

June 7th, 2022

Attention: Jennifer McGahan

Reference: 1835 Stittsville Main Street Redevelopment
Zoning By-law Amendment
Servicing Brief
City File No. D02-02-22-0016
Our Project No. 22008

Dear Ms. McGahan:

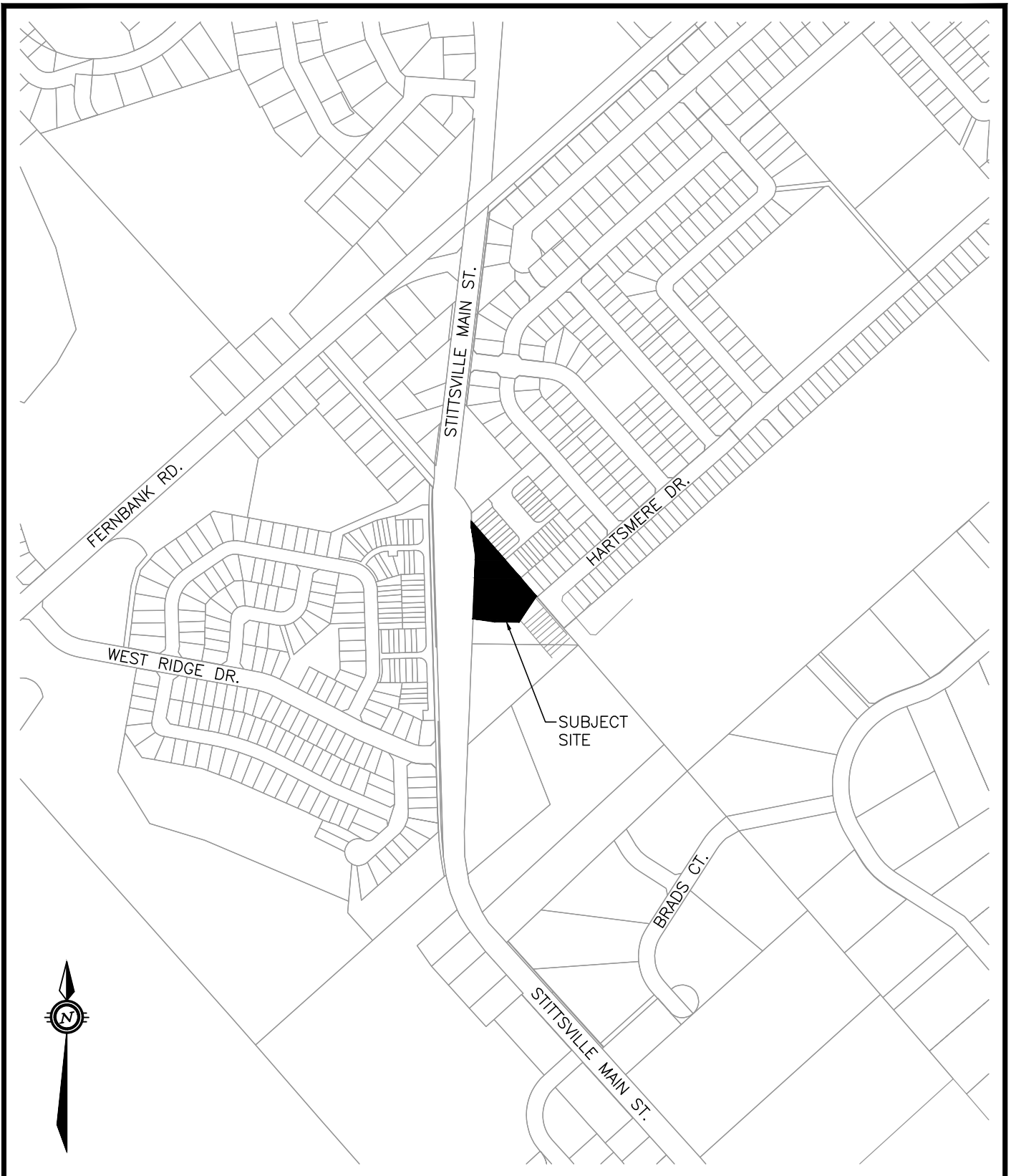
This Servicing Brief has been prepared to summarize the servicing and grading designs required in support of the zoning by-law amendment for the redevelopment of the property (currently zoned Rural Countryside Zone, RU) located at 1835 Stittsville Main Street in the community of Stittsville. The property is bounded by Stittsville Main Street to the west and existing residential homes to the north, east and south (refer to Fig. 1.0 – Key Plan following page 1). The redevelopment work is to include a severance of the 0.53 hectare property to create two lots and one retained parcel. The developer is proposing to construct two new single-family homes in addition to the existing dwelling to remain.

1.0 Servicing Design

The Stittsville South – Area 6 subdivision abuts the south-east property boundary of the subject site. The subdivision design was detailed in the report *Detailed Servicing & Stormwater Management Report*, prepared by Novatech, dated July 18, 2016 (herein referred to as the Novatech Report). As part of the subdivision design (previously approved by the City of Ottawa), service stubs were provided for the future Bell lands (i.e. subject site) within a 6.0 metre service easement off of Hartsmere Drive (refer to Novatech design drawings under **Attachment A**). At the time, the subject site was anticipated to be developed into a 100-unit senior's residence. The existing services provided within the 6.0 metre easement include:

- A 150 mm diameter watermain
- A 200 mm diameter sanitary sewer
- A 375 mm diameter storm sewer

Since no municipal infrastructure is available within the Stittsville Main Street right-of-way adjacent to the subject site, the existing service stubs contained within the 6.0 metre easement are proposed to be extended into the subject site to service the two new single-family homes. The existing dwelling on the property is currently serviced via an individual drilled well and septic system. As part of the redevelopment work, the existing well and septic system are to be abandoned and new services will be provided off the proposed extension of the existing service stubs. The extension of the existing infrastructure (water, sanitary and storm) will be contained within a proposed 6.0 metre easement located along the north-east property boundary. The easement will include a joint use and maintenance agreement (JUMA) to ensure that any future maintenance or repairs to the service



Robinson
Land Development

scale	N.T.S.	1835 STITTSVILLE MAIN STREET	project no.
date	11/02/22		22008
drawn by	BLM	KEY PLAN	FIG 1.0

extensions would require involvement from all property owners. Refer to the Servicing Plan (DWG. 22008-S1) and Service Easement Plan & Profile (DWG. 22008-P1) under **Attachment A**.

1.1 Water Servicing

1.1.1 Hydraulic Model

A water distribution hydraulic model was created using H2OMap Water software for the proposed development. The hydraulic model incorporated the proposed watermain layout, proposed hydrant location, boundary conditions provided by the City of Ottawa, and typical “C” factors in accordance with the current Ottawa Water Distribution Design Guidelines. Refer to the Hydraulic Water Model figure and boundary conditions provided under **Attachment B**.

The proposed 51 mm diameter extension of the existing watermain will be contained within the proposed 6.0 metre easement located along the north-east property boundary. Each dwelling will be serviced with a new 25 mm diameter water service fed off the 51 mm diameter watermain extension. The curb stops and service posts for each service will also be contained within the limits of the proposed easement with access in favour of the City such that the water can be shut off if required.

1.1.2 Domestic Demands

Water demands for the proposed development have been calculated in accordance with the current Ottawa Water Distribution Design Guidelines. Since the population is below 500 persons, maximum day and maximum hour peaking factors shall be in accordance with Table 3-3 of the MOE Design Guidelines For Drinking Water Systems. Water demands for the proposed development have been calculated as follows:

Average Daily Demand = (10.2 persons) x (280 L/person/day) / 86400 s/day = **0.033 L/s**

Maximum Daily Demand = (9.5) x (0.033 L/s) = **0.314 L/s**

Maximum Hourly Demand = (14.3) x (0.314 L/s) = **4.491 L/s**

Refer to the watermain design sheet provided under **Attachment B** for more details.

1.1.3 Domestic Model Results

As noted under *Section 7.3* of the *Novatech Report*, the Bell Lands (i.e. subject site) was anticipated to have low pressures during peak hour conditions that does not meet the minimum City of Ottawa design criteria of 40 psi. This was, however, based on the assumed configuration of a 100-unit senior's residence. A hydraulic simulation was completed for the proposed development using the water demands calculated in **Section 1.1.2** above. The system was analyzed at the proposed service connection to each dwelling. The results of the hydraulic simulation have been summarized in **Table 1** below:

Table 1: Hydraulic Simulation Domestic Demands

Condition	Lot 1 (psi)	Lot 2 (psi)	Lot 3 (psi)
Peak Hour Pressure	49.59	44.87	45.27
Maximum Pressure	56.76	52.01	52.41

Notes:

1. Lot 1 is denoted as junction J5 on the Hydraulic Model in **Attachment B**.
2. Lot 2 is denoted as junction J3 on the Hydraulic Model in **Attachment B**.
3. Lot 3 is denoted as junction J4 on the Hydraulic Model in **Attachment B**.

As demonstrated in **Table 1** above, the peak hour pressure at each dwelling is expected to be above the minimum allowable pressure of 40 psi. Further, the maximum pressure at each dwelling is expected to be below the maximum allowable pressure of 80 psi. Therefore, the hydraulic simulation has demonstrated that the proposed water servicing has been designed in accordance with the current Ottawa Water Distribution Design Guidelines.

1.1.4 Fire Flow

The total required fire flow for the existing dwelling and the two proposed dwellings have been calculated using the FUS long form. The total required fire flows have been summarized below:

Total Required Fire Flow (Existing Dwelling) **9,000 L/min**

Total Required Fire Flow (Lot #2) **9,000 L/min**

Total Required Fire Flow (Lot #3) **8,000 L/min**

Refer to supporting FUS calculations under **Attachment B** for more details.

An existing public hydrant is located on the south-east side Hartsmere Drive, approximately 69 metres from the eastern property corner of the subject site. A second existing public hydrant is located on the north-west side of Stittsville Main Street, approximately 61 metres from the northern property corner. Other hydrants are located in the vicinity of the property, however, they're part of private systems and are therefore not considered suitable for this development. We request that the City and local fire department review the suitability of the existing hydrants noted above as a means of providing fire protection for the proposed development. If the location of the existing hydrants relative to the on-site dwellings is not considered to be acceptable, the installation of a new hydrant is proposed.

Two locations for a new hydrant have been analyzed for the subject site. Hydrant (Option A) is proposed to be installed within the Hartsmere Drive right-of-way, fed from the existing 150 mm diameter watermain stub contained within the existing 6.0 metre easement. Hydrant (Option B) is proposed to be installed within the proposed 6.0 metre easement located on the subject site, fed from a proposed extension of the existing 150 mm diameter watermain stub (refer to the Hydrant Location Options Plan under **Attachment B**). Using the developed hydraulic model, the available fire flow at 20 psi has been estimated for each proposed hydrant location under the maximum day plus fire flow simulation as follows:

Hydrant (Option A) Available Fire Flow **11,529 L/min**

Hydrant (Option B) Available Fire Flow **3,947 L/min**

Due to pressure constraints of the existing watermain system, the available fire flow from both hydrant locations is limited (refer to the fire flow report under **Attachment B**). The length of the hydrant lead required to service the Option B location would further reduce the available fire flow. Since the Option A location can provide the greatest available fire flow and is more easily accessible (i.e. located adjacent to a municipal roadway), it is the preferred option. The available fire flow from the proposed hydrant is higher than the total required fire flows calculated using the FUS long form and therefore is adequate to service the proposed development.

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02, the aggregate fire flow capacity of all contributing fire hydrants within 150 metres of a building (measured in accordance with Table 1 – Maximum flow to be considered from a given hydrant), shall not be less than the required fire flow. As demonstrated on the hydrant coverage plans (provided under **Attachment B**), the contributing fire flow (from hydrants within 150 metres) is greater than the required fire flow for each dwelling. Therefore, it has been further demonstrated that there is sufficient fire flow available to support the proposed development.

The driveway for the existing dwelling, accessed via Stittsville Main Street, can be utilized as a fire route. The path of travel from the proposed hydrant to the furthest dwelling (Lot #3) is not more than 90 metres and the path of travel from the driveway (i.e. fire route) to the furthest dwelling is not more than 45 metres.

1.2 Sanitary Servicing

An extension of the existing 200 mm diameter sanitary sewer stub (contained within the existing 6.0 metre easement off Hartsmere Drive) will be required to provide a wastewater outlet for the three single-family homes. The extension of the sanitary sewer will be contained within the proposed 6.0 metre easement located along the north-east property boundary. Each dwelling will be serviced with a new 135 mm diameter sanitary service which outlets to the proposed 200 mm diameter sanitary sewer extension before being conveyed to the existing sanitary sewer system on Hartsmere Drive. Using current City of Ottawa design guidelines, the peak sanitary design flow for the proposed development has been calculated as follows:

$$\text{Population} = (3 \text{ single-family homes}) \times (3.4 \text{ persons/unit}) = 10.2 \text{ persons}$$

$$\text{Peak Factor} = 3.73 \text{ (Harmon Equation)}$$

$$\begin{aligned} \text{Peak Population Flow} &= (3.73) \times (10.2 \text{ persons}) \times (280 \text{ L/person/day}) / (86400 \text{ s/day}) \\ \text{Peak Population Flow} &= \mathbf{0.12 \text{ L/s}} \end{aligned}$$

$$\text{Extraneous Flow} = (0.53 \text{ ha}) \times (0.33 \text{ L/s/ha}) = \mathbf{0.17 \text{ L/s}}$$

$$\text{Peak Design Flow} = (0.12 \text{ L/s}) + (0.17 \text{ L/s}) = \mathbf{0.30 \text{ L/s}}$$

As calculated above, the proposed development is expected to generate a peak sanitary design flow of 0.30 L/s. Given that the existing sanitary sewer system was designed to accept flows from a 100-unit senior's residence using outdated design parameters (i.e. 350 L/person/day instead of current 280 L/person/day) there will be adequate capacity within the existing system to accommodate the proposed development. Refer to the sanitary sewer design sheets and Sanitary Drainage Area Plan prepared by Novatech for the Stittsville South subdivision under **Attachment C**. The proposed sanitary

sewer extension has been designed to meet the acceptable full flow velocity range of 0.60 m/s to 3.0 m/s and to have capacity to convey the peak design flow from the proposed development in accordance with the current City of Ottawa Sewer Design Guidelines. Refer to the sanitary sewer design sheet under **Attachment C**. Since typical vertical and horizontal separation distances cannot be achieved between the proposed sanitary sewer extension and proposed watermain extensions, the sanitary sewers should be constructed with joints capable of 345 kPa in accordance with current City design guidelines.

1.3 Storm Servicing

A 250 mm diameter storm sewer extension of the existing 375 mm diameter storm sewer stub (contained within the existing 6.0 metre easement off Hartsmere Drive) will be required to provide a stormwater outlet for the three single-family homes. The extension of the storm sewer will be contained within the proposed 6.0 metre easement located along the north-east property boundary. Each dwelling will be serviced with a new 100 mm diameter storm service which outlets to the proposed 250 mm diameter storm sewer extension. A proposed catch basin manhole will also be installed within the proposed 6.0 metre easement to capture surface runoff from the subject site before being conveyed to the existing storm sewer system on Hartsmere Drive. The proposed storm sewers have been designed to meet the acceptable full flow velocity range of 0.80 m/s to 3.0 m/s and to have capacity to convey the 5-year peak design flow (in accordance with the Novatech design for the downstream storm sewer system). Refer to the storm sewer design sheets and Storm Drainage Area Plan prepared by Novatech for the Stittsville South subdivision as well as the proposed storm sewer design sheet under **Attachment D**.

As noted in the Novatech Report, storm drainage from the Bell Lands (i.e. subject site) was allocated within the storm sewer system designed for the Stittsville South subdivision. The subject site was assigned an area of 0.532 hectares and a runoff coefficient value of 0.75. The design parameters allocated for the subject site assumed that the property would be developed into a 100-unit senior's residence. However, proposed redevelopment of the property into three single-family homes is much less impactful to the downstream storm sewer system than what was allocated in the Novatech Report. The weighted runoff coefficient for the redevelopment will be 0.35 compared to the 0.75 value which was previously assumed in the Novatech design. The 5-year peak design flow for the subject site has been calculated to be 42.16 L/s. As indicated in the storm sewer design sheets prepared by Novatech for the Stittsville South subdivision (refer to **Attachment D**), the downstream storm sewers (from Hartsmere Drive to the existing SWM facility on Parade Drive) will have sufficient capacity to accommodate the 5-year peak flow from the subject site.

2.0 Grading Design

The proposed grading has been designed to tie into existing elevations along the property boundaries and to minimize cut/fill where possible. The proposed grading has been designed in accordance with the following City of Ottawa design guidelines:

- Maximum slope in grassed areas between 2% and 7%.
- Grades above 7% require terracing.
- Maximum terracing of 3H:1V.
- Driveway grades between 2% and 6%.
- Rear terrace grades to be minimum 0.30 metres above swale spillover elevation.
- Swales shall have minimum depth of 150 mm and maximum depth of 600 mm.

Refer to the Grading Plan (DWG. 22008-GR1) under **Attachment A**.

3.0 Conclusion

It has been demonstrated that the redevelopment of the property located at 1835 Stittsville Main Street can be accomplished to include two new lots and one retained parcel. The three lots located on the subject site can be serviced with new water, sanitary and storm services by incorporating the following key design features:

- The creation of a 6.0 m service easement located along the north-east property boundary.
- A new hydrant located within the Hartsmere Drive right-of-way.
- A 51 mm diameter watermain extension of the existing 150 mm diameter watermain stub.
- A 200 mm diameter sanitary sewer extension of the existing 200 mm diameter sanitary sewer stub.
- A 250 mm diameter storm sewer extension of the existing 375 mm diameter storm sewer stub.
- A grading design which ties into existing elevations along the property boundaries.

If you require additional information or clarification, please contact the undersigned.

Yours truly,

ROBINSON LAND DEVELOPMENT



Brandon MacKechnie, P. Eng.
Project Engineer



Angela Jonkman, P. Eng.
Manager – Land Development & Drainage Services

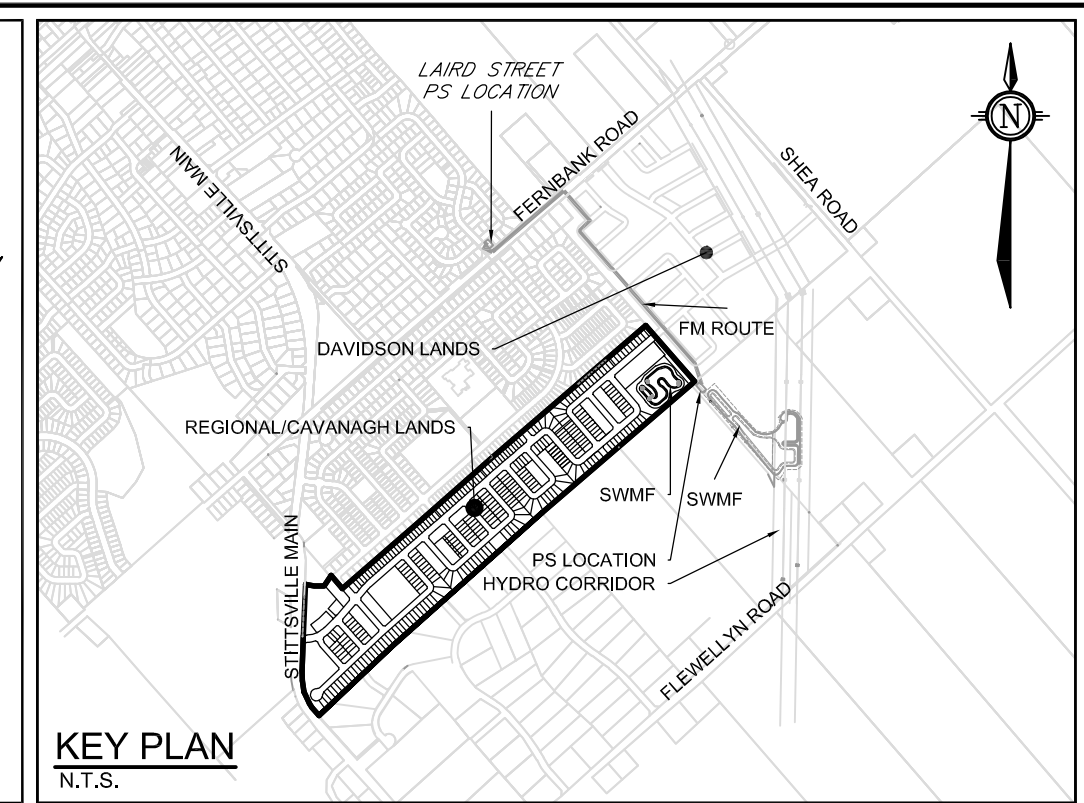
Attachment A

Novatech Design Drawings

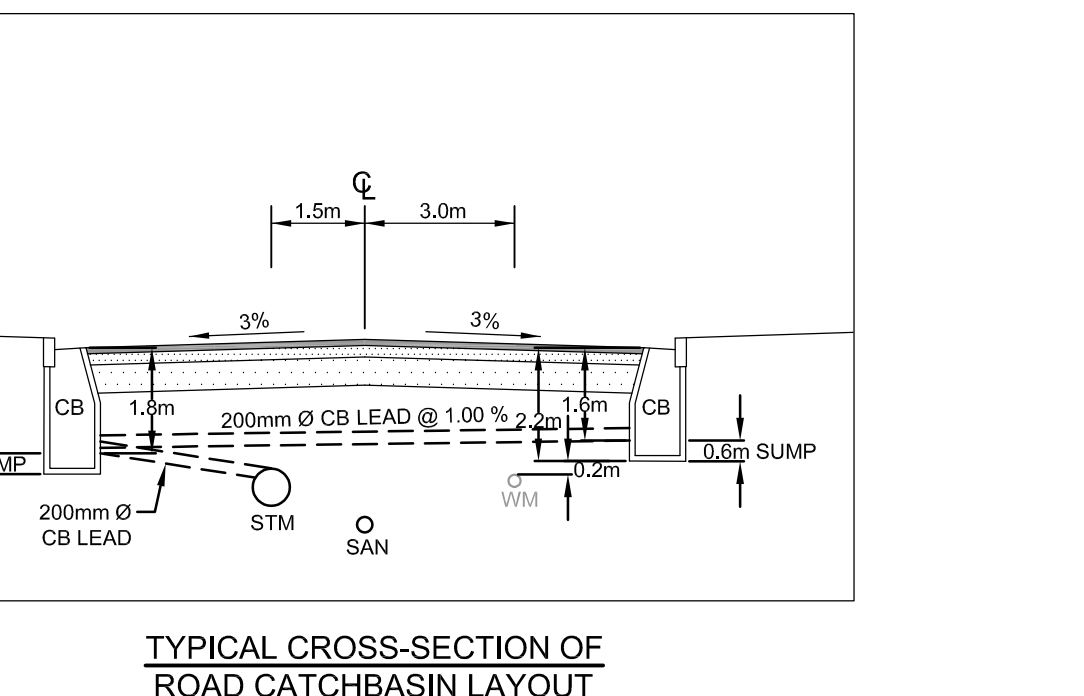
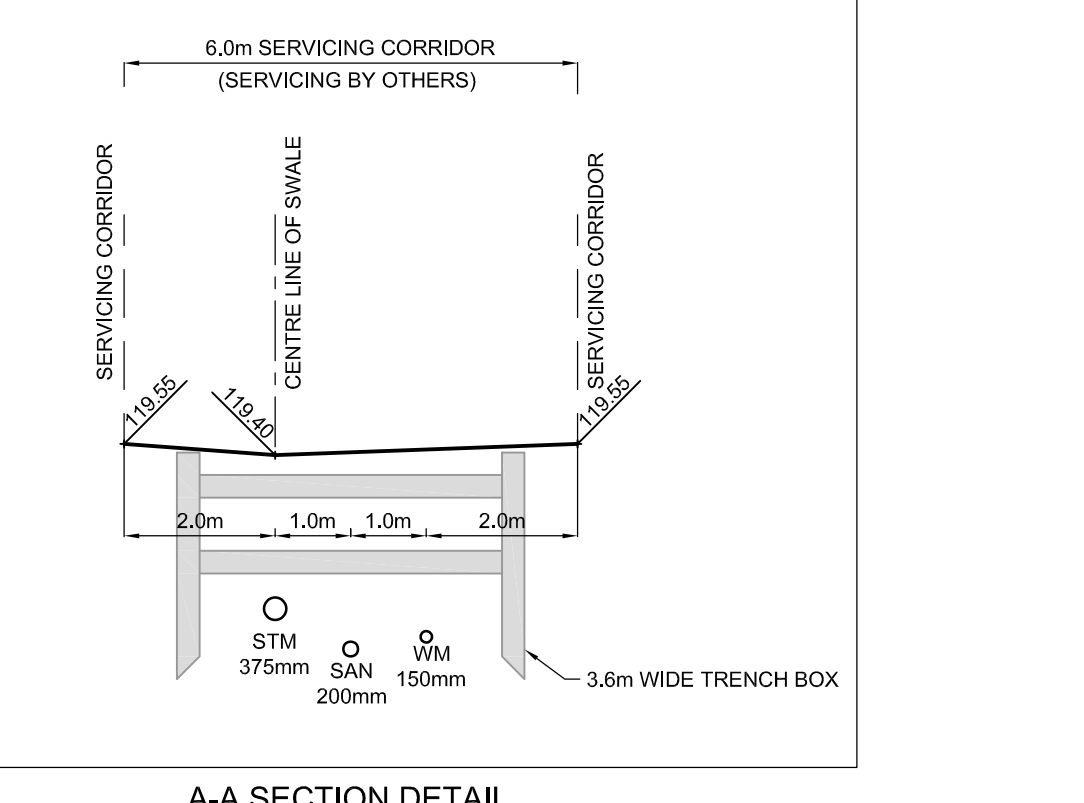
Servicing Plan (DWG. 22008-S1)

Service Easement Plan & Profile
(DWG. 22008-P1)

Grading Plan (DWG. 22008-GR1)



- LEGEND
- 200mm WM: PROPOSED WATERMAIN AND DIAMETER
- V&V: PROPOSED VALVE LOCATION
- V&V-B: VALVE & VALVE BOX
- V&V-C: VALVE & VALVE CHAMBER
- HYD: PROPOSED HYDRANT C/W VALVE & LEAD
- TF=98.45: PROPOSED TOP OF BOTTOM FLANGE
- BEND: PROPOSED BEND AND THRUSTBLOCK
- MH 101: PROPOSED SANITARY MH & SEWER
- MH 100: PROPOSED STORM MH & SEWER
- ...



