Stormwater Management and Servicing Report

New 2 Storey and 3 Storey Mixed-Use Buildings
875 Montreal Road
Ottawa, Ontario, K1K 0S7

Prepared for:

PLACK Property Development
2083 Delmar Drive
Ottawa, Ontario
K1H 5P6

Attention: Mr. Kevin Kozak

LRL File No.: 190084

January 13th, 2020

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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Mr. Kevin Kozak to complete a Stormwater Management Analysis and Servicing Brief for two proposed multi-use developments (2-storey and 3-storey) located at 875 Montreal Road in Ottawa, Ontario. The property is legally described as Lot 2 and part of Lot 1, Registered Plan 22, City Ward 13 (Rideau-Rockliffe). The location of the proposed development can be viewed in **Figure 1** below.

Figure 1: Arial View of Proposed Development Lot

The proposed building developments will be split into 2 phases.
Phase 1 will consist of the development of a 2-storey mixed-used building. The building with have a roof area of approximately 336 m^2 and consist of 2 units; 1 commercial unit (on ground floor) and 1 residential unit (on 2^{nd} level).
Phase 2 will consist of the development of a 3-storey mixed-use building. The building will have a roof area of approximately 226 m^2 and consist of 4 units; 1 commercial unit (on ground floor) and 3 residential units (on 2^{nd} & 3^{rd} levels).
The site will also encompass a paved parking lot at the rear (North end of lot). The balance of the lot will be landscaped area and paved walkways leading to building entrances/exits. The proposed development will have one vehicular entrance at Codd's road, along the West boundary of the property, and three pedestrian entrances, along via the sidewalk on Montreal road, at the South boundary of the lot.

This report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the new development. Should there be any changes in the design features, which may relate to the stormwater considerations, LRL Associates Ltd. should be advised to review the report recommendations.

2 FIELD WORK

The topographic survey work of the property was done on May 27th, 2019 by *Farley, Smith & Denis Surveying LTD. (Ontario Land Surveyors).* A site benchmark was established during the survey for future construction use. This benchmark (CP in North Face of Utility Pole) is located on the North side of Montreal Rd; the benchmark elevation is 103.97.

3 EXISTING SITE AND DRAINAGE DESCRIPTION

The proposed development is mostly a rectangular shape, with the exception of the South-West and South-East corners of the lot, which are cut due to the rounded curbs along Montreal road / Codd's road and Montreal road / Brunel street, respectively.

Not considering the aforementioned corners, the frontage of the lot (along Montreal road) is approximately 35.3m, with a depth of approximately 39.7m. With these dimensions, and considering the reduced corners, the property has a surface area of approximately 0.13 ha.

The property is surrounded with commercial properties/buildings along the South (across Montreal road), West (across Codd's road) and East (across Brunel street). A residential lot/building is found along the North boundary of the property.

Currently, the land is developed with a paved parking lot, and small commercial office. These will be demolished/removed prior to development.

Currently, overland water on the West side of the property flows West, uncontrolled, to the existing catchbasin located on Codd's road. Overland water in the center and East side of the property flows East, uncontrolled, to the existing catchbasin on Brunel street. Overland flow collected in both catchbasins will be conveyed to the existing 525mm diameter storm sewer running along Montreal road.

It is not currently known if prior development was serviced, the exact details of any service laterals are unknown at this time. If existing sanitary and water services are present, they are to be located and removed/capped, and new services are to be installed for the proposed development as per the design proposed. There is an existing sanitary manhole on the site, which is proposed to be removed. Both developments will have their own unique set of services. The proposed sanitary services will outlet to the existing 300 mm diameter concrete sanitary main along Montreal Road, and the proposed water services will connect to the existing 406 mm diameter PVC watermain, also running along Montreal road.

4 SCOPE OF WORK

As per applicable guidelines, the scope of work includes the following:

Stormwater management

- Calculate the allowable stormwater release rate.
- Calculate the anticipated post development stormwater release rates.
- Demonstrate how the target quantity objectives will be achieved.

Water services

- Calculate the expected water supply demand at average and peak conditions.
- Calculate the required fire flow as per the Fire Underwriters Survey (FUS) method.
- Confirm the adequacy of water supply and pressure during peak flow and fire flow.
- Describe the proposed water distribution network and connection to the existing system.

Sanitary services

- Describe the existing sanitary sewers available to receive wastewater from the building.
- Calculate peak flow rates from the development.
- Describe the proposed sanitary sewer system.

5 REGULATORY APPROVALS

An MECP Environmental Compliance Approval is not expected to be required for installation of the proposed storm and sanitary sewers within the site as the services will tie into City of Ottawa infrastructure within the roadway. A Permit to Take Water is not anticipated to be required for pumping requirements for sewer installation. The Rideau Valley Conservation Authority will need to be consulted in order to obtain municipal approval for site development. No other approval requirements from other regulatory agencies are anticipated.

6 STORMWATER MANAGEMENT

6.1 Existing Stormwater Infrastructure

As previously discussed, the South end of the subject property is bordered by Montreal road. Hence, the storm service connection will be located at Montreal road. At this location, a dedicated 525mm diameter storm sewer, flowing West, is available on the South side of the street.

In pre-development conditions, the majority of the stormwater would flow East, uncontrolled, overland to Brunel street. The balance, along the West boundary of the property, would flow West, uncontrolled, overland to Codd's road. The topography of the site in pre development conditions was reviewed to determine the direction of flow from overland runoff.
Refer to Appendix B for pre and post development watershed information.

6.2 Design Criteria

The stormwater management criteria for this development are based on pre consultation with City of Ottawa officials, the City of Ottawa Sewer Design Guidelines including City of Ottawa Stormwater Management Design Guidelines, 2012 (City standards), as well as the Ministry of the Environment's Stormwater Planning and Design Manual, 2003 (SWMP Manual).

6.2.1 Water Quality

There is no existing downstream stormwater management facility, the storm sewers will outlet directly to the Ottawa River. In the opinion of the RVCA, the distance to the outlet is sufficiently far that onsite quality controls would have negligible impact on surface water improvement. Stormwater runoff from the site will not require any additional quality control measures save and except best management practices.

Refer to Appendix C for the RVCA's opinion on water quality controls.

6.2.2 Water Quantity

All storm events up to and including the 100-year event will be controlled to the 5-year pre-development level. The site major overland flow route has been designed to ensure that storm events beyond the 100-year design storm can be safely conveyed overland towards the Codd's road right of way. The minor system (storm sewers) within the site are sized to convey the 5-year storm event flow from the site to the municipal storm sewer on Montreal road.

In the past, the site was occupied by a small single office trailer with a large portion of the property being covered in asphalt (impervious pavement), with little landscaped area. Post development conditions are introducing an increase in pervious surfaces (additional landscape), however, quantity control measures will still be required to meet City of Ottawa requirements. Within this section, the allowable release rate will be calculated using a runoff coefficient of C=0.5. The 100 year and 5-year post development flows will be controlled to the 5-year allowable flow rate of the site. Events greater than the 100-year storm are permitted to flow overland to the Right of Way (ROW).

Table 1 below summarizes the quantity controls for the 0.13 ha site for the 100 year and 5 year storm events.

Table 1: Summary of Stormwater Quantity Control Requirements

Quantity Control Parameters	Storm Sewer	
	5 Year Post Development	100 Year Post Development
Pre-Development Storm Event	5 Year	100 Year
Maximum Pre-Development Runoff Coefficient	0.5	0.5
Calculated Allowable Release Rate (L/s)	19.02	19.02

6.3 Method of Analysis

The Modified Rational Method has been used to calculate the runoff rate from the site to quantify the detention storage required for quantity control of the development. Refer to Appendix D for allowable release rate as well as storage calculations.

6.4 Allowable Release Rate

The maximum allowable release rate was calculated from the rational method for the 5-year pre development runoff using a runoff coefficient of C=0.5 as per City of Ottawa design guidelines. Runoff from post-development conditions must be controlled to the 5-year pre-development runoff using a maximum of C=0.5 for the runoff coefficient, for both minor and major storms (5-year up to 100-year storms), using a time of concentration not less than 10 minutes.

The formula used to calculate the allowable release rate is the following.

$$Q_{peak} = 2.78 * C * I * A$$

$$Q_{peak} = 2.78 * 0.5 * 104.2 * 0.131$$

$$\mathbf{Q_{peak} = 19.02\ L/s}$$

6.5 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished using a flow restrictor and overland ponding. The proposed site storm sewer and stormwater management system is shown on drawing C401 and C601 and detailed calculations, including the design sheet can be found in Appendix E.

The existing site is delineated by catchments EWS-01 and EWS-02. EWS-01, with an area of 0.026 ha, currently drains uncontrolled towards the West of the property. EWS-02, with an area of 0.106ha, currently drains uncontrolled towards the East of the property.

In pre-development conditions, the majority of the lot was an asphalt parking lot, with little landscaped area and an office/trailer at the rear of the property.

In post development conditions, significant changes will be made to the existing lot.

The bulk of the lot will be covered by the proposed buildings. Landscaped areas will follow the property line along the boundaries of the lot, as well as surround the buildings. Pedestrian walkways will be included in the landscaped area to allow for pedestrian access to the buildings from the existing sidewalk on Montreal road, at the South of the property. The rear (North) of the property will be an asphalt parking lot, with a vehicular entrance on the West, coming in from Codd's road.

The site has been analyzed and post development watersheds have been allocated. A portion of the exterior landscape boundary at the front of the buildings (along the South property line) will drain off the property uncontrolled (denoted as WS-03 & WS-04 on drawing C702).

Overland flow within watershed WS-01 (0.024ha) will be captured by CB01 & CB02. Overland flow within WS-02 (0.084ha) will be captured CBMH03. The grading proposed will provide positive overland drainage to the respective proposed storm water control systems.

All overland water captured will be conveyed, via underground storm sewers, to the City storm sewer running along Montreal road at a maximum release rate of 19.02 L/s (calculated flow). Table 2 below summarizes the drainage areas. Detailed calculations can be seen in Appendix A.

Table 2: Drainage Areas

Drainage Area Name	Area	Runoff Coefficient
WS-01 (controlled)	0.023	0.72
WS-02 (controlled)	0.084	0.84
WS-03 (uncontrolled)	0.015	0.34
WS-04 (uncontrolled)	0.008	0.25

Table 3 below summarizes the release rate and storage volumes required to meet the allowable release rate.

Table 3: Stormwater Release Rate & Storage Volume Summary

Description	Site Area (ha)	Montreal road	
		100 Year Release Rate (L/s)	100 Year Storage (m^3)
Controlled Area	0.108	14.64	23.40
Uncontrolled Area	0.023	4.38	N/A
Total	**0.131**	**19.02**	

In order to regulate the runoff, stormwater quantity control will be implemented.

In order to throttle the 100-year storm flows, the storm water will be controlled at the proposed monitoring manhole using a John Meunier Hydrovex 100VHV-1 (or equivalent). This ICD along with parking lot ponding will control the storm water runoff quantity during the 100-year storm event. The property is graded to have a high-water level of 103.17 and providing storage as required with a maximum controlled release rate of the required storage is of **19.02 L/s**. The storage created by this ICD can be seen on Civil Plan C601, where ponding at CBMH03 will account for 26.74 m^3 of water storage, thus satisfying the calculated storage requirement of 23.40m^3.

Greater details on the Hydrovex quantity control device can be found in Appendix E.

Watersheds WS-03 (0.015ha) and WS-04 (0.008ha), consisting of grass pedestrian walkways, will flow uncontrolled. The water will be conveyed to the roadway, as per the grading plan, and will be captured by the existing storm catchbasins located on Brunel street, Codd's road and Montreal road.

7 WATER SUPPLY AND FIRE PROTECTION

7.1 Existing Water Supply Services and Fire Hydrant Coverage

The subject property is in the MONT water distribution network pressure zone. The subject property is located to the North of an existing 406 mm dia. water main running in the east-west direction on the North side of Montreal road.

There is currently one existing fire hydrant near the property, within 75m. Based on GeoOttawa and the survey prepared by *Farley, Smith & Denis Surveying LTD. (Ontario Land Surveyors)*, the fire hydrant is directly outside the South property line of 875 Montreal road, along the concrete sidewalk on the North end of Montreal road. There are also four additional existing fire hydrants within a 150m radius of the property.

The required fire flow has been determined and is detailed in the following section. As shown below, it has been determined that there is a enough existing hydrants in close proximity to the subject development to provide the required flow.
Table 4 below summarizes the fire hydrant locations, as well as the aggregate fire flow of the contributing hydrants within 150m of the proposed building.

Table 4: Fire Protection Summary Table

Building	Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Additional Fire Hydrant(s) within 150m	Combined Fire Flow (L/min)
Proposed 3 Story Development	13,300	1	4	5700 + (3800 x 4) = 20,900

A figure summarizing the location of each relative fire hydrant, within proximity of 875 Montreal road, can be seen in Appendix F.

7.2 Water Supply Demand and Fire Flow

According to the Ontario Building Code, water demand can be calculated based on the number of fixture units in the proposed development.
The interior layout and architectural floor plans have been reviewed, and fixtures have been calculated with the use of OBC Table 7.6.3.2.A.

The summary & calculations for the total fixtures units, equivalent GPM's and water demands for the Phase 1 and 2 developments can be found in Appendix G.

The fire flow requirements were estimated using the method prescribed by the Fire Underwriters' Survey (FUS). This method is based on the floor area of the building to be protected, the type and combustibility of the structural frame and the separation distances with adjoining building units. In order to determine the critical (maximum) demand of fire protection, the fire flow calculations were conducted for the total area of all storeys. Tables 5 & 6 included below, summarise the input parameters used for the FUS calculations. Minimum required fire flows of **103.3 L/s** (Phase 1) and **118.3 L/s** (Phase 2) were calculated for the water supply pressure analysis. Refer to Appendix G for the fire flow calculation sheet.

Table 5: Input Parameters for Fire Flow Calculations – Phase 1 Development

Parameter	Frame used for Building	Combustibility of Contents	Presence of Sprinklers	Separation Distance			
				North	East	South	West
Value according to FUS options	Ordinary Construction	Combustible	No	20.1m - 30m	Over 45m	Over 45m	0m – 3m
Surcharge/reduction from base flow	1.0	0%	-0%	10%	0%	0%	25%

Table 6: Input Parameters for Fire Flow Calculations – Phase 2 Development

Parameter	Frame used for Building	Combustibility of Contents	Presence of Sprinklers	Separation Distance			
				North	East	South	West
Value according to FUS options	Ordinary Construction	Combustible	No	10.1m - 20m	0m – 3m	Over 45m	30.1m – 45m
Surcharge/reduction from base flow	1.0	0%	-0%	15%	25%	0%	5%

Typical commercial and residential demands have been represented in the design by means of the proposed number of fixture units. For your reference, the floor plans for Phases 1 and 2 have been included in Appendix H.

7.3 Water Supply Servicing Design

The proposed phase 1 building will be serviced by a new 100mm dia. service. The proposed phase 2 building will be serviced by a new 150mm dia. service. The proposed services will connect to the existing watermain on Montreal road to the South of the proposed developments. Refer to LRL drawing C.401 for the layout of the proposed water services.
Table 8 below summarizes the design criteria which have been respected during the design of the water service connections at this development.

Table 7: Water Supply Design Criteria

Design Parameter	Value
Minimum watermain diameter	100 mm
Minimum cover	2.4 m
Desired pressure range under maximum daily flow conditions	50 and 80 psi
Minimum pressure under peak hourly flow conditions	40 psi
Minimum pressure under the maximum day plus fire flow condition	20 psi

In order to show that the existing municipal infrastructure is capable of delivering sufficient water for the proposed building within the desired pressure range, the water demand was checked and verified for under conditions mimicking peak daily water demand, peak hourly water demand and a scenario combining peak water demand with flow required for fire protection. The boundary conditions for this hydraulic analysis provided at the Montreal road connection from the City of Ottawa expressed as the level of hydraulic grade line (HGL), are summarized in Table 8.

Table 8: Hydraulic Analysis - Boundary Conditions

Water Pressure at McArthur Ave			
HGL (m)		Pressure	
		kPa	psi
Minimum	146.7	453.22	65.73
Maximum	147.0	456.17	66.16

The pressure losses were calculated using the Hazen Williams head loss equation. Calculations can be found in Appendix I. A summary of the calculations has been included in Table 9 below.

Table 9: Water Pressure Calculations (Phase 1)

Scenario	Allowable Operating Pressures	Calculated Pressure (psi)
Maximum Daily Demand	Between 50 and 80 psi	65.36
Maximum Hourly Demand	Between 40 and 80 psi	65.70
Maximum Daily Demand + Fire Flow	Greater than 20 psi	21.30

Table 10: Water Pressure Calculations (Phase 2)

Scenario	Allowable Operating Pressures	Calculated Pressure (psi)
Maximum Daily Demand	Between 50 and 80 psi	65.66
Maximum Hourly Demand	Between 40 and 80 psi	65.63
Maximum Daily Demand + Fire Flow	Greater than 20 psi	56.19

It can be confirmed that the pressure at the building are within the desirable range.

8 SANITARY SERVICE

8.1 Existing Sanitary Sewer Services

Existing infrastructure surrounding the proposed development were reviewed to determine that there is an existing 300 mm dia. concrete sanitary sewer running East-West along Montreal road. The existing sanitary sewer is currently installed at approximately 0.17% slope as per the road profiles provided by the City of Ottawa. Road profile drawings have been included in Appendix J.

8.2 Sanitary Sewer Servicing Design

The anticipated sanitary flow was derived based on the 100% utilization ratio, using the calculated total maximum water demand. A maximum hourly demand of **3.99 L/s** was used for the Phase 1 development, and **5.90 L/s** for Phase 2.

Based on these flows, the new buildings will each be serviced with a new 100mm dia. sanitary service. Both services will connect to the existing 300mm dia. sanitary server on Montreal road. The new services will be located at the South-West corner, and South-East corner of the Phase 1 and Phase 2 developments, respectively. The new proposed 100mm dia. PVC sanitary services will be installed at a 2.0% gradient, meeting requirements outlined in the City of Ottawa Sewer Design Guidelines. Refer to LRL drawing C.401 for the proposed sanitary servicing.

9 Erosion and Sediment Control

During construction, erosion and sediment controls will be provided primarily via a sediment control fence to be erected along the perimeter of the site where runoff has the potential of leaving the site. Inlet sediment control devices are also to be provided in any catchbasin and/or manholes in and around the site that may be impacted by the site construction. Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification OPSS 577. Refer to LRL Associates drawing C.101 for erosion and sediment control details.

10 Conclusion

This Stormwater Management and Servicing Report for the development proposed at 875 Montreal road presents the rationale and details for the servicing requirements for the subject property.
In accordance with the report objectives, the servicing requirements for the development are summarized below:

Stormwater Management

- The storm water release rates from the proposed development will meet the pre-development allowable release rate of 19.02 L/s onto Montreal road.
- Stormwater quantity control objectives will be met with the use of an ICD, and on-site storm water ponding.

Water Service

- The anticipated maximum domestic hourly water demand of the proposed developments based on fixture counts, are 5.52 L/s for Phase 1 and 6.07 L/s for Phase 2.
- The maximum required fire flows were calculated as 95.0 L/s and 101.7 L/s for Phases 1 and 2, respectively, using the FUS method.
- There is (1) existing fire hydrant within 90m of the proposed building, along the South property line. (4) additional fire hydrants are located within 150m of the proposed site

- The combined fire flow from the hydrants will be sufficient to meet the Fire Flow Demand.
- The new development/expansion will be serviced with a new 100mmø & 150mmø water service connected to the existing 300mmø watermain on Montreal road.

Sanitary Service

- The anticipated sanitary flow from the proposed development is 3.99 L/s for Phase 1, and 5.90L/s for Phase 2.
- The proposed buildings will be serviced by new 100mm sanitary services connecting to the existing 300mm dia. sanitary sewer on Montreal road.

11 REPORT CONDITIONS AND LIMITATIONS

The report conclusions are applicable only to this specific project described in the preceding pages. Any changes, modifications or additions will require a subsequent review by LRL Associates Ltd. to insure the compatibility with the recommendations contained in this document.
If you have any questions or comments, please contact the undersigned.

Prepared by:
LRL Associates Ltd.

