
GRADING AND STORMWATER MANAGEMENT MEMORANDUM

DATE: 2020-06-19

EMAIL

TO: City of Ottawa IAD Review Officer

SUBJECT: Proposed Amendment to 1309 Carling Avenue – Phase 1 Site Plan
Application
City File Number: D07-12-18-0170

OUR FILE: DSEL Project No. 18-1028

ATTACHMENTS:

- Site Plan, SP-1 by Roderick Lahey Architect Incorporated., Dated May 21, 2020 (Proposed Amendment)
- Site Plan, SP-1, by Roderick Lahey Architect Incorporated., Dated September 10th, 2019 (Previously Approved)
- Grading Plan, GP-1, by DSEL, Dated June 19th, 2020 (Proposed Amendment)
- Grading Plan, GP-1, by DSEL, Dated July 19th, 2019 (Previously Approved)
- Site Servicing Plan, SSP-1, by DSEL, Dated June 19th, 2020 (Proposed Amendment)
- Site Servicing Plan, SSP-1, by DSEL, Dated July 19th, 2019 (Previously Approved)
- Stormwater Management Plan, SWM-1, by DSEL, Dated June 19th, 2020 (Proposed Amendment)
- Stormwater Management Plan, SWM-1, by DSEL, Dated July 19th, 2019 (Previously Approved)
- Stormwater Management Calculations, by DSEL, Dated May 29th, 2020 (Proposed Amendment)
- Stormwater Management Calculations, by DSEL, Dated July, 2019 (Previously Approved)

RioCan Holdings Incorporated has provided a revised site plan (SP-1) dated May 21, 2020, included at the back of this memo. The updated site plan proposes to amend the previously approved site plan application D07-12-18-0170.

The following memo addresses the impact of the updated site plan on the previously approved Functional Servicing and Stormwater Management Report prepared by David Schaeffer Engineering Ltd, dated July 2019.

The updated Site Plan proposes modifications to the drive aisle and parking layout located northeast of the proposed building. Based on the updated site plan there are no proposed changes to the number of dwellings, commercial area, amenity area or total building area, therefore, anticipated water and wastewater servicing is consistent with the previously approved report.

The revised site plan resulted in updates to the previously approved grading and stormwater management plans, **GP-1** and **SWM-1**, dated July 2019. As shown on the revised **GP-1** and **SWM-1**, drainage areas have been updated however drainage patterns have been kept consistent with the previously approved plans.

Table 1 summarizes the previously approved release rates and onsite storage required to meet established target release rates from the existing approved stormwater management plan. The previous established allowable release rate was **67.3 L/s**.

Table 1 - Previously Approved SWM Summary

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m ³)	100-Year Release Rate (L/s)	100-Year Required Storage (m ³)	100-Year Available Storage (m ³)
Unattenuated Areas (UN1)	14.8	0.0	28.1	0.0	0.0
Unattenuated Areas (UN2)	4.1	0.0	8.8	0.0	0.0
Attenuated Area (C1)	11.8	4.5	17.2	11.8	11.9
Attenuated Area (C2+ BLD)	1.8	132.5	3.9	255.0	264.5
Attenuated Area (C3)	5.7	0.8	6.1	28.6	29.8
Total	38.1	137.8	64.1	295.4	306.2

The attached storm calculation sheets illustrate the previously approved plan and proposed amendment.

Table 2, summarizes the anticipated release rates and onsite storage required to meet established target release rates as proposed by the amendment based on the updated drainage parameters.

Table 2 - Proposed Amendment SWM Summary

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m ³)	100-Year Release Rate (L/s)	100-Year Required Storage (m ³)	100-Year Available Storage (m ³)
Unattenuated Areas (UN1)	13.8	0.0	29.4	0.0	0.0
Unattenuated Areas (UN2)	2.9	0.0	6.3	0.0	0.0
Attenuated Area (C1)	11.3	4.3	17.7	11.5	11.9
Attenuated Area (C2+BLD)	4.4	115.5	6.1	242.9	265.2
Attenuated Area (C3)	5.6	0.6	6.1	28.1	29.8
Total	38.0	120.3	65.6	282.5	306.9

As demonstrated above, the proposed 100-year stormwater release rate is less than the allowable of **67.3 L/s**.

The proposed stormwater design conforms to all relevant **City Standards** and Policies and meets the design objectives.

DSEL trusts that the above will be sufficient to support an amendment to the previously approved grading plan to allow the proposed development to proceed. Please contact the undersigned if you have any questions.

Prepared by,
David Schaeffer Engineering Ltd.

Reviewed by,
David Schaeffer Engineering Ltd.



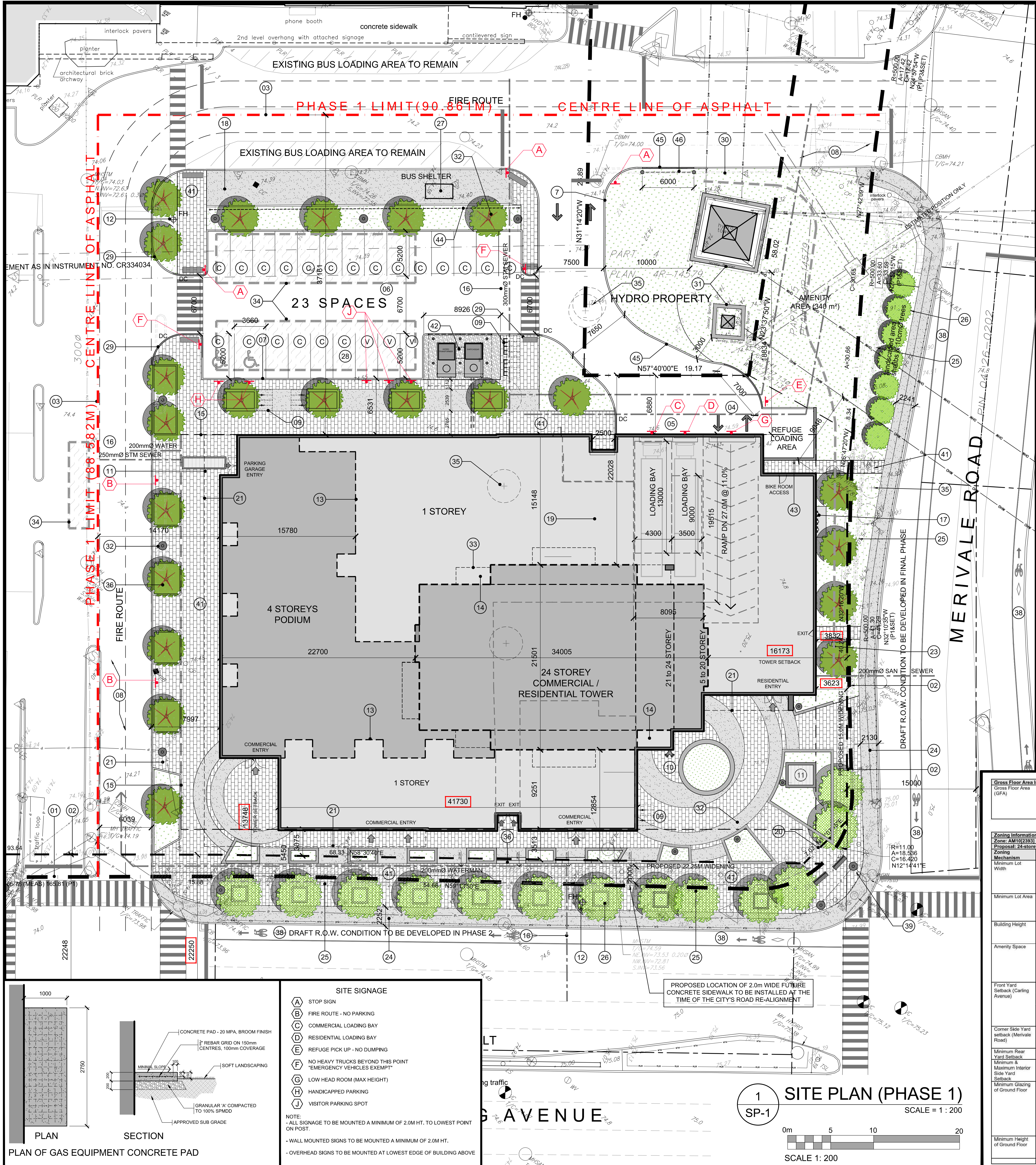

Per: Charlotte M. Kelly, EIT.

Per: Adam D. Fobert, P.Eng.

Prepared by,
David Schaeffer Engineering Ltd.



Per: Brandon N. Chow



KEY MAP

LEGAL DESCRIPTION
TOPOGRAPHIC PLAN of
LOTS 45, 46, 50 TO 57 INCLUSIVE AND
PART OF LOT 49
REGISTERED PLAN NO. 348 AND PART OF
LOT 48, NO. 311 AND PART OF LOTS 22 & 23
CONCESSION 1 (OTTAWA FRONT)
(GEOGRAPHIC TOWNSHIP OF NEPEAN)
CITY OF OTTAWA

PROJECT DEVELOPER
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- DRAWING NOTES**
- PROPERTY LINE
 - PROPOSED ROAD WIDENING
 - PHASING LINE
 - PARKING GARAGE ENTRY DRIVEWAY / RAMP WITH TRENCH DRAIN
 - GARAGE / LOADING BAY ENTRY
 - COMMERCIAL / VISITOR ASPHALT PARKING LOT
 - 150mm BARRIER CURB
 - EXISTING SITE ENTRY TO REMAIN
 - BICYCLE PARKING SPACES (0.6 x 1.8M) WITH RACK
 - SIAMSE CONNECTION
 - AIR INTAKE / EXHAUST GRILL
 - FIRE HYDRANT
 - OUTLINE OF PODIUM LEVELS ABOVE
 - OUTLINE OF TOWER LEVELS ABOVE
 - OUTLINE OF UNDERGROUND PARKING LEVELS
 - PROPOSED LOCATION OF UNDERGROUND UTILITIES
 - GAS REGULATOR / METER EQUIPMENT AREA
 - EX. CONCRETE SIDEWALK WITH STREET CURB TO BE REBUILT
 - EXISTING 1 STOREY BUILDING TO BE REMOVED
 - 5.0 x 5.0m SITE TRIANGLE
 - CANOPY ABOVE GROUND FLOOR
 - SITE FURNITURE - SEE LANDSCAPE PLAN
 - SWALE - SEE CIVIL PLAN
 - EXISTING CITY SIDEWALK
 - EXISTING WALL / FENCE TO BE REMOVED
 - EXISTING CITY TREES TO REMAIN
 - EXISTING BUS STOP / SHELTER TO REMAIN
 - STANDARD PARKING SPACE 2.6 x 5.2 m
 - DEPRESSED CURB WITH TWSI AS REQUIRED
 - EXISTING PARKING LOT / CURBS / ISLANDS / LIGHTS POLES, TO BE REMOVED
 - EXISTING HYDRO TOWER WITH CONCRETE BARRIERS AT BASE
 - LIGHT STANDARD
 - BALCONY ABOVE
 - STORM WATER STORAGE SYSTEM
 - EXISTING TREE TO BE REMOVED
 - LOW STEP, MAXIMUM HEIGHT 190mm
 - EXISTING BLACK METAL CITY BENCH
 - BICYCLE LANE
 - STREET / SIDEWALK LIGHTING
 - DISABLED PARKING SPACE 3.66 x 5.2 m
 - 2.0M WIDE PEDESTRIAN - HARD SURFACE WALK
 - HYDRO TRANSFORMER / EQUIPMENT
 - RETAINING WALL, UNDER 0.6 m
 - 1.2 m HT. BLACK METAL PICKET FENCE
 - DEPRESSED CURB
 - BOLLARD WITH BAR STYLE GATE

PROJECT INFORMATION

ZONING
AM10(2393) S368

SITE AREA
36,896 sq. m.
(397,145) sq. ft.

BUILDING HEIGHT
AREA 'A' = 24 STOREYS
AREA 'B' = 36 STOREYS

AMENITY AREA - 6m² PER UNIT
1,216 sq. m.

PROJECT STATISTICS - PHASE 1 ONLY

SITE AREA
7,191.2 sq. m.
(77,405) sq. ft.

BUILDING HEIGHT
(78.0 M) 24 STOREYS

AVERAGE MEAN GRADE
(GEO. ELEV.) 74.80

GROSS BUILDING - AREAS
(CITY OF OTTAWA'S DEFINITION)

PARKING LEVELS (2 LEVELS U/G)	0.0 sq. m. (000) sq. ft.
GROUND FLOOR	1,804.1 sq. m. (19,419) sq. ft.
2nd to 4th FLOOR	3 x 1,045.0 sq. m. 3 x 11,240 sq. ft.
5th FLOOR	0.0 sq. m. (0) sq. ft.
6th to 10th FLOOR	5 x 510.9 sq. m. 5 x (5,496) sq. ft.
11th to 20th FLOOR	10 x 515.05 sq. m. 10 x (5,544) sq. ft.
21st & 22nd FLOOR	2 x 460.8 sq. m. 2 x (4,968) sq. ft.
23rd & 24th FLOOR	2 x 393.8 sq. m. 2 x (4,239) sq. ft.
MECHANICAL FLOOR	0.0 sq. m. (000) sq. ft.
TOTAL AREA	14,532.8 sq. m. (154,492) sq. ft.

UNIT STATISTICS

STUDIO UNIT	13
1 BEDROOM UNIT	135
2 BEDROOM UNIT	65
TOTAL	213
COMMERCIAL RETAIL	1,612.3 sq. m. (17,358) sq. ft.
COMMERCIAL RESTAURANT	191.8 sq. m. (2,065) sq. ft.

AMENITY AREA

EXTERIOR COMMUNAL AT GRADE	340.0 sq. m. 3,660 sq. ft.
5th FLOOR COMMUNAL AMENITY ROOM	460.0 sq. m. 4,960 sq. ft.
5th FLOOR COMMUNAL ROOF TOP PATIO	640.0 sq. m. 6,940 sq. ft.
PRIVATE BALCONIES	1,505.0 sq. m. 16,200 sq. ft.
TOTAL =	2,945.0 sq. m. 31,970 sq. ft.
REQUIRED - 6.0M² PER UNIT (213) =	1,278.0 sq. m. 13,796 sq. ft.
REQUIRED COMMUNAL @ 50% =	639.0 sq. m. 6,878 sq. ft.

LOT COVERAGE

PAVED SURFACE =	1,849.9 sq. m.	25.7%
BUILDING FOOTPRINT =	2,830.0 sq. m.	39.3%
LANDSCAPE OPEN SPACE =	2,512.3 sq. m.	35.0%
TOTAL =	7,191.2 sq. m.	100.0%

CAR PARKING - PROVIDED

RESIDENTIAL UNITS	0.61 per UNIT	124
RESIDENTIAL VISITOR	0.1 per UNIT	20
COMMERCIAL RETAIL	3.24 per 1,000 sq. ft.	64
COMMERCIAL CAFÉ		0
TOTAL		208
STANDARD PARKING SPACE	2.6 x 5.2 m	185
SMALL CAR PARKING SPACE	2.4 x 4.6 m	18
HANDICAPPED SPACE	3.66 x 5.2 m	5

NOTATION SYMBOLS:

INDICATES DRAWING NOTES, LISTED ON EACH SHEET.