SEE DRAWING 113004-ND FOR NOTES AND DETAILS

CATCH-BASIN TABLE with columns: CB No., Station, TO Elevation, Invert, KD DA (mm), and rows of data for various catchbasins.

CATCH-BASIN TABLE with columns: CB No., Station, TO Elevation, Invert, KD DA (mm), and rows of data for various catchbasins.

STM MANHOLE TABLE with columns: MH ID, Station, TO Elev, Invert, DIA (mm), QPSD, and rows of data for manholes.

SAN MANHOLE TABLE with columns: MH ID, Station, TO Elev, Invert, DIA (mm), QPSD, and rows of data for manholes.

LANDSCAPE CB TABLE with columns: L/CB No., TO Elevation, Invert, DIA (mm), QPSD, and rows of data for landscape catchbasins.

RYCB TABLE with columns: RYCB No., TO Elevation, Invert, KD DA (mm), and rows of data for rain yard catchbasins.

NOTE: DURING SERVING, GRADING, AND REINSTATEMENT WORKS, TIE INTO EXISTING ELEVATIONS AND ELIMINATE ENCROACHMENT INTO ADJACENT PROPERTY LANDS, WHERE POSSIBLE. PERMISSION REQUIRED FOR WORKS ON ADJACENT PROPERTY LANDS.

USE PROTECTION FENCING AND BEST EFFORTS TO REDUCE IMPACT TO ADJACENT LANDS' EXISTING FEATURES INCLUDING, BUT NOT LIMITED TO, RETAINING WALLS, FENCES, HARD AND SOFT LANDSCAPE. ANY DISTURBED AREA IS TO BE RESTORED TO EXISTING CONDITIONS OR BETTER, TO THE SATISFACTION OF PROPERTY OWNER AND CITY.

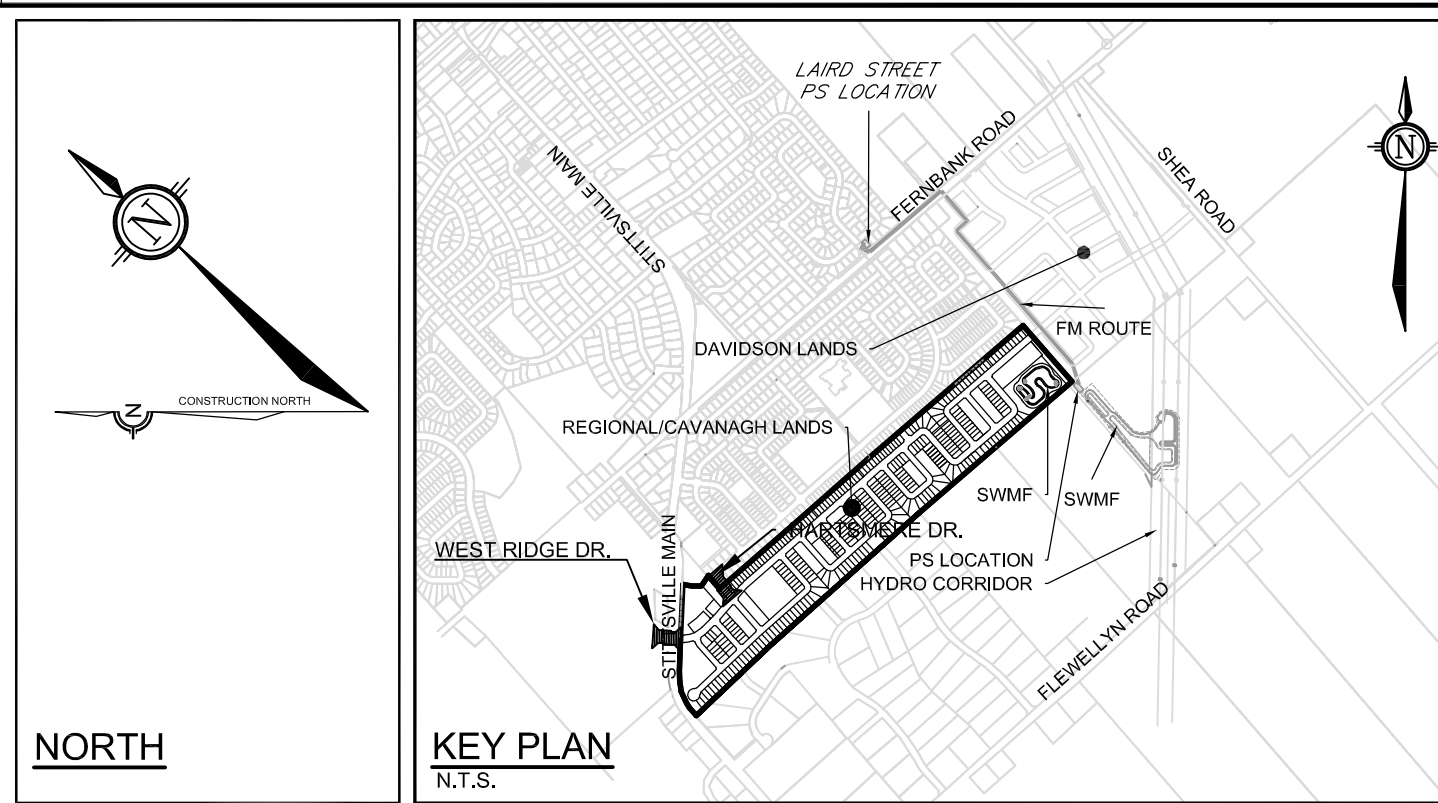
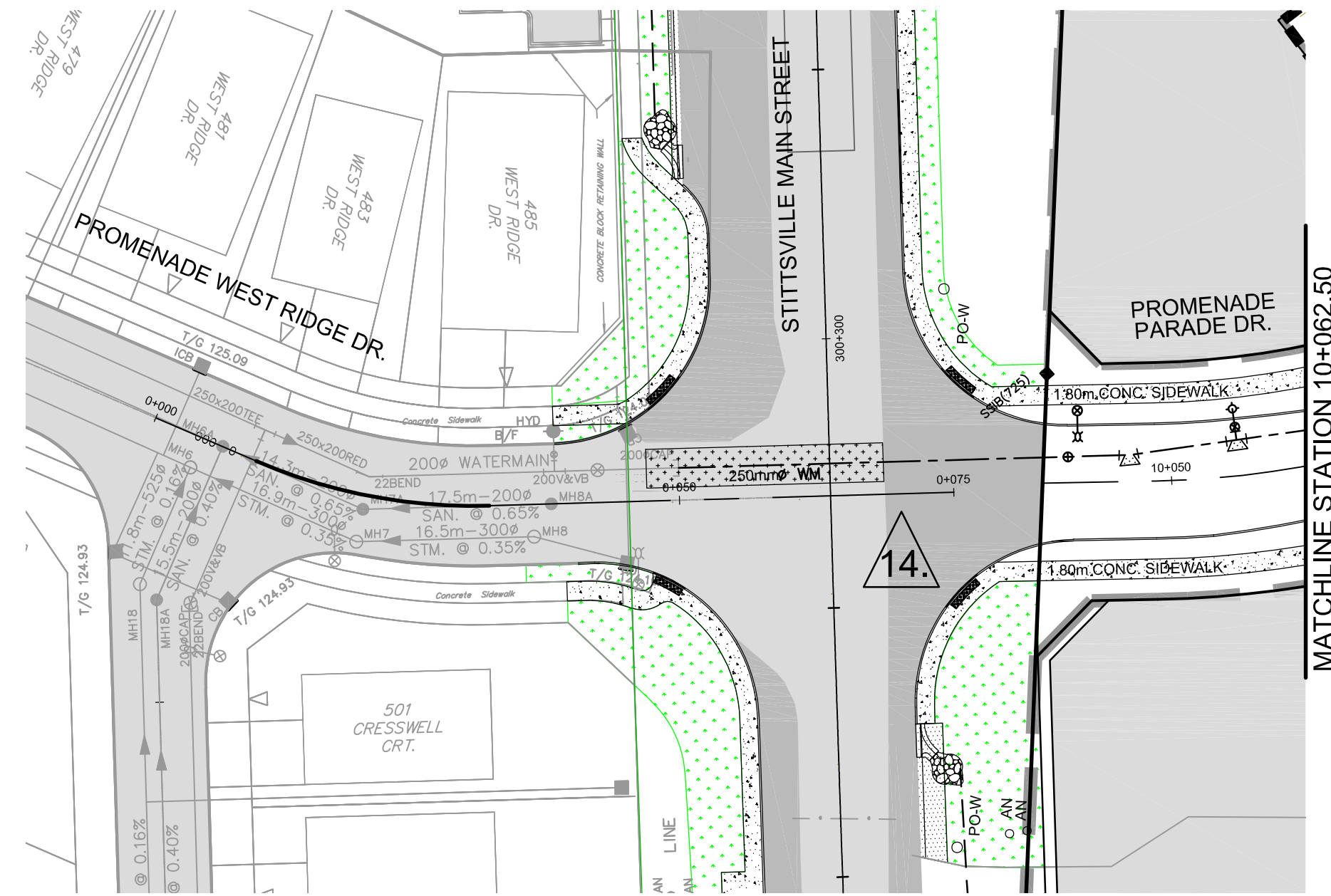
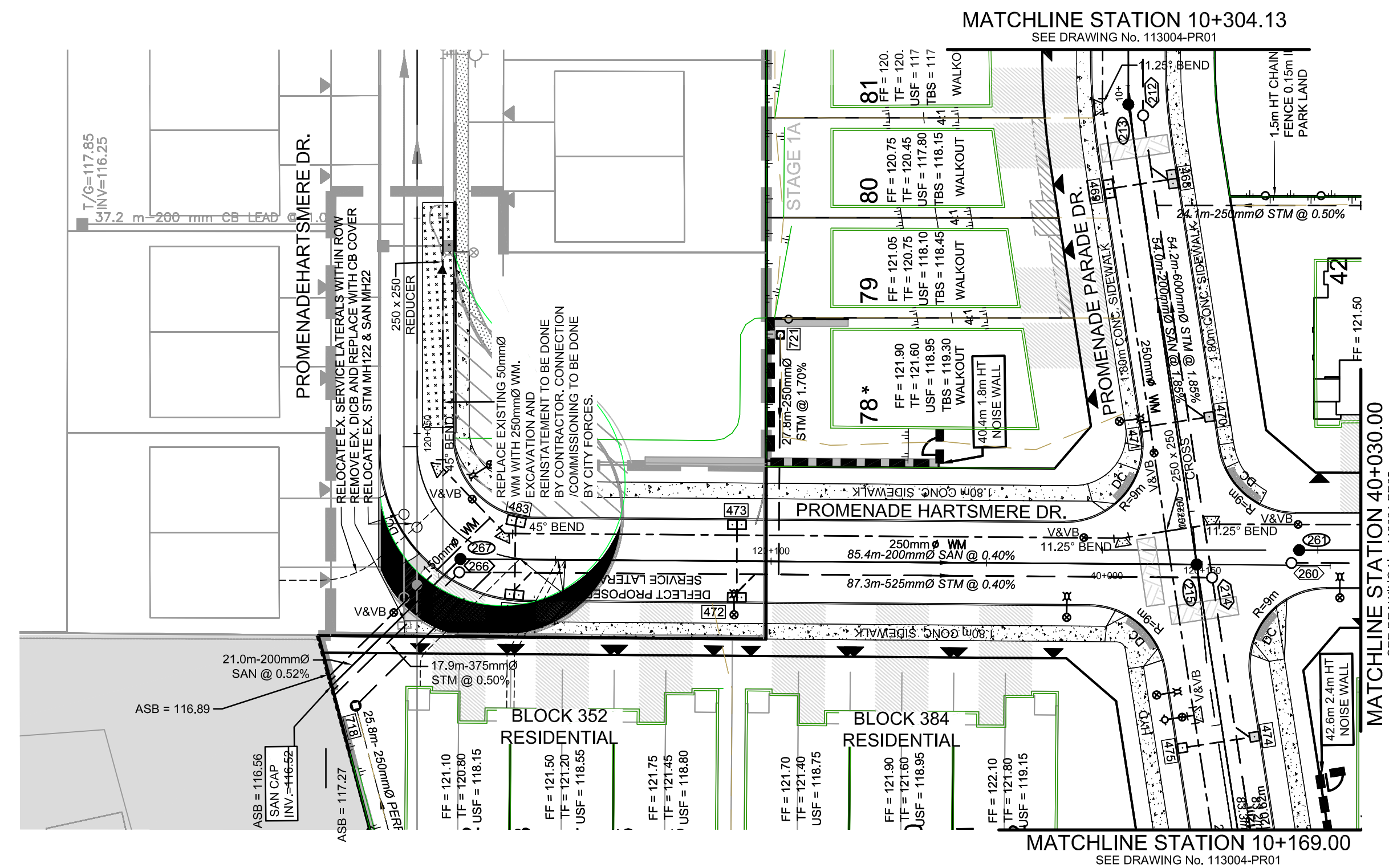
NOTE: THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE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

Revision table with columns: No., Revision, Date, By, and rows of revision entries.

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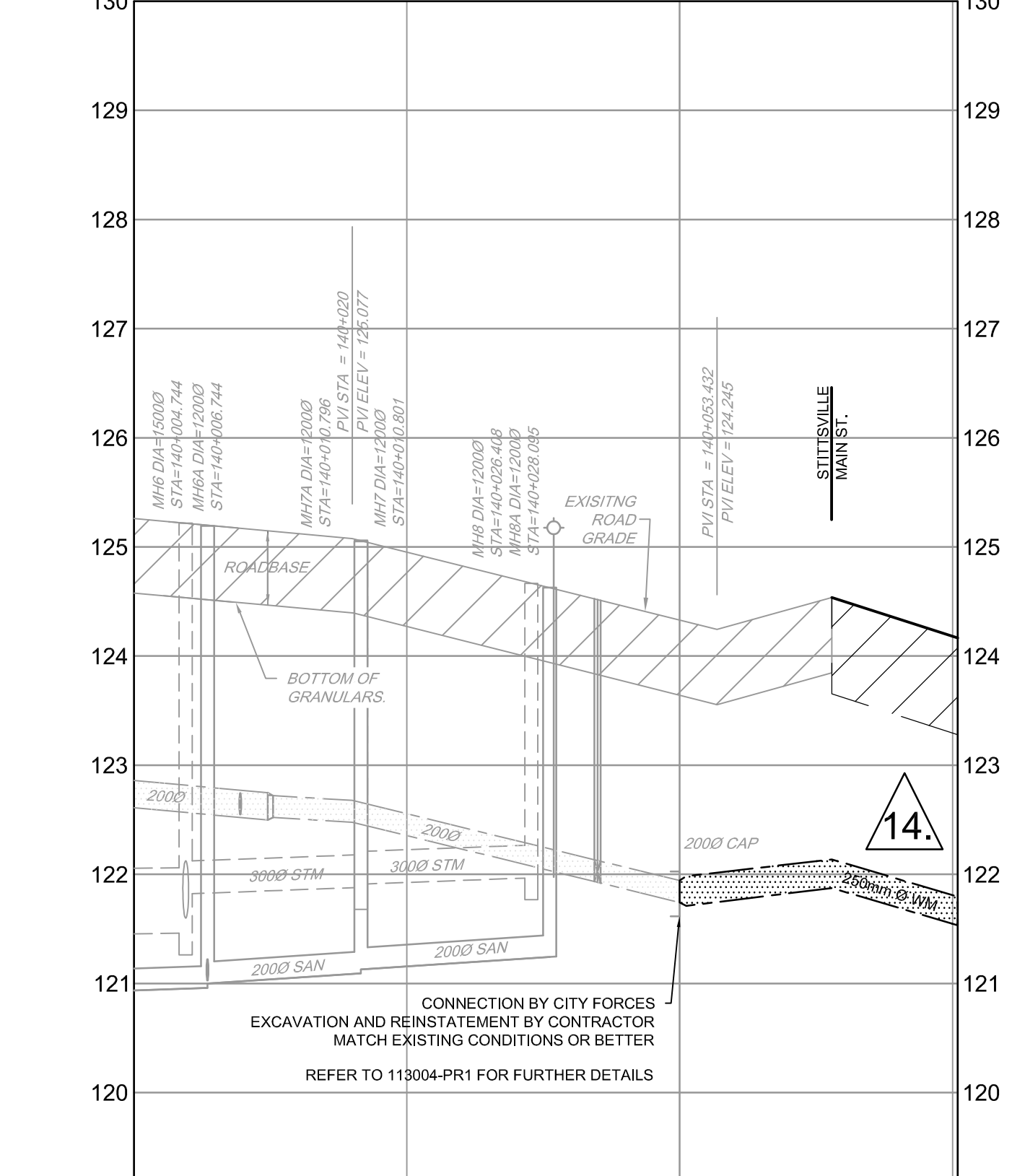
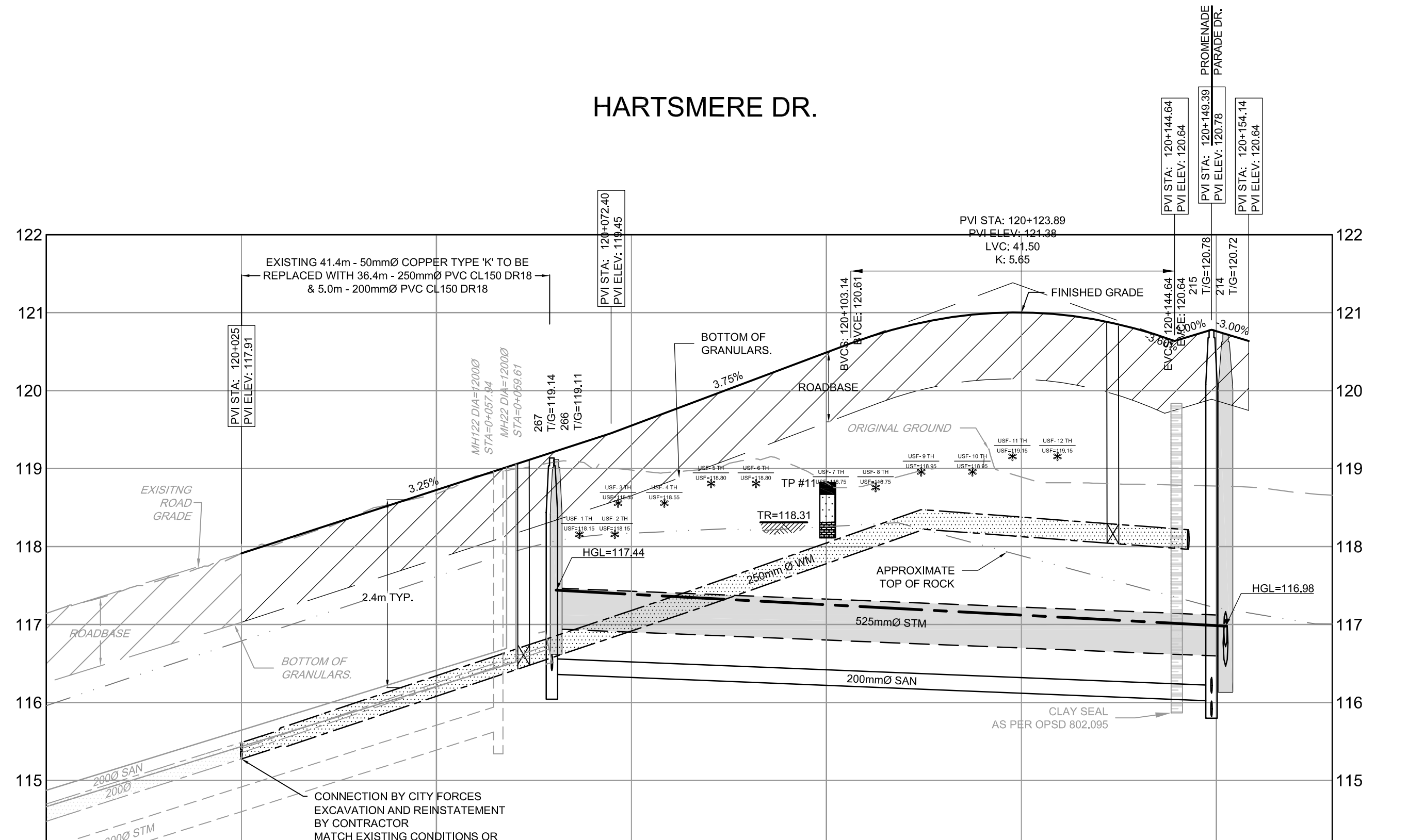
Revision table with columns: No., Revision, Date, By, and rows of revision entries.