Prepared by

Maxime Longtin
Civil Engineering Technologist

Approved by

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Jan 13/2020
PROVINCE OF ONTARIO

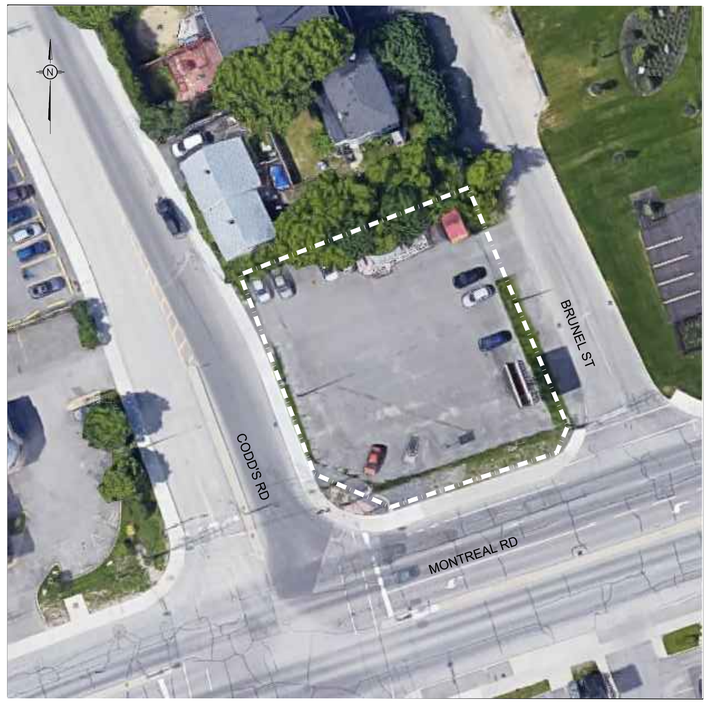
Virginia Johnson, P. Eng.
Civil Engineer

APPENDIX A

Civil Engineering Drawings

PLACK PROPERTY DEVELOPMENT
875 MONTREAL RD,
OTTAWA (ON)

REVISION 01



KEY PLAN (N.T.S.)

DRAWING INDEX	
TITLE PAGE	
SEDIMENT AND EROSION CONTROL PLAN	C101
DEMOLITION PLAN	C102
GRADING AND DRAINAGE PLAN	C301
SERVICING PLAN	C401
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901

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PLACK PROPERTY DEVELOPMENT
875 MONTREAL RD, OTTAWA
REV.01 - ISSUED FOR APPROVAL - JANUARY 13, 2020
LRL PROJECT no: 190084

NOT AUTHENTIC UNLESS SIGNED AND DATED

EROSION AND SEDIMENT CONTROL MEASURES:

** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES **

1. PRIOR TO START OF CONSTRUCTION:

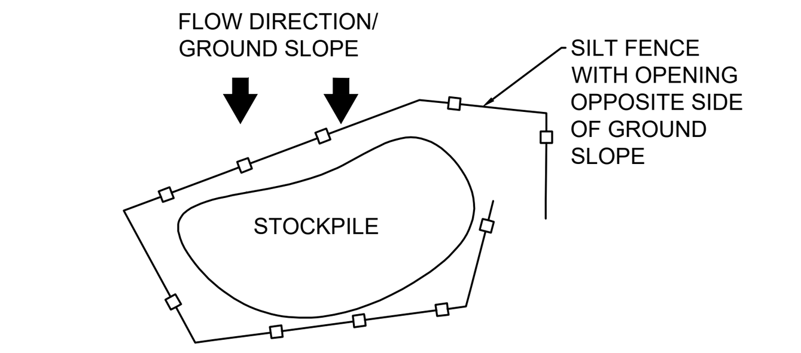
- PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:
- INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCHBASINS AND MANHOLES
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

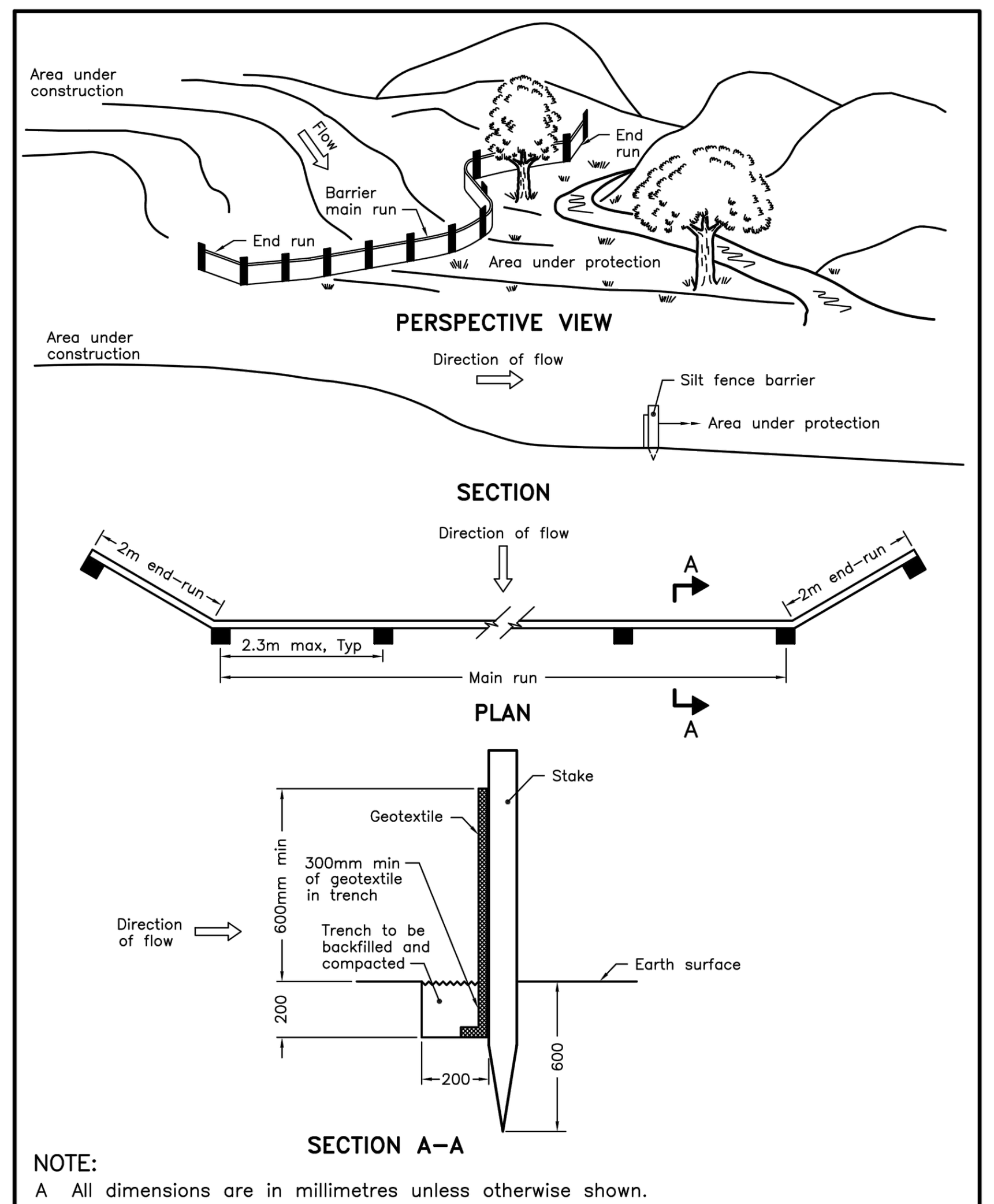
- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
- INSPECT SILT FENCES, FILTER CLOTHS AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- CONSTRUCT SWALES AS PER DETAIL.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED).
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THIS CONSULTING ENGINEER AND THE CITY DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PREVENT MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 15m LONG, 4M WIDE AND 0.3m DEEP AND SHALL CONSIST OF COARSE (50mm CRUSHERT-RUN LIMESTONE) MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

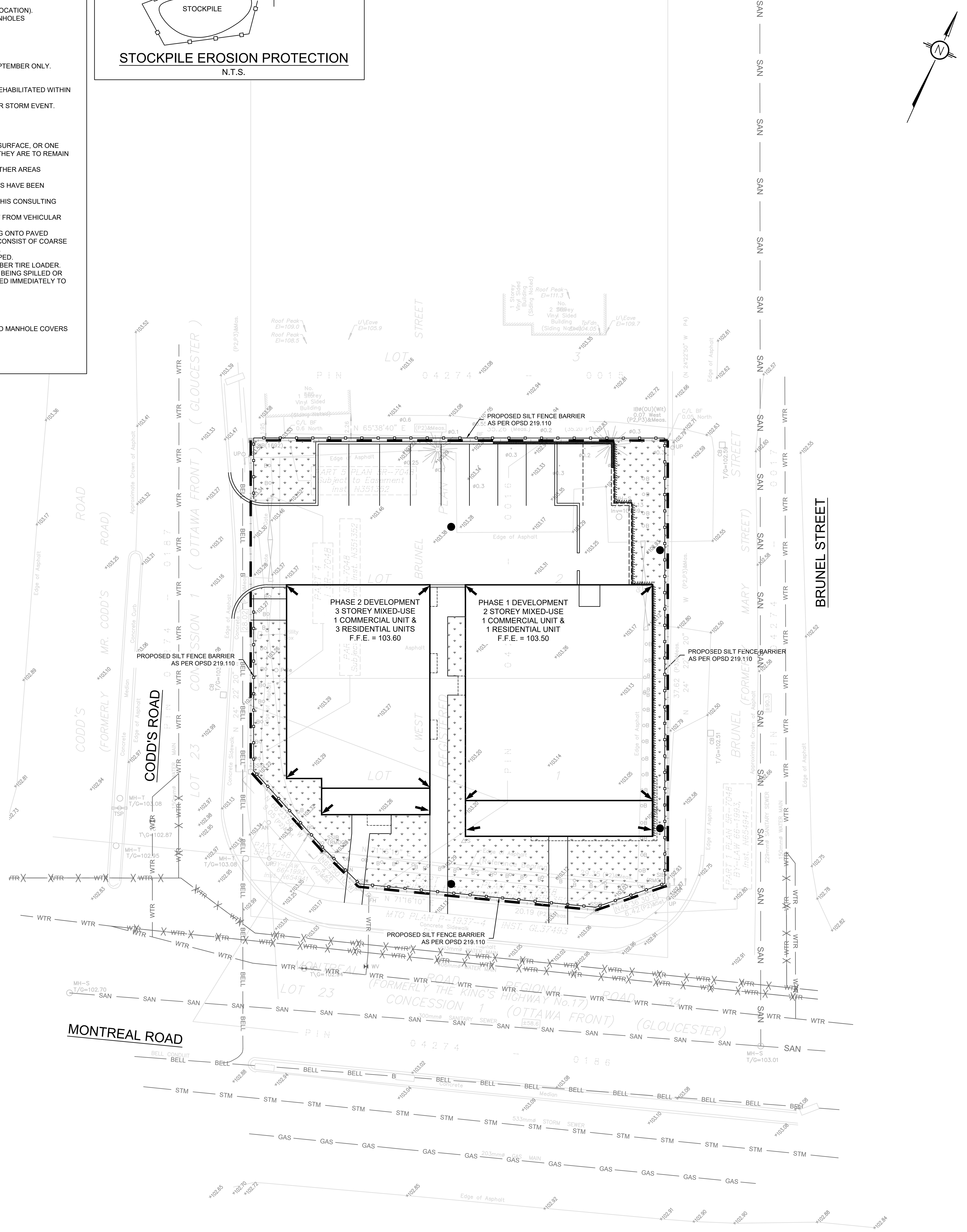


STOCKPILE EROSION PROTECTION
N.T.S.



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00EX MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB — SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM — STM PROPOSED STORM SEWER
- SAN — SAN PROPOSED SANITARY SEWER
- WTR — WTR PROPOSED WATERMAIN
- STM — STM EXISTING STORM SEWER
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- GAS — GAS EXISTING GAS LINE
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SCALE: 1:200

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	13 JAN 2020

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Jan 13/2020
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CLIENT
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DESIGNED BY:	DRAWN BY:	APPROVED BY:
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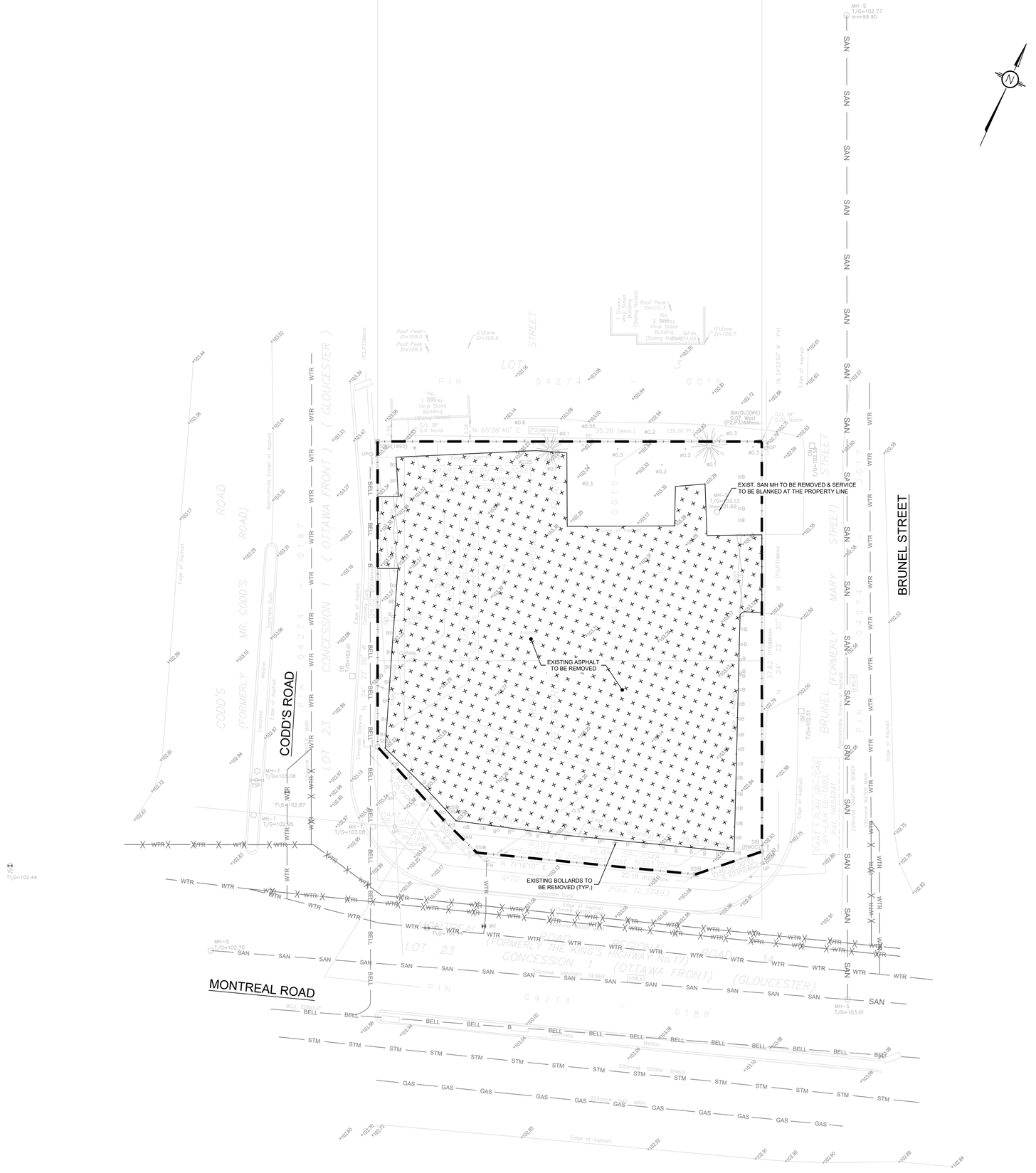
PROJECT
875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
190084

DATE
AUGUST 2019

C101



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CLIENT

PLACK PROPERTY DEVELOPMENT

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	V.J.

PROJECT

875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE

DEMOLITION PLAN

PROJECT NO.
190084

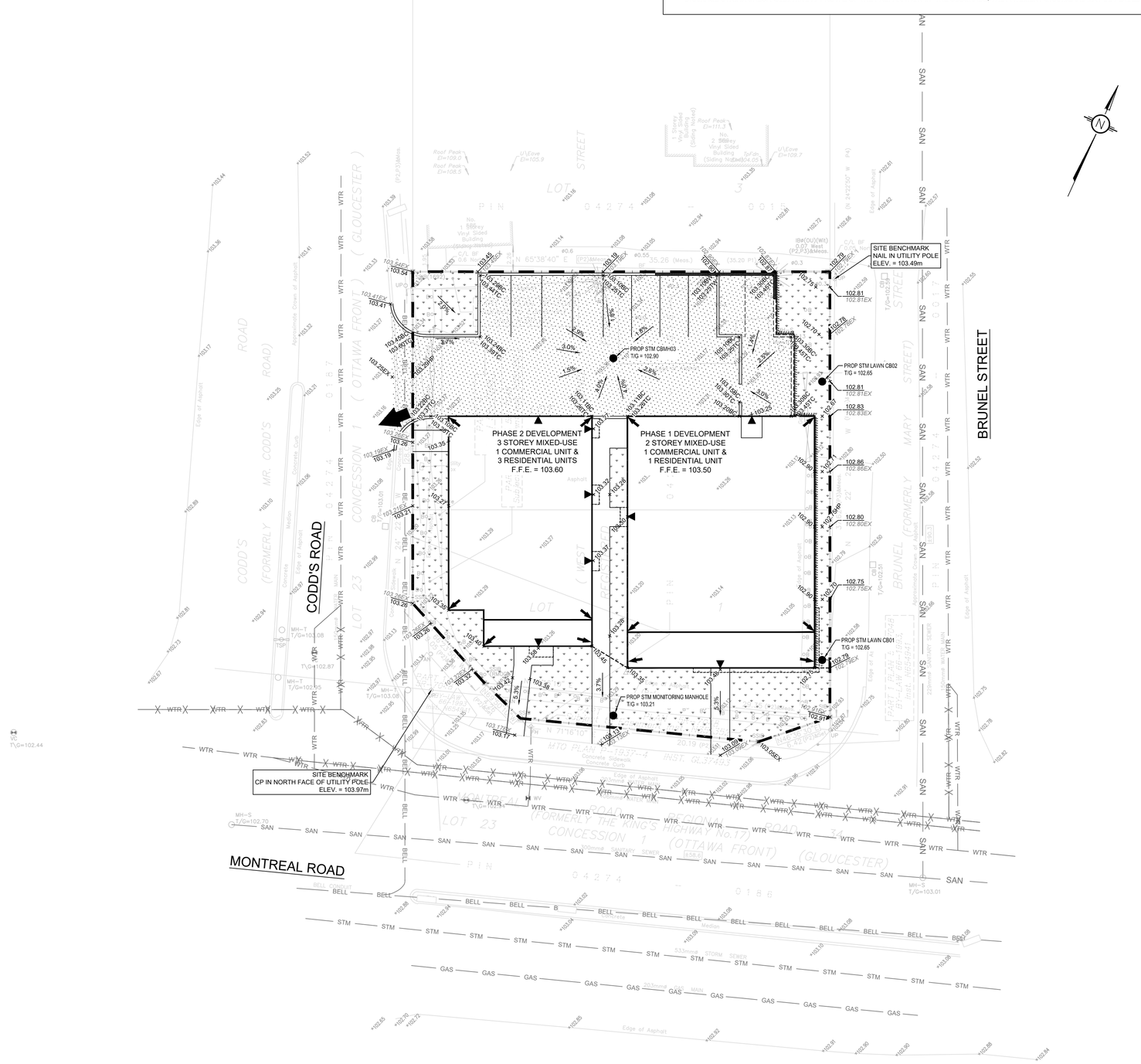
DATE
AUGUST 2019

C102

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 A/C (PG 58-28)	50	40
BINDER	HL.8 A/C (PG 58-28)	--	50
BASECOURSE	GRANULAR "A"	150	150
SUBBASE	GRANULAR "B" TYPE II	350	450

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.