INDICATES ASSEMBLY TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDULE.

INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A500 SERIES.

INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A500 SERIES.

DETAIL NUMBER

TITLE

SCALE

DETAIL REFERENCE PAGE

DETAIL CROSS REFERENCE PAGE

ISSUED FOR ASI #007	May 12, 20
ISSUED FOR REVIEW	May 6, 20
REVISED HYDRO CLEARANCES	Apr. 8, 20
ISSUED FOR CONSTRUCTION	Mar. 5, 20
ISSUED FOR TENDER # 4	Jan. 17, 20
ISSUED FOR PUBLIC MEETING	Oct. 31, 19
ISSUED FOR CONCRETE & REBAR TENDER	Oct. 18, 19
GENERAL REVISION - NOT ISSUED	Oct. 9, 19
ISSUED FOR SPC ROUND #4 COMMENTS	Sept. 10, 19
ISSUED FOR BUILDING PERMIT	Sept. 3, 19
ISSUED FOR EXCAVATION PERMIT	Aug. 22, 19
ISSUED FOR EXC. / ELEV. / R.A. TENDER	Aug. 22, 19
HYDRO CHANGES	Aug. 15, 19
ISSUED FOR SPC ROUND #3 COMMENTS	July 17, 19
ISSUED FOR 33% REVIEW	June 7, 19
UPDATED ZONING STAT SHEETS	June 3, 19
ISSUED FOR SPC ROUND #1 COMMENTS	Mar. 22, 19
ISSUED FOR HYDRO EMI STUDY	Mar. 14, 19
ISSUED FOR CONSULTANT COORDINATION	Feb. 28, 19
ISSUED FOR COMMUNITY MEETING	Jan. 09, 19
ISSUED FOR SITE PLAN CONTROL	Oct. 31, 18
ISSUED FOR ZONING AMENDMENT	Dec. 21, 15

REVISIONS:

ARCHITECT SEAL:	NORTH ARROW:
SEAL DATE: STAMP DATE	

CLIENT:
RIO CAN

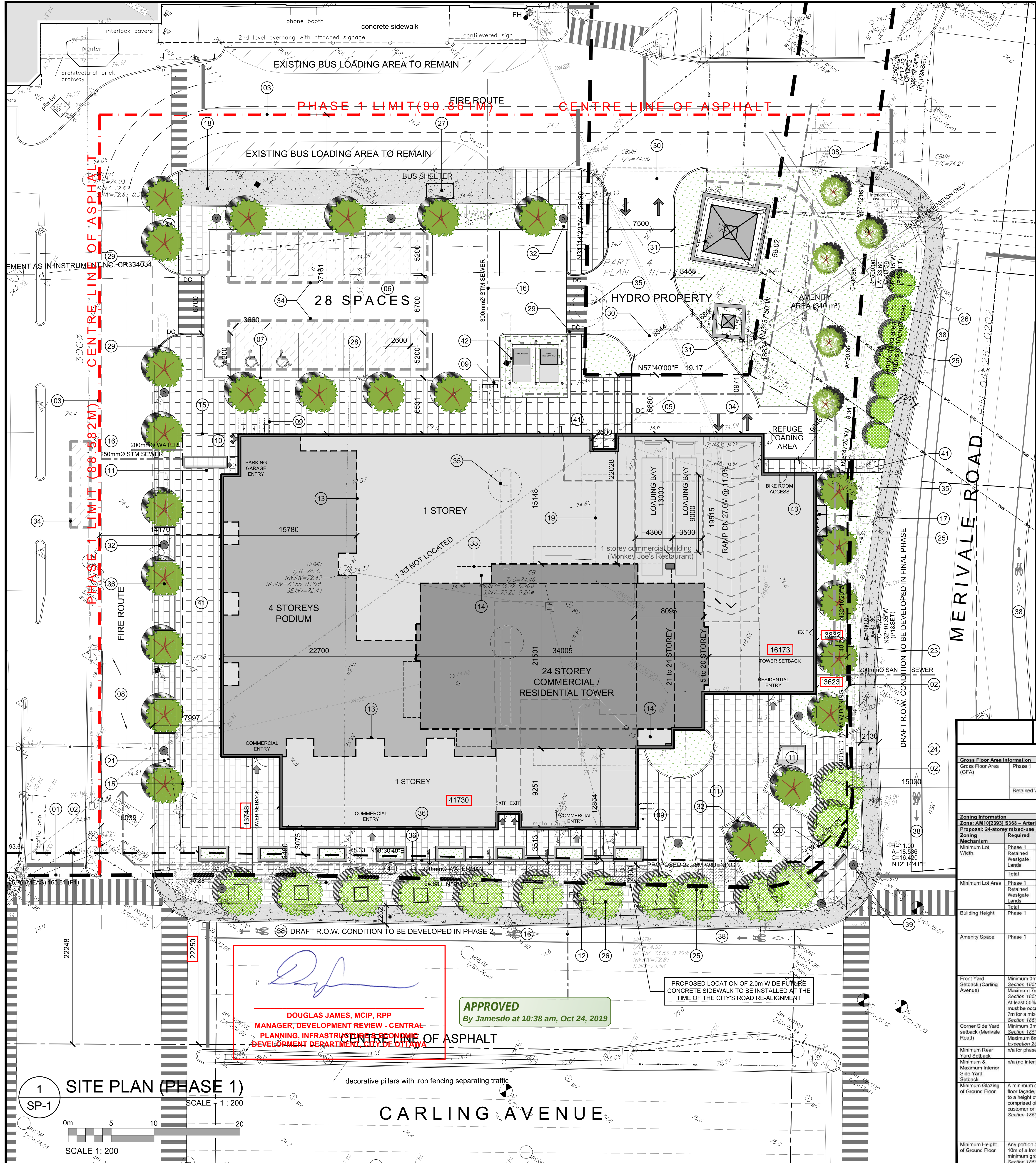
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PROJECT TITLE:
WESTGATE
1309 CARLING AVENUE

OTTAWA **ONTARIO**

SHEET TITLE:
SITE PLAN
PHASE 1
WESTGATE LANDS

DRAWN: RV	CHECKED: R.V.
SCALE: 1:200	SHEET No.
PROJECT No. 1807	SP-1



PROJECT INFORMATION

ZONING AM10(2393) S368

SITE AREA 36,896 sq. m. (97,145 sq. ft.)

BUILDING HEIGHT AREA 'A' = 24 STOREYS
AREA 'B' = 36 STOREYS

AMENITY AREA - 6m² PER UNIT 1,218 sq. m.

PROJECT STATISTICS - PHASE 1 ONLY

SITE AREA 7,191.2 sq. m. (77,405 sq. ft.)

BUILDING HEIGHT (78.0 M) 24 STOREYS

AVERAGE MEAN GRADE (GEO. ELEV.) 74.80

GROSS BUILDING - AREAS

(CITY OF OTTAWA'S DEFINITION)

PARKING LEVELS (2 LEVELS U/G)	0.0 sq. m.
GROUND FLOOR	1,904.1 sq. m. (19,419 sq. ft.)
2nd to 4th FLOOR	3 x 1,045.0 sq. m. (33,744 sq. ft.)
5th FLOOR	0.0 sq. m.
6th to 10th FLOOR	5 x 510.9 sq. m. (2,554.5 sq. ft.)
11th to 20th FLOOR	10 x 515.05 sq. m. (5,150.5 sq. ft.)
21st & 22nd FLOOR	2 x 460.8 sq. m. (931.6 sq. ft.)
23rd & 24th FLOOR	2 x 393.9 sq. m. (787.8 sq. ft.)
MECHANICAL FLOOR	0.0 sq. m.
TOTAL AREA	14,532.8 sq. m. (154,492 sq. ft.)

UNIT STATISTICS

STUDIO UNIT	13
1 BEDROOM UNIT	135
2 BEDROOM UNIT	65
TOTAL	213
COMMERCIAL RETAIL	1,612.3 sq. m. (17,355 sq. ft.)
COMMERCIAL RESTAURANT	2,830.0 sq. m. (30,540 sq. ft.)

AMENITY AREA

EXTERIOR COMMUNAL AT GRADE 340.0 sq. m. (3,640 sq. ft.)

5th FLOOR COMMUNAL AMENITY ROOM 480.0 sq. m. (5,167 sq. ft.)

5th FLOOR COMMUNAL ROOF TOP PATIO 645.0 sq. m. (6,943 sq. ft.)

PRIVATE BALCONIES 1,005.0 sq. m. (10,760 sq. ft.)

TOTAL 2,970.0 sq. m. (31,970 sq. ft.)

REQUIRED - 6.0M² PER UNIT (213) = 1,278.0 sq. m. (13,798 sq. ft.)

REQUIRED COMMUNAL @ 50% = 639.0 sq. m. (6,878 sq. ft.)

LOT COVERAGE

PAVED SURFACE	1,848.9 sq. m.	25.7%
BUILDING FOOTPRINT	2,830.0 sq. m.	39.3%
LANDSCAPE OPEN SPACE	2,512.3 sq. m.	35.0%
TOTAL	7,191.2 sq. m.	100.0%

CAR PARKING - PROVIDED

RESIDENTIAL UNITS	0.61 per UNIT	130
RESIDENTIAL VISITOR	0.1 per UNIT	20
COMMERCIAL RETAIL	3.24 per 1,000 sq. ft.	63
COMMERCIAL CAFE		0
TOTAL		213
STANDARD PARKING SPACE	2.8 x 5.2 m	201
SMALL CAR PARKING SPACE	2.4 x 4.6 m	7
HANDICAPPED SPACE	3.66 x 5.2 m	5

LEGAL DESCRIPTION

TOPOGRAPHIC PLAN OF LOTS 45, 46, 50 TO 57 INCLUSIVE AND PART OF LOT 49 REGISTERED PLAN NO. 348 AND PART OF LOT 48, NO. 311 AND PART OF LOTS 22 & 23 CONCESSION 1 (OTTAWA FRONT) (GEOGRAPHIC TOWNSHIP OF NEPEAN) CITY OF OTTAWA

PROJECT DEVELOPER

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DRAWING NOTES

- PROPERTY LINE
- PROPOSED ROAD WIDENING
- PHASING LINE
- PARKING GARAGE ENTRY DRIVEWAY / RAMP WITH TRENCH DRAIN
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- TREE WITH GRATE - SEE LANDSCAPE PLAN
- SITE FURNITURE - SEE LANDSCAPE PLAN
- SWALE - SEE CIVIL PLAN
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- STORM WATER STORAGE SYSTEM
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- DISABLED PARKING SPACE 3.66 x 5.2 m
- 2.0M WIDE PEDESTRIAN - HARD SURFACE WALK
- HYDRO TRANSFORMER / EQUIPMENT
- RETAINING WALL UNDER 0.6 m

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

COPYRIGHT RESERVED.

NOTATION SYMBOLS:

- INDICATES DRAWING NOTES, LISTED ON EACH SHEET.
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- DETAIL NUMBER
- DETAIL REFERENCE PAGE
- DETAIL CROSS REFERENCE PAGE

NO.	DESCRIPTION	DATE
1	ISSUED FOR SPC ROUND #4 COMMENTS	Sept. 10, 19
2	ISSUED FOR BUILDING PERMIT	Sept. 3, 19
3	ISSUED FOR EXCAVATION PERMIT	Aug. 22, 19
4	ISSUED FOR EXC. / ELEV. / R.A. TENDER	Aug. 22, 19
5	HYDRO CHANGES	Aug. 15, 19
6	ISSUED FOR SPC ROUND #3 COMMENTS	July 17, 19
7	ISSUED FOR 33% REVIEW	June 7, 19
8	UPDATED ZONING STAT SHEETS	June 3, 19
9	ISSUED FOR SPC ROUND #1 COMMENTS	Mar. 22, 19
10	ISSUED FOR HYDRO EMI STUDY	Mar. 14, 19
11	ISSUED FOR CONSULTANT COORDINATION	Feb. 28, 19
12	ISSUED FOR COMMUNITY MEETING	Jan. 09, 19
13	ISSUED FOR SITE PLAN CONTROL	Oct. 31, 18
14	ISSUED FOR ZONING AMENDMENT	Dec. 21, 15

ARCHITECT SEAL: **OTARIO ASSOCIATION OF ARCHITECTS** **RODERICK LAHEY** **LICENCE #4275**

SEAL DATE: STAMP DATE

CLIENT: **RIO CAN**

ARCHITECT: **rla / architecture** **roderick lahey architect inc.**

56 beech street, ottawa, ontario K1S 3J6
1.613.724.9932 1.613.724.1209 rla@architecture.ca