FOR REVIEW ONLY section containing a professional engineer seal for B. H. Baha, project details for City of Ottawa Stittsville South - Area 6, and contact information for Novatech.



HARTSMERE DR.

WEST RIDGE DR.



CHAINAGE	PROPOSED ELEVATION	EXISTING ELEVATION	STORM SEWER INVERTS	STORM CHAINAGE	SANITARY SEWER INVERTS	SANITARY CHAINAGE	TOP OF WATERMAIN ELEVATION	WATERMAIN STRUCTURE CHAINAGE
120+000	117.44	117.91	111.57m-3000 PVC SDR35 STM @ 3.10%		114.80m-2000 SDR35 SAN @ 3.08%		115.51	120+000
120+050	116.67	116.89					116.36	120+050
120+100	120.49	118.62	87.32m-525mm STM @ 0.45%		85.40m-200mm SAN @ 0.43%		118.06	120+100
120+150	120.64	118.89					118.27	120+150
120+200	120.64	118.89					118.27	120+200
120+250	120.64	118.89					118.27	120+250
120+300	120.64	118.89					118.27	120+300
120+350	120.64	118.89					118.27	120+350
120+400	120.64	118.89					118.27	120+400
120+450	120.64	118.89					118.27	120+450
120+500	120.64	118.89					118.27	120+500
120+550	120.64	118.89					118.27	120+550
120+600	120.64	118.89					118.27	120+600
120+650	120.64	118.89					118.27	120+650
120+700	120.64	118.89					118.27	120+700
120+750	120.64	118.89					118.27	120+750
120+800	120.64	118.89					118.27	120+800
120+850	120.64	118.89					118.27	120+850
120+900	120.64	118.89					118.27	120+900
120+950	120.64	118.89					118.27	120+950
121+000	120.64	118.89					118.27	121+000

CHAINAGE	PROPOSED ELEVATION	EXISTING ELEVATION	STORM SEWER INVERTS	STORM CHAINAGE	SANITARY SEWER INVERTS	SANITARY CHAINAGE	TOP OF WATERMAIN ELEVATION	WATERMAIN STRUCTURE CHAINAGE
140+000.000	122.200	122.200	112.1-402 CONC. STM. CL 100-D @ 0.35%		14.3m-2000 PVC SAN SDR-35 @ 0.65%		122.890	140+000.000
140+050.000	125.077	125.077	16.9m-3000 CONC. STM. CL 100-D @ 0.35%		17.5m-2000 PVC SAN SDR-35 @ 0.65%		122.790	140+050.000
140+100.000	124.629	124.629	16.9m-3000 CONC. STM. CL 100-D @ 0.35%		17.5m-2000 PVC SAN SDR-35 @ 0.65%		122.498	140+100.000
140+150.000	124.629	124.629	16.9m-3000 CONC. STM. CL 100-D @ 0.35%		17.5m-2000 PVC SAN SDR-35 @ 0.65%		122.199	140+150.000
140+200.000	124.629	124.629	16.9m-3000 CONC. STM. CL 100-D @ 0.35%		17.5m-2000 PVC SAN SDR-35 @ 0.65%		121.96	140+200.000
140+250.000	124.629	124.629	16.9m-3000 CONC. STM. CL 100-D @ 0.35%		17.5m-2000 PVC SAN SDR-35 @ 0.65%		122.10	140+250.000
140+300.000	124.629	124.629	16.9m-3000 CONC. STM. CL 100-D @ 0.35%		17.5m-2000 PVC SAN SDR-35 @ 0.65%		121.90	140+300.000

NOTE: THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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	NO.	REVISION	DATE	BY
16.	BLOCK 383 AS-BUILT ADDED	JAN 25/22	BHB	8.	REVISED AS PER CITY COMMENTS	APR 05/16	BHB
15.	AS-BUILT NOTES	APR 12/18	BHB	7.	ISSUED FOR TENDER	JAN 20/16	BHB
14.	REVISED WM FROM STA 140+050 TO STA 140+075	MAY 24/17	BHB	6.	MINOR REVISIONS	DEC 23/15	BHB
13.	ISSUED FOR EARLY SERVICING	OCT 26/16	BHB	5.	REVISED AS PER CITY COMMENTS	DEC 16/15	BHB
12.	ISSUED FOR MOECC-ECA APPROVAL	SEPT 21/16	BHB	4.	ISSUED FOR CITY REVIEW	SEPT 14/15	BHB
11.	REVISED AS PER CITY COMMENTS	SEPT 09/16	BHB	3.	ISSUED TO BUILDER FOR INFORMATION	APR 17/15	BHB
10.	ISSUED FOR MANHOLE SHOP DRAWINGS	AUG 30/16	BHB	2.	ISSUED TO BUILDER FOR INFORMATION	NOV 26/14	BHB
9.	REVISED AS PER CITY COMMENTS	JULY 18/16	BHB	1.	ISSUED FOR INFORMATION	AUG 15/14	BHB

SCALE: 1:500

FOR REVIEW ONLY

DESIGN: BCS/TGP

CHECKED: BHB

DRAWN: BHB

TGPI/EST: BHB

APPROVED: GJM

NOVATECH

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

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

CITY OF OTTAWA
STITTSVILLE SOUTH - AREA 6

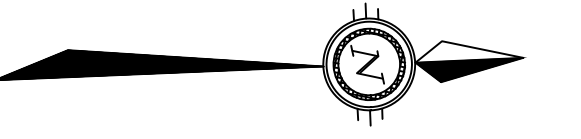
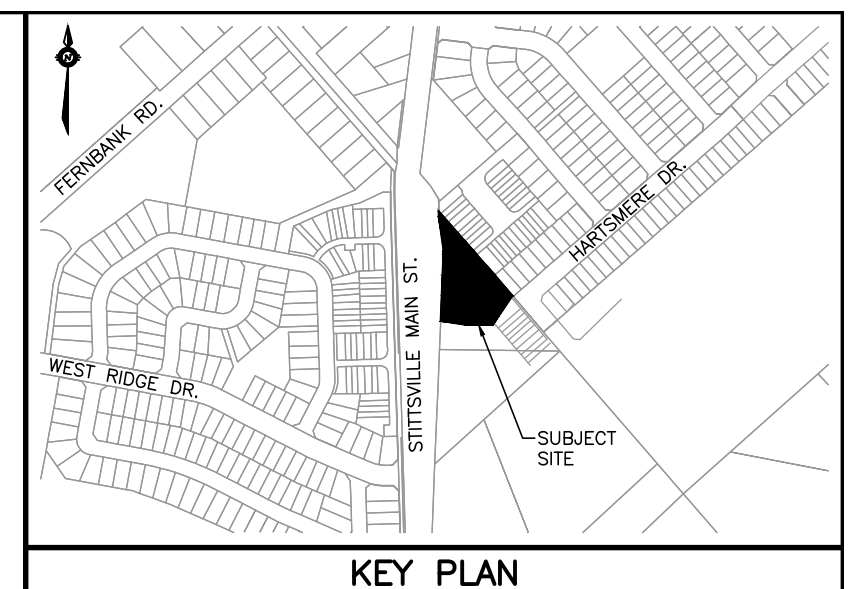
PLAN AND PROFILE
HARTSMERE DR.
STA 120+000.00 TO 120+164.85
WEST RIDGE DR.
STA 140+000.00 TO 140+075.00

PROJECT NO.: 113004-00
REV # 16
DRAWING NO.: 113004-PRO9

REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed: _____
Date: _____ 2016
Plan Number: 17274 D07-16-13-0033

SITE BENCHMARK
MAG NAIL IN UP
EL.=122.77m

STITTSVILLE MAIN STREET
(MTO PLAN P-1969-38, INST. (B)4379)
PIN 04449 - 0360



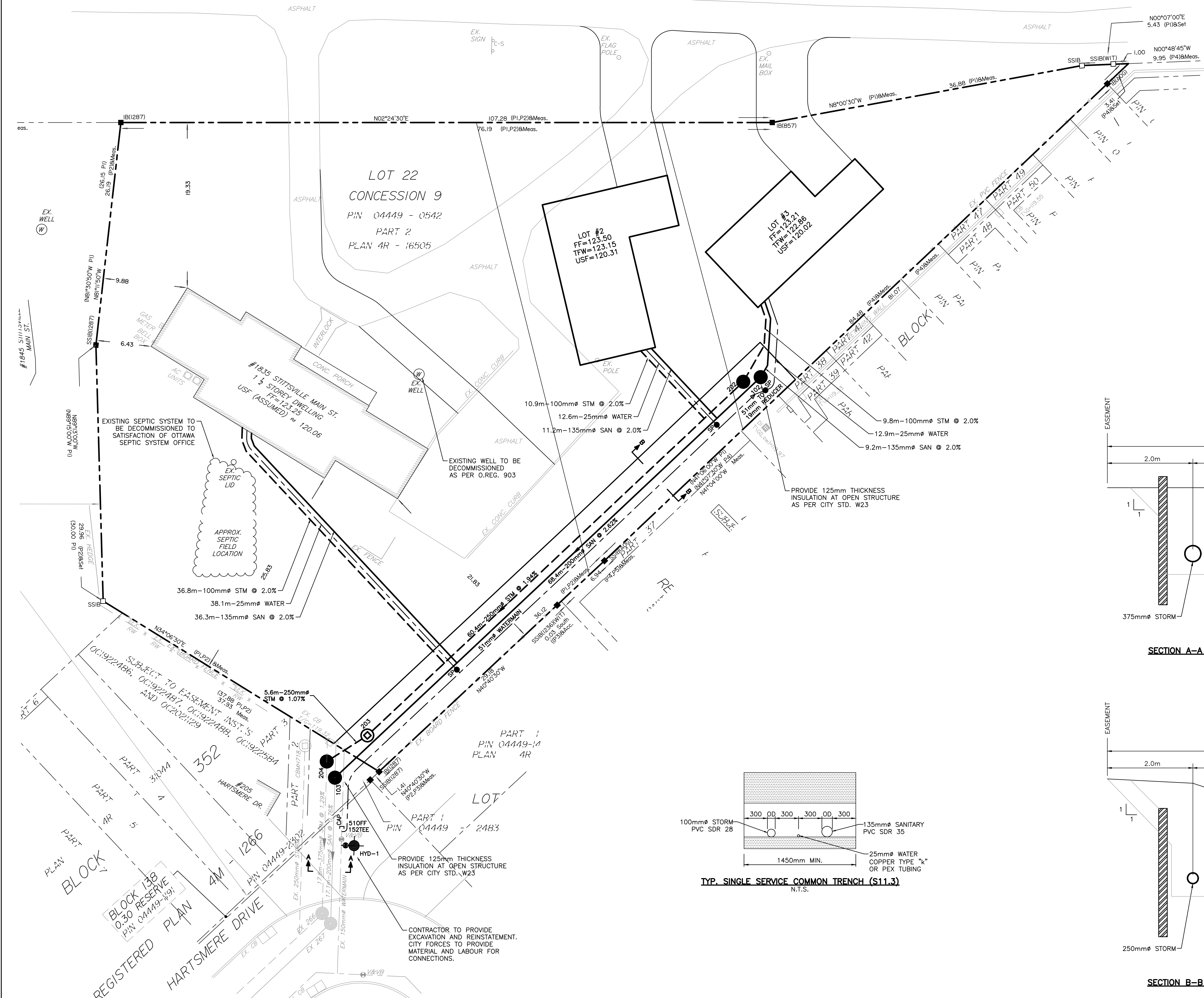
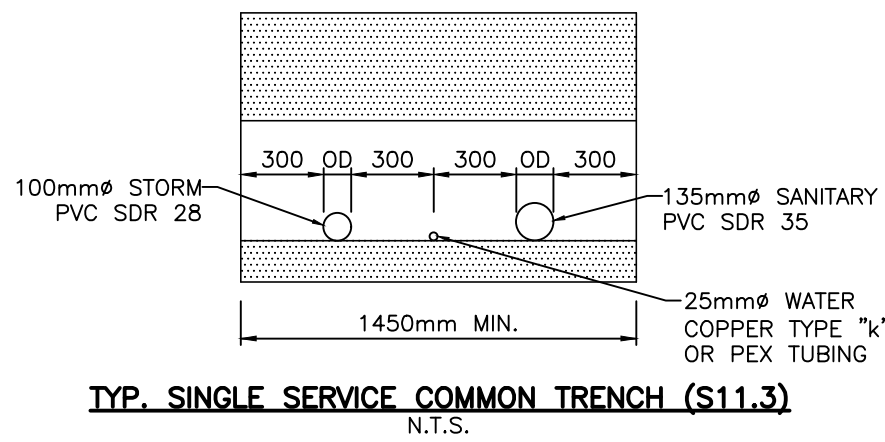
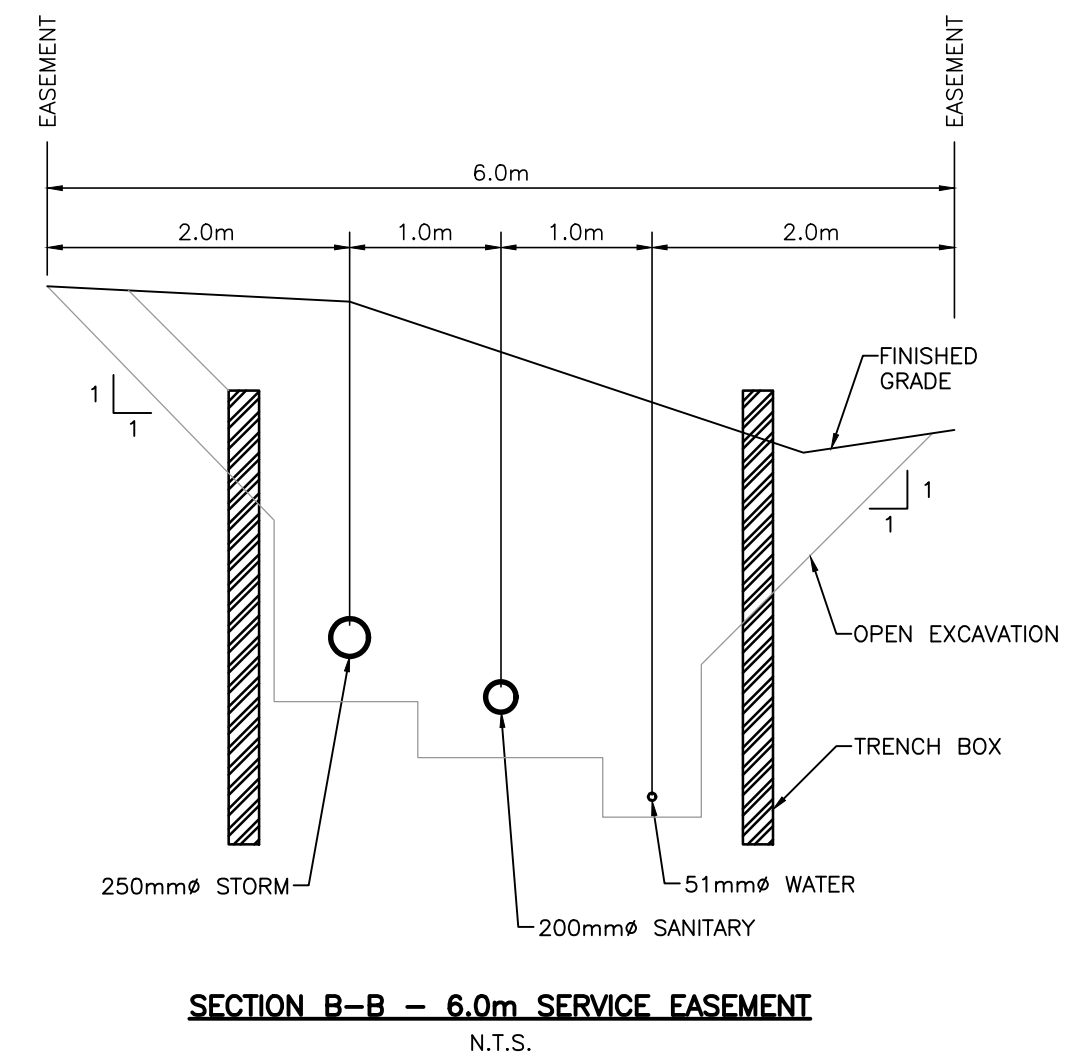
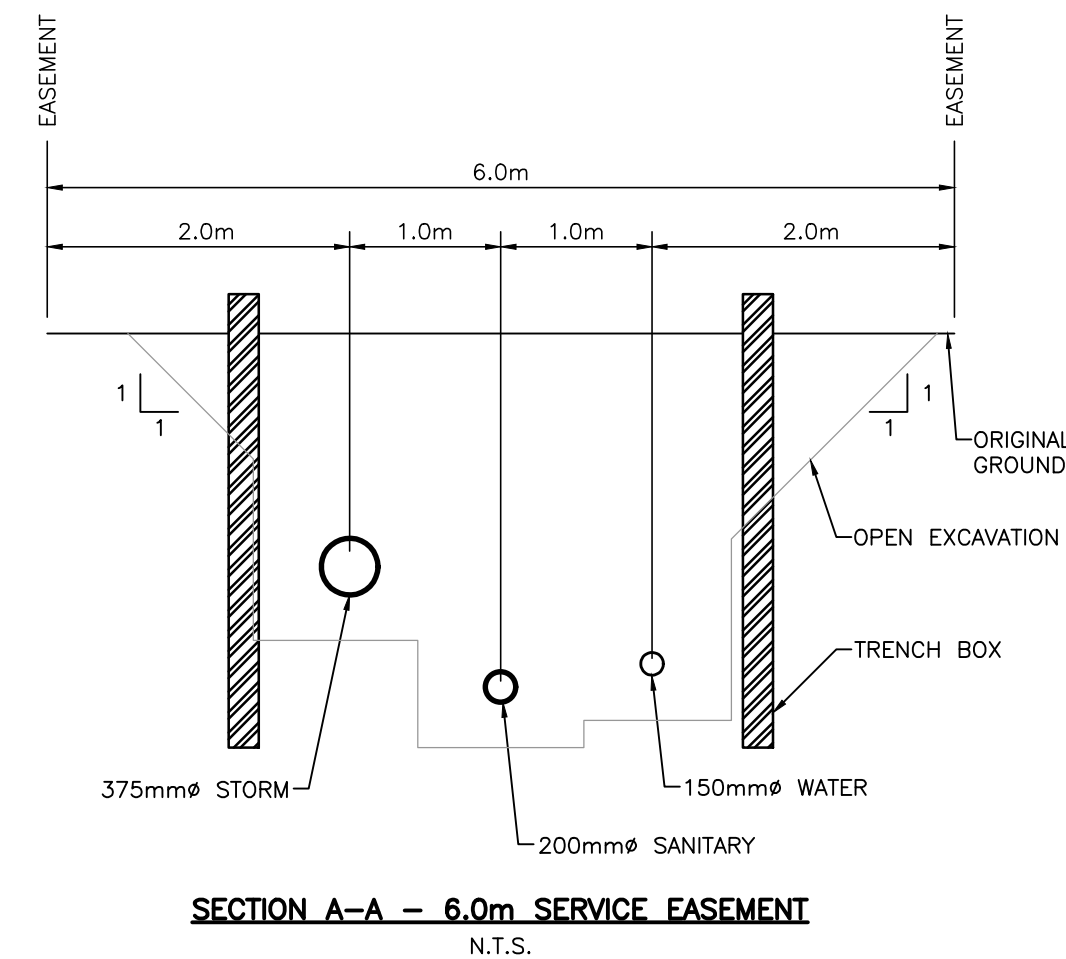
- LEGEND**
- PROPERTY BOUNDARY
 - - - EASEMENT
 - ⊙ EXISTING HYDRANT
 - ⊕ EXISTING VALVE & VALVE BOX
 - EXISTING WATERMAIN
 - EXISTING SANITARY SEWER & MANHOLE
 - EXISTING STORM SEWER & MANHOLE
 - EXISTING CATCH BASIN
 - ⊙ HYDRANT
 - CURB STOP & SERVICE POST
 - WATERMAIN
 - SANITARY SEWER & MANHOLE
 - STORM SEWER & MANHOLE
 - ⊕ CATCH BASIN MANHOLE
 - CATCH BASIN

STORM MANHOLE TABLE

MANHOLE No.	STRUCTURE	T/G ELEV	INVERT	COVER TYPE
203	1200mm	119.00	SE=117.42 NW=117.45	S28.1
EX 266	1200mm	119.11	W=117.00	S24.1
204	1200mm	119.30	E=117.23 NW=117.36	S24.1
202	1200mm	121.19	SE=118.62	S24.1

SANITARY MANHOLE TABLE

MANHOLE No.	STRUCTURE	T/G ELEV	INVERT	COVER TYPE
EX 267	1200mm	119.14	W=116.41	S24
103	1200mm	119.15	E=116.54 NW=116.60	S24
102	1200mm	120.91	SE=118.39	S24



NOTES

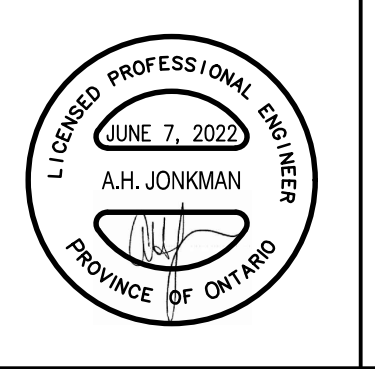
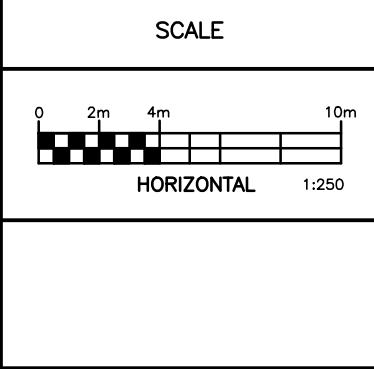
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE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

