122076	DWG: CSG-1
									DRAWN: AO	DATE: DEC. 2023			
									CHECK: EL	SCALE: 1:500			



KEY PLAN

LEGEND	
PROPERTY LINE	---
EXISTING CENTERLINE	---
PROPOSED CENTRELINE	---
EXISTING EDGE OF ASPHALT	---
PROPOSED EDGE OF ASPHALT	---
EXISTING DITCH/DIRECTION OF FLOW	---
EXISTING SANITARY SEWER/SIZE/DIRECTION OF FLOW	---
PROPOSED SANITARY SEWER/SIZE/DIRECTION OF FLOW	---
EXISTING WATERMAIN/SIZE	---
PROPOSED WATERMAIN/SIZE	---
PROPOSED STORM SEWER/SIZE/DIRECTION OF FLOW	---
PROPOSED SWALE LOCATION	---
PROPOSED SANITARY MAINTENANCE HOLE	● SAN MH 1
PROPOSED STORM MAINTENANCE HOLE	● CBMH 1
BOREHOLE AND/OR MONITORING WELL	● BH/MW
EXISTING WATER VALVE	⊕ WV
EXISTING FIRE HYDRANT	⊕ FHD
SPLIT DRAINAGE LOT	(SD)
WALKOUT LOT	(WO)
BACKSPLIT LOT	(BS)
FRONT DRAINING LOT	(FD)

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TBM-2: NAIL SPIKE IN HP ON SOUTH SIDE OF MILLER STREET AT HOUSE #481 (209.50M)

NOTES
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BASE PLAN DERIVED FROM DRAFT PLAN OF SUBDIVISION LOT 1690 AND PART OF LOTS 1687, 1688, 1689 AND 1691 REGISTERED PLAN 309, PREPARED BY TRAVIS & ASSOCIATES DATED DECEMBER 4, 2023.

