PROJECT: 116390-5.2.2

3777 STRANDHERD DRIVE
BARRHAVEN TOWN CENTRE
PAD C
SERVICING AND STORMWATER MANAGEMENT DESIGN BRIEF

Prepared for North American Development Group
by IBI Group

October 19, 2018

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1 INTRODUCTION

This Site Servicing Brief outlines the detailed design for extending storm, sanitary, and water services to Building Pad C, a proposed 467.1 sq. m stand-alone building, located in the existing Barrhaven Town Centre shopping plaza at the intersection of Strandherd Drive and Greenbank Road. The existing shopping center is bound by Strandherd Drive to the north, undeveloped land to the south, Greenbank Road to the east, and Jockvale Road to the west. Refer to key map below in Figure 1.1.

Figure 1.1 – Key Map

2 WATER DISTRIBUTION

The water service for Pad C will be provided through a proposed 50mm diameter type K copper line connected to the existing 200 mmØ private watermain network located in the existing parking lot. Fire protection will be provided by existing hydrants located in the parking lot. See Drawing C-001 in **Appendix A** for details.

The area where Pad C is proposed to be located is over a section of the existing watermain. This portion of the watermain will be removed and reconstructed in a new alignment as detailed on Drawing C-001.

3 SANITARY SEWERS

The area where Pad C is proposed to be located is adjacent to an existing 250 mmØ sanitary sewer and 75 mmØ forcemain. The proposed building will be serviced by a 150 mmØ service lateral to the realigned sewer as illustrated on Drawing C-001.

The sewer and a portion of the forcemain will be removed and reconstructed as illustrated on Drawing C-001.

Appendix A also contains a copy of the original sanitary sewer design sheet and tributary area plan for the Town Center Site Plan. Pad C is located in tributary Area 11. The original sanitary sewer design sheet included a building expansion area of approximately 897 sq. m. (9655 sq. ft.) Peak flow from the site (including expansion) was 6.97 l/s. The sewer design sheet has been updated to calculate peak flow based on actual/anticipated use for Pad B and C. Pad B was previously approved and is comprised of a Second Cup coffee house plus a 99 sq.m. general retail space. The number of seats in the Second Cup is 46, at a daily volume of 125 l/day/seat (City of Ottawa Sewer Design Guidelines Appendix 4-A) the 99 sq. m. of retail space has been allocated a daily volume of 5 l/sm. Pad C is 467.1 sq.m of retail space at a daily volume of 5 l/sm. The peak sanitary flow from the site, when including Pad B and C and eliminating the expansion areas is 7.026 l/s. This very minor increase in peak flow which should have no negative impact on downstream sewers. City staff had confirmed previously that an increase up to 7.2 l/s would be acceptable for this site. See email in **Appendix A**.

4 STORM SEWERS AND STORMWATER MANAGEMENT

The proposed building pad is an infill of an existing commercial plaza with existing storm sewers which outlet to the Kennedy-Burnett Stormwater Management Facility. Quality control is provided by the existing SWM facility as outlined in the November 2003 Stormwater Management Report by Robinson Consultants.

For the purposes of the subject development, the impacted areas can be categorized as two separate areas. The first area is the parking lot area, for which the overall asphalt area being serviced by the existing onsite storm sewer will be reduced by the proposed building. The parking lot area has no change in use from pre to post development, therefore a stormwater management strategy need-not be implemented for this area. As previously mentioned, the sewer servicing the parking lot area also benefits from a reduction in total drainage area, which will reduce flows to the outlet. The second area is the proposed commercial retail unit building. The proposed building is a change in use from the current asphalt parking lot, therefore stormwater management must be reviewed for the area of the proposed building.

Stormwater management criteria for new the CRU pad have been determined based on City of Ottawa comments from the initial Engineering submission. The City has requested a pre-development C of 0.50 be used. A Tc of 20minutes has been established, and a 5year storm intensity curve used determined the maximum release. Therefore the maximum allowable release rate for the new building can be calculated as follows:

Pre-Development

Tc = 20 minutes
A = 0.047 Ha
C = 0.50
i_{100} = 70.25 mm/hr

$Q_{100\ Pre}$ = 2.78 x C x i x A = 2.78 x 0.50 x 70.25 x 0.047 = **4.56 l/s**

Based on the aforementioned criteria, the maximum 5 year release rate from the building area is 4.56 l/s.

The proposed building has an estimated rooftop storage volume of 17.51m3, based on 150mm depth of ponding, and 75% useable rooftop area for storage. Inlet control devices are proposed in each inlet, similar to the Watts ® roof drain with flow control. With a release rate of 1.26l/s per inlet, the total release rate from the building is **2.52 l/s**. The building is over-controlling stormwater when compared to the pre-development design criteria.

During a 100 year storm, the maximum retention volume required is 17.40 l/s, therefore there is no overflow. According to the mechanical engineer, no rooftop scuppers are proposed, as the parapet is set 150mm above the drain grate.

In order to provide a piped outlet for Pad C, a proposed 250mm diameter storm sewer pipe will be connected to the existing storm sewer where the existing CB#3 will be replaced with MH1. The proposed storm sewer service is shown on Drawing C-001 in **Appendix A**.

5 GRADING

The exterior grading for Pad C will generally blend into the existing parking lot grades. The finished floor was established to minimize re-grading of the existing asphalt parking lot and to accommodate the rear exits, which tie into the existing drive aisle curbs and sidewalks. Drawing C-200 in **Appendix A** illustrates the proposed grades and limits of regrading.

There are no off-site grading proposed for this project.

Paterson Group geotechnical report dated June 20, 2018 provides details on the existing soils within the development. The report provides recommendations which include but are not limited to the following:

- The general permissible grade raise is 2.0 m.
- Fill placed below the foundations to meet OPSS Granular ‘A’ or Granular ‘B’ Type II placed in 300 mm lifts compacted to 98% SPMDD.
- Fill for roads to be suitable native material in 300 mm lifts compared to 95% SPMDD.
- Pavement Structure:

ACCESS LANES AND HEAVY TRUCK PARKING AREAS	CAR PARKING AREAS
40 mm superpave 12.5 mm 50 mm superpave 19 mm 150 mm Granular ‘A’ 400 mm Granular ‘B’ Type II	50 mm HL3 superpave 12.5 mm 150 mm Granular ‘A’ 300 mm Granular ‘B’ Type II

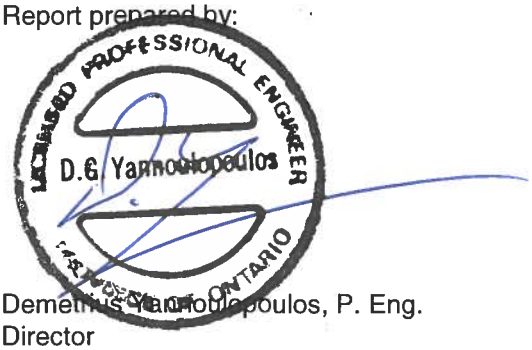
6 SEDIMENT AND EROSION CONTROL PLAN

To reduce the possibility of sediment loads entering the existing storm sewer system during construction, existing catchbasins in the vicinity of the proposed construction will have a silt bag placed in the structure. The catchbasin silt bags should be maintained on a regular basis and remain in place until vegetation is established. See Drawing C-900 in **Appendix A**.

7 RECOMMENDATIONS

This servicing and stormwater management design brief has demonstrated the proposed site plan can be serviced by connecting to existing storm, sanitary, and watermain pipes in the existing parking lot of the shopping plaza. The existing services have sufficient capacity to accommodate the proposed expansion. On-site stormwater management is provided by roof top detention to maintain post-development flows less than pre-development flows for both the 5 and 100 year storms. There will be a decrease in flow to the existing storm sewer system in both the 5 and 100 year storm event. The construction of storm, and sanitary sewers, and watermain for the proposed building can be completed in conformance with the City of Ottawa standards. Adherence to the sediment and erosion control plan during construction will minimize harmful impacts on downstream systems.

Report prepared by:



Demetrius Yannopoulos, P. Eng.
Director

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Appendix A

- Drawing C-001 – Site Servicing
- Original Sanitary Sewer Design Sheet
- Original Sanitary Sewer Tributary Area Plan
- Updated Sanitary Sewer Design Sheet
- Joe Zagorski's E-mail
- Figure 1 – Predevelopment Conditions
- Figure 2 – Post Development Conditions
- Modified Rational Calculation, 5 year
- Watts Roof Drain
- Modified Rational Calculation, 100 year
- Drawing C-200 – Grading
- Drawing C-900 – Sediment and Erosion Control Plan

DRAWING NOTES

1.0 GENERAL

1.1 CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

1.2 DO NOT SCALE DRAWINGS.

1.3 CONTRACTOR TO REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE ARCHITECT OR DESIGN ENGINEER AS APPLICABLE.

1.4 USE ONLY THE LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED 'ISSUED FOR CONSTRUCTION'.

1.5 ALL CONSTRUCTION SHALL COMPLY WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.

1.6 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.

1.7 FOR LEGAL SURVEY INFORMATION REFER TO REGISTERED PLAN.

1.8 ALL IRON WORK ELEVATIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MINOR ADJUSTMENTS AS DETERMINED BY THE ENGINEER.

1.9 ALL CONCRETE CURBS AND SIDEWALKS TO CONFORM TO O.P.S. AND CONSTRUCTED TO CITY STANDARDS. ALL ONSITE CURBS TO BE BARRIER TYPE.

1.10 ALL CONCRETE SHALL BE 'NORMAL PORTLAND CEMENT' IN ACCORDANCE WITH O.P.S.S. 1350 AND SHALL ACHIEVE A MINIMUM STRENGTH OF 30MPa AT 28 DAYS.

1.11 ALL CONSTRUCTION TRAFFIC TO ACCESS SITE OFF STRANDHERD DRIVE.

1.12 CONTRACTOR TO PROTECT EXISTING INFRASTRUCTURE AND PROPERTY SUCH AS TREES, PARKING METERS, SIDEWALKS, CURBS, ASPHALT, AND STREET SIGNS FROM DAMAGE DURING CONSTRUCTION. CONTRACTOR TO PAY THE COST TO REINSTATE OR REPLACE ANY DAMAGED INFRASTRUCTURE OR PROPERTY TO THE SATISFACTION OF THE CITY.

1.13 THE POSITION OF POLE LINES, CONDUITS, WATERMAIN, SEWERS, AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, SHALL PROTECT ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

1.14 CONTRACTOR TO SUPPLY SUITABLE FILL MATERIAL WHERE REQUIRED TO ROUGH GRADE THE SITE.

1.15 CONTRACTOR TO HAUL EXCESS MATERIAL OFFSITE AS NECESSARY TO GRADE SITE TO MEET THE PROPOSED GRADES. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR DISCOVER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY ENGINEER. ENGINEER TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.