NO.	REVISION DESCRIPTION	DATE	BY
2	REVISED PER COMMENTS	07/06/22	AHJ
1	ISSUED FOR ZONING BY-LAW AMENDMENT	10/02/22	AHJ

SCALE

0 2m 4m 10m

HORIZONTAL 1:250



Robinson Land Development

350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 roii.com

DESIGN

DESIGN	BLM
CHECKED	AHJ
DRAWN	BLM
CHECKED	AHJ
APPROVED	AHJ

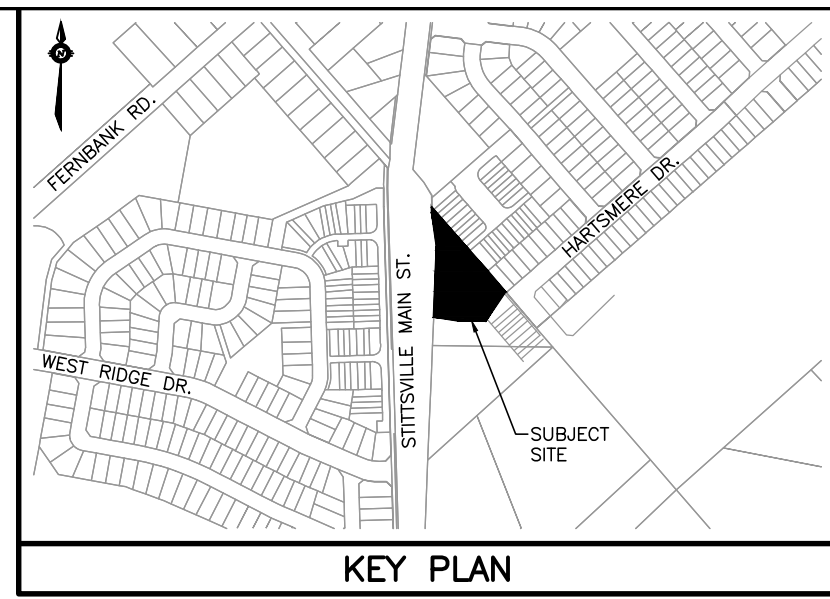
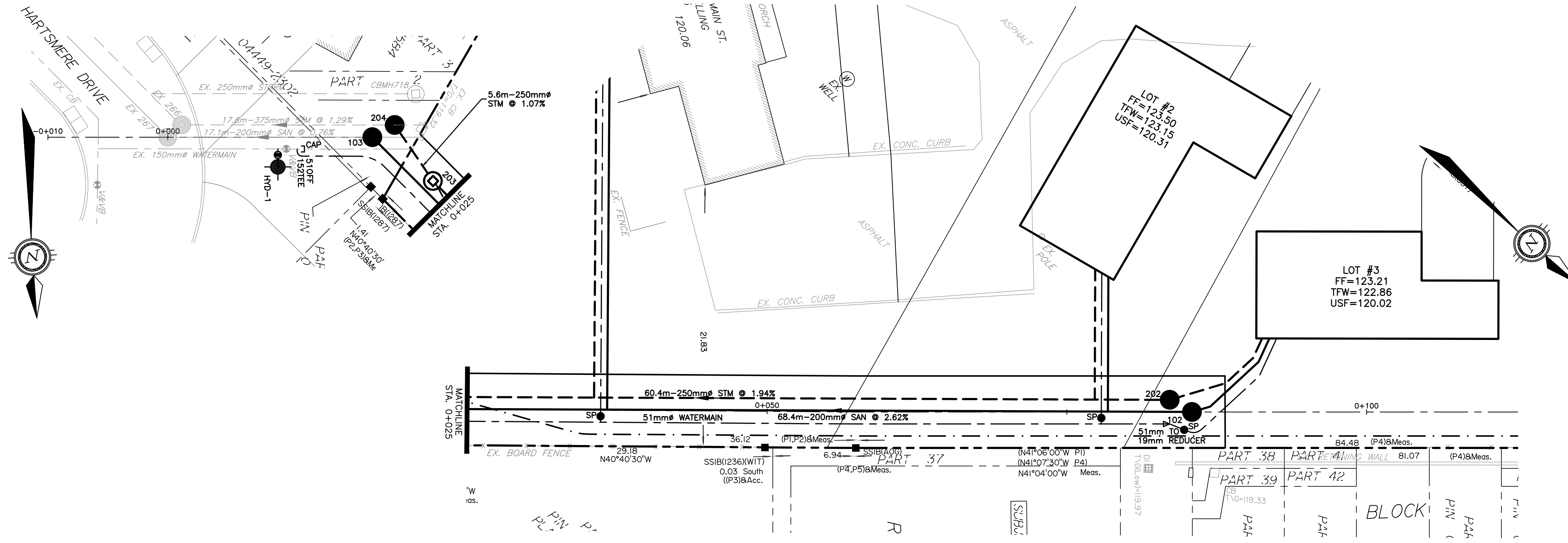
JENNIFER McGAHAN WIRE INVESTMENT CORP.

1835 STITTSVILLE MAIN STREET
STITTSVILLE, ON

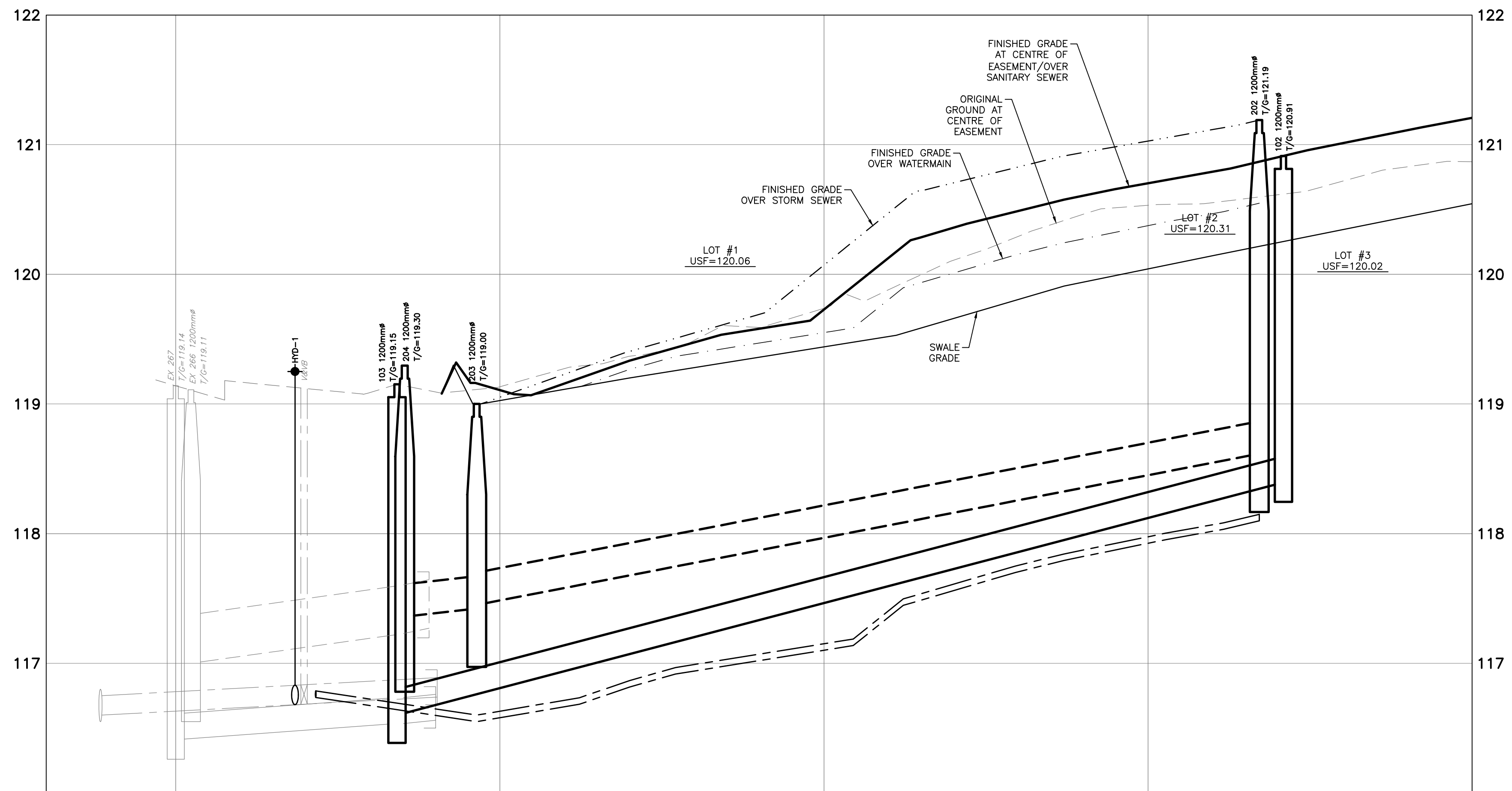
SERVICING PLAN

PROJECT No.	22008
SURVEY	AOV
DATED	JUNE 2022
DWG. No.	22008-S1

NOT FOR CONSTRUCTION



- LEGEND**
- PROPERTY BOUNDARY
 - EASEMENT
 - SWALE
 - EXISTING HYDRANT
 - EXISTING VALVE & VALVE BOX
 - EXISTING WATERMAIN
 - EXISTING SANITARY SEWER & MANHOLE
 - EXISTING STORM SEWER & MANHOLE
 - EXISTING CATCH BASIN
 - HYDRANT
 - CURB STOP & SERVICE POST
 - WATERMAIN
 - SANITARY SEWER & MANHOLE
 - STORM SEWER & MANHOLE
 - CATCH BASIN MANHOLE
 - CATCH BASIN

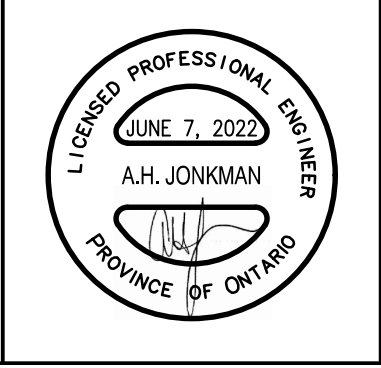
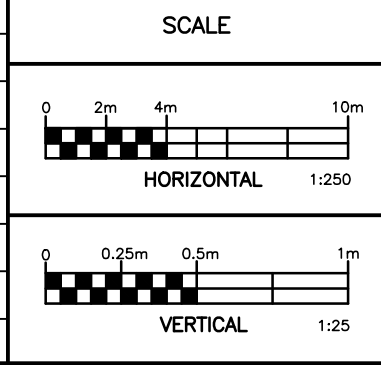


PROPOSED GRADE													PROPOSED GRADE					
TOP OF WATERMAIN ELEVATION	116.82	116.83	116.79	116.63	116.73	116.87	116.97	117.15	117.19	117.50	117.75	117.84	117.98	118.00	118.08	118.15	121.21	TOP OF WATERMAIN ELEVATION
STORM SEWER INVERT ELEVATION																		STORM SEWER INVERT ELEVATION
SANITARY SEWER INVERT ELEVATION																		SANITARY SEWER INVERT ELEVATION
ORIGINAL GROUND ELEVATION																		ORIGINAL GROUND ELEVATION
STATION	0+000	0+010.8	0+017.1	0+023.2	0+025	0+050	0+075	0+083.6	0+085.4	0+100								STATION

NOT FOR CONSTRUCTION

NOTES
 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 DESCRIPTION	DATE	BY
2	REVISED PER COMMENTS	07/06/22	AHJ
1	ISSUED FOR ZONING BY-LAW AMENDMENT	10/02/22	AHJ



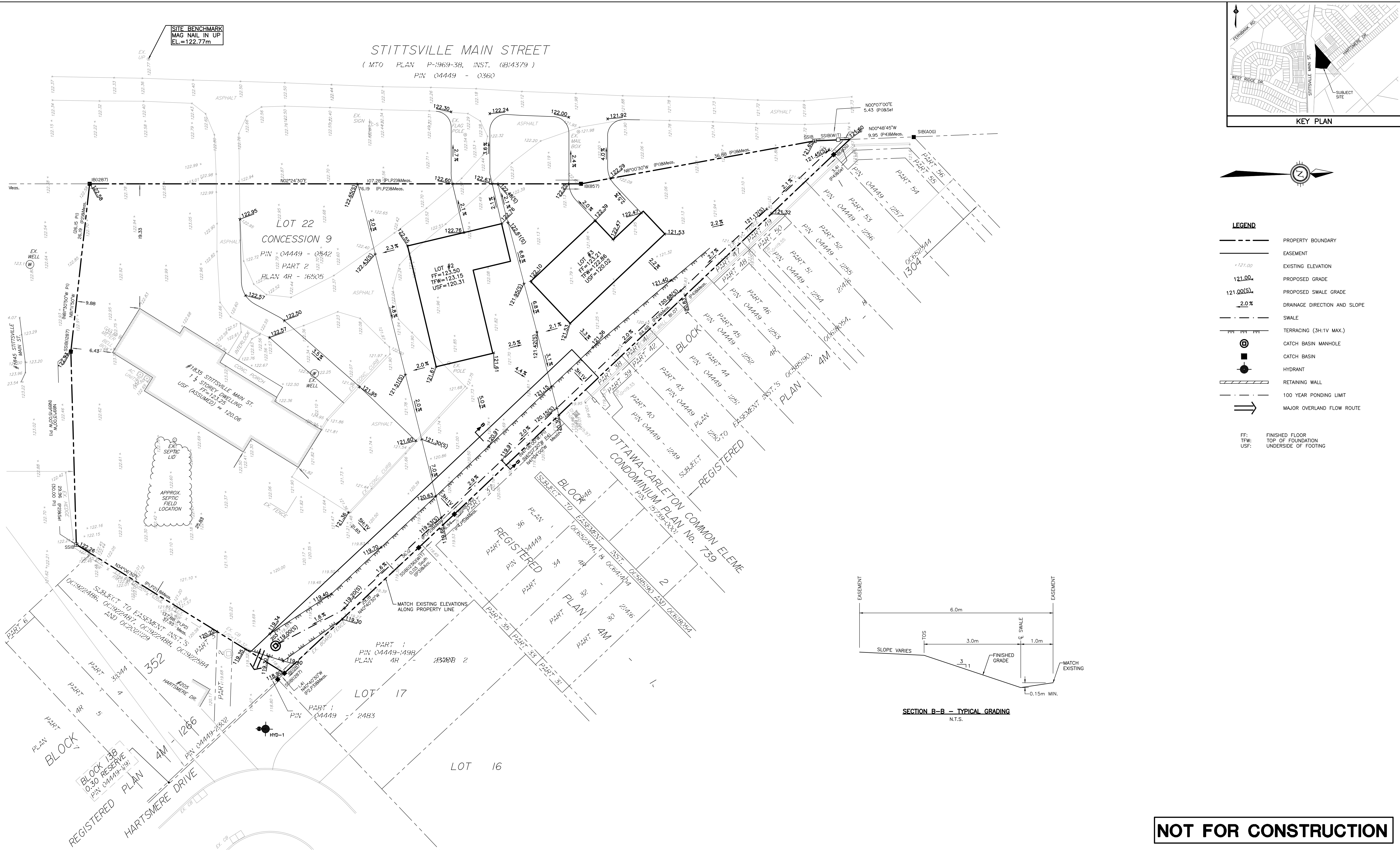
Robinson Land Development
 350 Palladium Drive
 Ottawa, ON K2V 1A8
 (613) 592-6060 roii.com

DESIGN	BLM
CHECKED	AHJ
DRAWN	BLM
CHECKED	AHJ
APPROVED	AHJ

**JENNIFER McGAHAN
 WIRE INVESTMENT CORP.**
 1835 STITTSVILLE MAIN STREET
 STITTSVILLE, ON

**SERVICE EASEMENT
 PLAN & PROFILE**
 STA. 0+000 TO STA. 0+100

PROJECT No.	22008
SURVEY	AOV
DATED	JUNE 2022
DWG. No.	22008-P1



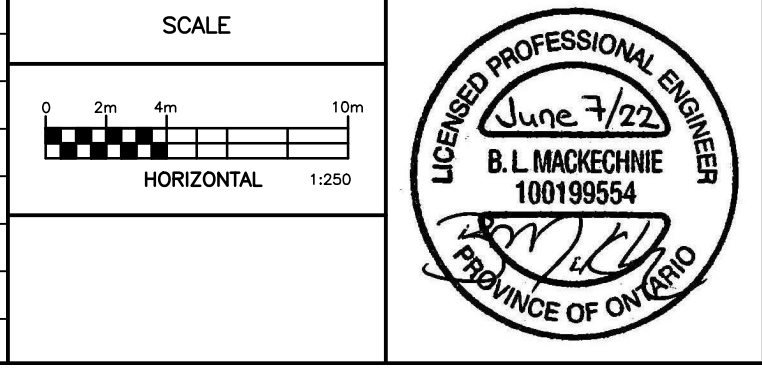
NOT FOR CONSTRUCTION

NOTES

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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 DESCRIPTION	DATE	BY
2	REVISED PER COMMENTS	07/06/22	AHJ
1	ISSUED FOR ZONING BY-LAW AMENDMENT	10/02/22	AHJ

SCALE	
HORIZONTAL 1:250	



Robinson
Land Development

350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 roii.com

DESIGN	BLM
CHECKED	AHJ
DRAWN	BLM
CHECKED	AHJ
APPROVED	AHJ

JENNIFER McGAHAN
WIRE INVESTMENT CORP.

1835 STITTSVILLE MAIN STREET
STITTSVILLE, ON

PROJECT No.	
22008	
SURVEY	
AOV	
DATED	
JUNE 2022	
DWG. No.	
22008-GR1	

Attachment B

Hydraulic Water Model Figure

Boundary Conditions

Watermain Design Sheet

Water Model Outputs

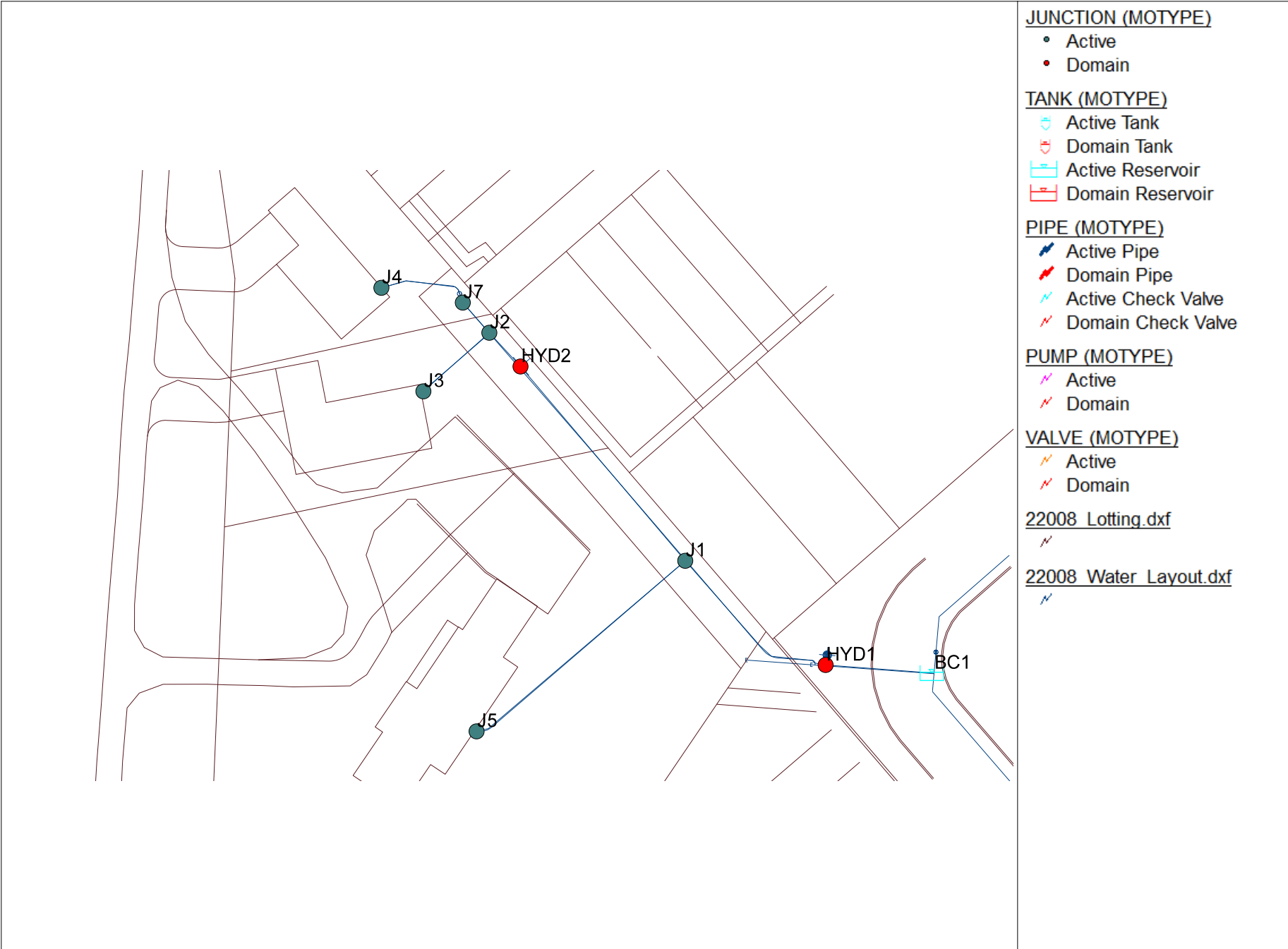
FUS Calculations

Hydrant Location Options Plan

Fire Flow Report

Hydrant Coverage Plans

1835 Stittsville Main Street - Water Model

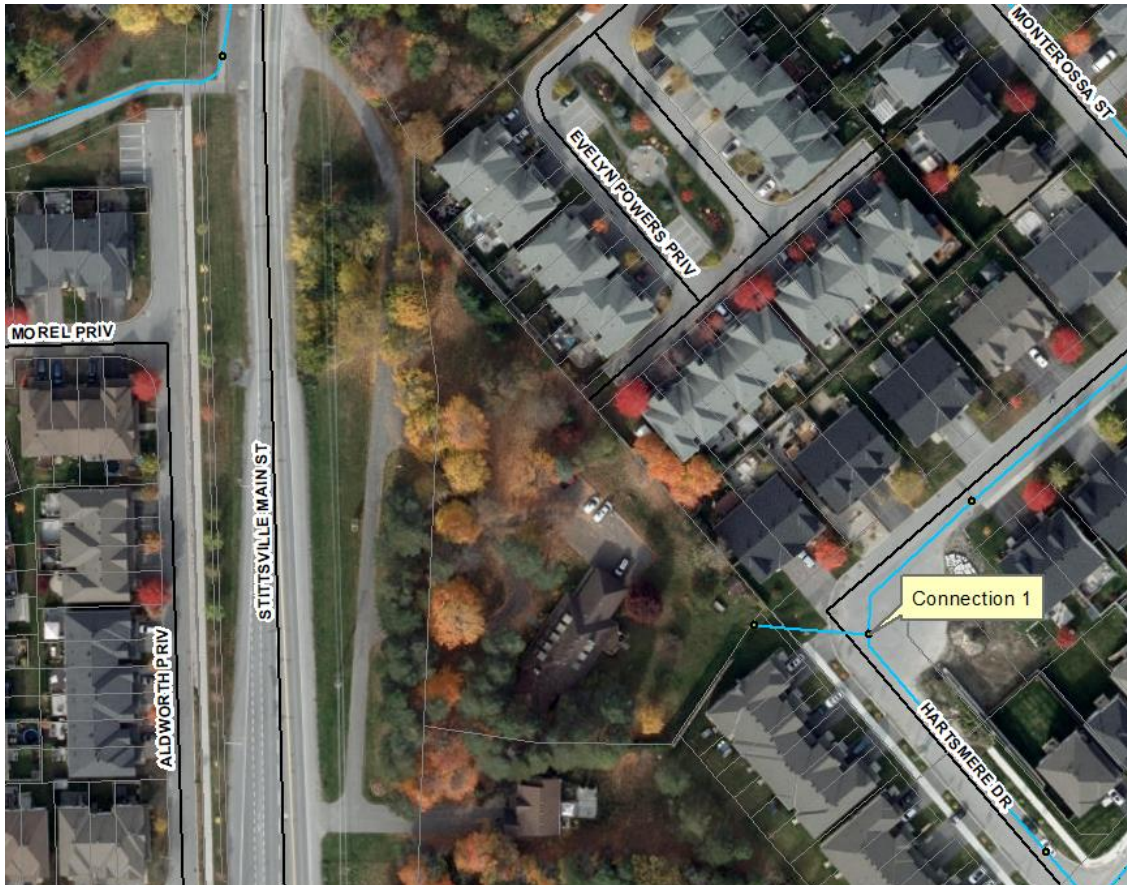


Boundary Conditions 1835 Stittsville Main Street

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	2	0.03
Maximum Daily Demand	19	0.31
Peak Hour	269	4.49
Fire Flow Demand #1	9,000	150.00