No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP

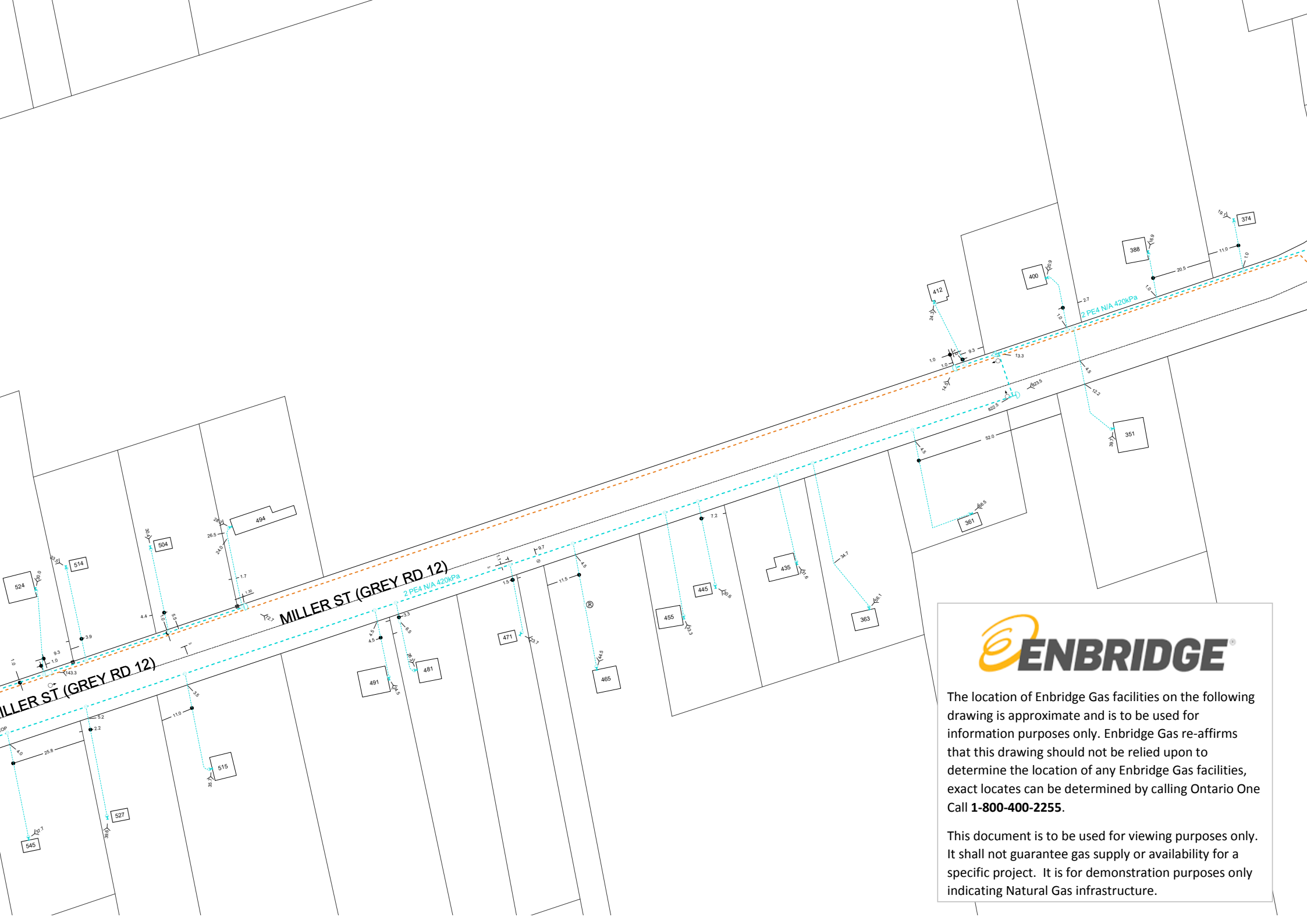
FOR FUNCTIONAL SERVICING
REPORT DEC 22, 2023

412 MILLER STREET
MUNICIPALITY OF MEAFORD
CONCEPT SITE GRADING PLAN



DESIGN: AO	FILE: 122076	DWG:
DRAWN: AO	DATE: DEC. 2023	CSG-2
CHECK: EL	SCALE: 1:500	

Appendix F: Existing Utility Plans



The location of Enbridge Gas facilities on the following drawing is approximate and is to be used for information purposes only. Enbridge Gas re-affirms that this drawing should not be relied upon to determine the location of any Enbridge Gas facilities, exact locates can be determined by calling Ontario One Call **1-800-400-2255**.

This document is to be used for viewing purposes only. It shall not guarantee gas supply or availability for a specific project. It is for demonstration purposes only indicating Natural Gas infrastructure.

