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KRP Properties
535 Legget Drive
Serviceability Report

535 Legget Drive

City of Ottawa

Serviceability Report

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

October 9th, 2024
Revised: November 28th, 2024

Novatech File: 124045
Ref: R-2024-083

November 28th, 2024

City of Ottawa
Planning, Infrastructure and Economic Development Department
Planning and Infrastructure Approvals Branch
110 Laurier Avenue West, 4th Floor
Ottawa ON, K1P 1J1

Attention: **Anton Chetrar, Infrastructure Project Manager**
Development Review

Reference: **535 Legget Drive**
Serviceability Report
Our File No.: 124045

Please find enclosed the Serviceability Report for the above-noted development located at 535 Legget Drive in the City of Ottawa. This report is being re-submitted in support of a site plan application to convert the 11 floors of the existing building from office space to ground floor commercial and upper floor residential units.

Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH

Greg MacDonald, P. Eng.
Director, Land Development and Public Sector Infrastructure

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Appendices

Tables

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1.0 INTRODUCTION

Novatech has been retained to prepare a Serviceability Report on behalf of KRP Properties to assess the site services to the existing building located at 535 Legget Drive. The report is in support of a site plan application for the conversion of offices to residential units. The ground floor will remain commercial. **Figure 1 - Key Plan** shows the site location.

1.1 Existing Conditions

The subject site is located at 535 Legget Drive and is approximately 1.3 hectares (ha.) in size.

Presently the site is occupied by an existing 11-storey office tower, addressed 535 Legget Drive (Tower C), surrounded by Brookstreet Hotel and KRP owned properties (555 Legget Drive and 515 Legget Drive). The building currently contains office space on all 11 floors.

The subject site is bound by Legget Drive to the south-west and surrounding KRP owned properties. Existing infrastructure on the surrounding streets is described in Section 2-4 and is shown in **Figure 2 – Existing Conditions Plan.**

The original design of the existing development was designed by Novatech Engineering and design information is provided in the following report;

- 'Kanata Research Park – Tower C, Stormwater Management Report', prepared by Novatech Engineering Consultants dated December, 1998 (Referenced as Novatech Original).

1.2 Proposed Development

It is proposed to convert the existing office building at 535 Legget to a mixed-use building containing commercial (office space, coffee shop etc..) on the ground floor and residential units on floors 2-11. The converted building will contain a total of 115 residential units, and 397m^2 of commercial space on the ground floor as shown in **Figure 3 – Proposed Site Plan.**

2.0 WATER SERVICING

There is an existing 610mm diameter concrete pressure pipe (C-301) watermain within Legget Drive which services the existing development. The existing building at 535 Legget Drive is serviced by a single 200 mm service from the 610mmmm diameter watermain within Legget Drive. The existing building is sprinkled and is equipped with a siamese connection located near the existing entrance at the west corner of the building. Existing hydrant coverage is provided by two hydrants on Legget Drive.

The City of Ottawa amended the second paragraph in Section 4.3.1 of its Water Distribution Design Guidelines to read as follows:

"Industrial, commercial, institutional service areas with a basic day demand greater than 50 m3/day and residential areas servicing 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area."

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CITY OF OTTAWA
535 LEGGET DRIVE

KEY PLAN

SCALE		
N.T.S		
DATE	JOB	FIGURE
JULY 2024	124045	FIGURE-1

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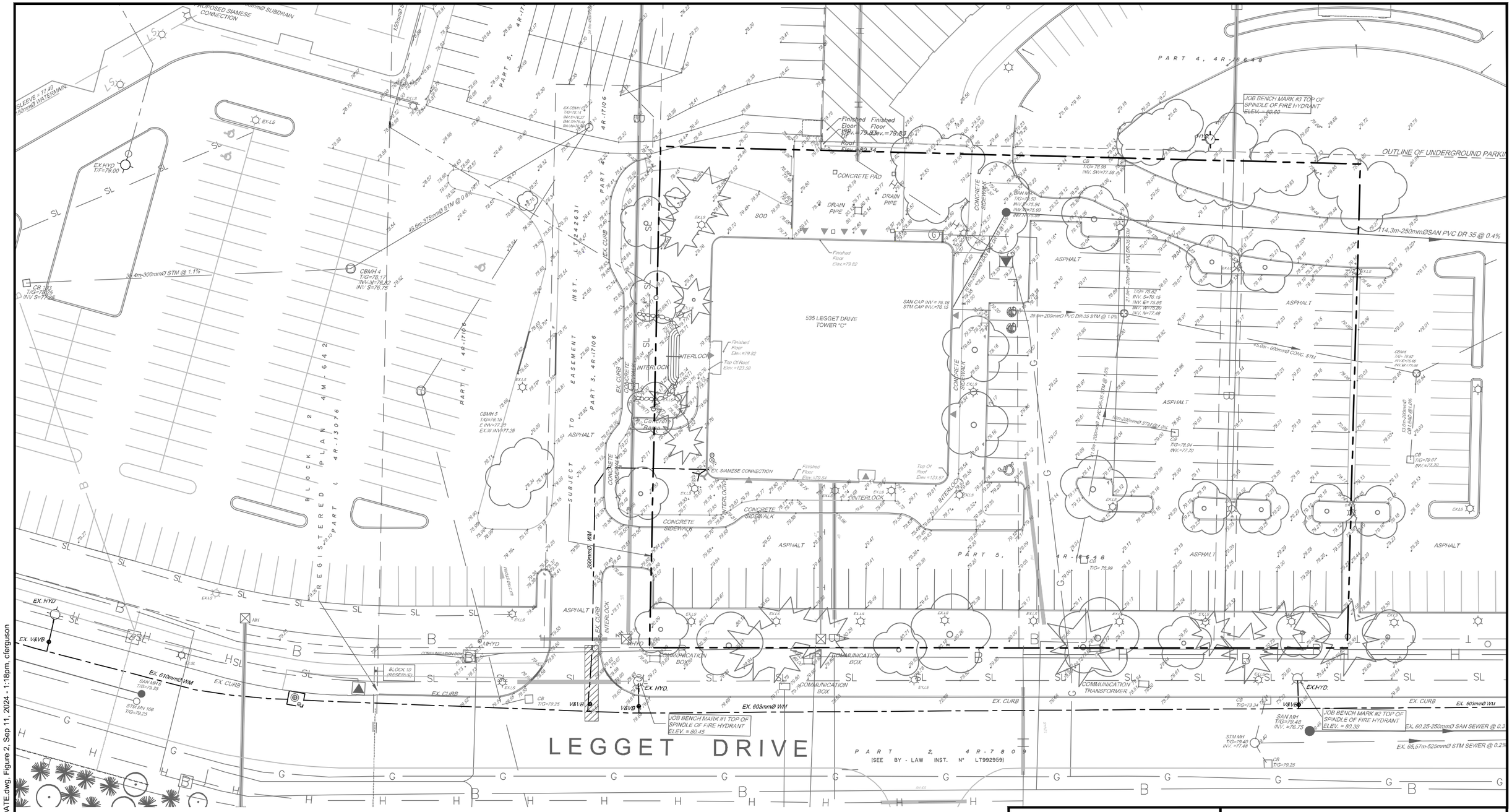

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535 LEGGET DRIVE

EXISTING CONDITIONS PLAN

SCALE 1 : 500 (0 5 10 15 20)

DATE SEPT 2024 | JOB 124045 | FIGURE FIG-2

M:\2024\124045\CAD_Existing\124045-EX_UPDATE.dwg, Figure 2, Sep 11, 2024 - 1:18pm, cferguson

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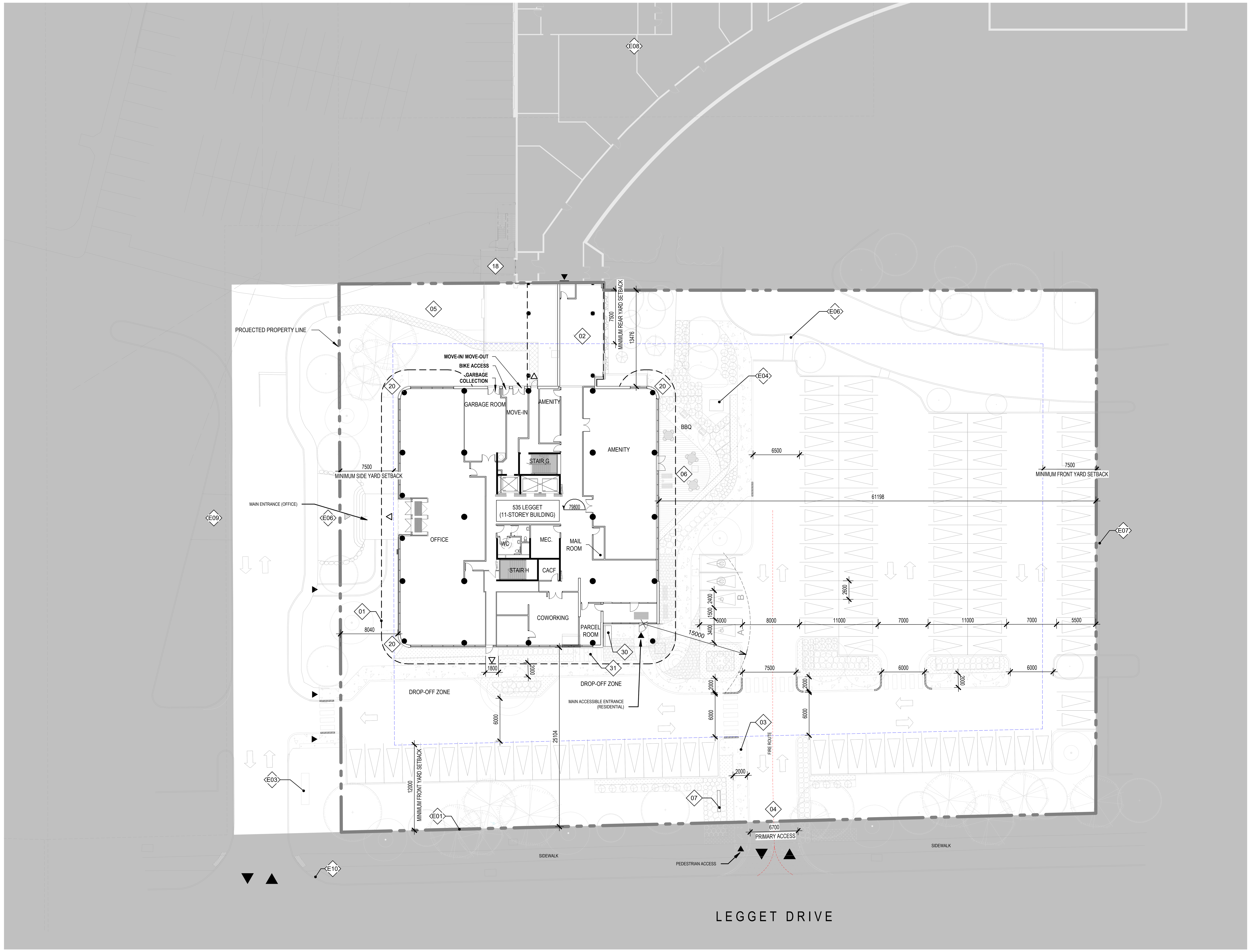


