

460 Keil Drive South

PRELIMINARY SERVICING REPORT

Kamal Baroudi

April 7, 2021



1.0 INTRODUCTION

This report has been prepared in support of the proposed development at 460 Keil Drive South in Chatham. The site is located at the south corner of the Park Avenue West and Keil Drive South intersection. The property also abuts existing residential and agricultural properties to the west and the Hydro One right-of-way to the south.

The development will convert 1.26ha of agricultural land into a mixed-use building having 465 square meters of retail space on the ground floor and 117 residential units above.

The purpose of this report is to present the servicing methods for the proposed mix use development – see Figure 1, Site Plan by Orchard Design Studio Inc.

2.0 EXISTING SERVICES

A topographic survey was completed by AGM survey forces to determine the drainage patterns of the existing lands as well as the location and elevation of relevant right-of-way features such as curb & gutter, sidewalks, manholes, catchbasins, fire hydrants, etc. The topographic survey in conjunction with the As-Constructed information provided by the Municipality were used to determine the location and size of existing subsurface infrastructure.

2.1. Sanitary Drainage

The subject property is fronted by an existing 825mm trunk sanitary sewer along Park Avenue West and an existing 200mm sanitary sewer under the east boulevard of Keil Drive South. The 200mm sanitary sewer outlets to the sanitary pumping station at the intersection of Keil Drive South and Bristol Drive which discharges sewage via a 150mm forcemain back to the Park Avenue West trunk sanitary sewer.

As-constructed plans indicate that a 200mm pipe was installed off the Keil Drive South mainline sewer and capped at the right-of-way limit to service the subject lands (see drawing C2 – Keil Drive South Sanitary Servicing – By Dillon Consulting).

2.2. Water Supply

The water supply available for the development is the existing 300mm watermain along Keil Drive, located under the west boulevard with a hydrant fronting the property at the southeast corner. There is also an existing 300mm watermain along Park Avenue West, located under the northeast bound lane, which feeds a hydrant at the northwest corner the property (Figure 2).

2.3. Storm Drainage

The subject property is fronted by an existing 300mm storm sewer along Park Avenue West that conveys runoff to the 450mm storm sewer along Keil Drive South. Both fronting sewers outlet to the 900mm sewer on Bristol Drive.

As-constructed plans indicate that on Keil Drive, a 375mm pipe was installed from manhole 52 to the west right-of-way limit to service the subject property (see drawing 1263 – Plan and Profile Keil Drive – By Sullo Associates Ltd.). Currently, a catchbasin is connected to said pipe, allowing runoff from the subject property to enter the storm sewer network.

3.0 SANITARY SERVICING

The existing 200mm service pipe off Keil Drive enters the property north of the proposed entrance (see Figure 3). Based on the current site plan, the existing service pipe is in a suitable location for a connection to be made, as such it will be used to outlet sanitary flows generated by the mixed-use development.

With 117 residential units and 465 square meters of retail space, the total expected population for the development is 194 people. Based on a per capita flow of 350 L/person/day the proposed development will contribute 3.71 L/second peak flow to the Keil Drive sanitary sewer (see Appendix B). Flows from the proposed development will converge with sewage from 455 Keil Drive South, resulting in a combined 4.99 L/second of flow. The Keil Drive sanitary sewer being a 200mm diameter pipe at 1% (based on as-constructed drawings) has ample capacity (32.80 L/s) to convey flows from 455 Keil Drive South and the proposed development.

A preliminary sanitary sewer alignment has been shown on Figure 3. All private property sanitary sewers will be designed in accordance with the *Ministry of the Environment Design Guidelines for Sewage Works* and the *Ontario Building Code*.

4.0 WATER SERVICING

Water supply will be “pulled” from the Keil Drive 300mm diameter watermain to the building in a suitable location, typically a mechanical room close to the fire fighters’ entrance. For preliminary layout purposes it was assumed that the mechanical room would be located next to the fire fighters’ entrance (Figure 3).

An on-site hydrant will be required if the building designer proposes a siamese connection. AGM will size the watermain to meet domestic water and applicable fire flow requirements.

In addition to the above servicing comments, the existing hydrant along Park Avenue West will be removed and a new hydrant installed (Figure 3) to avoid conflict with the proposed driveway.

5.0 STORM DRAINAGE

5.1. Proposed Storm Outlet

The existing 375mm service pipe off Keil Drive has a catchbasin connected to allow runoff from the existing agricultural lands to enter the storm sewer (Figure 2). Preliminary investigations, including topographic review, suggest that the existing 375mm service pipe is not in a suitable location to service the parking lot and building.

As a result, it is likely that it will need to be capped and another connection made downstream at the Keil Drive and Bristol Drive intersection to better suit servicing of the parking lot and building (Figure 3). The exact location and final determination of connection requirements will be confirmed during the detailed design phase.

5.2. Stormwater Management

The proposed mixed-use development will significantly increase hard surfaces, resulting in higher peak flows. Stormwater Management strategies will be implemented to comply with municipal requirements to attenuate post development peak flows for residential developments; “Runoff must be limited to the pre-development peak flow condition for the 1:2 year rainfall events with duration of 24 hours”, (Page 33, *Chatham-Kent Development Standards, June 2019*).

We anticipate that a subsurface “super-pipe” system will be required beneath the parking lot, with possibly a grassed surface storage facility if space permits. This system in conjunction with an orifice outlet, will restrict peak flows to the Keil Drive storm sewer to pre development levels. Additional runoff generated by the major system will be controlled by surface ponding on the parking lot to permissible depths. This concept is subject to change pending detailed servicing and grading design.

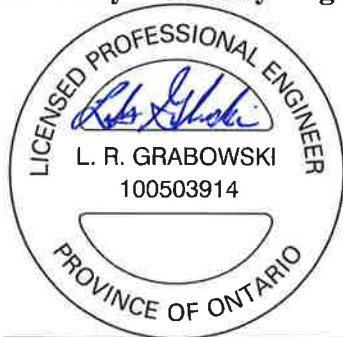
An oil grit separator will be required to ensure that discharge leaving the property is treated to the *Ministry of the Environment’s* normal level of protection (the long-term removal of 70% total suspended solids).

6.0 SUMMARY

All engineering design will be completed in accordance with the requirements, standards and guidelines of *Chatham-Kent*, the *Ministry of Environment, Conservation and Parks* and the *Ontario Building Code*. Surrounding properties are not adversely impacted by the proposed development, and the servicing as presented within this report is consistent with existing municipal infrastructure.