Location



Results

Connection 1 – Hartsmere Drive

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	160.2	58.5
Peak Hour	155.2	51.3
Max Day plus Fire 1	147.7	40.7

Ground Elevation = 119.1 m

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

WATERMAIN DESIGN SHEET

1835 Stittsville Main Street, Ottawa
Project No. 22008

JUNCTION NODE	RESIDENTIAL POPULATION				COMMERCIAL AREA (ha)	INSTITUTIONAL AREA (ha)	AVG. DAY DEMAND (L/s)				MAX. DAILY DEMAND (L/s)				MAX. HOURLY DEMAND (L/s)			
	UNIT COUNT			TOTAL POPULATION			RES.	COMM.	INST.	TOTAL	RES.	COMM.	INST.	TOTAL	RES.	COMM.	INST.	TOTAL
	SINGLE FAMILY	TOWNHOUSE	APARTMENTS															
J1	3			10.2			0.033			0.033	0.314			0.314	4.491			4.491
Total	3			10.2			0.033			0.033	0.314			0.314	4.491			4.491

Notes:

1. Residential peaking factors as per Table 3-3 of the MOE Design Guidelines for Drinking Water Systems (2008).

Population Density

Single Family = 3.4 cap/unit
Townhouses = 2.7 cap/unit
Apartments = 1.8 cap/unit

Avg. Day Demand:

Residential 280 L/cap/day
Commercial 28000 L/ha/day
Institutional 28000 L/ha/day

Max. Daily Demand:

Residential 9.5 x Avg. Day
Commercial 1.5 x Avg. Day
Institutional 1.5 x Avg. Day

Max. Hourly Demand:

Residential 14.3 x Max. Day
Commercial 1.8 x Max. Day
Institutional 1.8 x Max. Day

Table 3-3: Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People

DWELLING UNITS SERVICED	EQUIVALENT POPULATION	NIGHT MINIMUM HOUR FACTOR	MAXIMUM DAY FACTOR	PEAK HOUR FACTOR
10	30	0.1	9.5	14.3
50	150	0.1	4.9	7.4
100	300	0.2	3.6	5.4
150	450	0.3	3.0	4.5
167	500	0.4	2.9	4.3

1835 Stittsville Main Street - Peak Hour Pressure

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	DEMAND: DEMAND1 (Num)	OUTPUT: HEAD (m)	OUTPUT: PRESSURE (psi)
1	HYD1	119.11	0.00	155.20	51.30
2	J1	120.06	0.00	155.16	49.90
3	J2	123.50	0.00	155.13	44.97
4	J3	123.50	0.11	155.06	44.87
5	J4	123.21	0.11	155.06	45.27
6	J5	120.06	0.11	154.94	49.59
7	J7	123.50	0.00	155.13	44.97
8	HYD2	123.50	0.00	155.14	44.97

1835 Stittsville Main Street - Max Pressure

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	DEMAND: DEMAND1 (Num)	OUTPUT: HEAD (m)	OUTPUT: PRESSURE (psi)
1	HYD1	119.11	0.00	160.20	58.41
2	J1	120.06	0.00	160.17	57.02
3	J2	123.50	0.00	160.14	52.09
4	J3	123.50	0.10	160.08	52.01
5	J4	123.21	0.10	160.08	52.41
6	J5	120.06	0.10	159.98	56.76
7	J7	123.50	0.00	160.14	52.09
8	HYD2	123.50	0.00	160.15	52.10

1835 Stittsville Main Street - Pipe Report

	PIPE: ID (Char)	PIPEHYD: LENGTH (Num)	PIPEHYD: DIAMETER (Num)	PIPEHYD: ROUGHNESS (Num)
1	P1	15.07	152.00	100.00
2	P2	25.70	51.00	100.00
3	P3	37.70	25.40	100.00
4	P5	12.28	25.40	100.00
5	P6	5.60	51.00	100.00
6	P7	12.94	25.40	100.00
7	P4	35.45	51.00	100.00
8	P9	6.39	51.00	100.00

Project Name: 1835 Stittsville Main Street
Project Location: 1835 Stittsville Main Street
Project No: 22008
Date: 04-May-22

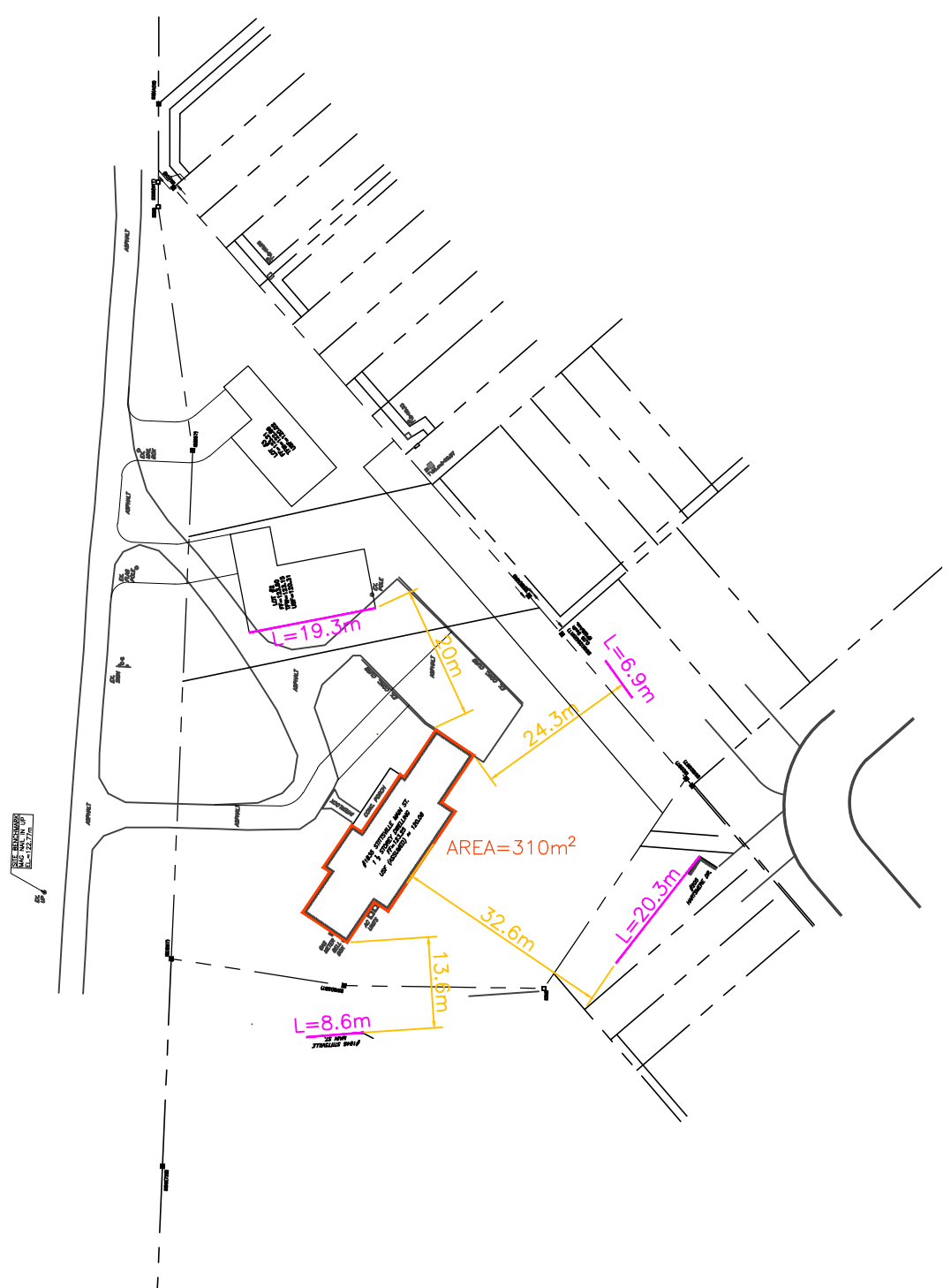
Building Type: Single-Family
Building Location: Lot #1 (Existing Dwelling)



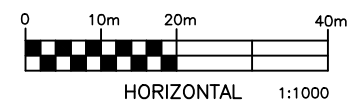
Calculations for Total Required Fire Flow

Step	Parameter			Value
A	Type of Construction	Options	C	Wood Frame 1.5
		Wood Frame	1.5	
		Ordinary Construction	1.0	
		Non-combustible construction	0.8	
		Fire resistive construction (< 2 hrs)	0.7	
		Fire resistive construction (> 2 hrs)	0.6	
B	Ground Floor Area			310 m ²
C	No. of Storeys			2
	Total Floor Area			620 m ²
D	Fire Flow			8,000 L/min
E	Occupancy Class	Options	Charge	Limited Combustible -0.15
		Non-combustible	-0.25	
		Limited Combustible	-0.15	
		Combustible	0.00	
		Free burning	0.15	
		Rapid Burning	0.25	
Occupancy Adjustment				-1200 L/min
Fire Flow				6,800 L/min
F	Sprinkler Protection	Options	Charge	None 0
		Complete Automatic Sprinkler Protection	-0.30	
		None	0.00	
		Sprinkler Reduction		
Exposures				
West Side				
Exposed Wall Length				8.6 m
Exposed Wall No. of Storeys				2
Length-Height Factor of Exposed Wall				17.2 m.storeys
Construction Type of Exposed Wall	Options	Wood Frame or Non-Combustible		
	Wood Frame or Non-Combustible			
	Ordinary with Unprotected Openings			
	Ordinary with Semi-protected Openings			
	Ordinary with Blank Wall			
Separation Distance				13.6 m
West Side Exposure Charge				0.12
North Side				
Exposed Wall Length				19.3 m
Exposed Wall No. of Storeys				2
Length-Height Factor of Exposed Wall				38.6 m.storeys
Construction Type of Exposed Wall	Options	Wood Frame or Non-Combustible		
	Wood Frame or Non-Combustible			
	Ordinary with Unprotected Openings			
	Ordinary with Semi-protected Openings			
	Ordinary with Blank Wall			
Separation Distance				20.0 m
North Side Exposure Charge				0.13

G	East Side			
	Exposed Wall Length		6.9	m
	Exposed Wall No. of Storeys		2	
	Length-Height Factor of Exposed Wall		13.8	m.storeys
	Construction Type of Exposed Wall	Options		Wood Frame or Non-Combustible
		Wood Frame or Non-Combustible		
		Ordinary with Unprotected Openings		
		Ordinary with Semi-protected Openings		
	Ordinary with Blank Wall			
	Separation Distance		24.3	m
	East Side Exposure Charge		0.08	
	South Side			
	Exposed Wall Length		20.3	m
	Exposed Wall No. of Storeys		2	
	Length-Height Factor of Exposed Wall		40.6	m.storeys
Construction Type of Exposed Wall	Options		Wood Frame or Non-Combustible	
	Wood Frame or Non-Combustible			
	Ordinary with Unprotected Openings			
	Ordinary with Semi-protected Openings			
Ordinary with Blank Wall				
Separation Distance		32.6	m	
South Side Exposure Charge		0.05		
Total Exposure Charge		0.38	< 0.75	
Increase for Exposures		2584	L/min	
H	Fire Flow		9,000	L/min
I	City Cap	For Single Detached Dwellings:		Condition Satisfied
		Minimum separation of 10 m between backs of adjacent units		N/A
		For Side-by-Side Town and Row Houses:		Condition Satisfied
		Minimum separation of 10 m between backs of adjacent units		N/A
		Firewalls to separate block into fire area no more than 600 m ²		N/A
Total Required Fire Flow		9,000	L/min	
Notes:				
1. Fire flow calculations have been prepared in accordance with City of Ottawa Technical Bulletin ISDTB-2014-02 and ISTB-2018-02.				
2. Step E, exposure charges interpolated from Table G5.				
3. Step I, cap is not applicable to back-to-back townhouses or multi-unit residential buildings.				
4. Step I, if conditions are satisfied, a total required fire flow cap of 10,000 L/min can be applied.				
Comments:				



- LEGEND**
- PROPERTY BOUNDARY
 - AREA BOUNDARY USED IN STEP B
 - EXPOSURE LENGTH USED IN STEP G



Robinson Land Development		
scale 1:1000	1835 STITTSVILLE MAIN STREET	project no. 22008
date 01/05/22		TITLE: FUS SKETCH – LOT 1
drawn by BLM		FUS1

Project Name: 1835 Stittsville Main Street
Project Location: 1835 Stittsville Main Street
Project No: 22008
Date: 04-May-22

Building Type: Single-Family
Building Location: Lot #2 (Proposed Dwelling)






Calculations for Total Required Fire Flow

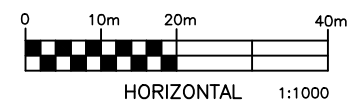
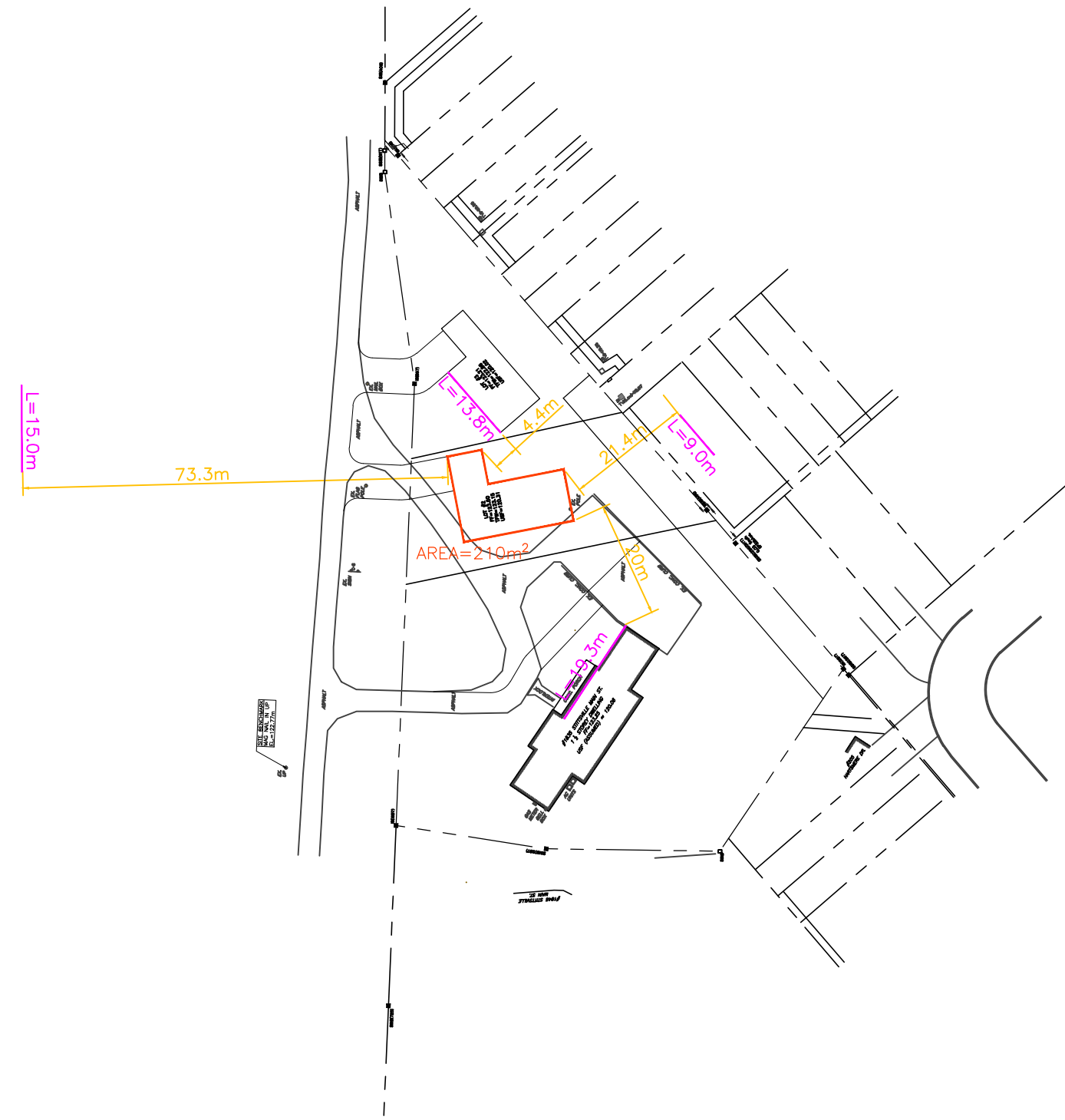
Step	Parameter			Value	
A	Type of Construction	Options	C	Wood Frame	1.5
		Wood Frame	1.5		
		Ordinary Construction	1.0		
		Non-combustible construction	0.8		
		Fire resistive construction (< 2 hrs)	0.7		
	Fire resistive construction (> 2 hrs)	0.6			
B	Ground Floor Area			210	m ²
C	No. of Storeys			2	
	Total Floor Area			420	m ²
D	Fire Flow			7,000	L/min
E	Occupancy Class	Options	Charge	Limited Combustible	-0.15
		Non-combustible	-0.25		
		Limited Combustible	-0.15		
		Combustible	0.00		
		Free burning	0.15		
	Rapid Burning	0.25			
	Occupancy Adjustment			-1050	L/min
	Fire Flow			5,950	L/min
F	Sprinkler Protection	Options	Charge	None	0
		Complete Automatic Sprinkler Protection	-0.30		
		None	0.00		
	Sprinkler Reduction			0	L/min
Exposures					
West Side					
	Exposed Wall Length			15.0	m
	Exposed Wall No. of Storeys			2	
	Length-Height Factor of Exposed Wall			30	m.storeys
	Construction Type of Exposed Wall	Options		Wood Frame or Non-Combustible	
		Wood Frame or Non-Combustible			
		Ordinary with Unprotected Openings			
		Ordinary with Semi-protected Openings			
	Ordinary with Blank Wall				
	Separation Distance			73.3	m
	West Side Exposure Charge			0.05	
North Side					
	Exposed Wall Length			13.8	m
	Exposed Wall No. of Storeys			2	
	Length-Height Factor of Exposed Wall			27.6	m.storeys
	Construction Type of Exposed Wall	Options		Wood Frame or Non-Combustible	
		Wood Frame or Non-Combustible			
		Ordinary with Unprotected Openings			
		Ordinary with Semi-protected Openings			
	Ordinary with Blank Wall				
	Separation Distance			4.4	m
	North Side Exposure Charge			0.17	

G	East Side			
	Exposed Wall Length	9.0	m	
	Exposed Wall No. of Storeys	2		
	Length-Height Factor of Exposed Wall	18	m.storeys	
	Construction Type of Exposed Wall	Options	Wood Frame or Non-Combustible	
		Wood Frame or Non-Combustible		
		Ordinary with Unprotected Openings		
		Ordinary with Semi-protected Openings		
	Ordinary with Blank Wall			
	Separation Distance	21.4	m	
	East Side Exposure Charge		0.08	
	South Side			
	Exposed Wall Length	19.3	m	
	Exposed Wall No. of Storeys	2		
	Length-Height Factor of Exposed Wall	38.6	m.storeys	
Construction Type of Exposed Wall	Options	Wood Frame or Non-Combustible		
	Wood Frame or Non-Combustible			
	Ordinary with Unprotected Openings			
	Ordinary with Semi-protected Openings			
Ordinary with Blank Wall				
Separation Distance	20.0	m		
South Side Exposure Charge		0.13		
Total Exposure Charge		0.43	< 0.75	
Increase for Exposures		2558.5	L/min	
H	Fire Flow	9,000	L/min	
I	City Cap	For Single Detached Dwellings:	Condition Satisfied	
		Minimum separation of 10 m between backs of adjacent units	N/A	
		For Side-by-Side Town and Row Houses:	Condition Satisfied	
		Minimum separation of 10 m between backs of adjacent units	N/A	
		Firewalls to separate block into fire area no more than 600 m ²	N/A	
Total Required Fire Flow		9,000	L/min	
Notes:				
1. Fire flow calculations have been prepared in accordance with City of Ottawa Technical Bulletin ISDTB-2014-02 and ISTB-2018-02.				
2. Step E, exposure charges interpolated from Table G5.				
3. Step I, cap is not applicable to back-to-back townhouses or multi-unit residential buildings.				
4. Step I, if conditions are satisfied, a total required fire flow cap of 10,000 L/min can be applied.				
Comments:				



LEGEND

-  PROPERTY BOUNDARY
-  AREA BOUNDARY USED IN STEP B
-  EXPOSURE LENGTH USED IN STEP G



<h1>Robinson</h1> <h2>Land Development</h2>				
scale	1:1000	1835 STITTSVILLE MAIN STREET	project no.	22008
date	01/05/22		TITLE:	FUS SKETCH – LOT 2
drawn by	BLM			

Project Name: 1835 Stittsville Main Street
Project Location: 1835 Stittsville Main Street
Project No: 22008
Date: 04-May-22