FIGURE 3 - PROPOSED SITE PLAN

GENERAL SITE PLAN - PROJECTED
1 : 300
1 / A101P

GROSS FLOOR AREA (GFA) AS PER CITY OF OTTAWA DEFINITION	
GROSS FLOOR AREA (RESIDENTIAL)	15 939 m²
GROSS FLOOR AREA (OFFICE)	400 m²
TOTAL GROSS FLOOR AREA (RESIDENTIAL & OFFICE)	16 339 m²

535 LEGGET - SITE STATISTICS	
PROPOSED LOT AREA	7 937 m²
FOOTPRINT	1 395 m² (45% max)
GROSS BUILDING AREA ABOVE GRADE	14 769 m²
CONSTRUCTION AREA UNDERGROUND	1 570 m2
GROSS FLOOR AREA (ABOVE + BELOW GRADE)	16 339 m²

LEGAL DESCRIPTION OF PROPERTY

PIN 04517-1171 Part Lot 8, Conc. 4, Ottawa, being Parts 5 and 6 Plan 4R16648 and Parts 4, 5 and 9 Plan 4R17106

535 LEGGET - NUMBER OF UNITS

LEVEL	NUMBER OF UNITS
BASEMENT	0
GROUND FLOOR	0
2nd FLOOR TO 9th	8 x 13 UNITS 104 UNITS
10th FLOOR	11 UNITS
11th FLOOR	-
TOTAL	115 UNITS

PARKING LEGEND

- TYPICAL PARKING SPACE 5.5 m X 2.6 m (5.2 m X 2.6 m min.)
- BARRIER FREE PARKING SPACE 6 m X 3.4 m
- BARRIER FREE PARKING SPACE 6 m X 2.4 m (min.)
- EV PARKING SPACE 6 m X 2.5 m (min.)

SURFACE LEGEND

- CLEAR STONE (BY LANDSCAPE ARCHITECT)
- PEDESTRIAN PATH (BY LANDSCAPE ARCHITECT)
- LANDSCAPING (BY LANDSCAPE ARCHITECT)
- DECK (BY LANDSCAPE ARCHITECT)
- INTERVENTION AREA
- ASPHALT (REFER TO CIVIL)
- PAVING (BY LANDSCAPE ARCHITECT)
- DEPRESSED SIDEWALK/ BARRIER FREE TACTILE PAVERS

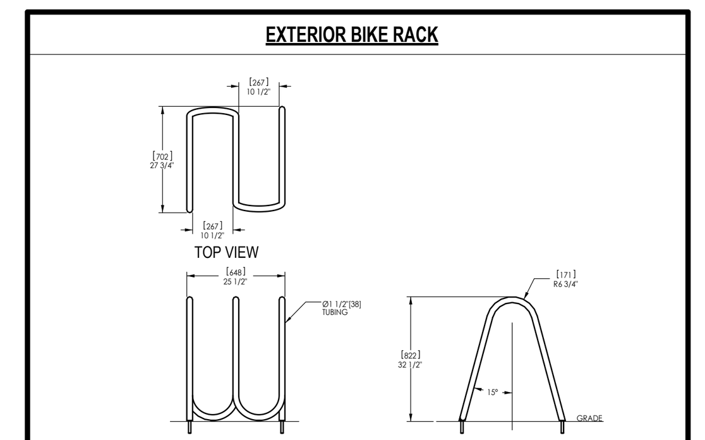
LINE TYPE & ACCESS LEGEND

- VEHICULAR ENTRY
- ACCESS TO BUILDING
- ACCESS TO OFFICE
- EXITS
- FIRE ROUTE (ON SITE)
- PROPERTY LINE
- CIRCULATION ARROW
- SETBACK

WALL AND DOOR LEGEND

- EXISTING WALL
- EXISTING STRUCTURE
- DEMOLISHED WALL
- NEW WALL
- DEMOLISHED DOOR
- EXISTING DOOR
- NEW DOOR

EXTERIOR BIKE RACK



GENERAL NOTES

# NOTE	DESCRIPTION
01	OUTLINE OF CANOPY ON LEVEL 2
02	LINK TO BROOKSTREET HOTEL
03	PROPOSED NEW ENTRANCE CONCRETE PATH
04	PROPOSED NEW VEHICULAR ENTRANCE
05	GRANDING TO SLOPE TOWARDS EXISTING LOADING DOCK LEVEL TO FACILITATE MOVE-IN/ MOVE-OUT AND GARBAGE COLLECTION (8% MAX FOR GARBAGE COLLECTION) SEE CIVIL ENG.
06	PROPOSED EXTERIOR DECK (REFER TO LANDSCAPE ARCHITECT)
07	NEW SIGNAGE
08	ADDITIONAL TREE (REFER TO LANDSCAPE ARCHITECT)
10	PROJECTED BUILDING OUTLINE - GROUND FLOOR
11	MARQUISE OUTLINE
13	NEW STAIRCASE OUTLINE, NOT PART OF PERMIT
14	PROJECTED BUILDING OUTLINE - SECOND FLOOR
16	CONTACT PANEL (SEE ELECTRICAL ENG.)
17	FIRE PANEL (SEE ELECTRICAL ENG.)
18	PROPOSED EXIT STAIR FROM BROOKSTREET HOTEL
19	RELOCATED ROPE GUIDE
20	CONCRETE DRAINAGE SPLASH PAD (REFER TO LANDSCAPE ARCHITECT)
21	FOOT SCRAPER GRILLE (7/A031)
22	ACCESSIBLE ENTRANCE/ EXIT/ ACCESS (AS REQUIRED FOR RHFAC)
30	SEATING AREA
31	PROPOSED EXTERIOR BIKE PARKING
32	EXIT TOWARDS BROOKSTREET HOTEL
33	STRUCTURAL REINFORCEMENT (2"X12" TRIPLE ROW) BEHIND DRYWALL AT TOILET AND SHOWER AS REQUIRED FOR RHFAC
34	STRUCTURAL REINFORCEMENT (2"X12" TRIPLE ROW) IN BEDROOM FOR CLOTHES ROD AS REQUIRED FOR RHFAC
35	FLOORING FINISH MUST CONTINUE UNDER WASHROOM VANITY AS REQUIRED FOR RHFAC
36	FLOORING FINISH MUST CONTINUE UNDER KITCHEN CABINETRY AS REQUIRED FOR RHFAC

GENERAL NOTES EXISTANT

# NOTE	DESCRIPTION
E01	PROPERTY LINE
E02	LOADING DOCK
E03	DEMOLITION OF EXISTING STREET SIGNAGE, FOLLOWED BY SURFACE RESTORATION AND STREETSCAPE ENHANCEMENT (SEE LANDSCAPE ARCHITECT)
E04	EXISTING MECHANICAL EQUIPMENT
E05	REINFORCING DOWELS EXTENDING ABOVE THE SLAB WITH PROTECTIVE HOARDING.
E06	EXISTING PEDESTRIAN ENTRANCE
E07	EXISTING CURB TO SEPARATE PARKINGS
E08	EXISTING BROOKSTREET HOTEL
E09	EXISTING BIKE RACK
E10	EXISTING FIRE HYDRANT
E12	GARBAGE CHUTE
E14	EXISTING ROOF ANCHOR
E15	PIPE / CONDUIT ENCLOSURE
E16	FLUE PIPES
E17	KITCHEN EXHAUST FAN
E18	EXISTING ROPE GUIDE TO BE RELOCATED
E19	EXISTING HOUSEKEEPING PAD TO BE DEMOLISHED
E20	DEMOLITION OF EXISTING CURBS AND SIDEWALK TO FACILITATE THE CREATION OF A NEW VEHICULAR ENTRANCE FROM LEGGET DRIVE, INCLUDING NECESSARY LANDSCAPE ADJUSTMENTS (SEE LANDSCAPE ARCHITECT AND CIVIL ENGINEER)
E21	EXISTING ACCESS TO BE DECOMMISSIONED AND PERMANENTLY CLOSED
E22	ALL EXISTING ROOF ASSEMBLIES MUST BE INSPECTED DURING THE DEMOLITION PHASE TO ASSESS AND DETERMINE THE NECESSARY INTERVENTIONS
E23	ALL EXISTING PRECAST CONCRETE PANELS AND ASSOCIATED ELEMENTS MUST BE INSPECTED DURING THE DEMOLITION PHASE TO ASSESS AND DETERMINE THE NECESSARY INTERVENTIONS.
E24	EXISTING DRAINS TO BE REPURPOSED (SEE CIVIL ENGINEER)
E25	EXISTING FOOT SCRAPER GRILL

ZONE PROVISIONS 535 LEGGET

ZONING BY-LAW 2008-250

CURRENT ZONING: IP6 [301]

	REQUIRED		PROVIDED
FRONT & CORNER YARD SETBACK	FRONT MIN. 12 m		25.10 m
INTERIOR RIGHT SIDE YARD SETBACK	MIN. 7.5 m		61.19 m
INTERIOR LEFT SIDE YARD SETBACK	MIN. 7.5 m		8.04 m
REAR YARD SETBACK	MIN. 7.5 m		13.45 m
BUILDING HEIGHT	44 m (MAX)		11 STOREYS 44 m (MAX)
AMENITY SPACE	6 m² X 115 UNITS = 690 m²		847 m²
PRIVATE AMENITY SPACE	-		145 m²
COMMUNAL AMENITY AREA	MINIMUM OF 50% OF REQUIRED TOTAL AMENITY AREA (423 m² min.)		702 m²
BICYCLE PARKING (RESIDENTIAL)	0.5 X 115 UNITS = 58 SPOTS (25% INDOORS)		93
BICYCLE PARKING (OFFICE)	2 SPOTS (1 LONG-TERM, 1 SHORT-TERM)		2
NUMBER OF PARKING SPACES			
	REQUIRED		PROVIDED
PARKING (RESIDENTIAL)	1.2 SPACES X 115 UNITS	138	81 SPACES
PARKING (VISITOR)	0.2 SPACES X 115 UNITS	23	20 SPACES
OFFICE	400 m²	4	4 SPACES
BARRIER FREE PARKING	TYPE A = 1 TYPE B = 1	2	TYPE A = 1 TYPE B = 1
TOTAL PARKING REQUIRED		167	107 SPACES