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PROJECT
875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
190084

DATE
AUGUST 2019

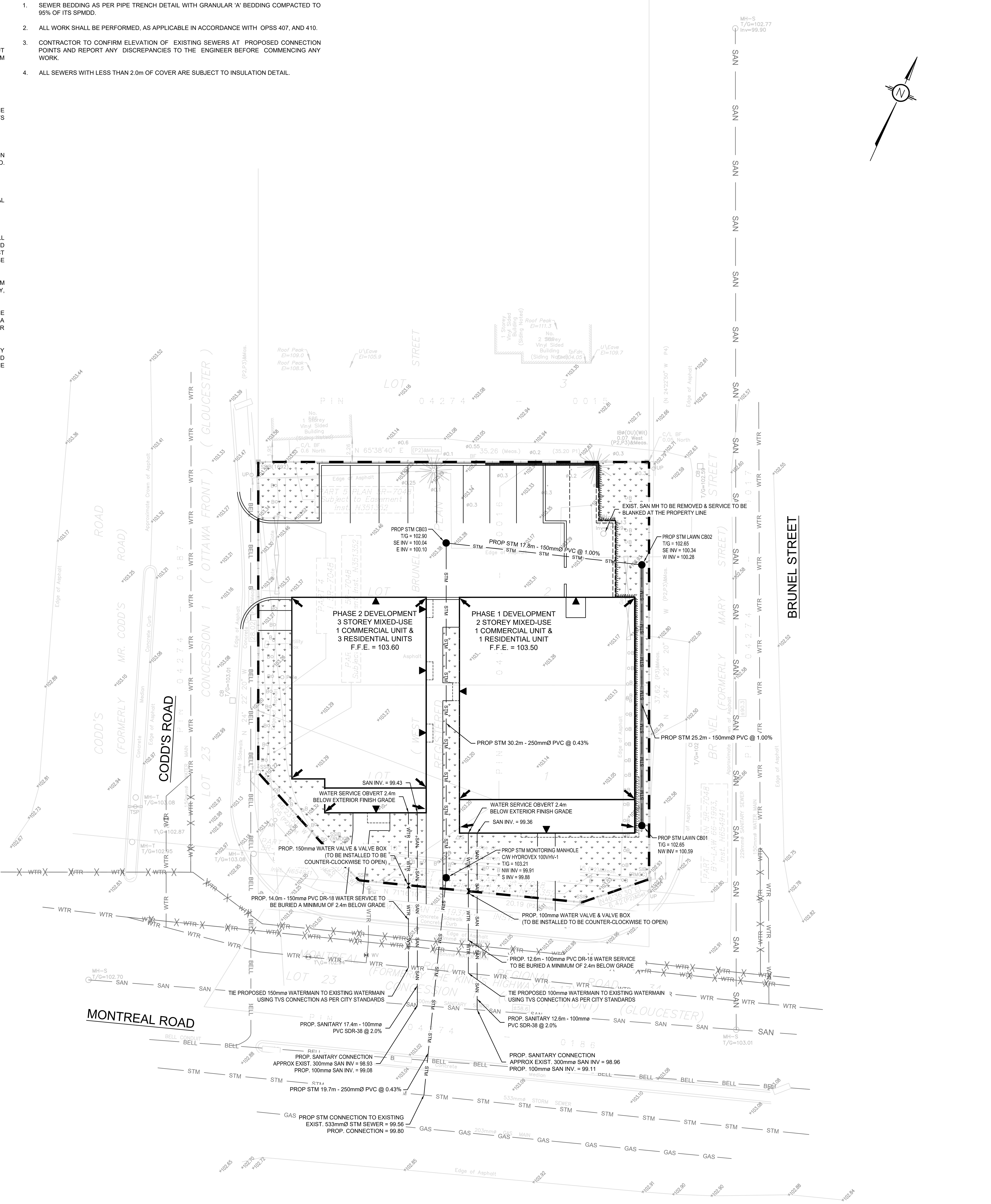
C301

NOTES: GENERAL

1. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
2. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
3. JOB BENCH MARK - REFER TO DRAWING C301.
4. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE, CATCH BASIN OUTLETS AND/OR STORM DETENTION AREAS ARE PROVIDED.
5. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS.
6. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
7. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A CLEAN STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.
8. CURBS TO BE BARRIER, CONSTRUCTED AS PER OPSD 600.110.
9. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
10. ABUTTING PROPERTY GRADE TO BE MATCHED.
11. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION.
12. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
13. FILTER FABRIC TO BE INSTALLED AND MAINTAINED BETWEEN THE FRAME AND COVER OF ALL CATCHBASINS, CATCHBASIN MANHOLES AND MANHOLES DURING THE CONSTRUCTION PERIOD TO MINIMIZE SEDIMENTS ENTERING THE STORM SEWER SYSTEM. ALL GRASSED AREAS MUST BE COMPLETED PRIOR TO THE REMOVAL OF THE FILTER FABRIC IN THE DRAINAGE STRUCTURES.
14. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS, IF ANY, LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
15. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS BUT NOT LIMITED TO; ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC.
16. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
17. ALL SIDEWALK CONSTRUCTION TO BE AS PER OPSD 310.010 & OPSD 310.050.

NOTES: SEWERS

1. SEWER BEDDING AS PER PIPE TRENCH DETAIL WITH GRANULAR 'A' BEDDING COMPACTED TO 95% OF ITS SPMDD.
2. ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSS 407, AND 410.
3. CONTRACTOR TO CONFIRM ELEVATION OF EXISTING SEWERS AT PROPOSED CONNECTION POINTS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE COMMENCING ANY WORK.
4. ALL SEWERS WITH LESS THAN 2.0m OF COVER ARE SUBJECT TO INSULATION DETAIL.



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- SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM PROPOSED STORM SEWER
- SAN PROPOSED SANITARY SEWER
- WTR PROPOSED WATERMAIN
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5m 2 0 5m

SCALE: 1:200

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	13 JAN 2020

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Jan 13/2020
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CLIENT
PLACK PROPERTY DEVELOPMENT

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	V.J.

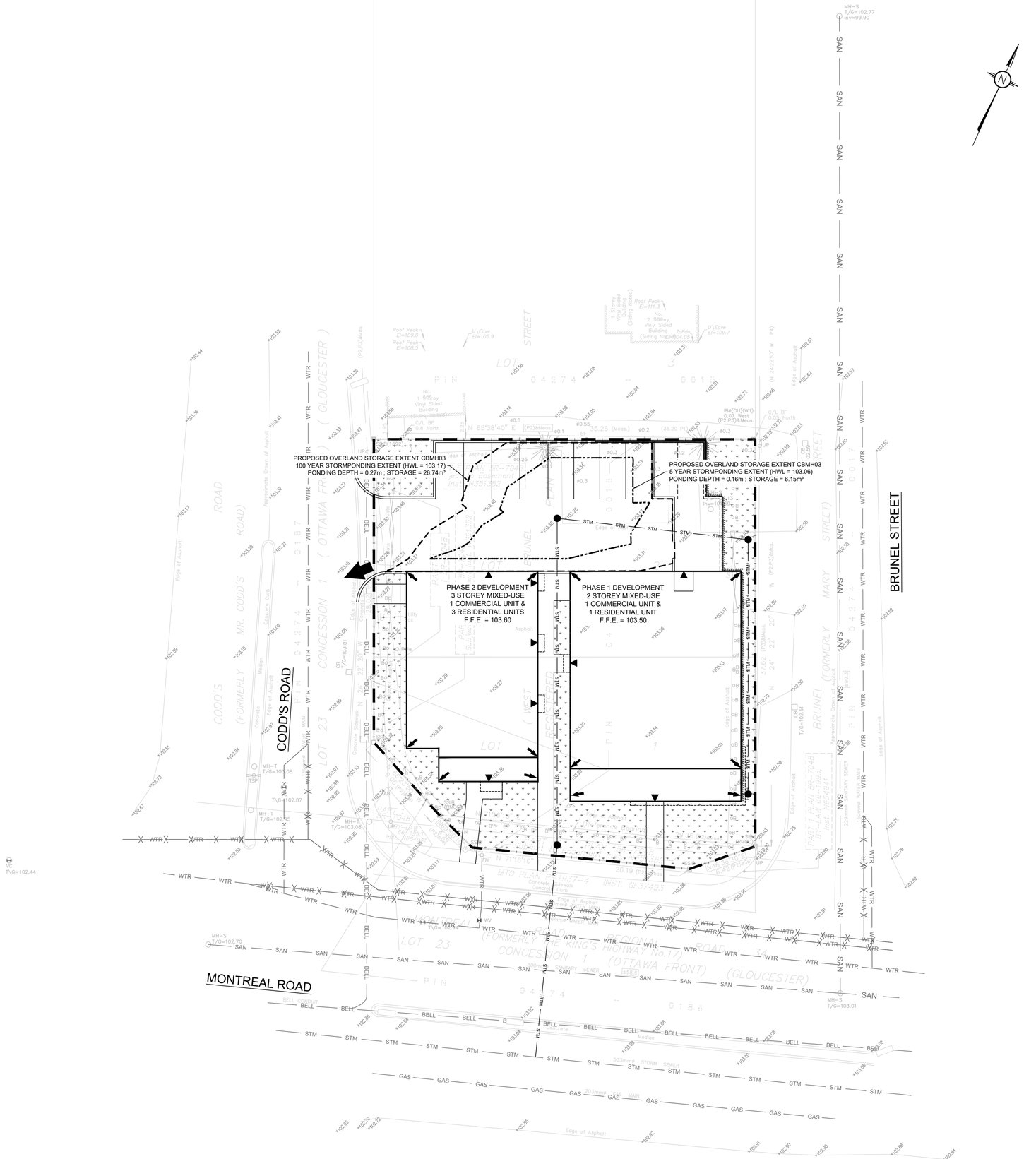
PROJECT
875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE
SERVICING PLAN

PROJECT NO.
190084

DATE
AUGUST 2019

C401



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5m 2 0 5m

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LICENSED PROFESSIONAL ENGINEER
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CLIENT

PLACK PROPERTY DEVELOPMENT

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	V.J.

PROJECT

875 MONTREAL ROAD
OTTAWA, ON

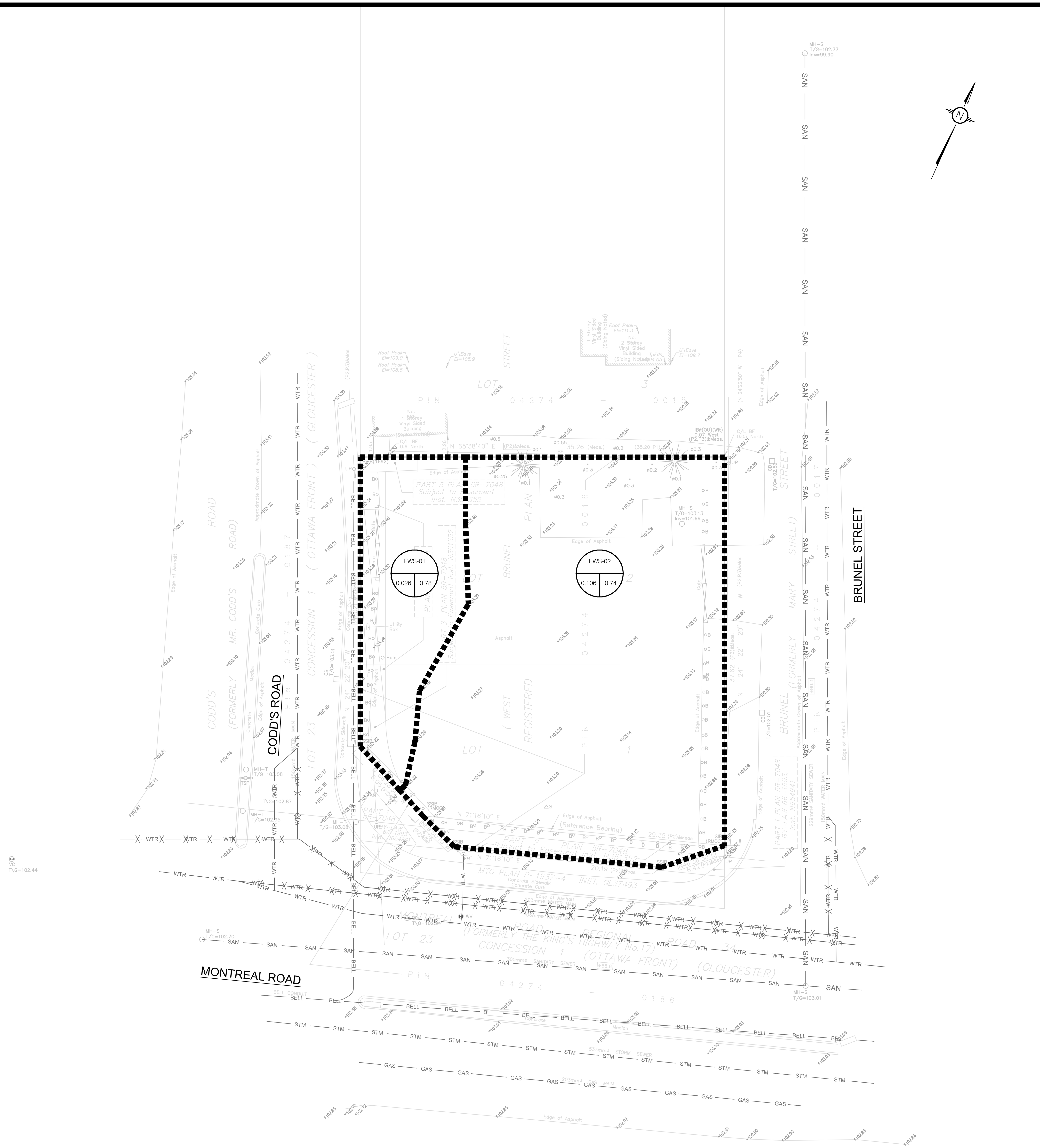
DRAWING TITLE

STORMWATER MANAGEMENT PLAN

PROJECT NO.
190084

DATE
AUGUST 2019

C601



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LICENSED PROFESSIONAL ENGINEER
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100510576
Jan 13/2020
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CLIENT
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DESIGNED BY:	DRAWN BY:	APPROVED BY:
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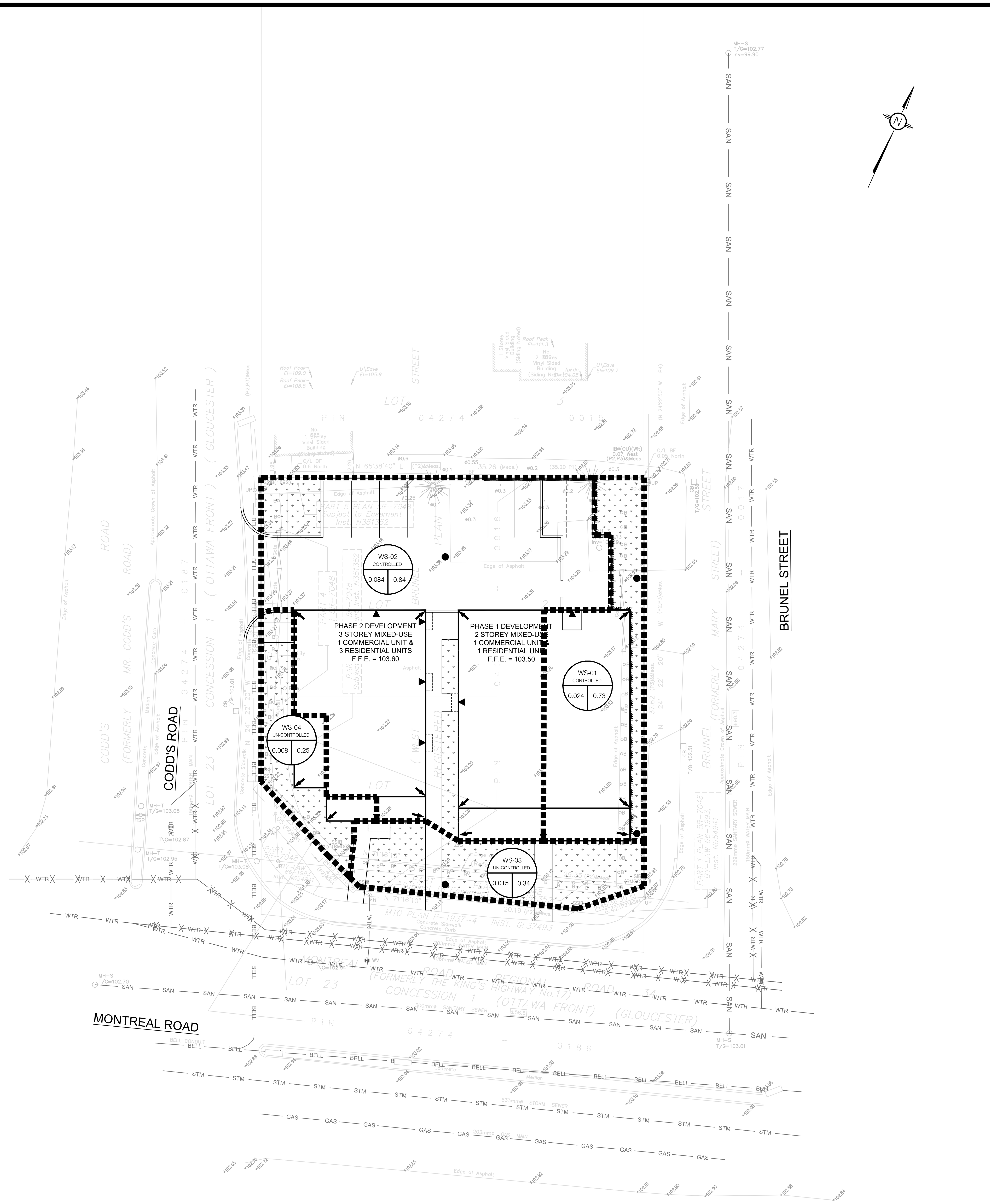
PROJECT
875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE
PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
190084

DATE
AUGUST 2019

C701



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GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

5m 2 0 5m

SCALE: 1:200

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	13 JAN 2020

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Jan 13/2020
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
PLACK PROPERTY DEVELOPMENT

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	V.J.

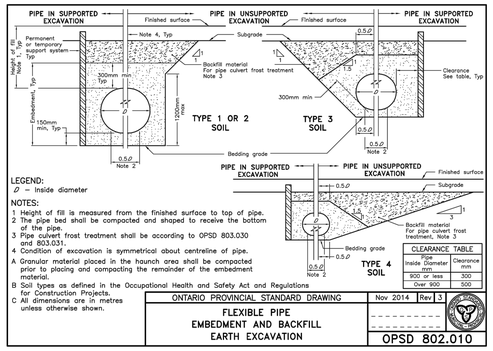
PROJECT
875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE
POST-DEVELOPMENT
WATERSHED PLAN

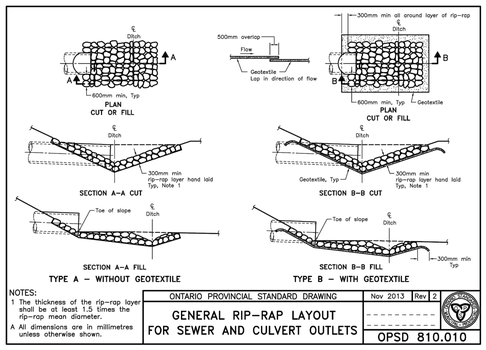
PROJECT NO.
190084

DATE
AUGUST 2019

C702

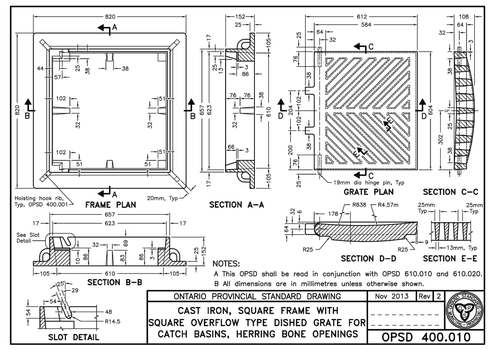


ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		OPSD 802.010



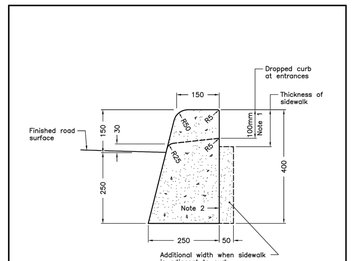
NOTES:
1 The thickness of the rip-rap layer shall be at least 1.5 times the rip-rap mean diameter.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 2
GENERAL RIP-RAP LAYOUT FOR SEWER AND CULVERT OUTLETS		OPSD 810.010



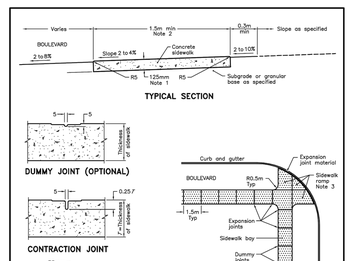
NOTES:
A This OPSD shall be read in conjunction with OPSD 610.010 and 610.020.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2013	Rev 2
CAST IRON, SQUARE FRAME WITH SQUARE OVERFLOW TYPE DISHED GRATE FOR CATCH BASINS, HERRING BONE OPENINGS		OPSD 400.010



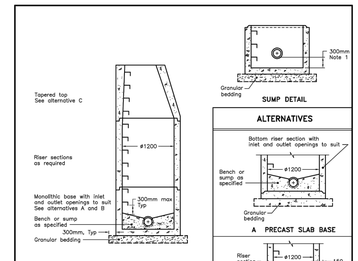
NOTES:
1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110



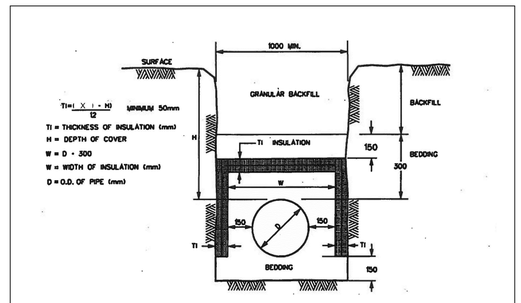
NOTES:
1 Sidewalk thickness at residential driveways and adjacent to curb shall be 150mm. At commercial and industrial driveways, the thickness shall be 200mm.
2 Sidewalk width shall be wider when specified.
3 This OPSD shall be read in conjunction with OPSD 310.030, 310.031, 310.032, 310.033 and 310.039.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
CONCRETE SIDEWALK		OPSD 310.010



NOTES:
1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



NOTES:
-FOR STORM INSULATION USE AN X VALUE OF 2000 IN THE ABOVE "TI" EQUATION.
-FOR SANITARY INSULATION USE AN X VALUE OF 2500 IN THE ABOVE "TI" EQUATION.
-FOR WATERMAIN INSULATION USE AN X VALUE OF 2400 IN THE ABOVE "TI" EQUATION.
-INCREMENTS OF INSULATION THICKNESS SHALL BE ADJUSTABLE TO 25mm.
-STAGGER JOINTS OF MULTIPLE SHEETS.
-ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

TYPICAL STORM AND SANITARYSEWER AND WATERMAIN INSULATION DETAIL
(N.T.S.)