Prepared By:

Archibald Gray & McKay Engineering Ltd.



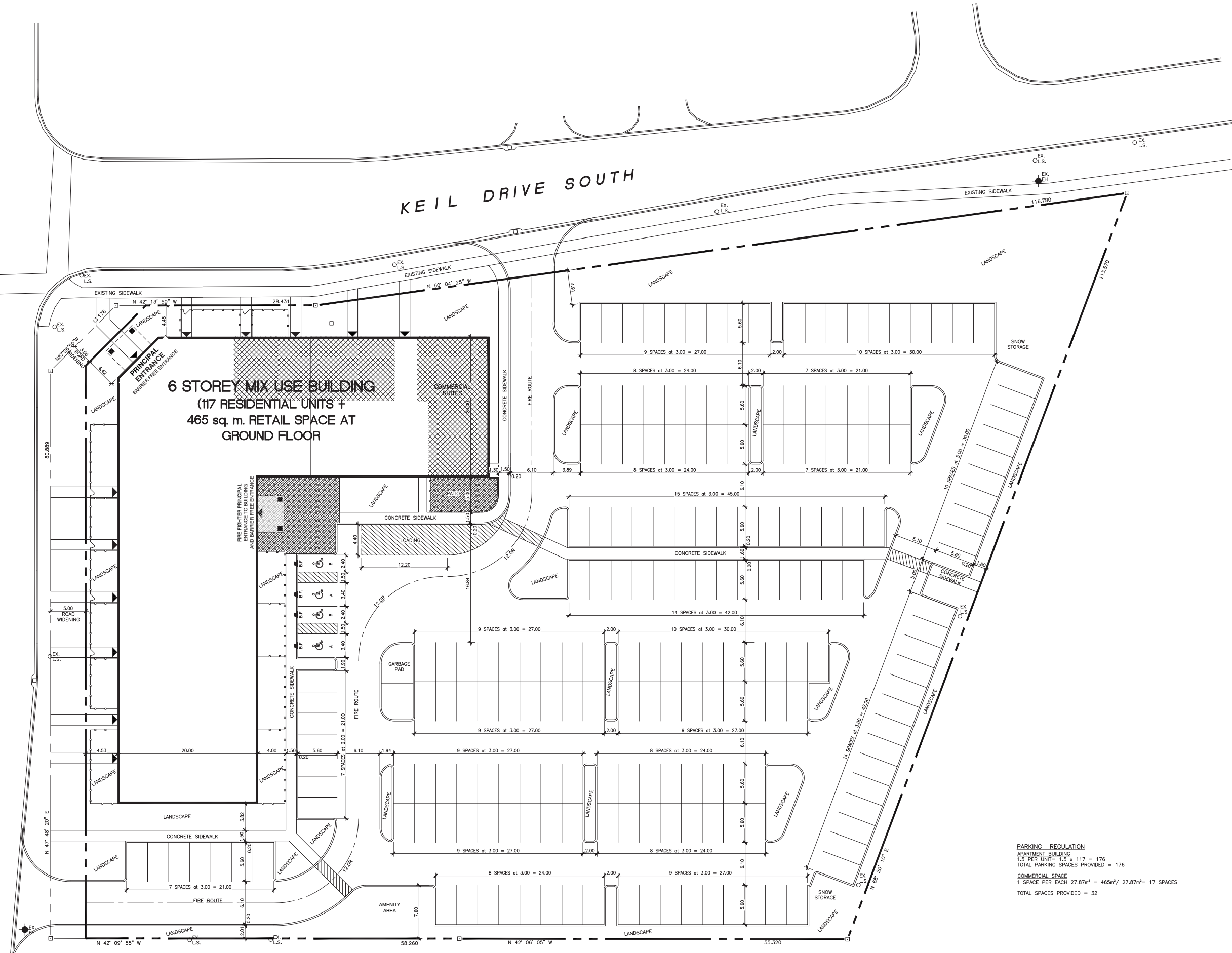
Per: Lukas Grabowski, P. Eng.
Project Engineer



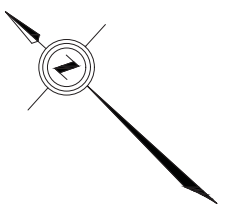
Hendrik Schuurmans, P. Eng.
Project Manager

