Robinson
Land Development

February 10th, 2022

Attention: **Jennifer McGahan**

Reference: **1835 Stittsville Main Street Redevelopment**
Zoning By-law Amendment
Servicing Brief
City File No. PC2021-0004
Our Project No. 22008

Dear Ms. McGahan:

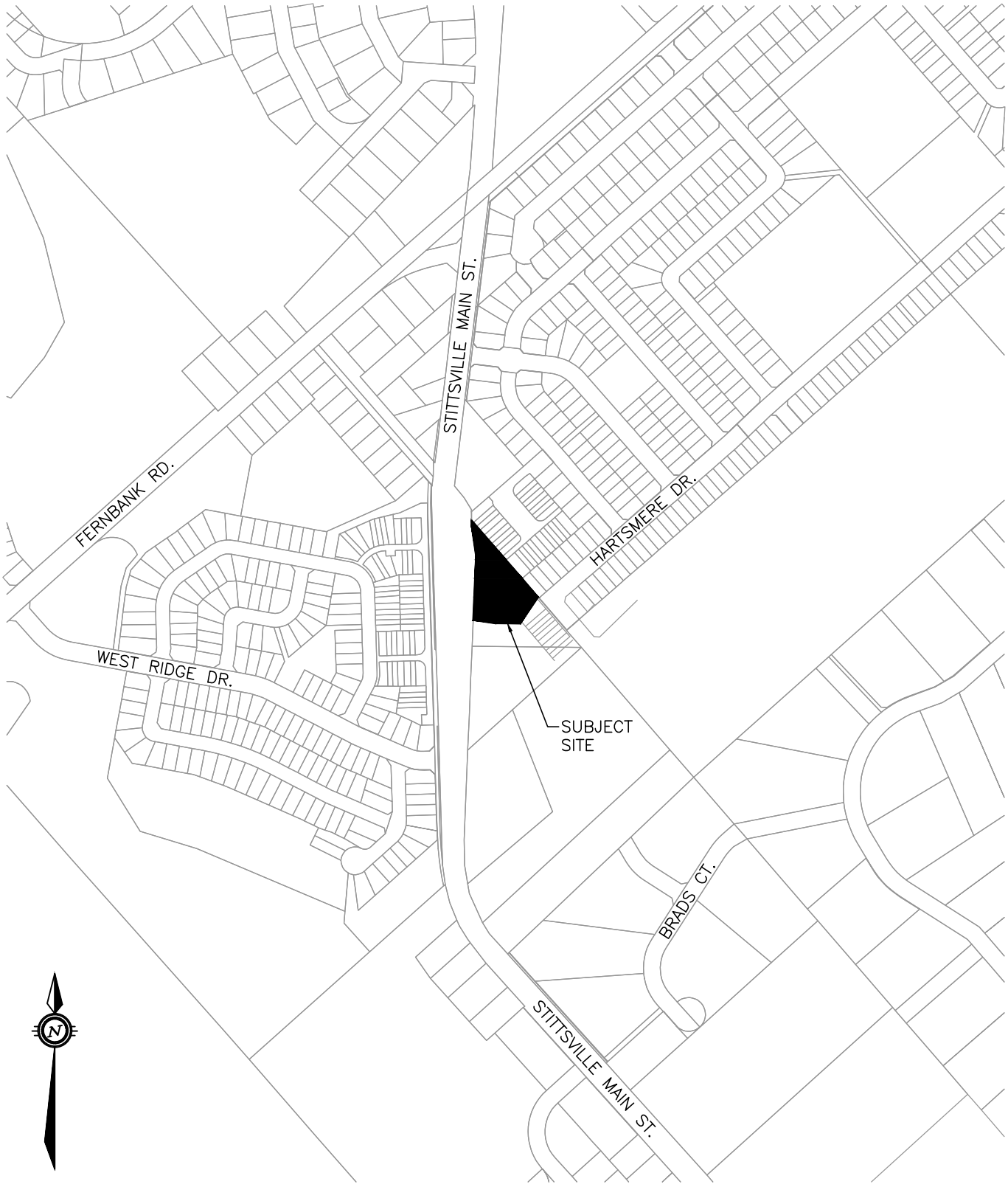
This Servicing Brief has been prepared to summarize the servicing and grading designs required in support of the zoning by-law amendment for the redevelopment of the property (currently zoned Rural Countryside Zone, RU) located at 1835 Stittsville Main Street in the community of Stittsville. The property 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
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scale N.T.S.	1835 STITTSVILLE MAIN STREET	project no. 22008
date 11/02/22		
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 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) **8,000 L/min**

Total Required Fire Flow (Lot #3) **7,000 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 the proposed extension of the existing 150 mm diameter watermain stub (refer to the Hydrant Location Plan under Attachment B). The available fire flow at each proposed hydrant location has been analyzed and is noted below:

Hydrant (Option A) Available Fire Flow **9,562 L/min**

Hydrant (Option B) Available Fire Flow **5,419 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.

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.

1.1.2 Domestic Demand

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 design criteria of 40 psi. This was, however, based on the assumed configuration of a 100-unit senior's residence. Using a conservative demand of 0.50 L/s, the peak hour simulation was analyzed for a 51 mm diameter watermain extension from the existing 150 mm diameter watermain stub. The analysis determined that the peak hour pressure within the 51 mm diameter watermain would range from approximately 48 psi to 55 psi, which is above the minimum required pressure of 40 psi (refer to the peak hour pressure report under Attachment B). Therefore, a 51 mm diameter watermain is more than sufficient to provide water supply to the three single-family homes.

An analysis has also been completed for the proposed development to determine the expected water demands for the three single-family homes. The following water demands were calculated for the development:

Average Daily Demand = (10.2 persons) x (280 L/person/day) / 86400 s/day = **0.03 L/s**
Maximum Daily Demand = (2.5) x (0.03 L/s) = **0.08 L/s**
Maximum Hourly Demand = (2.2) x (0.08 L/s) = **0.18 L/s**

The 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 19 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.

1.2 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:

Population = (3 single-family homes) x (3.4 persons/unit) = 10.2 persons

Peak Factor = 3.73 (Harmon Equation)

Peak Population Flow = (3.73) x (10.2 persons) x (280 L/person/day) / (86400 s/day)
Peak Population Flow = **0.12 L/s**

Extraneous Flow = (0.53 ha) x (0.33 L/s/ha) = **0.17 L/s**

Peak Design Flow = (0.12 L/s) + (0.17 L/s) = **0.30 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 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 0.60 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)

CATCHBASIN TABLE				
CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA. (mm)
444	40+115.27	119.68	117.88	152
445	40+115.27	119.68	118.08	
446	40+079.61	120.07	118.27	152
447	40+079.61	120.07	118.47	
448	10+209.83	120.26	118.46	152
449	10+210.83	120.26	118.66	
450	30+105.34	121.13	119.33	127
451	30+105.34	121.13	119.53	
452	30+068.18	121.28	119.48	102
453	30+068.18	121.28	119.68	
454	30+025.78	121.41	119.61	83
455	30+025.74	121.41	119.81	
456	50+188.32	121.01	119.21	152
457	50+188.32	121.01	119.41	
458	20+118	121.29	119.49	127
459	20+118	121.29	119.69	
460	50+115.54	121.69	120.09	152

CATCHBASIN TABLE				
CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA. (mm)
461	50+115.53	121.89	120.29	
462	50+041.02	123.38	121.58	152
463	50+041.10	123.38	121.78	
470	10+260.52	120.38	118.68	83
471	10+260.52	120.38	118.78	
472	120+096.58	120.22	118.42	
473	120+096.53	120.22	118.62	
474	10+223	120.53	118.73	127
475	10+223	120.53	118.93	
476	10+183.72	121.12	119.32	152
477	10+183.90	121.12	119.52	
478	10+119.94	122.08	120.28	127
479	10+119.94	122.08	120.48	
480	10+069.13	122.87	121.07	83
481	10+069.56	122.86	121.26	
482	120+070.29	119.41	117.81	
483	120+068.76	119.36	117.76	

STM MANHOLE TABLE					
MH ID	STATION	T/G ELEV	INVERT	DIA. (mm)	OPSD
214	10+242.11	120.72	SW#116.72 NW#116.59 NE#116.46	1500.00	701.011
216	10+159.01	121.52	SW#118.56 NE#118.55 SE#118.82	1200.00	701.010
218	10+086.87	122.52	NE#119.92 NW#119.95	1200.00	701.010
220	10+066.91	123.02	E#120.19	1200.00	701.010
250	50+298.15	120.10	SW#116.62 NE#116.53 NW#116.98	1500.00	701.011
252	50+216.22	121.35	NE#117.92 NW#117.93 SW#117.92	1500.00	701.011
254	50+135.20	121.67	SW#118.96 NE#118.36 NW#118.50	1800.00	701.012
256	50+015.34	124.02	NE#120.76	1200.00	701.010
260	40+021.95	120.64	SE#117.70	1200.00	701.010
264	20+061.20	122.17	SE#118.89	1200.00	701.010
266	120+065.35	119.11	SE#116.94	1200.00	701.010

SAN MANHOLE TABLE					
MH ID	STATION	T/G ELEV	INVERT	DIA. (mm)	OPSD
215	10+243.80	120.78	SW#116.12 NE#115.82 NW#116.02	1200.00	701.010
217	10+160.60	121.57	SW#117.96 NE#117.65 SE#118.03	1200.00	701.010
219	10+085.63	122.62	W#119.39 NE#119.36	1200.00	701.010
251	50+299.66	120.12	NE#115.89 SW#115.98 NW#116.39	1200.00	701.010
253	50+217.76	121.38	NW#117.55 SW#117.30 NE#117.29	1200.00	701.010
255	50+133.73	121.74	SW#118.36 NW#117.86 NE#117.76	1200.00	701.010
257	50+013.76	124.06	NE#120.16	1200.00	701.010
261	40+022.84	120.69	SE#117.09	1200.00	701.010
265	20+059.70	122.23	SE#118.25	1200.00	701.010
267	120+064.81	119.14	W#116.41 SE#116.36	1200.00	701.010

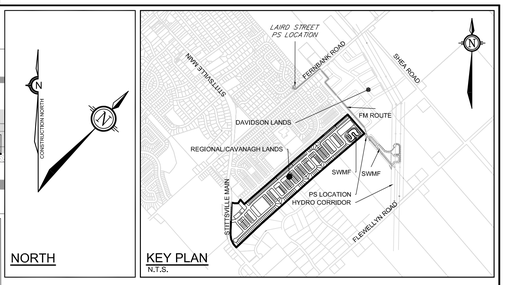
LANDSCAPE CB TABLE		
LYCB No.	T/G ELEVATION	INVERT
827	118.09	117.00
828	118.99	117.90
829	120.05	118.80
830	121.25	120.00
831	121.31	120.07
832	121.53	120.28
833	122.84	121.69
837	119.89	118.16
838	119.64	118.30
839	119.54	118.50
840	120.09	117.87
841	120.55	119.31
842	120.41	118.85
843	120.12	119.02
844	120.35	119.10

RYCB TABLE			
RYCB No.	T/G ELEVATION	INVERT	ICD DIA. (mm)
712	119.46	117.18	127
713	121.06	118.96	127
714	120.97	118.92	127
717	119.81	117.28	127
718	119.42	117.58	
719	120.57	118.04	152
720	122.19	119.84	127
721	118.79	117.21	

NOTE:
DURING SERVICING, 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.

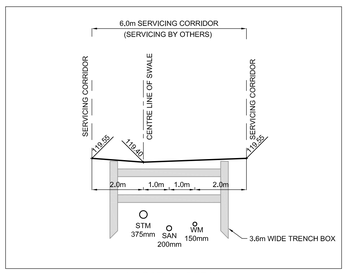
USE PROTECTION FENCING AND BEST EFFORTS TO REDUCE IMPACT TO ADJACENT LANDS' EXISTING FEATURES INCLUDING, BUT NOT LIMITED TO, RETAINING WALLS, FENCES, HARD AND SOFT LANDSCAPE. ANY DISTURBED AREA IS TO BE REINSTATED TO EXISTING CONDITIONS OR BETTER, TO THE SATISFACTION OF PROPERTY OWNER AND CITY.

1,75m 0,9m HT PRECAST RETAINING WALL, STONE STRONG OR EQUIVALENT.
8,0m 1,5m HT PRECAST RETAINING WALL, STONE STRONG OR EQUIVALENT.
2,25m 0,9m HT PRECAST RETAINING WALL, STONE STRONG OR EQUIVALENT.
12,0m 0,6m HT PRECAST RETAINING WALL, STONE STRONG OR EQUIVALENT.