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

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No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	M.L.	13 JAN 2020

LICENSED PROFESSIONAL ENGINEER
V. JOHNSON
100510576
Jan 13/2020
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
PLACK PROPERTY DEVELOPMENT

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	V.J.

PROJECT
875 MONTREAL ROAD
OTTAWA, ON

DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
190084
DATE
AUGUST 2019

C901

APPENDIX B

Pre and Post Development Watershed Areas

LRL Associates Ltd.
Storm Watershed Summary

LRL File No.	190084
Project:	875 Montreal Rd Mixed Use
Location:	Ottawa, On
Date:	January 8, 2020
Designed:	M. Longtin
Drawing Reference:	C.701/C.702

Pre-Development Catchments (Un-Controlled)

WATERSHED	C = 0.2	C = 0.80	C = 0.90	Total Area (ha)	Combined C
EWS-01	0.005	0.000	0.021	0.026	0.78
EWS-02	0.024	0.000	0.081	0.106	0.74
TOTAL	**0.029**	**0.000**	**0.103**	**0.131**	**0.75**

Post-Development Catchments (Controlled)

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
WS-01	0.006	0.000	0.018	0.024	0.73
WS-02	0.005	0.000	0.076	0.081	0.85
TOTAL	**0.011**	**0.000**	**0.094**	**0.105**	**0.83**

Post-Development Catchments (Un-Controlled)

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
WS-03	0.012	0.000	0.003	0.016	0.34
WS-04	0.007	0.000	0.004	0.011	0.44
TOTAL	**0.019**	**0.000**	**0.004**	**0.026**	**0.27**

APPENDIX C

Correspondence with Conservation Authority

Maxime Longtin

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: November 29, 2019 4:17 PM
To: Maxime Longtin
Cc: Eric Lalande; Virginia Johnson
Subject: RE: 875 Montreal Road

Good Afternoon Maxime,

The sewer runs more than 2 km to an outlet to a watercourse with no municipal treatment facility for quality. In the opinion of the RVCA, the distance to the outlet is sufficiently far that onsite quality controls would have negligible impact on surface water improvement. The RVCA would therefore accept that the stormwater runoff from the site does not require any additional quality control measures save and except best management practices.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

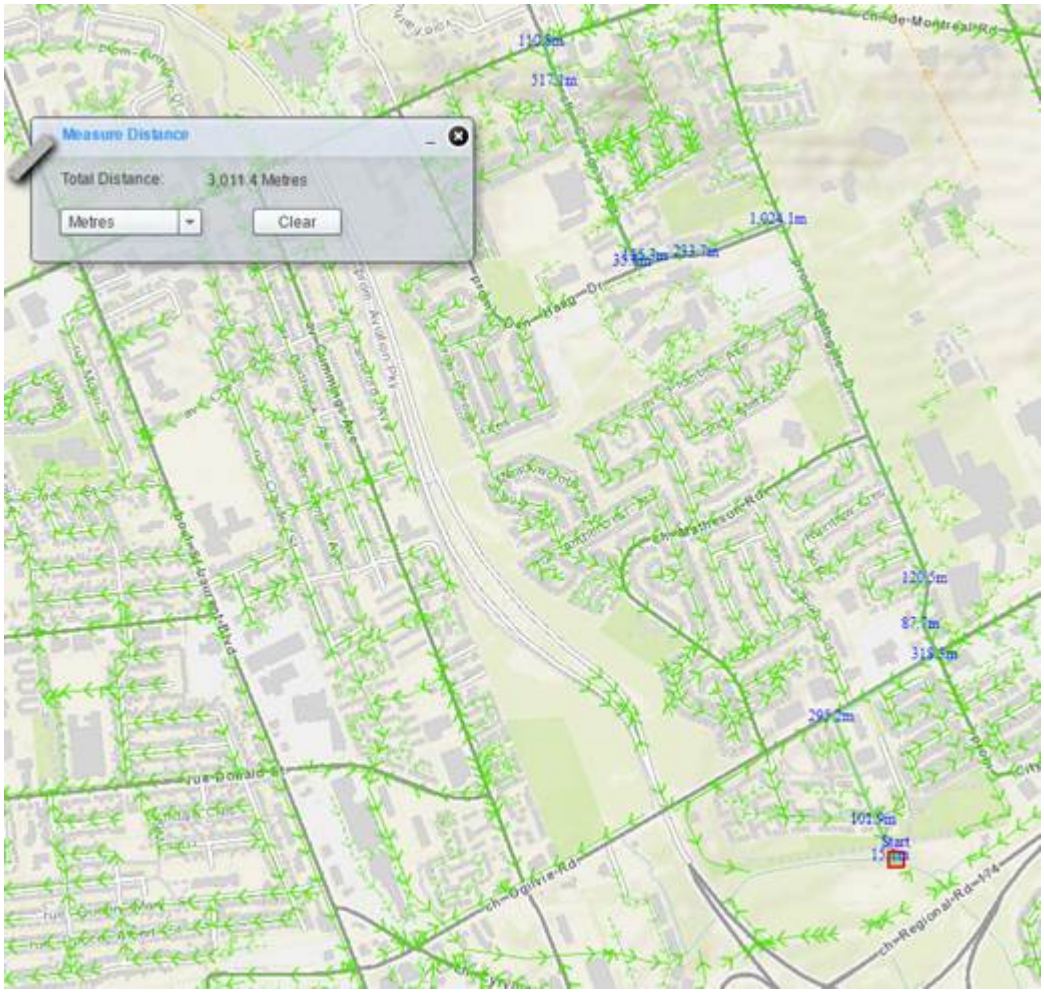
Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

From: Maxime Longtin <mlongtin@lrl.ca>
Sent: Wednesday, November 27, 2019 4:43 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Eric Lalande <eric.lalande@rvca.ca>; Virginia Johnson <vjohnson@lrl.ca>
Subject: 875 Montreal Road

Hi Jamie,

Do you have the requirements for quality control for this project? I attached the latest site plan for your use.

The outlet of that storm on Montreal Road is ultimately between Ogilvie and the Queensway, about 3km of pipe to our site.



Thank you, and have a good one

Maxime Longtin

Civil Engineering Technologist
LRL Associates Ltd.
5430 Canotek Road
Ottawa, Ontario K1J 9G2

T (613) 842-3434 or (877) 632-5664 ext 256
C (613) 915-8043
F (613) 842-4338
E mlongtin@lrl.ca
W www.lrl.ca

We care deeply, so let us know how we did by completing our Customer Satisfaction Survey.
Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre sondage sur la satisfaction de la clientèle

APPENDIX D

5 & 100 Year SWM Runoff and Storage Requirements

LRL File No. 190084
Project: 875 Montreal Rd Mixed Use
Location: Ottawa, On
Date: January 8, 2020
Designed: M. Longtin
Drawing Ref.: C.401

Stormwater Management Design Sheet

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = $A / (Td + C)^B$
A = Area (ha)
T_c = Time of concentration (min)

Allowable Release Rate from total Pre-development

5 Year Pre-Development Flow Rate

$I_5 = 998.071 / (Td + 6.053)^{0.814}$ **a = 1735.688** **b = 0.82** **C = 6.014**

C =	0.50	max of 0.5 as per City of Ottawa
I =	178.6	mm/hr
Tc =	10	min
Area=	0.131	
5 Year Storm Allowable Release Rate=	**19.02**	**L/s**

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.131**	ha	**∑R=**	**0.66**	**0.83**
Controlled	WS-01	0.024	ha	R=	0.73	0.92
	WS-02	0.081	ha	R=	0.85	1.00
	Total Contolled =	**0.105**	**ha**	**∑R=**	**0.83**	1.00
Un-controlled	WS-03	0.016	ha	R=	0.34	0.43
	WS-04	0.011	ha	R=	0.44	0.55
	Total Un-Contolled =	**0.026**	**ha**	**∑R=**	**0.38**	0.47

Post-development Stormwater Management

100 Year Storm Event:

$I_5 = 998.071 / (Td + 6.053)^{0.814}$ **a = 1735.688** **b = 0.820** **C = 6.014**

		Storage Required				
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m^3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	178.6	52.22	23.6	12.87	6.15	19.02
15	142.9	34.50	19.46	12.87	3.94	16.81
20	120.0	28.96	19.3	12.87	3.30	16.18
25	103.8	25.07	18.3	12.87	2.86	15.73
30	91.9	22.18	16.8	12.87	2.53	15.40
35	82.6	19.94	14.8	12.87	2.28	15.15
40	75.1	18.14	12.6	12.87	2.07	14.94
45	69.1	16.67	10.3	12.87	1.90	14.77
50	64.0	15.44	7.7	12.87	1.76	14.63
60	55.9	13.49	2.2	12.87	1.54	14.41
70	49.8	12.02	0.0	12.87	1.37	14.24
80	45.0	10.86	0.0	12.87	1.24	14.11
90	41.1	9.92	0.0	12.87	1.13	14.00
100	37.9	9.15	0.0	12.87	1.04	13.92
110	35.2	8.50	0.0	12.87	0.97	13.84
120	32.9	7.94	0.0	12.87	0.91	13.78

Onsite Stormwater Retention

Total Storage Required =	**23.61 m^3**	
Pipe Storage =	0.00 m^3	refer to Storm Sewer Design Sheet
CB/MH Storage =	0.00 m^3	refer to Storm Sewer Design Sheet
Surface Storage =	32.05 m^3	refer to LRL Plan C.601
Total Available Storage =	**32.05 m^3**	Excluding Roof top Storage

LRL File No. 190084
Project: 875 Montreal Rd Mixed Use
Location: Ottawa, On
Date: January 8, 2020
Designed: M. Longtin
Drawing Ref.: C.401

Stormwater Management Design Sheet

Runoff Equation

Q = 2.78CIA (L/s)
C = Runoff coefficient
I = Rainfall intensity (mm/hr) = A / (Td + C)^{B}
A = Area (ha)
T_c = Time of concentration (min)

Allowable Release Rate from total Pre-development

5 Year Pre-Development Flow Rate

I_5 = 998.071 / (Td + 6.053)$^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

C =	0.50	max of 0.5 as per City of Ottawa
I =	104.2	mm/hr
Tc =	10	min
Area=	0.131	
Pre-Development Release Rate=	**19.02**	**L/s**

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.131**	ha	**∑R=**	**0.67**	**0.83**
Controlled	WS-01	0.024	ha	R=	0.85	1.00
	WS-02	0.081	ha	R=	0.83	1.00
	Total Contolled =	**0.105**	**ha**	**∑R=**	**0.83**	1.00
Un-controlled	WS-03	0.016	ha	R=	0.34	0.43
	WS-04	0.011	ha	R=	0.44	0.55
	Total Un-Contolled =	**0.026**	**ha**	**∑R=**	**0.38**	0.47

Post-development Stormwater Management

5 Year Storm Event:

I_5 = 998.071 / (Td + 6.053)$^{0.814}$ **a = 998.071** **b = 0.814** **C = 6.053**

			Storage Required			
Time (min)	**Intensity (mm/hr)**	**Controlled Runoff (L/s)**	**Storage Volume (m^3)**	**Controlled Release Rate (L/s)**	**Uncontrolled Runoff (L/s)**	**Total Release Rate (L/s)**
10	104.2	25.35	5.5	16.15	2.87	19.02
15	83.6	20.33	3.76	16.15	2.30	18.45
20	70.3	17.09	1.1	16.15	1.94	18.08
25	60.9	14.82	0.0	16.15	1.68	17.82
30	53.9	13.12	0.0	16.15	1.49	17.63
35	48.5	11.80	0.0	16.15	1.34	17.48
40	44.2	10.75	0.0	16.15	1.22	17.36
45	40.6	9.88	0.0	16.15	1.12	17.26
50	37.7	9.16	0.0	16.15	1.04	17.18
60	32.9	8.01	0.0	16.15	0.91	17.05
70	29.4	7.15	0.0	16.15	0.81	16.95
80	26.6	6.46	0.0	16.15	0.73	16.88
90	24.3	5.91	0.0	16.15	0.67	16.81
100	22.4	5.45	0.0	16.15	0.62	16.76
110	20.8	5.07	0.0	16.15	0.57	16.72
120	19.5	4.74	0.0	16.15	0.54	16.68

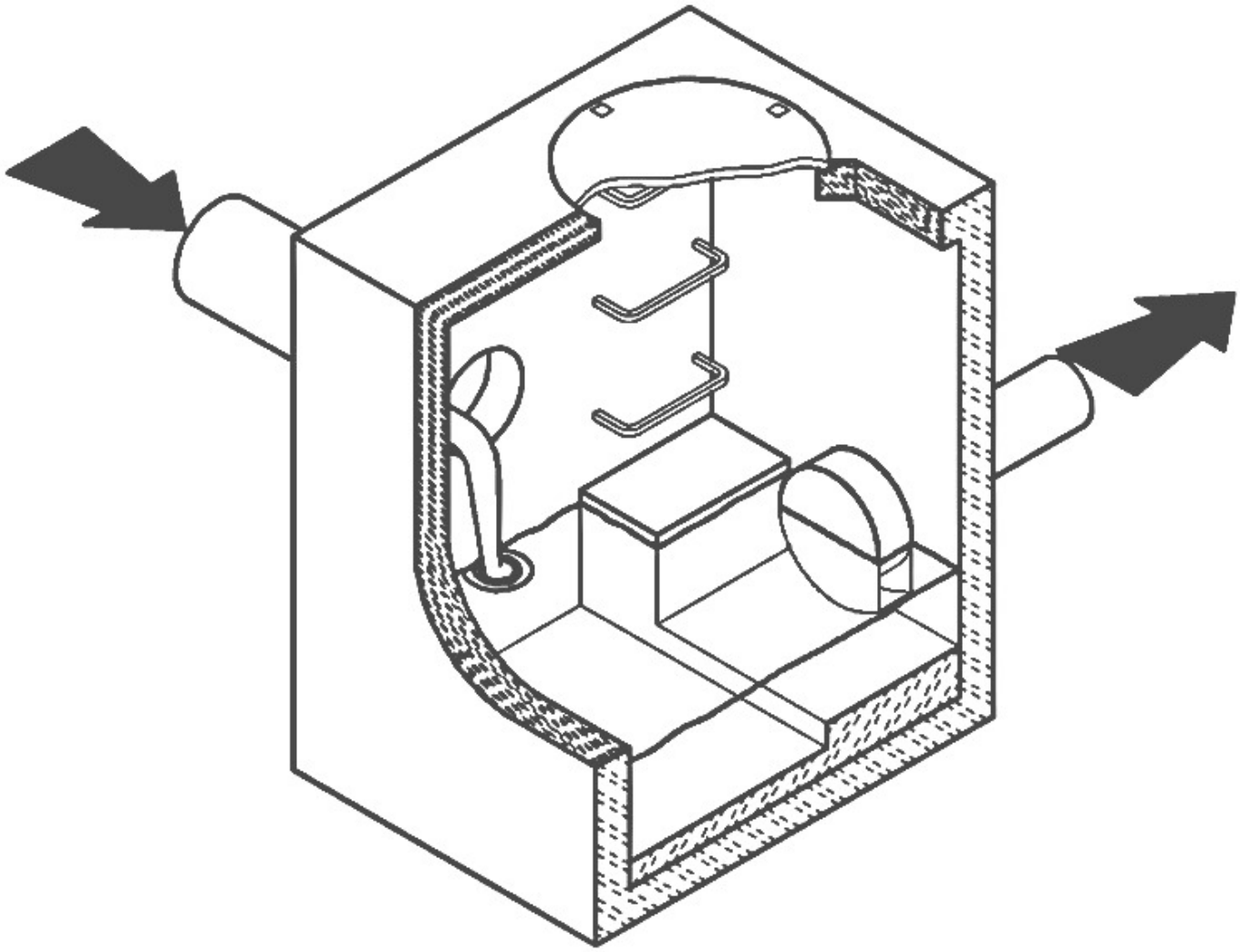
APPENDIX E

SWM Quantity Control & Inlet Control Device

CSO/STORMWATER MANAGEMENT

HYDROVEX® VHV / SVHV

Vertical Vortex Flow Regulator



JOHN MEUNIER

APPLICATIONS

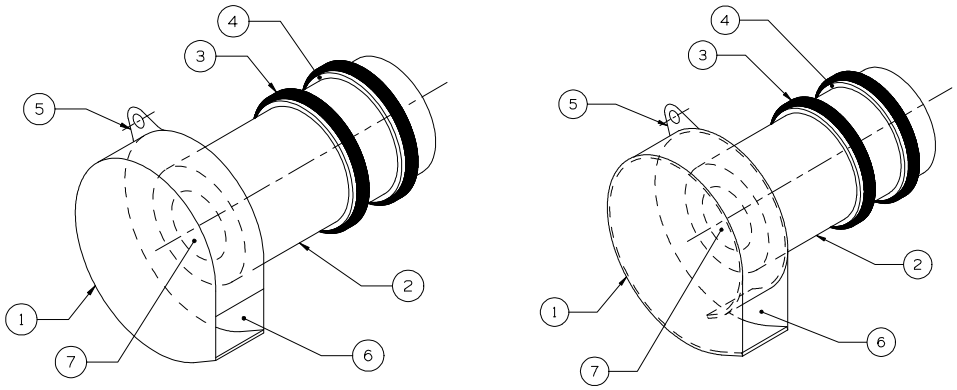
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. In a combined sewer system, the wastewater treatment plant may also experience significant increases in flows during storms, thereby losing its treatment efficiency.

A simple means of controlling excessive water runoff is by controlling excessive flows at their origin (manholes). **John Meunier Inc.** manufactures the **HYDROVEX® VHV / SVHV** line of vortex flow regulators to control stormwater flows in sewer networks, as well as manholes.

The vortex flow regulator design is based on the fluid mechanics principle of the forced vortex. This grants flow regulation without any moving parts, thus reducing maintenance. The operation of the regulator, depending on the upstream head and discharge, switches between orifice flow (gravity flow) and vortex flow. Although the concept is quite simple, over 12 years of research have been carried out in order to get a high performance.

The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators **(refer to Figure 1)** are manufactured entirely of stainless steel, and consist of a hollow body (**1**) (in which flow control takes place) and an outlet orifice (**7**). Two rubber "O" rings (**3**) seal and retain the unit inside the outlet pipe. Two stainless steel retaining rings (**4**) are welded on the outlet sleeve to ensure that there is no shifting of the "O" rings during installation and use.

1. **BODY**
2. **SLEEVE**
3. **O-RING**
4. **RETAINING RINGS (SQUARE BAR)**
5. **ANCHOR PLATE**
6. **INLET**
7. **OUTLET ORIFICE**



VHV ***SVHV***

FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTREX FLOW REGULATORS

ADVANTAGES

- The **HYDROVEX® VHV / SVHV** line of flow regulators are manufactured entirely of stainless steel, making them durable and corrosion resistant.
- Having no moving parts, they require minimal maintenance.
- The geometry of the **HYDROVEX® VHV / SVHV** flow regulators allows a control equal to an orifice plate, having a cross section area 4 to 6 times smaller. This decreases the chance of blockage of the regulator, due to sediments and debris found in stormwater flows. **Figure 2** illustrates the comparison between a regulator model 100 SVHV-2 and an equivalent orifice plate. One can see that for the same height of water, the regulator controls a flow approximately four times smaller than an equivalent orifice plate.
- Installation of the **HYDROVEX® VHV / SVHV** flow regulators is quick and straightforward and is performed after all civil works are completed.
- Installation requires no special tools or equipment and may be carried out by any contractor.
- Installation may be carried out in existing structures.