PROJECT TITLE: **WESTGATE**
1309 CARLING AVENUE

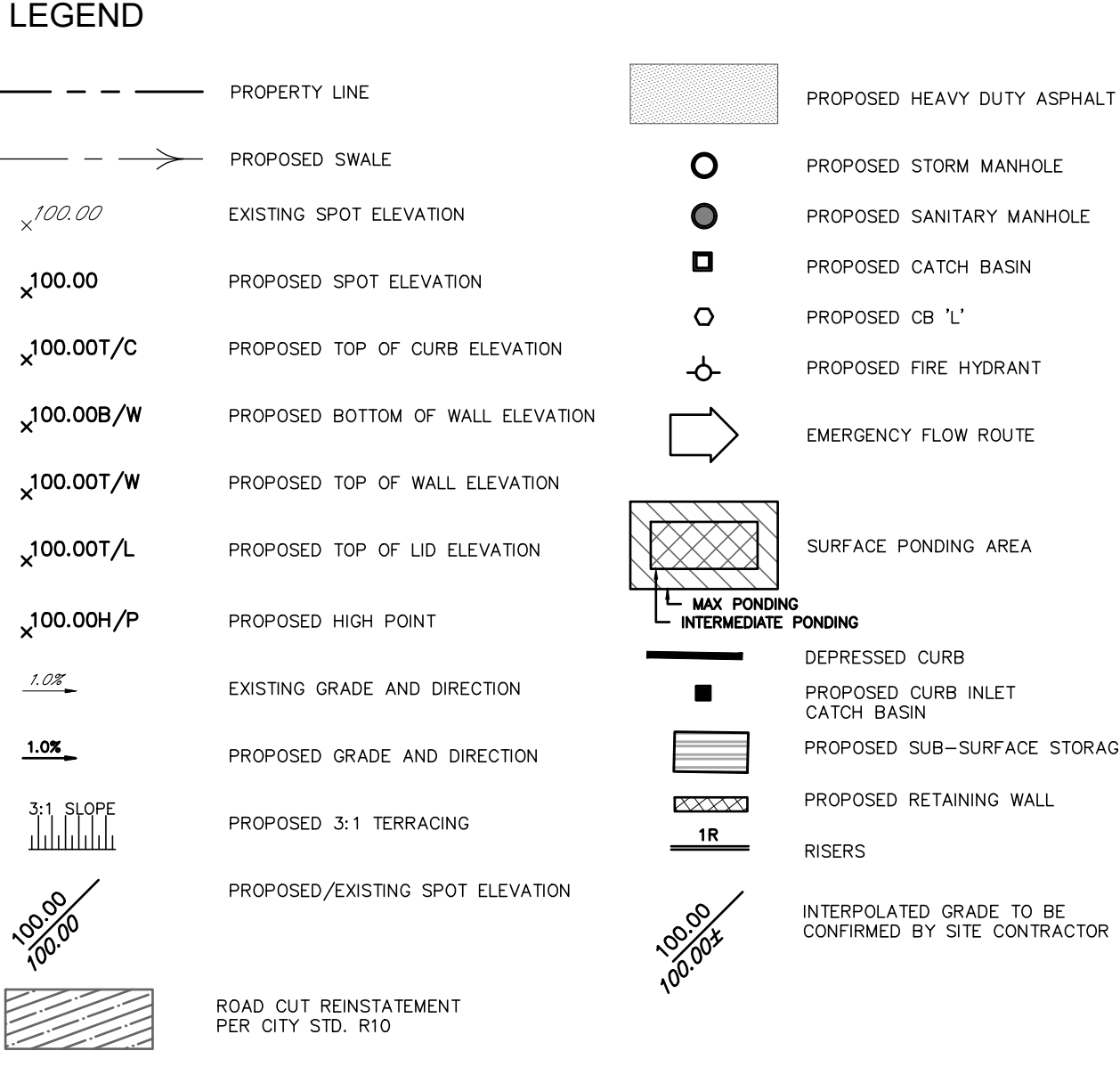
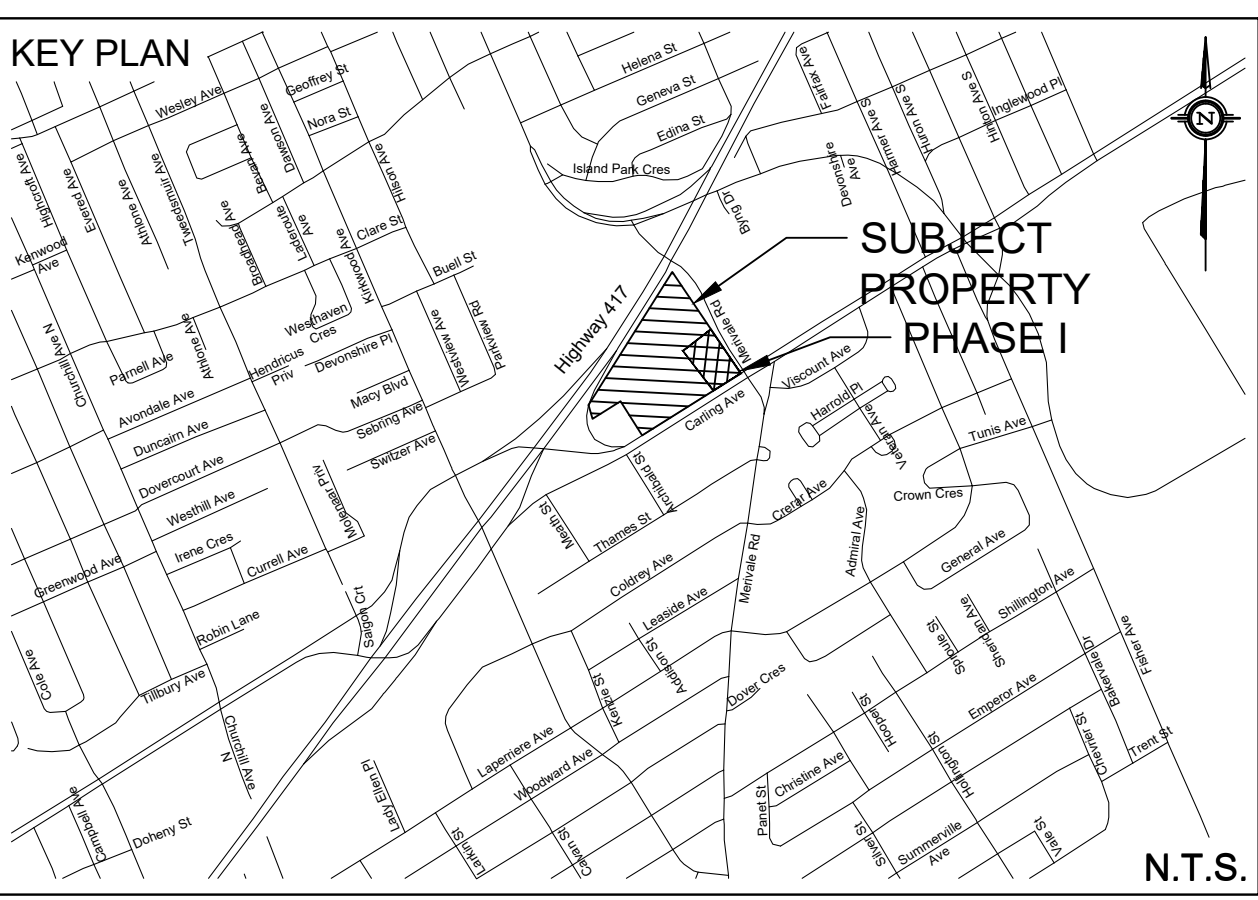
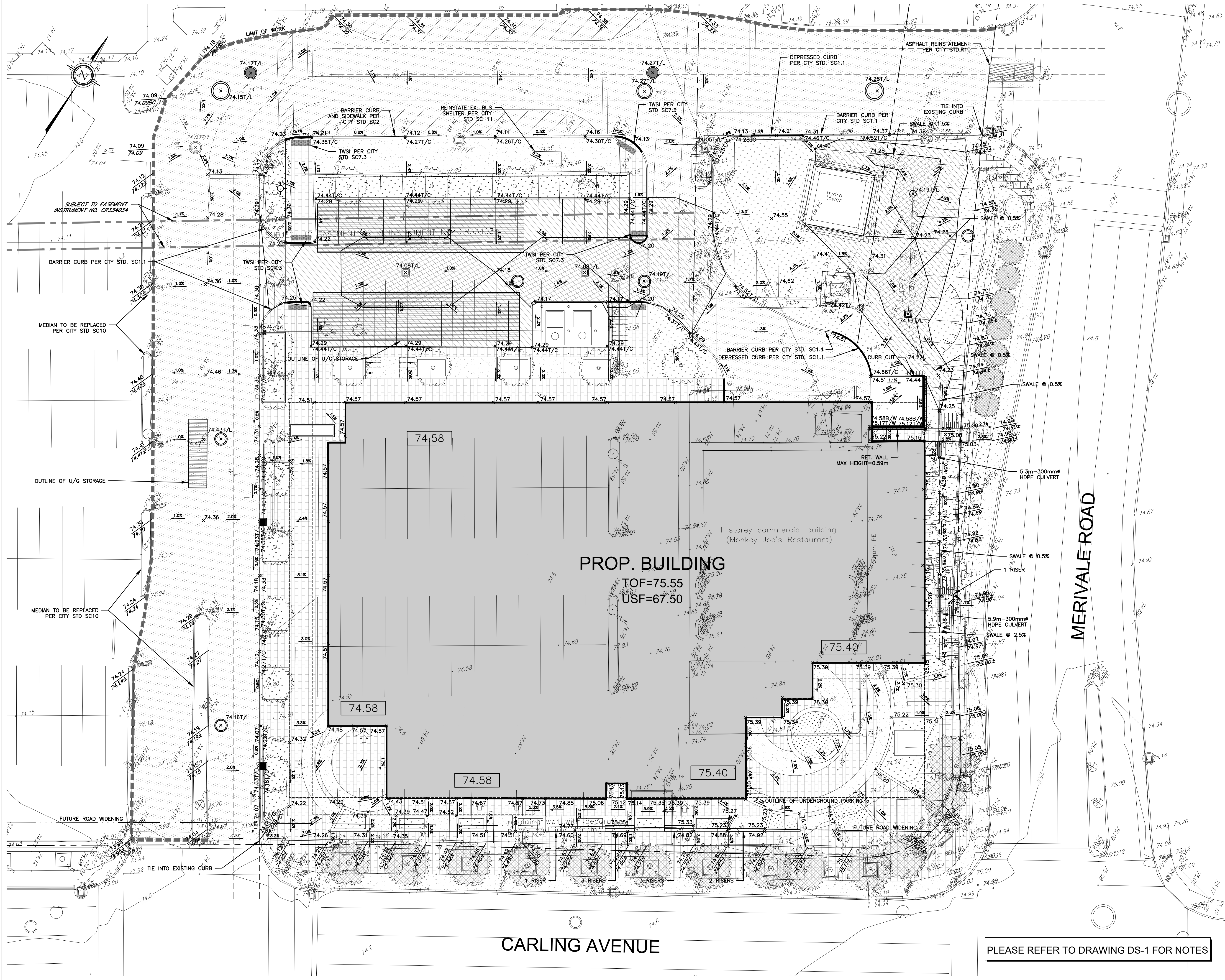
OTTAWA ONTARIO

SHEET TITLE: **SITE PLAN**
PHASE 1
WESTGATE LANDS

DRAWN:	CHECKED:
RV	R.V.

SCALE:	SHEET No.
1:200	SP-1

PROJECT No. **1807**



TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC
PROJ. NO. 181613355-114
DATED AUGUST 8, 2015

SITE PLAN INFORMATION
SITE PLAN PROVIDED BY RLA ARCHITECTURE
PROJ. NO. 1807
DATED MAY 21, 2020

GEOTECHNICAL STUDY
GEOTECHNICAL RECOMMENDATIONS PROVIDED BY GOLDER ASSOCIATES LTD.
PROJ. NO. 18106595-1000
DATED NOVEMBER 2018

SITE SERVICING AND STORMWATER MANAGEMENT STUDY
SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO.18-1028
DATED JULY 2019
STORMWATER MANAGEMENT MEMO DATED MAY 2020

BENCH MARK
LOCATED MONUMENT 01919680315
ELEV=83.635

No.	BY	YY.MM.DD	DESCRIPTION
8	C.M.K.	20.06.19	REVISED PER CITY COMMENTS
7	C.M.K.	20.05.29	REVISED PER SITE PLAN
6	C.M.K.	20.05.11	ISSUED FOR CONTRACTOR COORDINATION
5	B.N.C.	20.03.20	ISSUED FOR CONSTRUCTION
4	A.A.S.	20.03.09	ISSUED FOR CONSTRUCTION
3	B.N.C.	19.07.19	ISSUED FOR MUNICIPAL REVIEW
2	B.N.C.	19.04.03	ISSUED FOR MUNICIPAL REVIEW
1	C.M.K.	18.11.06	ISSUED FOR MUNICIPAL REVIEW

REVIEWED BY _____

PROJECT No18-1028

GRADING PLAN
1309 CARLING AVENUE - PHASE I © DSEL

RIOCAN HOLDINGS INC.