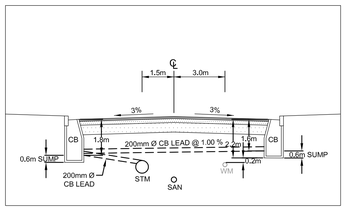


LEGEND

- PROPOSED WATERMAIN AND DIAMETER (200mmØ WM)
- PROPOSED VALVE LOCATION
- V&VB — VALVE & VALVE BOX
- V&VC — VALVE & VALVE CHAMBER
- PROPOSED HYDRANT C/W VALVE & LEAD (HYD)
- T/F=98.45 — PROPOSED TOP OF BOTTOM FLANGE
- PROPOSED BEND AND THRUSTBLOCK (BEND) 11.25°, 22.5°, 45° or TEE (SEE PLAN AND PROFILES)
- MH 101 — PROPOSED SANITARY MH & SEWER
- MH 100 — PROPOSED STORM MH & SEWER
- PROPOSED LANDSCAPE TEE CATCH BASIN & PERFORATED SUBDRAIN
- PROPOSED LANDSCAPE ELBOW CATCH BASIN & PERFORATED SUBDRAIN
- PROPOSED REAR YARD CATCH BASIN MAN HOLE & LEAD
- PROPOSED REAR YARD CATCH BASIN & LEAD
- PROPOSED ROAD CATCHBASIN
- PROPOSED ROAD CATCHBASIN WITH INLET CONTROL DEVICE
- DIRECTION OF FLOW
- MH 101 — EXISTING SANITARY MH & SEWER
- MH 102 — EXISTING STORM MH & SEWER
- 200mmØ WM — EXISTING WATERMAIN
- SERVICE CONNECTION STUB
  - 100mm STORM @1.0%
  - 19mm WATER
  - 125mm SANITARY @1.0%
- PROPOSED CLAY SEAL
- 11* — LOT SPECIFIC SETBACK REQUIRED BY BUILDER (FOUR-PARTY SECONDARY SERVICING)
- 11 — LOT SPECIFIC SETBACK REQUIRED BY BUILDER (RYCB LEAD)
- EXISTING ROADWAY TO BE REMOVED
- EASEMENT



A-A SECTION DETAIL
SCALE 1:100



TYPICAL CROSS-SECTION OF ROAD CATCHBASIN LAYOUT
N.T.S.

SEE DRAWING 113004-ND FOR NOTES AND DETAILS

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

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

No.	REVISION	DATE	BY
21.	BLOCK 353 AS-BUILT ADDED	JAN 25/22	BHB
20.	ISSUED FOR COMMENCE WORK NOTIFICATION STAGE 2A	OCT 18/17	BHB
19.	CLOUDED AREAS RELOTTED, PART LOT CONTROL	OCT 18/17	BHB
18.	REVISED WM FROM STA 10+000 TO STA 10+005	MAY 24/17	BHB
17.	ISSUED FOR FINAL APPROVAL	MAR 26/17	BHB
16.	ISSUED FOR EARLY SERVICING	OCT 26/16	BHB
15.	REVISED RYCB STRUCTURES & ISSUED FOR LAYOUT	OCT 17/16	BHB
14.	ISSUED FOR MOECC-ECA APPROVAL	SEPT 21/16	BHB
13.	REVISED AS PER CITY COMMENTS	SEPT 09/16	BHB
12.	ISSUED FOR MANHOLE SHOP DRAWINGS	AUG 29/16	BHB
11.	REVISED AS PER CITY COMMENTS	JULY 18/16	BHB
10.	REVISED AS PER CITY COMMENTS	APR 05/16	BHB
9.	REVISED FOR ADDENDUM #3	APR 01/16	BHB
8.	REVISED FOR TENDER ADDENDUM #1	FEB 04/16	BHB
7.	ISSUED FOR TENDER	JAN 20/16	BHB
6.	REVISED AS PER CITY COMMENTS	DEC 16/15	BHB
5.	ISSUED FOR CITY REVIEW	SEPT 14/15	BHB
4.	ISSUED TO BUILDER FOR INFORMATION	JUL 21/15	BHB
3.	ISSUED TO BUILDER FOR INFORMATION	APR 24/15	BHB
2.	ISSUED TO BUILDER FOR INFORMATION	NOV 26/14	BHB
1.	ISSUED FOR INFORMATION	AUG 15/14	BHB

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

DESIGN BCS/ TGP
CHECKED BHB
DRAWN BCS/ TGP
CHECKED BHB
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
B. H. BAHIA
100164647
PROVINCE OF ONTARIO

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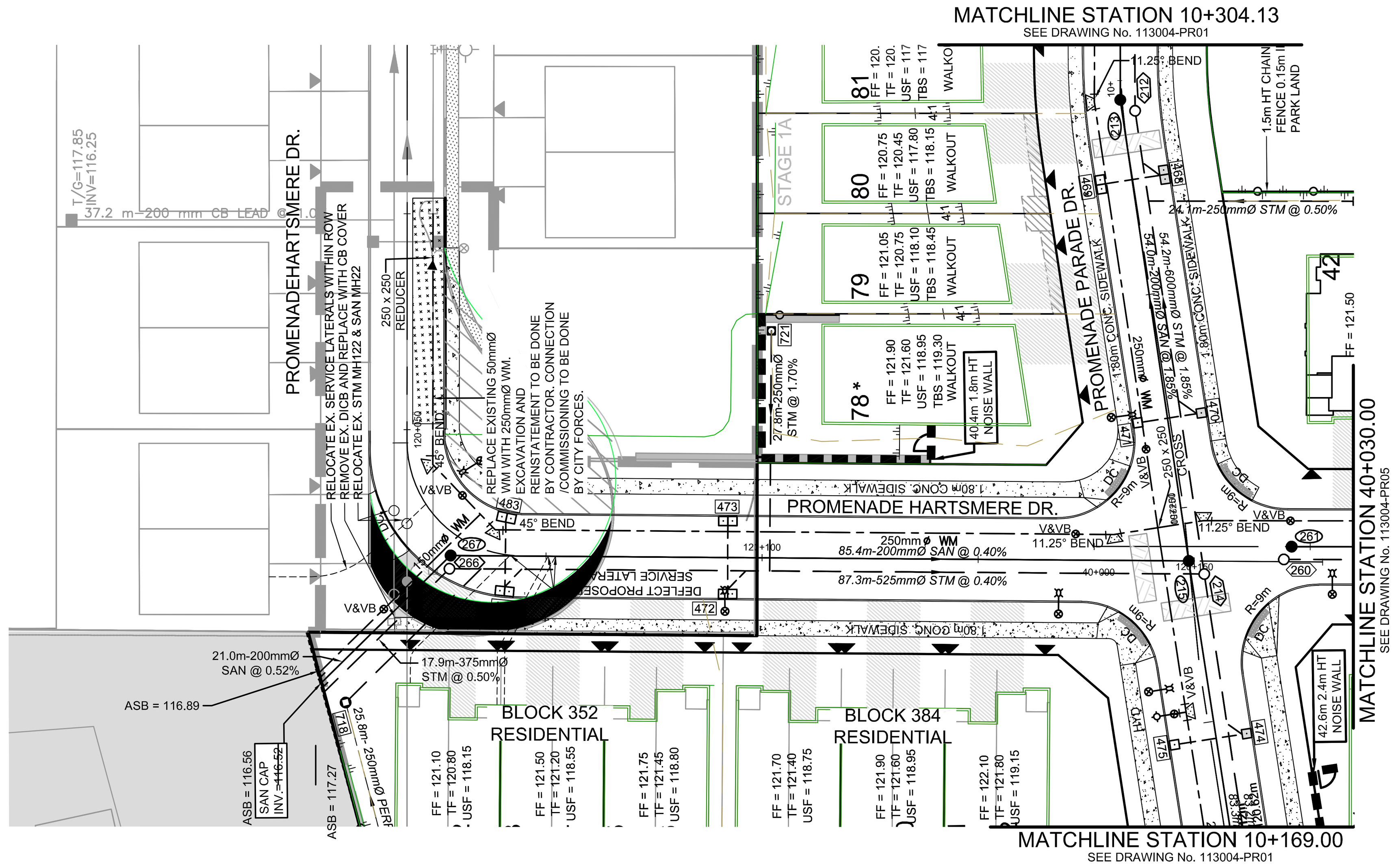
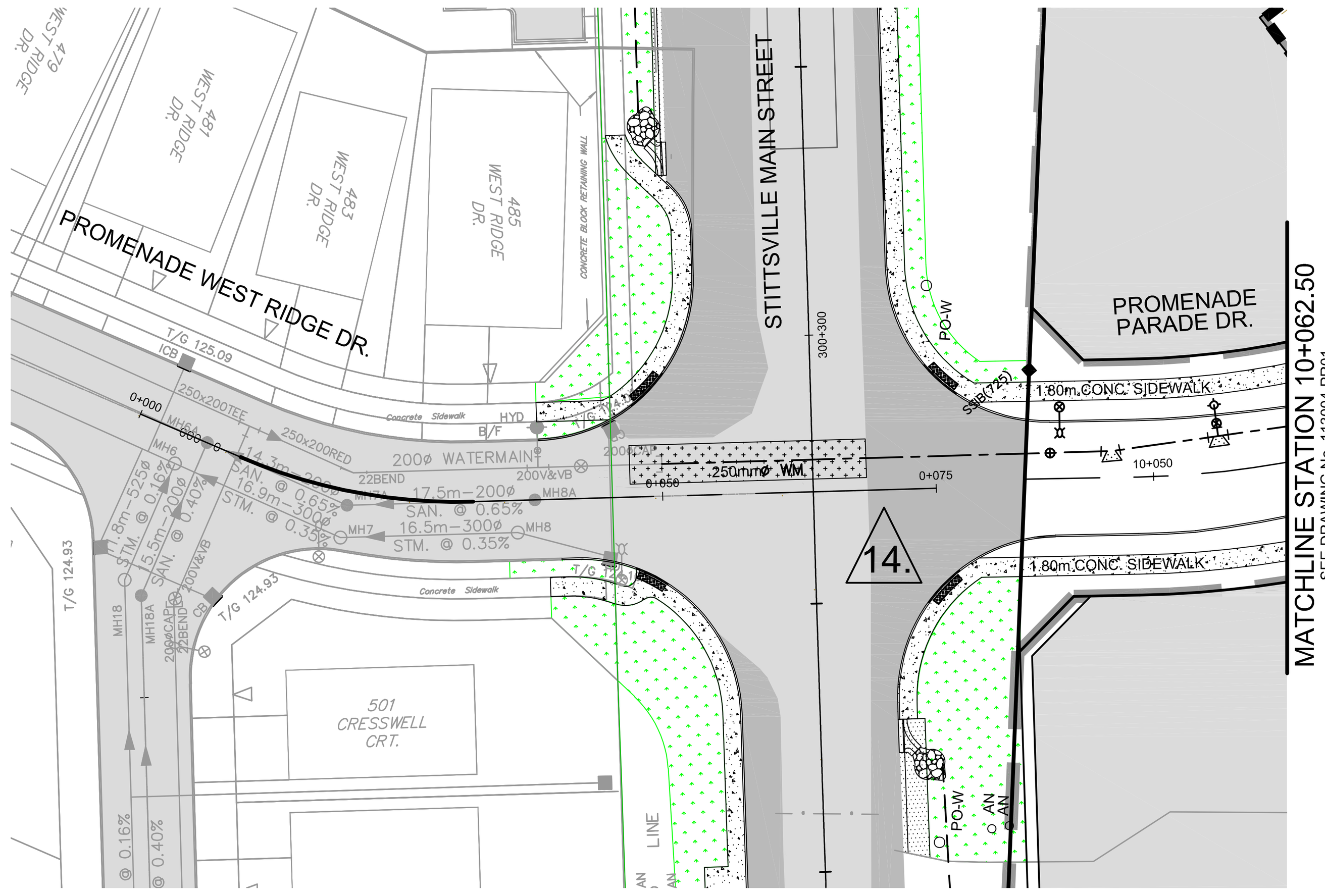
Facsimile (613) 254-5867
Website www.novatech-eng.com