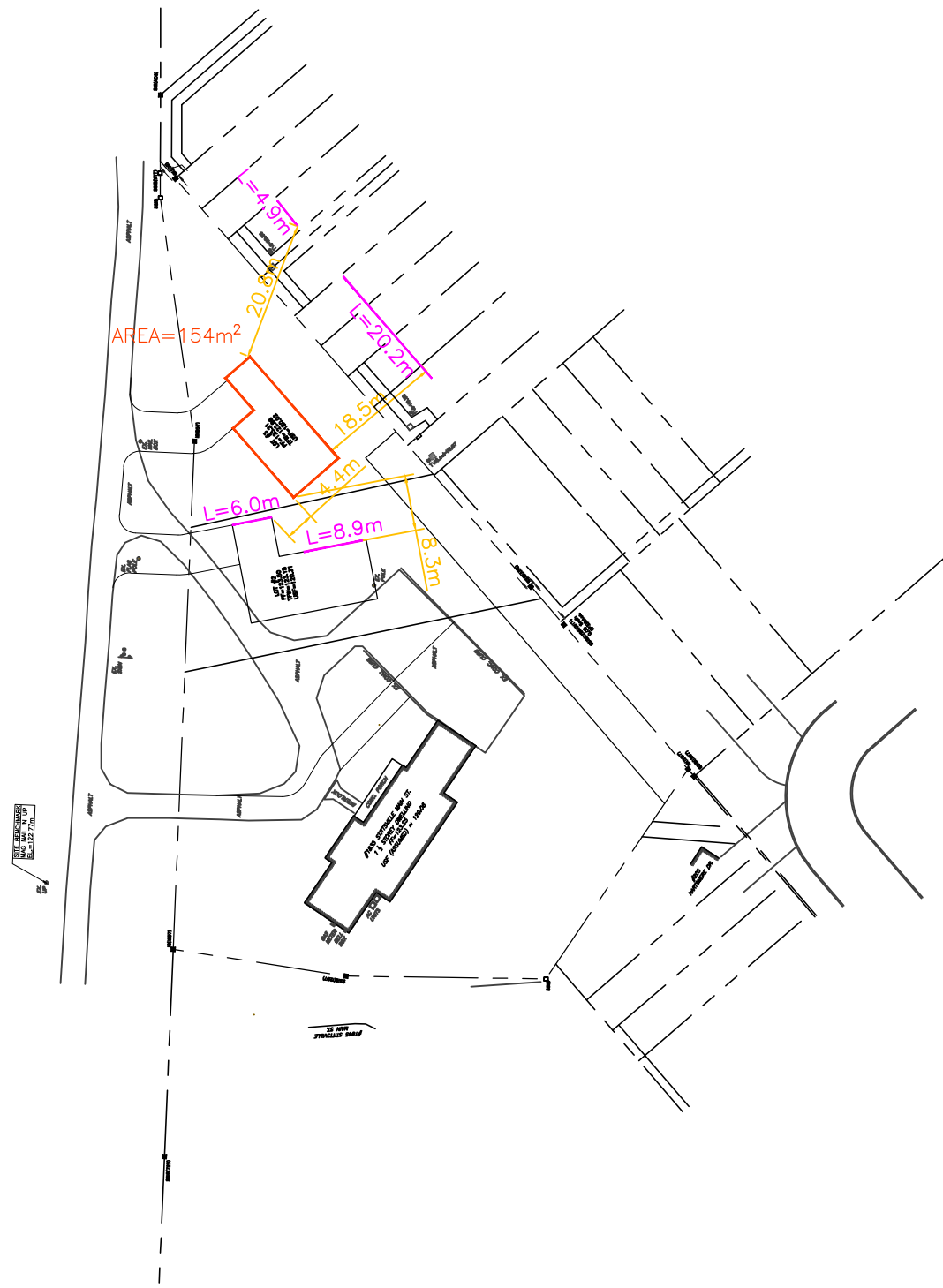
Building Type: Single-Family
Building Location: Lot #3 (Proposed Dwelling)



Calculations for Total Required Fire Flow

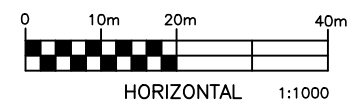
Step	Parameter			Value	
A	Type of Construction	Options	C	Wood Frame	1.5
		Wood Frame	1.5		
		Ordinary Construction	1.0		
		Non-combustible construction	0.8		
		Fire resistive construction (< 2 hrs)	0.7		
		Fire resistive construction (> 2 hrs)	0.6		
B	Ground Floor Area			154	m ²
C	No. of Storeys			2	
	Total Floor Area			308	m ²
D	Fire Flow			6,000	L/min
E	Occupancy Class	Options	Charge	Limited Combustible	-0.15
		Non-combustible	-0.25		
		Limited Combustible	-0.15		
		Combustible	0.00		
		Free burning	0.15		
		Rapid Burning	0.25		
Occupancy Adjustment				-900	L/min
Fire Flow				5,100	L/min
F	Sprinkler Protection	Options	Charge	None	0
		Complete Automatic Sprinkler Protection	-0.30		
		None	0.00		
	Sprinkler Reduction				0
Exposures					
West Side					
Exposed Wall Length				6.0	m
Exposed Wall No. of Storeys				2	
Length-Height Factor of Exposed Wall				12	m.storeys
Construction Type of Exposed Wall	Options	Wood Frame or Non-Combustible		Wood Frame or Non-Combustible	
	Wood Frame or Non-Combustible				
	Ordinary with Unprotected Openings				
	Ordinary with Semi-protected Openings				
	Ordinary with Blank Wall				
Separation Distance				4.4	m
West Side Exposure Charge				0.17	
North Side					
Exposed Wall Length				4.9	m
Exposed Wall No. of Storeys				2	
Length-Height Factor of Exposed Wall				9.8	m.storeys
Construction Type of Exposed Wall	Options	Wood Frame or Non-Combustible		Wood Frame or Non-Combustible	
	Wood Frame or Non-Combustible				
	Ordinary with Unprotected Openings				
	Ordinary with Semi-protected Openings				
	Ordinary with Blank Wall				
Separation Distance				20.8	m
North Side Exposure Charge				0.08	

G	East Side			
	Exposed Wall Length		20.2	m
	Exposed Wall No. of Storeys		2	
	Length-Height Factor of Exposed Wall		40.4	m.storeys
	Construction Type of Exposed Wall	Options		Wood Frame or Non-Combustible
		Wood Frame or Non-Combustible		
		Ordinary with Unprotected Openings		
		Ordinary with Semi-protected Openings		
	Ordinary with Blank Wall			
	Separation Distance		18.5	m
	East Side Exposure Charge		0.13	
	South Side			
	Exposed Wall Length		8.9	m
	Exposed Wall No. of Storeys		2	
	Length-Height Factor of Exposed Wall		17.8	m.storeys
Construction Type of Exposed Wall	Options		Wood Frame or Non-Combustible	
	Wood Frame or Non-Combustible			
	Ordinary with Unprotected Openings			
	Ordinary with Semi-protected Openings			
Ordinary with Blank Wall				
Separation Distance		8.3	m	
South Side Exposure Charge		0.17		
Total Exposure Charge		0.55	< 0.75	
Increase for Exposures		2805	L/min	
H	Fire Flow		8,000	L/min
I	City Cap	For Single Detached Dwellings:		Condition Satisfied
		Minimum separation of 10 m between backs of adjacent units		N/A
		For Side-by-Side Town and Row Houses:		Condition Satisfied
		Minimum separation of 10 m between backs of adjacent units		N/A
		Firewalls to separate block into fire area no more than 600 m ²		N/A
Total Required Fire Flow		8,000	L/min	
Notes:				
1. Fire flow calculations have been prepared in accordance with City of Ottawa Technical Bulletin ISDTB-2014-02 and ISTB-2018-02.				
2. Step E, exposure charges interpolated from Table G5.				
3. Step I, cap is not applicable to back-to-back townhouses or multi-unit residential buildings.				
4. Step I, if conditions are satisfied, a total required fire flow cap of 10,000 L/min can be applied.				
Comments:				



LEGEND

- PROPERTY BOUNDARY
- AREA BOUNDARY USED IN STEP B
- EXPOSURE LENGTH USED IN STEP G



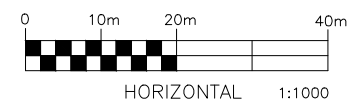
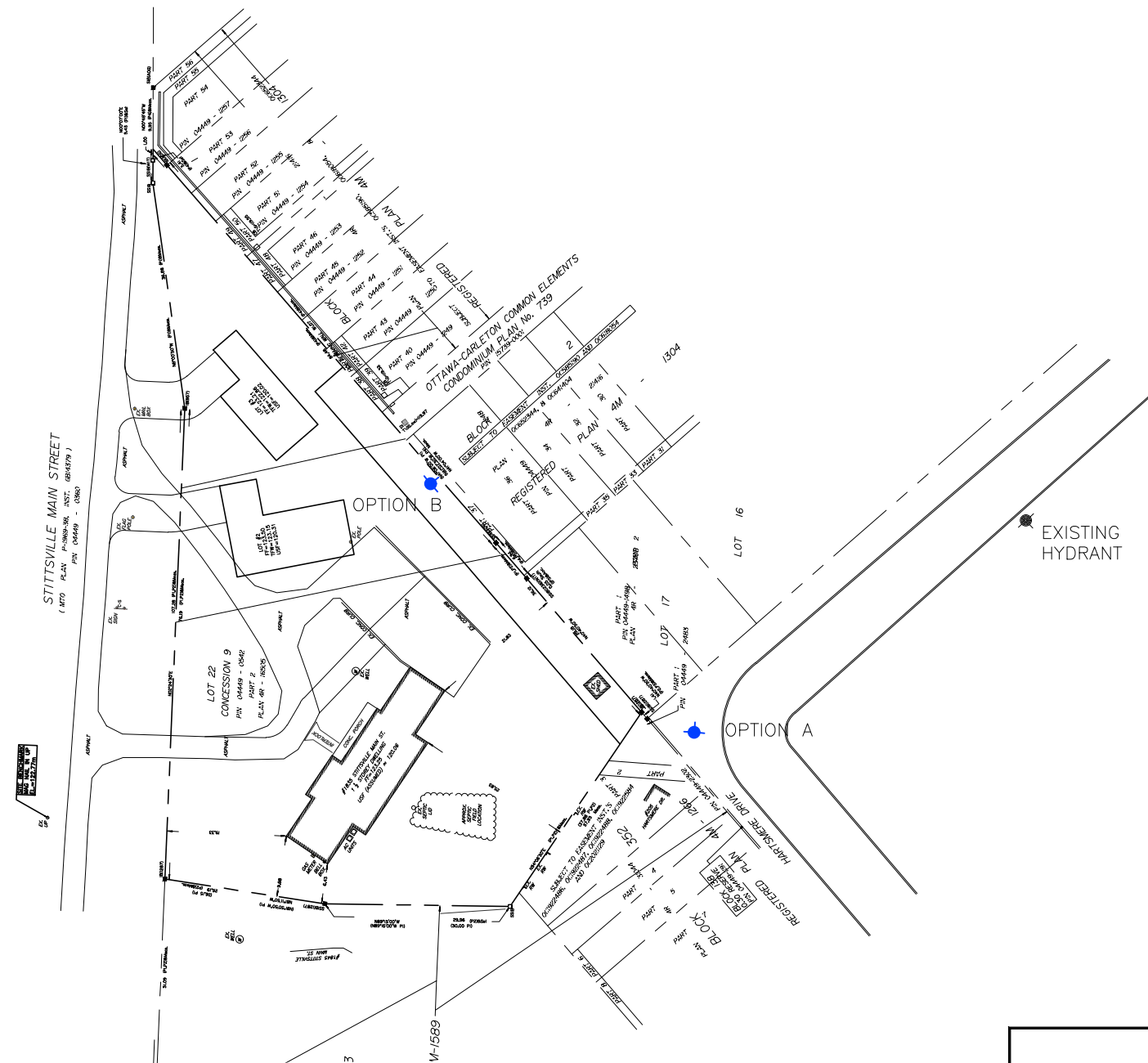
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scale	1:1000	project no.
date	01/05/22	22008
drawn by	BLM	FUS3
TITLE:		1835 STITTSVILLE MAIN STREET
		FUS SKETCH – LOT 3

EXISTING
HYDRANT



LEGEND

- PROPERTY BOUNDARY
- EASEMENT
- ⊙ EXISTING HYDRANT
- ⊙ PROPOSED HYDRANT



Robinson
Land Development

scale	1:1000	1835 STITTSVILLE MAIN STREET	project no.	22008
date	11/02/22		TITLE:	HYDRANT LOCATION PLAN
drawn by	BLM			





1835 Stittsville Main Street - Max Day + Fireflow Report

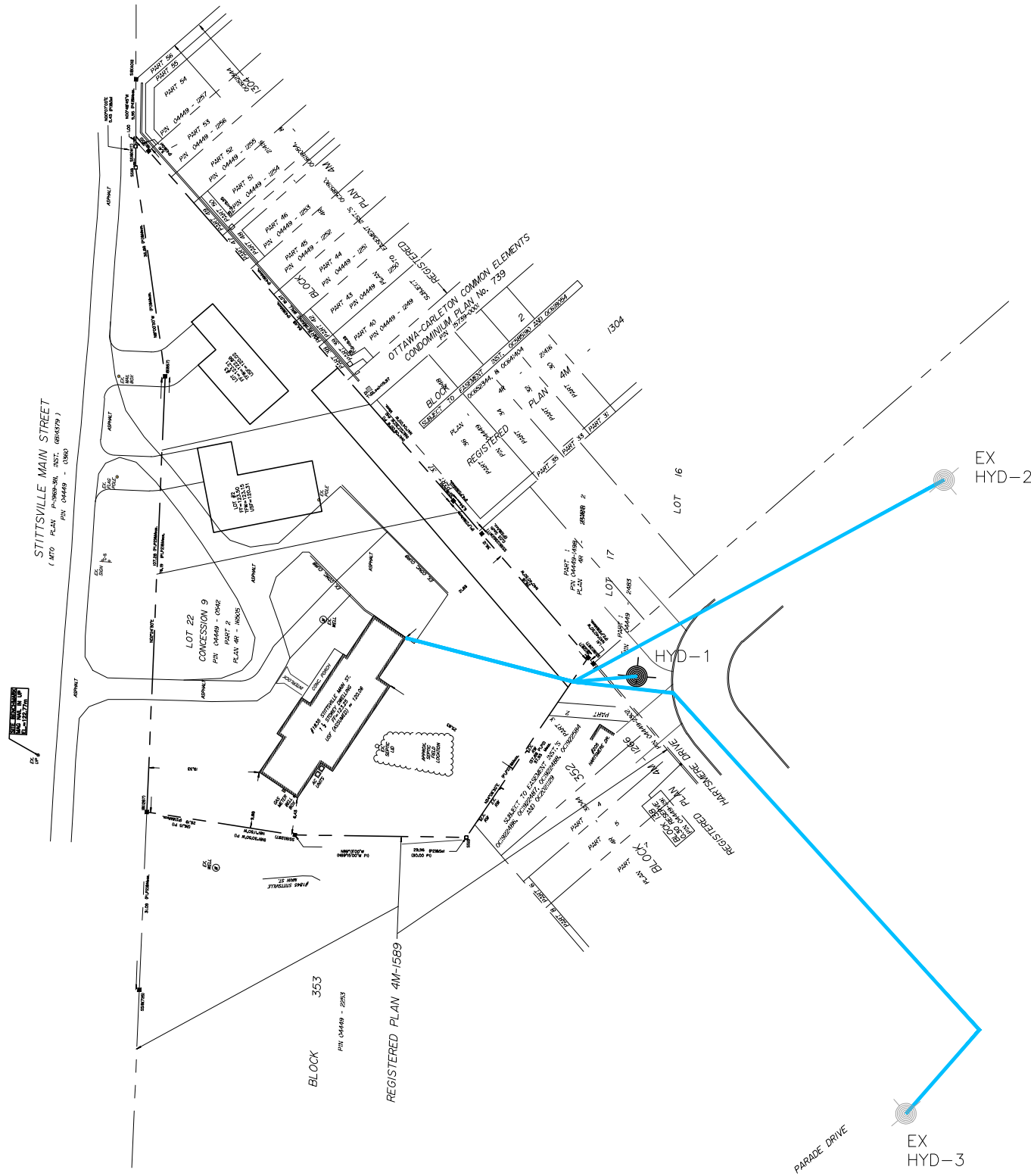
	ID	Total Demand (Lpm)	Critical Node ID	Critical Node Pressure (psi)	Critical Node Head (m)	Available Flow at Hydrant (Lpm)	Available Flow Pressure (psi)
1	<input type="checkbox"/> HYD1	8,999.94	HYD2	21.34	138.51	11,529.05	20.00
2	<input type="checkbox"/> HYD2	8,999.94	HYD2	-31.61	101.27	3,947.30	20.00

EX
HYD-4



LEGEND

-  PROPERTY BOUNDARY
-  HYDRANT COVERAGE LENGTH
-  EXISTING HYDRANT
-  PROPOSED HYDRANT



LOT 1 HYDRANT COVERAGE TABLE		
HYDRANT ID	DISTANCE TO BUILDING (m)	CONTRIBUTION TO REQUIRED FIRE FLOW (L/min)
HYD-1	41.4	5,700
EX HYD-2	104.0	3,800
EX HYD-3	146.8	3,800
REQUIRED		9,000
TOTAL		13,300

- NOTES:
- CONTRIBUTION TO REQUIRED FIRE FLOW DETERMINED USING TABLE 1 FROM CITY OF OTTAWA TECHNICAL BULLETIN ISTB-2018-02 APPENDIX I.
 - ASSUMED HYDRANT CLASS: AA.

Robinson
Land Development

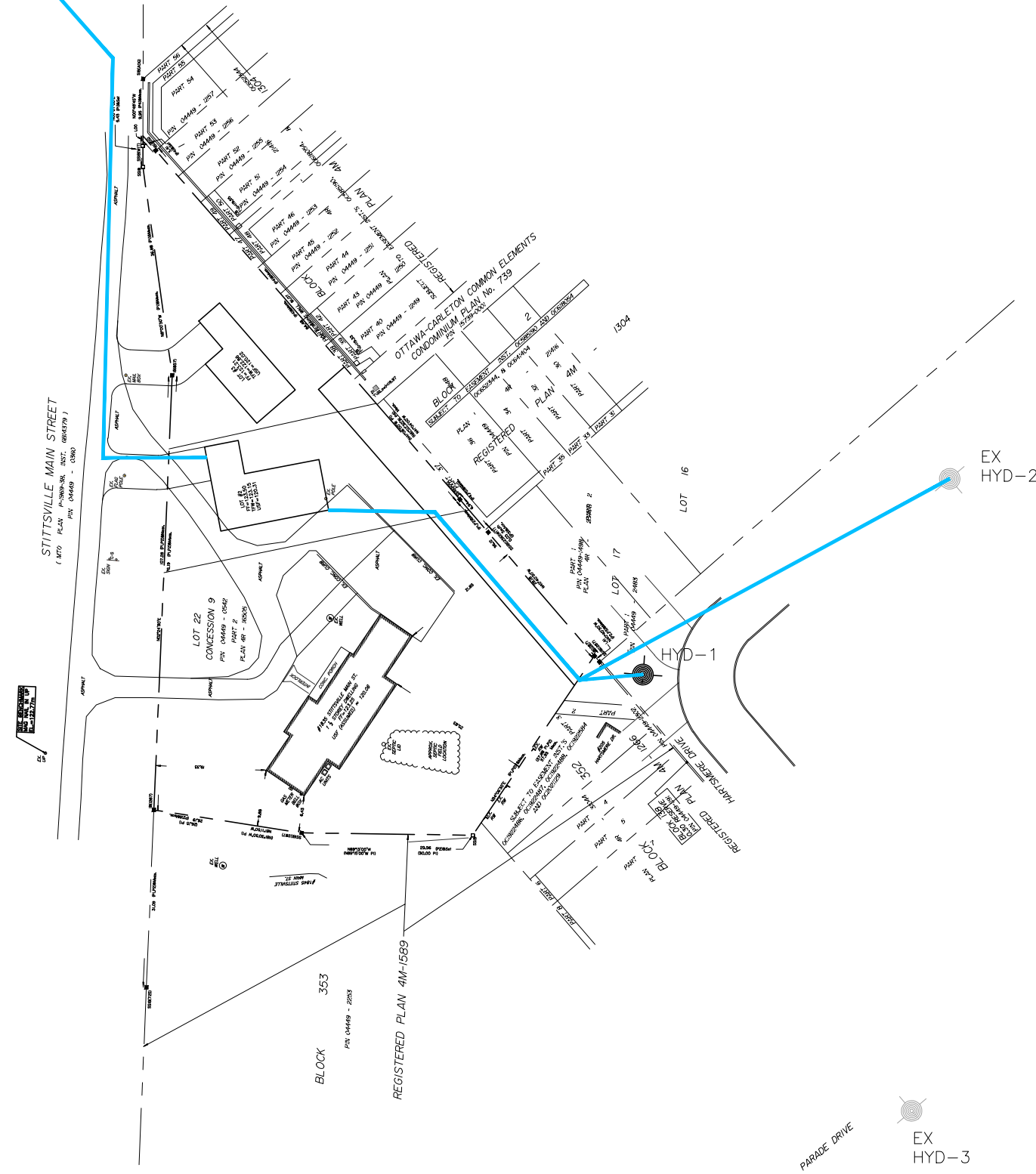
scale 1:1000	1835 STITTSVILLE MAIN STREET	project no. 22008
date 01/06/22		TITLE: LOT 1 - HYDRANT COVERAGE PLAN
drawn by BLM		HYD-1

EX
HYD-4



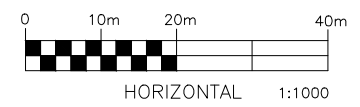
LEGEND

- PROPERTY BOUNDARY
- HYDRANT COVERAGE LENGTH
- EXISTING HYDRANT
- PROPOSED HYDRANT



LOT 2 HYDRANT COVERAGE TABLE		
HYDRANT ID	DISTANCE TO BUILDING (m)	CONTRIBUTION TO REQUIRED FIRE FLOW (L/min)
HYD-1	68.6	5,700
EX HYD-2	131.2	3,800
EX HYD-4	138.5	3,800
REQUIRED		9,000
TOTAL		13,300

- NOTES:
- CONTRIBUTION TO REQUIRED FIRE FLOW DETERMINED USING TABLE 1 FROM CITY OF OTTAWA TECHNICAL BULLETIN ISTB-2018-02 APPENDIX I.
 - ASSUMED HYDRANT CLASS: AA.