NOTES GÉNÉRALES General Notes

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SCEAU / Seal

NEUF
ARCHITECT(E)S

CLIENT Client

KRP Properties

OUVRAGE Project

535 LEGGET DRIVE

EMPLACEMENT Location: 535 LEGGET DRIVE, KANATA, ONTARIO

NO PROJET No.: 13338

NO	RÉVISION	DATE (aa-mm-jj)
B	ÉMISSION POUR COORDINATION	2024 06 21
C	AUDIT PROGRAMMATION	2024 06 25
D	ISSUED FOR COORDINATION	2024 07 18
E	ISSUED FOR COORDINATION	2024 08 09
F	LIMITED WINDOW WALL TENDER DRAFT	2024 09 13
G	ISSUED FOR SITE PLAN APPROVAL	2024 10 04
H	ISSUED FOR COORDINATION	2024 10 04
I	ISSUE FOR CODE REVIEW	2024 10 07
J	ISSUED FOR COORDINATION	2024 10 18
K	ISSUED FOR COORDINATION	2024 10 28
L	INTERNAL COORDINATION	2024 11 01
M	ISSUED FOR COORDINATION	2024 11 08

DESSINÉ PAR Drawn by: AT MS

VÉRIFIÉ PAR Checked by: KP

DATE (aa.mm.jj): 24.09.18

ÉCHELLE Scale: As indicated

TITRE DU DESSIN Drawing Title

GENERAL SITE PLAN - PROJECTED

RÉVISION Revision: M

NO. DESSIN Dwg Number: A101P

This replaced the previous wording which read:

"Service areas with a basic day demand greater than 50 m3/day (about 50 homes) shall be connected with a minimum of two feedermains to avoid the creation of a vulnerable service area."

The second paragraph of Section 4.3.1 was also amended to add the following:

"Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area."

"Basic Day Demand is defined as "The demand when there is no ooutdoor watering demand, which is during a typical winter day." It is clear that it is separate from and less than the Average Day Demand of 280 L/cap/day.

As 535 Legget Drive is an individual residential facility, connected by one 200 mm water service calculations were performed to determine if a second water service should be added. Calculations were performed using a basic day demand of 240 L/cap/day, based on monitoring results undertaken on the Shadow Ridge Subdivision in May 2013 (excerpt attached in **Appendix B**).

Basic Day Demand = 202 population x 240 L/cap/day = 48,480 L/day = 48.48 m3/day.

Based on the above a second water service is not required.

Water demand calculations have been calculated using criteria from Section 4 of the City of Ottawa Water Distribution Guidelines and the Ontario Building Code as provided in **Table 2.1 – Watermain Design Parameters and Criteria.** Demand is shown **in Table 2.2 – Estimated Water Demands.**

Table 2.1: Watermain Design Parameters and Criteria

Domestic Demand Design Parameters	**Design Parameters**
Unit Population: 1-Bedroom Apartment 2-Bedroom Apartment	 1.4 people/unit 2.1 people/unit
Commercial Demand	28000 L/gross ha/day
Average Day Residential Demand (ADY)	280 L/c/d
Maximum Day Demand (MXDY)	Residential: 2.5 x Avg Day Commercial: 1.5 x Avg Day
Peak Hour Demand (PKHR)	Residential: 2.2 x Maximum Day Commercial: 2.7 x Avg Day
Fire Demand (FF) Design	
Per FUS 2020	

System Pressure Criteria Design Parameters	Criteria
Maximum Pressure (BSDY) Condition	< 80 psi occupied areas < 100 psi unoccupied areas
Minimum Pressure (PKHR) Condition	> 40 psi
Minimum Pressure (MXDY+FF) Condition	> 20 psi

The required fire demand was calculated using the Fire Underwriters Survey 2020 (FUS) Guidelines. Through correspondence with the architect, it is understood that the proposed building use will be residential occupancy (Limited Combustible), composed of fire resistive construction (2 hrs.), and containing a fully supervised sprinkler system designed as per NFPA 13.

The water demand calculations, fire flow calculations and correspondence are provided in **Appendix B** for reference.

Table 2.2: Estimated Water Demand

Population	Commercial Area (m^2)	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
199	397	0.65	3.17	4.79	117

Note as per ITSB-2018-02 the fire flow was distributed among several surrounding hydrants as outlined in **Table 2.3**.

Table 2.3: Maximum Flow to be considered from a given hydrant.

Hydrant Class	Distance to building (m)	Contribution to Fire Flow	
		(L/min)	(L/s)
AA	≤75	5700	95
	>75and ≥150	3800	63.33
A	≤75	3800	63.33
	>75and ≥150	2850	47.50
B	≤75	1900	31.67
	>75and ≥150	1500	25.00
C	≤75	800	13.33
	>75and ≥150	800	13.33

Based on City of Ottawa mapping all existing hydrants within the vicinity of the proposed building are Class AA (Blue). As the fire flow is calculated as 117 L/s, two (2) hydrants will be required to achieve the required flow. There are presently 2 existing class AA Hydrants within

the boulevards of Legget Drive within 75m of the building wall capable of providing a combined maximum flow of 190L/s as per **Table 2.3**. One hydrant is within 45m of the proposed siamese connection. Should the City shut down part of the 610 mm watermain by closing the valve north of the entrance fire demand can be achieved of the other hydrants along Legget Drive and on site which can provide an adequate fire flow of 120 L/s.Refer to **Appendix B** for calculations. **Figure 4 – Hydrant Coverage** shows the site hydrant coverage plan.

The above water demand information was submitted to the City for boundary conditions from the City's water model. These boundary conditions when received will be used to analyze the performance of the proposed and existing watermain systems for three theoretical conditions:

1) High Pressure check under Average Day conditions
2) Peak Hour demand
3) Maximum Day + Fire Flow demand.

3.0 SANITARY SERVICING

3.1 Existing Sanitary Conditions

There are existing City sanitary sewers in Legget Drive fronting the development. There is an existing 250mm diameter sanitary sewer within Legget Drive and a 250mm to 700mm diameter trunk sewer which runs through the Marshes Golf Course to the pump station located on Legget Drive.

The existing building is ultimately serviced with a 250mm diameter sewer building drain (building to external manhole) via the trunk sewer within Marshes Golf Course which ultimately outlets to the pump station on Legget Drive. The condition of the existing service was reviewed using CCTV technology completed by Clean Water Works (CWW). The pipe is in good condition but has a sump approximately 10m from the manhole towards the building. The sump will be repaired during construction. The CWW report is included within **Appendix C** for reference.

The existing office development currently occupying 535 Legget Drive has a peak sanitary flow including infiltration was calculated to be **1.79 L/s**. The overall pre-development sanitary design sheet for the trunk sewer within Marshes Golf Course and surrounding KRP property can be found in **Appendix C**.

3.2 Proposed Sanitary

It is proposed to service the proposed development with the existing 250mm diameter sanitary sewer.

Sanitary flows for the proposed development were calculated using criteria from Section 4 of the City of Ottawa Sewer Design Guidelines and the Ontario Building Code as follows:

TOWER "B"

HOTEL
18 STOREY

EXISTING 535 LEGGET
11-STOREY BUILDING
OFFICE TO RESIDENTIAL
FFE=79.90
BASEMENT FLOOR
ELEV.=76.80

535 LEGGET DRIVE
TOWER "C"

OUTLINE OF UNDERGROUND PARKING

STM MH. RAISE
TOP TO 79.40

SAN MH
T/G= 79.25

44.7m

71.1m

LEGGET DRIVE

LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- PROPOSED HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE

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CITY OF OTTAWA
535 LEGGET DRIVE

COVERAGE PLAN

SCALE 1 : 750 (0, 10, 20, 30)

DATE NOVEMBER 2024 | JOB 124045 | FIGURE COV

SHT11X17.DWG - 279mmX432mm

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Table 3.1: Sanitary Sewer Design Parameters

Design Component	Design Parameter
Unit Population: 1-Bedroom Apartment 2-Bedroom Apartment	 1.4 people/unit 2.1 people/unit
Residential Flow Rate	Design = 280 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0) Harmon Correction Factor = 0.8m (Design)
Commercial Peaking Factor	1.0 (less than 20% of contributing area) 1.5 (more than 20% of contributing area)
Extraneous Flow Rate	Design = 0.33 L/s/ha
Minimum Pipe Size	250mm Diameter
Minimum Velocity[1]	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Cover	2.0 m (Unless frost protection provided)

The peak sanitary flow including infiltration for the proposed use of the building was calculated to be **2.52 L/s**. Detailed sanitary flow calculations are provided in **Appendix C** for reference.

3.3 Sanitary Downstream Analysis

The increase in sanitary flow from **1.79L/s** (pre-development) to **2.52 L/s** (post-development) was analysed in the downstream system.

The slight increase in flow creates a negligible difference within the downstream system. The downstream system still has adequate capacity in all runs. The highest Q/Q_{FULL} within the KRP sanitary truck sewer system downstream of the site is 36.35%.

Refer to post-development sanitary sheet within **Appendix C** for reference.

4.0 STORM SERVICING

4.1 Existing Storm Conditions

Currently the building is being serviced by a 250mm diameter storm service which ultimately outlets to the existing KRP Storm Pond to the north-east. The condition of the existing service was reviewed using CCTV technology completed by CWW. The pipe is in good condition but has a sump approximately 10m from the manhole towards the building. The sump will be repaired during construction. The CWW report is included within **Appendix D** for reference.

4.2 Proposed Storm

It is proposed to service the development to the existing 250mm diameter storm sewer. Refer to the General Plan of Services (**124045-GP**) for more details.

Table 4.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2 Year Return Period
Storm Sewer Design	Rational Method
IDF Rainfall Data	Ottawa Sewer Design Guidelines
Initial Time of Concentration (Tc)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Refer to **Appendix D** for detailed storm drainage area plans and storm sewer design sheets.

5.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

The stormwater management strategy for the site is based on the established criteria from the City of Ottawa, and the Novatech Original Report.

5.1 Design Criteria

Through correspondence with the City of Ottawa, the Novatech Original Report and our knowledge of development requirements in the area, the following criteria have been adopted to control post-development stormwater discharge from the site:

- Control proposed post-development flows to existing pre-development flows.
- Provide source controls which are in conformity with the City of Ottawa requirements, where possible;
- Limit ponding to 0.15 m for all rooftop storage areas and 0.30 m for all parking storage areas;
- Ensure no surface ponding during the 2-year Storm event; and
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

The approach to the stormwater management design is to determine the allowable release rate for the site, calculate the uncontrolled flow, and ensure that the remaining flow, in combination with the uncontrolled flow, does not exceed the allowable release rate. All proposed development runoff in excess of the allowable release rate, will be attenuated on-site prior to being released into the storm sewers.