PARK AVENUE WEST

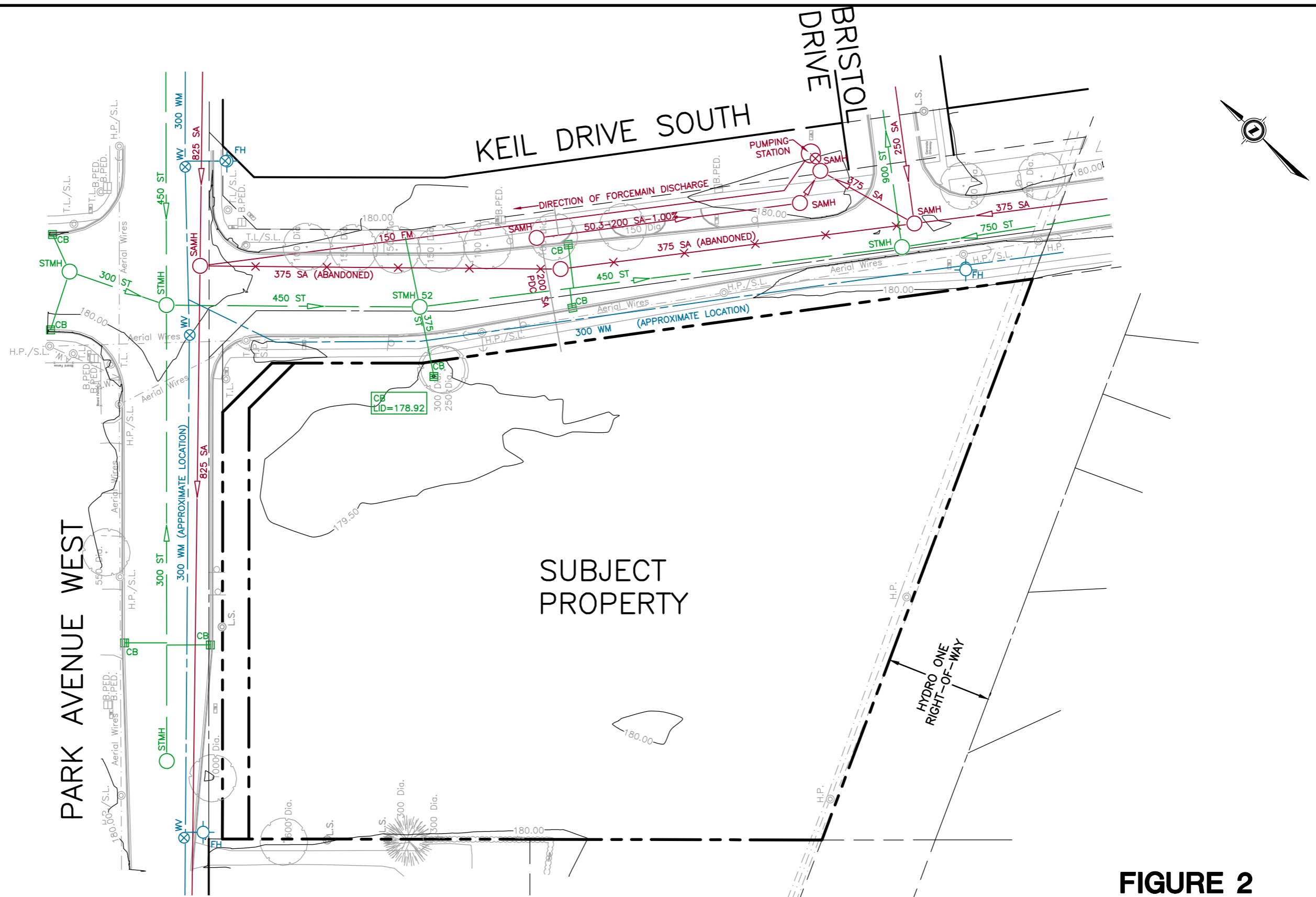
KEIL DRIVE SOUTH



PARKING REGULATION
 APARTMENT BUILDING
 1.5 PER UNIT = 1.5 x 117 = 176
 TOTAL PARKING SPACES PROVIDED = 176
 COMMERCIAL SPACE
 1 SPACE PER EACH 27.87m² = 465m² / 27.87m² = 17 SPACES
 TOTAL SPACES PROVIDED = 32



<p>ORCHARD STUDIO INCORPORATED 0310 800 0411</p>	
<p>PROJ: 460 Keil Street - Site Plan.dwg DATE: 2021-01-31 4:08 PM SCALE: 1:250 DWG BY: MSR DATE: JANUARY 2021</p>	
<p>STATUS: CLIENT REVIEW</p>	<p>DATE: _____</p>
<p>NO. _____</p>	<p>REVISION _____</p>
<p>PROJECT: MIXED USE DEVELOPMENT 460 KEIL DRIVE, SOUTH Chatham, Ontario</p>	
<p>TITLE: SITE PLAN</p>	
<p>SHEET No. A1.1</p>	
















**FIGURE 2
EXISTING
INFRASTRUCTURE**

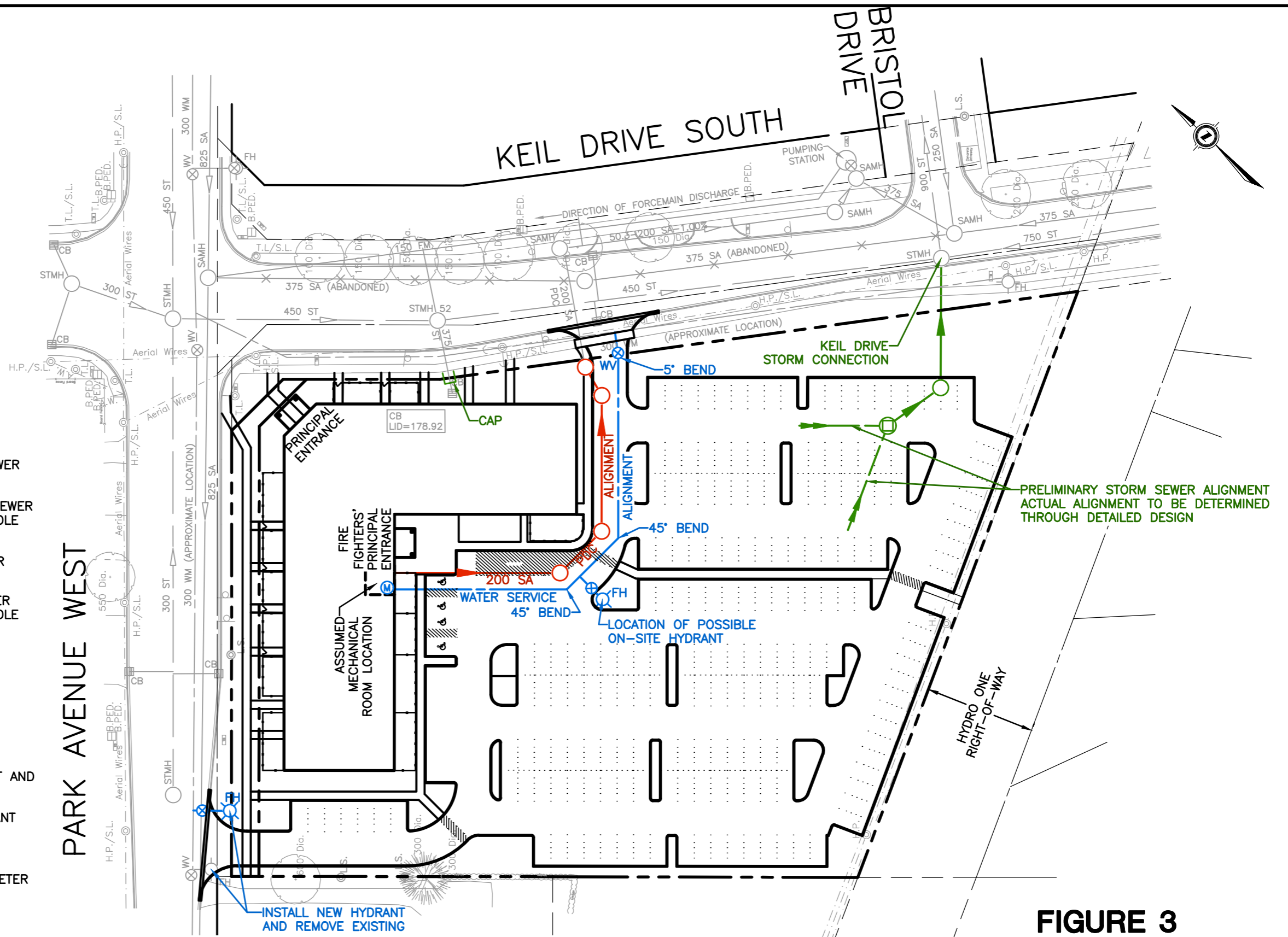
SCALE 1:750
DATE: APRIL 2021

AGM
ARCHIBALD, GRAY & MCKAY
ENGINEERING LTD.
3514 WHITE OAK ROAD, LONDON, ON, N6E 2Z9
PHONE 519-685-5300 FAX 519-685-5303
EMAIL info@agm.on.ca WEB www.agm.on.ca
PLAN • SURVEY • ENGINEER

NOTE: SITE PLAN LAYOUT BY ORCHARD DESIGN STUDIO INC.