1.16 ALL DISTURBED BOULEVARDS TO BE REINSTATED WITH SOD ON 100mm TOPSOIL.

1.17 UTILITY DUCTS TO BE INSTALLED PRIOR TO ROAD BASE CONSTRUCTION.

1.18 REFER TO ARCHITECTURAL SITE PLAN FOR PAVEMENT MARKING, PREPARED BY SCOLER LEE AND ASSOC.

1.19 CONTRACTOR TO UNCOVER EXISTING UTILITIES WELL IN ADVANCE OF PIPE LAYING IN ORDER TO CORRECT GRADE CONFLICTS AS REQUIRED, IF REQUIRED.

1.20 JOB BENCHMARKS:
- BM#1 MAGNETIC NAIL IN BASE OF LAMP STANDARD ELEV. 97.576
- BM#2 T/G EX. CBMH32 ELEV. 96.750

1.21 BACKWATER VALVE REQUIRED ON BUILDING SERVICES PER CITY STANDARDS REFER TO MECHANICAL.

1.22 REFER TO MECHANICAL FOR ROOF DRAIN LOCATION

2.0 SANITARY

2.1 ALL SANITARY SEWERMAINS TO BE CSA CERTIFIED PVC SDR 35, BELL AND SPIGGOT TYPE. ONLY FACTORY FITTINGS TO BE USED. SEWER TO BE INSTALLED AS PER OSPD 1005.01.

2.2 ALL SANITARY MAINTENANCE HOLES TO BE 1.2m DIAMETER AS PER CITY OF OTTAWA STANDARDS COMPLETE WITH BENCHING, STEPS IF REQUIRED, AND FRAME AND COVER.

2.3 SANITARY MH FRAME AND COVER TO BE CLOSED COVER TYPE, AS PER CITY STANDARD S24.

2.4 SANITARY SEWER LEAKAGE TEST AND CCTV INSPECTION SHALL BE COMPLETED AS PER CITY SPECIFICATIONS PRIOR TO INSTALLATION OF BASE COURSE ASPHALT.

2.5 ANY SANITARY SEWER WITH LESS THAN 1.8m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.

2.6 CONNECTION TO THE EXISTING SANITARY SEWER TO BE INCLUDED IN THE COST FOR SANITARY SEWER INSTALLATION. THIS INCLUDES REINSTATEMENT OF ROAD CUTS TO CITY STANDARDS.

3.0 STORM

3.1 ALL STORM SEWER TO BE CSA CERTIFIED PVC SDR 35 OR CONCRETE CLASS 100-D, BELL AND SPIGGOT TYPE. ALL STORM SEWERS TO BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. ONLY FACTORY FITTINGS TO BE USED.

3.2 ALL STORM MAINTENANCE HOLES TO BE SIZED IN WITH THE PLANS AND AS PER CITY OF OTTAWA STANDARDS COMPLETE WITH BENCHING FOR SEWERS 900mm OR GREATER, STEPS IF REQUIRED, AND FRAME AND COVER.

3.3 STORM MH FRAME AND COVERS TO BE OPEN TYPE, AS PER CITY STANDARD S24. CONTRACTOR TO INSTALL FILTER FABRIC UNDER STORM MH COVER UNTIL SODDING IS COMPLETE.

3.4 STORM MAINTENANCE HOLES TO BE AS PER OPSD 701.010, TAPER TOP TYPE COMPLETE WITH 300mm SUMP FOR SEWER LESS THAN 900mmø.

3.5 ANY STORM SEWER WITH LESS THAN 1.8m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.

3.6 CONNECTION TO THE EXISTING STORM SEWER TO BE INCLUDED IN THE COST FOR STORM SEWER INSTALLATION. THIS INCLUDES REINSTATEMENT OF ROAD CUT TO CITY STANDARDS.

4.0 WATER

4.1 ALL WATER SERVICES TO BE COPPER OR APPROVED EQUAL WITH MINIMUM COVER OF 2.4 m AND INSTALLED AS PER CITY OF OTTAWA STANDARDS.

4.2 THRUST BLOCKS TO BE INSTALLED AT ALL BENDS, TEES, AND CAPS ALL AS PER OPSD 1103.01 AND 1103.02.

4.3 CONTRACTOR TO CONDUCT PRESSURE AND LEAKAGE TESTING OF ALL WATERMAINS AND DISINFECT AND CHLORINATE ALL WATERMAINS TO THE SATISFACTION OF M.O.E.E. AND THE CITY OF OTTAWA.

4.4 TRACER WIRE TO BE INSTALLED ALONG THE FULL LENGTH OF WATERMAIN AND ATTACHED TO EACH MAIN STOP AS PER MUNICIPAL STANDARDS.

4.5 ALL COMPONENTS OF THE WATER DISTRIBUTION SYSTEM SHALL BE CATHODICALLY PROTECTED AS PER MUNICIPAL STANDARDS.

4.6 ALL VALVES & VALVE BOXES, HYDRANTS, AND HYDRANT VALVES AND ASSEMBLIES SHALL BE INSTALLED AS PER CITY OF OTTAWA STANDARDS.

4.7 ANY WATERMAIN WITH LESS THAN 2.4m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD W22, OR AS APPROVED BY THE ENGINEER.

4.8 CONTRACTOR IS RESPONSIBLE FOR ACQUIRING THE WATER PERMIT FROM THE CITY OF OTTAWA AND PAYMENT OF ANY FEES ASSOCIATED WITH SECURING THE WATER PERMIT. OWNER IS RESPONSIBLE FOR REIMBURSING THE CONTRACTOR FOR THE ACTUAL COST OF ACQUIRING THE WATER PERMIT.

4.9 CONNECTION TO EXISTING WATERMAIN TO BE CITY FORCES, EXCAVATION AND BACKFILLING AND REINSTATEMENT BY CONTRACTOR, COST TO BE INCLUDING THE COST FOR THE WATERMAIN INSTALLATION. THIS COST INCLUDES REINSTATEMENT OF ROAD CUTS TO CITY STANDARDS.

4.10 ALL WATERMAIN CROSSING AS PER CITY OF OTTAWA STANDARDS W25 & W25.2

5.0 ROADS

5.1 CONTRACTOR TO REINSTATE ROAD CUTS PER CITY OF OTTAWA STANDARD R-10.

5.2 THE CONTRACTOR SHALL PREPARE A TRAFFIC MANAGEMENT PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER. CONTRACTOR TO MAINTAIN TRAFFIC FLOW DURING THE ENTIRE CONSTRUCTION PERIOD UNLESS OTHERWISE APPROVED BY THE ENGINEER. MAINTENANCE OF ROAD CUTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PROVISION OF FLAGMEN, DETOURS AS NECESSARY, BARRICADES AND SIGNS TO THE FULL SATISFACTION OF THE ENGINEER AND ROAD AUTHORITY SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

5.3 CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.

5.4 FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT REQUIREMENTS.

5.5 CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR B MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOETCHNICAL ENGINEER. CONTRACTOR TO PROVIDE ENGINEER WITH SAMPLES OF GRANULAR B MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL ENGINEER THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

5.6 GRANULAR A MATERIAL ONLY TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL ENGINEER OF GRANULAR B PLACEMENT.

5.7 CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR A MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOETCHNICAL ENGINEER. CONTRACTOR TO PROVIDE ENGINEER WITH SAMPLES OF GRANULAR A MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL ENGINEER THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

5.8 ASPHALT MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL ENGINEER OF GRANULAR A PLACEMENT.

5.9 CONTRACTOR TO SUPPLY, PLACE AND COMPACT ASPHALT MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER. CONTRACTOR TO PROVIDE ENGINEER WITH SAMPLES OF ASPHALT MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL ENGINEER THAT THE MATERIAL MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.

5.10 CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING LINE AND GRADE IN ACCORDANCE WITH THE PLANS, AND FOR PROVIDING THE ENGINEER WITH VERIFICATION PRIOR TO PLACEMENT.

5.11 CONTRACTOR TO REINSTATE ANY DISTURBED AREA WITHIN EXISTING ROW OR ADJACENT LANDS TO THE BETTER OF IMPORTED SOD ON 100MM TOPSOIL, OR TO MATCH ORIGINAL CONDITION.

5.12 ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR DISCOVER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY ENGINEER. ENGINEER TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.

5.13 PAVEMENT STRUCTURE (MATERIAL TYPES AND THICKNESSES) FOR HEAVY DUTY AND LIGHT DUTY AREAS TO BE AS SPECIFIED IN THE GEOTECHNICAL REPORT AND SHOWN ON THE PLANS.

6.0 SEDIMENT AND EROSION CONTROL

6.1 CONTRACTOR TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES AS IDENTIFIED IN THE EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.). DURING ALL PHASES OF THE SITE PREPARATION AND CONSTRUCTION THE MEASURES ARE TO BE MAINTAINED TO THE SATISFACTION OF THE ENGINEER AND CITY OF OTTAWA IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL. SHOULD ANY ADDITIONAL MEASURES BE REQUIRED TO ADDRESS FIELD CONDITIONS THEY SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER OR THE CITY OF OTTAWA. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

6.2 ANY GROUND WATER PUMPING IS LIMITED TO 10 000l/d, AND SHALL BE DISCHARGED IN TO AN APPROVED FILTER MECHANISM PRIOR TO RELEASE TO THE ENVIRONMENT.

6.3 SEEPAGE BARRIERS WILL BE CONSTRUCTED IN ANY TEMPORARY DRAINAGE DITCH.

6.4 SILT SACKS OR APPROVED EQUIVALENT, WILL BE PLACED ON NEW OPEN INFRASTRUCTURES SUCH AS MANHOLES AND CATCH BASINS UNTIL STRUCTURES ARE COMMISSIONED AND PUT IN USE.

7.0 GEOTECHNICAL.

7.1 FOR DETAILS OF TEST PITS AND VARIOUS CONSTRUCTION REQUIREMENTS SEE GEOTECHNICAL REPORT, BY PATERSON GROUP DATED JUNE 20, 2018.

7.2 FILL MATERIAL WITHIN THE PARKING LOT AND BUILDING PAD AREAS, AND SUPPORTING BUILDING FOUNDATIONS SHALL BE COMPACTED TO 98% STANDARD MODIFIED PROCTOR DENSITY AND TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.