5.2 Quantity Control

The allowable release rate for the development was calculated to be 98.4L/s in the 5-year and 152.5 L/s in the 100-year based on the Novatech Original. Novatech Original calculations can be found in **Appendix D**.

The pre-existing conditions storm drainage area plan and design sheet can be found in **Appendix D** for reference. The runoff coefficient of the existing site was calculated to be **0.73**. Additionally, the post-development storm drainage area plan and design sheet can be found in **Appendix D** for reference. The runoff coefficient of the post-development site was calculated to be **0.74**.

Drainage areas from the previous Original Novatech Report will remain unchanged. The original storm drainage plan and storage volumes, release rates, ponding depths and orifice sizes for the 5-year and 100-year event from Novatech Original Report has been included in **Appendix D**.

Design Storms

The design storms are based on City of Ottawa design storms. Design storms were used for the 2, 5, and 100-year return periods (i.e storm events) for the new roof drainage plan.

Model Parameters

Post-Development roof drainage catchments were modelled based on the proposed site plan shown on drawing **124045-ROOF** within **Appendix D**. The building roofs were assumed to have no depression storage.

The roof has been divided into ten (10) drainage areas for the post development condition. The drainage areas are as follows;

Area R-01, R-02

- Stormwater from the building roof will be captured and controlled by flow control roof drains prior to releasing to the existing storm sewer servicing the development. The ponding will be limited to 0.15m in depth with overflow scuppers provided for emergencies. Storage of stormwater will be provided for storms up to and including the 100-year event. Further details will be provided once a mechanical consultant is retained for the subject development.

Area R-03, R-04, R-05, R-06

- Stormwater from the upper floor terraces will be captured and released to ground level via a downspout. Splash pads will be provided on grade to mitigate erosion. Released stormwater will drain to the existing catch basins within the development.

Area R-07, R-08, R-09, R-10

- Stormwater capture via the 2nd floor canopy roof will be captured and control by flow control roof drains. The area for each canopy roof drain was calculated by utilizing the horizontal area of the drainage area plus 25% of vertical area from floors 2-11. The four areas were equalized for simplicity. Storage of stormwater will be provided for storms up to and including the 100-year event.

Table 5.1 below summarizes the flow, storage required, and storage provided for each of the new roof drainage areas.

6.0 EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks (catchbasin inserts) will be placed in existing and proposed catchbasins and catchbasin manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair, or replacement requirements. Sediments that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (**124045-ESC**) for additional information.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Watermain

The analysis of the existing and proposed watermain network confirms the following:

- The existing 200mm dia. watermain service which connects to the existing 610mm in Legget Drive will continue to service the proposed development.
- It is expected that there are adequate flows to service the proposed fire protections system which will be confirmed once boundary conditions are received.

Sanitary Servicing

The analysis of the existing and proposed sanitary system confirms the following:

- It is proposed to service the development with the existing 200mm sanitary service.
- The peak sanitary flow including infiltration for the proposed use of the building was calculated to be **2.52 L/s**.
- The slight increase in flow creates a negligible difference within the downstream system. The downstream system still has adequate capacity in all runs.

Strom Servicing

The analysis of the existing and proposed sanitary system confirms the following:

- It is proposed to service the development with the existing 250mm storm service.
- The runoff coefficient of the post-development site was calculated to be **0.74**. We believe the 0.01 increase in runoff coefficient is negligible.
- Proposed roof drains releasing **15.1 L/s** - less then pre-development allowable.

- All other drainage areas from the previous Original Novatech Report will remain unchanged.

8.0 CLOSURE

This report is submitted for review and approval in support of the site plan application. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:

Curtis Ferguson, E.I.T.
Engineering Intern, Land Development and Public Sector Infrastructure

Reviewed by:

Greg MacDonald, P.Eng
Director, Land Development and Public Sector Infrastructure

Appendix A
Pre-Consultation Minutes

File No.: PC2024-0273

July 22, 2024

James Ireland
Novatech
Via email: j.ireland@novatech-eng.com

Subject: **Pre-Consultation: Meeting Feedback**
Proposed Site Plan Control Application – 535 Legget Drive

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on Enter Date of Meeting.

Pre-Consultation Preliminary Assessment

1 ☐	2 ☐	3 ☐	4 ☒	5 ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please consider proceeding to a Phase 3 pre-consultation. Fill in the Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density, you may be required to complete or repeat the pre-consultation process before filing an Official application.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. The following policies apply to the site:

    a. The site is designated within the Kanata North Economic District on Schedule B5 – Suburban Transect

    b. The subject site is situated within 600 meters of a future BRT station located at at March/Terry Fox and March/Solandt, as shown on Schedule C2 – Transit Network – Ultimate

    c. Per Schedule C4 – Urban Road Network, Legget Drive is classified as an existing collector road.

    d. The site is located within a Design Priority Area identified on Schedule C7-A – Design Priority Areas – Urban.

2. Provide dimensions on plans to confirm zoning compliance and/or identify any performance standards requiring relief.

3. Explore opportunities to introduce more landscaped areas/medians, tree plantings and outdoor amenity areas into the existing surface parking areas.

4. Remove front yard parking between the building and Legget Drive. Policy 5h of Section 6.6.3.2 states that surface parking along Legget Drive shall be discouraged and as development occurs, phasing out of existing visible parking is encouraged. As well, the policy directs that surface parking lots should not be located between the right of way and the main entrance of the building.

5. Proposed sidewalk connection to Legget Drive is appreciated. Please ensure that the walkway has a minimum width of 2 metres, per Policy 5f of Section 6.6.3.2 in the Official Plan.

6. It is understood that the applicant is not intending to provide ground-floor commercial space as part of the development. Staff have concerns that this

approach does not align with the planned function of activity centres in the KNED, per Policy 4 of Section 6.6.3.2 of the OP. Ensure this matter is addressed in the Planning Rationale required in support of the associated Zoning By-law Amendment.

7. Staff appreciate that the main entrance has been oriented to Legget Drive.

8. Provide vehicular parking calculation in the next submission. Based on the information currently available, it appears that's zoning relief is required - 109 spaces provided, 164 required (based on 117 units). Staff have no concerns with reducing the parking rates, as Policy 4(3) of Section 6.6.3.2 directs that development within activity centres shall not require minimum parking.

9. Provide additional information on proposed bicycle parking in the next submission. It appears that six spaces are provided along the Legget Drive façade. How many interior bicycle parking spaces are being provided?

    a. Please provide an adequate number of biycle parking facilities in accordance with Policy 9 of Section 4.1.2:

        i. Long-term bicycle parking facilities shall be secure, sheltered and usable by all types of cyclists. Where located inside buildings, long-term bicycle parking facilities shall provide safe, accessible, direct and convenient access to the exterior; and

        ii. Short-term bicycle parking facilities shall be highly visible, well-lit, near building entrances and where appropriate, sheltered.

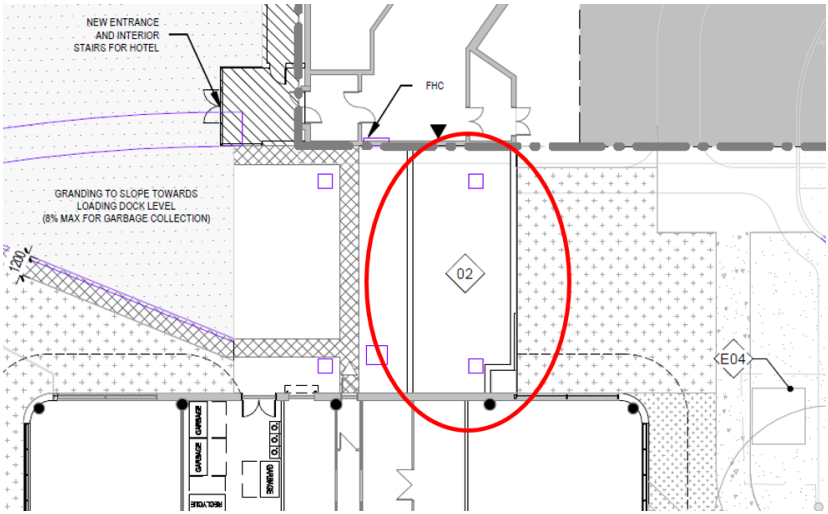
10. Provide further information on how amenity area will be provided. Refer to Section 137 of the Zoning By-law for minimum requirements.

    a. Please confirm if residents are allowed to use the amenity areas located in the hotel to the North.

    b. Explore opportunities to provide outdoor amenity space; consider reducing parking in the front yard, and replacing it with amenity space.

11. If the intention is to be eligible for City waste pick-up, please note that the garbage bins must be brought to an accessible collection point – to be reviewed further at formal review. Waste Collection Services has confirmed that they would not collect the bins from the loading dock.

12. Provide further information on how the connection with the hotel functions (shown as Note 02 Link Hotel on the Site Plan). It appears to be an open-air connection currently – is the intention to have a building connection?



13. Section 37 requirements / Community Benefits Charge

    a. The former Section 37 regime has been replaced with a "Community Benefits Charge", By-law No. 2022-307, of 4% of the land value. This charge will be required for ALL buildings that are 5 or more storeys and 10 or more units and will be required at the time of building permit unless the development is subject to an existing registered Section 37 agreement. Questions regarding this change can be directed to Ranbir.Singh@ottawa.ca.

14. Office-to-Residential Conversion

    a. The Site Plan Control process for Office-to-Residential Conversions with no additions or new storeys are subject to the following:

        i. A scoped list of minimum required materials.

        ii. A Site Plan Control – Standard application fee

    b. Refer to feedback provided for PC2024-0128 for additional discussion.

15. Please note that there is an on-going Community Planning Permit (CPP) Study for the Kanata North Economic District. It is anticipated that the Pilot CPP By-law will be adopted by Council in September 2024. More information on the study can be found on Engage Ottawa.

16. Please note that Urban Design Guidelines are currently being prepared for the Kanata North Economic District. It is anticipated that that the design guidelines will be completed in the next year and will apply to the proposed development.

Please contact Elizabeth Desmarais at Elizabeth.Desmarais@ottawa.ca for more information/to review the draft guidelines.

17. Required Applications

    a. Site Plan Control – more information on the process can be found here.

        i. Standard Site Plan Control application fee applies.

    b. Major Zoning By-law Amendment – more information on the process can be found here. Refer to previous pre-con notes (File No. PC2024-0128) for feedback on this file.

Feel free to contact Colette Gorni, Planner II, for follow-up questions.