2300 Young Street Suite 500
Toronto, Ontario, M4P 1E4
Tel. 1-800-465-2733

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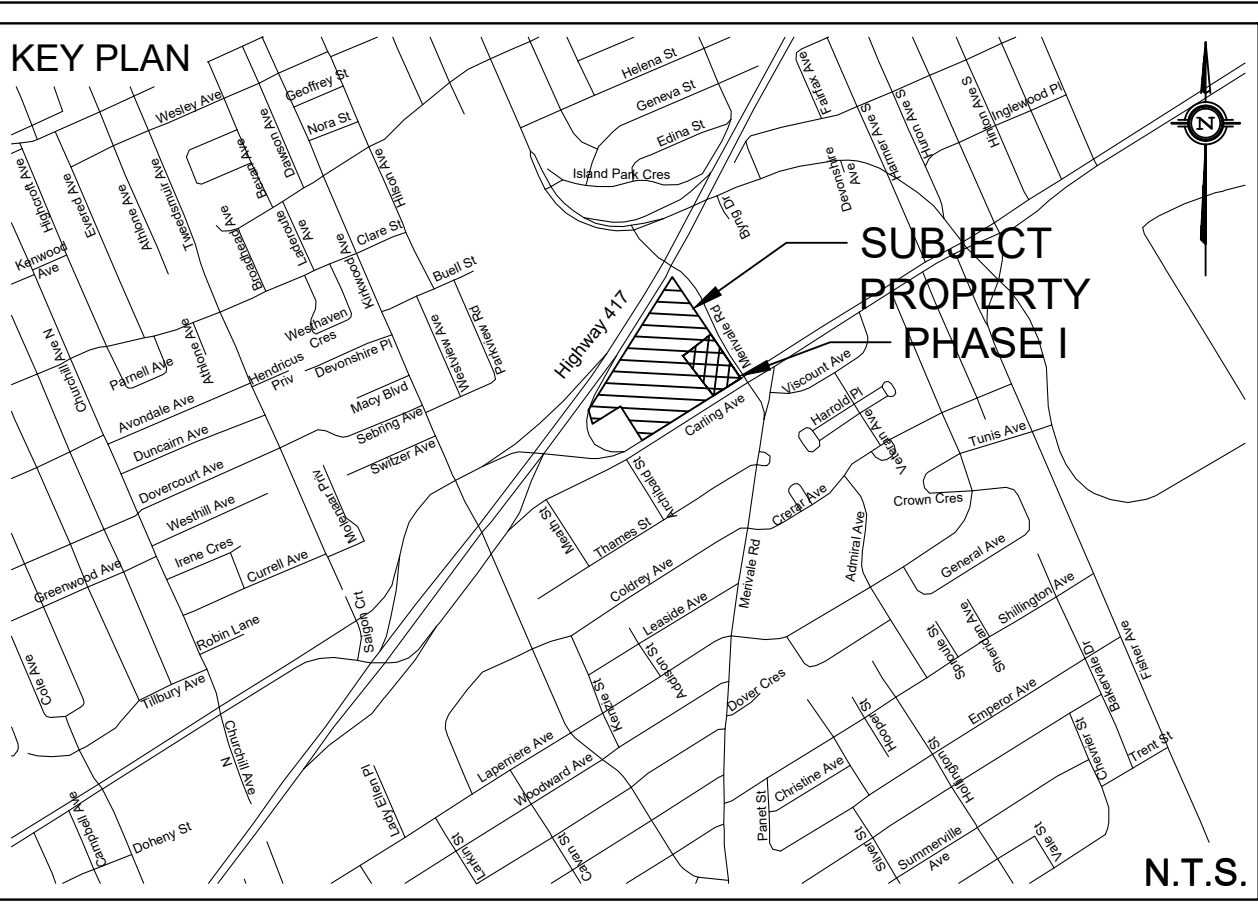
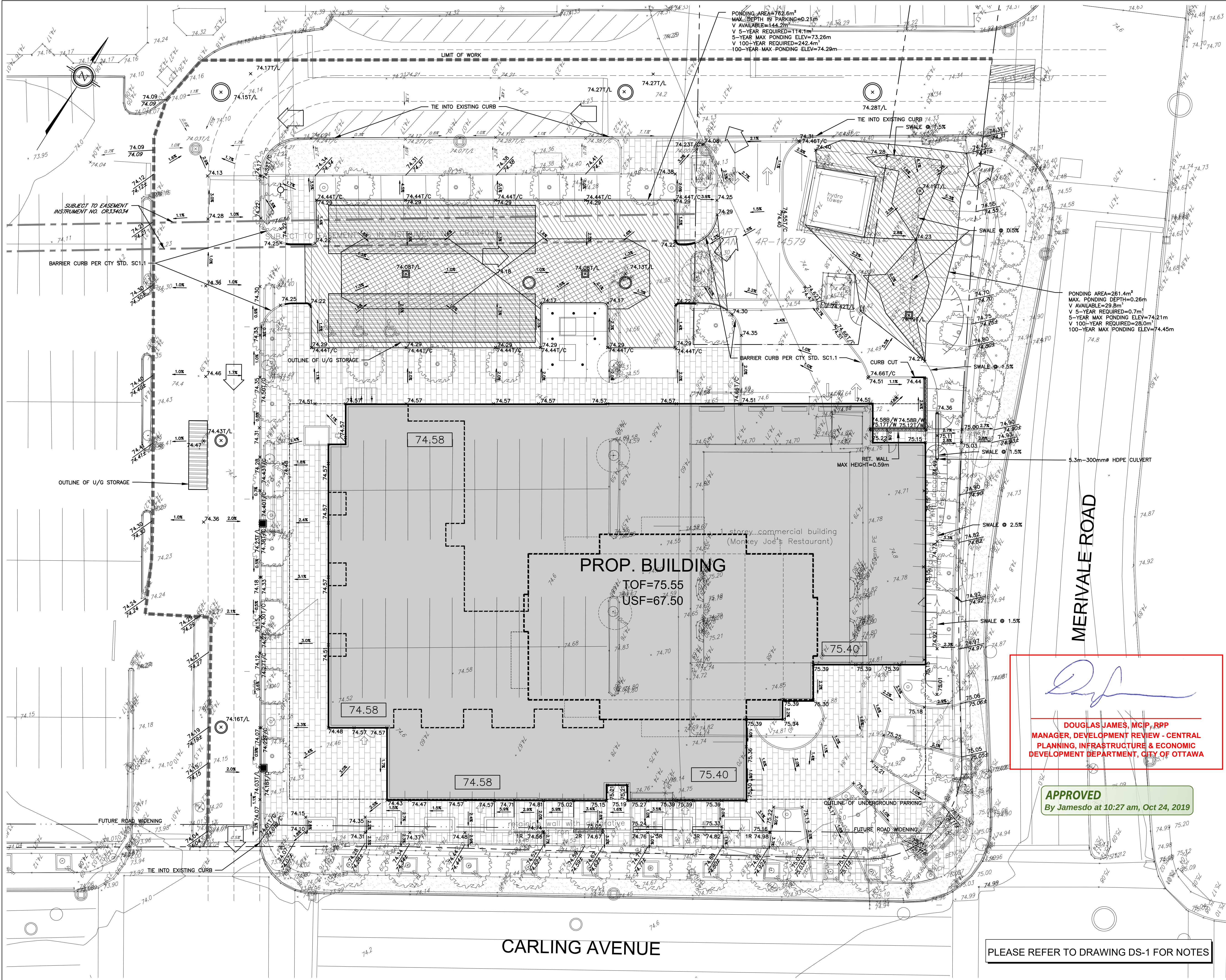
120 Iser Road Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DESIGNED BY: A.J.G. CHECKED BY: A.D.F.

SCALE: 1:200 DATE: NOVEMBER 2018

DRAWN BY: C.M.K. CHECKED BY: R.D.F. DRAWING NO. GP-1

SHEET NO. 2 of 6



LEGEND	
---	PROPERTY LINE
---	PROPOSED SWALE
x100.00	EXISTING SPOT ELEVATION
x100.00/C	PROPOSED SPOT ELEVATION
x100.00B/W	PROPOSED TOP OF CURB ELEVATION
x100.00T/W	PROPOSED BOTTOM OF WALL ELEVATION
x100.00T/L	PROPOSED TOP OF WALL ELEVATION
1.0%	PROPOSED GRADE AND DIRECTION
3:1 SLOPE	PROPOSED 3:1 TERRACING
100/00	PROPOSED/EXISTING SPOT ELEVATION
---	ROAD CUT REINSTATEMENT PER CITY STD. R10
---	PROPOSED HEAVY DUTY ASPHALT
○	PROPOSED STORM MANHOLE
●	PROPOSED SANITARY MANHOLE
□	PROPOSED CATCH BASIN
○	PROPOSED CB 'L'
+	PROPOSED FIRE HYDRANT
→	EMERGENCY FLOW ROUTE
---	SURFACE PONDING AREA
---	MAX PONDING INTERMEDIATE PONDING
---	DEPRESSED CURB
---	PROPOSED CURB INLET CATCH BASIN
---	PROPOSED SUB-SURFACE STORAGE
---	PROPOSED RETAINING WALL
1R	RISERS
---	INTERPOLATED GRADE TO BE CONFIRMED BY SITE CONTRACTOR

NOT FOR CONSTRUCTION

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC
PROJ. NO. 181613355-114
DATED AUGUST 8, 2015

SITE PLAN INFORMATION
SITE PLAN PROVIDED BY RLA ARCHITECTURE
PROJ. NO. 1807
DATED JULY 17, 2019

GEOTECHNICAL STUDY
GEOTECHNICAL RECOMMENDATIONS PROVIDED BY GOLDER ASSOCIATES LTD.
PROJ. NO. 18106595-1000
DATED NOVEMBER 2018

SITE SERVICING AND STORMWATER MANAGEMENT STUDY
SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO.18-1028
DATED JULY 2019

BENCH MARK
LOCATED MONUMENT 01919680315
ELEV=83.635

No.	BY	YY.MM.DD	DESCRIPTION
3	B.N.C.	19.07.19	ISSUED FOR MUNICIPAL REVIEW
2	B.N.C.	19.04.03	ISSUED FOR MUNICIPAL REVIEW
1	C.M.K.	18.11.06	ISSUED FOR MUNICIPAL REVIEW

PROJECT No18-1028

REVIEWED BY

GRADING PLAN
1309 CARLING AVENUE - PHASE I © DSEL

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Tel. 1-800-465-2733

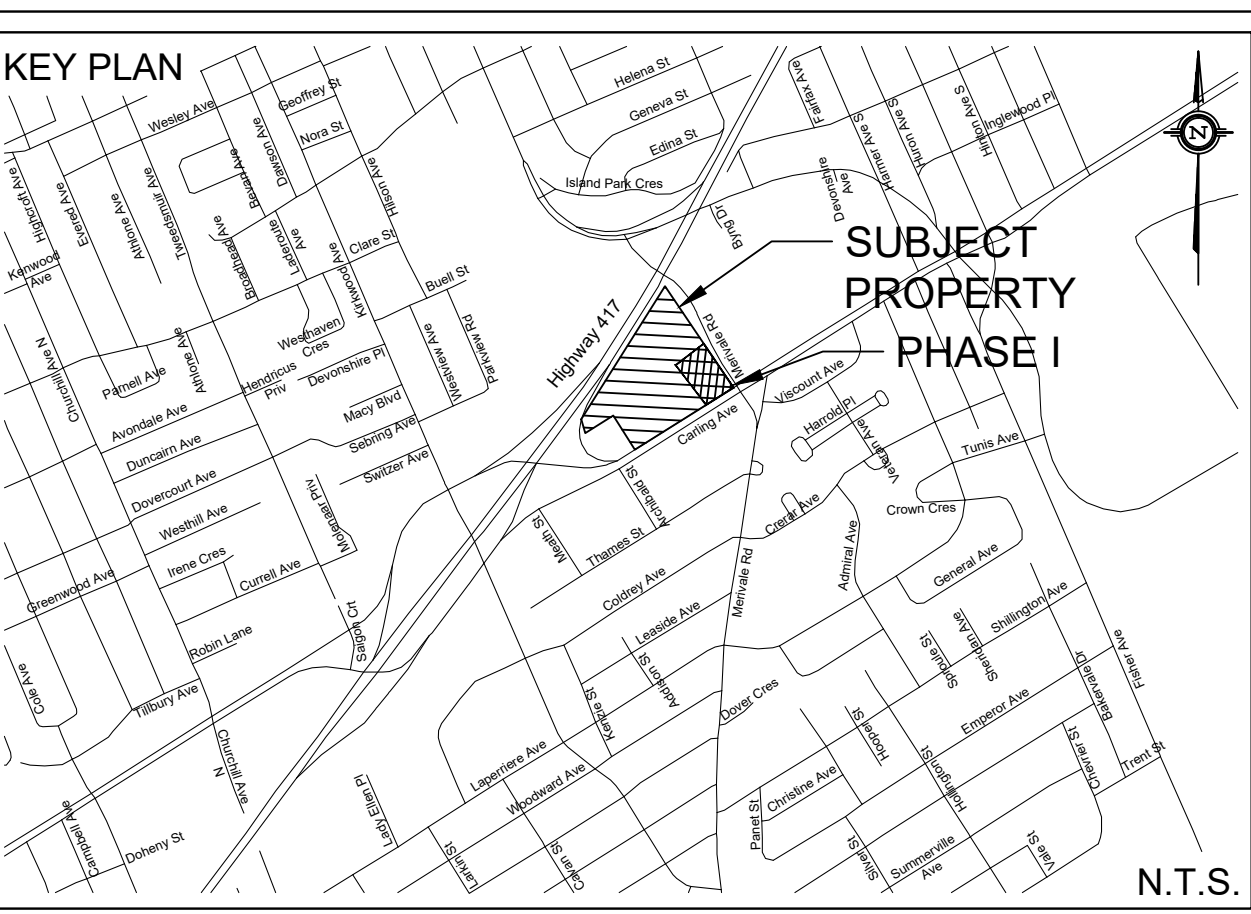
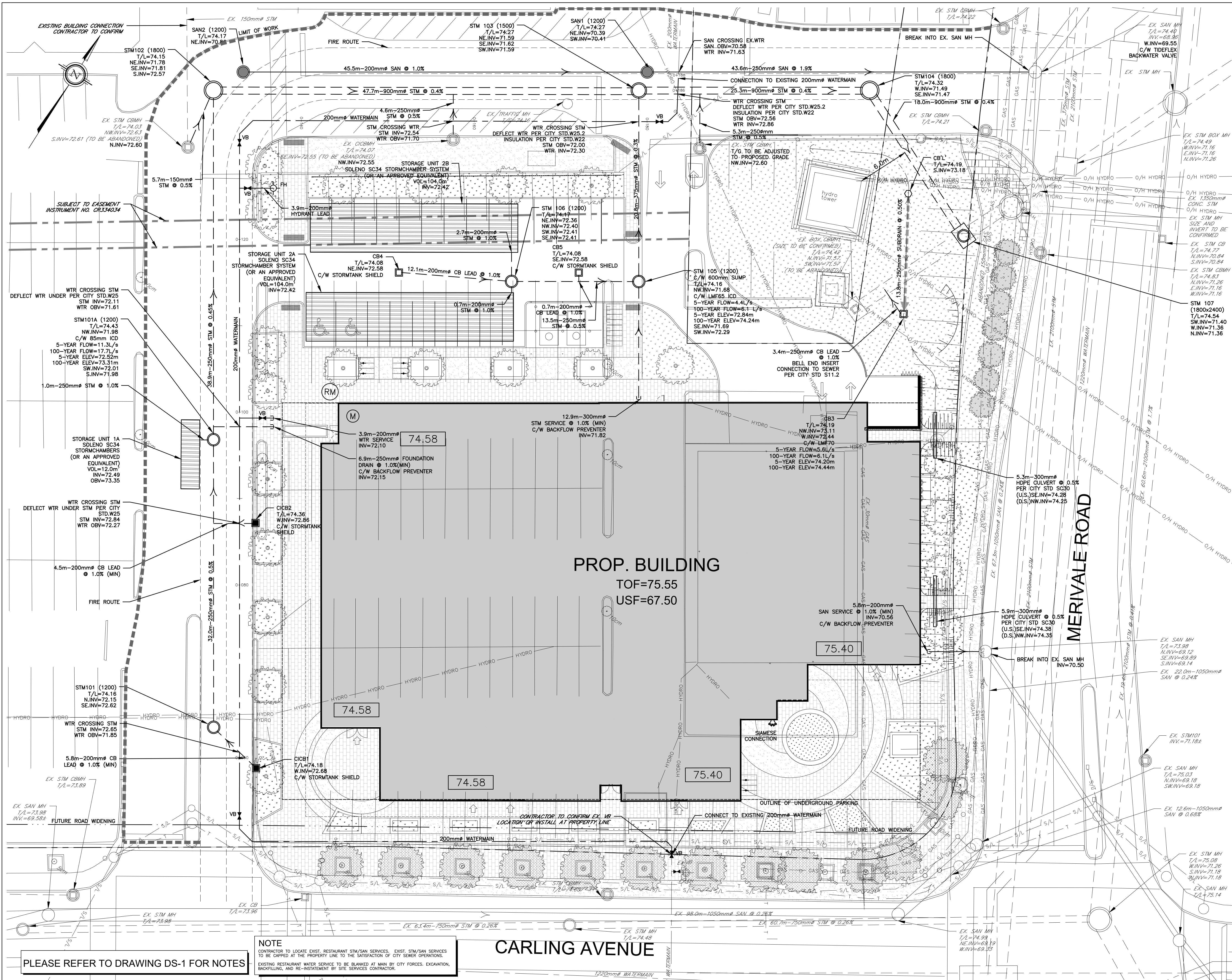
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DRAWN BY: C.M.K. CHECKED BY: R.D.F.
DRAWING NO. GP-1

SHEET NO. 2 of 6



LEGEND	
---	PROPERTY LINE
---	PROPOSED WATERMAIN
---	PROPOSED SANITARY SEWER
---	PROPOSED STORM SEWER
---	PROPOSED PERFORATED SUBDRAIN
---	EXISTING GAS
---	HYDRO
---	EXISTING UNDERGROUND HYDRO
---	S/L
---	EXISTING STREET LIGHT LINES
---	O/H HYDRO
---	EXISTING OVERHEAD HYDRO
---	T
---	EXISTING TRAFFIC LINES
○	PROPOSED STORM MANHOLE
○	PROPOSED SANITARY MANHOLE
□	PROPOSED CATCH BASIN
○	PROPOSED CB 'T' or 'L'
■	PROPOSED CURB INLET CATCH BASIN
VB	PROPOSED VALVE BOX
◇	PROPOSED FIRE HYDRANT
◇	PROPOSED SIAMESE CONNECTION
RM	PROPOSED REMOTE WATER METER
M	PROPOSED WATER METER

EXISTING UNDERGROUND SERVICES AND UTILITY LOCATIONS DERIVED FROM THE BEST AVAILABLE DATA, AS-CONSTRUCTED DRAWINGS, UTILITY DRAWINGS AND INFRASTRUCTURE MAPPING PROVIDED BY THE CITY OF OTTAWA.