7.3 ALL FILL MATERIAL TO BE CERTIFIED AS ACCEPTABLE BY THE GEOTECHNICAL ENGINEER.

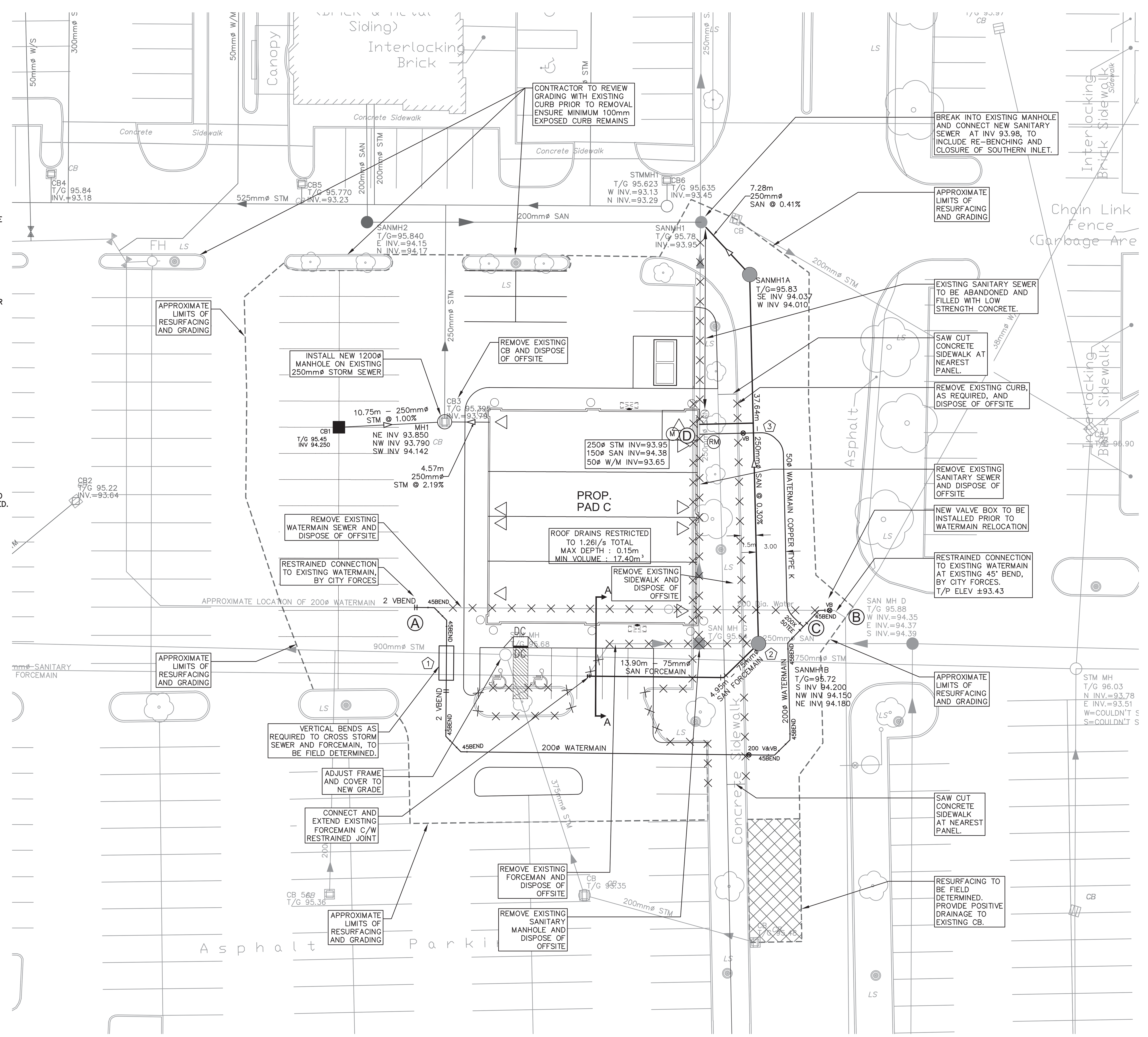
7.4 ALL COMPACTION METHODS TO BE PERFORMED TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER TO INCLUDE BUT NOT BE LIMITED TO THE THICKNESS OF LIFTS, AND COMPACTION EQUIPMENT USED.

7.5 CLAY SEALS TO BE INSTALLED WHERE INDICATED ON THE DRAWINGS OR AS APPROVED AND DIRECTED BY THE GEOTECHNICAL ENGINEER ALL IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.

7.6 PIPE BEDDING AND BACKFILL SHALL BE COMPLETED IN ACCORDANCE WITH LATEST CITY OF OTTAWA STANDARD. AT A MINIMUM BEDDING FOR SEWER AND WATERMAIN SHALL BE 150mm OPSS GRANULAR A, COMPACTED TO 95% SPMDD AND EXTEND TO SPRINGLINE OF PIPE. COVER MATERIAL SHALL CONSIST OF OPSS GRANULAR A AND SHALL EXTEND FROM SPRINGLINE TO MINIMUM 300mm ABOVE OBVERT OF PIPE, AND COMPACTED TO 95% SPMDD. SEE GEOTECHNICAL REPORT FOR ADDITIONAL DETAILS.

LEGEND:

- 200ø STORM — EXISTING STORM SEWER
- 200ø SANITARY — EXISTING SANITARY SEWER
- 150ø WATERMAIN — EXISTING WATERMAIN
- 200ø STORM — PROPOSED STORM SEWER
- 200ø SANITARY — PROPOSED SANITARY SEWER
- 150ø WATERMAIN — PROPOSED WATERMAIN
- EXSANMH10A — EXISTING SANITARY MANHOLE
- EXSTMH10 — EXISTING STORM MANHOLE
- 85.68 — EXISTING HYDRANT C/W BOTTOM OF FLANGE ELEVATION
- CB — EXISTING CATCHBASIN
- SANMH10A — PROPOSED SANITARY MANHOLE
- STMH10 — PROPOSED STORM MANHOLE
- CBMH2 — PROPOSED CATCHBASIN MANHOLE
- 85.68 — PROPOSED HYDRANT C/W BOTTOM OF FLANGE ELEVATION
- CB — PROPOSED CATCHBASIN
- BARRIER CURB
- DC — DEPRESSED CURB
- RM — PROPOSED REMOTE WATER METER
- M — PROPOSED WATER METER
- LS — EXISTING LIGHT POLE
- REGULAR ASPHALT TO BE SAW CUT AND REINSTATE WITH STEP JOINT AS PER CITY STANDARDS
- HEAVY DUTY ASPHALT TO BE SAW CUT AND REINSTATE WITH STEP JOINT AS PER CITY STANDARDS
- SILT FENCE AS PER OPSD-219.110
- FILTER FABRIC TO BE PLACED BENEATH STRUCTURE FRAME. FILTER FABRIC TO REMAIN IN PLACE UNTIL SITE IS STABILIZED AND VEGETATION IS ESTABLISHED.



WATERMAIN SCHEDULE					
	Station	Description	Finished Grade	Top of Watermain	As Built Watermain
A	0+000.00	EXISTING WATERMAIN	95.80	93.30	
	0+001.00	45° VERTICAL BEND	95.81	93.35	
	0+001.80	45° VERTICAL BEND	95.82	92.50	
	0+002.00	45° BEND	95.84	92.50	
	0+003.81	45° BEND	95.84	92.50	
	0+010.91	45° VERTICAL BEND	95.73	92.50	
	0+011.16	45° VERTICAL BEND	95.73	93.33	
	0+015.65	45° BEND	95.63	93.23	
	0+017.85	45° BEND	95.61	93.21	
	0+047.22	200Ø V&VB	95.62	93.22	
	0+049.84	45° BEND	95.66	93.26	
	0+052.04	45° BEND	95.69	93.29	
	0+061.94	45° BEND	95.77	92.72	
C	0+064.24	50Ø SERVICE TEE TO PAD C	95.80	93.06	
	0+066.53	45° BEND	95.82	93.40	
B	0+067.40	EXISTING WATERMAIN	95.83	93.43	
C	0+000.00	50Ø SERVICE TEE TO PAD C	95.80	93.06	
	0+023.50	50Ø V&VB	95.87	93.50	
D	0+027.91	SERVICE PAD C	96.08	93.65	

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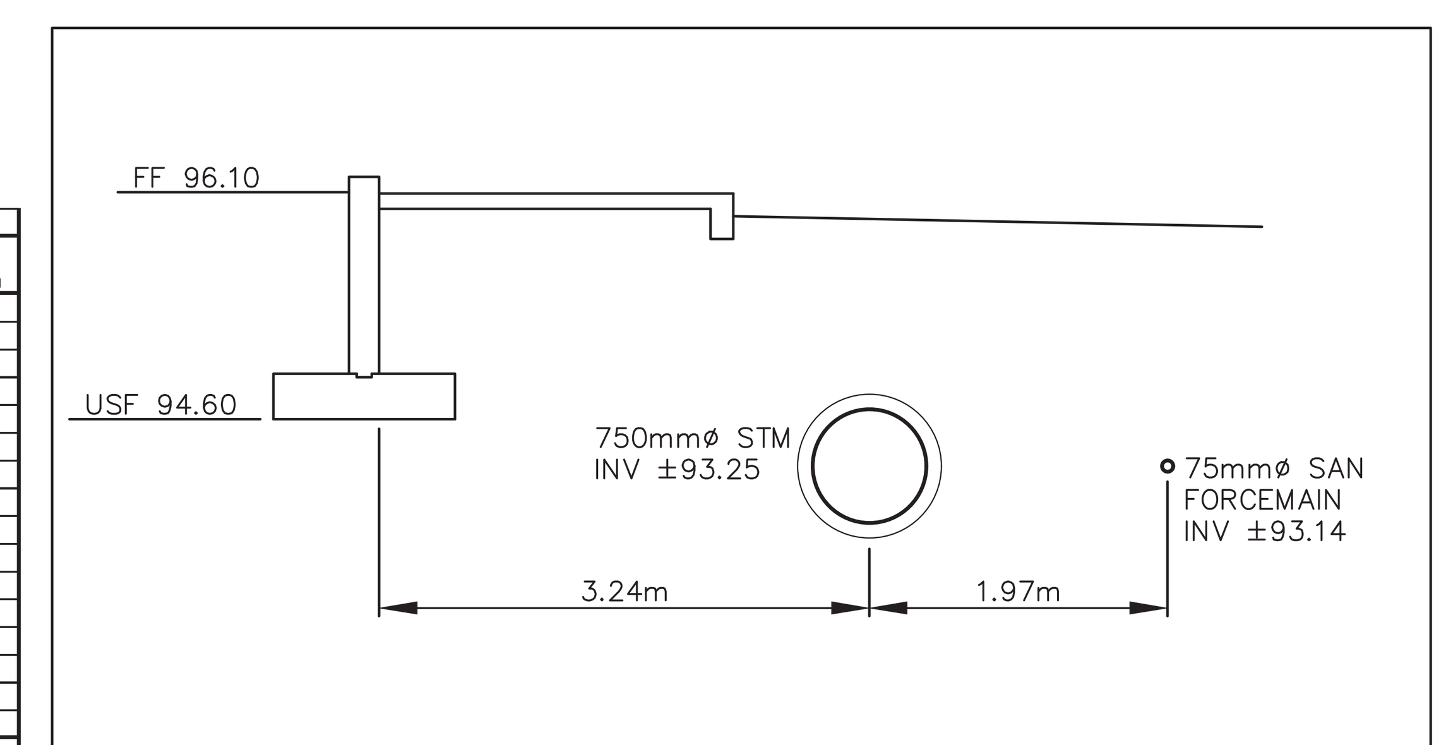
CROSSING TABLE