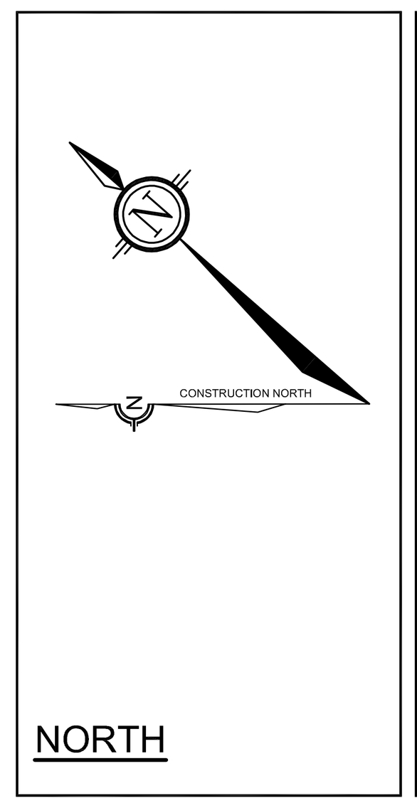
CITY OF OTTAWA
STITTSVILLE SOUTH - AREA 6

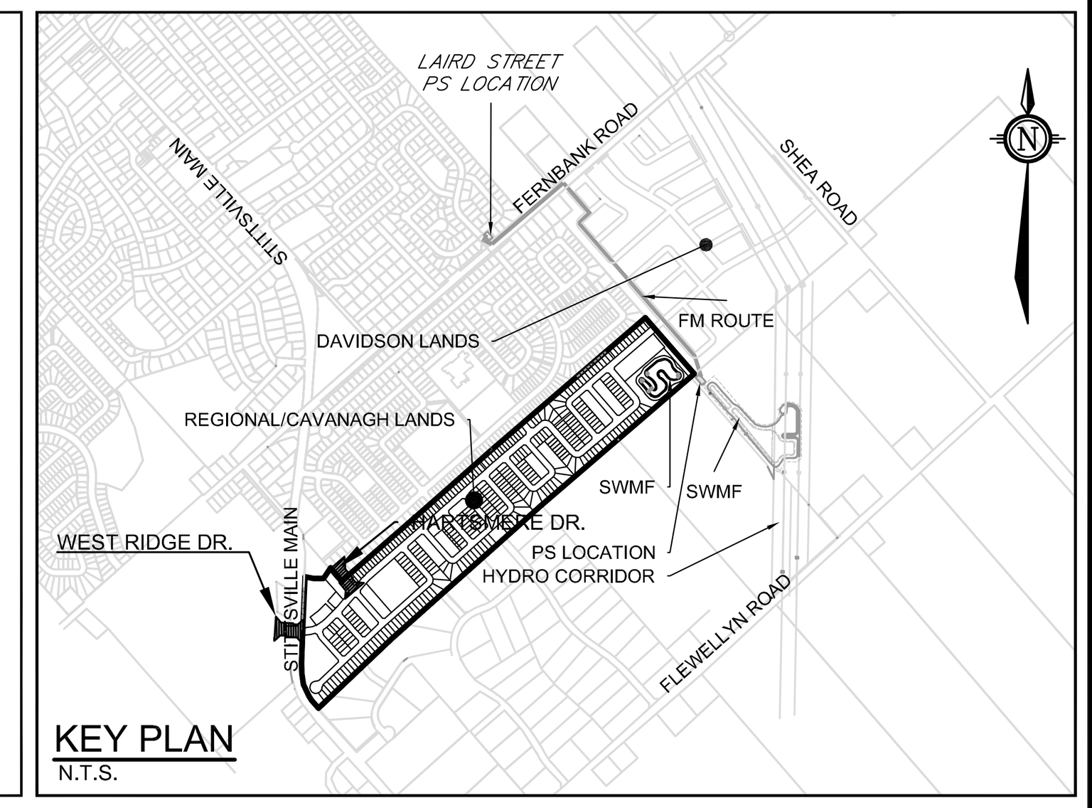
GENERAL PLAN AND SERVICES

PROJECT No. 113004-00
REV REV # 21
DRAWING No. 113004-GP1

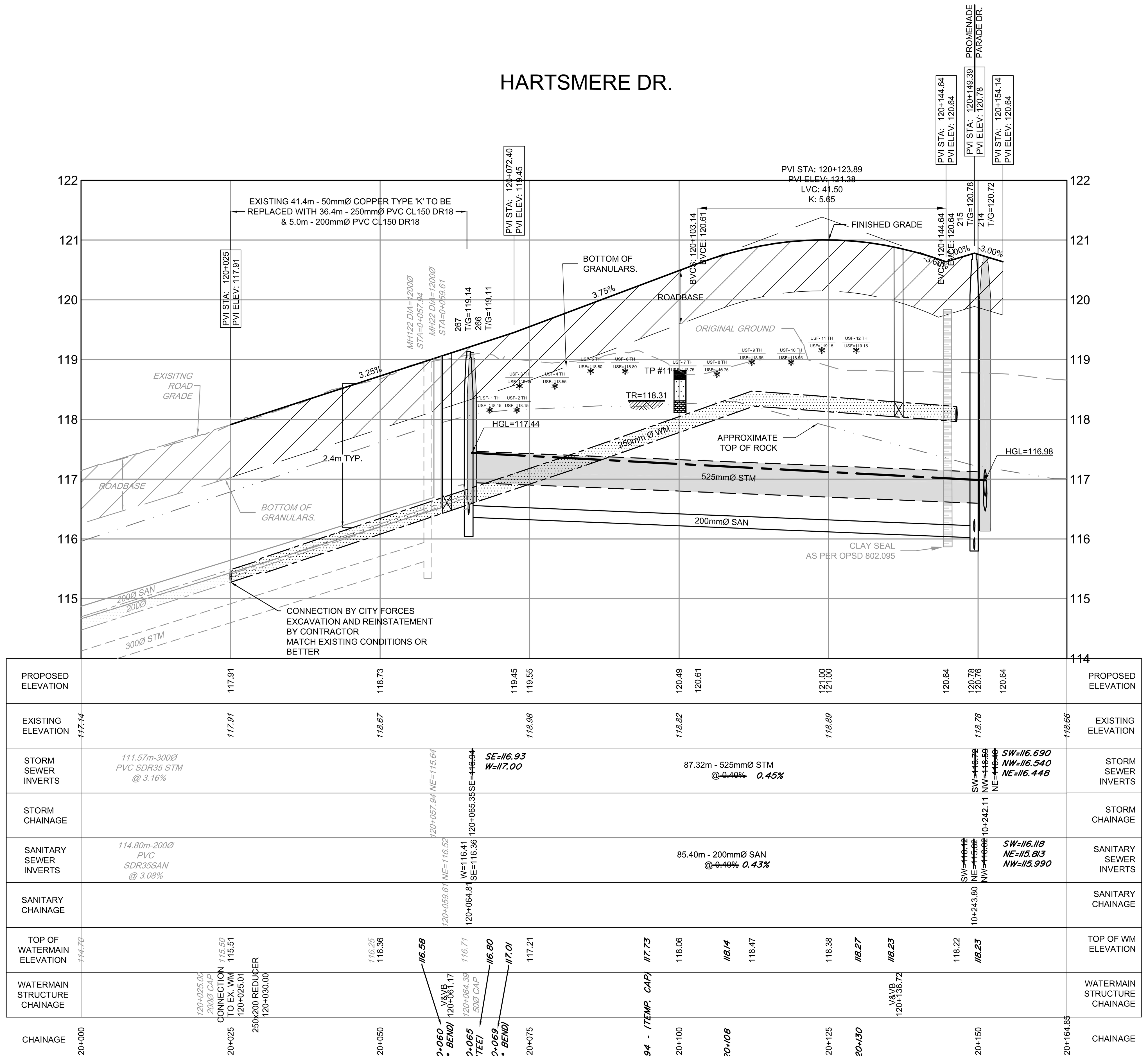

MATCHLINE STATION 10+304.13
SEE DRAWING No. 113004-PR01
PROMENADE HARTSMERE DR.
PROMENADE PARADE DR.
BLOCK 352
RESIDENTIAL
BLOCK 384
RESIDENTIAL
MATCHLINE STATION 40+030.00
SEE DRAWING No. 113004-PR05
MATCHLINE STATION 10+169.00
SEE DRAWING No. 113004-PR01



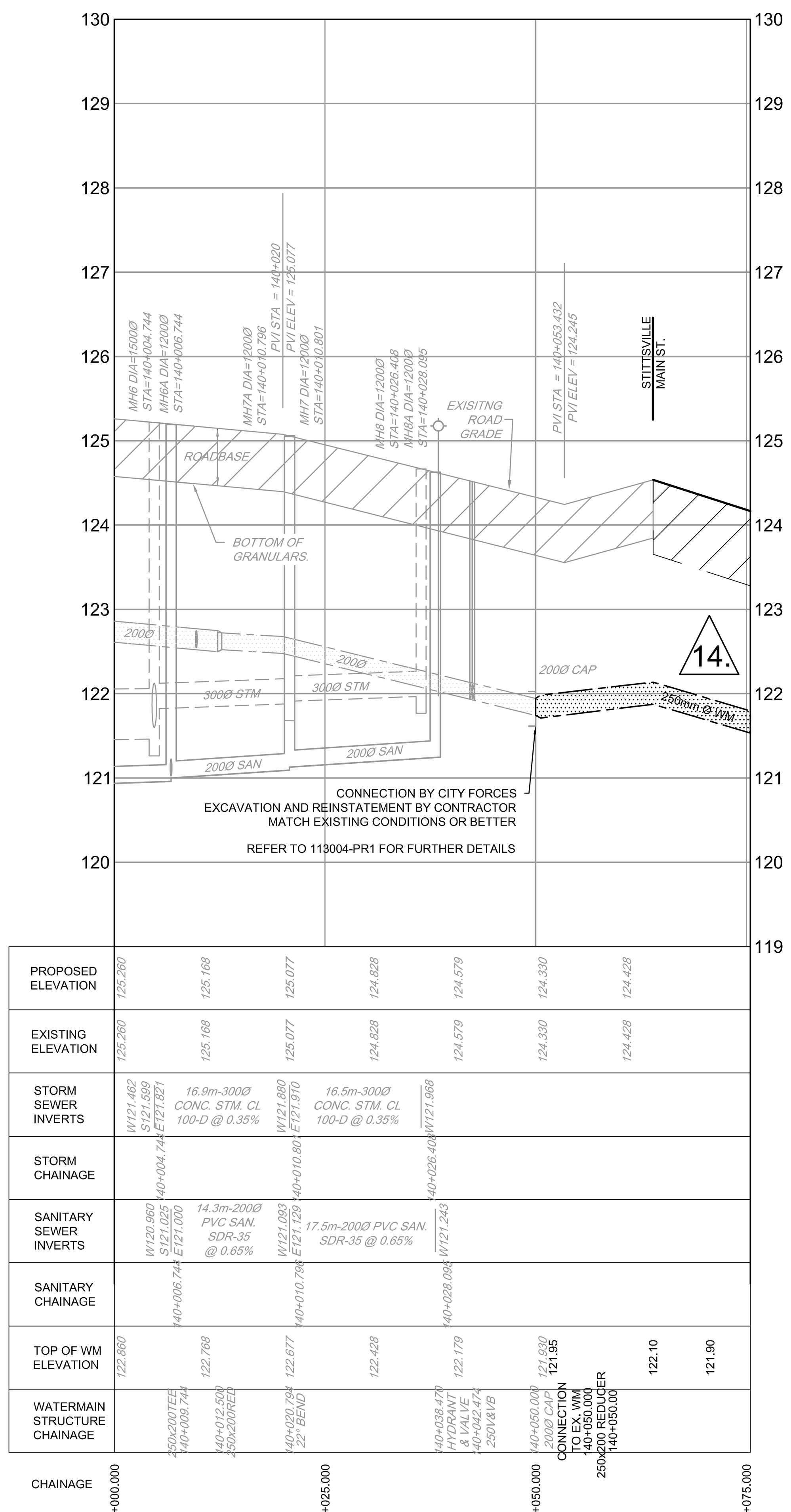




HARTSMERE DR.


EXISTING 41.4m - 50mmØ COPPER TYPE 'K' TO BE REPLACED WITH 36.4m - 250mmØ PVC CL150 DR18 & 5.0m - 200mmØ PVC CL150 DR18
FINISHED GRADE
BOTTOM OF GRANULARS
ROADBASE
ORIGINAL GROUND
EXISITING ROAD GRADE
HGL=117.44
HGL=116.98
250mm Ø WM
APPROXIMATE TOP OF ROCK
525mmØ STM
200mmØ SAN
CLAY SEAL AS PER OPSD 802.095
CONNECTION BY CITY FORCES EXCAVATION AND REINSTATEMENT BY CONTRACTOR MATCH EXISTING CONDITIONS OR BETTER
PROPOSED ELEVATION
EXISTING ELEVATION
STORM SEWER INVERTS
STORM CHAINAGE
SANITARY SEWER INVERTS
SANITARY CHAINAGE
TOP OF WATERMAIN ELEVATION
WATERMAIN STRUCTURE CHAINAGE
CHAINAGE

WEST RIDGE DR.


STITTSVILLE MAIN ST.
ROADBASE
BOTTOM OF GRANULARS
EXISTING ROAD GRADE
200Ø CAP
CONNECTION BY CITY FORCES EXCAVATION AND REINSTATEMENT BY CONTRACTOR MATCH EXISTING CONDITIONS OR BETTER
REFER TO 113004-PR1 FOR FURTHER DETAILS
PROPOSED ELEVATION
EXISTING ELEVATION
STORM SEWER INVERTS
STORM CHAINAGE
SANITARY SEWER INVERTS
SANITARY CHAINAGE
TOP OF WM ELEVATION
WATERMAIN STRUCTURE CHAINAGE
CHAINAGE

REVIEWED BY DEVELOPMENT REVIEW BRANCH

Signed ____________________

Date ____________________ 2016

Plan Number 17274 D07-16-13-0033

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

No.	REVISION	DATE	BY	No.	REVISION	DATE	BY
16.	BLOCK 353 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