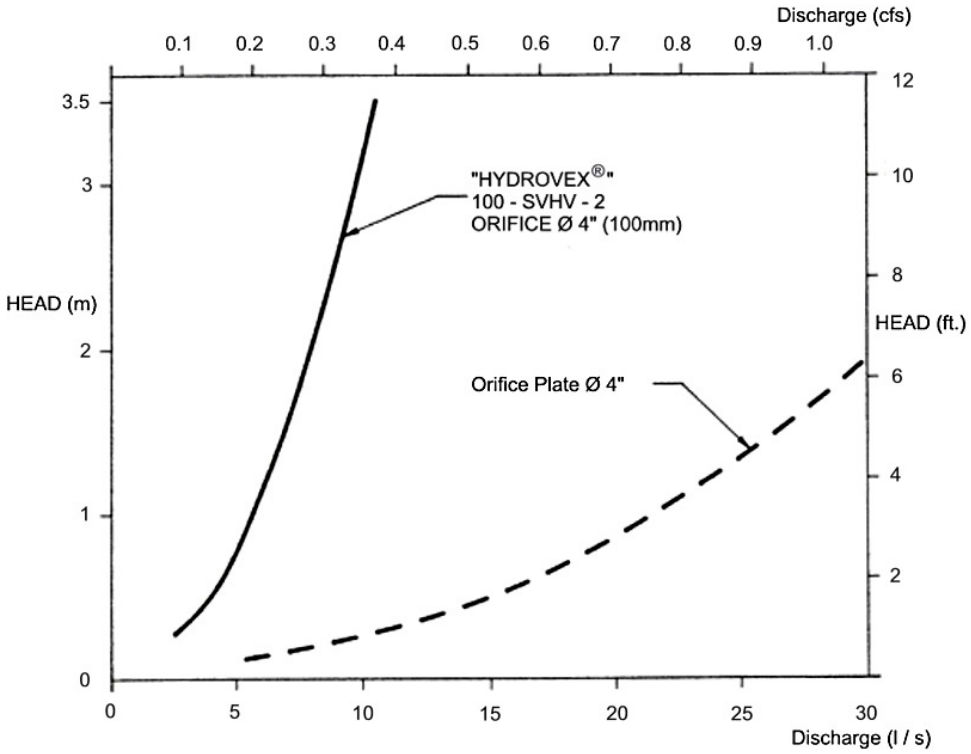


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

SELECTION

Selection of a **VHV or SVHV** regulator can be easily made using the selection charts found at the back of this brochure (see **Figure 3)**. These charts are a graphical representation of the maximum upstream water pressure (head) and the maximum discharge at the manhole outlet. The maximum design head is the difference between the maximum upstream water level and the invert of the outlet pipe. All selections should be verified by John Meunier Inc. personnel prior to fabrication.

Example:

✓ Maximum design head	2m (6.56 ft.)
✓ Maximum discharge	6 L/s (0.2 cfs)
✓ Using **Figure 3** - VHV	model required is a **75 VHV-1**

INSTALLATION REQUIREMENTS

All **HYDROVEX® VHV / SVHV** flow regulators can be installed in circular or square manholes. **Figure 4** gives the various minimum dimensions required for a given regulator. ***It is imperative to respect the minimum clearances shown to ensure easy installation and proper functioning of the regulator.***

SPECIFICATIONS

In order to specify a **HYDROVEX®** regulator, the following parameters must be defined:

- The model number (ex: 75-VHV-1)
- The diameter and type of outlet pipe (ex: 6" diam. SDR 35)
- The desired discharge (ex: 6 l/s or 0.21 CFS)
- The upstream head (ex: 2 m or 6.56 ft.) *
- The manhole diameter (ex: 36" diam.)
- The minimum clearance "H" (ex: 10 inches)
- The material type (ex: 304 s/s, 11 Ga. standard)

* ***Upstream head is defined as the difference in elevation between the maximum upstream water level and the invert of the outlet pipe where the HYDROVEX® flow regulator is to be installed.***

PLEASE NOTE THAT WHEN REQUESTING A PROPOSAL, WE SIMPLY REQUIRE THAT YOU PROVIDE US WITH THE FOLLOWING:

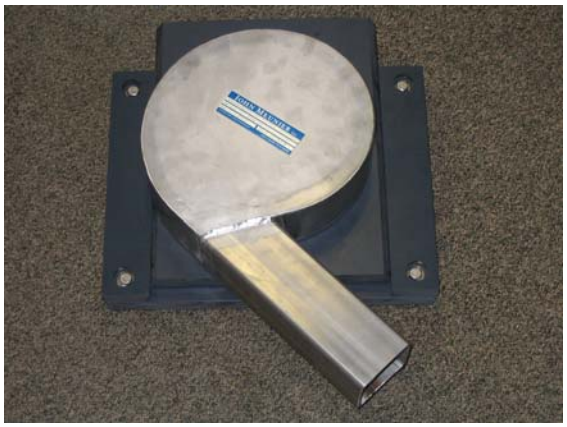
- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

Typical VHV model in factory

OPTIONS

FV – SVHV (mounted on sliding plate)

VHV-1-O (standard model with odour control inlet)



FV – VHV-O (mounted on sliding plate with odour control inlet)

VHV with Gooseneck assembly in existing chamber without minimum release at the bottom

VHV with air vent for minimal slopes

HYDROVEX®

VHV Vertical Vortex Flow Regulator

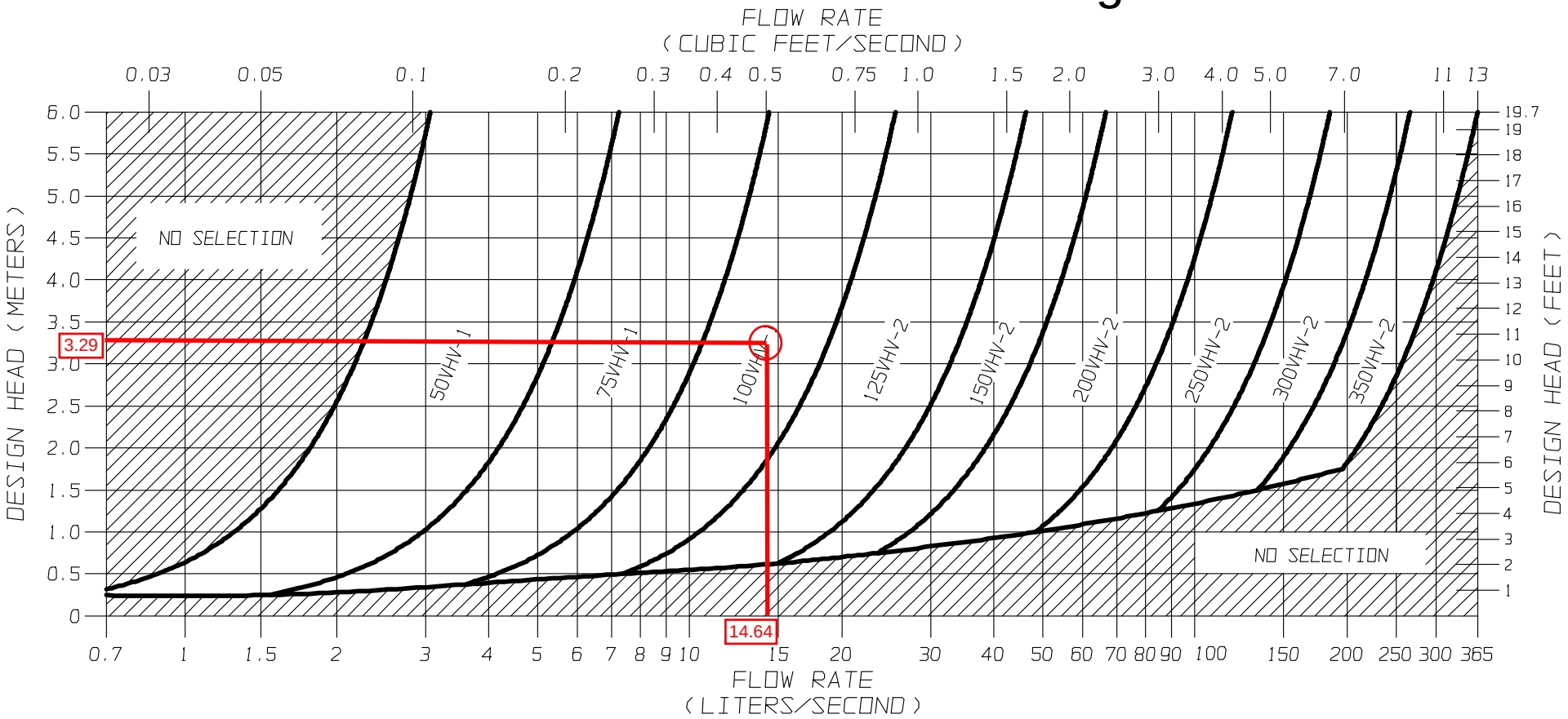
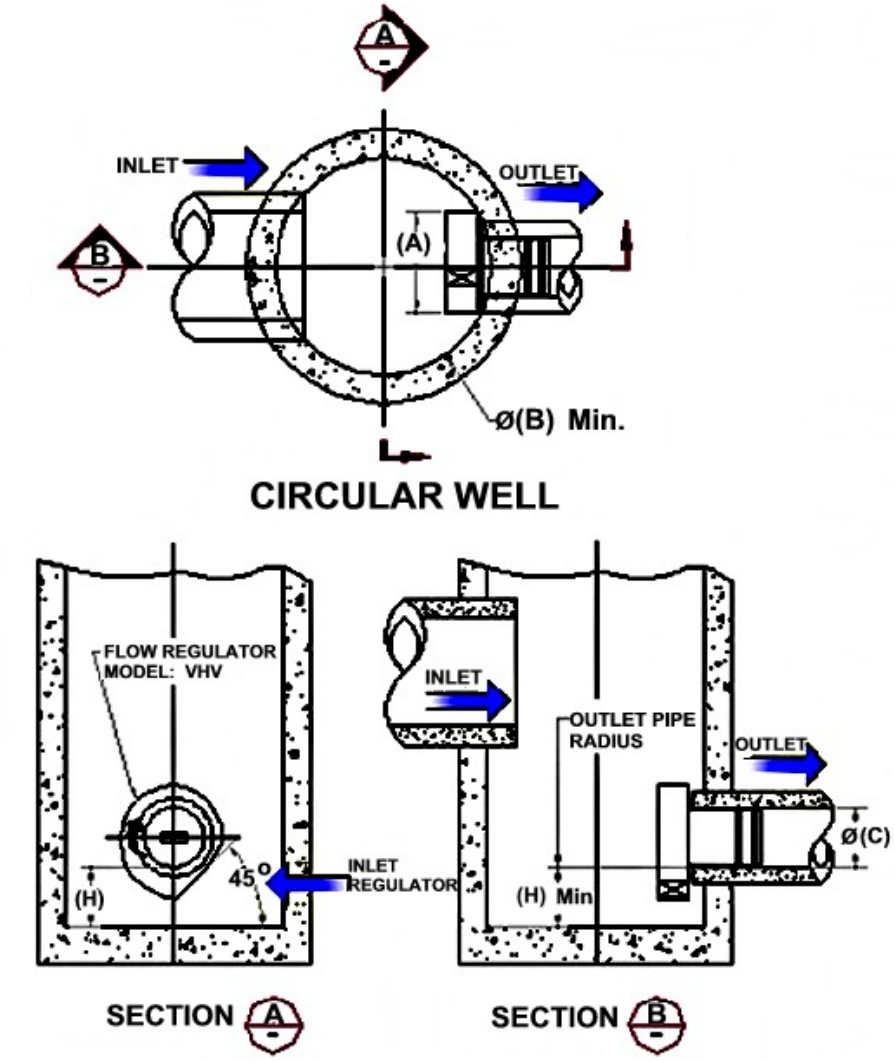


FIGURE 3 - VHV

JOHN MEUNIER

FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL VHV)

Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	900	36	150	6	200	8
125VHV-2	275	11	900	36	150	6	200	8
150VHV-2	350	14	900	36	150	6	225	9
200VHV-2	450	18	1200	48	200	8	300	12
250VHV-2	575	23	1200	48	250	10	350	14
300VHV-2	675	27	1600	64	250	10	400	16
350VHV-2	800	32	1800	72	300	12	500	20



INSTALLATION

The installation of a **HYDROVEX®** regulator may be undertaken once the manhole and piping is in place. Installation consists of simply fitting the regulator into the outlet pipe of the manhole. **John Meunier Inc.** recommends the use of a lubricant on the outlet pipe, in order to facilitate the insertion and orientation of the flow controller.

MAINTENANCE

HYDROVEX® regulators are manufactured in such a way as to be maintenance free; however, a periodic inspection (every 3-6 months) is suggested in order to ensure that neither the inlet nor the outlet has become blocked with debris. The manhole should undergo periodically, particularly after major storms, inspection and cleaning as established by the municipality

GUARANTY

The **HYDROVEX®** line of **VHV / SVHV** regulators are guaranteed against both design and manufacturing defects for a period of 5 years. Should a unit be defective, **John Meunier Inc.** is solely responsible for either modification or replacement of the unit.

John Meunier Inc.
ISO 9001 : 2008

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2000 Argentia Road, Plaza 4, Unit 430
Mississauga (Ontario) Canada L5N 1W1
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Revised: 2011-05-03

APPENDIX F

Fire Hydrant Coverage

LRJ
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

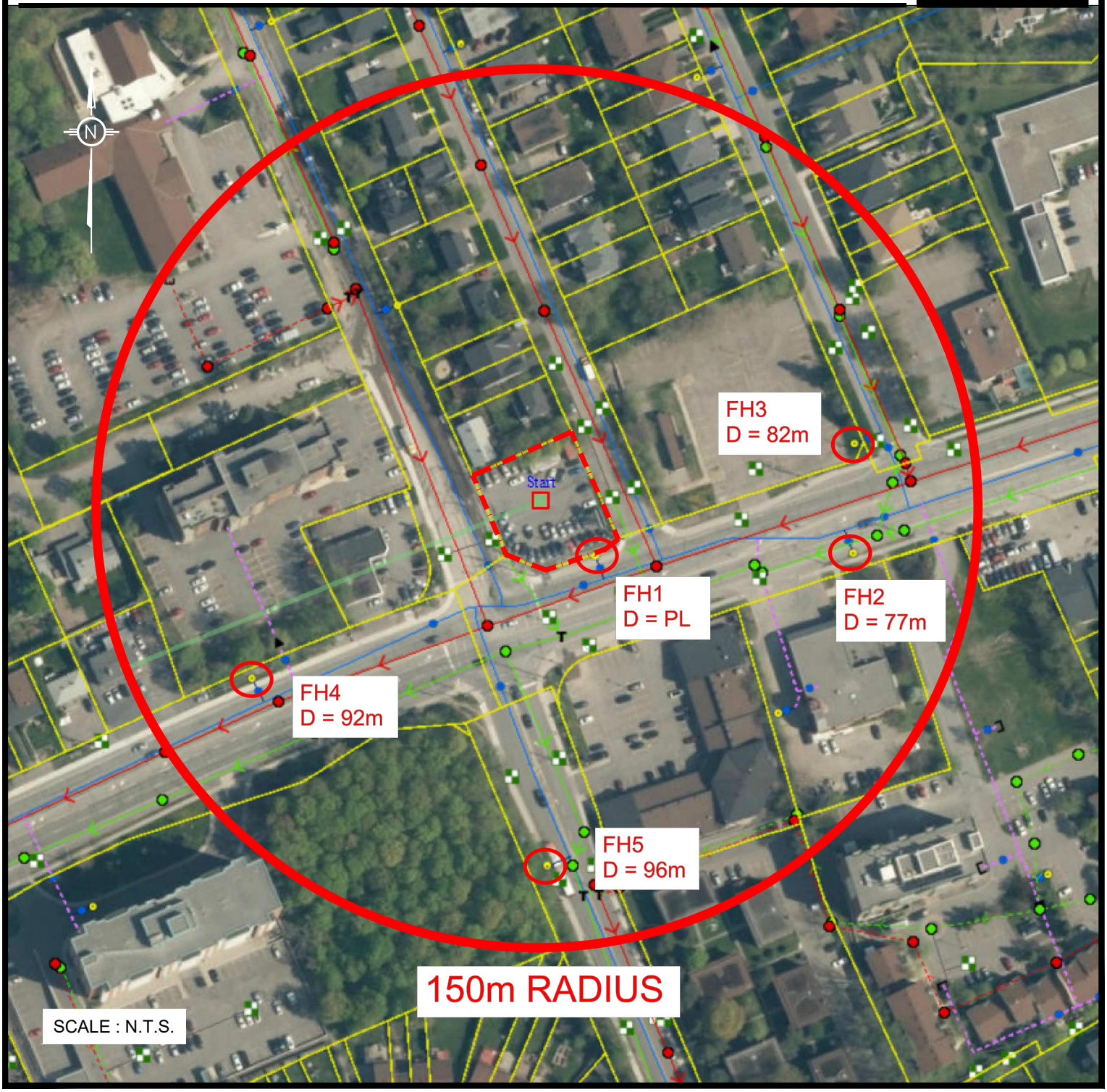
PROJECT

NEW 2 AND 3 STOREY MIXED-USE BUILDINGS
875 MONTREAL ROAD, OTTAWA

DRAWING TITLE

APPENDIX F
FIRE HYDRANT COVERAGE

CLIENT	DATE	PROJECT	
PLACK PROPERTY DEVELOPMENT	01/06/2020	190084	F



APPENDIX G

Proposed Development Water Demands & Fire Flow Calculations

Water Service Calculations

LRL File No. : 190084
Project : 875 Montreal Road - Proposed Developments (Phase 1)
Date : December 3, 2019
Designed by : Kyle Herold

Water Demand (Commercial, Ground Level)

Fixture Calculations	Fix. Units	Quant	Total Fix. Units
Bathroom Group (6 LPF)	3.6	1	3.6
Lavatory (8.3 L/m) Private	0.7	1	0.7
Lavatory (8.3 L/m) Public	2	1	2
Sink, Clinic Service (Public)	3	1	3
Sink, Clinic Service (Private)	0	1	0
Sink, Kitchen (Dom)	1.4	1	1.4
Dishwasher (Dom)	1.4	1	1.4
		Total	**12.1**

Total fixture units: 12.1 (as per OBC Table 7.6.3.2.A) (as per PS&D)
Conversion of fixture units to equivalent gpm: 9 gpm

Average water demand = 49058.91 L / day
= 0.57 L/s

Maximum daily peak factor: 1.5
Maximum daily demand = 73588 L / day
= 0.85 L / s

Maximum hour peak factor: 1.8
Maximum hour demand = 132459 L / day
= 1.53 L / s

Water Demand (Residential, 2nd Level)

Fixture Calculations	Fix. Units	Quant	Total Fix. Units
Bathroom Group (6 LPF)	3.6	2	7.2
Lavatory (8.3 L/m) Private	0.7	1	0.7
Sink, Bathroom	0	2	0
Shower Head	1.4	1	1.4
Sink, Laundry	1.4	1	1.4
Clothes Washer	1.4	1	1.4
Sink, Kitchen (Dom)	1.4	1	1.4
Dishwasher (Dom)	1.4	1	1.4
		Total	**14.9**

Total fixture units: 14.9 (as per OBC Table 7.6.3.2.A) (as per PS&D)

Conversion of fixture units to equivalent gpm: 11.5 gpm

Average water demand = 62686.385 L / day

= 0.73 L/s

Maximum daily peak factor: 2.5

Maximum daily demand = 156716 L / day

= 1.81 L / s

Maximum hour peak factor: 2.2

Maximum hour demand = 344775 L / day

= 3.99 L / s

Adjusted total maximum water demand = 477234 L / day

= 5.52 L / s

Water Service Pipe Sizing

$Q = VA$

Where: V = velocity

A = area of watermain pipe

Q = water supply flow rate

By deriving the above formula, we can obtain the diameter of the pipe:

Minimum pipe diameter: $d = (4Q/\pi V)^{1/2}$

$d =$ 0.063 m

$d =$ 63 mm

Proposed pipe diameter: **100** mm (as per correspondance with City of Ottawa)

Fire Flow Calculations - Phase 1

LRL File No. 190084
Date January 7, 2020
Method Fire Underwriters Survey (FUS)
Prepared by Kyle Herold

Step	Task	Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
Structural Framing Material								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Ordinary Construction	1		
			Ordinary Construction	1.0				
			Non-combustible construction	0.8				
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
Floor Space Area								
2	Total area					429		
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x Area$^{0.5}$				L/min	4,559
							L/s	76.0
Reductions or surcharge due to factors affecting burning								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Combustible	0%		
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%			L/min	4,559
			Rapid burning	25%			L/s	76.0
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	0%		
			Water supply is standard for both the system and fire department hose lines	-10%	False	0	L/min	4,559
			Fully supervised system	-10%	False	0	L/s	76.0
6	Choose separation	Exposure distance between units	North side	20.1 to 30m	10%			
			East side	Over 45m	0%			
			South side	Over 45m	0%		L/min	6,154
			West side	0 to 3m	25%	35%	L/s	1.0
Net required fire flow								
7	Obtain fire flow, duration, and volume				Minimum required fire flow rate (rounded to nearest 100)		L/min	6,200
					Minimum required fire flow rate		L/s	103.3
					Required duration of fire flow		hr	1.5

Water Service Calculations

LRL File No. : 190084
Project : 875 Montreal Road - Proposed Developments (Phase 2)
Date : January 7, 2020
Designed by : Kyle Herold

Water Demand (Commercial, Ground Level)

Fixture Calculations	Fix. Units	Quant	Total Fix. Units
Lavatory (8.3 L/m) Public	2	1	2
		Total	**2**

Total fixture units: 2 (as per OBC Table 7.6.3.2.A) (as per PS&D)
Conversion of fixture units to equivalent gpm: 1 gpm

Average water demand = 5450.99 L / day
= 0.06 L/s

Maximum daily peak factor:	1.5		1.14
Maximum daily demand =	8176	L / day	2.78
=	0.09	L / s	6.07

Maximum hour peak factor:	1.8	
Maximum hour demand =	14718	L / day
=	0.17	L / s

Water Demand (Residential, 2nd + 3rd Level)