1	200Ø W/M 0.50m BELOW 900Ø STM 200Ø W/M 0.78m BELOW 75Ø F.M.
2	200Ø W/M 0.50m BELOW 750Ø STM 200Ø W/M 1.47m BELOW 250Ø SAN 75Ø F.M. 0.2m ABOVE 750Ø STM
3	50Ø W/M 0.58m BELOW 250Ø SAN



SECTION A-A
NTS

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APPLICANT : RON RICHARDS
R. G. RICHARDS & ASSOCIATES
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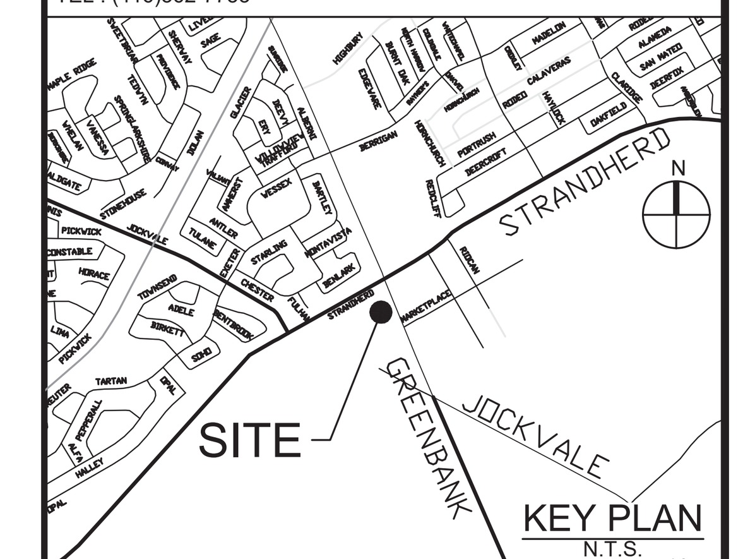
TEL: (416)219-5122

ARCHITECT : ALLAN BORENSTEIN
SCOLER LEE + ASSOCIATES ARCHITECTS INC.
STE 900, 60 ST, CLAIR AVE E, TORONTO, ONTARIO, M4T 1N5
TEL : (416)362-7753



KEY PLAN
N.T.S.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4	SPA SUBMISSION #2	DGY	18:10:15
3	ISSUED FOR SPA	DGY	18:05:14
2	REVISED PER ARCH COMMENTS	DGY	18:05:03
1	ISSUED FOR TEAM COORDINATION	DGY	18:05:02

NorthAMERICAN DEVELOPMENT GROUP

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Project Title

PAD C BARHAVEN TOWN CENTRE

LICENSED PROFESSIONAL ENGINEER D. G. Yannoulopoulos 2018/10/15 PROVINCE OF ONTARIO

Drawing Title

SITE SERVICING PLAN

3777 STRANDHERD DRIVE

Scale 1:250

Design	Date
R.M.	APRIL 2018

Drawn	Checked
E.H.	D.G.Y.

Project No.	Drawing No.
116390	C-001

D07-12-18-0106

#17717

TABLE 1: SANITARY SEWER DESIGN SHEET

Design Criteria		
Min. Velocity	0.60	m/s
Max. Velocity	4.00	m/s
Mannings 'n'	0.013	

WILLS

D.M. Wills Associates Limited
Consulting Engineers

450 Charlotte Street
Peterborough, ON
Canada K9J 2W3

P 705.742.2297
F 705.741.3568
E wills@dmwills.com

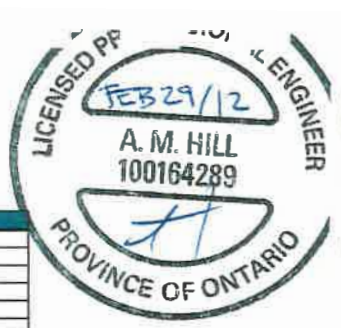
Project Information	
D.M. Wills Project	Barrhaven Town Center
D.M. Wills Project No.	08-10158
Project Location	Barrhaven Town Centre 3777 Strandherd Dr.
Designed by	D. Welch
Checked by	A. Hill
Date	September 22, 2010
Design/As-built	Design

$Q = V \times A$

$V = (1/n) \times R^{2/3} \times S^{1/2}$

Denotes field entered

Denotes field calculated



Area No.	Description	Manholes		Area		Commercial Area		Design Flow			Pipe Data							Comment
		From	To	Unit (ha)	Accum. (ha)	Unit (ha)	Accum. (ha)	Infilt. Q (l/s)	Comm. Q (l/s)	Total Q_D (l/s)	Length (m)	Grade (%)	Dia. (m)	Capacity Q_C (l/s)	Percent Capacity (%)	Velocity Full (m/s)	Velocity Actual (m/s)	
	Forcemain Sewer																	
1	BBBY to Main	100	101	1.65	1.65	0.51	0.51	0.46	0.45	0.91	67.0	0.51	0.150	10.8	8.4%	0.61		Pipe Info from Wills Dwg 10158Ph2-SS03 (Aug 18/10)
2	Sunoco to Swiss Main	R	Q	0.42	0.42	0.02	0.02	0.12	1.29	1.41	40.0	1.00	0.200	32.8	4.3%	1.04	0.52	Pipe Info from Trow Dwg No. 01 (Site Grading & Services Plan Mar /06)
		Q	P	0.00	0.42	0.00	0.02	0.12	1.29	1.41	3.0	1.00	0.200	32.8	4.3%	1.04	0.52	Pipe Info from Trow Dwg No. 01 (Site Grading & Services Plan Mar /06)
3	Swiss Chalet to PS	U	T	0.28	0.28	0.05	0.05	0.08	0.40	0.48	17.0	0.47	0.200	22.5	2.1%	0.72	0.29	Pipe Info from Robinson 03032-2 (June /05)
		T	S	0.00	0.28	0.00	0.05	0.08	0.40	0.48	43.8	0.48	0.200	22.7	2.1%	0.72	0.29	Pipe Info from Robinson 03032-2 (June /05)
		S	P	0.00	0.28	0.00	0.05	0.08	0.40	0.48	25.7	0.51	0.200	23.3	2.1%	0.74	0.30	Pipe Info from Robinson 03032-2 (June /05)
		P	101	0.00	0.71	0.00	0.08	0.20	1.69	1.89	67.6	0.90	0.200	31.1	6.1%	0.99	0.55	Pipe Info from Robinson 03032-2 (June /05)
		101	L	0.00	2.36	0.00	0.59	0.66	1.69	2.35	17.0	0.90	0.200	31.1	7.6%	0.99	0.58	Pipe Info from Robinson 03032-2 (June /05)
4	Shopper's	O	N	0.51	0.51	0.14	0.14	0.14	0.12	0.26		0.40	0.200	20.7	1.3%	0.66	0.23	Assumed Pipe Grade
5	Jockvale Rd	V	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.40	0.200	20.7	0.0%	0.66	0.01	Plugged Main
		N	L	0.42	0.93	0.00	0.14	0.26	0.12	0.38	49.0	0.58	0.200	25.0	1.5%	0.80	0.29	Pipe Info from Trow Dwg No. 01 (Site Grading & Services Plan Mar /06)
6	Home Depot	M	L	3.59	3.59	0.99	0.99	1.01	0.86	1.86		0.50	0.150	10.8	17.3%	0.61	0.46	Pipe Info from Trow Dwg No. 01 (Site Grading & Services Plan Mar /06)
	Pump Station	L	PS	0.00	6.88	0.00	1.72	1.93	3.11	5.04	18.7	2.03	0.250	84.8	5.9%	1.73		Pipe Info from Robinson 02056-11 (Jan /04)
		PS	LIFT	0.00	6.88	0.00	1.72	1.93	3.11	5.04								Lift Station
	Gravity Sewer																	
7	Veterinarian	VET	B	0.16	0.16	0.03	0.03	0.05	0.03	0.07								Service Connection
8	Proposed Pad A	A	B	0.39	0.39	0.05	0.05	0.11	0.04	0.15	69.6	0.40	0.200	20.8	0.7%	0.66	0.19	Pipe Info from Wills Dwg 10158Ph1-SS03 (May 11/10)
		B	C	0.00	1.07	0.00	0.08	0.30	0.07	0.37	54.8	0.42	0.200	21.2	1.7%	0.68	0.26	Pipe Info from Wills Dwg 10158Ph1-SS03 (May 11/10)
9	Area 9	Area9	B	0.52	0.52	0.00	0.00	0.15	0.00	0.15								Catchment Area Only
10	Ex. Plaza + Fut. Exp. +8,000sq.ft. Future	F	E	3.31	3.31	1.01	1.01	0.93	0.87	1.80	90.0	0.38	0.200	20.2	8.9%	0.64	0.40	Pipe Info from Robinson Dwg 89112-02 (Apr 4/91)
		E	D	0.00	3.31	0.00	1.01	0.93	0.87	1.80	71.0	0.41	0.200	21.0	8.6%	0.67	0.41	Pipe Info from Robinson Dwg 89112-02 (Apr 4/91)
11	Mr Lube	104	C	0.00	0.00	0.02	0.02	0.00	0.01	0.01	5.0	2.00	0.200	46.4	0.0%	1.48	0.16	Pipe Info from Wills Dwg 10158Ph1-SS03 (May 11/10)
		C	D	0.00	1.07	0.00	0.10	0.30	0.08	0.38	74.0	0.39	0.250	37.2	1.0%	0.76	0.25	Pipe Info from Robinson Dwg 89112-02 (Apr 4/91)
		D	G	1.22	5.60	0.00	1.10	1.57	0.96	2.53	22.0	0.41	0.250	38.0	6.6%	0.77	0.44	Pipe Info from Robinson Dwg 89112-02 (Apr 4/91)
		LIFT	G	0.00	6.88	0.00	1.72	1.93	2.17	4.10								Lift Station
		G	H	0.00	12.48	0.00	2.82	3.49	3.13	6.62	43.0	0.79	0.250	52.9	12.5%	1.08	0.74	Pipe Info from Robinson 03032-2 (June /05)
	BMO	I	H	0.00	0.00	0.05	0.05	0.00	0.30	0.30	34.3	0.29	0.250	32.1	0.9%	0.65	0.21	Pipe Info from Robinson 03032-2 (June /05)
	McDonald's	Mc D	H	0.00	0.00	0.04	0.04	0.00	0.04	0.04		0.50	0.200	23.2	0.2%	0.74	0.13	Service Connection
		H	J	0.00	12.48	0.00	2.91	3.49	3.47	6.96	40.0	0.40	0.250	37.6	18.5%	0.77	0.59	Pipe Info from Robinson Dwg 89112-02 (Apr 4/91)
		J	K	0.00	12.48	0.00	2.91	3.49	3.47	6.97	25.0	0.40	0.250	37.6	18.5%	0.77	0.59	Pipe Info from Robinson Dwg 89112-02 (Apr 4/91)