DESIGN BCS/ TGP
CHECKED BHB
DRAWN TGP/EST
CHECKED BHB
APPROVED GJM

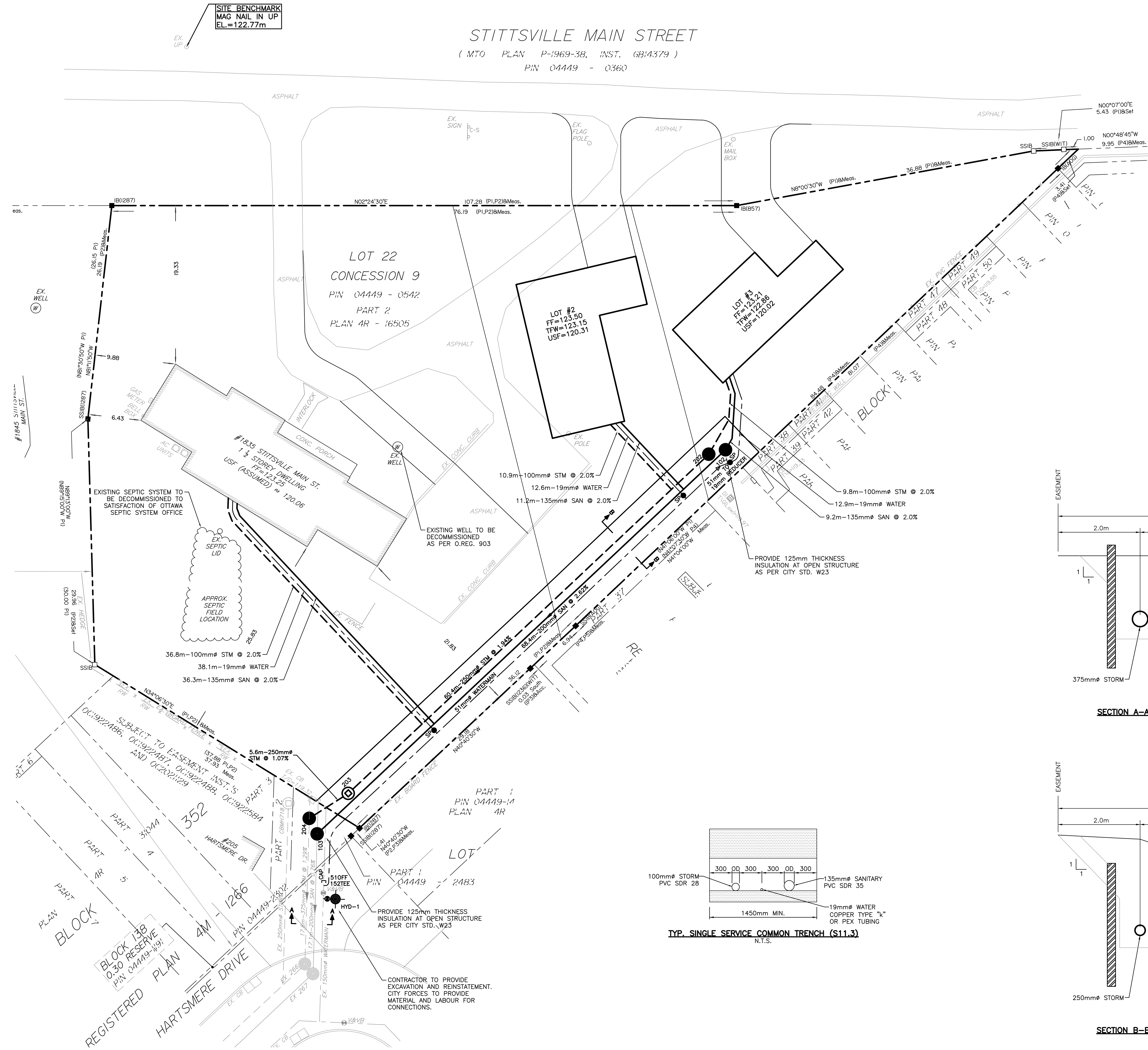
FOR REVIEW ONLY

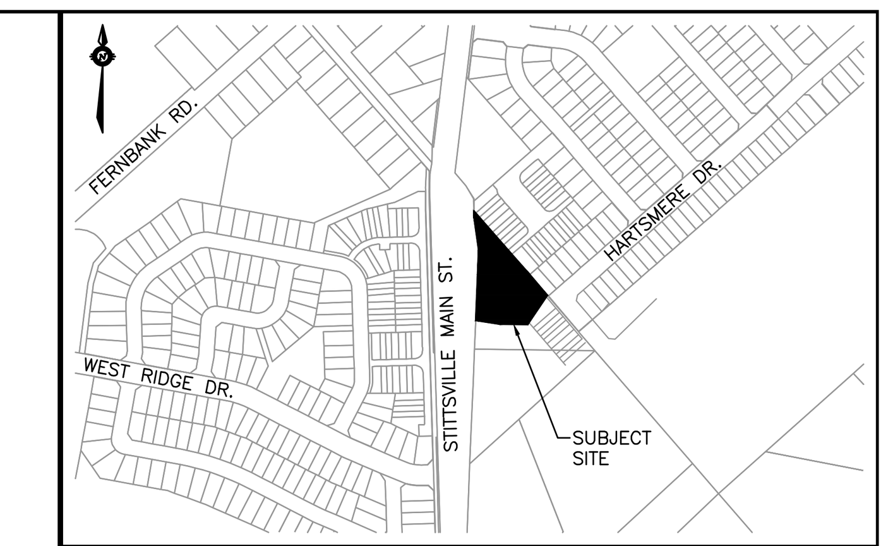
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

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 REV # 16
DRAWING No. 113004-PR09





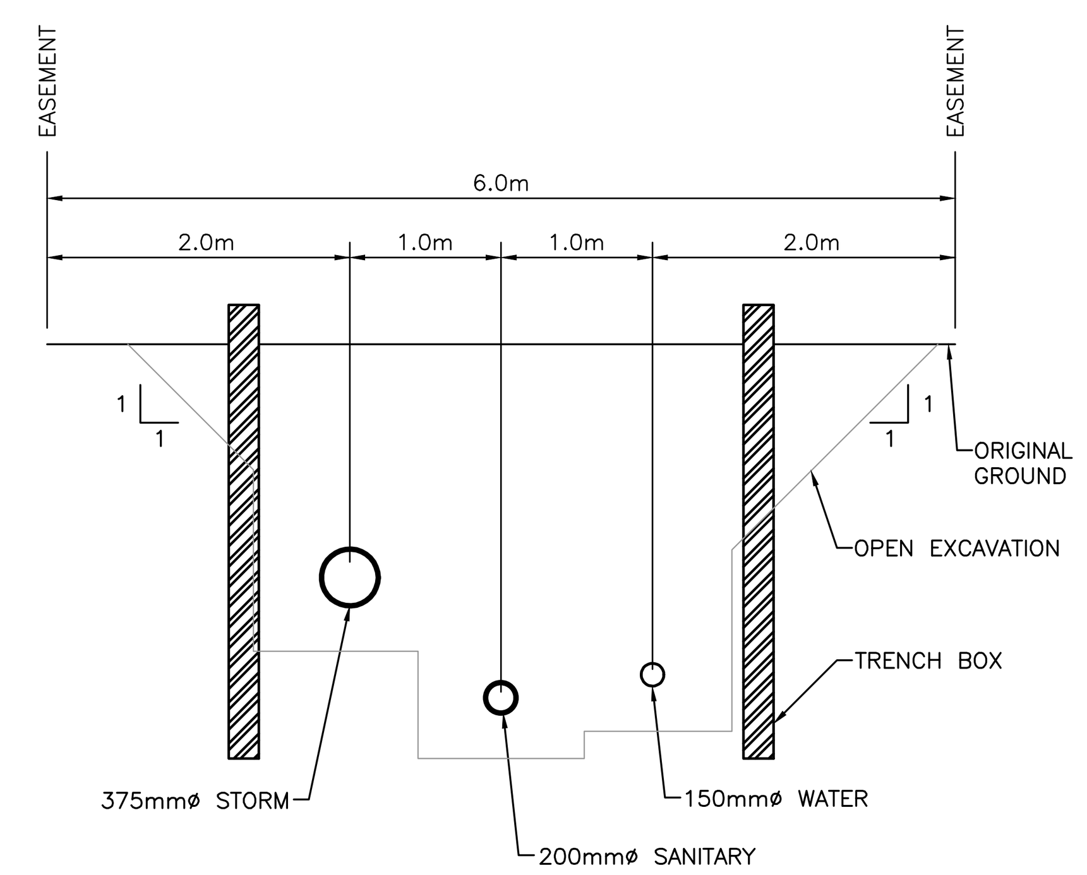
KEY PLAN

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

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

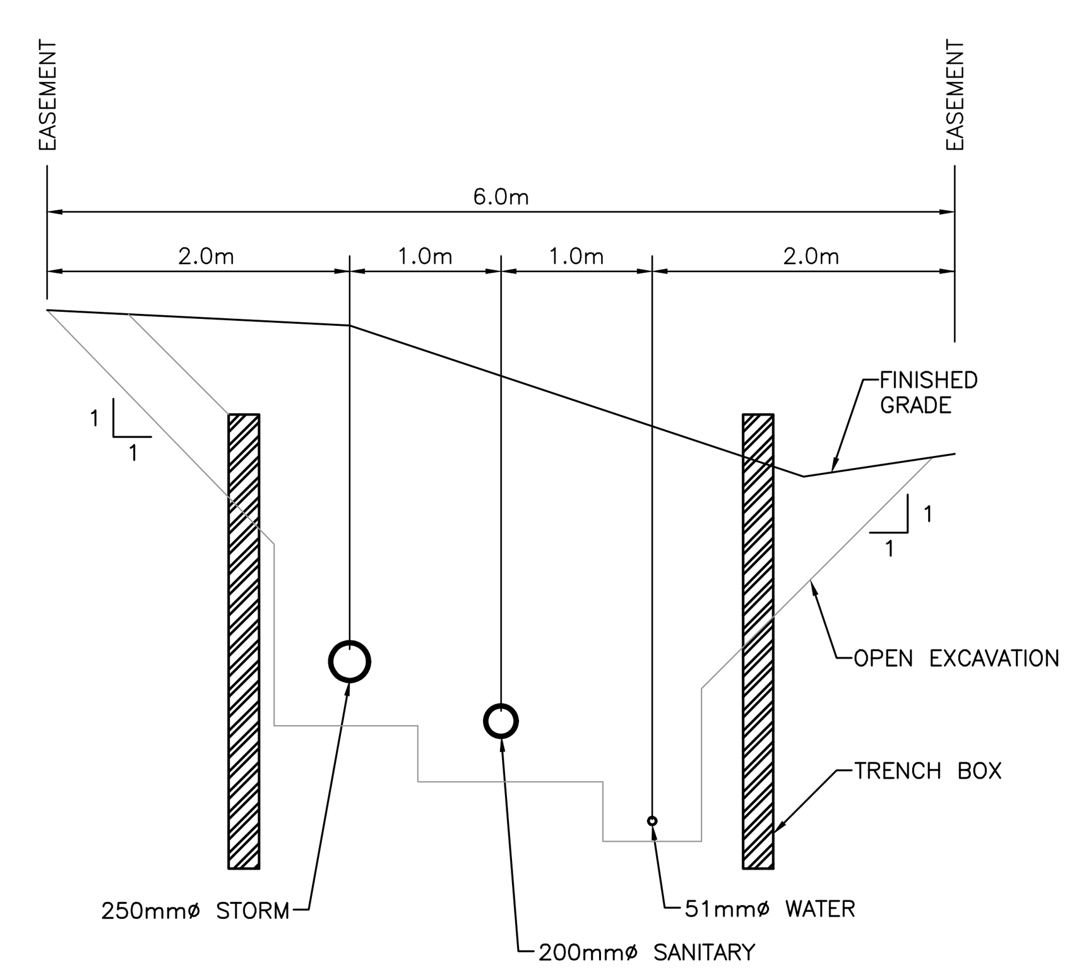
LEGEND

- 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



SECTION A–A – 6.0m SERVICE EASEMENT
N.T.S.

TYP. SINGLE SERVICE COMMON TRENCH (S11.3)
N.T.S.



SECTION B–B – 6.0m SERVICE EASEMENT
N.T.S.

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
1	ISSUED FOR ZONING BY–LAW AMENDMENT	10/02/22	AHJ

SCALE: HORIZONTAL 1:250

LICENSED PROFESSIONAL ENGINEER — Feb.2/22 — B.L. MACKECHNIE 100199554 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — FEB. 10, 2022 — A.H. JONKMAN — PROVINCE OF ONTARIO