LEGEND

-  SAMH 200 SA EXISTING SANITARY SEWER AND MANHOLE
-  200 SA PDC PROPOSED SANITARY SEWER ALIGNMENT AND MANHOLE LOCATION
-  STMH 450 ST EXISTING STORM SEWER AND MANHOLE
-  POSSIBLE STORM SEWER ALIGNMENT AND MANHOLE LOCATION
-  CBMH POSSIBLE CATCHBASIN MANHOLE LOCATION
-  CB EXISTING CATCHBASIN
-  300 WM EXISTING WATERMAIN
-  FH EXISTING FIRE HYDRANT AND VALVE
-  FH PROPOSED FIRE HYDRANT AND VALVE
-  PROPOSED PVC WATER SERVICE ALIGNMENT, METER & VALVE LOCATION
-  EXISTING TREE
-  HP EXISTING HYDRO POLE
-  LS EXISTING LIGHT STANDARD



**FIGURE 3
PRELIMINARY
SERVICING LAYOUT**

SCALE 1:750
DATE: APRIL 2021

AGM ARCHIBALD, GRAY & MCKAY ENGINEERING LTD.
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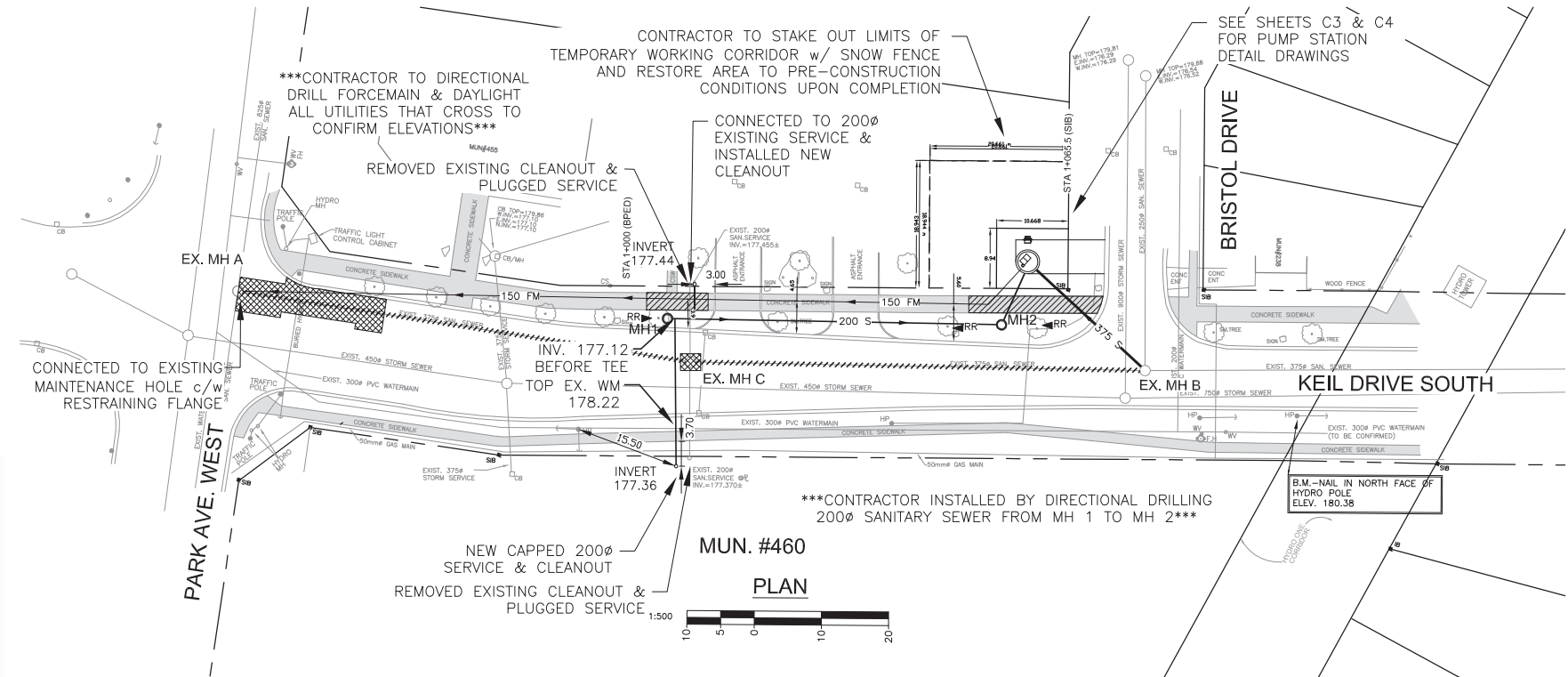
APPENDIX A

As-Constructed Materials

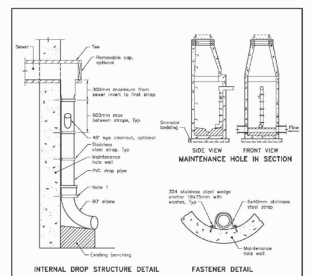
DILLON CONSULTING LIMITED 202 KING STREET WEST, SUITE 300, CHATHAM, ONTARIO, N7M 1E5. PHONE (519) 554-7802, FAX (519) 554-2050

- NOTES:**
- THE OWNER AND DILLON CONSULTING LIMITED DO NOT GUARANTEE THE ACCURACY OF THE UTILITIES SHOWN ON THE DRAWINGS. OTHER UTILITIES MAY BE PRESENT OR THE UTILITIES SHOWN MAY DIFFER IN SIZE OR LOCATION FROM THOSE SHOWN.
 - ALL DIMENSIONS AND RADII ARE TO CONSTRUCTION BASELINE OR EDGE OF PAVEMENT. (UNLESS OTHERWISE SHOWN)
 - CHAINAGES SHOWN REFER TO CONSTRUCTION BASELINE.