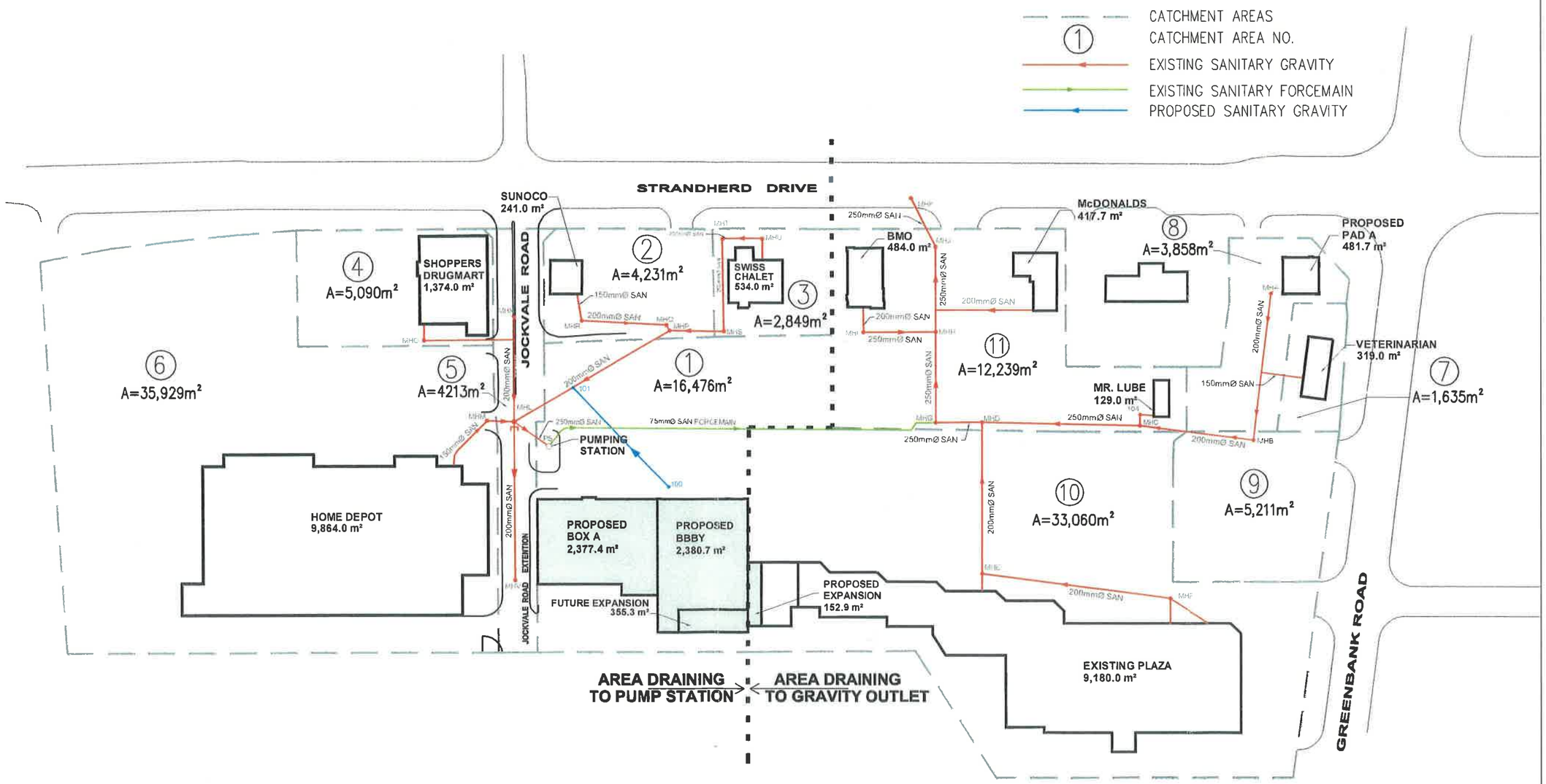


FIGURE 1: SANITARY CATCHMENT AREA PLAN

Sketch No.	WILLS D.M. Wills Associates Limited Consulting Engineers dmwills.com 452 Charlotte Street Peterborough, Ontario Canada K9J 2W3 P 705-742-2297 F 705-741-3958 E wills@dmwills.com • PROVEN SOLUTIONS • TRUSTED RESULTS •	Drawn By L.D.	Scale Horz 1: 2000 Vert N/A
		DESIGNED D.W.	
		CHECKED A.H.	Plot Date SEPT 13, 2010
		Project No. 08-10158	Drawing File No. FIG 1

IBI GROUP
IBI
333 Preston Street, Suite 400
OTTAWA, ONTARIO
K1S 5N4

Pad B& C SANITARY SEWER DESIGN SHEET

PROJECT : Barrhaven Town Centre Pad C
CITY OF OTTAWA
DEVELOPER : Barrhaven Town Centre Inc.

PAGE: 1 OF 1
JOB #: 116390
DATE: 1-May-18
DESIGN: DY

LOCATION				SITE AREA		BUILDING AREA		DESIGN FLOW				PROPOSED SEWER					
Area	DESCRIPTION	FROM MH	TO MH	IND. Area (Ha)	CUMUL. Area (Ha)	BLDG Area (SM)	CUMUL. BLDG Area (SM)	PEAK FACT.	DESIGN FLOW (l/s)	INFILT FLOW (l/s)	PEAK FLOW (l/s)	CAPACITY l/s	VELOCITY (full) m/s	LGTH. (m)	PIPE (mm)	GRADE %	AVAIL. CAP. (%)
	Forcemain sewer																
1	*BBBY tp Main*	*100*	*101*	*1.6476*	*1.648*	*5113.00*	*5113.00*	*1.50*	*0.30*	*0.46*	*0.91*	*11.35*	*0.62*	*67.0*	*150*	*0.51*	*91.97%*
2	*Sunoco to Swiss main*	*R*	*Q*	*0.4231*	*0.423*	*241.00*	*241.00*	*1.50*	*0.86*	*0.12*	*1.41*	*34.21*	*1.06*	*40.0*	*200*	*1.00*	*95.88%*
		Q	*P*	*0*	*0.423*	*0.00*	*241.00*	*1.50*	*0.86*	*0.12*	*1.41*	*34.21*	*1.06*	*3.0*	*200*	*1.00*	*95.88%*
3	*Swiss Chalet to PS*	*U*	*T*	*0.2849*	*0.285*	*534.00*	*534.00*	*1.50*	*0.27*	*0.08*	*0.48*	*23.45*	*0.72*	*17.0*	*200*	*0.47*	*97.95%*
		T	*S*	*0*	*0.285*	*0.00*	*534.00*	*1.50*	*0.27*	*0.08*	*0.48*	*23.71*	*0.73*	*43.8*	*200*	*0.48*	*97.98%*
		S	*P*	*0*	*0.285*	*0.00*	*534.00*	*1.50*	*0.27*	*0.08*	*0.48*	*24.42*	*0.75*	*25.7*	*200*	*0.51*	*98.04%*
		P	*101*	*0*	*0.708*	*0.00*	*775.00*	*1.50*	*1.13*	*0.20*	*1.89*	*32.46*	*1.00*	*67.6*	*200*	*0.90*	*94.18%*
		101	*L*	*0*	*2.356*	*0.00*	*5888.00*	*1.50*	*1.43*	*0.66*	*2.80*	*32.46*	*1.00*	*17.0*	*200*	*0.90*	*91.38%*
4	*Shoppers*	*O*	*N*	*0.509*	*0.509*	*1374.00*	*1374.00*	*1.50*	*0.08*	*0.14*	*0.26*	*21.63*	*0.67*		*200*	*0.40*	*98.79%*
5	*Jockvale Rd*	*V*	*L*	*0*	*0.000*	*0.00*	*0.00*	*1.50*	*0.00*	*0.00*	*0.00*	*21.63*	*0.67*		*200*	*0.40*	*100.00%*
		N	*L*	*0.4213*	*0.930*	*0.00*	*1374.00*	*1.50*	*0.08*	*0.26*	*0.38*	*26.07*	*0.80*	*49.0*	*200*	*0.58*	*98.54%*
6	*Home Depot*	*M*	*L*	*3.5929*	*3.593*	*9864.00*	*9864.00*	*1.50*	*0.57*	*1.01*	*1.87*	*11.24*	*0.62*		*150*	*0.50*	*83.40%*
	Pump Station	*L*	*PS*	*0*	*6.879*	*0.00*	*17126.00*	*1.50*	*2.08*	*1.93*	*5.05*	*88.37*	*1.74*	*18.7*	*250*	*2.03*	*94.29%*
		PS	*LIFT*	*0*	*6.879*	*0.00*	*17126.00*	*1.50*	*2.08*	*1.93*	*5.05*						
	Gravity Sewer																
7	*Veterinarian*	*VET*	*EX A-B*	*0.16*	*0.16*	*319.00*	*319.00*	*1.50*	*0.02*	*0.05*	*0.07*						
8	*Pad A*	*EX A*	*EX B*	*0.39*	*0.55*	*482.00*	*801.00*	*1.50*	*0.05*	*0.15*	*0.22*	*21.63*	*0.67*	*69.6*	*200*	*0.40*	*98.97%*
9	**Pad B**	**Pad B***	**2B**	**0.52**	**0.52**	**0.00**	**0.00**	**1.50**	**0.072**	**0.15**	**0.254**	**22.47**	**1.23**	**7.5**	**150**	**2.00**	**98.87%**
		2B	**EX B**	**0.00**	**0.52**	**0.00**	**0.00**	**1.50**	**0.072**	**0.15**	**0.254**	**27.60**	**0.85**	**29.2**	**200**	**0.65**	**99.08%**
		EX B	*EX C*	*0.00*	*1.07*	*0.00*	*801.00*	*1.50*	*0.12*	*0.30*	*0.478*	*22.18*	*0.68*	*54.8*	*200*	*0.42*	*97.85%*
10	*Ex plaza*	*EX F*	*EX E*	*3.31*	*3.31*	*9180.00*	*9180.00*	*1.50*	*0.53*	*0.93*	*1.723*	*21.08*	*0.65*	*90.0*	*200*	*0.38*	*91.83%*
		EX E	*EX D*	*0.00*	*3.31*	*0.00*	*9180.00*	*1.50*	*0.53*	*0.93*	*1.723*	*21.92*	*0.68*	*71.0*	*200*	*0.41*	*92.14%*
11	*Mr Lube*	*104*	*EX C*	*0.00*	*0.00*	*129.00*	*129.00*	*1.50*	*0.01*	*0.00*	*0.011*	*48.38*	*1.49*	*5.0*	*200*	*2.00*	*99.98%*
		EX C	*EX D*	*0.00*	*1.07*	*0.00*	*930.00*	*1.50*	*0.13*	*0.30*	*0.489*	*38.76*	*0.77*	*74.0*	*250*	*0.39*	*98.74%*
		EX D	**1B**	*1.22*	*5.60*	*0.00*	*10110.00*	*1.50*	*0.66*	*1.57*	*2.554*	*39.73*	*0.78*	*15.6*	*250*	*0.41*	*93.57%*
1 to 6		*EX LIFT*	**1B**	*0.00*	*6.88*	*0.00*	*17126.00*	*1.50*	*1.45*	*1.93*	*4.095*						
11	**Pad C**	**1B**	**1A**	**0.00**	**12.48**	**467.00**	**27703.00**	**1.50**	**2.130**	**3.49**	**6.690**	**34.00**	**0.67**	**37.6**	**250**	**0.30**	**80.32%**
		1A	*EX H*	**0.00**	**12.48**	**0.00**	**27703.00**	**1.50**	**2.130**	**3.49**	**6.690**	**34.00**	**0.67**	**7.3**	**250**	**0.30**	**80.32%**
11	*BMO*	*EX I*	*EX H*	*0.00*	*0.00*	*484.00*	*484.00*	*1.50*	*0.20*	*0.00*	*0.300*	*33.39*	*0.66*	*34.3*	*250*	*0.29*	*99.10%*
11	*McDonalds*	*EX McD*	*EX H*	*0.00*	*0.00*	*417.00*	*417.00*	*1.50*	*0.02*	*0.00*	*0.036*						
		EX H	*EX J*	*0.00*	*12.48*	*0.00*	*28604.00*	*1.50*	*2.355*	*3.49*	*7.026*	*39.22*	*0.77*	*40.0*	*250*	*0.40*	*82.09%*
		EX J	*EX K*	*0.00*	*12.48*	*0.00*	*28604.00*	*1.50*	*2.355*	*3.49*	*7.026*	*39.22*	*0.77*	*25.0*	*250*	*0.40*	*82.09%*