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

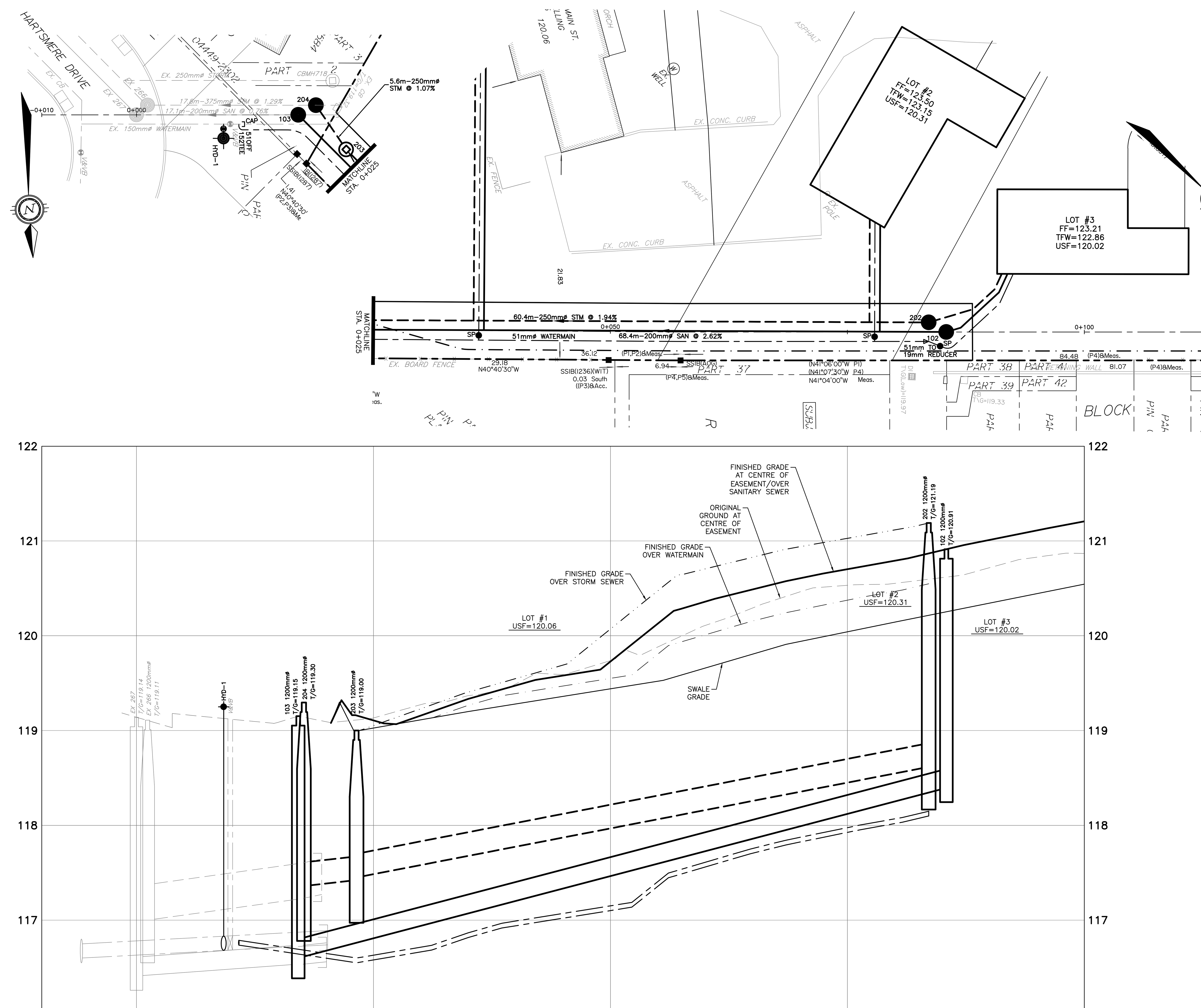
DESIGN: BLM
CHECKED: AHJ
DRAWN: BLM
CHECKED: AHJ
APPROVED: AHJ

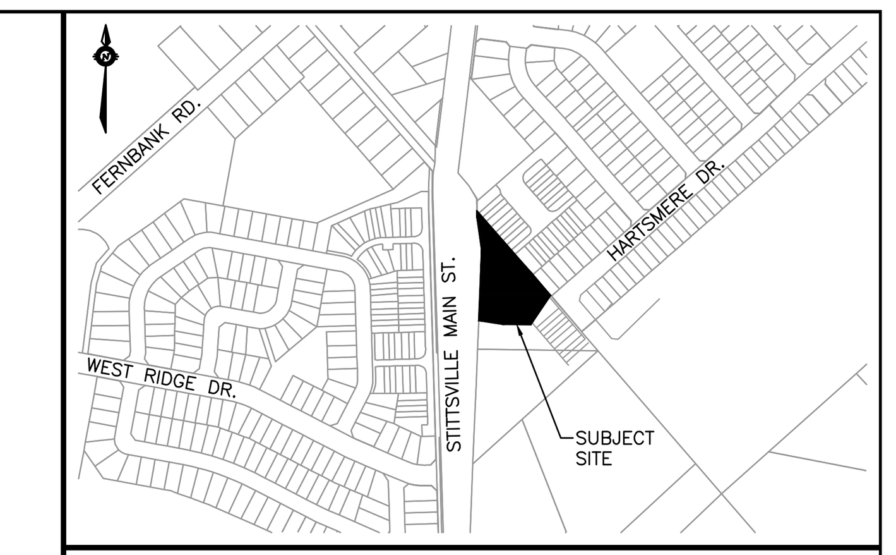
JENNIFER McGAHAN
WIRE INVESTMENT CORP.

1835 STITTSVILLE MAIN STREET
STITTSVILLE, ON

SERVICING PLAN

PROJECT No.: 22008
SURVEY: AOV
DATED: FEBRUARY 2022
DWG. No: 22008-S1





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	119.11, 119.73, 120.70, 121.21
TOP OF WATERMAIN ELEVATION	116.80 150FF 250TEE, HYD-1 116.82, 116.83 V&VB, 116.79 51OFF 152TEE, 116.60, 116.63, 116.73, 116.87, 116.97, 117.15 117.16, 117.19, 117.50, 117.75, 117.84, 117.98, 118.00, 118.08, 118.15
STORM SEWER INVERT ELEVATION	117.00 W, 117.23 E 117.36 NW, 117.42 SE 117.45 NW, 60.4m-250mmø STM @ 1.94%, 118.62 SE
SANITARY SEWER INVERT ELEVATION	116.41 W, 116.54 E 116.60 NW, 5.6m-250mmø STM @ 1.07%, 68.4m-200mmø SAN @ 2.62%, 118.39 SE
ORIGINAL GROUND ELEVATION	119.13, 119.74, 120.53, 120.87
STATION	-0+005.8, 0+000 0+000 0+001.2, 0+009.9 0+010.8, 0+017.1 0+017.7, 0+023.2, 0+025, 0+050, 0+075, 0+083.6, 0+085.4, 0+100

NOT FOR CONSTRUCTION

NOTES

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NO.	REVISION DESCRIPTION	DATE	BY
1	ISSUED FOR ZONING BY-LAW AMENDMENT	10/02/22	AHJ

SCALE: HORIZONTAL 1:250; VERTICAL 1:25

LICENSED PROFESSIONAL ENGINEER — Feb.2/22 — B. L. MACKECHNIE 100199554 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — FEB. 10, 2022 — A.H. JONKMAN — PROVINCE OF ONTARIO

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

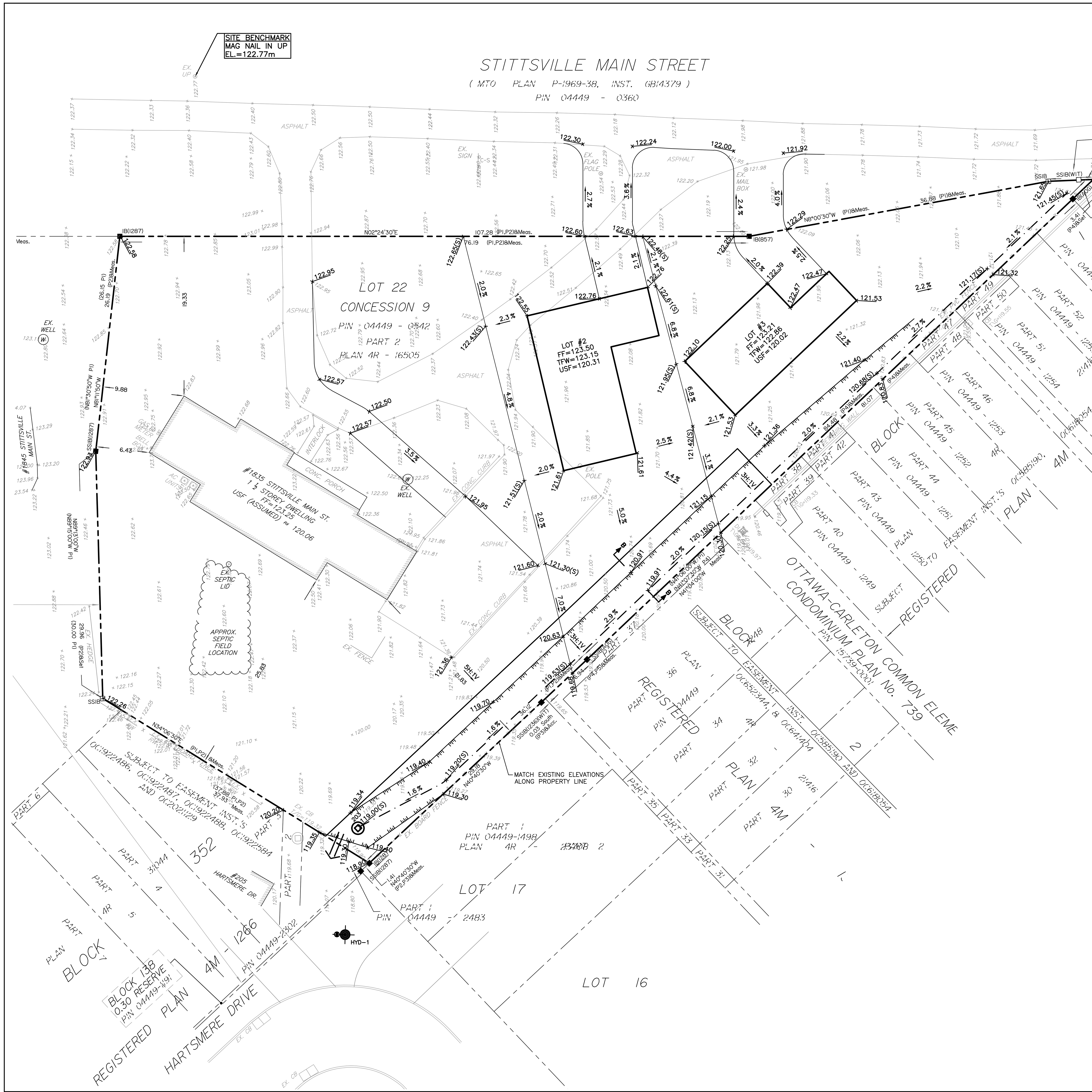
DESIGN	BLM
CHECKED	AHJ
DRAWN	BLM
CHECKED	AHJ
APPROVED	AHJ

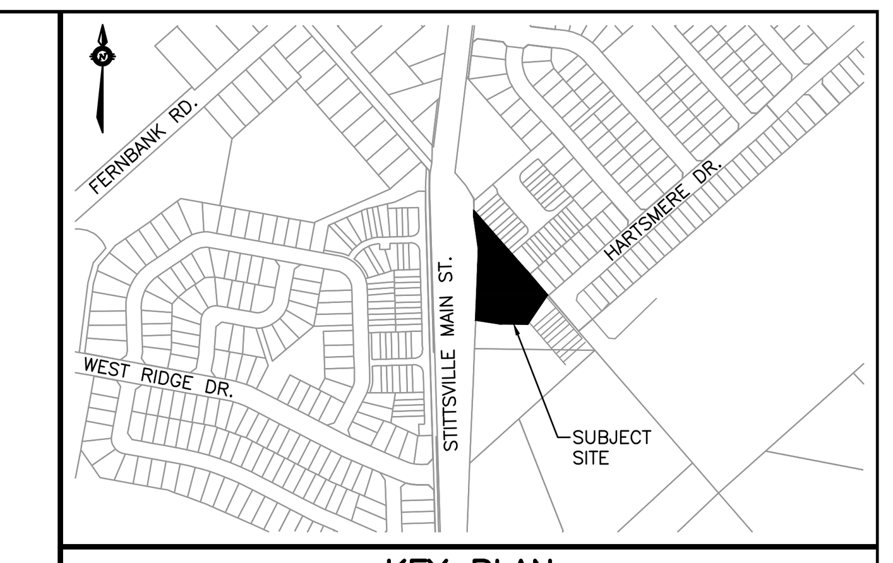
JENNIFER McGAHAN
WIRE INVESTMENT CORP.

1835 STITTSVILLE MAIN STREET
STITTSVILLE, ON

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

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



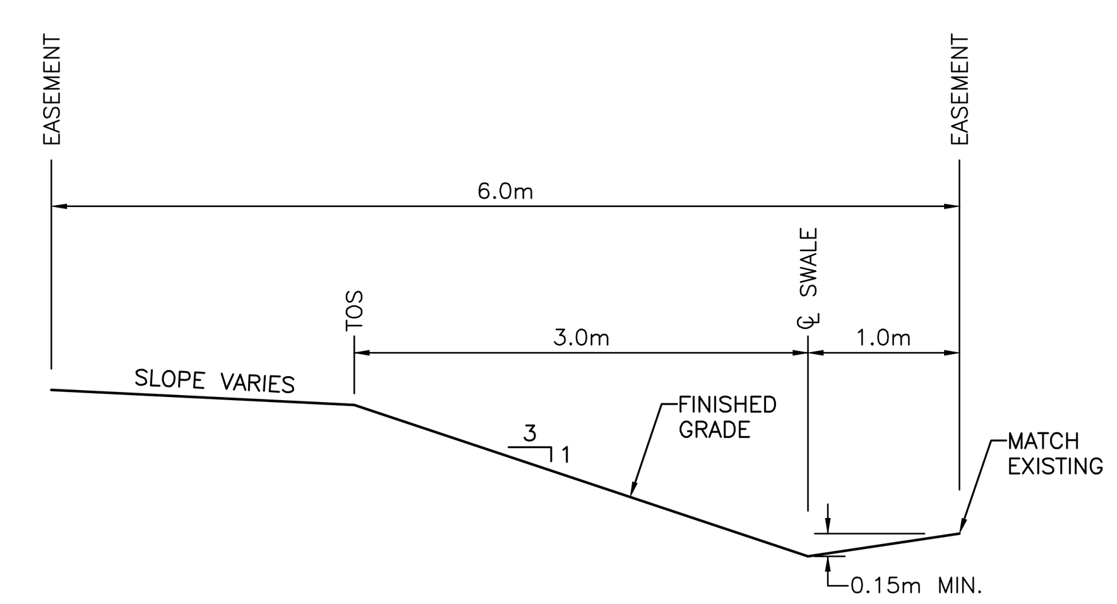


KEY PLAN

LEGEND

	PROPERTY BOUNDARY
	EASEMENT
+121.00	EXISTING ELEVATION
121.00	PROPOSED GRADE
121.00(S)	PROPOSED SWALE GRADE
2.0%	DRAINAGE DIRECTION AND SLOPE
	SWALE
	TERRACING (3H:1V MAX.)
	CATCH BASIN MANHOLE
	CATCH BASIN
	HYDRANT
	RETAINING WALL
	100 YEAR PONDING LIMIT
	MAJOR OVERLAND FLOW ROUTE

FF: FINISHED FLOOR
TFW: TOP OF FOUNDATION
USF: UNDERSIDE OF FOOTING



SECTION B-B – TYPICAL GRADING
N.T.S.

NOT FOR CONSTRUCTION

NOTES
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NO.	REVISION DESCRIPTION	DATE	BY
1	ISSUED FOR ZONING BY-LAW AMENDMENT	10/02/22	AHJ

SCALE
HORIZONTAL 1:250

LICENSED PROFESSIONAL ENGINEER Feb.2/22 B. L. MACKECHNIE 100199554 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER FEB. 10, 2022 A.H. JONKMAN PROVINCE OF ONTARIO

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

DESIGN	BLM
CHECKED	AHJ
DRAWN	BLM
CHECKED	AHJ
APPROVED	AHJ

JENNIFER McGAHAN
WIRE INVESTMENT CORP.