CONTRACTOR TO CONFIRM ELEVATIONS AND LOCATIONS OF EXISTING UNDERGROUND SERVICES AND UTILITIES WITHIN THE RIGHT OF WAY PRIOR TO INSTALLATION OF SITE SERVICING INFRASTRUCTURE.

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 THE FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

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PROJ. NO. 181613355-114
DATED AUGUST 8, 2015

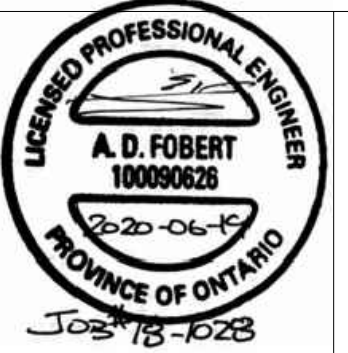
SITE PLAN INFORMATION
SITE PLAN PROVIDED BY RLA ARCHITECTURE
PROJ. NO. 1807
DATED MAY 21, 2020

GEOTECHNICAL STUDY
GEOTECHNICAL RECOMMENDATIONS PROVIDED BY GOLDER ASSOCIATES LTD.
PROJ. NO. 18106595-1000
DATED NOVEMBER 2018

SITE SERVICING AND STORMWATER MANAGEMENT STUDY
SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 18-1028
DATED JULY 2019
STORMWATER MANAGEMENT MEMO DATED MAY 2020

BENCH MARK
LOCATED MONUMENT 01919680315
ELEV=83.635

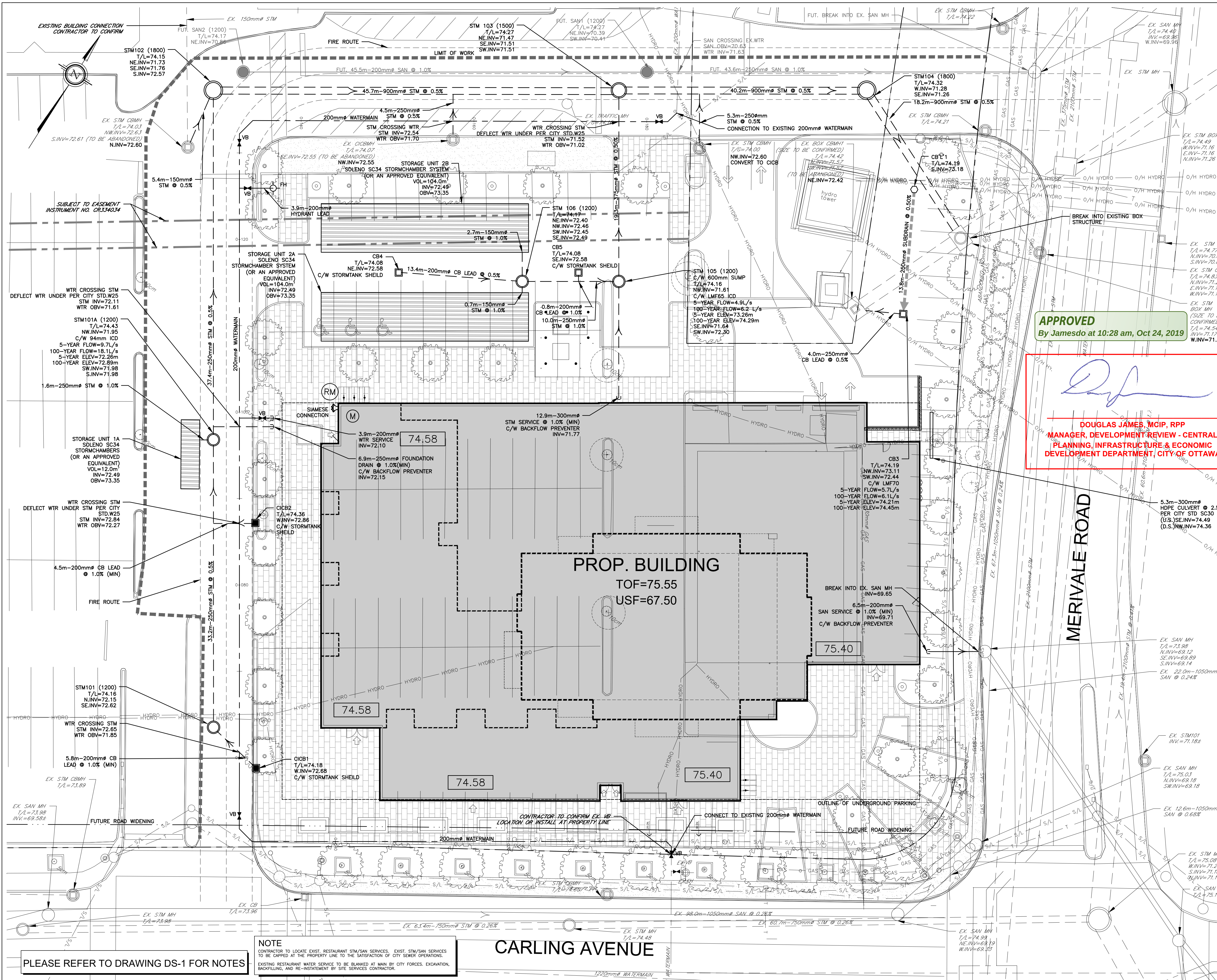
No.	BY	YY.MM.DD.	DESCRIPTION
8	C.M.K.	20.06.19	REVISED PER CITY COMMENTS
7	C.M.K.	20.05.29	REVISED PER SITE PLAN
6	C.M.K.	20.05.11	ISSUED FOR CONTRACTOR COORDINATION
5	B.N.C.	20.03.20	ISSUED FOR CONSTRUCTION
4	A.A.S.	20.03.09	ISSUED FOR CONSTRUCTION
3	B.N.C.	19.07.19	ISSUED FOR MUNICIPAL REVIEW
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1	C.M.K.	18.11.06	ISSUED FOR MUNICIPAL REVIEW



PROJECT No18-1028

SITE SERVICING PLAN
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RIOCAN HOLDINGS INC.		2300 Young Street Suite 500 Toronto, Ontario, M4P 1E4 Tel. 1-800-465-2733	
DSEL david schaeffer engineering ltd SMART SUBSIDIARIES		120 Iber Road Unit 103 Stittsville, Ontario, K2S 1E9 Tel. (613) 836-0856 Fax. (613) 836-7183 www.DSEL.ca	
DRAWN BY:	C.M.K.	CHECKED BY:	R.D.F.
DESIGNED BY:	A.J.G.	CHECKED BY:	A.D.F.
SCALE:	1:200	DATE:	NOVEMBER 2018
SSP-1		SHEET No. 3 of 6	



KEY PLAN

SUBJECT PROPERTY
PHASE I

N.T.S.

LEGEND

---	PROPERTY LINE	○	PROPOSED STORM MANHOLE
---	PROPOSED WATERMAIN	○	PROPOSED SANITARY MANHOLE
---	PROPOSED SANITARY SEWER	□	PROPOSED CATCH BASIN
---	PROPOSED STORM SEWER	○	PROPOSED CB 'T' or 'L'
---	PROPOSED PERFORATED SUBDRAIN	□	PROPOSED CURB INLET CATCH BASIN
---	EXISTING GAS	VB	PROPOSED VALVE BOX
---	EXISTING UNDERGROUND HYDRO	○	PROPOSED FIRE HYDRANT
---	S/L	○	PROPOSED SIAMESE CONNECTION
---	EXISTING STREET LIGHT LINES	○	PROPOSED REMOTE WATER METER
---	O/H HYDRO	○	PROPOSED WATER METER
---	EXISTING OVERHEAD HYDRO		
---	EXISTING TRAFFIC LINES		

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NOT FOR CONSTRUCTION

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DATED NOVEMBER 2018

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SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 18-1028
DATED JULY 2019

BENCH MARK

LOCATED MONUMENT 01919680315
ELEV=83.635

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No.	BY	YY.MM.DD.	DESCRIPTION

REVIEWED BY

PROJECT No18-1028

SITE SERVICING PLAN

1309 CARLING AVENUE - PHASE I

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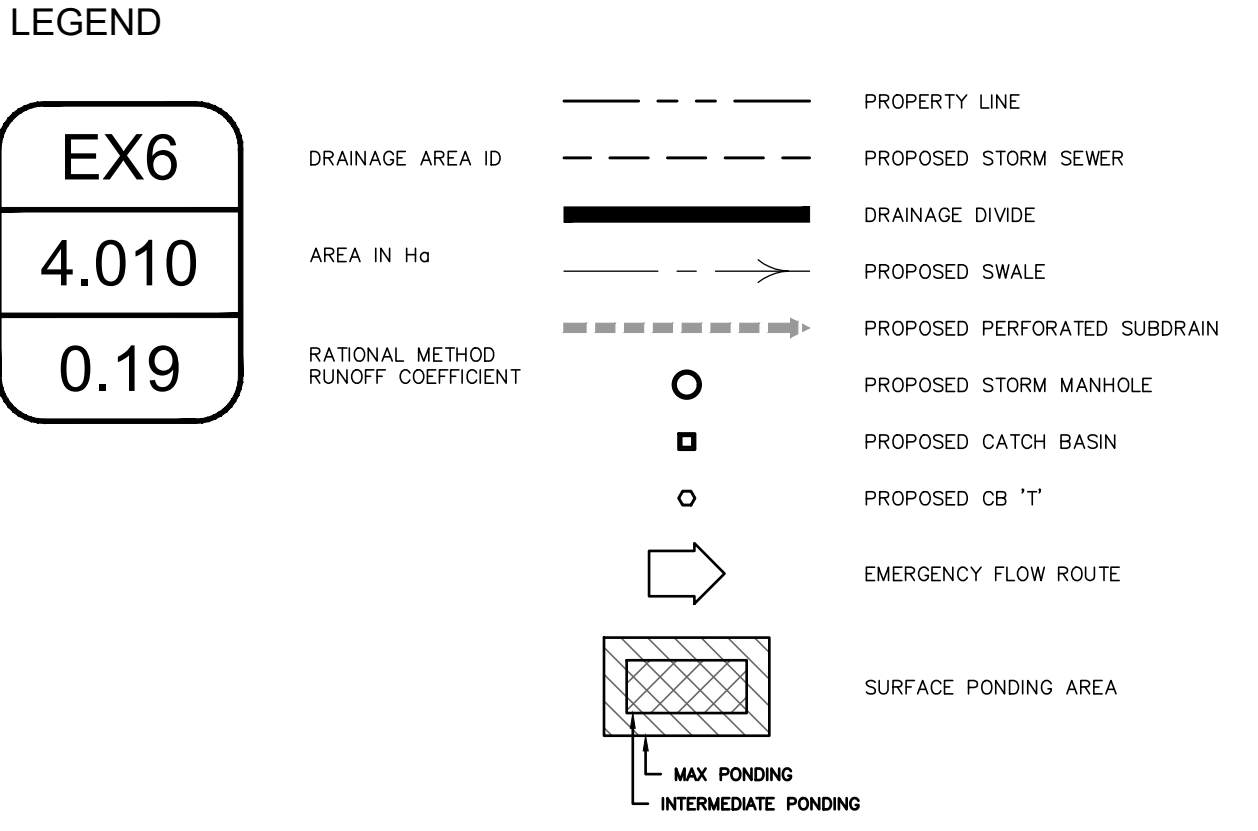
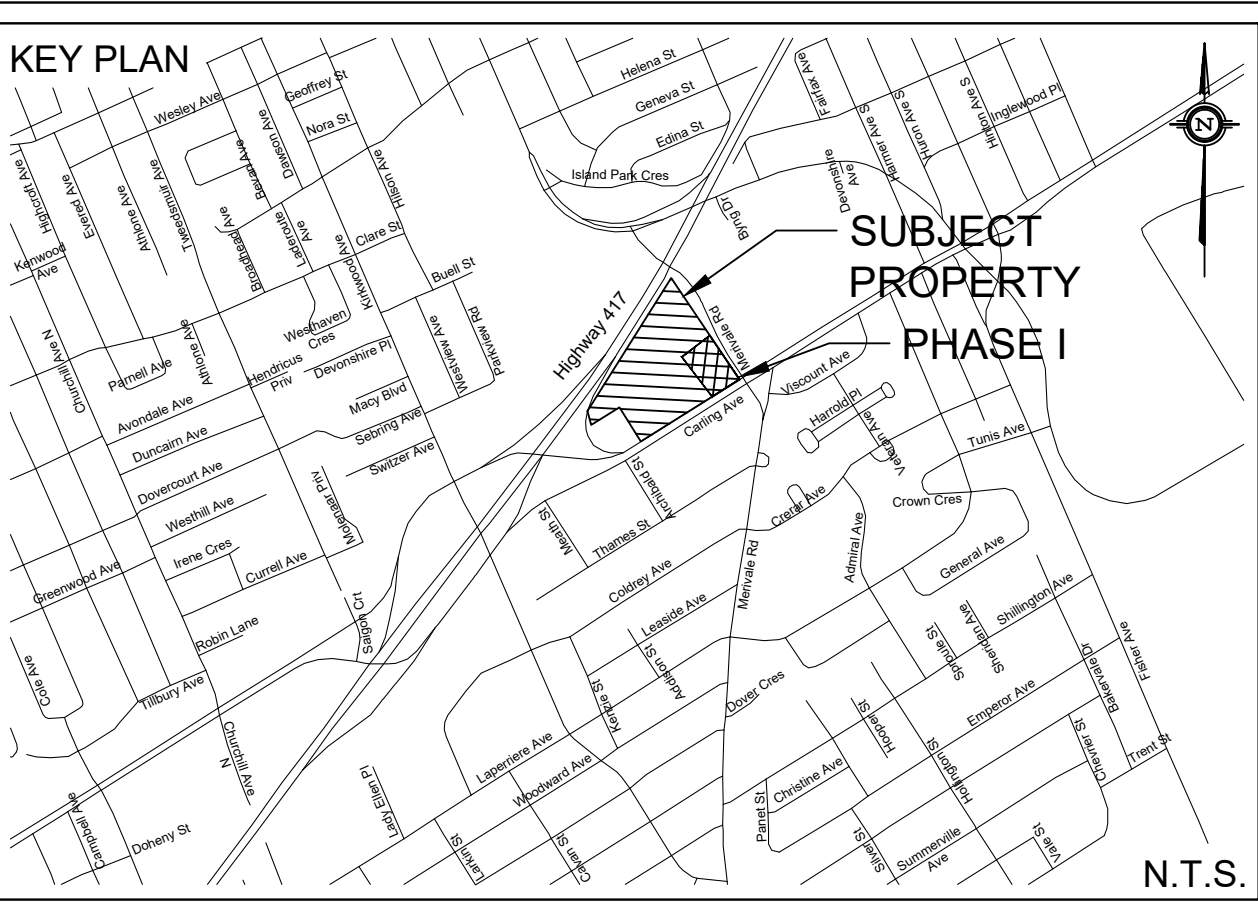
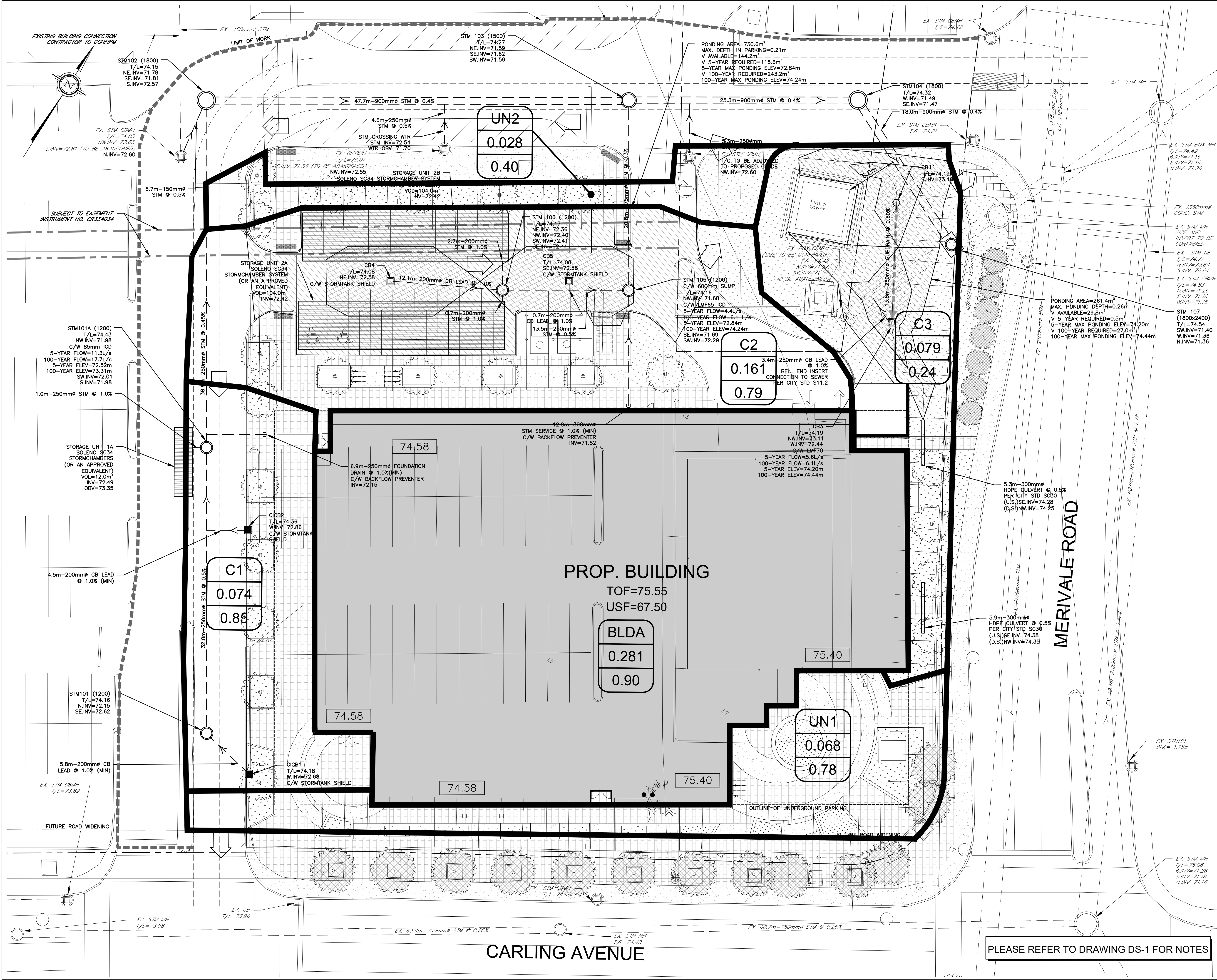
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DESIGNED BY:	A.J.G.	CHECKED BY:	A.D.F.		
SCALE:	1:200	DATE:	NOVEMBER 2018	SSP-1	3 of 6