Urban Design

Comments:

Submission Requirements

18. Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation.

    a. The Urban Design Brief should be structured by generally following the headings highlighted under Section 3 – Contents of these Terms of Reference.

19. The site is within a Design Priority Area, attendance at the UDRP is strongly recommended.

20. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of references (Planning application submission information and materials | City of Ottawa) the prepare these drawings and studies. These include:

    a. Design Brief

    b. Site Plan

    c. Concept Plan (can be a apart of the design brief)

    d. Landscape Plan

    e. Elevations

    f. Conceptual Floor Plans

    g. UDRP Report (optional)

Comments on Preliminary Design

Applicants are to provide a response to the below comments in the Design Brief:

21. The site is in a Design Priority Area, these are areas in the city where the new Official Plan anticipates design excellence and a high-quality public realm treatment to be achieved. Please ensure that these policies are addressed within the design brief.

22. Attendance at UDRP is recommended.

23. Please provide a concept plan illustrating the development in the wider context. Vehicular and pedestrian circulation between the subject property, Brookstreet Hotel and 555 Legget should be illustrated.

24. The drop off area should be reconfigured to provide additional landscape area and opportunity for retail patio in the future. In line with the Official Plan, it would be preferred to remove or reduce parking in the front of the building.

25. Juliet balconies are appreciated. Projecting balconies are not appropriate.

26. New building entrance should be more prominent.

27. Staff is looking forward to seeing more detail of the building façade including the proposed connection to the hotel.

28. If fencing is provided on the amenity space. Please consider low, transparent fencing to lessen impact on the public realm.

29. Please provide bicycle parking spaces according to city standards. Please ensure that bicycle parking is well incorporated into landscape design.

30. The sidewalks shown in the plan are quite narrow. A minimum of 1.8m should be provided.

Feel free to contact Lisa Stern, Urban Design Planner, for follow-up questions.

Engineering

Comments:

31. Water Quantity Control: Storm water quantity control is not required but it is recommended to look at ways to control storm water flow on site.

32. Water Quality Control is provided at the Pond.

33. Provide the proposed Sanitary sewer release rate to confirm that there is sufficient capacity.

34. As discussed at the Pre-Consult on April 16, 2024, please provide confirmation that the sanitary sewer leaving the site, currently shown as private on GeoOttawa, is now public and runs through a private easement.

35. Existing building service laterals will require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on existing condition plan.

36. Water Supply Redundancy: Residential buildings with a basic day demand greater than 50m3/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.

    It was noted at the meeting that the basic day demand for the proposed development will be below the 50m3/day (0.57 L/s). The Consultant will need to demonstrate in the Site Servicing Report that the basic day demand is below the 50m3/day and provide confirmation from the architect regarding the population count on the proposed residential building.

    Note: The existing water service to the building is off Legget Drive. The watermain on Legget Drive is a 610mm concrete pressure pipe (C-301). The City periodically isolates these C-301 watermains for structural inspections and therefore do not allow two connections to backbone watermains for redundancy. Further, the applicant will have to demonstrate that they can achieve the required fire flows to their site with the 610mm watermain isolated.

37. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.

38. Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street

in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.

a. Type of Development and Units

b. Site Address

c. A plan showing the proposed water service connection location.

d. Average Daily Demand (L/s)

e. Maximum Daily Demand (L/s)

f. Peak Hour Demand (L/s)

g. Fire Flow (L/min)

[Fire flow demand requirements shall be based on ISTB-2021-03]. Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF). Hydrant capacity shall be assessed to demonstrate the RFF can be achieved. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

39. List of required reports and plans:

a. PLANS:

i. Existing Conditions and Removals Plan

ii. Site Servicing Plan (if new services are proposed)

iii. Road Reinstatement Plan (if new services are proposed)

iv. Topographical survey

b. REPORTS:

i. Site Servicing Report

ii. Erosion and Sediment Control Plan/Brief

iii. Hydraulic Watermain Analysis

iv. Stormwater Management Report and Servicing Brief

v. Phase I ESA

vi. Record of Site Condition

vii. Phase II ESA (Depending on recommendations of Phase I ESA)

Feel free to contact Anton Chetrar, Project Manager, for follow-up questions at anton.chetrar@ottawa.ca

Noise

Comments:

40. Noise Impact Studies required for the following:

    a. Road, as the site is within proximity to a collector road (Legget Drive).

    b. Stationary, due to the proximity to neighboring exposed mechanical equipment and/or if there will be any exposed mechanical equipment.

Feel free to contact Rochelle Fortier-Lesage (rochelle.fortier@ottawa.ca), Transportation Project Manager, for follow-up questions.

Transportation

Comments:

41. Correct TIA Screening form. The site plan shows a new access is proposed to Legget Drive which would trigger a limited scope TIA per recommendations from the Office-to-Residential Conversions report. In this case a design review memo will suffice. Include relevant elements from Modules 4.1 to 4.5 of the TIA guidelines. Feel free to reach out to discuss the scope.

42. Ensure that the development proposal complies with the Right-of-Way protection requirements - See Schedule C16 of the Official Plan.

43. The new proposed access to Legget Drive is offset from the existing access to 570 March on the south side of the street. Preference is to align the accesses to mitigate overlapping left turn conflicts.

44. If one-way traffic is proposed for the east-west drive aisle located to the south of the building, then the access aisle width should be reduced to clarify this function. One-way and do not enter signage should also be provided and shown on the plan.

45. Show on-site circulation elements along the main westerly drive aisle and the rear of the site, including any proposed/existing pavement markings. It is unclear what changes (if any) are proposed to the loading dock at the rear of the site. Please provide turning movement diagrams for the loading dock if physical changes are proposed.

46. Show the existing lay-by on the west side of the building at the main entrance. Are any changes proposed? Drop-offs are also noted on the south side of the building. Preference is to consolidate these drop-off zones and provide one clearly defined area.

47. Upgrade the existing asphalt pathway on the Legget Drive frontage to a concrete sidewalk.

48. Provide a pedestrian connection along the east side of the existing entrance and laneway.

49. On site plan:

    a. Ensure site accesses meet the City's Private Approach Bylaw and all driveways/aisles meet the requirements outlined in Section 107 of the Zoning By-law.

    b. Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.

    c. Ensure all internal pathways are a minimum of 1.5m wide. A width of 1.8m to 2.0m is desirable.

    d. Turning movement diagrams at the new proposed access will be required.

    e. Clear throat length requirements for apartments (100-200 units) on a collector is 15m. Ensure this length is provided and dimension it on the site plan.

    f. Corner clearances should follow minimum distances set out within TAC Figure 8.8.2.

    g. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).

    h. Sidewalk is to be continuous across access as per City Specification 7.1.

    i. Show dimensions for site elements (i.e. lane/aisle widths, access width, parking stalls, sidewalks, pedestrian pathways, etc.)

j. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements.

k. Grey out any area that will not be impacted by this application.

Feel free to contact Rochelle Fortier-Lesage (rochelle.fortier@ottawa.ca), Transportation Project Manager, for follow-up questions.

Environment

Comments:

50. No comments.

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

Forestry

Comments:

Tree Conservation Report

51. The concept plan provided at PC2 shows a proposed new vehicular entrance from Legget, through a treed area, and changes appear to be proposed at the western building entrance as well. With this and the fact that this is now a Site Plan application, a Tree Conservation Report is required in accordance with Schedule E of the Tree Protection By-law. Ownership of all trees on the subject site and with Critical Root Zones extending onto the subject site must be determined, and plans must show how they will be protected from proposed works.

52. Section 4.8.2 of the New Official Plan provides strong direction to maintain the urban forest canopy and its ecosystem services during intensification noting when considering the impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation. Applications must address the cumulative impacts on the urban forest, over time and space, with the goal of 40% urban forest canopy cover in mind. Further, that the City and the Committee of Adjustment may refuse a development application where it deems the loss of a tree(s) avoidable.

53. The locations of vehicle entrances, curbs, buildings, and structures should account for the retention and protection of significant trees on and adjacent to the site, including those that provide privacy for neighboring properties.

54. If any shared or adjacent trees are impacted by the proposal, the applicant is responsible for consulting with the owners of the trees and for obtaining signed

permission if any trees must be removed. If no permission is granted, plans must be designed to allow for the full protection of these trees.

55. A permit is required prior to removal of any protected trees on site. The tree permit will be released upon site plan approval. Please contact the planner associated with the file or the Planning Forester, Nancy Young (Nancy.young@ottawa.ca) for information on obtaining the tree permit.

56. To ensure that no harm is caused to breeding birds, tree removal and vegetation clearing should be avoided during the migratory bird season (April 15 – August 15) as specified by The City of Ottawa's Environmental Impact Study Guidelines.

Tree Conservation Report Requirements

57. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City

58. An approved TCR is a requirement of Site Plan approval.

59. The TCR may be combined with the LP provided all information is supplied

60. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

61. Compensation may be required for the removal of city owned trees.

62. The TCR must contain 2 separate plans:

    a. Plan/Map 1 - show existing conditions with tree cover information

    b. Plan/Map 2 - show proposed development with tree cover information

63. Please ensure retained trees are shown on the landscape plan.

64. The TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition.

65. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

66. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.

67. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca.

68. The location of tree protection fencing must be shown on the plan.

69. Show the critical root zone of the retained trees.

70. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

Landscape Plan Comments

71. A Landscape Plan is required with this application and must address all requirements within the Landscape Plan Terms of Reference https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf, including the projection of canopy cover toward the target of 40%, and confirmation of adequate soil volumes to support any proposed trees. This may be combined with the TCR to clarify the existing and proposed trees.

72. The Official Plan section 4.8.2, sub 3 provides the following direction related to tree planting related to site plans:

    a. Preserve and provide space for mature, healthy trees on private and public property, including the provision of adequate volumes of high-quality soil as recommended by a Landscape Architect;

    b. On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect;

73. Please confirm the amount of parking required vs provided.

    a. Given the proposed rezoning to residential use, it is a high priority to provide outdoor green space for tree planting, shade, and amenity use. It is strongly recommended to convert some of the existing parking space (particularly that facing Legget) to soft landscaping for this purpose. The conceptual Landscape Plan should be updated to account for such changes to the parking and landscaping on site.

        i. Planting additional trees within the ROW facing Legget should be prioritized to help screen the view of the parking lot from the road.

Landscape Plan Requirements

74. The City recommends the following Best Management Practices to improve the climate change resiliency of new developments:

a. For parking lots, provide 1 new tree for every 5 parking spaces to help cool the landscape of the site.

b. Confirm sufficient Soil volumes to support canopy cover on site ($30m^3$ for street trees)

c. Proposed species must not include invasive species and target a minimum of 50% native species.