1835 STITTSVILLE MAIN STREET
STITTSVILLE, ON

GRADING PLAN

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

Attachment B

FUS Calculations

Hydrant Location Plan

Fire Flow Report

Peak Hour Pressure Report

FUS Fire Flow Calculations

Calculations Based on 1999 Publication "Water Supply for Public Fire Protection" by Fire Underwriters' Survey (FUS)

Project No.: 22008
Project Name: 1835 Stittsville Main Street
Date: Feb. 02-22

Building Type/Description/Name: Existing Single Family Home
2 Storeys

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units per TH Block)	Type of Housing	Single Family	1	Single Family	1	Units	
			Townhouse - indicate # of units	1				
			Other (comm, ind, etc.)	1				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement):			2	2	Storeys	
2.3	Length-height factor	Length	North Side	6.9	Length-Height factor	13.8	m.Storeys	
			East Side	36.0	Length-Height factor	72	m.Storeys	
			South Side	8.0	Length-Height factor	16	m.Storeys	
			West Side	33.9	Length-Height factor	67.8	m.Storeys	
3	Enter Ground Floor Area of One Unit	Enter Ground Floor Area (A) of One Unit Only:			310	620	Area in Square Metres (m^2)	
		Measurement Units	Square Feet (ft^2)	0.09290304	Square Metres (m2)			
			Square Metres (m^2)	1				
			Hectares (ha)	10,000				
4	Obtain Required Fire Flow Without Reductions	Required Fire Flow (without reductions or increases per FUS) (F=220*C*√A), round to nearest 1000 L/min						8000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited Combustible	-0.15	N/A	6800
			Limited Combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid Burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Complete Automatic Sprinkler Protection	-0.3	None	0	N/A	0
			None	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	24.5	8%	0.34	N/A	2312
			East Side	36.0	5%			
			South Side	13.6	12%			
			West Side	30.0	9%			
6	Obtain Required Fire Flow, Duration & Volume	***Total Required Fire Flow, rounded to nearest 1000 L/min:***						**9000**
		Total Required Fire Flow (above) in L/s:						**150**
		Required Duration of Fire Flow (hrs):						**2**
		Required Volume of Fire Flow (m^3):						**1080**

Note: The most current FUS document should be referenced before design to ensure that the above figures are consistent with the intent of the Guidelines

Legend	
	Drop down menu - choose option, or enter value
	No information, No input required

FUS Fire Flow Calculations

Calculations Based on 1999 Publication "Water Supply for Public Fire Protection" by Fire Underwriters' Survey (FUS)

Project No.: 22008
Project Name: 1835 Stittsville Main Street
Date: Feb. 02-22

Building Type/Description/Name: Single Family Home - Lot #2
2 Storeys

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units per TH Block)	Type of Housing	Single Family	1	Single Family	1	Units	
			Townhouse - indicate # of units	1				
			Other (comm, ind, etc.)	1				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement):			2	2	Storeys	
2.3	Length-height factor	Length	North Side	19.3	Length-Height factor	38.6	m.Storeys	
			East Side	9.0	Length-Height factor	18	m.Storeys	
			South Side	19.3	Length-Height factor	38.6	m.Storeys	
			West Side	15.0	Length-Height factor	30	m.Storeys	
3	Enter Ground Floor Area of One Unit	Enter Ground Floor Area (A) of One Unit Only:			210	420	Area in Square Metres (m^2)	
		Measurement Units	Square Feet (ft^2)	0.09290304	Square Metres (m2)			
			Square Metres (m^2)	1				
			Hectares (ha)	10,000				
4	Obtain Required Fire Flow Without Reductions	Required Fire Flow (without reductions or increases per FUS) (F=220*C*√A), round to nearest 1000 L/min						7000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited Combustible	-0.15	N/A	5950
			Limited Combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid Burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Complete Automatic Sprinkler Protection	-0.3	None	0	N/A	0
			None	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	4.4	18%	0.39	N/A	2320.5
			East Side	22.4	8%			
			South Side	20.3	8%			
			West Side	73.0	5%			
6	Obtain Required Fire Flow, Duration & Volume				***Total Required Fire Flow, rounded to nearest 1000 L/min:***			8000
					Total Required Fire Flow (above) in L/s:			133.333
					Required Duration of Fire Flow (hrs):			2
					Required Volume of Fire Flow (m^3):			960

Note: The most current FUS document should be referenced before design to ensure that the above figures are consistent with the intent of the Guidelines

Legend	
	Drop down menu - choose option, or enter value
	No information, No input required

FUS Fire Flow Calculations

Calculations Based on 1999 Publication "Water Supply for Public Fire Protection" by Fire Underwriters' Survey (FUS)

Project No.: 22008
Project Name: 1835 Stittsville Main Street
Date: Feb. 02-22

Building Type/Description/Name: Single Family Home - Lot #3
2 Storeys

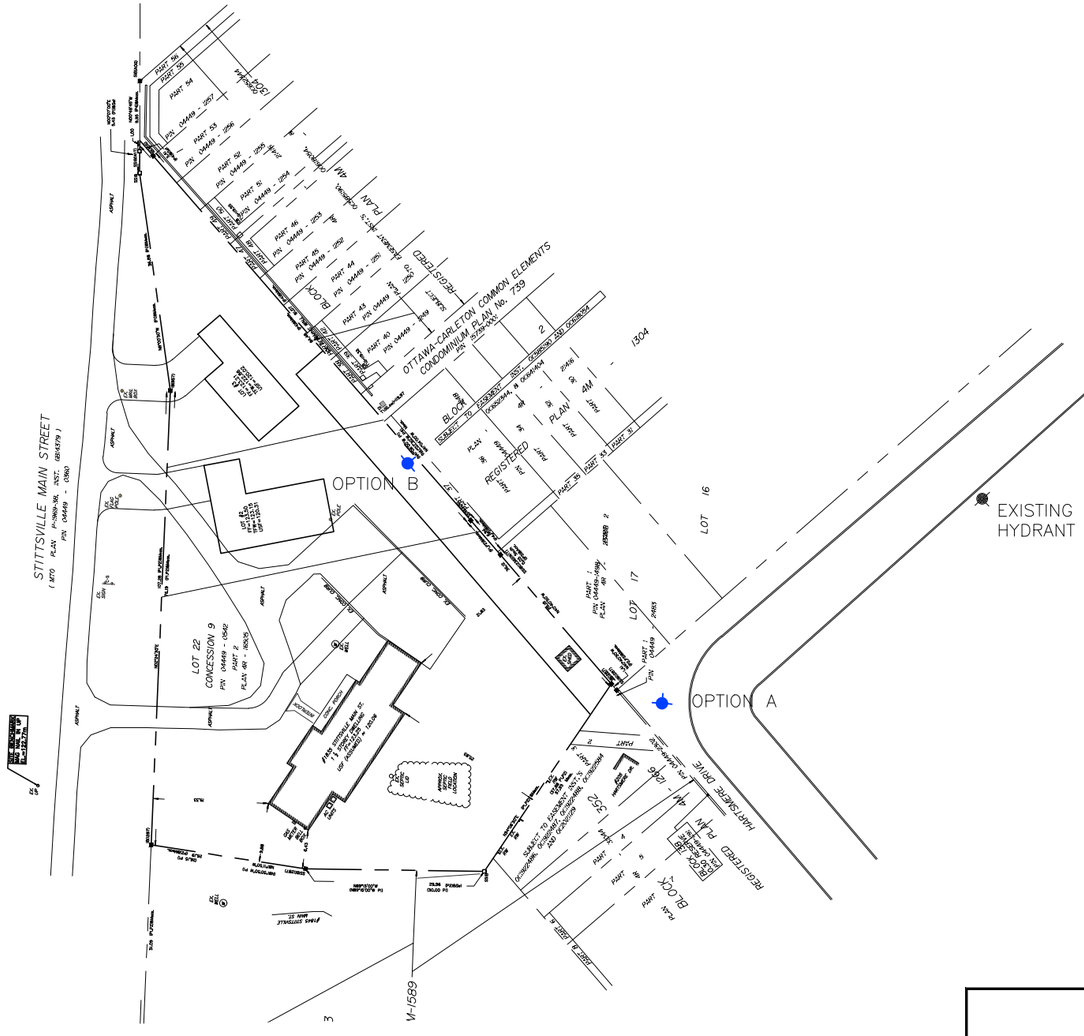
Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units per TH Block)	Type of Housing	Single Family	1	Single Family	1	Units	
			Townhouse - indicate # of units	1				
			Other (comm, ind, etc.)	1				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement):			2	2	Storeys	
2.3	Length-height factor	Length	North Side	19.3	Length-Height factor	38.6	m.Storeys	
			East Side	9.0	Length-Height factor	18	m.Storeys	
			South Side	19.3	Length-Height factor	38.6	m.Storeys	
			West Side	15.0	Length-Height factor	30	m.Storeys	
3	Enter Ground Floor Area of One Unit	Enter Ground Floor Area (A) of One Unit Only:			155	310	Area in Square Metres (m^2)	
		Measurement Units	Square Feet (ft^2)	0.09290304	Square Metres (m2)			
			Square Metres (m^2)	1				
			Hectares (ha)	10,000				
4	Obtain Required Fire Flow Without Reductions	Required Fire Flow (without reductions or increases per FUS) (F=220*C*√A), round to nearest 1000 L/min						6000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited Combustible	-0.15	N/A	5100
			Limited Combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid Burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Complete Automatic Sprinkler Protection	-0.3	None	0	N/A	0
			None	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	77.0	5%	0.4	N/A	2040
			East Side	16.8	12%			
			South Side	4.4	18%			
			West Side	74.0	5%			
6	Obtain Required Fire Flow, Duration & Volume	***Total Required Fire Flow, rounded to nearest 1000 L/min:***						7000
		Total Required Fire Flow (above) in L/s:						116.667
		Required Duration of Fire Flow (hrs):						2
		Required Volume of Fire Flow (m^3):						840

Note: The most current FUS document should be referenced before design to ensure that the above figures are consistent with the intent of the Guidelines

Legend	
	Drop down menu - choose option, or enter value
	No information, No input required

EXISTING HYDRANT



LEGEND

- PROPERTY BOUNDARY
- EASEMENT
- EXISTING HYDRANT
- PROPOSED HYDRANT

0 10m 20m 40m

HORIZONTAL 1:1000

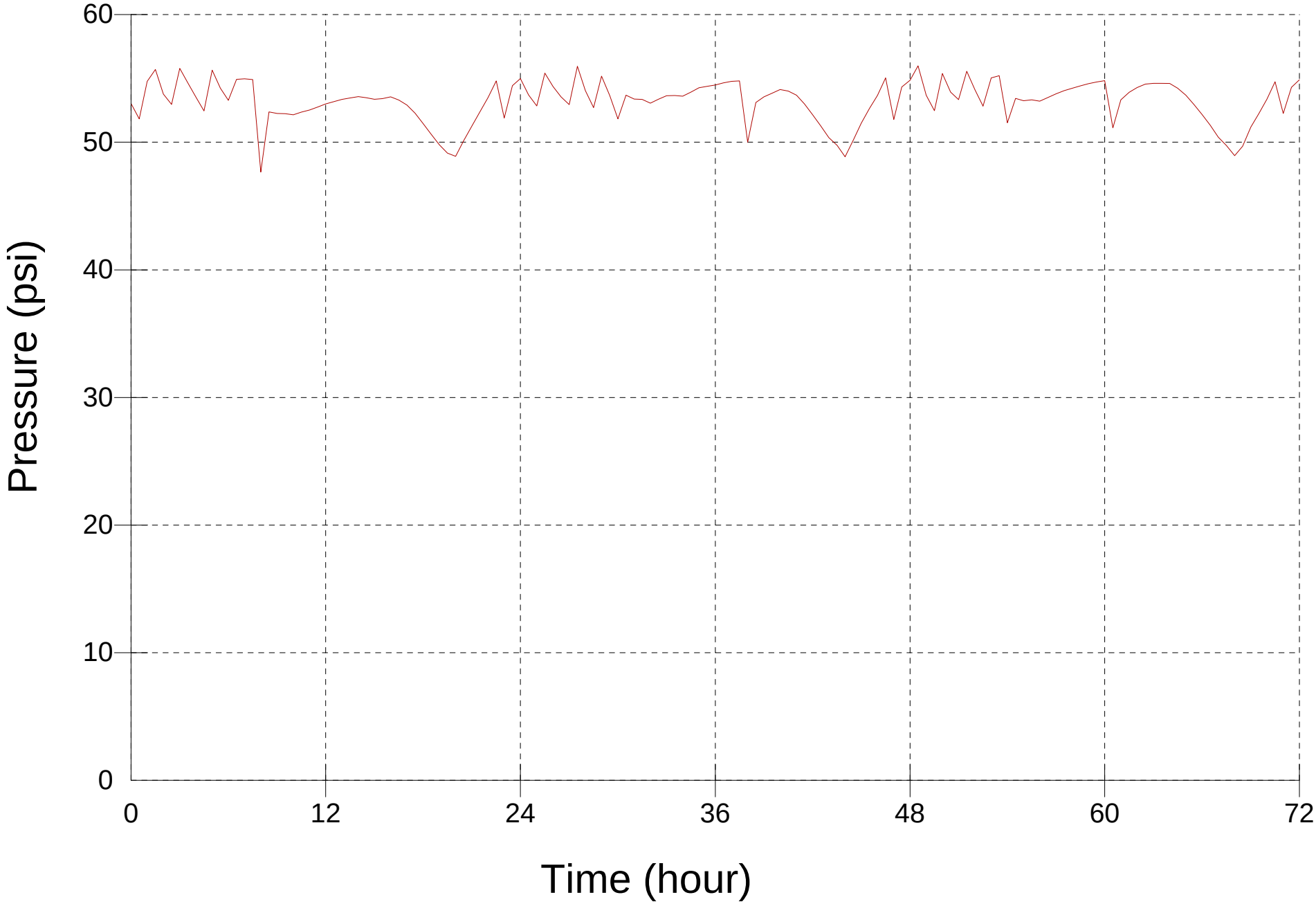
Robinson
Land Development

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

		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		J_A	6,959.951	J_B	33.124	144.701	9,562.104	20.000
2		J_B	6,959.951	J_B	0.945	122.065	5,418.698	20.000