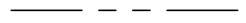



Robinson
Land Development

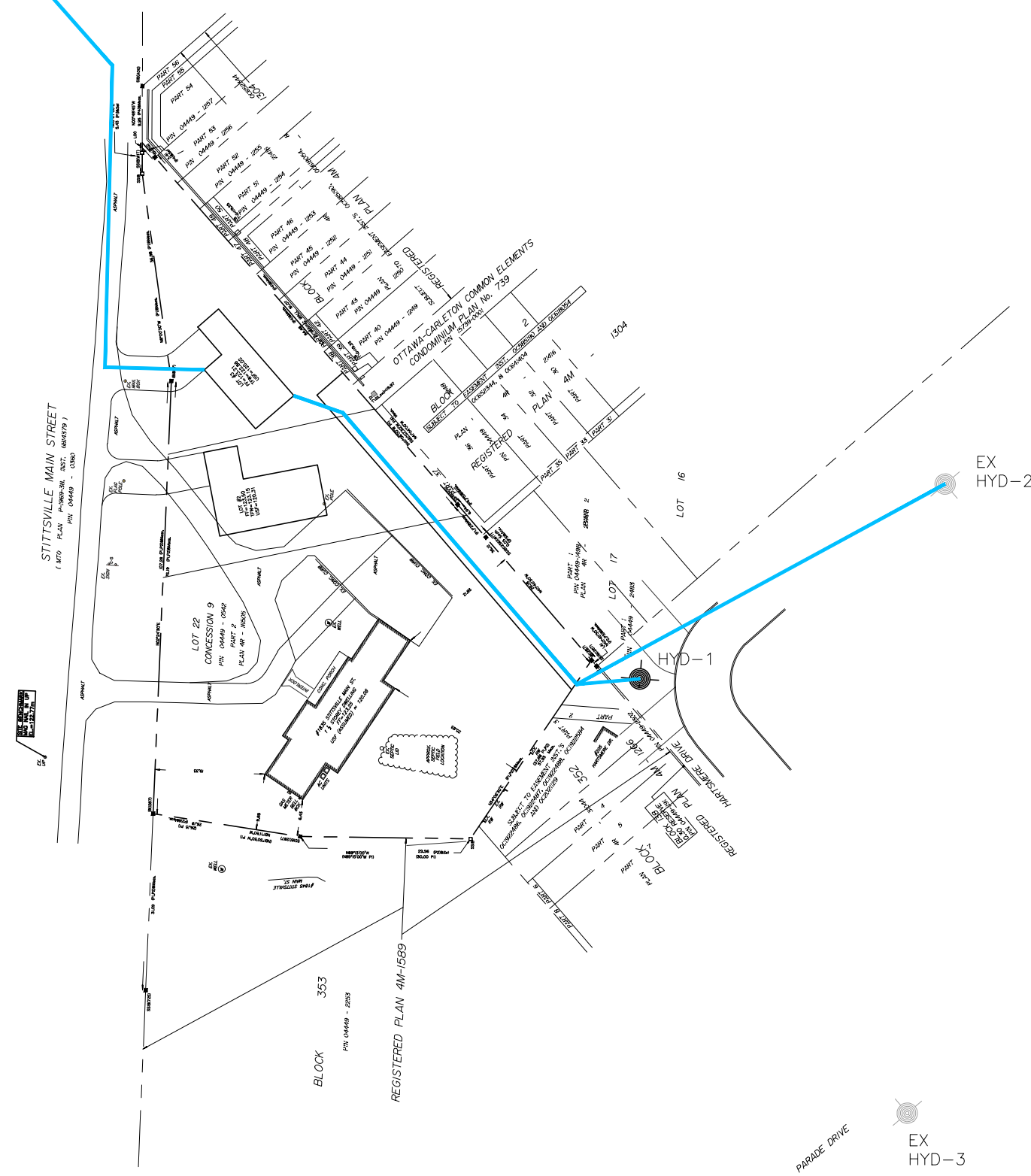
scale 1:1000	1835 STITTSVILLE MAIN STREET	project no. 22008
date 01/06/22		TITLE: LOT 2 – HYDRANT COVERAGE PLAN
drawn by BLM		HYD-2

EX
HYD-4



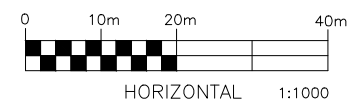
LEGEND

-  PROPERTY BOUNDARY
-  HYDRANT COVERAGE LENGTH
-  EXISTING HYDRANT
-  PROPOSED HYDRANT



LOT 3 HYDRANT COVERAGE TABLE		
HYDRANT ID	DISTANCE TO BUILDING (m)	CONTRIBUTION TO REQUIRED FIRE FLOW (L/min)
HYD-1	83.4	3,800
EX HYD-2	146.0	3,800
EX HYD-4	120.9	3,800
REQUIRED		8,000
TOTAL		11,400

- NOTES:
- CONTRIBUTION TO REQUIRED FIRE FLOW DETERMINED USING TABLE 1 FROM CITY OF OTTAWA TECHNICAL BULLETIN ISTB-2018-02 APPENDIX I.
 - ASSUMED HYDRANT CLASS: AA.



Robinson
Land Development

scale 1:1000	1835 STITTSVILLE MAIN STREET	project no. 22008
date 01/06/22		TITLE: LOT 3 – HYDRANT COVERAGE PLAN
drawn by BLM		HYD-3

Attachment C

*Novatech Sanitary Sewer Design
Sheet*

*Novatech Sanitary Drainage Area
Plan*

Sanitary Sewer Design Sheet

STITTSVILLE SOUTH - AREA 6
SANITARY SEWER DESIGN SHEET



JOB# 113004

123	121	HICKSTEAD	3					0.010	0.262	0.010	0.00	0.00	0.262	4.000	0.165	0.00	0.00	0.073	0.239	12.9	200	PVC	0.50	24.195	0.75	1%
121	119	HICKSTEAD	10					0.034	0.512	0.044	0.00	0.00	0.775	4.000	0.716	0.00	0.00	0.217	0.933	60.7	200	PVC	0.60	26.504	0.82	4%
119	133	HICKSTEAD	10					0.034	0.502	0.078	0.00	0.00	1.277	4.000	1.267	0.00	0.00	0.358	1.625	71.4	200	PVC	0.80	30.604	0.94	5%
133	131	PARADE	5					0.017	0.403	1.910	1.33	0.00	27.955	3.601	27.859	0.06	0.00	7.827	35.741	82.0	375	PVC	0.30	100.184	0.88	36%
115	117	CAVALLO		16				0.043	0.496	0.043	0.00	0.00	0.496	4.000	0.700	0.00	0.00	0.139	0.839	70.9	200	PVC	1.90	47.164	1.45	2%
117	131	CAVALLO		18				0.049	0.541	0.092	0.00	0.00	1.038	4.000	1.488	0.00	0.00	0.291	1.778	71.0	200	PVC	1.90	47.164	1.45	4%
131	129	PARADE	6					0.020	0.402	2.022	1.33	0.00	29.395	3.582	29.338	0.06	0.00	8.231	37.624	74.3	375	PVC	0.30	100.184	0.88	38%
129	127	PARADE	1					0.003	0.083	2.025	1.33	0.00	29.478	3.582	29.383	0.06	0.00	8.254	37.692	12.4	375	PVC	0.30	100.184	0.88	38%
127	125	PARADE	6					0.020	0.374	2.046	1.33	0.00	29.852	3.578	29.651	0.06	0.00	8.359	38.064	69.0	375	PVC	0.30	100.184	0.88	38%
125	113	PARADE	4			0.85		0.014	1.126	2.059	2.18	0.00	30.979	3.576	29.829	0.09	0.00	8.674	38.593	63.9	375	PVC	0.15	70.841	0.62	54%
123	115	HICKSTEAD	6					0.020	0.401	0.020	0.00	0.00	0.401	4.000	0.331	0.00	0.00	0.112	0.443	73.4	200	PVC	1.35	39.756	1.23	1%
115	113	HICKSTEAD	6					0.020	0.686	0.041	0.00	0.00	1.088	4.000	0.661	0.00	0.00	0.305	0.966	83.0	200	PVC	1.35	39.756	1.23	2%
113	111	HICKSTEAD	7					0.024	0.532	2.124	2.18	0.00	32.599	3.565	30.674	0.09	0.00	9.128	39.892	111.0	375	PVC	0.15	70.841	0.62	56%
111	109	HICKSTEAD	5					0.017	0.401	2.141	2.18	0.00	33.000	3.563	30.896	0.09	0.00	9.240	40.226	115.7	375	PVC	0.60	141.682	1.24	28%
Friendly Cres.			70					0.238	4.860																	
Davidson			329	230	0	172	2.14	2.93	2.101	32.710																
109	107									4.480	4.32	2.93	70.571	3.289	59.682	0.16	2.54	20.580	82.970	71.7	375	PVC	0.25	91.455	0.80	91%
107	105									4.480	4.32	2.93	70.571	3.289	59.682	0.16	2.54	20.580	82.970	62.1	375	PVC	0.25	91.455	0.80	91%
105	101									4.480	4.32	2.93	70.571	3.289	59.682	0.16	2.54	20.580	82.970	11.0	375	PVC	2.00	258.675	2.27	32%
101	99									4.480	4.32	2.93	70.571	3.289	59.682	0.16	2.54	20.580	82.970	73.3	450	CONC	2.00	420.634	2.56	20%
99	PS									4.480	4.32	2.93	70.571	3.289	59.682	0.16	2.54	20.580	82.970	6.1	450	CONC	2.00	420.634	2.56	20%

Design Parameters:

- 1) Q(e) = 0.28 L/sec/ha Singles 3.4 persons/unit
- 2) Q(p) = (PqxM/86,400) Semis/Towns 2.7 persons/unit
- 3) Q(pk) = 1000 L/d/ha x M Stacked 2.3 persons/unit
- 4) Q(c) = 50000 L/d/ha x N Apartements 2.1 persons/unit

5) Q(d) = Q(p) + Q(pk) + Q(c) + Q(e)

Definitions:

- P = Population
- q = Average per capita flow = 350 L/person/day
- M = Residential Peaking Factor (Harmon Formula from section 4.4.1 of the City Sewer Design Guidelines):

N = Commercial / Park Peaking Factor (1.5) from City Design Guidelines

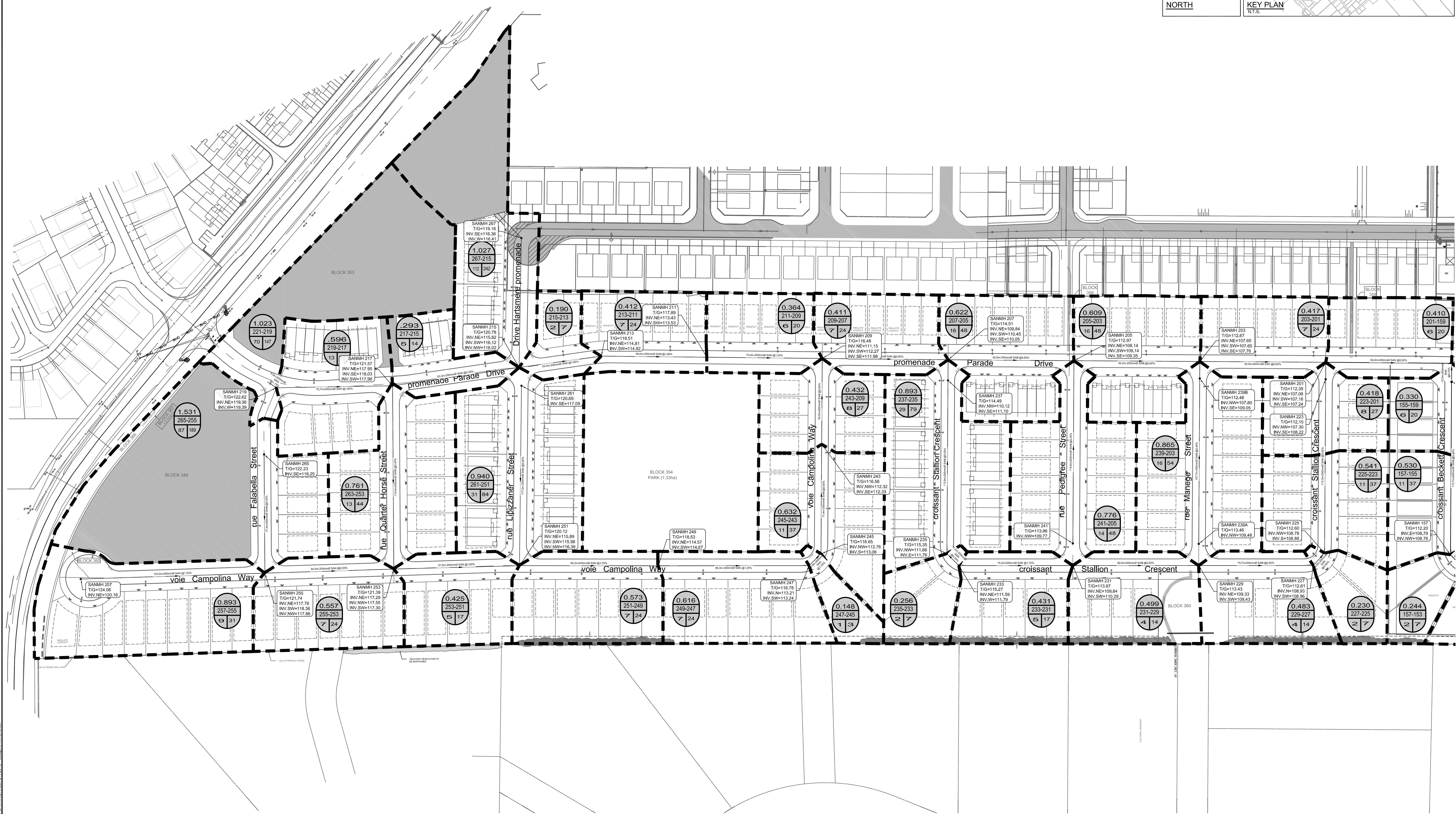
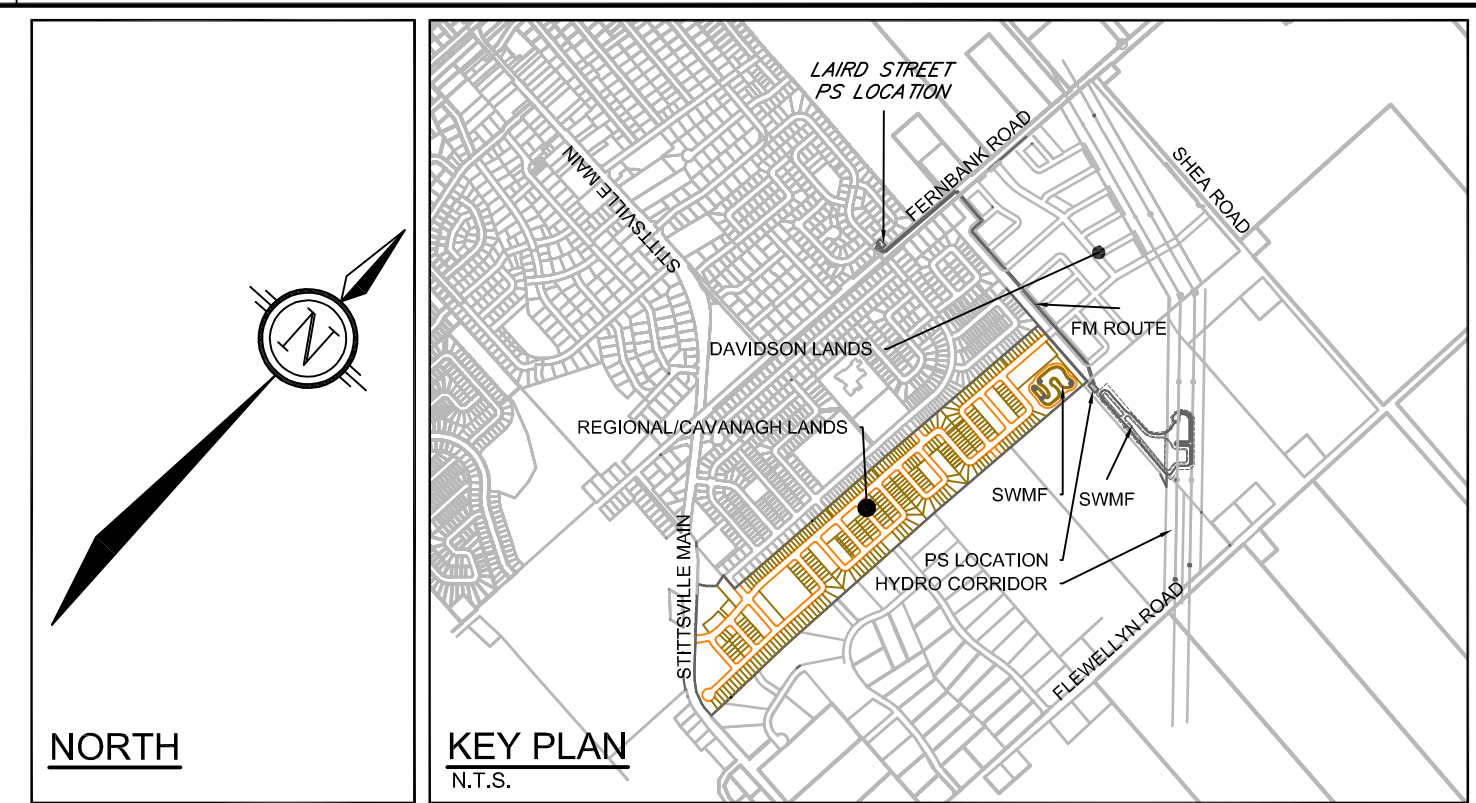
- Q(d) = Design Flow (L/sec)
- Q(p) = Population Flow (L/sec)
- Q(pk) = Park Flow (L/sec)
- Q(c) = Commercial Flow (L/sec)
- Q(e) = Extraneous Flow (L/sec)

STITTSVILLE SOUTH - AREA 6
SANITARY SEWER DESIGN SHEET

Date	April 5, 2016		
Design	BHB		
Job No.	Dwg. Reference:	Checked and Stamped:	
113004	113004-SAN	--	

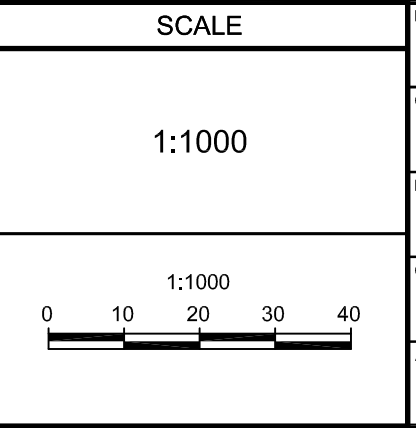


- LEGEND**
- SANITARY DRAINAGE AREA
 - 4.68 DRAINAGE AREA (hectares)
 - 1 MAHOLE TO MANHOLE
 - POULATION
 - NUMBER OF UNITS



NOTE:
 THE POSITION OF ALL POLE LINES, CONDUITS,
 WATERMANS, 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
3.	ISSUED FOR TENDER	JAN 2016	BHB
2.	REVISED AS PER CITY COMMENTS	DEC 16/15	BHB
1.	ISSUED FOR CITY REVIEW	SEPT 14/15	BHB



DESIGN	FOR REVIEW ONLY
BCS/TGP	
CHECKED	
DRAWN	
BCS/TGP	
CHECKED	
DRAWN	
APPROVED	

NOVATECH
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 Suite 200, 240 Michael Cowland Drive
 Ottawa, Ontario, Canada K2M 3P6
 Telephone: (613) 254-9643
 Facsimile: (613) 254-5867
 Website: www.novatech-eng.com

CITY OF OTTAWA
STITTSVILLE SOUTH - AREA 6

SANITARY DRAINAGE AREA PLAN

PROJECT NO.: 113004-00
 REV: REV # 3
 DRAWING NO.: 113004-SAN1

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SANITARY SEWER DESIGN SHEET
1835 STITTSVILLE MAIN STREET, STITTSVILLE

LOCATION			RESIDENTIAL AREA AND POPULATION				RESIDENTIAL FLOW				PIPE						
			INDIVIDUAL		CUMULATIVE		PEAK FACTOR	PEAK POP. FLOW (L/s)	EXTRAN. FLOW (L/s)	PEAK DESIGN FLOW (L/s)	LENGTH (m)	DIAMETER (mm)	SLOPE (%)	CAPACITY (L/s)	VELOCITY (m/s)	EXCESS CAPACITY (L/s)	PERCENT FULL
STREET	FROM MH	TO MH	POP.	AREA (ha)	POP.	AREA (ha)											
TO HARTSMERE DRIVE SANITARY SEWER																	
EASEMENT	102	103	10.2	0.53	10.2	0.53	3.73	0.12	0.17	0.30	68.4	201.16	2.62	53.97	1.70	53.67	0.55
<i>EX EASEMENT</i>	<i>103</i>	<i>EX 267</i>	<i>0.0</i>	<i>0.00</i>	<i>10.2</i>	<i>0.53</i>	<i>3.73</i>	<i>0.12</i>	<i>0.17</i>	<i>0.30</i>	<i>17.1</i>	<i>201.16</i>	<i>0.76</i>	<i>29.07</i>	<i>0.91</i>	<i>28.77</i>	<i>1.03</i>

DESIGN PARAMETERS																
Average Daily Flow =			280	L/person/day	Per Unit Populations:											
Comm./Inst. Flow =			28000	L/ha/day	Single Family	3.4 persons/unit										
Industrial Flow =					Semi-detached	2.7 persons/unit										
Maximum Residential Peak Factor =			4.0		Duplex	2.3 persons/unit										
Harmon - Correction Factor (K) =			0.8		Townhouse	2.7 persons/unit										
Comm./Inst. Peak Factor =			1.5		Apartments:											
Extraneous Flow =			0.33	L/s/ha	Bachelor	1.4 persons/unit										
Minimum Velocity =			0.6	m/s	1 Bedroom	1.4 persons/unit										
Maximum Velocity =			3.0	m/s	2 Bedroom	2.1 persons/unit										
					3 Bedroom	3.1 persons/unit										
					Average Apt.	1.8 persons/unit										



Attachment D

*Novatech Storm Sewer Design
Sheet*

Novatech Storm Drainage Area Plan

Storm Sewer Design Sheet

LOCATION				AREA (ha)									FLOW						PROPOSED SEWER									
Area	Street	FROM MH	TO MH	R=	R=	R=	R=	R=	R=	R=	R=	R=	INDIV. 2.78 AC	ACCUML. 2.78 AC	TIME OF CONC.	DESIGN STORM	RAINFALL INTENSITY	Peak Flow (L/sec)		DIA. ACTUAL (mm)	DIA. (mm)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	FLOW TIME (min)	Ratio (Q/Qfull)
				0.20	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75						Q 5YR	Q total									
A-01	PARADE	220	218										0.14	0.14	10.00	5	104.19	15.0	15.0	0.457	450	CONC	1.15	21.1	318.7	1.94	0.18	5%
A-03	PARADE	218	216									0.17	0.17	10.18	5	103.25	74.7	74.7	0.457	450	CONC	1.85	73.5	404.3	2.46	0.50	18%	
A-02	PARADE	218	216									0.41	0.72	10.68														
A-04	PARADE	216	214									0.87	1.82	15.00	5	83.56	151.7	151.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A-06	PARADE	216	214				0.34					0.47	0.47	15.00	5	83.56	334.0	334.0	0.457	450	CONC	2.20	83.2	440.8	2.69	0.52	76%	
A-05, A07	PARADE	216	214									0.99	4.00	15.52														
A-10	HEARTSMERE	266	214									0.37	0.37	10.00	5	104.19	96.7	96.7	0.533	525	CONC	0.40	85.6	283.6	1.27	1.12	34%	
A-09	HEARTSMERE	266	214									0.55	0.93	11.12														
A-12	PARADE	214	212									0.27	0.27	15.52	5	81.93	450.7	450.7	0.610	600	CONC	1.85	54.2	870.7	2.98	0.30	52%	
A-11, A-13	PARADE	214	212									0.30	5.50	15.82	5	81.00	471.4	471.4	0.610	600	CONC	1.85	71.7	870.7	2.98	0.40	54%	
A-14	PARADE	212	210									0.32	5.82	16.22	5	79.81	575.6	575.6	0.686	675	CONC	1.55	75.0	1,091.1	2.95	0.42	53%	
A15	PARADE	210	208	1.01								0.56	0.56	16.64														
A-16	PARADE	210	208				0.21					0.26	0.26	10.00	5	104.19	98.5	98.5	0.381	375	PVC	1.6	120.0	231.2	2.03	0.99	43%	
A-17	PARADE	210	208									0.57	7.21	10.99														
A-18, A-19	CAMPOLINA	256	254									0.95	0.95	15.00	5	83.56	197.0	197.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A-20	FALABELLA	264	254									2.36	2.36	15.00	5	83.56	246.1	246.1	0.610	600	CONC	0.50	77.3	452.7	1.55	0.83	54%	
A-21	FALABELLA	264	254									0.59	2.95	15.83														
A-22	CAMPOLINA	254	252				0.46					0.51	0.51	15.83	5	80.97	443.3	443.3	0.686	675	CONC	0.55	81.0	650.0	2.75	0.49	68%	
A-23	CAMPOLINA	254	252				0.33					0.36	0.36	16.32														
A-24	CAMPOLINA	254	252									0.71	5.47	10.00	5	104.19	91.2	91.2	0.457	450	CONC	0.40	119.4	188.0	2.75	0.72	49%	
A-25, A-26, A-27	QUARTER HORSE	216	252									0.88	0.88	10.72														
A-28	CAMPOLINA	252	250				0.34					0.38	0.38	16.32	5	79.52	541.2	541.2	0.686	675	CONC	1.60	81.9	1,108.6	3.00	0.45	49%	
A-29	CAMPOLINA	252	250									0.46	6.81	16.78														
A-30,31	LIPIZZANER	260	250									1.02	1.02	10.00	5	104.19	105.8	105.8	0.457	450	CONC	0.60	119.7	230.2	2.75	0.73	46%	
A-32	CAMPOLINA	250	248									0.47	8.29	16.78	5	78.23	648.2	648.2	0.762	750	CONC	1.35	93.3	1,348.7	2.75	0.57	48%	
A-34	CAMPOLINA	248	246				0.30					0.33	0.33	17.34	5	76.68	758.6	758.6	0.762	750	CONC	1.35	97.4	1,348.7	2.96	0.55	56%	
A-35	CAMPOLINA	248	246				0.38					0.42	0.75	17.34	5	76.68	758.6	758.6	0.762	750	CONC	1.35	97.4	1,348.7	2.96	0.55	56%	
A-33, A-36	CAMPOLINA	248	246									0.52	9.89	17.89	5	75.25	744.5	744.5	0.762	750	CONC	1.35	12.1	1,348.7	2.75	0.07	55%	
A-37	CAMPOLINA	246	244									0.00	9.89	17.96	5	75.06	804.5	804.5	0.991	975	CONC	0.60	70.5	1,810.1	2.75	0.43	44%	
A-37	CAMPOLINA	244	242									0.83	10.72	18.39	5	73.99	824.0	824.0	0.991	975	CONC	0.60	55.9	1,810.1	2.75	0.34	46%	
A-38	CAMPOLINA	242	208									0.42	11.14	18.73														
A-39	PARADE	208	206				0.37					0.52	0.52	18.73	5	73.17	1,458.2	1,458.2	1.067	1050	CONC	0.85	79.0	2,625.3	2.94	0.45	56%	
A-40	PARADE	208	206									1.06	19.93	19.18														