75. Minimum Setbacks:

a. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

b. Maintain 2.5m from curb.

c. Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

d. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

76. Tree Specifications:

a. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

b. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

c. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).

d. Plant native trees whenever possible.

e. No root barriers, dead-man anchor systems, or planters are permitted.

f. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

77. Hard Surface Planting:

a. Curb style planter is highly recommended.

b. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

c. Trees are to be planted at grade.

78. Soil Volume:

a. Please document on the LP that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

b. Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

79. Sensitive Marine Clay

a. Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

Feel free to contact Nancy Young (nancy.young@ottawa.ca), Forester, for follow-up questions.

Tree Canopy

80. The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

81. At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate. Indicate on the plan the projected future canopy cover at 40 years for the site.

Feel free to contact Nancy Young (nancy.young@ottawa.ca), Forester, for follow-up questions.

Parkland

Comments:

82. Please be sure that the application provides a parkland conveyance requirement calculation and provides rationale for the most suitable way to address parkland policies of Section 4.4 of the Official Plan.

83. The applicable rate is 1 ha per 600 units. Based on 127 units, at the noted rate, the parkland dedicaion amount is 0.212 ha. The parkland dedication amount is capped at 10% the gross land area for sites less that 5 ha in size. As this is the case and the gross land area is 1.24 ha, the applicable parkland dedication amount is 0.124 ha.

84. Please note Official Plan Policy 4.4.1.3) For Site Plan Control applications in the Downtown, Inner Urban, Outer Urban and Suburban Transects, where the development site is more than 4,000 square metres, the City shall place a priority on acquisition of land for park(s) as per the Planning Act and the Parkland Dedication By-law.

85. Please note Parkland Dedication By-law Section 8, 4. “Where conveyance of land for park purposes is not feasible within the site being developed, the City: may consider the conveyance of land outside of the site being developed if the City is satisfied that the land provides a benefit to the residents of the land being developed”.

86. Will the applicant be participating in a landowners agreement to provide for the dedication and construction of parks in the Kanata North Economic District?

Feel free to contact Anissa McAlpine, Parks Planner, for follow-up questions at anissa.mcalpine@ottawa.ca.

Other

87. The High-Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.

    a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.

b. Please refer to the HPDS information attached and ottawa.ca/HPDS for more information.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Colette Gorni

c.c. Nishan Dave, Planner I (DR West)
Spencer Mulvaney, Planning Co-op Student (DR West)
Anton Chetrar, Infrastructure Project Manager
Ryan Brault, Infrastructure Project Manager
Rochelle Fortier, Transportation Project Manager
Nancy Young, Planning Forester
Anissa McAlpine, Parks Planner
Elizabeth Desmarais, Planner (KNED Design Guidelines)

Appendix B
Water Servicing

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Boundary Condition Request

Novatech Project #: 124045
Project Name: KRP Tower C conversion
Date: 11/20/2024
Input By: Curtis Ferguson, E.I.T.
Reviewed By: Anthony Mestwarp,P.Eng.
Drawing Reference:

Legend: Input by User | No Input Required | Calculated Cells →

Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
MOE Design Guidelines for Drinking-Water Systems (2008)
Fire Underwriter's Survey Guideline (2020)
Ontario Building Code, Part 3 (2012)

Small System = YES

	# of Dwellings	Area (ha.)	Pop. Equiv.	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)	Basic Day Demand (m^3/day)
Residential Input							
Apartments (2-BR)	53		111.30	0.36	1.77	2.67	26.7
Apartments (1-BR)	62		86.80	0.28	1.38	2.08	20.8
Industrial / Commercial / Institutional (ICI) Input							
Industrial Area - Light				0.00	0.00	0.00	0.0
Industrial Area - Heavy				0.00	0.00	0.00	0.0
Commercial Area		0.04		0.01	0.02	0.04	1.1
Institutional Area				0.00	0.00	0.00	0.0
Other Area				0.00	0.00	0.00	0.0
Totals	**115**	**0.04**	**198.10**	**0.65**	**3.17**	**4.79**	**48.7**

Summary

i. Type of Development and Units:	11-Storey Apartment Building with 115 units		
ii. Site Address:	535 Legget Drive, Ottawa, Ontario		
iii. Proposed Water Service Connection Location(s):	Legget Drive		
iv. Average Day Flow Demand:		0.65	L/s
v. Peak Hour Flow Demand:		4.79	L/s
vi. Maximum Day Flow Demand:		3.17	L/s
vii. Required Fire Flow #1:		7000	L/min
viii. Required Fire Flow #2:			L/min
ix. Required Fire Flow #3:			L/min

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

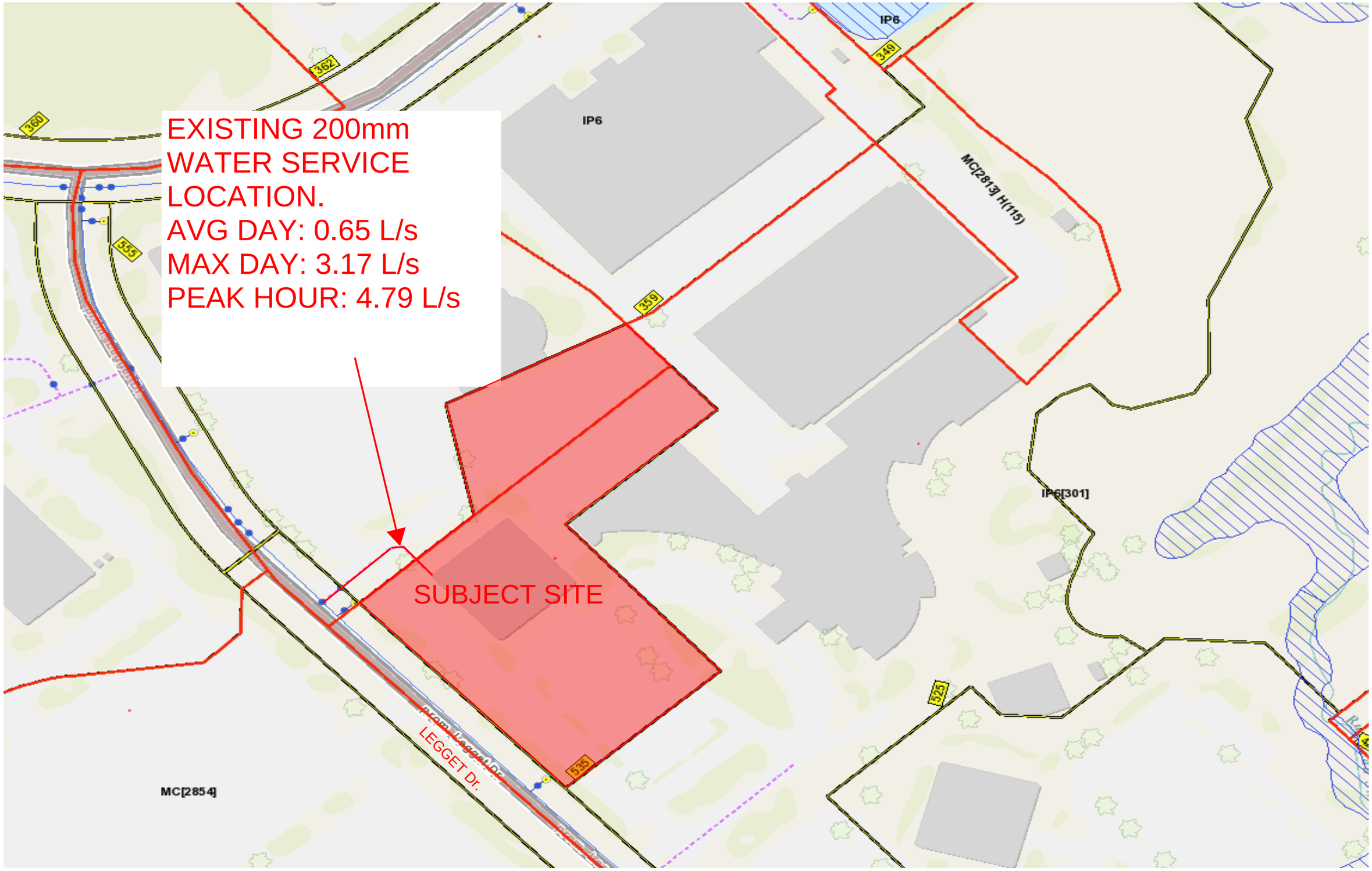
Design Parameters

Residential							Vulnerable Service Area (VSA)
Unit Type Population Equiv.	Singles	Semis/ Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)	Apts (3-BR)	
	3.4	2.7	2.1	1.4	1.8	3.1	
Daily Demand	L/per person/day						50
Average Demand	280						< 50 m³/day
Basic Demand	240						> 50 m³/day

Residential Peaking Factors		Max Day (x Avg Day)	Peak Hour (x Avg Day)
	Pop.		
Small System (If Applicable) *Modified*	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
	300	3.60	*5.50*
	450	3.00	*5.50*
	500	2.90	*5.50*
Large System (Default)	> 500	2.50	5.50

Institutional / Commercial / Industrial				
Industrial		Commercial	Institutional	Other Area
Light	Heavy			
L/gross ha/day				L/m²/day
35,000	55,000	28,000	28,000	5

ICI Peaking Factors	Max Day (x Avg Day)	Peak Hour (x Avg Day)
	1.50	2.70


EXISTING 200mm
WATER SERVICE
LOCATION.
AVG DAY: 0.65 L/s
MAX DAY: 3.17 L/s
PEAK HOUR: 4.79 L/s
SUBJECT SITE
LEGGET Dr.
IP6
IP6
IP6[301]
MC[2813] H(115)
MC[2854]
360
362
355
359
349
535
525