- DENOTES CONCRETE SIDEWALK REMOVAL & REPLACEMENT (MATCH EXISTING)
- DENOTES ASPHALT PAVEMENT REMOVAL & REPLACEMENT (MATCH EXISTING)
- REMOVE & REPLACE TREE
- GROUT EXISTING SEWER



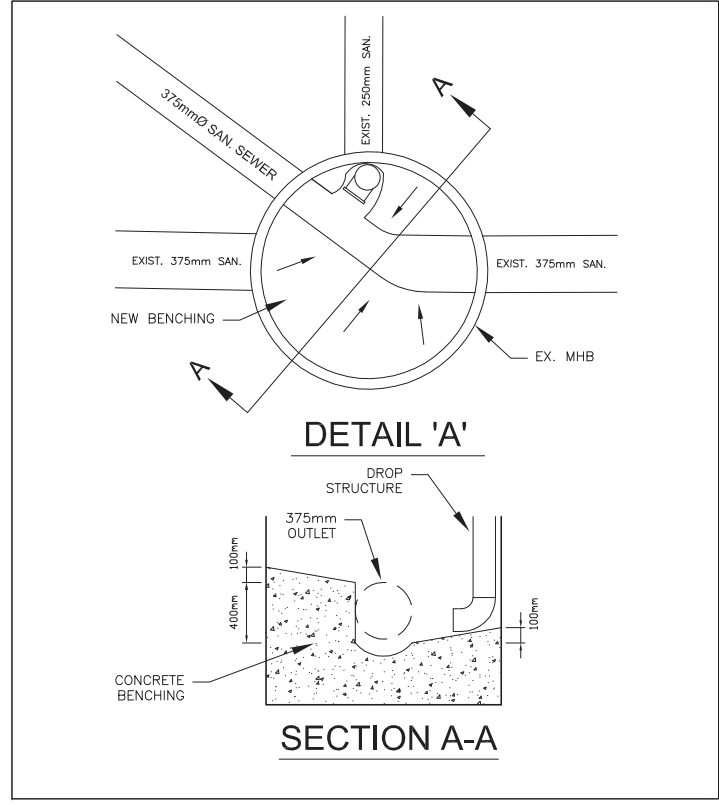
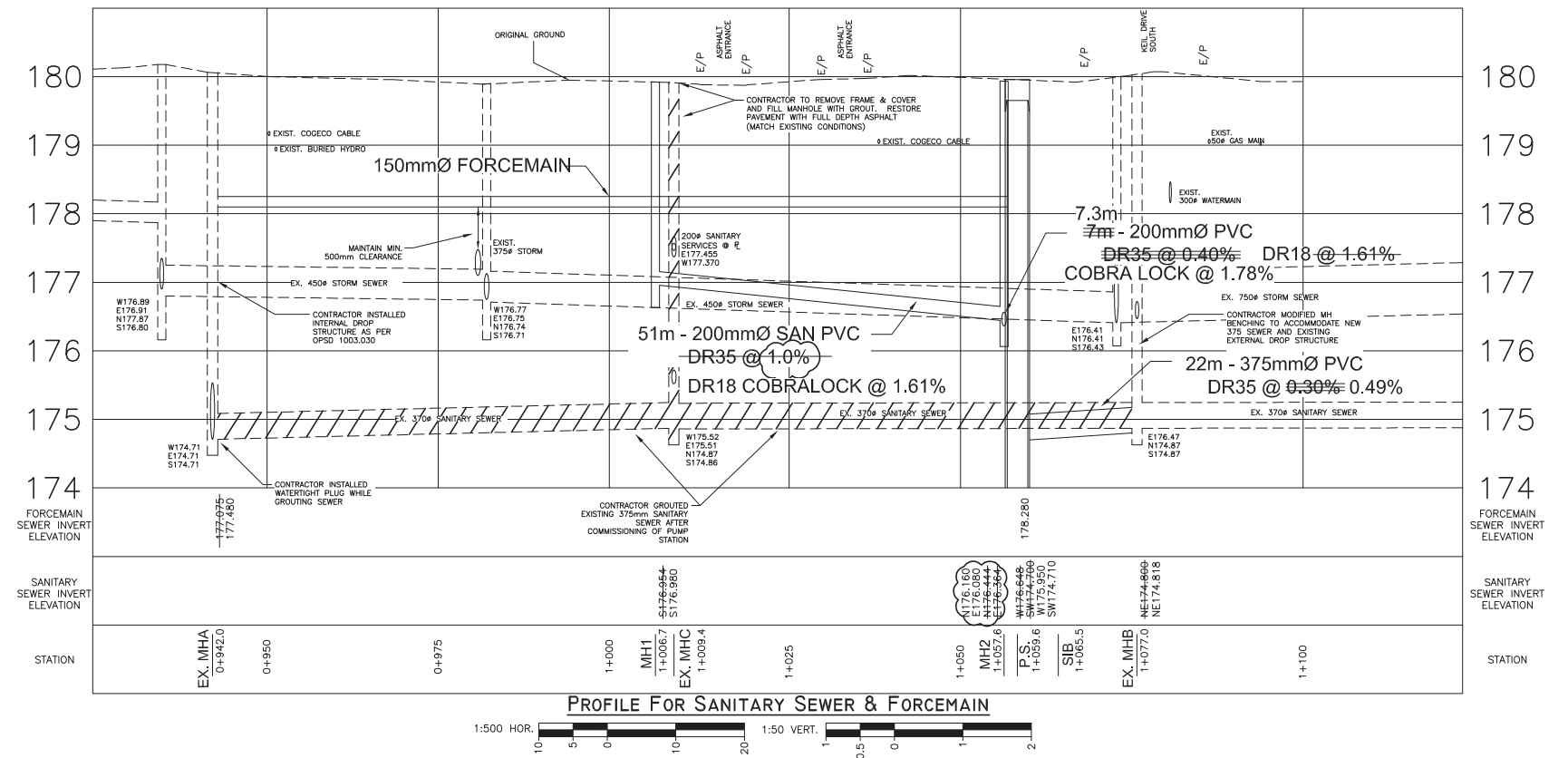
No.	TYPE OF STRUCTURE	SIZE	TYPE OF GRATE	ELEV. TOP GRATE	ELEV. NORTH INVERT	ELEV. EAST INVERT	ELEV. SOUTH INVERT	ELEV. WEST INVERT	ELEV. NORTHEAST INVERT	SUMP OR BENCHED	REMARKS
M.H. #1	701.010	1200	401.010 TYPE A	179.90	---	---	176.980 176.954	---	---	BENCHED	
M.H. #2	701.010	1200	401.010 TYPE A	179.90	176.160 176.144	176.080 176.064	---	---	---	BENCHED	
EXIST. M.H. #B	EXIST.	1200	EXIST.	180.07	EXIST. 174.87	EXIST. 176.47	EXIST. 174.87	---	174.818 174.806	BENCHED	REBENCH FOR NEW OUTLET
EXIST. M.H. #A	EXIST.	1500	EXIST.	180.06	---	EXIST. 174.71	EXIST. 174.71	EXIST. 174.71	---	BENCHED	