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PROJ. NO. 16161335-114
DATED AUGUST 8, 2015

SITE PLAN INFORMATION

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PROJ. NO. 18-1028
DATED JULY 2019
STORMWATER MANAGEMENT MEMO DATED MAY 2020

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1	C.M.K.	18.11.06	ISSUED FOR MUNICIPAL REVIEW

LICENCED PROFESSIONAL ENGINEER

A.D. FOBERT

100090628

2020-06-15

PROVINCE OF ONTARIO

2018-10-28

PROJECT No18-1028

REVIEWED BY

STORMWATER MANAGEMENT PLAN

1309 CARLING AVENUE - PHASE I

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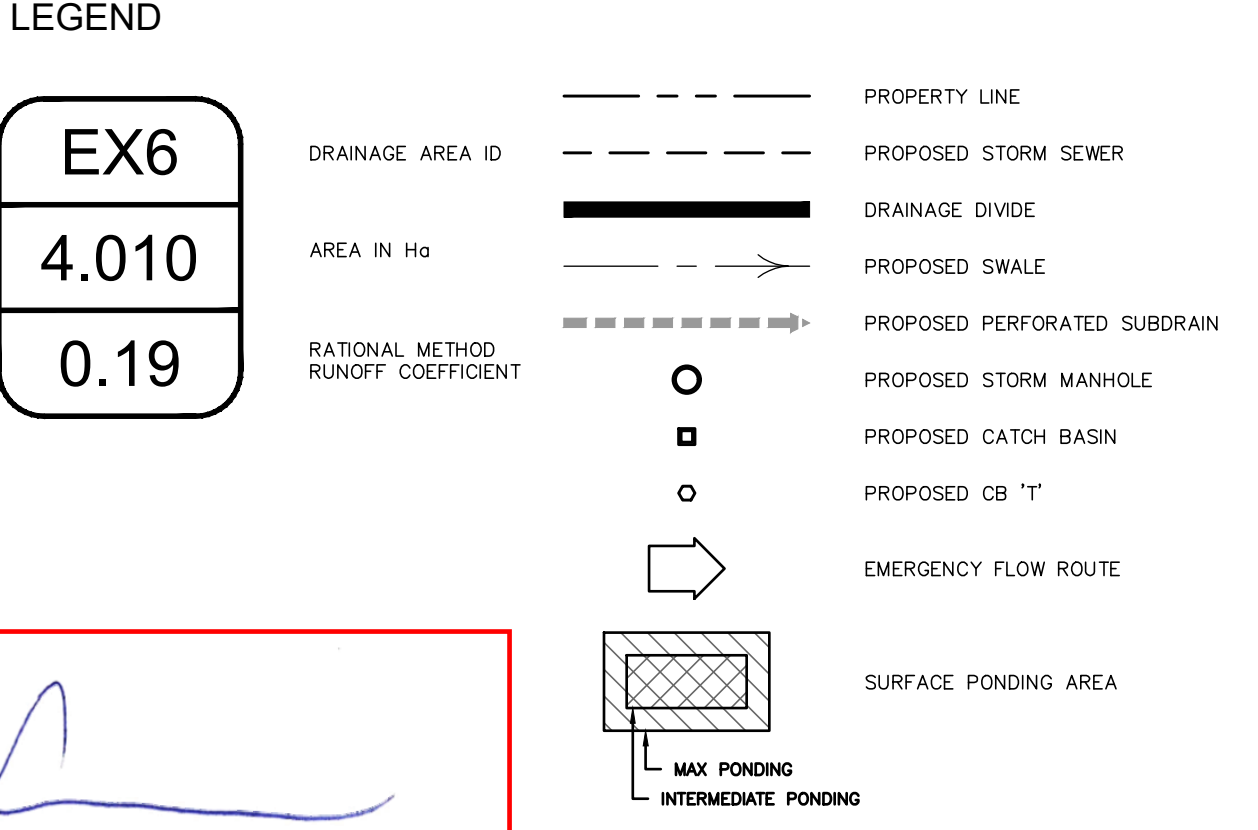
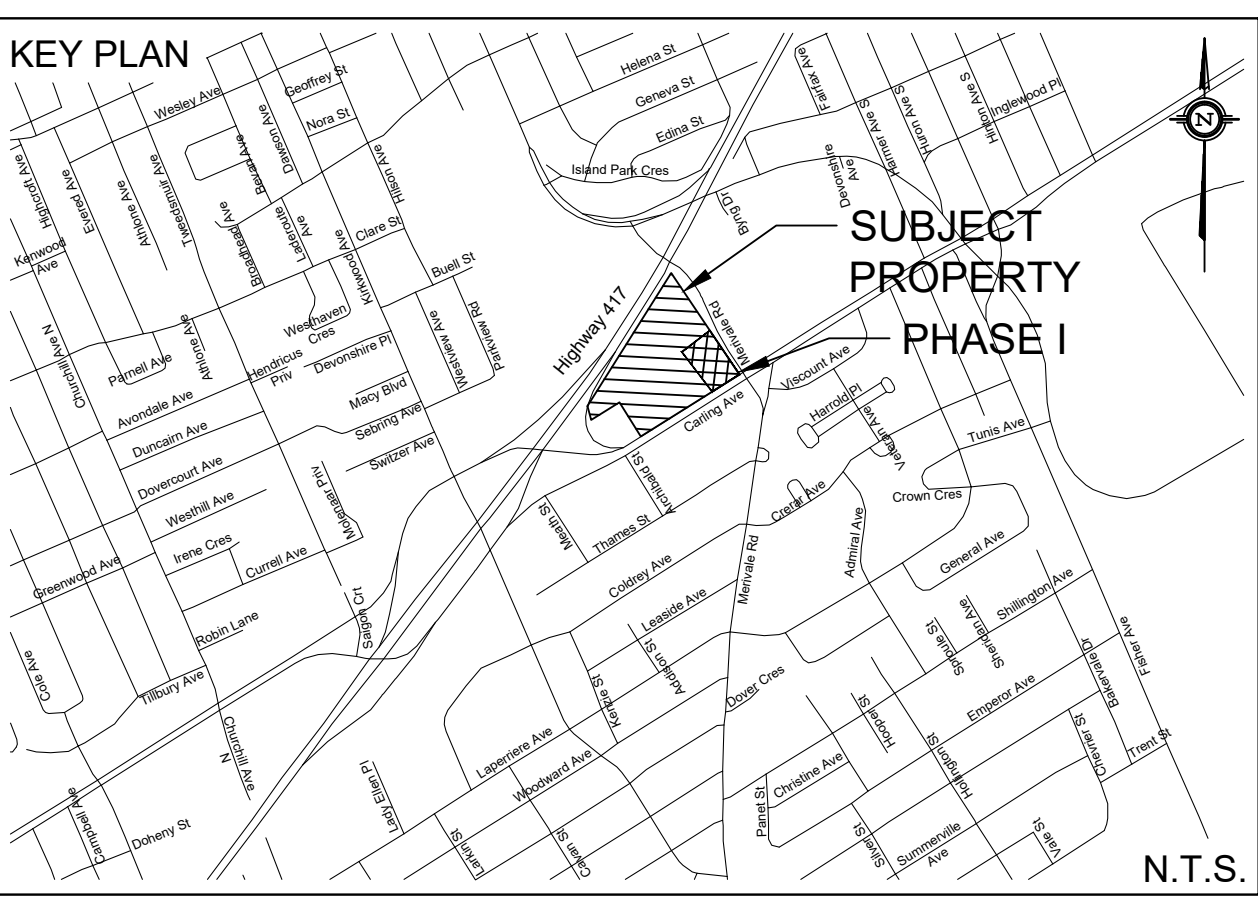
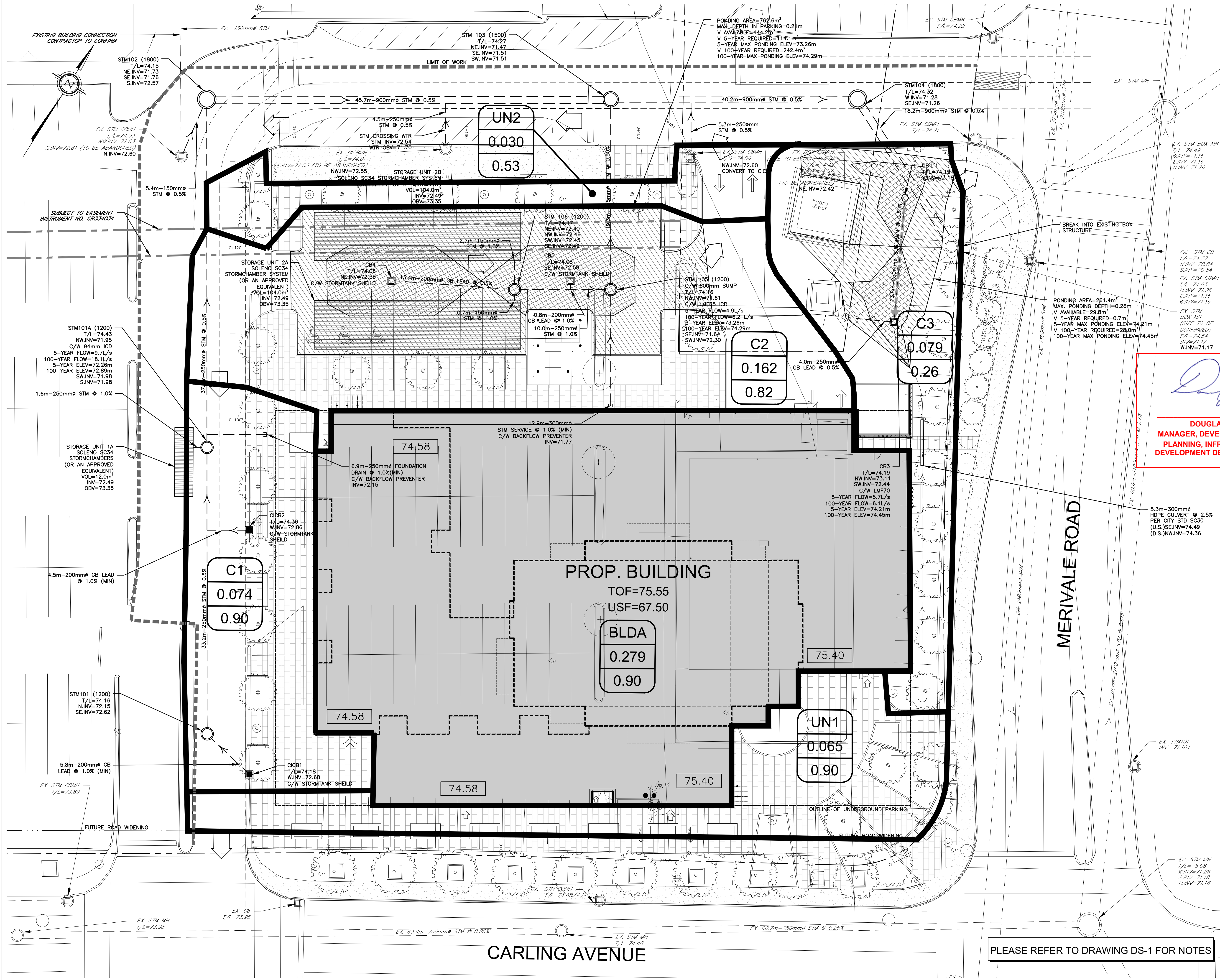
DRAWN BY: C.M.K. CHECKED BY: R.D.F. DRAWING NO. SHEET NO.