		ID	Available Flow Head (m)
1		J_A	134.069
2		J_B	135.469

Junction J TEMP 9000 [MXDY SUMMER 1YR 2016]



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

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION			FLOW																	PROPOSED SEWER						
FROM MH	TO MH	STREET	RESIDENTIAL UNITS				PARK	COMMERCIAL	INDIVIDUAL		CUMULATIVE				PEAK FACTOR (M)	POPUL. FLOW	PEAK PARK FLOW	PEAK COMMERCIAL FLOW	PEAK EXTRAN. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	TYPE	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			SINGLES	SEMIS/ TOWNS	STACKS	APT.	PARK AREA (ha.)	COMMERCIAL AREA (ha.)	POPUL. (1000's)	AREA (ha.)	POPUL. (1000's)	PARK AREA (ha)	COMMERCIAL AREA (ha)	RESIDENTIAL AREA (ha.)		Q(p) L/s	Q(pk) L/s	Q(c) L/s	Q(e) (L/s)	Q(d) (L/s)							
221	219	PARADE			70				0.161	1.023	0.161	0.00	0.00	1.023	4.000	2.609	0.00	0.00	0.287	2.895	35.3	200	PVC	1.15	36.693	1.13	8%
219	217	PARADE	4	9					0.038	0.596	0.199	0.00	0.00	1.620	4.000	3.223	0.00	0.00	0.454	3.676	75.7	200	PVC	1.85	46.540	1.44	8%
217	215	PARADE		5					0.014	0.293	0.212	0.00	0.00	1.913	4.000	3.442	0.00	0.00	0.536	3.977	83.3	200	PVC	2.20	50.751	1.56	8%
267	215	HARSTMERE		12		100			0.242	1.027	0.242	0.00	0.00	1.027	4.000	3.928	0.00	0.00	0.288	4.215	84.3	200	PVC	0.40	21.640	0.67	19%
215	213	PARADE	2						0.007	0.190	0.462	0.00	0.00	3.131	3.992	7.464	0.00	0.00	0.877	8.341	54.0	200	PVC	1.85	46.540	1.44	18%
213	211	PARADE	7						0.024	0.412	0.485	0.00	0.00	3.543	3.981	7.828	0.00	0.00	0.992	8.820	69.0	200	PVC	1.85	46.540	1.44	19%
211	209	PARADE	6				1.33		0.020	1.694	0.506	1.33	0.00	5.238	3.972	8.138	0.06	0.00	1.467	9.665	75.0	200	PVC	1.55	42.599	1.31	23%
257	255	CAPMOLINA	9						0.031	0.893	0.031	0.00	0.00	0.893	4.000	0.496	0.00	0.00	0.250	0.746	120.0	200	PVC	1.50	41.907	1.29	2%
265	255	FALABELLA	5		82				0.206	1.531	0.206	0.00	0.00	1.531	4.000	3.331	0.00	0.00	0.429	3.760	77.4	200	PVC	0.50	24.195	0.75	16%
255	253	CAPMOLINA	7						0.024	0.557	0.260	0.00	0.00	2.982	4.000	4.213	0.00	0.00	0.835	5.048	84.0	200	PVC	0.55	25.376	0.78	20%
263	253	QUARTER HORSE	13						0.044	0.761	0.044	0.00	0.00	0.761	4.000	0.716	0.00	0.00	0.213	0.929	119.4	200	PVC	0.40	21.640	0.67	4%
253	251	CAPMOLINA	5						0.017	0.425	0.321	0.00	0.00	4.169	4.000	5.205	0.00	0.00	1.167	6.372	81.9	200	PVC	1.60	43.281	1.33	15%
261	251	LIPIZZANER		31					0.084	0.940	0.084	0.00	0.00	0.940	4.000	1.356	0.00	0.00	0.263	1.620	117.2	200	PVC	0.60	26.504	0.82	6%
251	249	CAPMOLINA	7						0.024	0.573	0.429	0.00	0.00	5.683	4.000	6.947	0.00	0.00	1.591	8.538	90.3	200	PVC	1.35	39.756	1.23	21%
249	247	CAPMOLINA	7						0.024	0.616	0.453	0.00	0.00	6.299	3.996	7.325	0.00	0.00	1.764	9.089	98.3	200	PVC	1.35	39.756	1.23	23%
247	245	CAPMOLINA	1						0.003	0.148	0.456	0.00	0.00	6.448	3.995	7.377	0.00	0.00	1.805	9.182	10.9	200	PVC	1.35	39.756	1.23	23%
245	243	CAPMOLINA	11						0.037	0.632	0.493	0.00	0.00	7.080	3.977	7.948	0.00	0.00	1.982	9.930	71.4	200	PVC	0.60	26.504	0.82	37%
243	209	CAPMOLINA	8						0.027	0.432	0.521	0.00	0.00	7.512	3.965	8.361	0.00	0.00	2.103	10.464	55.9	200	PVC	0.60	26.504	0.82	39%
209	207	PARADE	7						0.024	0.411	1.050	1.33	0.00	13.162	3.786	16.106	0.06	0.00	3.685	19.850	82.0	250	PVC	0.85	57.197	1.13	35%
207	205	PARADE	7	9					0.048	0.622	1.098	1.33	0.00	13.784	3.773	16.787	0.06	0.00	3.860	20.704	82.0	250	PVC	0.85	57.197	1.13	36%
241	205	PEDIGREE	14						0.048	0.776	0.048	0.00	0.00	0.776	4.000	0.771	0.00	0.00	0.217	0.989	119.0	200	PVC	0.35	20.243	0.62	5%
205	203	PARADE	7	9					0.048	0.609	1.194	1.33	0.00	15.170	3.749	18.132	0.06	0.00	4.248	22.437	82.0	250	PVC	0.60	48.055	0.95	47%
239A	239B	MANEGE	16						0.054	0.865	0.054	0.00	0.00	0.865	4.000	0.881	0.00	0.00	0.242	1.124	107.7	200	PVC	0.40	21.640	0.67	5%
239B	203	MANEGE							0.000	0.000	0.054	0.00	0.00	0.865	4.000	0.881	0.00	0.00	0.242	1.124	11.1	200	PVC	0.40	21.640	0.67	5%
203	201	PARADE	7						0.024	0.417	1.272	1.33	0.00	16.453	3.730	19.222	0.06	0.00	4.607	23.886	82.0	250	PVC	0.60	48.055	0.95	50%
237	235	STALLION	1	28					0.079	0.893	0.079	0.00	0.00	0.893	4.000	1.280	0.00	0.00	0.250	1.530	112.8	200	PVC	0.50	24.195	0.75	6%
235	233	STALLION	2						0.007	0.256	0.086	0.00	0.00	1.150	4.000	1.390	0.00	0.00	0.322	1.712	11.0	200	PVC	0.50	24.195	0.75	7%
233	231	STALLION	5						0.017	0.431	0.103	0.00	0.00	1.581	4.000	1.666	0.00	0.00	0.443	2.108	74.2	200	PVC	0.50	24.195	0.75	9%
231	229	STALLION	4						0.014	0.499	0.116	0.00	0.00	2.081	4.000	1.886	0.00	0.00	0.583	2.469	82.0	200	PVC	0.50	24.195	0.75	10%
229	227	STALLION	4						0.014	0.483	0.130	0.00	0.00	2.564	4.000	2.106	0.00	0.00	0.718	2.824	74.7	200	PVC	0.50	24.195	0.75	12%
227	225	STALLION	2						0.007	0.230	0.137	0.00	0.00	2.794	4.000	2.217	0.00	0.00	0.782	2.999	10.9	200	PVC	0.50	24.195	0.75	12%
225	223	STALLION	11						0.037	0.541	0.174	0.00	0.00	3.336	4.000	2.823	0.00	0.00	0.934	3.757	113.2	200	PVC	0.50	24.195	0.75	16%
223	201	STALLION	8						0.027	0.418	0.201	0.00	0.00	3.754	4.000	3.263	0.00	0.00	1.051	4.315	11.1	200	PVC	0.50	24.195	0.75	18%
201	159	PARADE	6						0.020	0.410	1.494	1.33	0.00	20.62	3.681	22.275	0.06	0.00	5.773	28.105	82.0	300	PVC	0.50	71.334	0.98	39%
157	155	BECKETT	11						0.037	0.530	0.037	0.00	0.00	0.530	4.000	0.606	0.00	0.00	0.148	0.754	112.7	200	PVC	0.40	21.640	0.67	3%
155	159	BECKETT	6						0.020	0.330	0.058	0.00	0.00	0.860	4.000	0.937	0.00	0.00	0.241	1.177	12.0	200	PVC	0.70	28.628	0.88	4%
159	145	PARADE	13						0.044	0.631	1.596	1.33	0.00	22.108	3.660	23.661	0.06	0.00	6.190	29.908	82.0	300	PVC	0.50	71.334	0.98	42%
157	153	BECKETT	2						0.007	0.244	0.007	0.00	0.00	0.244	4.000	0.110	0.00	0.00	0.068	0.179	10.9	200	PVC	0.30	18.741	0.58	1%
153	151	BECKETT	6						0.020	0.561	0.027	0.00	0.00	0.805	4.000	0.441	0.00	0.00	0.226	0.666	66.8	200	PVC	0.30	18.741	0.58	4%
151	149	BECKETT	1						0.003	0.114	0.031	0.00	0.00	0.920	4.000	0.496	0.00	0.00	0.258	0.753	11.1	200	PVC	0.50	24.195	0.75	3%
149	147	BECKETT		14					0.038	0.445	0.068	0.00	0.00	1.365	4.000	1.108	0.00	0.00	0.382	1.491	112.3	200	PVC	0.50	24.195	0.75	6%
147	145	BECKETT		9					0.024	0.393	0.093	0.00	0.00	1.759	4.000	1.502	0.00	0.00	0.492	1.994	11.9	200	PVC	0.85	31.546	0.97	6%
145	143	PARADE	9						0.031	0.589	1.719	1.33	0.00	24.456	3.636	25.322	0.06	0.00	6.848	32.226	74.3	300	PVC	0.50	71.334	0.98	45%
143	141	PARADE	3						0.010	0.262	1.729	1.33	0.00	24.719	3.634	25.459	0.06	0.00	6.921	32.436	13.9	300	PVC	0.50	71.334	0.98	45%
141	139	PARADE	6						0.020	0.359	1.750	1.33	0.00	25.078	3.630	25.732	0.06	0.00	7.022	32.810	61.2	300	PVC	0.50	71.334	0.98	46%
139	137	PARADE	12						0.041	0.569	1.791	1.33	0.00	25.647	3.623	26.277	0.06	0.00	7.181	33.514	60.8	300	PVC	0.50	71.334	0.98	47%
137	135	PARADE	2						0.007	0.222	1.797	1.33	0.00	25.870	3.621	26.368	0.06	0.00	7.244	33.667	12.3	300	PVC	0.50	71.334	0.98	47%
135	133	PARADE	5						0.017	0.404	1.814	1.33	0.00	26.274	3.618	26.594	0.06	0.00	7.357	34.007	74.3	300	PVC	0.50	71.334	0.98	48%

STITTSVILLE SOUTH - AREA 6
SANITARY SEWER DESIGN SHEET

JOB# 113004

NOVATECH
Engineers, Planners & Landscape Architects

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) = (PxqxM/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

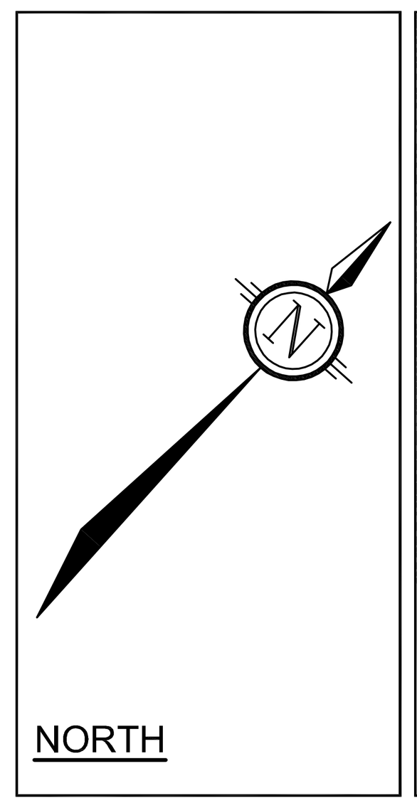
Date	April 5, 2016		
Design	BHB		
Job No.		**Dwg. Reference:**	**Checked and Stamped:**
113004		113004-SAN	--