Fixture Calculations	Fix. Units	Quant	Total Fix. Units
Bathroom Group (6 LPF)	3.6	3	10.8
Lavatory (8.3 L/m) Private	0.7	3	2.1
Sink, Kitchen (Dom)	1.4	3	4.2

Dishwasher (Dom)	1.4	3	4.2
Clothes Washer	1.4	3	4.2
		Total	**25.5**

Total fixture units: 25.5 (as per OBC Table 7.6.3.2.A) (as per PS&D)

Conversion of fixture units to equivalent gpm: 17 gpm

Average water demand = 92666.83 L / day

= 1.07 L/s

Maximum daily peak factor: 2.5

Maximum daily demand = 231667 L / day

= 2.68 L / s

Maximum hour peak factor: 2.2

Maximum hour demand = 509668 L / day

= 5.90 L / s

Adjusted total maximum water demand = 524385 L / day

= 6.07 L / s

Water Service Pipe Sizing

$Q = VA$ Where: V = velocity

A = area of watermain pipe

Q = water supply flow rate

By deriving the above formula, we can obtain the diameter of the pipe:

Minimum pipe diameter: $d = (4Q/\pi V)^{1/2}$

$d =$ 0.066 m

$d =$ 66 mm

Proposed pipe diameter: **150** mm (as per pressure loss calculations

Fire Flow Calculations - Phase 2

LRL File No. 190084
Date January 7, 2020
Method Fire Underwriters Survey (FUS)
Prepared by Kyle Herold

Step	Task	Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
Structural Framing Material								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Ordinary Construction	1		
			Ordinary Construction	1.0				
			Non-combustible construction	0.8				
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
Floor Space Area								
2	Total area					**492**		
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x Area$^{0.5}$				L/min	**4,880**
							L/s	81.3
Reductions or surcharge due to factors affecting burning								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Combustible	**0%**		
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%			L/min	**4,880**
			Rapid burning	25%			L/s	81.3
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	**0%**		
			Water supply is standard for both the system and fire department hose lines	-10%	False	0	L/min	**4,880**
			Fully supervised system	-10%	False	0	L/s	81.3
6	Choose separation	Exposure distance between units	North side	10.1 to 20m	15%			
			East side	0 to 3m	25%			
			South side	Over 45m	0%		L/min	**7,076**
			West side	30.1 to 45m	5%	**45%**	L/s	1.0
Net required fire flow								
7	Obtain fire flow, duration, and volume				Minimum required fire flow rate (rounded to nearest 100)		L/min	**7,100**
					Minimum required fire flow rate		L/s	**118.3**
					Required duration of fire flow		hr	**1.5**

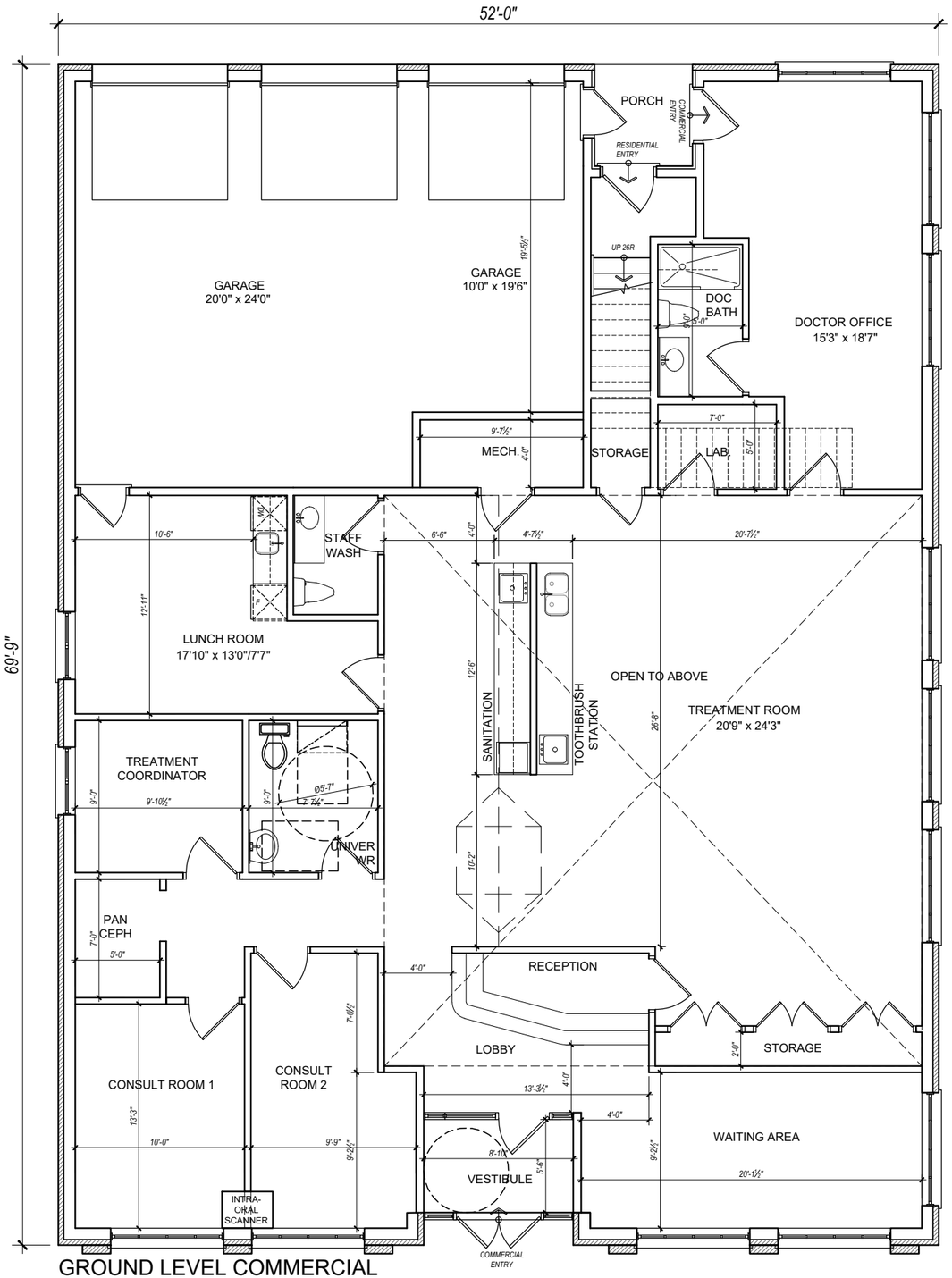
APPENDIX H

Floor Plans

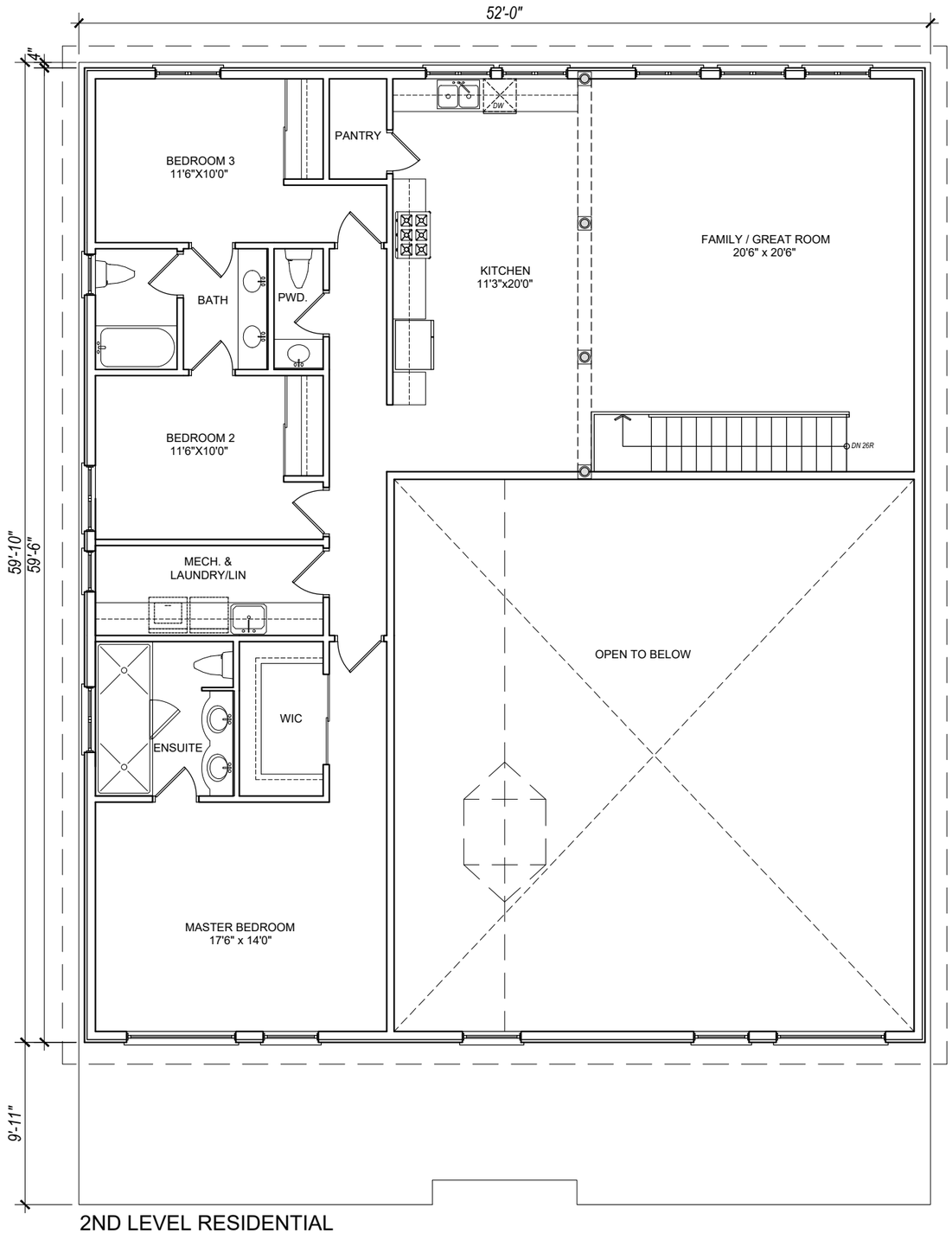
PROJ. #: 1916
SCALE: 1/8" = 1'-0"
DATE: OCT. 31, 2019

875 Montreal Road Mixed-Use
Phase 1

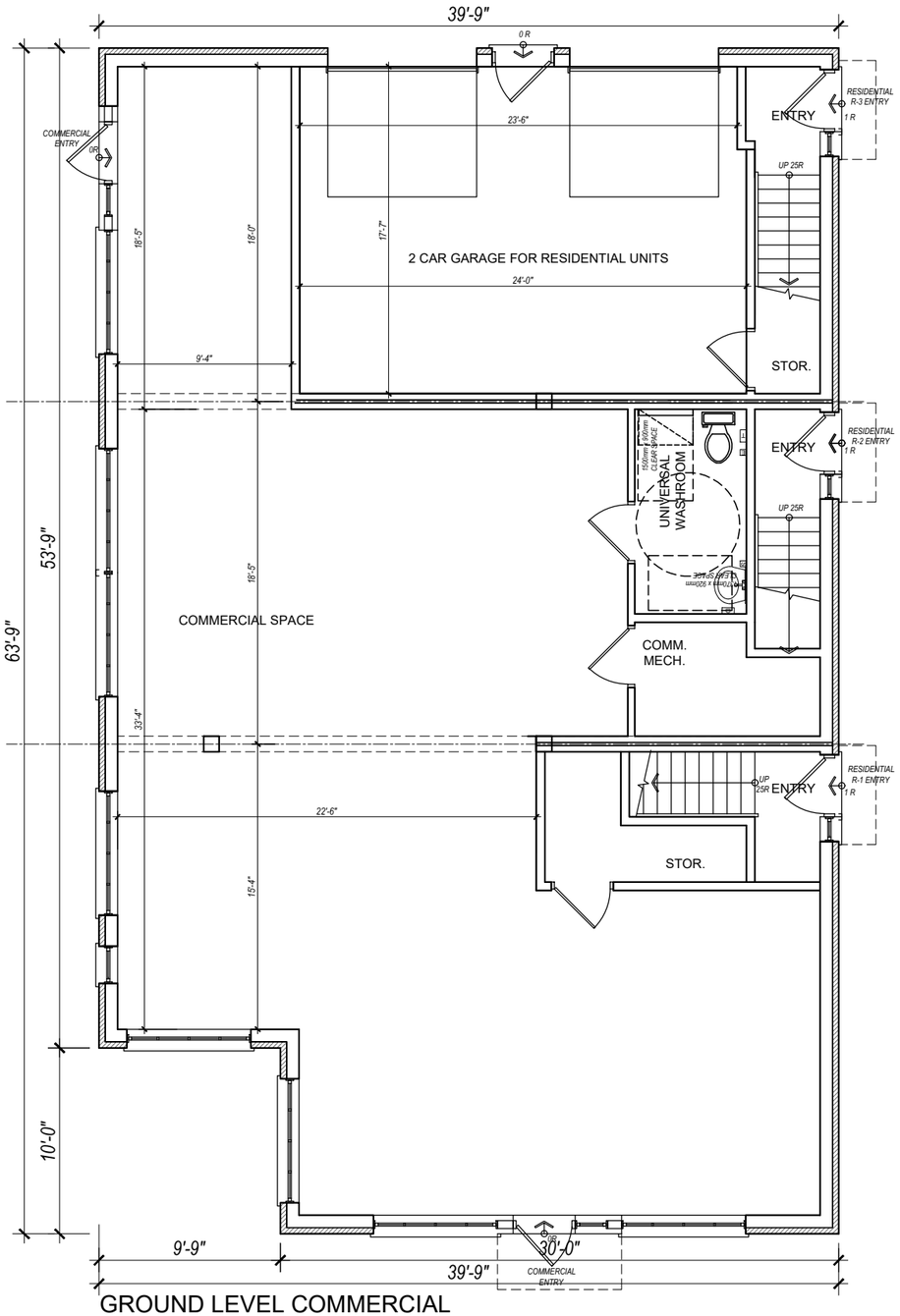
C W ARCHITECT INC.
T: (613) 877-4790 E: chun@cwarchitect.ca
222 Reynolds Rd, Lansdowne, ON, K0E1L0



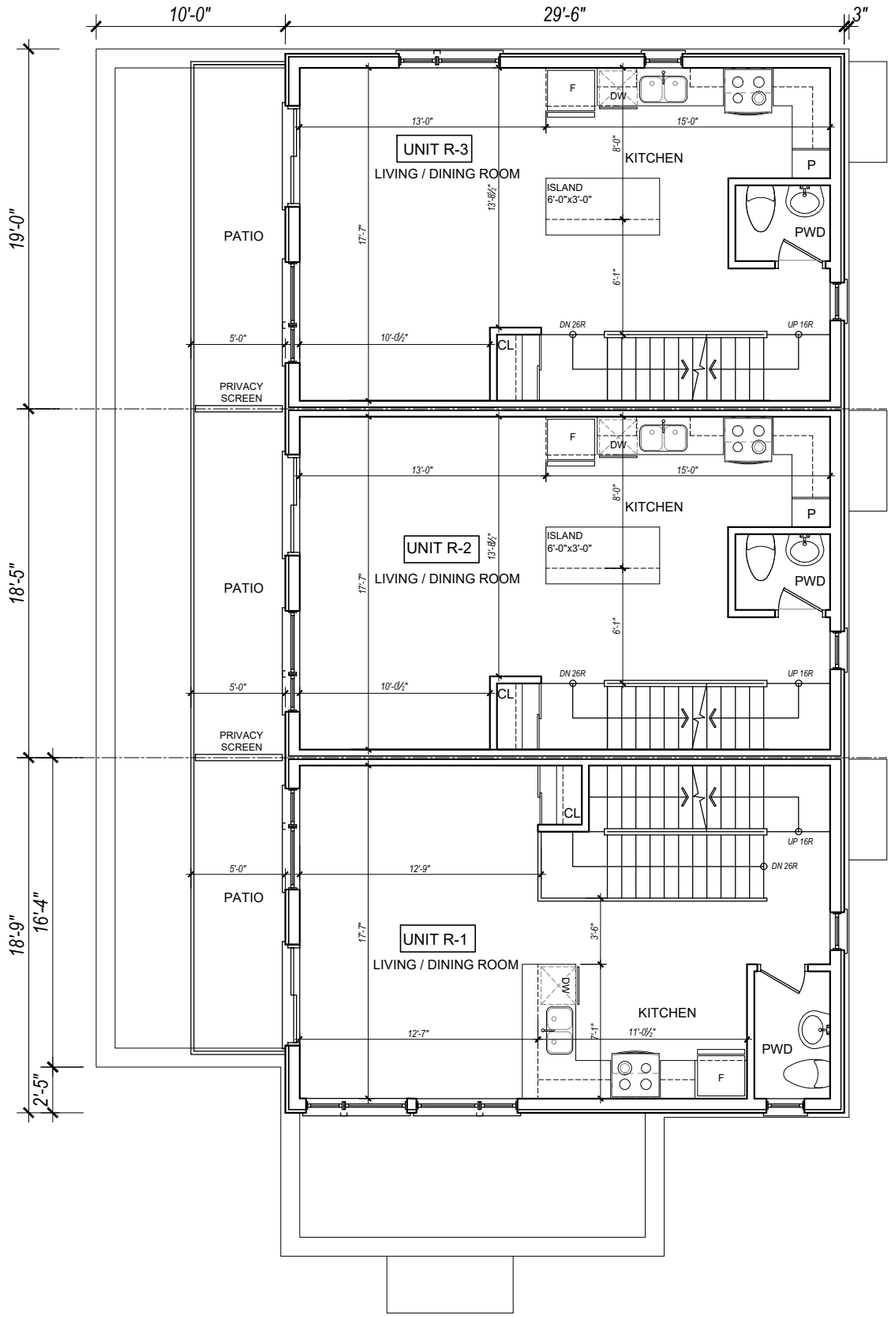
GROUND LEVEL COMMERCIAL
COMMERCIAL: 2,768 SQFT



2ND LEVEL RESIDENTIAL
RESIDENTIAL: 1,940 SQFT



GROUND LEVEL COMMERCIAL
COMMERCIAL: 1,752 SQFT
RESIDENTIAL: 208 SQFT



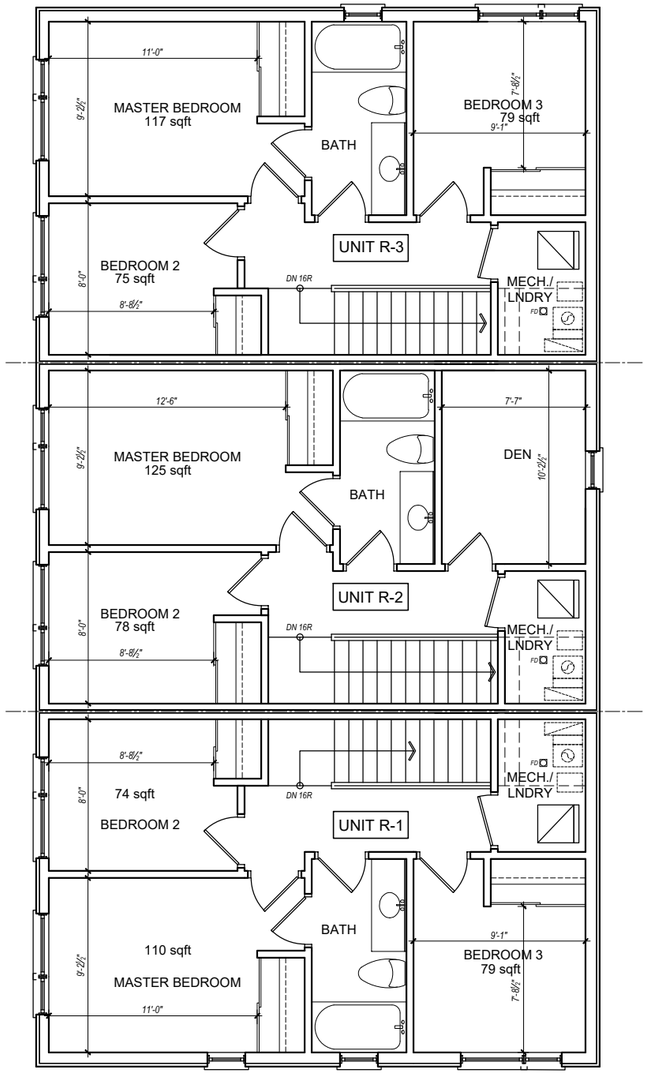
2ND LEVEL RESIDENTIAL
RESIDENTIAL: 1,664 SQFT

PROJ. #: 1916
SCALE: 1/8" = 1'-0"
DATE: NOV. 7, 2019

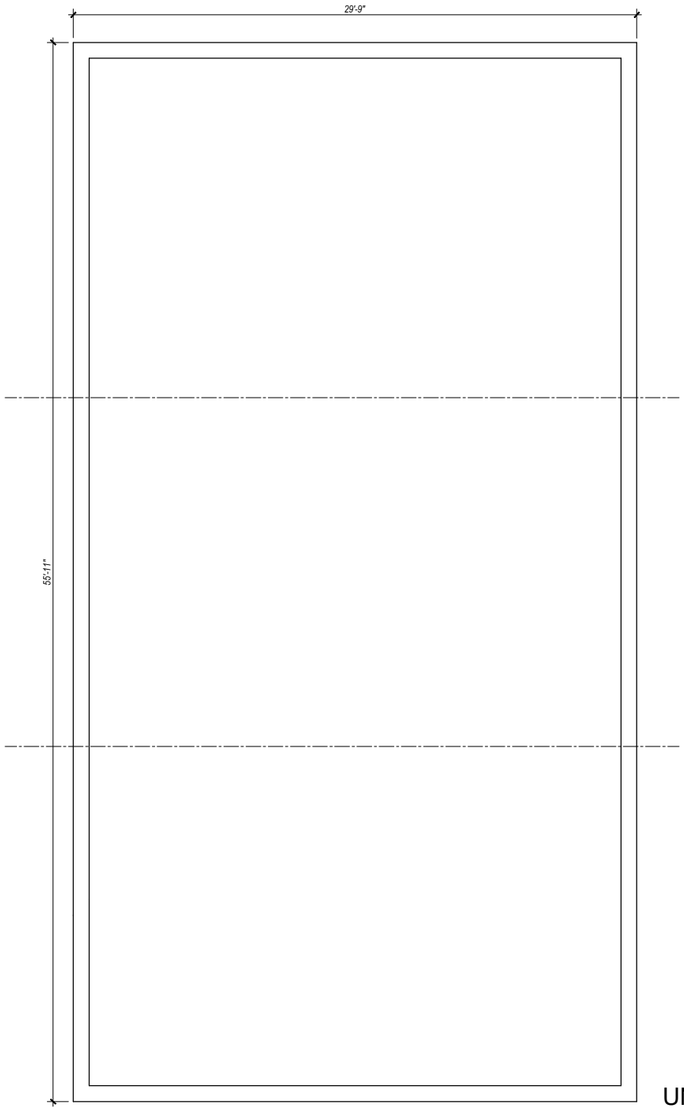
875 Montreal Road Mixed-Use

Phase 2

C W ARCHITECT INC.
Tel: (613) 877-4790 Email: chun@cwarchitect.ca
222 Reynolds Road, Lansdowne, Ontario K0E 1L0