NOTES:

- At the bottom, a stainless steel strip is required at bottom of hole.
- Internal drop structure shall be used on existing maintenance holes 1200mm diameter and larger with a minimum height of 600mm from the steel plate insert to the top of manhole. The existing manhole shall be modified as required.
- Drop plate shall be one side similar to the following dimensions:
- Drop plate shall be 1200mm x 1200mm or larger - minimum hole diameter 300mm.
- All dimensions are in millimetres unless otherwise shown.

ONTARIO PROFESSIONAL STANDARD DRAWING
INTERNAL DROP STRUCTURE FOR EXISTING MAINTENANCE HOLES
QPSD 1003.030



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FOR THE MUNICIPALITY
OF CHATHAM-KENT**



NO.	ISSUED FOR	DATE	BY	DESIGN	REVIEWED BY
5	AS-BUILT	09 NOV 10	RMT/KS		
4	ISSUED FOR CONSTRUCTION	20 JULY 09	LRO/JJT		
3	ISSUED FOR TENDER	13 MAY 09	LRO/JJT		
2	NOE SUBMISSION	11 MAY 09	LRO/JJT		
1	CLIENT REVIEW	13 APR 09	LRO/JJT		

ISSUED FOR: _____ DATE: _____ BY: _____

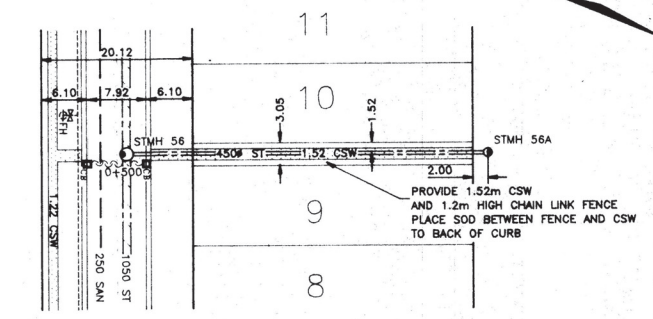
Keil Drive South Sanitary Servicing

PLAN & PROFILE STA 1+000 TO 1+150

C2

PROJECT NO. 08-9206
SHEET NO. _____

EASEMENT BETWEEN LOTS 9 AND 10



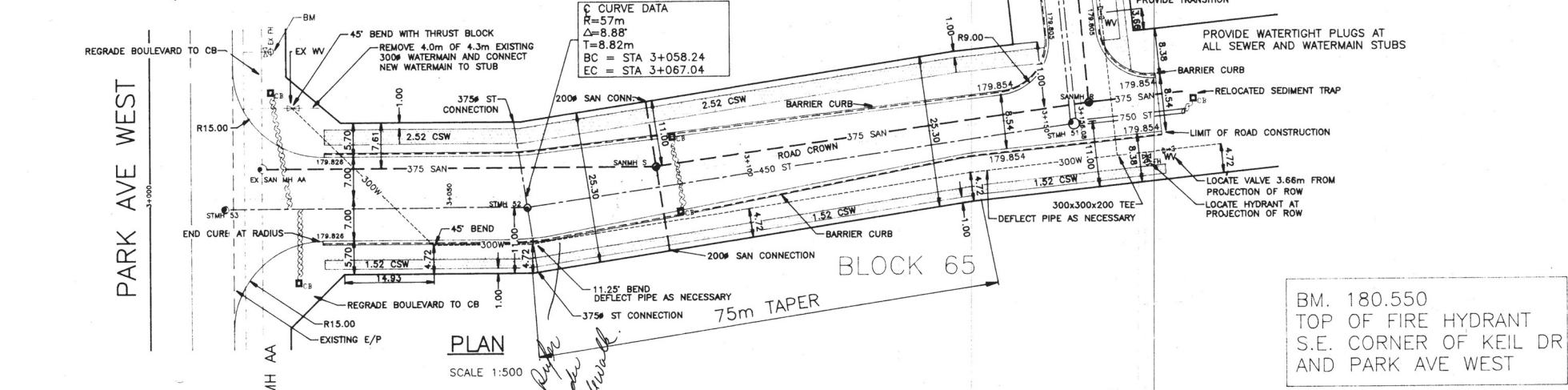
KEIL DRIVE

SEE SHEET 5 OF 8

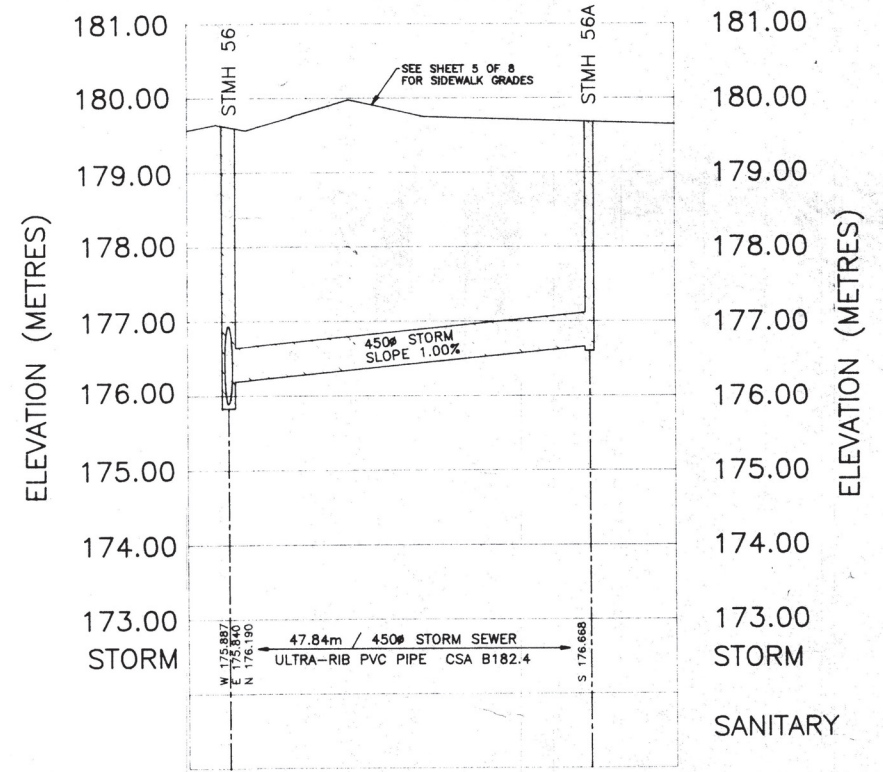
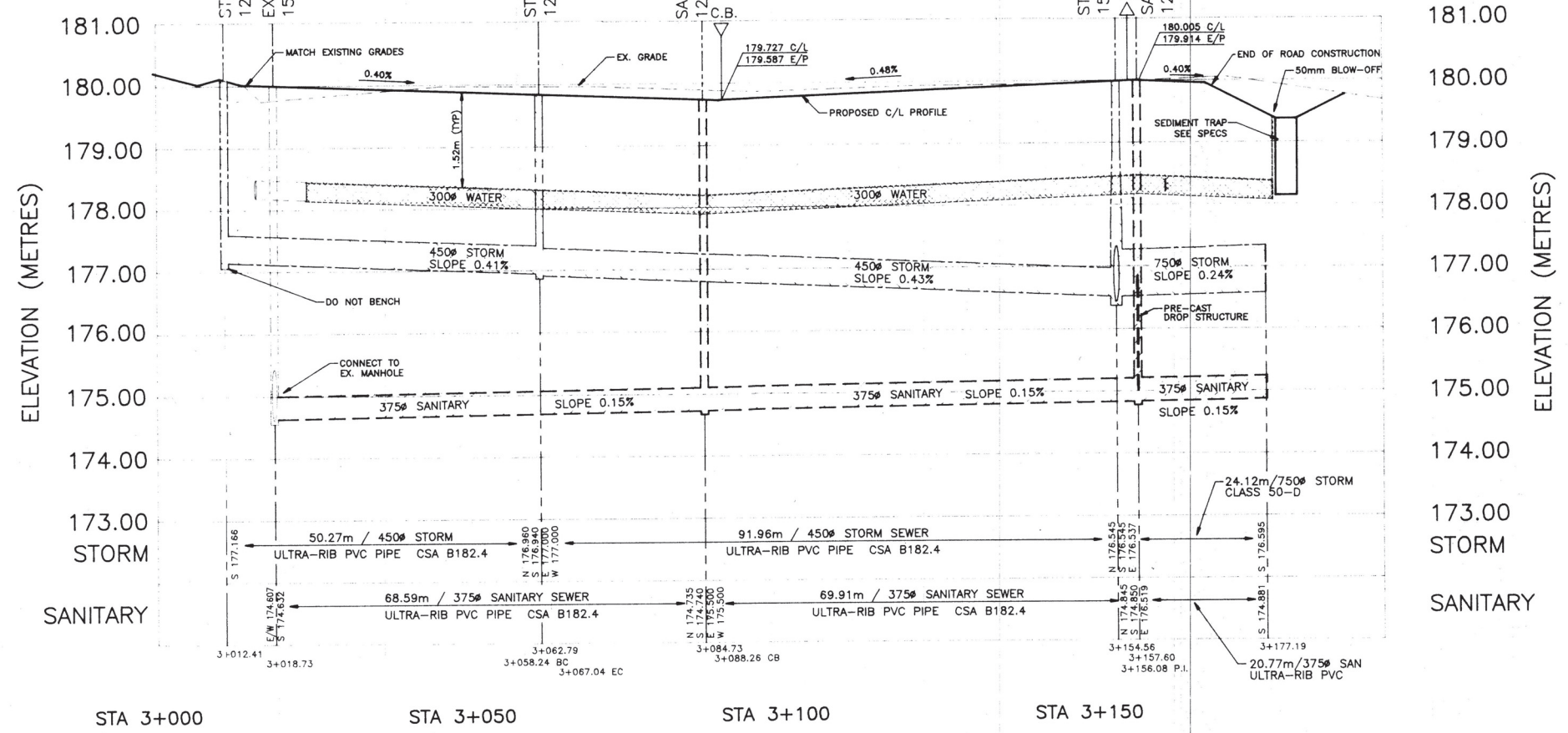
BLOCK 62/PART 3

BLOCK 63

BLOCK 65



BM. 180.550
TOP OF FIRE HYDRANT
S.E. CORNER OF KEIL DR
AND PARK AVE WEST



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901542

Parkview
E.S.T.A.T.E.S.
CORP.