DESIGNED BY: A.J.G. CHECKED BY: A.D.F.

SCALE: 1:200 DATE: NOVEMBER 2018 SWM-1 1 of 1

z:\projects\18-1028_riocan_westgate-phase-1\design\p2_drawings\p2-2_main (dse)\spa_sub3\spa_2020-06-19_1028_s.dwg

CITY FILE No.: D07-12-18-0170 CITY PLAN No.: 17818



DOUGLAS JAMES, MCIP, RPP
MANAGER, DEVELOPMENT REVIEW - CENTRAL
PLANNING, INFRASTRUCTURE & ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

APPROVED
By Jamesdo at 10:31 am, Oct 24, 2019

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TOPOGRAPHIC INFORMATION			
TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC			
PROJ. NO. 18161335-114			
PER CITY STD SC30			
DATED AUGUST 8, 2015			
SITE PLAN INFORMATION			
SITE PLAN PROVIDED BY RLA ARCHITECTURE			
PROJ. NO. 1807			
RECEIVED JULY 16, 2019			
GEOTECHNICAL STUDY			
GEOTECHNICAL RECOMMENDATIONS PROVIDED BY GOLDER ASSOCIATES LTD.			
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DATED NOVEMBER 2018			
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PROJECT No18-1028

STORMWATER MANAGEMENT PLAN
1309 CARLING AVENUE - PHASE I © DSEL

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PLEASE REFER TO DRAWING DS-1 FOR NOTES

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012



2016 AES Approved RELEASE RATE

Area ID	Total Area (ha)	C	t _c (min)	5-year		100-year	
				i (mm/hr)	Q (L/s)	i (mm/hr)	Q (L/s)
A1	3.69	0.50	20.0	70.3	360.0	70.3	360.0
A2	1.09	0.50	20.0	70.3	106.2	70.3	106.2
EX-1	0.34	0.20	20.0	70.3	13.2	120.0	22.5
Total	5.12				479.4		488.7

Target Flow Rate

Area ID	Total Area (ha)	C	t _c (min)	5-year		100-year	
				i (mm/hr)	Q (L/s)	i (mm/hr)	Q (L/s)
A1-1	0.64	0.50	20.0	70.3	62.4	70.3	62.4
A2-1	0.05	0.50	20.0	70.3	4.9	70.3	4.9
Total	0.69				67.3		67.3

Estimated Post Development Peak Flow from Unattenuated Areas

UN1		Imp.	Perv.	Total
Area		0.056	0.012	0.068
C		0.9	0.2	0.78

Area ID

UN1

Total Area

0.068 ha

C

0.78 Rational Method runoff coefficient

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} [*] (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
12.2	93.7	13.8	13.8	0.0	0.0	160.4	29.4	29.4	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

UN2		Imp.	Perv.	Total
Area		0.008	0.020	0.028
C		0.9	0.2	0.40

Area ID

UN2

Total Area

0.028 ha

C

0.40 Rational Method runoff coefficient

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} [*] (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
12.2	93.7	2.9	2.9	0.0	0.0	160.4	6.3	6.3	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID C1

C1	Imp.	Perv.	Total
Area	0.069	0.005	0.074
C	0.9	0.2	0.85

Total Subsurface Storage (m³) 12.0

Stage Attenuated Areas Storage Summary

	Surface Storage				Surface and Subsurface Storage			
	Stage	Ponding	h _o	delta d	V*	V _{acc} **	Q _{release} †	V _{drawdown}
	(m)	(m²)	(m)	(m)	(m³)	(m³)	(L/s)	(hr)
Orifice INV	71.98		0.00			0.0	0.0	0.00
U/G STORAGE INV	72.49		0.51	0.51	4.0	4.0	10.9	0.10
U/G STORAGE S/L	72.95		0.97	0.46	4.0	7.9	15.1	0.15
U/G STORAGE OBV	73.35		1.37	0.41	4.0	11.9	18.0	0.18
T/L	74.43		2.45	1.08	0.0	11.9	24.0	0.14

* V=Incremental storage volume
**V_{acc}=Total surface and sub-surface
† Q_{release} = Release rate calculated from orifice equation

Orifice Location STM101A Dia 85
Total Area 0.074 ha
C 0.85 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} ‡ (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m³)	i (mm/hr)	Q _{actual} ‡ (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m³)
1	203.5	35.8	11.3	24.6	1.5	351.4	72.5	17.7	54.8	3.3
5	141.2	24.9	11.3	13.6	4.1	242.7	50.1	17.7	32.4	9.7
10	104.2	18.3	11.3	7.1	4.3	178.6	36.9	17.7	19.2	11.5
15	83.6	14.7	11.3	3.5	3.1	142.9	29.5	17.7	11.8	10.6
20	70.3	12.4	11.3	1.1	1.3	120.0	24.8	17.7	7.1	8.5
25	60.9	10.7	10.7	0.0	0.0	103.8	21.4	17.7	3.7	5.6
30	53.9	9.5	9.5	0.0	0.0	91.9	19.0	17.7	1.3	2.3
35	48.5	8.5	8.5	0.0	0.0	82.6	17.0	17.7	0.0	0.0
40	44.2	7.8	7.8	0.0	0.0	75.1	15.5	17.7	0.0	0.0
45	40.6	7.2	7.2	0.0	0.0	69.1	14.3	17.7	0.0	0.0
50	37.7	6.6	6.6	0.0	0.0	64.0	13.2	17.7	0.0	0.0
55	35.1	6.2	6.2	0.0	0.0	59.6	12.3	17.7	0.0	0.0
60	32.9	5.8	5.8	0.0	0.0	55.9	11.5	17.7	0.0	0.0
65	31.0	5.5	5.5	0.0	0.0	52.6	10.9	17.7	0.0	0.0
70	29.4	5.2	5.2	0.0	0.0	49.8	10.3	17.7	0.0	0.0
75	27.9	4.9	4.9	0.0	0.0	47.3	9.8	17.7	0.0	0.0
80	26.6	4.7	4.7	0.0	0.0	45.0	9.3	17.7	0.0	0.0
85	25.4	4.5	4.5	0.0	0.0	43.0	8.9	17.7	0.0	0.0
90	24.3	4.3	4.3	0.0	0.0	41.1	8.5	17.7	0.0	0.0
95	23.3	4.1	4.1	0.0	0.0	39.4	8.1	17.7	0.0	0.0
100	22.4	3.9	3.9	0.0	0.0	37.9	7.8	17.7	0.0	0.0

5-year Q _{attenuated}	11.25 L/s	100-year Q _{attenuated}	17.69 L/s
5-year Max. Storage Required	4.3 m³	100-year Max. Storage Required	11.5 m³
Est. 5-year Storage Elevation	72.52 m	Est. 100-year Storage Elevation	73.31 m

RioCan Holdings Inc.
1309 Carling Avenue
Proposed Site Conditions - Phase I
Proposed Amendment

Area ID C2+BLDA

C2+BLDA	Imp.	Perv.	Total
Area	0.416	0.026	0.442
C	0.9	0.2	0.86

Total Subsurface Storage (m³) 208.0

Stage Attenuated Areas Storage Summary

	Stage (m)	Surface Storage			Surface and Subsurface Storage			
		Ponding (m ²)	h _o (m)	delta d (m)	V* (m ³)	V _{acc} ** (m ³)	Q _{release} † (L/s)	V _{drawdown} (hr)
Orifice INV	71.68		0.00			0.0	0	0.00
U/G STORAGE INV	72.42		0.74	0.74	68.6	68.6	3.75	5.08
U/G STORAGE S/L	73.03		1.35	0.61	68.6	137.3	4.7	8.11
U/G STORAGE OBV	73.64		1.96	0.61	68.6	205.9	5.2	11.00
T/L	74.08	0.4	2.40	0.44	0.1	206.0	5.75	9.95
0.10m Ponding	74.18	234.4	2.50	0.10	8.1	214.1	6	9.91
0.21m Ponding	74.29	741.0	2.61	0.11	51.0	265.2	6.1	12.08

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface

† Q_{release} = Release rate calculated from Tempest LMF Curve

Orifice Location STM105 **Dia** LMF65

Total Area 0.442 ha

C 0.86 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} ‡ (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} ‡ (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
1	203.5	214.7	4.4	210.3	12.6	351.4	431.4	6.1	425.4	25.5
5	141.2	149.0	4.4	144.6	43.4	242.7	298.0	6.1	291.9	87.6
10	104.2	109.9	4.4	105.5	63.3	178.6	219.2	6.1	213.2	127.9
15	83.6	88.2	4.4	83.8	75.4	142.9	175.4	6.1	169.4	152.4
20	70.3	74.1	4.4	69.7	83.7	120.0	147.3	6.1	141.2	169.5
25	60.9	64.3	4.4	59.9	89.8	103.8	127.5	6.1	121.4	182.2
30	53.9	56.9	4.4	52.5	94.5	91.9	112.8	6.1	106.7	192.1
35	48.5	51.2	4.4	46.8	98.3	82.6	101.4	6.1	95.3	200.2
40	44.2	46.6	4.4	42.2	101.3	75.1	92.3	6.1	86.2	206.9
45	40.6	42.9	4.4	38.5	103.9	69.1	84.8	6.1	78.7	212.6
50	37.7	39.7	4.4	35.3	106.0	64.0	78.5	6.1	72.5	217.4
55	35.1	37.1	4.4	32.7	107.8	59.6	73.2	6.1	67.1	221.6
60	32.9	34.8	4.4	30.4	109.3	55.9	68.6	6.1	62.6	225.3
65	31.0	32.8	4.4	28.4	110.6	52.6	64.6	6.1	58.6	228.5
70	29.4	31.0	4.4	26.6	111.7	49.8	61.1	6.1	55.1	231.3
75	27.9	29.4	4.4	25.0	112.6	47.3	58.0	6.1	52.0	233.8
80	26.6	28.0	4.4	23.6	113.4	45.0	55.2	6.1	49.2	236.1
85	25.4	26.8	4.4	22.4	114.1	43.0	52.7	6.1	46.7	238.1
90	24.3	25.6	4.4	21.2	114.6	41.1	50.5	6.1	44.4	239.9
95	23.3	24.6	4.4	20.2	115.1	39.4	48.4	6.1	42.4	241.5
100	22.4	23.6	4.4	19.2	115.5	37.9	46.5	6.1	40.5	242.9

5-year Q_{attenuated} 4.40 L/s
5-year Max. Storage Required 115.5 m³
Est. 5-year Storage Elevation 72.84 m

100-year Q_{attenuated} 6.06 L/s
100-year Max. Storage Required 242.9 m³
Est. 100-year Storage Elevation 74.24 m

Estimated Post Development Peak Flow from Attenuated Areas

Area ID C3

C3	Imp.	Perv.	Total
Area	0.005	0.074	0.079
C	0.9	0.2	0.24

Stage Attenuated Areas Storage Summary

	Stage (m)	Surface Storage			Surface and Subsurface Storage			
		Ponding (m ²)	h _o (m)	delta d (m)	V* (m ³)	V _{acc} ** (m ³)	Q _{release} † (L/s)	V _{drawdown} (hr)
Orifice INV	72.44		0.00			0.0	0	0.00
Storage Pipe SL	72.57		0.13	0.13	0.0	0.0	1.5	0.00
Storage Pipe OBV	72.69		0.25	0.13	0.0	0.0	2.2	0.00
T/L	74.19	0.4	1.75	1.50	0.2	0.2	5.6	0.01
0.11m Ponding	74.30	83.9	1.86	0.11	3.3	3.5	6	0.16
0.26m Ponding	74.46	261.4	2.02	0.16	26.3	29.8	6.1	1.36

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface

† Q_{release} = Release rate calculated from Tempest LMF Curve

Orifice Location CB3 Dia LMF70

Total Area 0.079 ha

C 0.24 Rational Method runoff coefficient Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} ‡ (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} ‡ (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
1	203.5	10.9	5.6	5.3	0.3	351.4	82.9	6.1	76.8	4.6
5	141.2	7.6	5.6	1.9	0.6	242.7	57.3	6.1	51.2	15.4
10	104.2	5.6	5.6	0.0	0.0	178.6	42.1	6.1	36.1	21.6
15	83.6	4.5	4.5	0.0	0.0	142.9	33.7	6.1	27.6	24.9
20	70.3	3.8	3.8	0.0	0.0	120.0	28.3	6.1	22.2	26.7
25	60.9	3.3	3.3	0.0	0.0	103.8	24.5	6.1	18.4	27.6
30	53.9	2.9	2.9	0.0	0.0	91.9	21.7	6.1	15.6	28.1
35	48.5	2.6	2.6	0.0	0.0	82.6	19.5	6.1	13.4	28.1
40	44.2	2.4	2.4	0.0	0.0	75.1	17.7	6.1	11.6	28.0
45	40.6	2.2	2.2	0.0	0.0	69.1	16.3	6.1	10.2	27.6
50	37.7	2.0	2.0	0.0	0.0	64.0	15.1	6.1	9.0	27.0
55	35.1	1.9	1.9	0.0	0.0	59.6	14.1	6.1	8.0	26.3
60	32.9	1.8	1.8	0.0	0.0	55.9	13.2	6.1	7.1	25.6
65	31.0	1.7	1.7	0.0	0.0	52.6	12.4	6.1	6.3	24.7
70	29.4	1.6	1.6	0.0	0.0	49.8	11.8	6.1	5.7	23.8
75	27.9	1.5	1.5	0.0	0.0	47.3	11.2	6.1	5.1	22.8
80	26.6	1.4	1.4	0.0	0.0	45.0	10.6	6.1	4.5	21.7
85	25.4	1.4	1.4	0.0	0.0	43.0	10.1	6.1	4.0	20.7
90	24.3	1.3	1.3	0.0	0.0	41.1	9.7	6.1	3.6	19.5
95	23.3	1.3	1.3	0.0	0.0	39.4	9.3	6.1	3.2	18.3
100	22.4	1.2	1.2	0.0	0.0	37.9	8.9	6.1	2.9	17.1