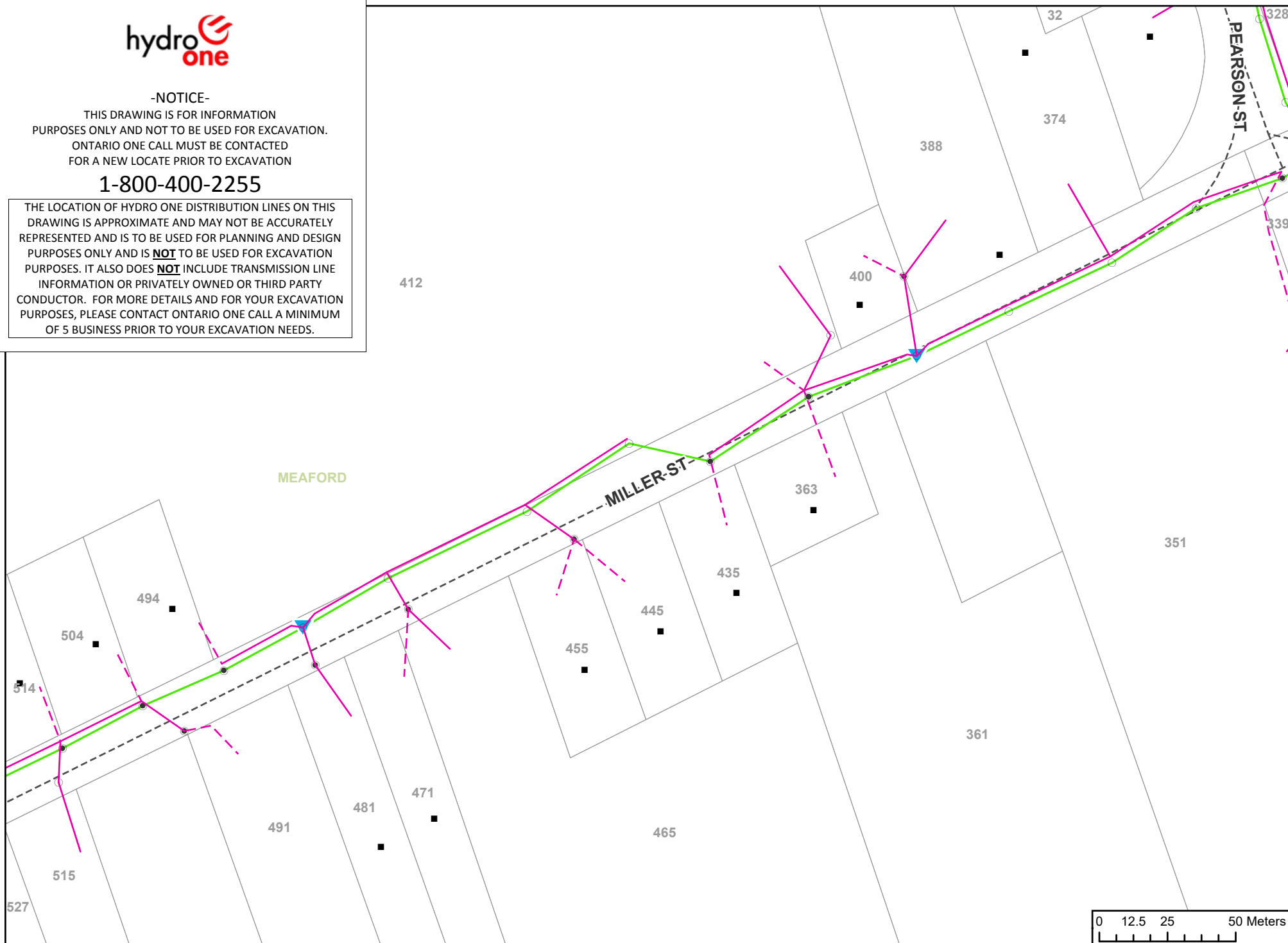


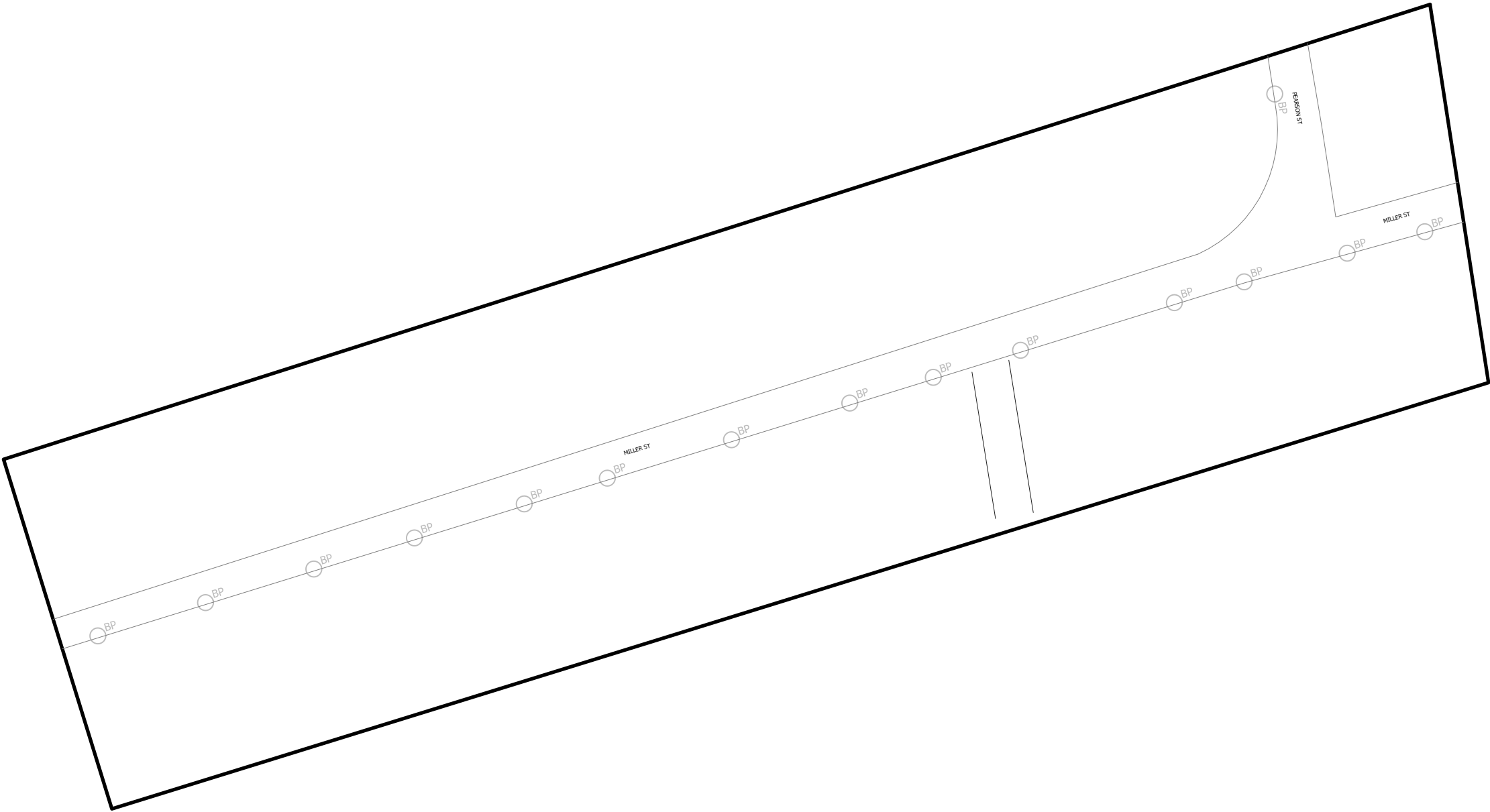
-NOTICE-

THIS DRAWING IS FOR INFORMATION
PURPOSES ONLY AND NOT TO BE USED FOR EXCAVATION.
ONTARIO ONE CALL MUST BE CONTACTED
FOR A NEW LOCATE PRIOR TO EXCAVATION

1-800-400-2255

THE LOCATION OF HYDRO ONE DISTRIBUTION LINES ON THIS
DRAWING IS APPROXIMATE AND MAY NOT BE ACCURATELY
REPRESENTED AND IS TO BE USED FOR PLANNING AND DESIGN
PURPOSES ONLY AND IS **NOT** TO BE USED FOR EXCAVATION
PURPOSES. IT ALSO DOES **NOT** INCLUDE TRANSMISSION LINE
INFORMATION OR PRIVATELY OWNED OR THIRD PARTY
CONDUCTOR. FOR MORE DETAILS AND FOR YOUR EXCAVATION
PURPOSES, PLEASE CONTACT ONTARIO ONE CALL A MINIMUM
OF 5 BUSINESS PRIOR TO YOUR EXCAVATION NEEDS.





PLEASE NOTE:
THIS DRAWING IS FOR MARKUP ONLY - NOT FOR PERMIT TO PROCEED
CONSTRUCTION. BELL CANADA PLANT LOCATION IS APPROXIMATE.

BELL CANADA

Municipal Operations Department
Floor 5 Blue, 100 Borough Drive
Scarborough, Ontario, M1P 4W2
Ph. 416-296-6929

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Bell Canada's discretion.

Bell Canada Legend Info

 Existing Bell Pole

CALL FOR LOCATES
1-800-400-2255

HAND DIG
if within 1m of Bell plant

HAND DIG
when crossing Bell plant

Maintain clearance of 0.6m

If further details required
You must acquire Locates or Test Pits



Dwg # - 1

Mark Up # - 60387

CAD Tech - NHAN NGUYEN