FUS - Fire Flow Calculations

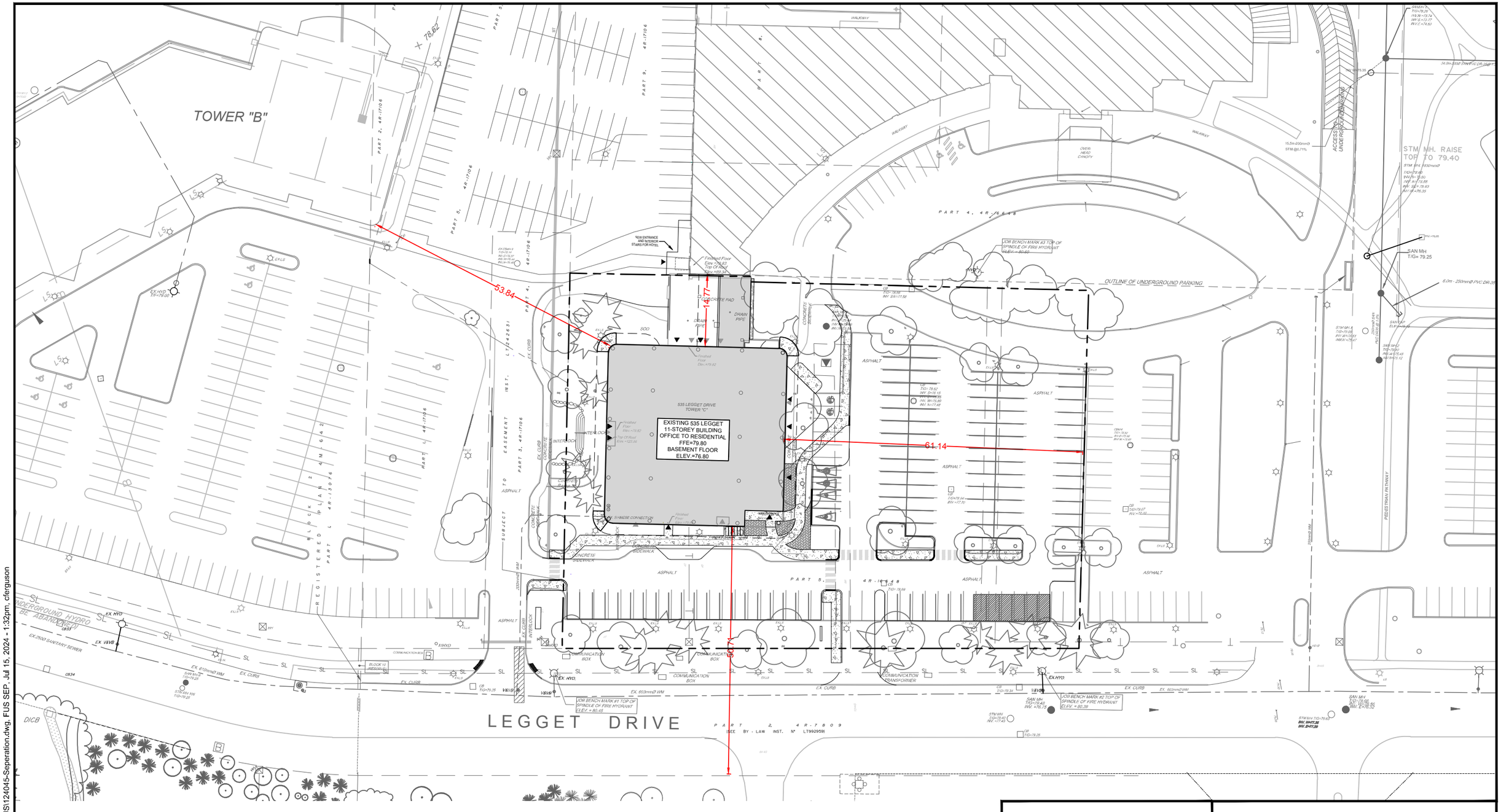
Engineers, Planners & Landscape Architects

Novatech Project #: 124045
Project Name: Tower C Conversion KRPC
Date: 6/24/2024
Input By: Curtis Ferguson, E.I.T.
Reviewed By: Greg MacDonald, P.Eng.
Drawing Reference: 124045-FUS SEP

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: 11 Storey Tower - Office to Residential Conversion
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	1313			
		Number of Floors/Storeys	11			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**7,878**	
	F	**Base fire flow without reductions**				**16,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**13,600**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-6,800**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Sub-Total	**-50%**	
		Area of Sprinklered Coverage (m^2)	14443	100%		
				Cumulative Total	**-50%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**0**
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**0%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**7,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**117**
				or	USGPM	1,849



LEGEND

- PROPERTY LINE
- PROPOSED TACTILE INDICATOR
- PROPOSED ENTRANCE
- DC — PROPOSED DEPRESSED CURB

NOVATECH
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Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
535 Legget Dr

FUS SEPARATION

SCALE 1 : 750 (0 10 20 30)

DATE	JOB	FIGURE
NOV 2024	124045	FUS

SHT11X17.DWG - 279mmX432mm

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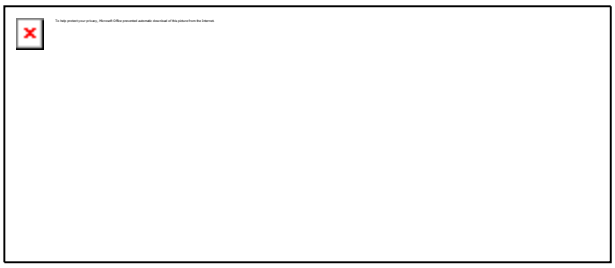
Curtis Ferguson

From: Mayank Shekhawat <mshekhawat@neuf.ca>
Sent: Thursday, August 1, 2024 5:37 PM
To: Curtis Ferguson
Cc: Greg MacDonald
Subject: RE: 535 Legget Drive - KRP Properties (124045)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi **Curtis**,

Apologies for missing your initial email. Please see response in green below-



MAYANK SHEKHAWAT, COA, INTERN OAA, LEED AP BD+C, MRAIC
Diplômé en architecture (INTMD). Graduate Architect (INTMD)
T 514 847 1117 #360 F 514 847 2287 C 514 386 2389
630, boul. René-Lévesque O. 32e étage, Montréal (QC) H3B 1S6
47 Clarence Street, suite 406, Ottawa (ON) K1N 9K1
NEUF ARCHITECTES INC.

50 ANS ET TOUJOURS NEUF . 50 YEARS AND STILL NEUF

From: Curtis Ferguson <c.ferguson@novatech-eng.com>
Sent: Thursday, August 1, 2024 1:49 PM
To: Mayank Shekhawat <mshekhawat@neuf.ca>
Cc: Greg MacDonald <g.Macdonald@novatech-eng.com>
Subject: RE: 535 Legget Drive - KRP Properties (124045)

Hi Mayank,

Hope you are doing well.

Checking in on below.

Thanks,
Curtis Ferguson, B.A.Sc., E.I.T. | Land Development
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 EXT: 331

From: Curtis Ferguson
Sent: Tuesday, July 16, 2024 1:34 PM
To: Mayank Shekhawat <mshekhawat@neuf.ca>

Cc: Greg MacDonald <g.Macdonald@novatech-eng.com>
Subject: 535 Legget Drive - KRP Properties (124045)

Hi Mayank,

I have a few questions regarding 535 Legget Drive hoping you can confirm.

- Do we have a finalized unit count? +/- 117 units

FUS (building construction);

- Confirmed building floor area (of all floors). +/- 16 104 sqm (Gross floor area)

- Construction Material (one of below);
  - Type V – Wood Frame
  - Type IV – Mass Timber
  - Type III – Ordinary Construction
  - Type II – Non-Combustible Construction
  - Type I – Fire Resistive Construction (2hrs) These categories are in reference to the IBC? Can you provide a bit more clarification on the purpose of this information? At the first look, considering it's a high-rise building with concrete structure (2hrs) and uses concrete panels and a curtain wall system for the envelope (non-combustible materials), it seems to be a Type I construction.

- Occupancy hazard (one of below); These categories are in reference to the IBC? Can you provide a bit more clarification on the purpose of this information? Again, if it is a type I construction, the material category it corresponds to would be non-combustible.
  - Non-combustible
  - Limited combustible
  - Combustible

- Sprinkler Reduction; Please verify with GWAL
  - Adequately Designed System (NFPA 13) – **Yes OR No**
  - Standard Water Supply – **Yes OR No**
  - Fully Supervised System – **Yes OR No**

Thanks,
Curtis Ferguson, B.A.Sc., E.I.T. | Land Development
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 EXT: 331

Curtis Ferguson

From: Mark Sarasin <marks@gwal.com>
Sent: Friday, August 2, 2024 1:21 PM
To: Curtis Ferguson; Raj Vyas; Xiangyu Cai; Liaqat Ali
Cc: Greg MacDonald; Mayank Shekhawat
Subject: RE: 535 Legget Drive - KRP Properties (124045)

Yes to all

Mark Sarasin, P.Eng | **Senior Associate, Mechanical Engineer**
GOODKEY, WEEDMARK & ASSOCIATES LTD.

Vacation Alert: Aug.6 – Aug.9, 2024

Email: marks@gwal.com

Office: (613) 727-5111 ext. 308 Mobile: (613) 816-0844

Address: 1688 Woodward Drive | Ottawa, Ontario | K2C 3R8

Website: www.gwal.com

GWAL
Goodkey, Weedmark & Associates Ltd

Your Trusted Choice for Mechanical & Electrical Consulting Engineers Since 1956

Follow us on LinkedIn

From: Curtis Ferguson <c.ferguson@novatech-eng.com>
Sent: Friday, August 2, 2024 10:03 AM
To: Mark Sarasin <marks@gwal.com>; Raj Vyas <RajV@gwal.com>; Xiangyu Cai <xcai@gwal.com>; Liaqat Ali <lali@gwal.com>
Cc: Greg MacDonald <g.Macdonald@novatech-eng.com>; Mayank Shekhawat <mshekhawat@neuf.ca>
Subject: RE: 535 Legget Drive - KRP Properties (124045)

Good Morning Team GWAL,

Please confirm below regarding sprinkler systems within the existing 535 Legget Drive.

- Sprinkler Reduction; Please verify with GWAL
    - Adequately Designed System (NFPA 13) – **Yes OR No**
    - Standard Water Supply – **Yes OR No**
    - Fully Supervised System – **Yes OR No**

Thanks,
Curtis Ferguson, B.A.Sc., E.I.T. | Land Development
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 EXT: 331

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47 Clarence Street, suite 406, Ottawa (ON) K1N 9K1
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50 ANS ET TOUJOURS NEUF . 50 YEARS AND STILL NEUF

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Subject: 535 Legget Drive - KRP Properties (124045)

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  - Type I – Fire Resistive Construction (2hrs) These categories are in reference to the IBC? Can you provide a bit more clarification on the purpose of this information? At the first look, considering it's a high-rise building with concrete structure (2hrs) and uses concrete panels and a curtain wall system for the envelope (non-combustible materials), it seems to be a Type I construction.