Q = average daily flow (commercial lands) — 50000 l/d/Ha
M = Commercial Peaking Factor = 1.5
I = Unit of peak extraneous flow — 0.28 l/s/Ha
Q(p) = Peak commercial flow (l/s)
Q(i) = Peak extraneous (infiltration) flow (l/s)

SPECIFY
Coeff. of friction (n) =0.013

REV. # :

Except for the bolded sewers information, data contained on this spread sheet was not design by IBI but was obtained from D.M. Willis Assoc Ltd report "Barrhaven Town Centre Inc dated Sept 2010
*** Design flow for Pad B based on 46 seats at 125 l/day/seat, plus 99sm of retail space at 5 l/sm**
**** Design flow for Pad C based on 467sm of retail space at 5 l/sm**

From: Zagorski, Joseph
To: Demetrius Yannoulopoulos
Cc: Diduch, Roman
Subject: RE: Barrhaven town center
Date: Thursday, April 18, 2013 4:27:24 PM

Hi Demetrius,

I reviewed attached information and 7.2 L/s flow is acceptable. Thx.

M.Joseph Zagorski, P.Eng.
Senior Project Manager
Infrastructure Policy, Policy Development and Urban Design
Planning and Growth Management Department
City of Ottawa, 110 Laurier Avenue West. 4th Floor, Ottawa, ON K1P 1J1
tel: (613) 580-2424, ext. 22611
fax: (613) 580-2578
e-mail: Joseph.Zagorski@ottawa.ca

From: Demetrius Yannoulopoulos [mailto:dyannoulopoulos@IBIGroup.com]
Sent: April 17, 2013 3:29 PM
To: Zagorski, Joseph
Subject: Barrhaven town center

Hi Joseph
See attached emails I sent Roman recently. As discussed we are looking to add a small pad to the existing commercial plaza, the flow from the site would increase from 6.97 to 7 l/s. Also the owner is also looking to fill a vacancy in the site (I thought it was a new Pad) and I had asked Roman if that could be adjusted to 7.2 l/s.
Thx
Demetrius

Demetrius Yannoulopoulos P.Eng.
Associate Director

IBI Group
400-333 Preston Street
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tel 613 225 1311 ext 590
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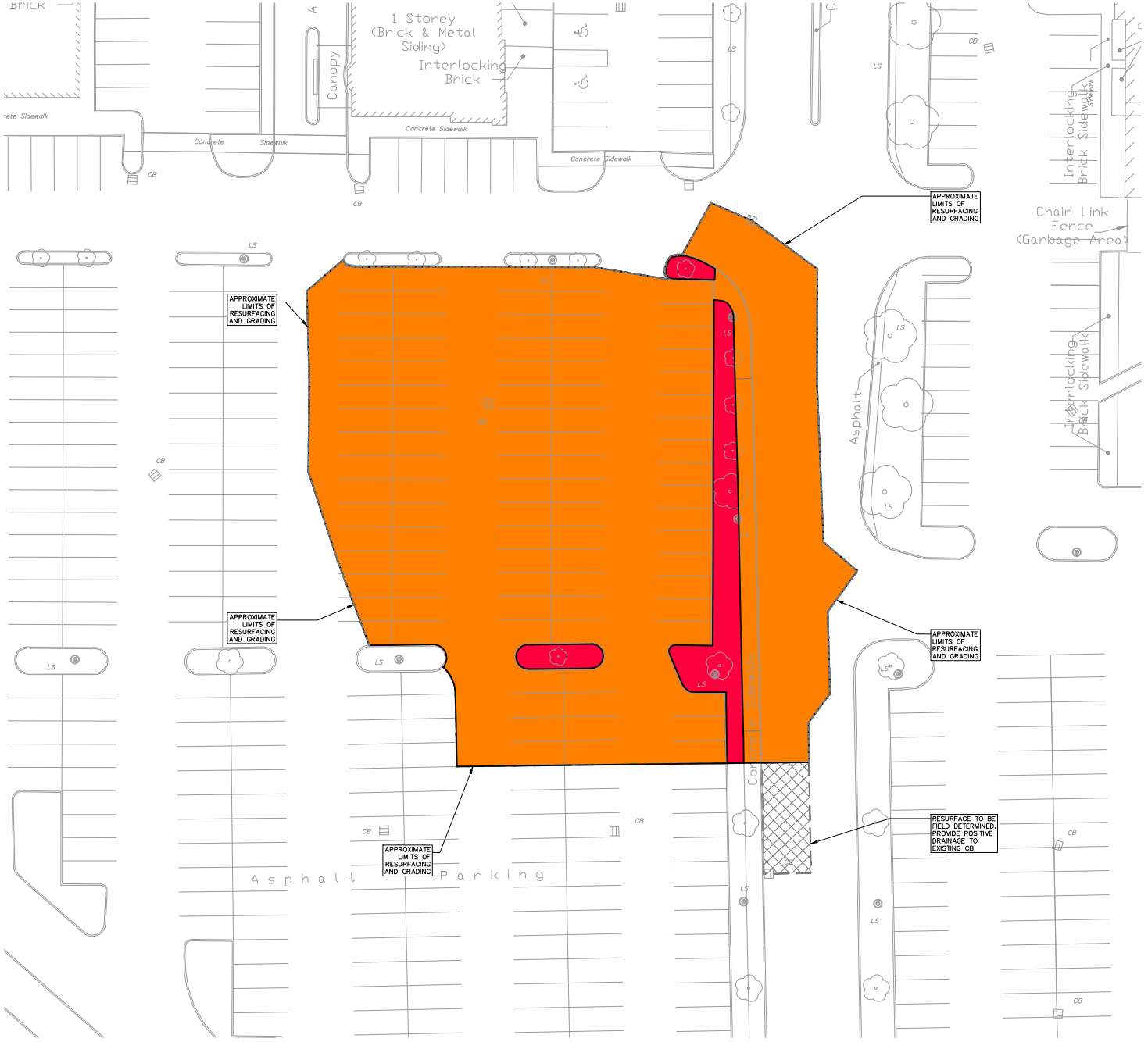


N

LEGEND:

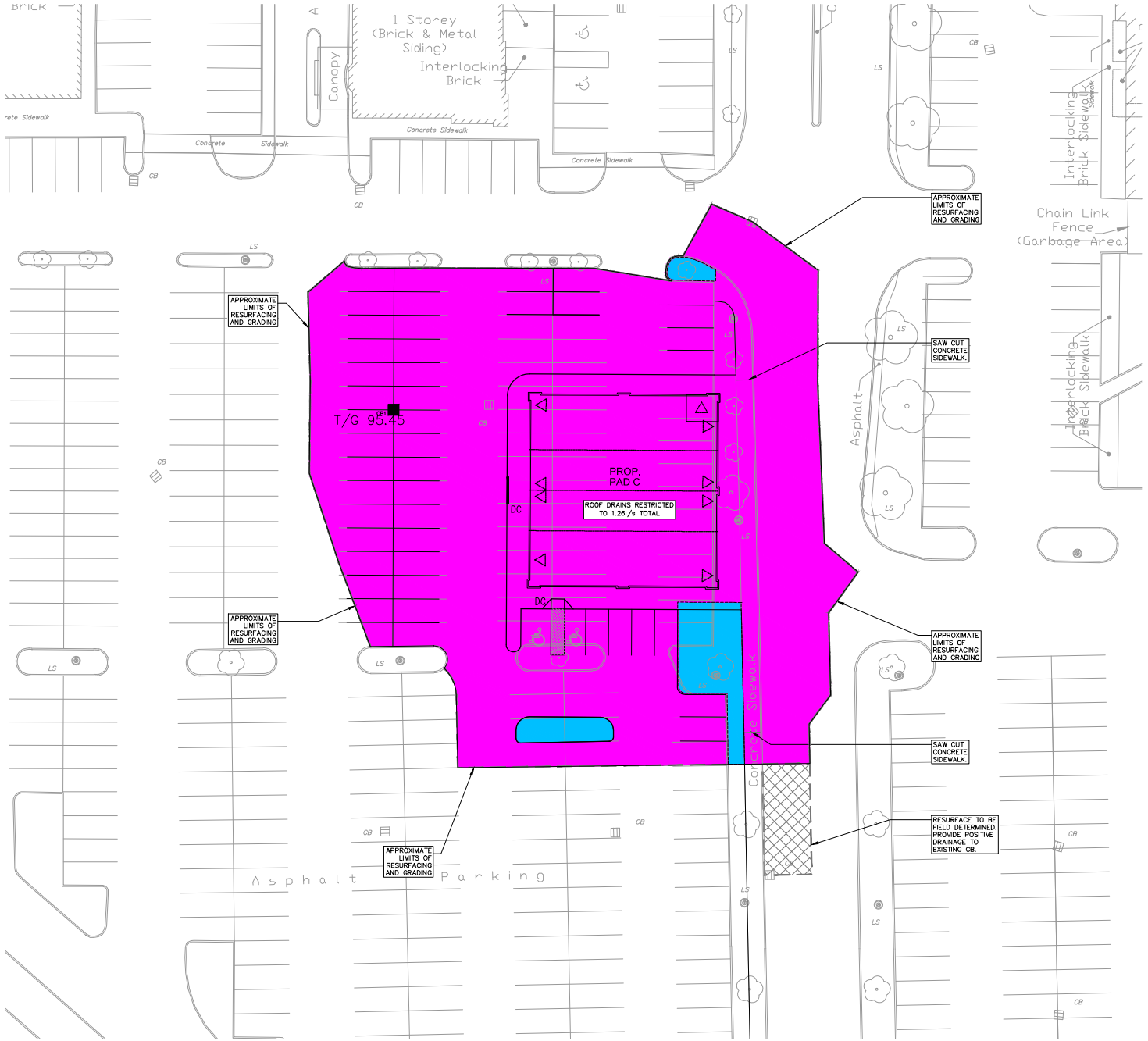
	C = 0.90 (PAVEMENT)	0.28 Ha
	C = 0.20 (GRASSED)	0.02 Ha