5-year Q_{attenuated} 5.65 L/s
5-year Max. Storage Required 0.6 m³
Est. 5-year Storage Elevation 74.20 m

100-year Q_{attenuated} 6.09 L/s
100-year Max. Storage Required 28.1 m³
Est. 100-year Storage Elevation 74.45 m

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m ³)	100-Year Release Rate (L/s)	100-Year Required Storage (m ³)	100-Year Available Storage (m ³)
Unattenuated Areas (UN1)	13.8	0.0	29.4	0.0	0.0
Unattenuated Areas (UN2)	2.9	0.0	6.3	0.0	0.0
Attenuated Area (C1)	11.3	4.3	17.7	11.5	11.9
Attenuated Areas (C2+BLDA)	4.4	115.5	6.1	242.9	265.2
Attenuated Area (C3)	5.6	0.6	6.1	28.1	29.8
Total	38.0	120.3	65.6	282.5	306.9

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012



2016 AES Approved RELEASE RATE

Area ID	Total Area (ha)	C	t _c (min)	5-year		100-year	
				i (mm/hr)	Q (L/s)	i (mm/hr)	Q (L/s)
A1	3.69	0.50	20.0	70.3	360.0	70.3	360.0
A2	1.09	0.50	20.0	70.3	106.2	70.3	106.2
EX-1	0.34	0.20	20.0	70.3	13.2	120.0	22.5
Total	5.12				479.4		488.7

Target Flow Rate

Area ID	Total Area (ha)	C	t _c (min)	5-year		100-year	
				i (mm/hr)	Q (L/s)	i (mm/hr)	Q (L/s)
A1-1	0.64	0.50	20.0	70.3	62.4	70.3	62.4
A2-1	0.05	0.50	20.0	70.3	4.9	70.3	4.9
Total	0.69				67.3		67.3

Estimated Post Development Peak Flow from Unattenuated Areas

UN1	Imp.	Perv.	Total
Area	0.063	0.000	0.063
C	0.9	0.2	0.90

Area ID UN1
Total Area 0.063 ha
C 0.90 Rational Method runoff coefficient

t _c (min)	5-year						100-year					
	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)		i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	
12.2	93.7	14.8	14.8	0.0	0.0		160.4	28.1	28.1	0.0	0.0	

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

UN2	Imp.	Perv.	Total
Area	0.014	0.016	0.030
C	0.9	0.2	0.53

Area ID UN2
Total Area 0.030 ha
C 0.53 Rational Method runoff coefficient

t _c (min)	5-year						100-year					
	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)		i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	
12.2	93.7	4.1	4.1	0.0	0.0		160.4	8.8	8.8	0.0	0.0	

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID	C1	Imp.	Perv.	Total
Area		0.074	0.000	0.074
C		0.9	0.2	0.90

Total Subsurface Storage (m³) 12.0

Stage Attenuated Areas Storage Summary

Stage	Surface Storage				Surface and Subsurface Storage			
	Ponding (m)	h _s (m ³)	delta d (m)	v* (m ³)	V _{sub} ** (m ³)	Q _{release} † (L/s)	V _{transform} (hr)	
Orifice INV	71.95		0.00		0.0	0.0	0.00	
U/G STORAGE INV	72.49		0.54	0.54	4.0	4.0	0.10	
U/G STORAGE S/L	72.95		1.00	0.46	4.0	7.9	0.14	
U/G STORAGE OBV	73.35		1.40	0.41	4.0	11.9	0.18	
T/L	74.43		2.48	1.08	0.0	11.9	0.14	

* V=Incremental storage volume
**V_{sub}=Total surface and sub-surface
† Q_{release} = Release rate calculated from orifice equation

Orifice Location STM101A Dia 85
Total Area 0.074 ha
C 0.90 Rational Method runoff coefficient Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations

t _c (min)	5-year						100-year					
	i (mm/hr)	Q _{actual} † (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)		i (mm/hr)	Q _{actual} † (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	
1	203.5	37.8	11.8	26.0	1.6		351.4	72.5	17.2	55.3	3.3	
5	141.2	26.2	11.8	14.4	4.3		242.7	50.1	17.2	32.9	9.9	
10	104.2	19.4	11.8	7.5	4.5		178.6	36.9	17.2	19.6	11.8	
15	83.6	15.5	11.8	3.7	3.3		142.9	29.5	17.2	12.3	11.0	
20	70.3	13.0	11.8	1.2	1.5		120.0	24.8	17.2	7.5	9.0	
25	60.9	11.3	11.3	0.0	0.0		103.8	21.4	17.2	4.2	6.3	
30	53.9	10.0	10.0	0.0	0.0		91.9	19.0	17.2	1.7	3.1	
35	48.5	9.0	9.0	0.0	0.0		82.6	17.0	17.2	0.0	0.0	
40	44.2	8.2	8.2	0.0	0.0		75.1	15.5	17.2	0.0	0.0	
45	40.6	7.5	7.5	0.0	0.0		69.1	14.3	17.2	0.0	0.0	
50	37.7	7.0	7.0	0.0	0.0		64.0	13.2	17.2	0.0	0.0	
55	35.1	6.5	6.5	0.0	0.0		59.6	12.3	17.2	0.0	0.0	
60	32.9	6.1	6.1	0.0	0.0		55.9	11.5	17.2	0.0	0.0	
65	31.0	5.8	5.8	0.0	0.0		52.6	10.9	17.2	0.0	0.0	
70	29.4	5.5	5.5	0.0	0.0		49.8	10.3	17.2	0.0	0.0	
75	27.9	5.2	5.2	0.0	0.0		47.3	9.8	17.2	0.0	0.0	
80	26.6	4.9	4.9	0.0	0.0		45.0	9.3	17.2	0.0	0.0	
85	25.4	4.7	4.7	0.0	0.0		43.0	8.9	17.2	0.0	0.0	
90	24.3	4.5	4.5	0.0	0.0		41.1	8.5	17.2	0.0	0.0	
95	23.3	4.3	4.3	0.0	0.0		39.4	8.1	17.2	0.0	0.0	
100	22.4	4.2	4.2	0.0	0.0		37.9	7.8	17.2	0.0	0.0	

5-year Q_{attenuated} 11.83 L/s
5-year Max. Storage Required 4.5 m³
Est. 5-year Storage Elevation 72.55 m

100-year Q_{attenuated} 17.22 L/s
100-year Max. Storage Required 11.8 m³
Est. 100-year Storage Elevation 73.34 m

Area ID C2+BLDA

C2+BLDA	Imp.	Perv.	Total
Area	0.421	0.019	0.441
C	0.9	0.2	0.87

Total Subsurface Storage (m³) 208.0

Stage Attenuated Areas Storage Summary

	Stage (m)	Surface Storage			Surface and Subsurface Storage			
		Ponding (m ³)	h _b (m)	delta d (m)	V* (m ³)	V _{acc} ** (m ³)	Q _{release} † (L/s)	V _{drawdown} (hr)
Orifice INV	71.60		0.00			0.0	0	0.00
U/G STORAGE INV	72.49		0.89	0.89	68.6	68.6	1.3	14.67
U/G STORAGE S/L	72.95		1.35	0.46	68.6	137.3	1.8	21.19
U/G STORAGE O/BV	73.35		1.75	0.41	68.6	205.9	3.2	17.88
T/L	74.08	0.4	2.48	0.73	0.1	206.0	4.7	12.18
0.10m Ponding	74.18	234.4	2.58	0.10	8.1	214.2	6.1	9.75
0.21m Ponding	74.29	725.3	2.69	0.11	50.3	264.5	6.2	11.85

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface† Q_{release} = Release rate calculated from Tempest LMF Curve

Orifice Location STM105 Dia LMF65

Total Area 0.441 ha

C

0.87 Rational Method runoff coefficient

Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} † (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} † (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
1	203.5	216.6	1.8	214.8	12.9	351.4	430.0	3.9	426.1	25.6
5	141.2	150.2	1.8	148.5	44.5	242.7	297.0	3.9	293.1	87.9
10	104.2	110.9	1.8	109.1	65.5	178.6	218.5	3.9	214.6	128.8
15	83.6	88.9	1.8	87.1	78.4	142.9	174.9	3.9	171.0	153.9
20	70.3	74.8	1.8	73.0	87.6	120.0	146.8	3.9	142.9	171.5
25	60.9	64.8	1.8	63.0	94.6	103.8	127.1	3.9	123.2	184.8
30	53.9	57.4	1.8	55.6	100.1	91.9	112.4	3.9	108.5	195.4
35	48.5	51.6	1.8	49.9	104.7	82.6	101.1	3.9	97.2	204.1
40	44.2	47.0	1.8	45.3	108.6	75.1	92.0	3.9	88.1	211.4
45	40.6	43.2	1.8	41.5	112.0	69.1	84.5	3.9	80.6	217.7
50	37.7	40.1	1.8	38.3	114.9	64.0	78.3	3.9	74.4	223.2
55	35.1	37.4	1.8	35.6	117.5	59.6	73.0	3.9	69.1	228.0
60	32.8	35.1	1.8	33.3	119.8	55.9	68.4	3.9	64.5	232.3
65	31.0	33.0	1.8	31.3	121.9	52.6	64.4	3.9	60.5	236.1
70	29.4	31.3	1.8	29.5	123.9	49.8	60.9	3.9	57.0	239.6
75	27.9	29.7	1.8	27.9	125.6	47.3	57.8	3.9	53.9	242.8
80	26.6	28.3	1.8	26.5	127.2	45.0	55.1	3.9	51.2	245.6
85	25.4	27.0	1.8	25.2	128.7	43.0	52.6	3.9	48.7	248.3
90	24.3	25.8	1.8	24.1	130.0	41.1	50.3	3.9	46.4	250.7
95	23.3	24.8	1.8	23.0	131.3	39.4	48.3	3.9	44.4	252.9
100	22.4	23.8	1.8	22.1	132.5	37.9	46.4	3.9	42.5	255.0

5-year Q_{assumed} 1.76 L/s 100-year Q_{assumed} 3.88 L/s
 5-year Max. Storage Required 132.5 m³ 100-year Max. Storage Required 255.0 m³
 Est. 5-year Storage Elevation 72.91 m Est. 100-year Storage Elevation 74.27 m

Estimated Post Development Peak Flow from Attenuated Areas

Area ID C3

C3	Imp.	Perv.	Total
Area	0.008	0.071	0.079
C	0.9	0.2	0.27

Stage Attenuated Areas Storage Summary

	Stage (m)	Surface Storage			Surface and Subsurface Storage			
		Ponding (m ²)	h _s (m)	delta d (m)	V* (m ³)	V _{acc} ** (m ³)	Q _{release} † (L/s)	V _{drawdown} (hr)
Orifice InV	72.44		0.00			0.0	0	0.00
Storage Pipe SL	72.57		0.13	0.13	0.0	0.0	1.5	0.00
Storage Pipe CBV	72.69		0.25	0.13	0.0	0.0	2.2	0.00
T/L	74.19	0.4	1.75	1.50	0.2	0.2	5.6	0.01
0.11m Ponding	74.30	83.9	1.86	0.11	3.3	3.5	6	0.16
0.26m Ponding	74.46	261.4	2.02	0.16	26.3	29.8	6.1	1.36

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface† Q_{release} = Release rate calculated from Tempest LMF Curve

Orifice Location CB3 Dia LMF70

Total Area

0.079 ha

C

0.27 Rational Method runoff coefficient

Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations

t _c (min)	5-year					100-year				
	i (mm/hr)	Q _{actual} † (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} † (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
1	203.5	12.0	5.7	6.3	0.4	351.4	83.8	6.1	77.7	4.7
5	141.2	8.3	5.7	2.6	0.8	242.7	57.9	6.1	51.8	15.5
10	104.2	6.1	5.7	0.5	0.3	178.6	42.6	6.1	36.5	21.9
15	83.6	4.9	4.9	0.0	0.0	142.9	34.1	6.1	28.0	25.2
20	70.3	4.1	4.1	0.0	0.0	120.0	28.6	6.1	22.5	27.0
25	60.9	3.6	3.6	0.0	0.0	103.8	24.8	6.1	18.7	28.0
30	53.9	3.2	3.2	0.0	0.0	91.9	21.9	6.1	15.8	28.5
35	48.5	2.9	2.9	0.0	0.0	82.6	19.7	6.1	13.6	28.6
40	44.2	2.6	2.6	0.0	0.0	75.1	17.9	6.1	11.8	28.4
45	40.6	2.4	2.4	0.0	0.0	69.1	16.5	6.1	10.4	28.0
50	37.7	2.2	2.2	0.0	0.0	64.0	15.3	6.1	9.2	27.5
55	35.1	2.1	2.1	0.0	0.0	59.6	14.2	6.1	8.1	26.8
60	32.9	1.9	1.9	0.0	0.0	55.9	13.3	6.1	7.2	26.1
65	31.0	1.8	1.8	0.0	0.0	52.6	12.6	6.1	6.5	25.2
70	29.4	1.7	1.7	0.0	0.0	49.8	11.9	6.1	5.8	24.3
75	27.9	1.6	1.6	0.0	0.0	47.3	11.3	6.1	5.2	23.3
80	26.6	1.6	1.6	0.0	0.0	45.0	10.7	6.1	4.6	22.3
85	25.4	1.5	1.5	0.0	0.0	43.0	10.2	6.1	4.2	21.2
90	24.3	1.4	1.4	0.0	0.0	41.1	9.8	6.1	3.7	20.0
95	23.3	1.4	1.4	0.0	0.0	39.4	9.4	6.1	3.3	18.9
100	22.4	1.3	1.3	0.0	0.0	37.9	9.0	6.1	2.9	17.7

5-year Q_{attenuated} 5.67 L/s
5-year Max. Storage Required 0.8 m³
Est. 5-year Storage Elevation 74.21 m

100-year Q_{attenuated} 6.10 L/s
100-year Max. Storage Required 28.6 m³
Est. 100-year Storage Elevation 74.45 m

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m ³)	100-Year Release Rate (L/s)	100-Year Required Storage (m ³)	100-Year Available Storage (m ³)
Unattenuated Areas (UN1)	14.8	0.0	28.1	0.0	0.0
Unattenuated Areas (UN2)	4.1	0.0	8.8	0.0	0.0
Attenuated Area (C1)	11.8	4.5	17.2	11.8	11.9
Attenuated Areas (C2+BLDA)	1.8	132.5	3.9	255.0	264.5
Attenuated Area (C3)	5.7	0.8	6.1	28.6	29.8
Total	38.1	137.8	64.1	295.4	306.2