3RD LEVEL RESIDENTIAL
RESIDENTIAL: 1,664 SQFT



ROOF PLAN

UNIT R-1: 1,187 SQFT
UNIT R-2: 1,160 SQFT
UNIT R-3: 1,187 SQFT
TOTAL: 3,534 SQFT

PROJ. #: 1916
SCALE: 1/8" = 1'-0"
DATE: NOV. 7, 2019

875 Montreal Road Mixed-Use

Phase 2

C W ARCHITECT INC.
Tel: (613) 877-4790 Email: chun@cwarchitect.ca
222 Reynolds Road, Lansdowne, Ontario K0E 1L0

APPENDIX I

Boundary Conditions Correspondence & Calculations

Kyle Herold

From: Valic, Jessica <jessica.valic@ottawa.ca>
Sent: Friday, December 20, 2019 10:42 AM
To: Kyle Herold
Cc: Virginia Johnson; Maxime Longtin
Subject: RE: 190084 - 875 Montreal Road - Boundary Conditions
Attachments: 875 Montreal Dec 2019.pdf

Good Morning Kyle,

Please see below and attached. Note that the Infrastructure Project Manager for this development will be assigned when the application is submitted, but I wanted to flag that 75mm water services are not currently accepted by the City. The services will either need to be 50mm or 100mm.

Please refer to Guidelines and Technical bulletin ISDTB-2014-02 concerning basic day demands greater than 0.5 L/s.

The following are boundary conditions, HGL, for hydraulic analysis at 875 Montreal (zone MONT) assumed to be connected to the 406mm on Montreal Rd (see attached PDF for location).

Existing Conditions based on current pump operations:

Phase 1
MIN HGL = 146.7m
MAX HGL = 147.0m,
MXDY+Fire (103 L/s) = 146.5m

Phase 2
MIN HGL = 146.7m
MAX HGL = 147.0m
MXDY+Fire (118 L/s) = 146.5m

Please note the following:

- *Boundary conditions provided above are for existing conditions. Upgrades to the Montreal and Brittany pump stations are currently being planned. The City plans to control the discharge HGL to 143.0m. Furthermore, the current plan is to use a different pumping strategy that will try to maintain a constant HGL of 143.0m even during peak hour and/or fire flow conditions.*

These are for current conditions and are based on computer model simulation.

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.

Please do not hesitate to contact me with any questions/concerns.

Regards,

Jessica Valic, E.I.T.
Engineering Intern
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 15672
jessica.valic@ottawa.ca

From: Kyle Herold <kherold@lrl.ca>
Sent: December 13, 2019 3:36 PM
To: Valic, Jessica <jessica.valic@ottawa.ca>
Cc: Virginia Johnson <vjohnson@lrl.ca>; Maxime Longtin <mlongtin@lrl.ca>
Subject: 190084 - 875 Montreal Road - Boundary Conditions

Good afternoon Jessica,

We are currently working on the serviceability for the development of two new mixed-use buildings at 875 Montreal Road. I am writing to request the boundary conditions for the developments.

Please use the following data to provide the require boundary conditions:

Phase 1 Development 2 Storey Mixed-Use:
Average Total Daily Demand = 0.73 L/s
Maximum Daily Demand = 1.81 L/s
Maximum Hourly Demand = 3.99 L/s
Required Fire Flow = 103.3 L/s

Phase 2 Development 3 Storey Mixed-Use:
Average Total Daily Demand = 1.07 L/s
Maximum Daily Demand = 2.68 L/s
Maximum Hourly Demand = 5.90 L/s
Required Fire Flow = 118.3 L/s

Please note:
We calculated the following demands based on OBC's fixture count (refer to FUS design sheets included).

For your reference, I have included copies of the Water Supply Calculations, FUS Fire Flow Calculations, Site Plan and Draft Servicing Plan along with this email.

If you have any questions or concerns, please do not hesitate to reach out.

Thank you,

Kyle Herold
Civil EIT / Field Technician
LRL Associates Ltd.
5430 Canotek Road
Ottawa, Ontario K1J 9G2
T (613) 842-3434 or (877) 632-5664 ext 261
C (613) 915-2988
F (613) 842-4338
E kherold@lrl.ca
W www.lrl.ca
We care deeply, so let us know how we did by completing our Customer Satisfaction Survey.
Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre sondage sur la satisfaction de la clientèle

'

'

Pipe Pressure Losses Calculations

LRL File No.	190084
Project	875 Montreal Road - Proposed Developments (Phase 1)
Date	1/7/2020
Designed:	Maxime Longtin

Piezometric Head Equation (Derived from Bernoulli's Equation)

$$h = \frac{p}{\gamma} + z$$

Where:

h = HGL (m)

p = Pressure (Pa)

γ = Specific weight (N/m3) = 9810

z = Elevation of centreline of pipe (m) = 100.5

Water Pressure at Montreal Road Connection			
HGL (m)		Pressure	
		kPa	psi
Minimum =	146.7	453.22	65.73
Maximum =	147.0	456.17	66.16
Max. Day + Fire =	146.5	451.26	65.45

Hazen Williams Equation

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

Where:

h_f = Head loss over the length of pipe (m)

Q = Volumetric flow rate (m^3/s)

L = Length of pipe (m)

C = Pipe roughness coefficient

d = Pipe diameter (m)

Scenario 1: maximum daily demand

Q (L/s)	1.81	
C	100	
L (m.)	12.6	
I.D. (mm)	100	
V (m/s)	0.23	
h_f (m)	0.02	
Head Loss (psi)	0.02	
Min. Pressure (psi)	65.71	
Max. Pressure (psi)	66.14	
Service Obv. @ Street Connection (m)	100.70	
Service Obv. @ Building Connection (m)	100.95	
Pressure Adjustment (psi)	-0.36	(due to service elevation difference from street to building)
Adjusted Min. Pressure (psi)	65.36	(must not be less than 50psi)
Adjusted Max. Pressure (psi)	65.78	(must not be more than 80psi)

Scenario 2: maximum hourly demand

Q (L/s)	3.99	
C	100	
L (m.)	12.6	
I.D. (mm)	100	
V (m/s)	0.51	
h_f (m)	0.07	
Head Loss (psi)	0.10	
Min. Pressure (psi)	65.63	
Max. Pressure (psi)	66.06	
Service Obv. @ Street Connection (m)	100.70	
Service Obv. @ Building Connection (m)	100.95	
Pressure Adjustment (psi)	-0.36	(due to service elevation difference from street to building)
Adjusted Min. Pressure (psi)	65.28	(must not be less than 50psi)
Adjusted Max. Pressure (psi)	65.70	(must not be more than 80psi)

Scenario 3: maximum daily demand + fire flow

Q (L/s)	105.11	
C	100	
L (m.)	12.6	
I.D. (mm)	100	
V (m/s)	13.38	
h_f (m)	30.80	
Head Loss (psi)	43.80	
Pressure (psi)	21.65	
Service Obv. @ Street Connection (m)	100.70	
Service Obv. @ Building Connection (m)	100.95	
Pressure Adjustment (psi)	-0.36	(due to service elevation difference from street to building)
Adjusted Pressure (psi)	21.30	(must not be less than 20psi)

Pipe Pressure Losses Calculations

LRL File No.	190084
Project	875 Montreal Road - Proposed Developments (Phase 2)
Date	1/7/2020
Designed:	Maxime Longtin

Piezometric Head Equation (Derived from Bernoulli's Equation)

$$h = \frac{p}{\gamma} + z$$

Where:

h = HGL (m)

p = Pressure (Pa)

γ = Specific weight (N/m3) = 9810

z = Elevation of centreline of pipe (m) = 100.5

Water Pressure at Jamie Avenue Connection			
HGL (m)		Pressure	
		kPa	psi
Minimum =	146.7	453.22	65.73
Maximum =	147	456.17	66.16
Max. Day + Fire =	146.5	451.26	65.45

Hazen Williams Equation

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

Where:

h_f = Head loss over the length of pipe (m)

Q = Volumetric flow rate (m^3/s)

L = Length of pipe (m)

C = Pipe roughness coefficient

d = Pipe diameter (m)

Scenario 1: maximum daily demand

Q (L/s)	2.68	
C	100	
L (m.)	14	
I.D. (mm)	150	
V (m/s)	0.15	
h_f (m)	0.01	
Head Loss (psi)	0.01	
Min. Pressure (psi)	65.73	
Max. Pressure (psi)	66.15	
Service Obv. @ Street Connection (m)	100.70	
Service Obv. @ Building Connection (m)	101.05	
Pressure Adjustment (psi)	-0.50	(due to service elevation difference from street to building)
Adjusted Min. Pressure (psi)	65.23	(must not be less than 50psi)
Adjusted Max. Pressure (psi)	65.66	(must not be more than 80psi)

Scenario 2: maximum hourly demand

Q (L/s)	5.9	
C	100	
L (m.)	14	
I.D. (mm)	150	
V (m/s)	0.33	
h_f (m)	0.02	
Head Loss (psi)	0.03	
Min. Pressure (psi)	65.70	
Max. Pressure (psi)	66.13	
Service Obv. @ Street Connection (m)	100.70	
Service Obv. @ Building Connection (m)	101.05	
Pressure Adjustment (psi)	-0.50	(due to service elevation difference from street to building)
Adjusted Min. Pressure (psi)	65.20	(must not be less than 40psi)
Adjusted Max. Pressure (psi)	65.63	(must not be more than 80psi)

Scenario 3: maximum daily demand + fire flow

Q (L/s)	120.98	
C	100	
L (m.)	14	
I.D. (mm)	150	
V (m/s)	6.84	
h_f (m)	6.16	
Head Loss (psi)	8.76	
Pressure (psi)	56.69	
Service Obv. @ Street Connection (m)	100.70	
Service Obv. @ Building Connection (m)	101.05	
Pressure Adjustment (psi)	-0.50	(due to service elevation difference from street to building)
Adjusted Pressure (psi)	56.19	(must not be less than 20psi)

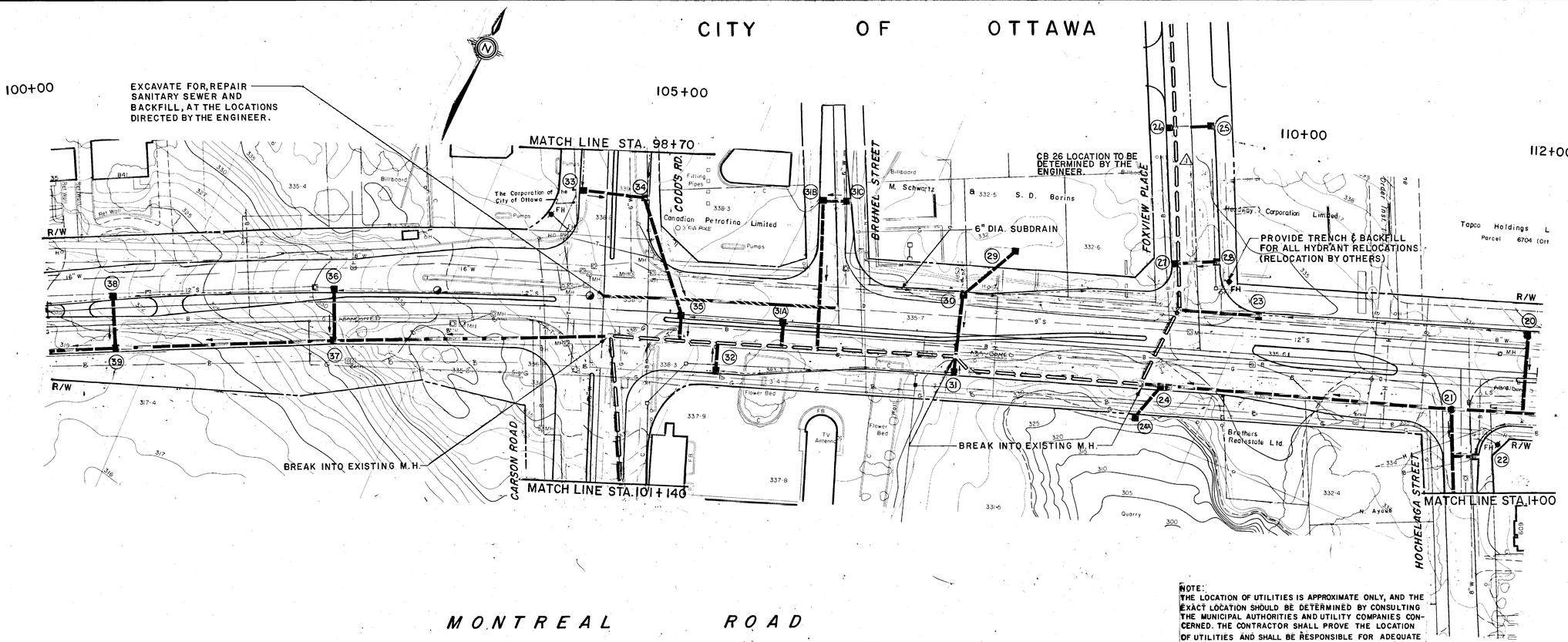
APPENDIX J

Plan and Profile Drawings

10169

R-987-9

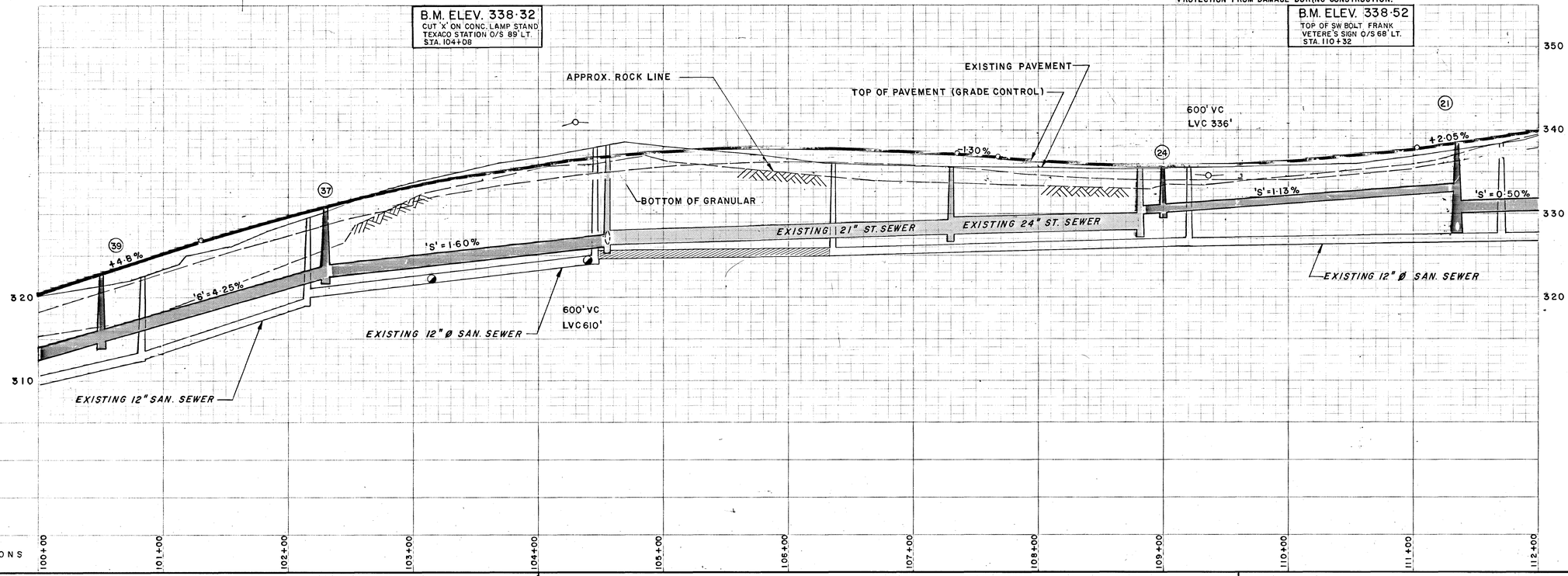
CITY OF OTTAWA



MONTREAL ROAD

B.M. ELEV. 338.32
CUT 'X' ON CONC. LAMP STAND
TEXACO STATION O/S 89' LT.
STA. 104+08

B.M. ELEV. 338.52
TOP OF SW BOLT FRANK VETERE'S SIGN O/S 68' LT.
STA. 110+32



NOTE:
THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE DURING CONSTRUCTION.