0.28 Ha @ 0.90 = 0.252
0.02 Ha @ 0.20 = 0.004
TOTAL PRE-DEVELOPMENT AC = 0.256

AVG C = 0.853

J:\116390_PadCBarrh\5.9 Drawings\59civil\current\116390Figures.dwg Layout Name: FIG1

Scale	Project Title	Drawing Title	Sheet No.
NTS	BARRHAVEN TOWN CENTRE PAD C	STORMWATER MANAGEMENT PRE-DEVELOPMENT CONDITION (EXISTING)	FIGURE 1



LEGEND:

	C = 0.90 (PAVEMENT)	0.29 Ha
	C = 0.20 (GRASSED)	0.01 Ha

0.29 Ha @ 0.90 = 0.261
0.01 Ha @ 0.20 = 0.002
TOTAL POST-DEVELOPMENT AC = 0.263

AVG C = 0.876

NON ROOF AREA AVG C = 0.872

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Scale	Project Title	Drawing Title	Sheet No.
NTS	BARRHAVEN TOWN CENTRE PAD C	STORMWATER MANAGEMENT POST-DEVELOPMENT CONDITION (PROPOSED)	FIGURE 2

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

PROJECT: PAD C
DATE: 9/24/2018
FILE: 116390-5.7
REV #: -
DESIGNED BY: RM
CHECKED BY: RM

STORMWATER MANAGEMENT

Formulas and Descriptions

i_{2yr} = 1:2 year Intensity = $732.951 / (T_c+6.199)^{0.810}$
i_{5yr} = 1:5 year Intensity = $998.071 / (T_c+6.053)^{0.814}$
i_{100yr} = 1:100 year Intensity = $1735.688 / (T_c+6.014)^{0.820}$
T_c = Time of Concentration (min)
C = Average Runoff Coefficient
A = Area (Ha)
Q = Flow = 2.78CiA (L/s)

Maximum Allowable Release Rate

Restricted Flowrate (based on C=0.50 Tc=20min)

C =	0.5	
T_c =	20	min
i_{100yr} =	70.25	mm/hr
A_{site} =	0.047	Ha
$Q_{restricted}$ =	4.56	L/s

MODIFIED RATIONAL METHOD (100-Year, 5-Year & 2-Year Ponding)

Drainage Area	PAD C		
Area (Ha)	0.047		
C =	1.00	Restricted Flow Q_r (L/s)=	2.52

100-Year Ponding

T_c Variable (min)	i_{100yr} (mm/hour)	Peak Flow Q_p =2.78xCi_{100yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 100yr (m^3)
34	84.27	10.94	2.52	8.42	17.18
39	76.51	9.93	2.52	7.41	17.35
44	70.18	9.11	2.52	6.59	**17.40**
49	64.91	8.43	2.52	5.91	17.36
54	60.44	7.85	2.52	5.33	17.26

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	17.40	17.51	0	0.00

overflows to: roof controlled

Roof Storage= 75% of roof area, at maximum ponding depth of 150mm

Drainage Area	PAD C		
Area (Ha)	0.047		
C =	0.90	Restricted Flow Q_r (L/s)=	2.52

5-Year Ponding

T_c Variable (min)	i_{5yr} (mm/hour)	Peak Flow Q_p =2.78xCi_{5yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 5yr (m^3)
20	70.25	8.21	2.52	5.69	6.83
22	66.15	7.73	2.52	5.21	6.88
24	62.54	7.31	2.52	4.79	**6.89**
26	59.35	6.93	2.52	4.41	6.89
28	56.49	6.60	2.52	4.08	6.86

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	6.89	17.51	0	0.00

overflows to: roof controlled

Drainage Area	PAD C		
Area (Ha)	0.047		
C =	0.90	Restricted Flow Q_r (L/s)=	2.52

2-Year Ponding

T_c Variable (min)	i_{2yr} (mm/hour)	Peak Flow Q_p =2.78xCi_{2yr} A (L/s)	Q_r (L/s)	Q_p-Q_r (L/s)	Volume 2yr (m^3)
17	57.42	6.71	2.52	4.19	4.27
18	55.49	6.48	2.52	3.96	4.28
19	53.70	6.27	2.52	3.75	**4.28**
20	52.03	6.08	2.52	3.56	4.27
21	50.48	5.90	2.52	3.38	4.26

Storage (m^3)

Overflow	Required	Surface	Sub-surface	Balance
0.00	4.28	17.51	0	0.00

overflows to: roof controlled

WATTS® DRAINAGE

Adjustable Accutrol Weir

Tag: _____

Adjustable Flow Control for Roof Drains

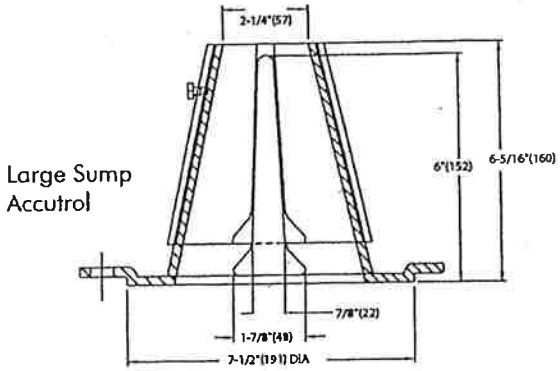
ADJUSTABLE ACCUTROL(for Large Sump Roof Drains only)

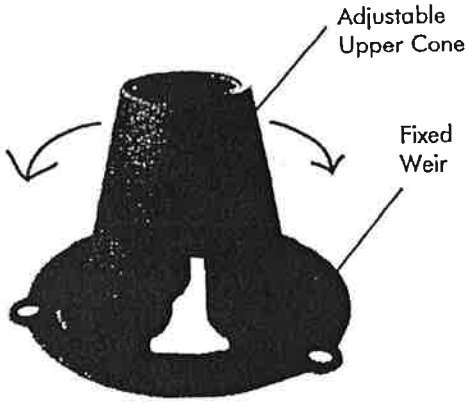
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2" of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3" of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm(per inch of head) x 2 inches of head] + 2-1/2 gpm(for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	Head of Water 1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	10	10	10	10	10

Job Name _____ Contractor _____

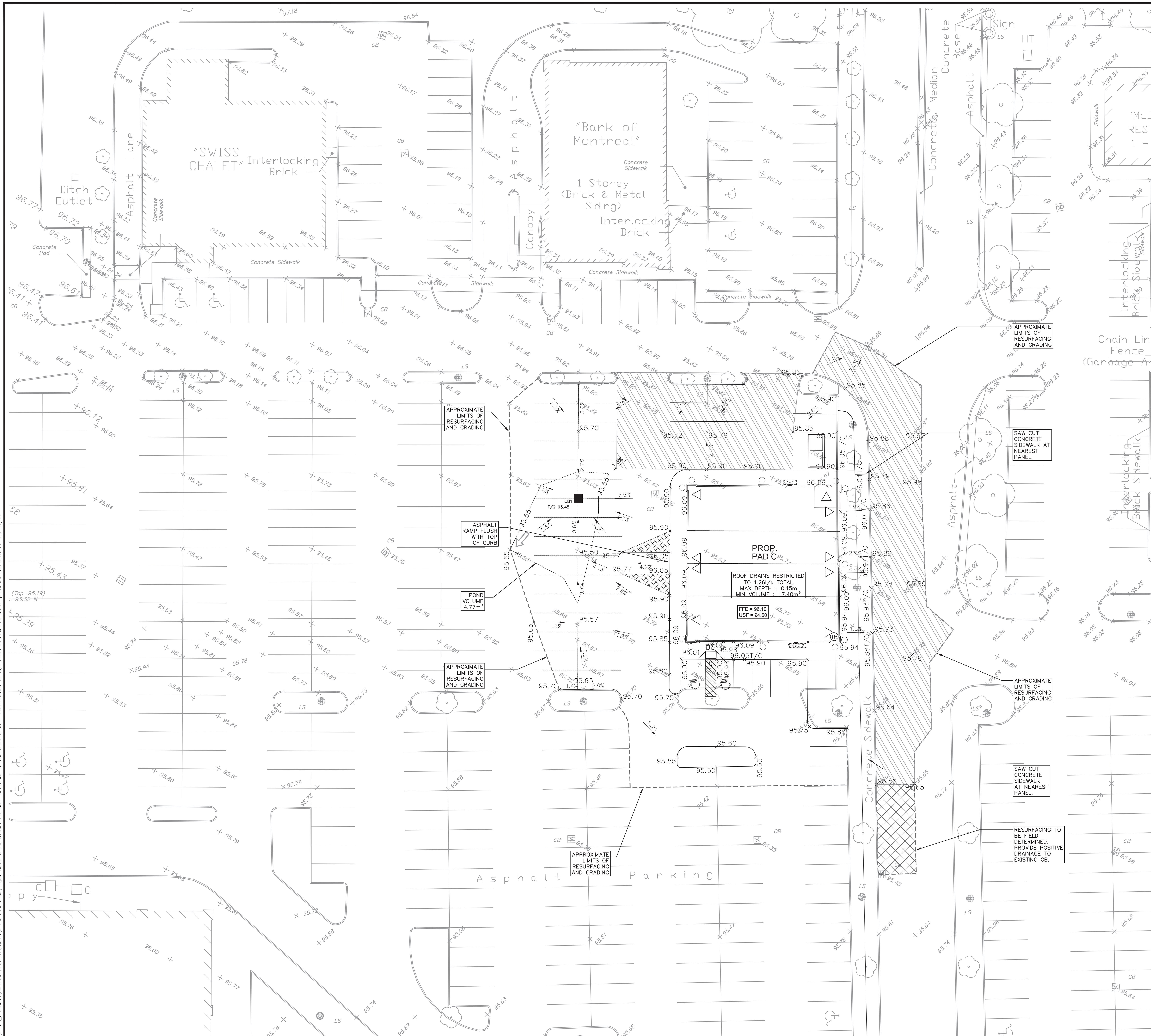
Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