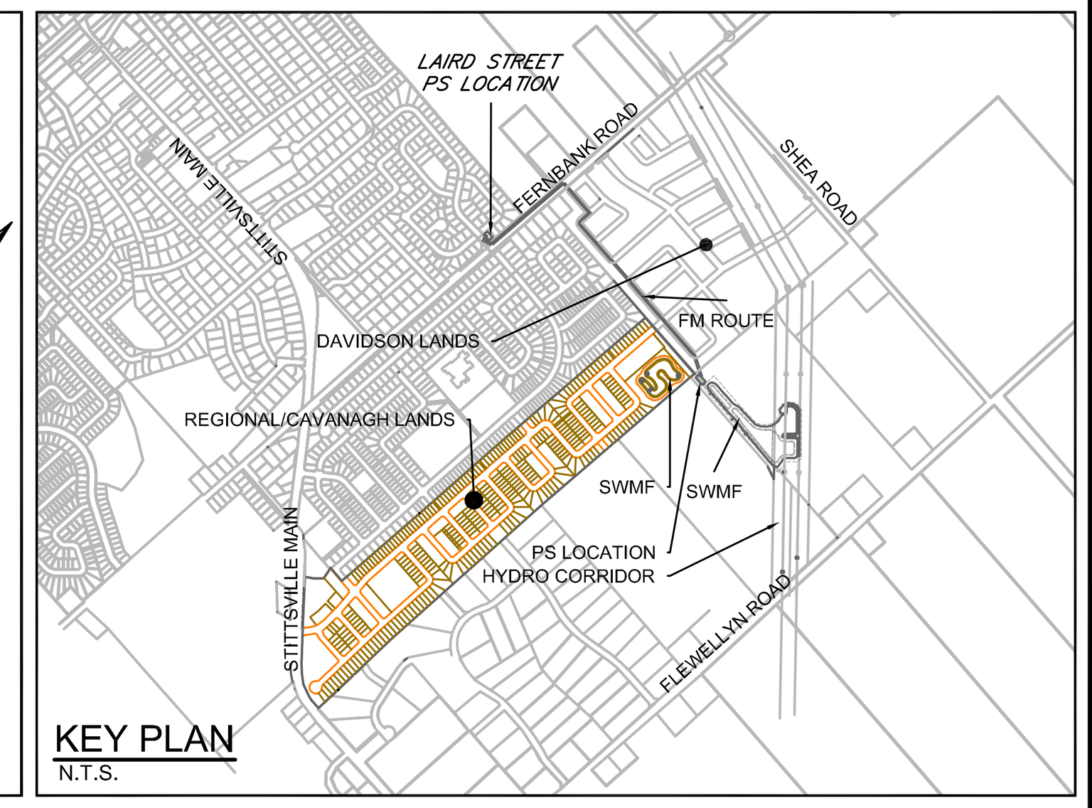
LICENSED PROFESSIONAL ENGINEER
B. H. BAHIA
100164647
April 5, 2016.
PROVINCE OF ONTARIO

LEGEND

SANITARY DRAINAGE AREA

4.68	DRAINAGE AREA (hectares)
COMM 1	MAHOLE TO MANHOLE
0	POULATION
0	NUMBER OF UNITS





KEY PLAN
N.T.S.

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

No.	REVISION	DATE	BY
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

DESIGN	BCS/TGP
CHECKED	BHB
DRAWN	BCS/TGP
CHECKED	BHB
APPROVED	GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
B. H. BAHIA
100164647
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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

PLANB1.DWG - 1000mmx707mm

SANITARY SEWER DESIGN SHEET
1835 STITTSVILLE MAIN STREET, STITTSVILLE

LOCATION			RESIDENTIAL AREA AND POPULATION				RESIDENTIAL FLOW				PIPE						
			INDIVIDUAL		CUMULATIVE												
STREET	FROM MH	TO MH	POP.	AREA (ha)	POP.	AREA (ha)	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
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**
EX EASEMENT	*103*	*EX 267*	*0.0*	*0.00*	*10.2*	*0.53*	*3.73*	*0.12*	*0.17*	*0.30*	*17.1*	*201.16*	*0.76*	*29.07*	*0.91*	*28.77*	*1.03*

DESIGN PARAMETERS

Average Daily Flow =	280	L/person/day
Comm./Inst. Flow =	28000	L/ha/day
Industrial Flow =		
Maximum Residential Peak Factor =	4.0	
Harmon - Correction Factor (K) =	0.8	
Comm./Inst. Peak Factor =	1.5	
Extraneous Flow =	0.33	L/s/ha
Minimum Velocity =	0.6	m/s
Maximum Velocity =	3.0	m/s

Per Unit Populations:

Single Family	3.4 persons/unit
Semi-detached	2.7 persons/unit
Duplex	2.3 persons/unit
Townhouse	2.7 persons/unit
Apartments:	
Bachelor	1.4 persons/unit
1 Bedroom	1.4 persons/unit
2 Bedroom	2.1 persons/unit
3 Bedroom	3.1 persons/unit
Average Apt.	1.8 persons/unit

Robinson
Land Development

Attachment D

Novatech Storm Sewer Design Sheet

Novatech Storm Drainage Area Plan

Storm Sewer Design Sheet

Stittsville Area 6
STORM SEWER DESIGN SHEET (5-YEAR EVENT)
JOB# 113004

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)									FLOW							PROPOSED SEWER								
Area	Street	FROM MH	TO MH	R= 0.20	R= 0.40	R= 0.45	R= 0.50	R= 0.55	R= 0.60	R= 0.65	R= 0.70	R= 0.75	INDIV. 2.78 AC	ACCUML. 2.78 AC	TIME OF CONC.	DESIGN STORM	RAINFALL INTENSITY	Peak Flow (L/sec) Q 5YR	Peak Flow (L/sec) Q total	DIA. ACTUAL (mm)	DIA. (mm)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	FLOW TIME (min)	Ratio (Q/Qfull)
A-01	PARADE	220	218								0.07		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						0.10				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								0.21		0.41	0.72														
															10.68													
A-04	PARADE	216	214									0.87	1.82	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
															15.00													
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								0.51		0.99	4.00														
															15.52													
A-10	HEARTSMERE	266	214						0.22				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								0.29		0.55	0.93														
															11.12													
A-12	PARADE	214	212						0.16				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								0.16		0.30	5.50														
A-14	PARADE	212	210								0.16		0.32	5.82	15.82	5	81.00	471.4	471.4	0.610	600	CONC	1.85	71.7	870.7	2.98	0.40	54%
A15	PARADE	210	208	1.01									0.56	0.56	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%
A-16	PARADE	210	208			0.21							0.26	0.26														
A-17	PARADE	210	208								0.29		0.57	7.21														
															16.64													
A-18, A-19	CAMPOLINA	256	254								0.49		0.95	0.95	10.00	5	104.19	98.5	98.5	0.381	375	PVC	1.6	120.0	231.2	2.03	0.99	43%
															10.99													
A-20	FALABELLA	264	254									1.13	2.36	2.36	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-21	FALABELLA	264	254								0.30		0.59	2.95	15.00	5	83.56	246.1	246.1	0.610	600	CONC	0.50	77.3	452.7	1.55	0.83	54%
															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														
A-24	CAMPOLINA	254	252								0.37		0.71	5.47														
															16.32													
A-25, A-26, A-27	QUARTER HORSE	216	252								0.45		0.88	0.88	10.00	5	104.19	91.2	91.2	0.457	450	CONC	0.40	119.4	188.0	2.75	0.72	49%
															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								0.23		0.46	6.81														
															16.78													
A-30,31	LIPIZZANER	260	250								0.52		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%
															10.73													
A-32	CAMPOLINA	250	248								0.24		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														
A-33, A-36	CAMPOLINA	248	246								0.27		0.52	9.89														
A-37	CAMPOLINA	246	244										0.00	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	244	242								0.42		0.83	10.72	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-38	CAMPOLINA	242	208								0.22		0.42	11.14	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%
															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						0.636				1.06	19.93														
															19.18													

Stittsville Area 6
STORM SEWER DESIGN SHEET (5-YEAR EVENT)
JOB# 113004

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)									FLOW							PROPOSED SEWER								
Area	Street	FROM MH	TO MH	R= 0.20	R= 0.40	R= 0.45	R= 0.50	R= 0.55	R= 0.60	R= 0.65	R= 0.70	R= 0.75	INDIV. 2.78 AC	ACCUML. 2.78 AC	TIME OF CONC.	DESIGN STORM	RAINFALL INTENSITY	Peak Flow (L/sec) Q 5YR	Peak Flow (L/sec) Q total	DIA. ACTUAL (mm)	DIA. (mm)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	FLOW TIME (min)	Ratio (Q/Qfull)
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								0.25		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								0.29		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								0.37		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								0.47		0.92	1.43														
															11.19													
A-49	PARADE	204	202								0.48		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								0.50		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								0.31		0.61	27.68														
															20.65													
A-57	STALLION	232	230								0.27		0.53	0.53	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-58	STALLION	230	228		0.33								0.37	0.37	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-59	STALLION	230	228								0.31		0.61	1.51														
A-60	STALLION	228	226		0.07								0.07	0.07	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-61	STALLION	228	226								0.28		0.55	2.14														
A-62	STALLION	224	222								0.34		0.66	2.79	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-63	STALLION	222	200								0.23		0.45	3.25	12.68	5	91.89	298.2	298.2	0.762	750	CONC	0.50	59.7	820.8	1.80	0.55	36%
															13.23													
A-64	PARADE	200	152			0.30							0.38	0.38														
A-65	PARADE	200	152			0.28							0.34	0.34	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-66	PARADE	200	152								0.31		0.60	32.25														
															21.15													
A-67, A-68	BECKETT	150	148								0.54		1.05	1.05	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-67, A-68	BECKETT	148	152										0.00	1.05	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-69	PARADE	152	138								0.28		0.54	33.84	21.15	5	67.83	2,295.4	2,295.4	1.372	1350	CONC	0.50	85.0	3,935.9	2.75	0.52	58%
															21.66													
A-70	BECKETT	150	146										0.00	0.00	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-70	BECKETT	146	144								0.30		0.57	0.57	10.23	5	103.00	59.1	59.1	0.457	450	CONC	0.30	68.0	162.8	2.75	0.41	36%
A-70	BECKETT	144	142										0.00	0.57	10.64	5	100.92	57.9	57.9	0.533	525	CONC	0.50	12.3	317.0	1.42	0.14	18%
A-71	BECKETT	142	140			0.37							0.46	0.46	10.79	5	100.22	203.8	203.8	0.610	600	CONC	0.50	111.4	452.7	2.75	0.68	45%
A-72, A-73	BECKETT	142	140								0.51		1.00	2.03														
A-72, A-73	BECKETT	140	138										0.00	2.03	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													

Stittsville Area 6
STORM SEWER DESIGN SHEET (5-YEAR EVENT)
JOB# 113004

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				AREA (ha)									FLOW							PROPOSED SEWER								
Area	Street	FROM MH	TO MH	R= 0.20	R= 0.40	R= 0.45	R= 0.50	R= 0.55	R= 0.60	R= 0.65	R= 0.70	R= 0.75	INDIV. 2.78 AC	ACCUML. 2.78 AC	TIME OF CONC.	DESIGN STORM	RAINFALL INTENSITY	Peak Flow (L/sec) Q 5YR	Peak Flow (L/sec) Q total	DIA. ACTUAL (mm)	DIA. (mm)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (L/s)	VELOCITY (m/s)	FLOW TIME (min)	Ratio (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								0.522		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								0.32		0.62	38.37														
A-80	PARADE	132	130								0.35		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		0.59	41.45														
															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								0.31		0.59	0.79														
A-87	HICKSTEAD	114	126								0.35		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%
															11.56													
A-88	PARADE	126	124				0.40						0.55	0.55														
A-89	PARADE	126	124								0.19		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%
															24.06													
A-90	CAVALLO	110	112								0.25		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								0.33		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%
															10.97													
A-92	PARADE	124	122				0.40						0.55	0.55	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-93	PARADE	124	122								0.42		0.82	46.35														
															24.62													
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								0.23		0.44	0.77														
A-96	HICKSTEAD	110	104								0.28		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%
															11.41													
A-97	HICKSTEAD	108	106			0.09							0.11	0.11	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-98	HICKSTEAD	108	106								0.26		0.50	0.61														
A-99	HICKSTEAD	106	104			0.16							0.20	0.20	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-100	HICKSTEAD	106	104			0.32							0.40	0.40														
A-101, A-102	HICKSTEAD	106	104								0.45		0.87	2.08														
															12.76													
A-103	PARADE	104	102								0.46		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)

Stittsville Area 6 - Regional and Cavanagh Lands
STORM SEWER DESIGN SHEET

Date	April 5, 2016		
Design	T.P.	B.C.S	
Job No.	**Dwg. Reference:**	**Checked and Stamped:**	
113004	113004-STM	BHB	

M:\2013\113004\CAD\Design\113004-STM.dwg, CAVANGH, Jul 19, 2016 - 10:10am, tphillips

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

REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed ______
Date ______ 2016
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

DESIGN BCS/TGP
CHECKED BHB
DRAWN BCS/TGP
CHECKED BHB
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
B. H. BAHIA
100164647
July 18, 2016
PROVINCE OF ONTARIO

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CITY OF OTTAWA
STITTSVILLE SOUTH - AREA 6

STORM DRAINAGE AREA PLAN

PROJECT No. 113004-00
REV REV # 5
DRAWING No. 113004-STM1

PLANB1.DWG - 1000mmx707mm

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:
1. Rainfall intensity calculated using City of Ottawa IDF curve equatios.
2. 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
3. Manning's roughness coefficient = 0.013
4. 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 = $732.951 / (\text{Time in min} + 6.199)^{0.810}$

Robinson
Land Development