MANHOLE AND CATCHBASIN DATA

No.	STATION	OFFSET	TYPE		ELEVATION	
			STRUCT.	COVER	GRATE	LOW INV.
20	111+90	33' LT	J-3-9	J-3-18	339.51	335.76
21	111+35	32' RT	J-3-14	S-3-7	338.18	328.66
22	H 0+70	14' LT	J-3-9	J-3-19	336.97	333.43
23	109+75	33' LT	J-3-9	J-3-18	335.64	332.20
24	109+00	32' RT	DD-708A	J-3-18	335.08	329.95
25	F 1+80	19' RT	J-3-9	J-3-18	337.10	333.31
26	F 1+80	19' LT	J-3-9	J-3-18	336.96	333.18
27	F 0+70	19' LT	J-3-14	J-3-18	334.69	331.25
28	F 0+70	19' RT	J-3-9	J-3-18	334.74	331.08
29	107+35	33' LT	J-3-8	S-3-4	336.10	332.01
30	107+36	33' LT	J-3-14	J-3-18	336.80	328.57
31	107+35	33' RT	J-3-9	J-3-18	336.49	333.24
32	105+40	45' RT	J-3-9	J-3-18	337.02	333.05
33	C99+05	21' RT	J-3-14	J-3-18	337.58	333.83
34	C99+05	33' LT	J-3-14	J-3-18	337.58	333.50
35	105+09	3' RT	J-3-14	J-3-18	337.53	331.07
36	102+30	9' LT	J-3-9	J-3-18	331.13	327.38
37	102+30	33' RT	J-3-14	J-3-18	330.24	322.41
38	100+50	9' LT	J-3-9	J-3-18	331.13	327.38
39	100+50	33' RT	J-3-14	J-3-18	322.26	314.75
31A	105+90	5' RT	J-3-9	J-3-18	337.99	333.54
31B	B 1+00	14' LT	J-3-14	J-3-18	336.00	331.77
31C	B 1+00	14' RT	J-3-9	J-3-18	336.08	332.40
24A	108+80	58' RT	S-3-24	J-3-16	332.62	331.66

SEWER DATA

No.	to No.	SIZE	LENGTH	CLASS	INVERTS	
					INLET	OUTLET
19	21	18"	184'	C-76-IV	330.98	330.06
20	TRUNK	9"	64'	C-14-ES	335.78	331.14
21	24	12"	239'	C-14-ES	332.76	329.91
21	61	18"	293'	C-76-IV	328.66	325.02
22	TRUNK	9"	23'	C-14-ES	333.43	328.64
23	EX. MH.	9"	55'	C-14-ES	332.20	331.16
24	EX. M.H.	12"	29'	C-14-ES	329.95	329.68
25	EXIST.	12"	22'	C-14-ES	333.31	330.14
26	EXIST.	12"	18'	C-14-ES	333.18	330.14
27	EXIST.	9"	18'	C-14-ES	331.55	330.04
28	EXIST.	9"	21'	C-14-ES	331.08	331.00
29	30	12"	53'	C-14-ES	332.01	328.61
30	EX. MH.	12"	53'	C-14-ES	328.57	328.39
31	EX. M.H.	9"	7'	C-14-ES	333.24	331.06
32	EXIST.	9"	25'	C-14-ES	333.05	327.94
33	34	9"	54'	C-14-ES	333.83	333.50
34	35	12"	103'	C-14-ES	333.50	332.50
35	EXIST.	12"	18'	C-14-ES	331.07	327.74
36	37	9"	42'	C-14-ES	327.38	326.49
EX.M.H.	37	18"	22'	C-76-IV	326.01	322.41
37	39	18"	180'	C-76-IV	322.41	314.75
38	39	9"	42'	C-14-ES	319.24	318.51
31A	EXIST.	9"	24'	C-14-ES	333.54	328.54
31C	31B	9"	24'	C-14-ES	332.40	332.00
31B	EXIST.	9"	118'	C-14-ES	331.77	328.04
24A	24	9"	52'	C-14-ES	331.66	331.17

FOR REDUCED DRAWINGS
HORIZONTAL 0 10 20 40 60'
VERTICAL 0 3 6 9'

AS CONSTRUCTED

McCORMICK RANKIN
CONSULTING ENGINEERS

REGISTERED PROFESSIONAL ENGINEER F. TURNER PROVINCE OF ONTARIO

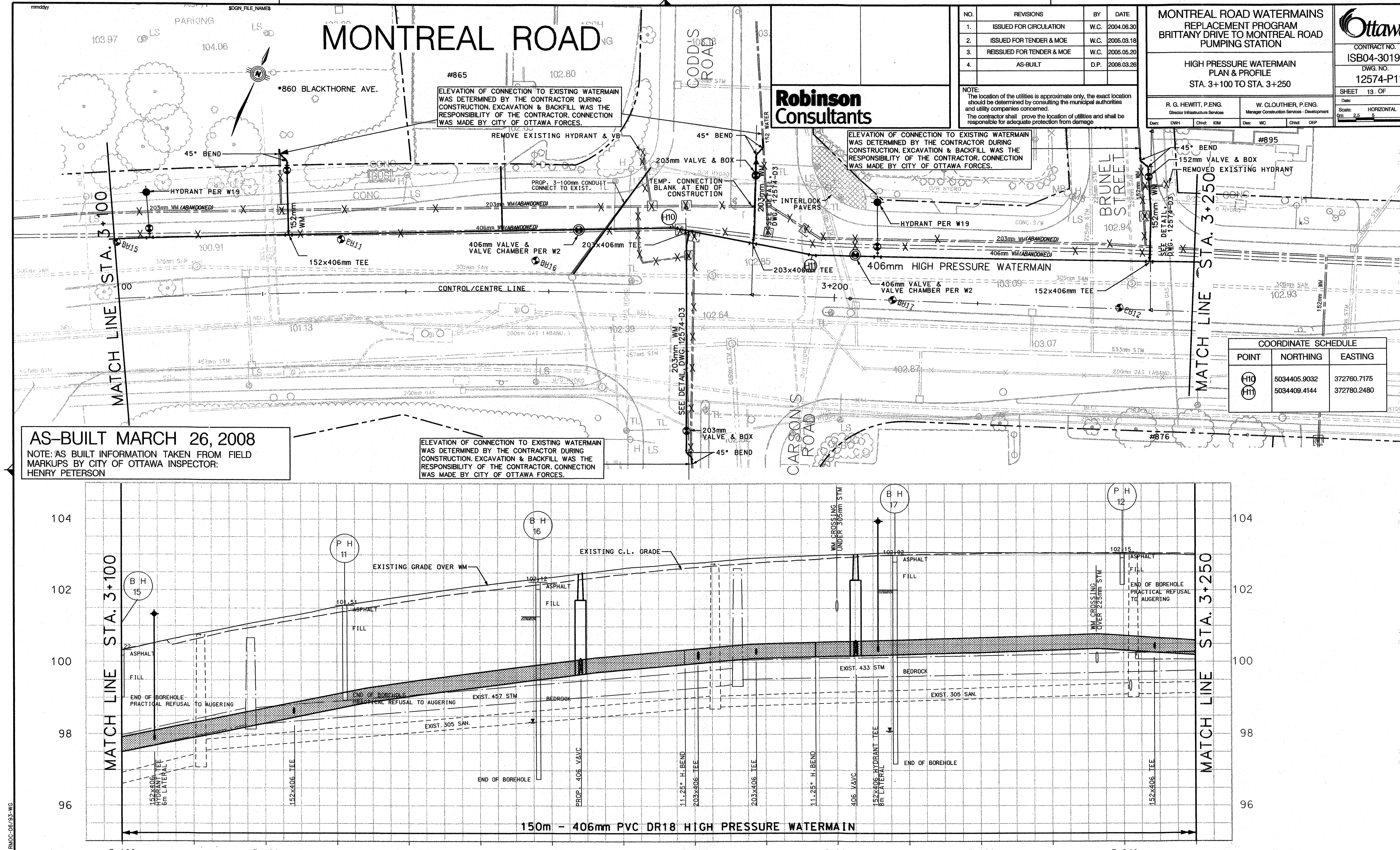
NO.	REVISION	BY	DATE
1	STORM SEWER ADJUSTED	D.H.	07/83

THE REGIONAL MUNICIPALITY OF OTTAWA—CARLETON
Transportation Department

MONTREAL ROAD
EASTERN PARKWAY TO BATHGATE DRIVE

STORM SEWER
STA. 100+00 TO STA. 112+00

Des: P.T.	Chkd:	N.H. ORR P. ENG. Director Design & Construction
Dwn: H.R.	Chkd: P.T.	
Date: JULY 1983		
Scale: Horiz. 1"=40' Vert. 1"=6'		Chief Design Engineer
CONTRACT NO. 78-503		DWG. NO. R987-R-9
		SHEET 9 OF 33



COORDINATE SCHEDULE

POINT	NORTHING	EASTING
H10	5034405.9032	372760.7175
H11	5034409.4144	372780.2480

STATION	EXISTING GRADE OVER WATERMAIN	PROPOSED TOP OF WATERMAIN
+100.0	100.33	97.91
+104.6	100.53	98.10
+120.0	101.02	98.73
+124.0	101.16	98.87
+140.0	101.70	99.45
+160.0	102.21	99.97
+164.1	102.31	100.08
+178.6	102.63	100.35
+180.0	102.65	100.37
+180.5	102.66	100.38
+188.6	102.78	100.51
+197.0	102.87	100.55
+200.0	102.92	100.57
+202.6	102.95	100.58
+205.7 / +207	102.98	100.60
+220.0	103.04	100.68
+236.3	103.06	100.78
+240.0	103.06	100.73
+244.4	103.05	100.67
+251.2	103.01	100.58

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

NO.	REVISIONS	BY	DATE
1.	ISSUED FOR CIRCULATION	W.C.	2004.06.30
2.	ISSUED FOR TENDER & MOE	W.C.	2005.03.18
3.	REISSUED FOR TENDER & MOE	W.C.	2005.05.20
4.	AS-BUILT	D.P.	2008.03.26

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

Robinson Consultants

MONTREAL ROAD WATERMAINS
REPLACEMENT PROGRAM BRITTANY DRIVE TO MONTREAL ROAD PUMPING STATION

HIGH PRESSURE WATERMAIN
PLAN & PROFILE
STA. 3+100 TO STA. 3+250

R. G. HEWITT, P.ENG. — Director Infrastructure Services
W. CLOUTHIER, P.ENG. — Manager Construction Services - Development

Dwn: DWH | Chkd: IDM | Des: WC | Chkd: DEP

Ottawa
CONTRACT NO. ISB04-3019
DWG. NO. 12574-P11
SHEET 13. OF
Date:
Scale: HORIZONTAL 0m 2.5 5 10

DWG. FRAME 790mm x 534mm RMOC-06/93-WG

ISSUED

12574

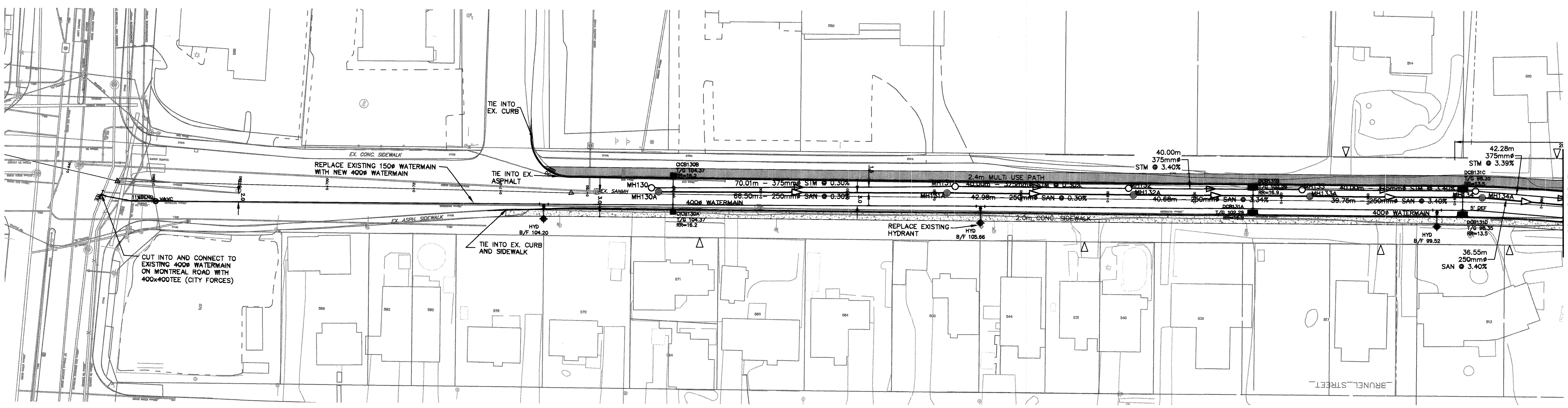
REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed: Will Curry
Date: March 8 2016
Plan Number: 17063

NOTES:

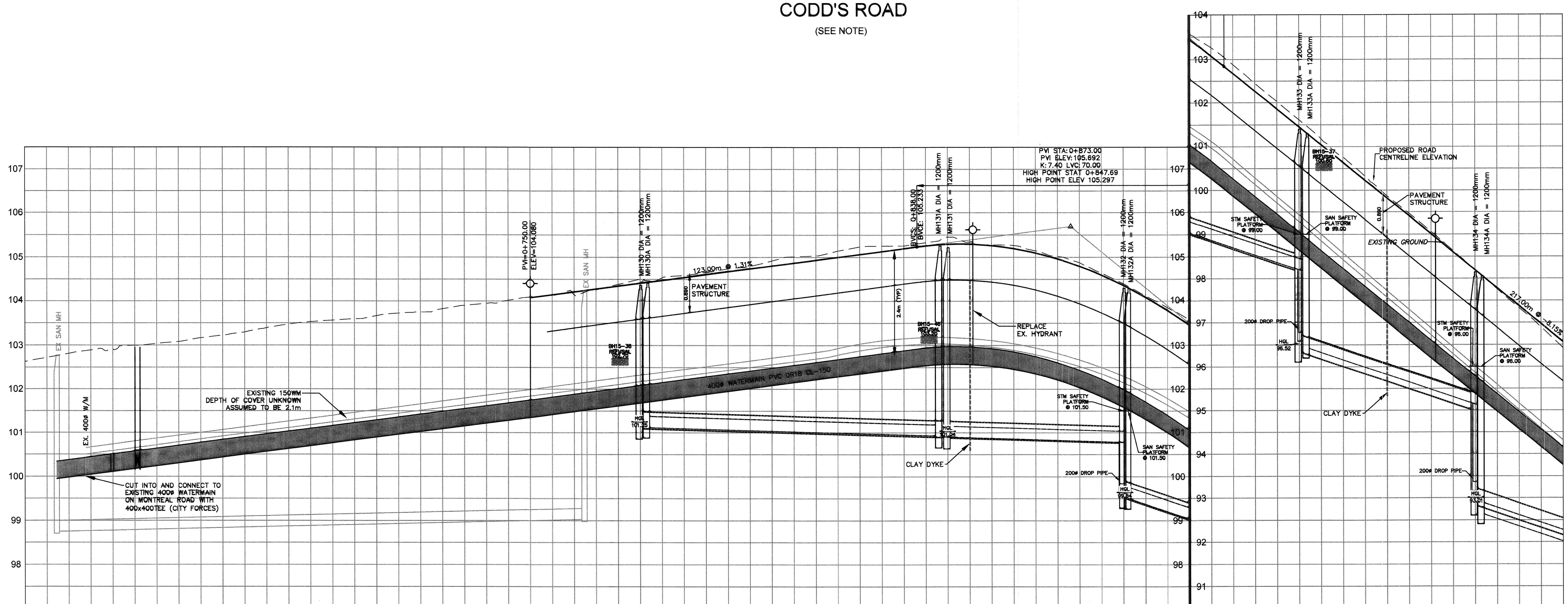
1. CODD'S ROAD UP TO STATION 1+000 WILL BE SUBJECT TO A ROAD MODIFICATION APPROVAL PROCESS.

2. ALL SERVICE LATERALS TO BE INSTALLED TO THE PROPERTY LINE.



CODD'S ROAD

(SEE NOTE)



ROAD GRADE	TOP OF WATERMAIN	STM SEWER INVERT	SAN SEWER INVERT	STATION
	100.343		90.042	0+640
			TEE	0+648.863
	100.575		11BEND	0+655.10
			V&VC	0+660 / 0+660.605
	100.835			0+680
	101.096		54.7m - 250mmø STM PVC DR-35 @ 0.63%	0+700
	101.357			0+720
	101.617			0+740
104.080 EX.	101.800		HYD	0+750.000
104.211	101.882		99.030	0+760
104.473	102.148	101.100NW	101.126NW	0+780
104.735	102.415	70.01m - 375mmø PVC STM @ 0.30%	66.50m - 250mmø PVC DR-35 SAN @ 0.30%	0+800
104.997	102.682			0+820
105.233 / 105.257	102.908 / 102.943	100.890SE / 100.885NW	100.926SE / 100.906NW	0+840
105.297	102.974	40.00m - 375mmø PVC STM @ 0.30%	42.98m - 250mmø PVC DR-35 SAN @ 0.30% / HYD	0+850.731
105.194	102.854			0+860
104.591	102.224	100.765SE / 99.530NW	100.777SE / 99.510NW	0+880
103.447	101.051	40.00m - 375mmø PVC STM @ 3.40%	40.68m - 250mmø PVC DR-35 SAN @ 3.34%	0+900
102.838	100.521			
101.860	99.452	98.170SE / 96.360NW	98.150SE / 96.451NW	0+920
100.229	97.822	40.00m - 375mmø PVC STM @ 3.40%	39.75m 250mmø PVC DR-35 SAN @ 3.40%	0+940
			HYD	0+955.993
98.599	96.191	95.001SE / 92.855N	95.100SE / 92.660N	0+960
		42.28m 375mmø PVC STM @ 3.39%	36.55m 250mmø PVC DR-35 SAN @ 3.40%	
96.968	94.560			0+980

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	ISSUED FOR CITY APPROVAL	J.I.M.	2016:02:29
7	ISSUED FOR MOE APPROVAL	J.I.M.	2016:02:18
6	REVISED PER CITY COMMENTS	J.I.M.	2016:01:27
5	REVISED PER CITY COMMENTS	J.I.M.	2015:11:30
4	REVISED PER CITY COMMENTS	J.I.M.	2015:11:20
3	REVISED PER CITY COMMENTS	J.I.M.	2015:11:13
2	ISSUED FOR CITY INTERNAL CIRCULATION	J.I.M.	2015:09:22
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2015:06:30

CANADA LANDS COMPANY
SOCIÉTÉ IMMOBILIÈRE DU CANADA
30 Metcalfe Street Suite 601
Ottawa, On K1P 5L4
613 998 7777

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title

WATERIDGE VILLAGE AT ROCKCLIFFE

PHASE 1A

LICENSED PROFESSIONAL ENGINEER J. I. MOFFATT 16/02/29 PROVINCE OF ONTARIO

N

Drawing Title

CODD'S ROAD

MONTREAL RD TO 0+980

Scale
HORIZ. SCALE 1 : 500
VERT. SCALE 1 : 50

Design: J.I.M./M.B.
Date: JUNE 2015
Drawn: D.D. / M.M.
Checked: J.I.M.
Project No.: 38298
Drawing No.: 103

D07-16-15-0003

#17063

APPENDIX K

Storm Sewer Design Sheets

LRL Associates Ltd.
Storm Design Sheet

LRL File No.	190084
Project:	875 Montreal Rd Mixed Use
Location:	Ottawa, On
Date:	January 8, 2020
Designed:	M. Longtin
Drawing Reference:	C.401

Storm Design Parameters

Rational Method Q = 2.78CIA

Q = Peak flow in litres per second (L/s)
A = Drainage area in hectares (ha)
C = Runoff coefficient
I = Rainfall intensity (mm/hr)

Runoff Coefficient (C)

Grass	0.20
Gravel	0.80
Asphalt / rooftop	0.90

Ottawa Macdonald-Cartier International Airport IDF curve equation (5 year event, intensity in mm/hr)

$I = 998.071 / (T_c + 6.053)^{0.814}$

Min. velocity = 0.80 m/s
Manning's "n" = 0.013

LOCATION			AREA (ha)			FLOW					STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (l/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q_{FULL})
WS-01	Lawn CB01	Lawn CBMH02	0.006	0.000	0.018	0.05	0.05	10.00	104.2	5.13	150	PVC	1.00%	25.2	15.2	0.86	0.49	**0.34**
WS-01	Lawn CBMH02	CB03	0.000	0.000	0.000	0.05	0.05	10.00	104.2	5.13	150	PVC	1.00%	17.8	15.2	0.86	0.34	**0.34**
WS-02	CB03	Monitoring MH	0.005	0.000	0.076	0.19	0.24	10.49	101.7	24.55	250	PVC	0.43%	30.2	39.0	0.79	0.63	**0.63**

APPENDIX L

Legal Survey

372787, 5034442

May-27-19 4:04:33 PM

TOPOGRAPHIC PLAN OF SURVEY OF

LOT 2 AND PART OF LOT 1
(WEST BRUNEL STREET)
REGISTERED PLAN 22
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2019

Scale 1: 200

0 2.5 5 10 15 20 metres

Metric Note

Distances and coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99995.

Bearing Note

Bearings hereon are grid bearings derived from the northerly limit of Part 2 having a bearing of N 71° 16' 10" E as shown on Plan 5R-7048 and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

Elevation Notes

1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978. (FSD File No. 551-05)
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

Utility Notes

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: Plans E4C, C-22-11 & C-22-12.
4. Sanitary and storm sewer grades and inverts were derived from: Field measurement
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

—□—	Denotes	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
IBØ	"	Round Iron Bar
(OU)	"	Origin Unknown
(Wit)	"	Witness
Meas	"	Measured
Acc.	"	Accepted
(P1)	"	Registered Plan 22
(P2)	"	Plan 5R-7048
(P3)	"	Plan 4R-9583
(P4)	"	Plan by (1692) dated Sept.22, 2016 (File No.03-16)
○ MH-S	"	Maintenance Hole (Sanitary)
○ MH-T	"	Maintenance Hole (Traffic)
⊖ VC	"	Valve Chamber (Watermain)
—— ST ——	"	Underground Storm Sewer
—— S ——	"	Underground Sanitary Sewer
—— W ——	"	Underground Water
—— G ——	"	Underground Gas
—— B ——	"	Underground Bell
—— OHW ——	"	Overhead Wires
○ UP	"	Utility Pole
○ AN	"	Anchor
□ CB	"	Catch Basin
◇ FH	"	Fire Hydrant
□ GM	"	Gas Meter
⊳⊲ TSP	"	Traffic Signal Post
∘ B	"	Bollard
Ø	"	Diameter
BF	"	Board Fence
Inv.	"	Invert
T/G	"	Top of Grate
U/Eave	"	Underside of Eave
TpFdn	"	Top of Foundation
C/L	"	Centreline
+65.00	"	Location of Elevations
+65.00	"	Top of Concrete Curb Elevation
	"	Deciduous Tree
	"	Coniferous Tree

Surveyor's Certificate

I certify that :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 24th day of May, 2019.

May 27/19
Date

Jamie Leslie
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2088432

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29 (3).

FARLEY, SMITH & DENIS SURVEYING LTD.

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