LOCATION				AREA (ha)										FLOW						PROPOSED SEWER								
Area	Street	FROM MH	TO MH	R=	R=	R=	R=	R=	R=	R=	R=	R=	INDIV. 2.78 AC	ACCUMUL. 2.78 AC	TIME OF CONC.	DESIGN STORM	RAINFALL INTENSITY	Peak Flow (L/sec)		DIA. ACTUAL (mm)	DIA. (mm)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	FLOW TIME (min)	Ratio (Q/Qfull)
				0.20	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75						Q 5YR	Q total									
A-56	STALLION	232	234		0.38								0.42	0.42	10.00	5	104.19	43.7	43.7	0.381	375	PVC	0.30	12.3	100.1	0.88	0.23	44%
A-41	STALLION	234	236										0.48	0.90	10.23	5	102.98	92.5	92.5	0.533	525	CONC	0.50	111.9	317.0	1.42	1.31	29%
A-42	STALLION	236	206										0.57	1.47	11.55	5	96.67	141.9	141.9	0.533	525	CONC	0.50	13.5	317.0	1.42	0.16	45%
															11.71													
A-44	PARADE	206	204			0.58							0.72	0.72	19.18	5	72.11	1,646.3	1,646.3	1.067	1050	CONC	0.85	84.9	2,625.3	2.94	0.48	63%
A-43	PARADE	206	204										0.71	22.83	19.66													
A-46	PEDIGREE	240	204				0.36						0.50	0.50	10.00	5	104.19	148.5	148.5	0.533	525	CONC	0.35	118.4	265.3	1.19	1.66	56%
A-45, A-47, A-48	PEDIGREE	240	204										0.92	1.43	11.19													
A-49	PARADE	204	202										0.94	25.19	19.66	5	71.01	1,788.8	1,788.8	1.372	1350	CONC	0.60	79.0	4,311.6	2.75	0.48	41%
															20.14													
A-52	MANEGE	238	202			0.37							0.46	0.46	10.00	5	104.19	149.5	149.5	0.457	450	CONC	0.40	119.0	188.0	1.14	1.73	80%
A-50, A-51, A-53	MANEGE	238	202										0.98	1.43	11.73													
A-54	PARADE	202	200			0.36							0.45	0.45	20.14	5	69.95	1,936.2	1,936.2	1.372	1350	CONC	0.60	85.0	4,311.6	2.75	0.52	45%
A-55	PARADE	202	200										0.61	27.68	20.65													
															10.00	5	104.19	55.6	55.6	0.457	450	CONC	1.75	73.3	393.2	2.75	0.44	14%
A-57	STALLION	232	230										0.53	0.53	10.44	5	101.90	154.1	154.1	0.610	600	CONC	0.50	82.0	452.7	1.55	0.88	34%
A-58	STALLION	230	228		0.33								0.37	0.37	11.33	5	97.68	208.8	208.8	0.686	675	CONC	0.50	76.9	619.7	1.68	0.76	34%
A-59	STALLION	230	228										0.61	1.51	12.09	5	94.32	263.5	263.5	0.762	750	CONC	0.50	63.6	820.8	1.80	0.59	32%
A-60	STALLION	228	226		0.07								0.07	0.07	12.68	5	91.89	298.2	298.2	0.762	750	CONC	0.50	59.7	820.8	1.80	0.55	36%
A-61	STALLION	228	226										0.55	2.14	13.23													
A-62	STALLION	224	222										0.66	2.79	10.00	5	104.19	109.9	109.9	0.457	450	CONC	0.40	111.8	188.0	1.14	1.63	58%
A-63	STALLION	222	200										0.45	3.25	11.63	5	96.32	101.6	101.6	0.457	450	CONC	0.40	12.0	188.0	2.75	0.07	54%
															11.70													
A-64	PARADE	200	152			0.30							0.38	0.38	20.65	5	68.85	2,220.2	2,220.2	1.372	1350	CONC	0.50	79.0	3,935.9	2.66	0.49	56%
A-65	PARADE	200	152			0.28							0.34	0.34	21.15													
A-66	PARADE	200	152										0.60	32.25	21.66													
															10.00	5	104.19	0.0	0.0	0.381	375	PVC	0.30	12.1	100.1	0.88	0.23	0%
A-67, A-68	BECKETT	150	148										1.05	1.05	11.33	5	97.68	208.8	208.8	0.686	675	CONC	0.50	76.9	619.7	1.68	0.76	34%
A-67, A-68	BECKETT	148	152										0.00	1.05	10.79	5	100.22	203.8	203.8	0.610	600	CONC	0.50	111.4	452.7	2.75	0.68	45%
															11.46	5	97.06	197.4	197.4	0.610	600	CONC	0.50	11.9	452.7	1.55	0.13	44%
															11.59													

LOCATION				AREA (ha)										FLOW						PROPOSED SEWER									
Area	Street	FROM MH	TO MH	R=	R=	R=	R=	R=	R=	R=	R=	R=	INDIV.	ACCUML.	TIME OF	DESIGN	RAINFALL	Peak Flow (L/sec)		DIA.	DIA.	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	FLOW	Ratio	
				0.20	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	2.78 AC	2.78 AC	CONC.	STORM	INTENSITY	Q 5YR	Q total	ACTUAL (mm)	(mm)			(%)	(m)	(L/s)	(m/s)	(min)	(Q/Qfull)
A-74	PARADE	138	136			0.27							0.34	0.34															
A-76	PARADE	138	136			0.03							0.04	0.04	21.66	5	66.80	2,489.1	2,489.1	1.372	1350	CONC	0.50	72.2	3,935.9	2.66	0.45	63%	
A-75, A-77	PARADE	138	136										1.02	37.26															
A-75, A-77	PARADE	136	134										0.00	37.26	22.12	5	65.93	2,456.6	2,456.6	1.372	1350	CONC	0.50	12.6	3,935.9	2.75	0.08	62%	
A-78	PARADE	134	132			0.39							0.49	0.49	22.19	5	65.78	2,523.7	2,523.7	1.372	1350	CONC	0.50	59.2	3,935.9	2.66	0.37	64%	
A-79	PARADE	134	132										0.62	38.37															
A-80	PARADE	132	130										0.68	39.05	22.56	5	65.09	2,541.7	2,541.7	1.524	1500	CONC	0.50	62.7	5,212.9	2.75	0.38	49%	
A-81	PARADE	130	128		1.06								1.18	40.23	22.94	5	64.39	2,590.7	2,590.7	1.524	1500	CONC	0.50	13.6	5,212.9	2.75	0.08	50%	
A-82	PARADE	128	126			0.33							0.41	0.41															
A-83	PARADE	128	126			0.17							0.22	0.22	23.02	5	64.24	2,663.1	2,663.1	1.524	1500	CONC	0.50	72.2	5,212.9	2.86	0.42	51%	
A-84	PARADE	128	126										0.305	41.45															
A-85															23.45														
A-85	HICKSTEAD	116	114			0.16							0.20	0.20	10.00	5	104.19	82.4	82.4	0.381	375	PVC	0.60	61.7	141.6	1.24	0.83	58%	
A-86	HICKSTEAD	116	114										0.59	0.79															
A-87	HICKSTEAD	114	126										0.68	1.47	10.83	5	100.01	147.4	147.4	0.457	450	CONC	0.80	71.4	265.8	1.62	0.73	55%	
A-88	PARADE	126	124					0.40					0.55	0.55															
A-89	PARADE	126	124										0.36	43.84	23.45	5	63.50	2,783.8	2,783.8	1.524	1500	CONC	0.30	82.0	4,037.9	2.21	0.62	69%	
A-90	CAVALLO	110	112										0.48	0.48	10.00	5	104.19	50.1	50.1	0.381	375	PVC	1.90	70.9	251.9	2.21	0.53	20%	
A-91	CAVALLO	112	124										0.65	1.13	10.53	5	101.45	114.7	114.7	0.533	525	CONC	0.45	71.0	300.8	2.75	0.43	38%	
A-92	PARADE	124	122					0.40					0.55	0.55															
A-93	PARADE	124	122										0.82	46.35	24.06	5	62.43	2,893.8	2,893.8	1.524	1500	CONC	0.30	73.4	4,037.9	2.21	0.55	72%	
A-94	HICKSTEAD	118	110			0.27							0.33	0.33	10.00	5	104.19	80.4	80.4	0.381	375	PVC	1.35	74.2	212.4	1.86	0.66	38%	
A-95	HICKSTEAD	118	110										0.44	0.77															
A-96	HICKSTEAD	110	104										0.55	1.32	10.66	5	100.81	132.9	132.9	0.381	375	PVC	1.35	83.0	212.4	1.86	0.74	63%	
A-97	HICKSTEAD	108	106			0.09							0.11	0.11															
A-98	HICKSTEAD	108	106										0.50	0.61	10.00	5	104.19	63.2	63.2	0.457	450	PVC	0.25	78.2	148.6	0.91	1.44	43%	
A-99	HICKSTEAD	106	104			0.16							0.20	0.20															
A-100	HICKSTEAD	106	104			0.32							0.40	0.40	11.44	5	97.16	202.0	202.0	0.762	750	CONC	0.20	90.2	519.1	1.14	1.32	39%	
A-101, A-102	HICKSTEAD	106	104										0.87	2.08															
A-103	PARADE	104	102										0.90	4.30	12.76	5	91.57	393.5	393.5	0.762	750	CONC	0.35	120.0	686.7	1.51	1.33	57%	
A-103	PARADE	102	100										0.00	4.30	14.09	5	86.62	372.3	372.3	0.762	750	CONC	0.35	14.9	686.7	1.51	0.16	54%	
A-103	PARADE	122	100										0.00	50.65	24.62	5	61.52	3,115.6	3,115.6	1.524	1500	CONC	0.30	23.1	4,037.9	2.21	0.17	77%	
															24.79														

DESIGN PARAMETERS
Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per Second (l/s)
A = Area in hectares (ha)
I = Rainfall Intensity (mm/lr)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min Pipe Velocity = 0.80 m/s
3) Tc = 10 min (subdivision)

Stittville Area 6 - Regional and Cavanagh Lands STORM SEWER DESIGN SHEET								
Date	April 5, 2016							
Design	T.P.	B.C.S						
Job No.	113004			Dwg. Reference:	113004-STM			Checked and Stamped:
								BHB

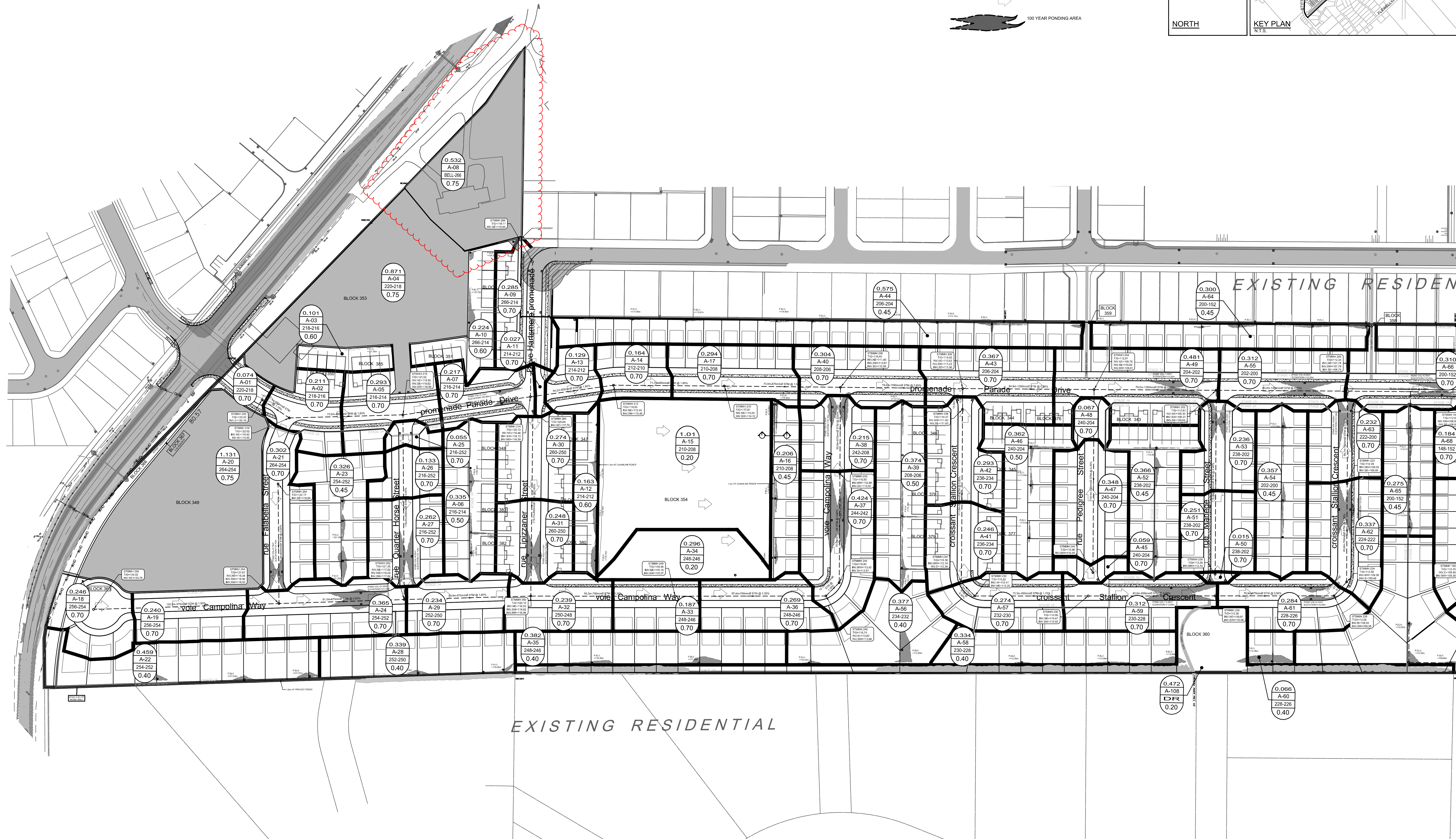
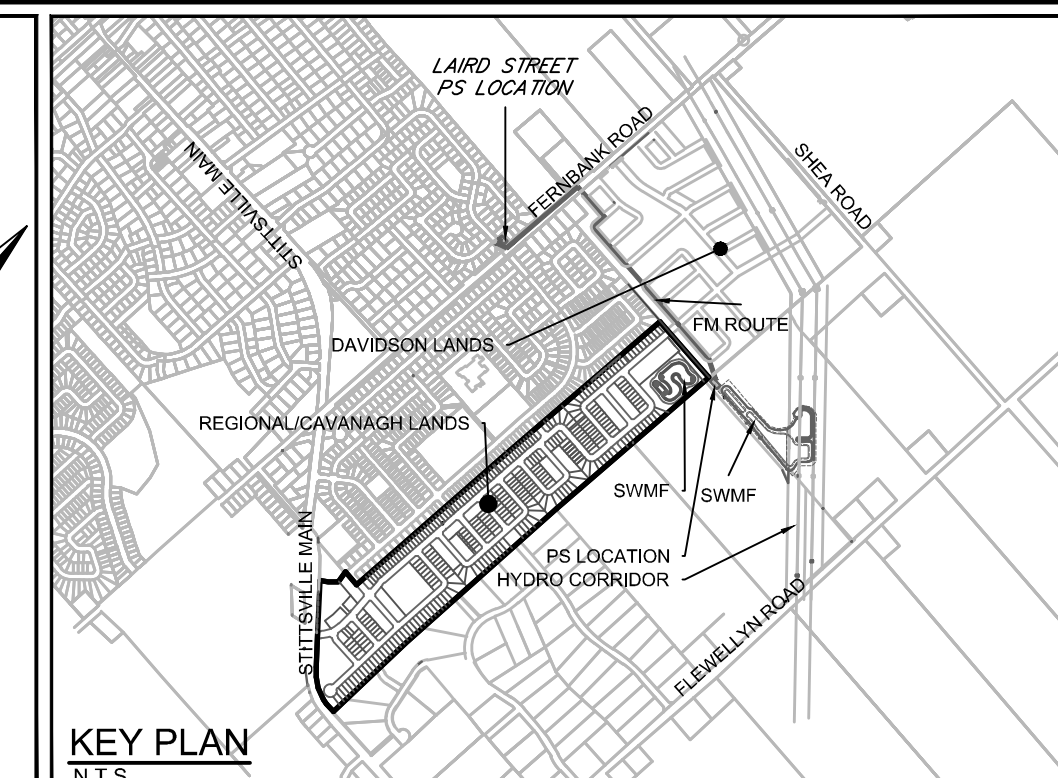


LEGEND

- 1.02 DRAINAGE AREA (hectares)
- A-35 DRAINAGE AREA NUMBER
- Creek MANHOLE TO MANHOLE
- 0.20 RUN-OFF COEFFICIENT
- STORM DRAINAGE AREA
- MAJOR OVERLAND FLOW
- WEST WIND SUBDIVISION OVERLAND FLOW
- 100 YEAR PONDING AREA

NORTH

KEY PLAN
N.T.S.



EXISTING RESIDENTIAL

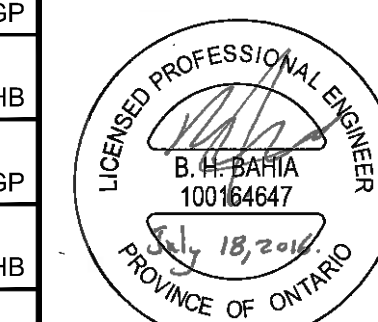
NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS,
WATERMANS, SEWERS AND OTHER
UNDERGROUND AND OVERGROUND UTILITIES AND
STRUCTURES IS NOT NECESSARILY SHOWN ON
THE CONTRACT DRAWINGS, AND WHERE SHOWN,
THE ACCURACY OF THE POSITION OF SUCH
UTILITIES AND STRUCTURES IS NOT GUARANTEED.
BEFORE STARTING WORK, DETERMINE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

REVIEWED BY DEVELOPMENT REVIEW BRANCH	
Signed _____	2016
Date _____	
Plan Number _____	D07-16-13-0033

No.	REVISION	DATE	BY
5.	REVISED AS PER CITY COMMENTS	JULY 18/16	BHB
4.	REVISED AS PER CITY COMMENTS	APR 05/16	BHB
3.	ISSUED FOR TENDER	JAN 20/16	BHB
2.	REVISED AS PER CITY COMMENTS	DEC 16/15	BHB
1.	ISSUED FOR CITY REVIEW	SEPT 14/15	BHB

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

PERSON		FOR REVIEW ONLY	
BCS/TGP	BHB	BCS/TGP	BHB
DRWN	BHB	APPROVED	GJM



CITY OF OTTAWA STITTSVILLE SOUTH - AREA 6	
STORM DRAINAGE AREA PLAN	
PROJECT No.	113004-00
REV	REV # 5
DRAWING No.	113004-STM1

D:\02\113004-00\Drawings\113004-STM1.dwg C:\Users\CAVANGH\JUL 19 2016 10:10am.tbl

**STORM SEWER DESIGN SHEET
1835 STITTSVILLE MAIN STREET, STITTSVILLE**

LOCATION				AREA (ha)		INDIV. 2.78AR	ACCUM. 2.78AR	TIME OF CONC. (min)	5 YR RAINFALL INTENSITY (mm/hr)	5 YR PEAK FLOW (L/s)	PROPOSED SEWER						
DRAINAGE AREA	STREET NAME	FROM MH	TO MH	TOTAL AREA	C						PIPE DIA. (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min)	5 YEAR PERCENT FULL
TO HARTSMERE DR. STORM SEWER																	
	EASEMENT	202	203	0.00	0.00	0.00	0.00	15.00	83.56	0.00	251.46	1.94	60.4	84.21	1.70	0.59	0%
POST	EASEMENT	203	204	0.53	0.35	0.52	0.52	15.59	81.69	42.28	251.46	1.07	5.6	62.54	1.26	0.07	68%
	EX. EASEMENT	204	EX 266	0.00	0.00	0.00	0.52	15.67	81.46	42.16	366.42	1.29	17.8	187.41	1.78	0.17	22%

Design Parameters

Notes:

- Rainfall intensity calculated using City of Ottawa IDF curve equatios.
- Peak flows calculated using the Rational Method.
 $Q = 2.78CIA$, where:
 Q = Peak Flow (L/s)
 A = Drainage Area (ha)
 I = Rainfall Intensity (mm/hr)
 C = Runoff Coefficient
- Manning's roughness coefficient = 0.013
- Full flow velocity: MIN 0.8 m/s; MAX 3.0 m/s (City of Ottawa Sewer Design Guidelines, v.2012)

IDF curve equations (Intensity in mm/hr)

100 year Intensity = $1735.688 / (\text{Time in min} + 6.014)^{0.820}$
 50 year Intensity = $1569.580 / (\text{Time in min} + 6.014)^{0.820}$
 25 year Intensity = $1402.884 / (\text{Time in min} + 6.018)^{0.819}$
 10 year Intensity = $1174.184 / (\text{Time in min} + 6.014)^{0.816}$
 5 year Intensity = $998.071 / (\text{Time in min} + 6.053)^{0.814}$
 2 year Intensity = $732.951 / (\text{Time in min} + 6.199)^{0.810}$