WATTS DRAINAGE CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattsdrainage.ca

CANADA

(Dimension) Denotes Millimeters



LEGEND:

+87.12	EXISTING GRADES
87.30 x	PROPOSED GRADES
87.30T/C x	PROPOSED TOP OF CURB
97.33	AS–BUILT GRADE
(double line)	EXISTING CURBS
(double line)	PROPOSED CURBS
DC	DEPRESSED CURB
(box)	REGULAR PAVEMENT STRUCTURE
(hatched box)	HEAVY DUTY PAVEMENT STRUCTURE
(arrow)	MAJOR/EMERGENCY OVERLAND FLOW ROUTE
(arrow)	SURFACE FLOW DIRECTION
△	BUILDING ENTRANCE
○	EXISTING LIGHT POLE
(1R)	RISER

REGULAR PAVEMENT STRUCTURE

50mm	SUPERPAVE 12.5mm
150mm	OPSS GRAN. A
300mm	OPSS GRAN. B TYPE II

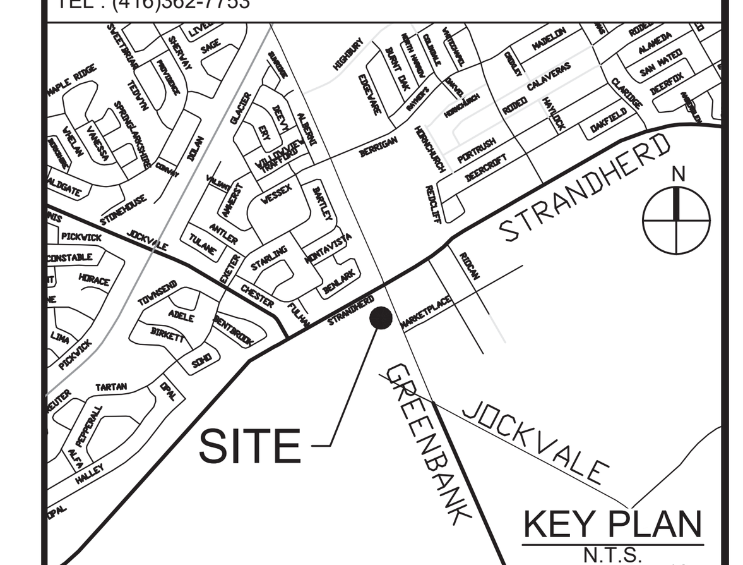
HEAVY DUTY PAVEMENT STRUCTURE
(HEAVY TRUCK PARKING AND ACCESS LANES)

40mm	SUPERPAVE 12.5mm
50mm	SUPERPAVE 19.0mm
150mm	OPSS GRAN. A
400mm	OPSS GRAN. B TYPE II

OWNER : STEVE BISHOP
NORTH AMERICAN DEVELOPMENT GROUP.
2851 JOHN ST, SUITE ONE, MARKHAM, ONTARIO, L3R 5R7
TEL: (905)477-9200

APPLICANT : RON RICHARDS
R. G. RICHARDS & ASSOCIATES
1568 BOXWOOD WAY, MISSISSAUGA, ONTARIO, M4T 1N5
TEL: (416)219-5122

ARCHITECT : ALLAN BORENSTEIN
SCOLER LEE + ASSOCIATES ARCHITECTS INC.
STE 900, 60 ST, CLAIR AVE E, TORONTO, ONTARIO, M4T 1N5
TEL : (416)362-7753



KEY PLAN
N.T.S.

No.	REVISIONS	By	Date
14			
13			
12			
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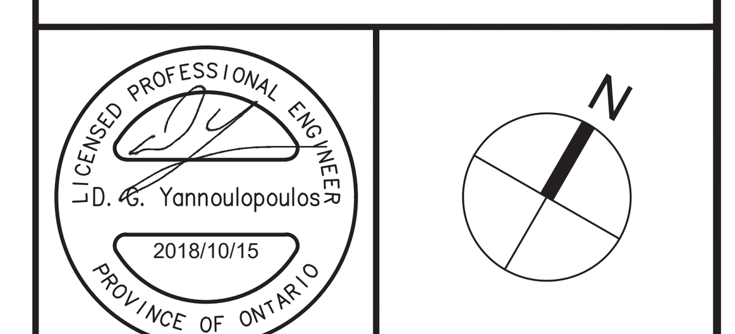
7			
6			
5			
4	SPA SUBMISSION #2	DGY	18:10:15
3	ISSUED FOR SPA	DGY	18:05:14
2	REVISED PER ARCH COMMENTS	DGY	18:05:03
1	ISSUED FOR TEAM COORDINATION	DGY	18:05:02

NorthAMERICAN DEVELOPMENT GROUP

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

Project Title
PAD C BARHAVEN TOWN CENTRE



Drawing Title
SITE GRADING PLAN
3777 STRANDHERD DRIVE

Scale 1:250

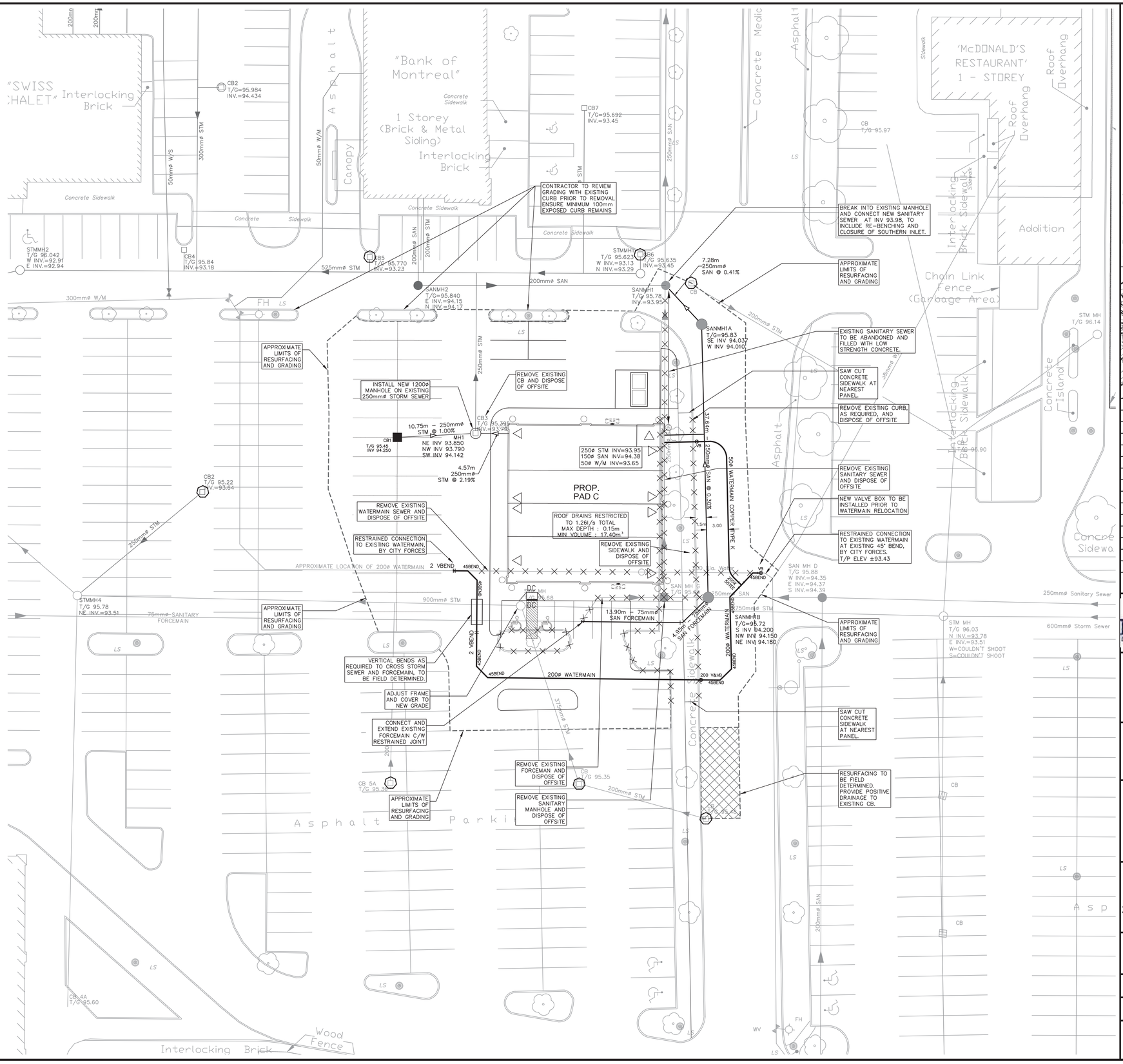
Design: R.M.	Date: APRIL 2018
Drawn: E.H.	Checked: D.G.Y.
Project No.: 116390	Drawing No.: C-200

D07-12-18-0106

#17717

NOTES:

1. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
2. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
3. GEOTEXTILE FABRIC TO BE PLACED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE FABRIC IN STREET CB'S TO REMAIN UNTIL BASE COURSE ASPHALT IS LAID. GEOTEXTILE FABRIC IN RYCB'S TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
4. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
5. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
6. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.



LEGEND :

- LIGHT DUTY SILT FENCE AS PER OPSD-219.110
- SNOW FENCE
- STRAW BALE CHECK DAM AS PER OPSD-219.180
- ROCK CHECK DAM AS PER OPSD-219.210
- SILT SACK PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH (10.3 × 22.5)

OWNER : STEVE BISHOP
NORTH AMERICAN DEVELOPMENT GROUP.
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TEL: (905)477-9200

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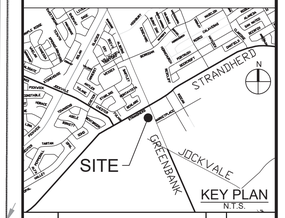

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Project Title
PAD C BARHAVEN TOWN CENTRE

LICENCED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
2018/10/15
PROVINCE OF ONTARIO

Drawing Title
SEDIMENT AND EROSION CONTROL PLAN
3777 STRANDHERD DRIVE

Scale
1:250

Design	Date
R.M.	APRIL 2018
Drawn	Checked
E.H.	D.G.Y.
Project No.	Drawing No.
116390	C-900

D07-12-18-0106

#17717