SULLO ASSOCIATES LTD.
CONSULTING ENGINEERS

DESIGN	SJK	DATE	15 MAY 96
DRAWN	SJK	NO.	1
CHECKED	JC	ISSUED FOR	APPROVALS
DATE	15 MAY 96		

SUBDIVISION 36T-90001 PHASE 4
PLAN AND PROFILE
KEIL DRIVE

DRWG NO: 1263
SHEET NO: 6 of 8
SCALE: AS SHOWN

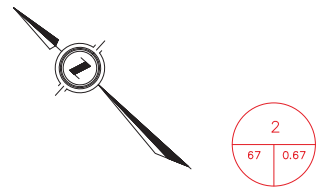
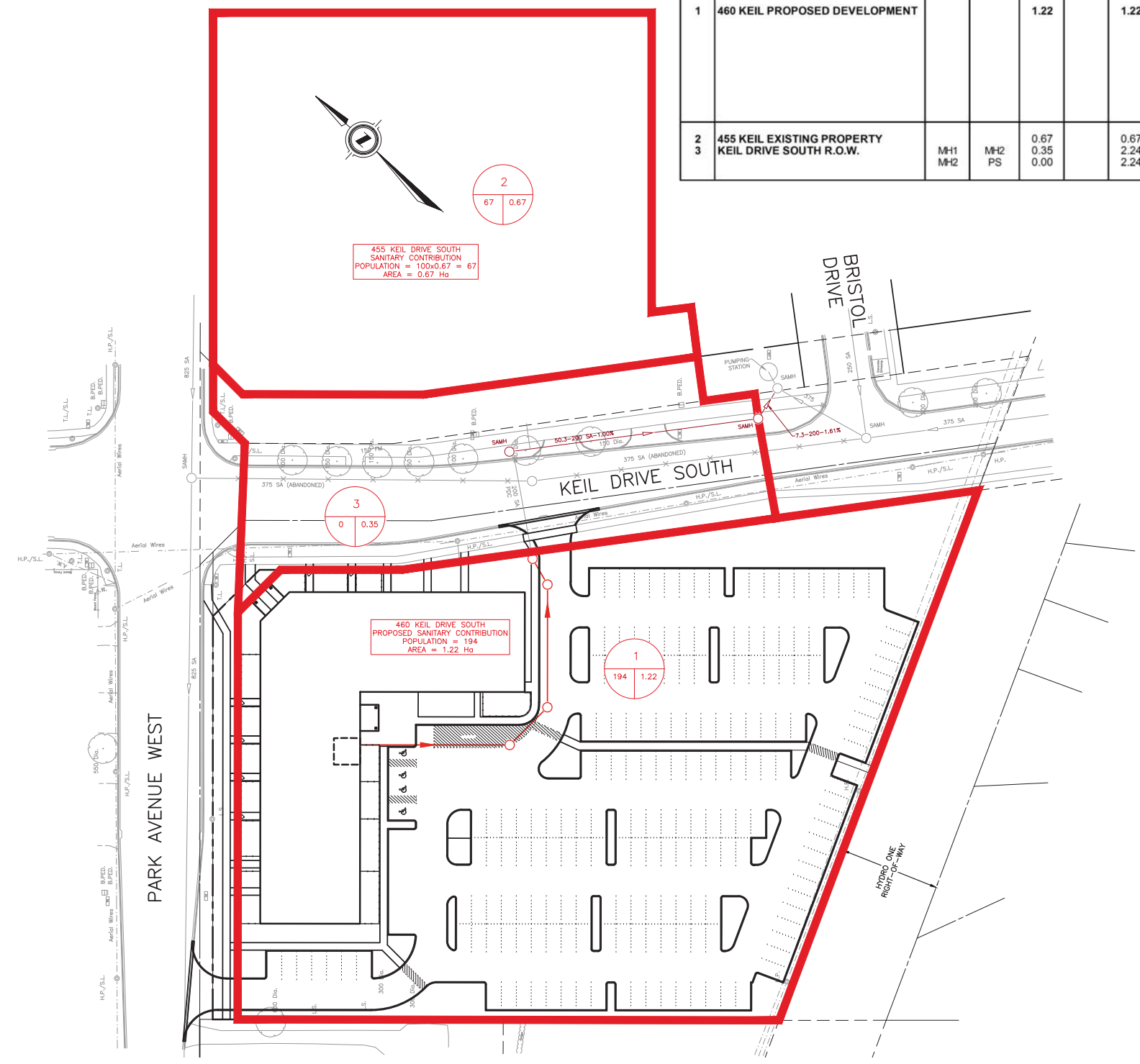
APPENDIX B

Sanitary Design Sheet / Flow Calcululations

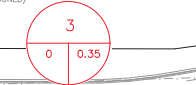


AREA No.	LOCATION	FROM MH	TO MH	AREA			POPULATION					SEWAGE FLOW				SEWER DESIGN					PROFILE					
				GROSS	NET	TOTAL	PER Ha	PER UNIT	# of UNITS	SUM POP	TOTAL POP	PEAKING FACTOR	INFILT L/s	SEWAGE L/s	TOTAL L/s	SIZE mm	SLOPE %	CAP L/s	N	VEL m/s	LENGTH m	FALL IN SEWER	DROP IN MANHOLE	INVERT U.S.	INVERT D.S.	
1	460 KEIL PROPOSED DEVELOPMENT			1.22		1.22	1.6	117	187.2	194	4.57	0.122	3.587	3.709												
2	455 KEIL EXISTING PROPERTY	MH1	MH2	0.67		0.67			67	67	4.72	0.067	1.280	1.347												
3	KEIL DRIVE SOUTH R.O.W.	MH2	PS	0.35		2.24			0	261	4.51	0.224	4.770	4.994												
				0.00		2.24			0	261	4.51	0.224	4.770	4.994												

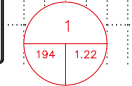
ADD SHOPPING CENTRE EQUIVALENT POPULATION = 6.643
 CALCULATION:
 5 L/Day/Sq.m. of Floor @ 465 sq.m. of retail
 Total Daily Flow = 2325 L/Day
 Equivalent Population = 2325 / 350 L per capita flow
 Equivalent Population = 6.643



455 KEIL DRIVE SOUTH
 SANITARY CONTRIBUTION
 POPULATION = 100 x 0.67 = 67
 AREA = 0.67 Ha



460 KEIL DRIVE SOUTH
 PROPOSED SANITARY CONTRIBUTION
 POPULATION = 194
 AREA = 1.22 Ha



LEGEND

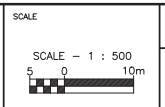
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING SANITARY SEWER AND MANHOLE ANALYZED FOR CAPACITY
- PROPOSED SANITARY SEWER ALIGNMENT AND MANHOLE LOCATION
- DRAINAGE AREA BOUNDARY
- AREA NUMBER
- SIZE OF AREA IN HECTARES
- POPULATION

Printed by Luba Gombosi on 2021-04-07 12:34

AS CONSTRUCTED SERVICES	COMPLETION	DESIGN	No.	REVISIONS	DATE	BY	CONSULTANT OR DIVISION	ENGINEER'S STAMP
		DESIGN	LRG					
		DRAWN	LRG					
		CHECKED	HES					
		APPROVED	HES					
		DATE	APRIL 2021					

AGM ARCHIBALD, GRAY & MCKAY
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 EMAIL: info@agm.on.ca WEB: www.agm.on.ca

Kamal Baroudi



460 KEIL DRIVE SOUTH
 SANITARY DRAINAGE AREA
 PLAN

PROJECT No. 1463-1
 SHEET No. DA.1
 PLAN FILE No.