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  - Limited combustible
  - Combustible

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  - Standard Water Supply – **Yes OR No**
  - Fully Supervised System – **Yes OR No**

Thanks,
Curtis Ferguson, B.A.Sc., E.I.T. | Land Development
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 EXT: 331

TOWER "B"

HOTEL
18 STOREY

EXISTING 535 LEGGET
11-STOREY BUILDING
OFFICE TO RESIDENTIAL
FFE=79.90
BASEMENT FLOOR
ELEV.=76.80

535 LEGGET DRIVE
TOWER "C"

OUTLINE OF UNDERGROUND PARKING

STM MH. RAISE
TOP TO 79.40

SAN MH
T/G= 79.25

44.7m

71.1m

LEGGET DRIVE

LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- PROPOSED HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE

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

CITY OF OTTAWA
535 LEGGET DRIVE

COVERAGE PLAN

SCALE 1 : 750 (0, 10, 20, 30)

DATE NOVEMBER 2024 | JOB 124045 | FIGURE COV

SHT11X17.DWG - 279mmX432mm

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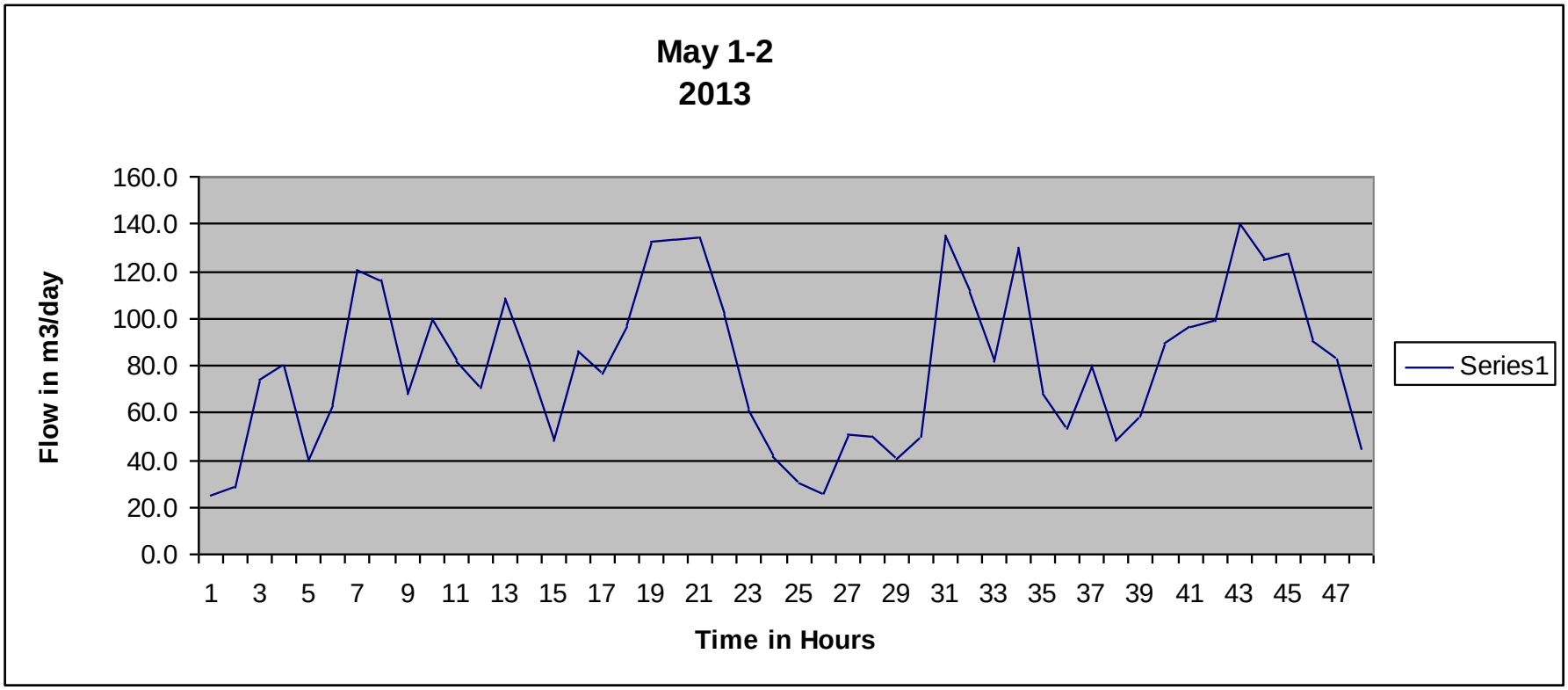

Figure 1 Typical Two Day Period - No Lawn Watering

Occupancy Summary

Total Phase 1 Units = 164

Less:

4 Units Within Existing Temporary Road Connections
16 Units Built but Not Sold
22 Units Built but Not Yet Occupied

Total: 122 Units in Use

Basic Day Demand = 80 m3/day = 80,000 L/day per 330 people (122 units x 2.7 ppu) = 243 L/cap/day

Appendix C
Sanitary Servicing

TOWER "B"

HOTEL
18 STOREY

0.396
A-01
115 198

EXISTING 535 LEGGET
11-STOREY BUILDING
OFFICE TO RESIDENTIAL
FFE=79.80
BASEMENT FLOOR
ELEV.=76.80

0.392
A-02
0 0

OUTLINE OF UNDERGROUND PARKING

STM MH. RAISE
TOP TO 79.40

SAN MH
T/C= 79.26

14.3m-250mmØSAN PVC DR 35 @ 0.4%

EX. UNDERGROUND HYDRO
TO BE ABANDONED

EX. 250Ø SANITARY SEWER

EX. 60.25-250mmØ SAN SEWER @ 0.31%

LEGEND

PROPERTY LINE

PROPOSED SANITARY SEWER AND MANHOLE

SAN MH — *EXISTING SANITARY MANHOLE & SEWER*

SANITARY SEWER DRAINAGE AREA BOUNDARY

0.396
A-01
117 202

DRAINAGE AREA (ha)
SAN SEWER PIPE RUN
NO. UNITS/POPULATION

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

CITY OF OTTAWA
535 LEGGET DRIVE

SANITARY DRAINAGE
AREA PLAN

SCALE 1 : 750 (0, 10, 20, 30)

DATE NOV 2024 | JOB 124045 | FIGURE SAN

SHT11X17.DWG - 279mmX432mm

M:\2024\124045\CAD\Civil\124045-SAN.dwg, SAN, Nov 18, 2024 - 12:11pm, dferguson

SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124045
Project Name: 535 Legget Drive
Date: 9/11/2024
Revised: 11/24/2024
Input By: Anjush Musyaju E.I.T
Reviewed By: Curtis Ferguson E.I.T.
Drawing Reference: 124045-SAN

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Annual Cell Output
- Calculated Rare Cell Output

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Demand																Design Capacity							
				Residential Flow									Industrial / Commercial / Institutional (ICI) Flow						Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design							
Street	Area ID	From MH	To MH	1 Bedroom	2 Bedroom	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Commercial / Institutional Area (ha.)	Cumulative Commercial / Institutional Area (ha.)	Average Design Commercial / Institutional Flow (L/s)	Commercial / Institutional Peaking Factor	Cumulative ICI Area (ha.)	Peak Design ICI Flow Q (ici) (L/s)	Cumulative Extraneous Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Q(D) / Qfull
Private Site	A1	Tower C	Ex. San MH 1	62	53	0.198	0.198	0.64	3.52	2.26	0.396	0.396	0.040	0.040	0.00	1.00	0.040	0.00	0.436	0.14	2.40	15.0	250 PVC	0.254	0.013	1.00	62.0	1.22	3.9%
Private Site	A2	Ex. San MH 1	Ex. San MH 2	0	0	0.000	0.198	0.64	3.52	2.26	0.392	0.788	0.000	0.000	0.00	1.00	0.000	0.00	0.788	0.26	2.52	54.3	250 PVC	0.254	0.013	0.40	39.2	0.77	6.4%
Totals				**62**	**53**	**0.198**	**0.198**	**0.64**	**3.52**	**2.26**	**0.788**	**0.788**	**0.000**	**0.000**	**0.00**	**1.00**	**0.000**	**0.00**	**0.788**	**0.26**	**2.52**	**54.3**							

Demand Equation / Parameters

1. **Q(D), Q(A), Q(R) =** Q(p) + Q(fd) + Q(ici) + Q(e)
2. **Q(p) =** (P x q x M x K / 86,400)
3. **q =** 280 L/per person/day (design)
   200 L/per person/day (annual and rare)
4. **M = Harmon Formula (maximum of 4.0)**
5. **K =** 0.8 (design)
   0.6 (annual and rare)
6. **Park flow is considered equivalent to a single unit / ha**
   Park Demand = 4 single unit equivalent / park ha (~ 3,600 L/ha/day)
7. **Q(fd) =** 0.45 L/s/unit
8. **Q(ici) =** ICI Area x ICI Flow x ICI Peak
9. **Q(e) =** 0.33 L/s/ha (design)
   0.30 L/s/ha (annual)
   0.55 L/s/ha (rare)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(A) = Peak Annual Flow (L/s)
Q(R) = Peak Rare Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

	1 Bedroom	2 Bedroom	3 Bedroom
P = Residential Population =	1.4	2.1	3.1

q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor
Typ. Service Diameter (mm) = 135
Typ. Service Length (m) = 15 15
I/I Pipe Rate (L/mm dia/m/hr) = 0.007
Q(fd) = Foundation Flow (L/s)
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Institutional / Commercial / Industrial	Industrial	Commercial / Institutional	
Design =	35000	28000	L/gross ha/day
Annual / Rare =	10000	17000	L/gross ha/day
ICI Peak *			
Design =	1.0	1.5	* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)
Annual / Rare =		1.0	

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

SANITARY TRUNK SEWER
Sanitary Sewer Design Sheet
EXISTING CONDITIONS

PROJECT : 99089-5
DESIGNED BY: SM/FST
CHECKED BY: DDB
DATE: 5-Feb-16

NOVATECH
Engineers, Planners & Landscape Architects

	LOCATION			INDIVIDUAL		CUMULATIVE		PEAK FLOWS				PROPOSED SEWER					
	AREA	FROM MH	TO MH	FLOW RATE (L/s)	Infiltration Area (ha)	FLOW RATE (L/s)	Infiltration Area (ha)	PEAK FACTOR M	PEAK FLOW Q (p) (L/s)	PEAK EXTRAN.FLOW Q(i) (L/s)	***PEAK DESIGN FLOW Q (d) (L/s)***	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
	528 March Road Site	SAN MH 4	EX. SAN MH A	0.35	2.20	0.35	2.20	5.7	2.00	0.62	***2.61***	25.4	250	PVC	0.50	43.87	0.87
	Legget Drive	EX. SAN MH A	EX. SAN MH B	0.00	0.00	0.35	2.20	5.7	2.00	0.62	***2.61***	55.1	250	PVC	0.33	35.64	0.70
	Legget Drive (Newbridge)	EX. SAN MH	EX. SAN MH C	1.69	4.05	1.69	4.05	1.5	2.54	1.13	***3.67***	60.3	250	PVC	0.31	34.54	0.68
	Legget Drive	EX. SAN MH C	EX. SAN MH B	0.00	0.00	1.69	4.05	1.5	2.54	1.13	***3.67***	68.0	250	PVC	0.29	33.41	0.66
**	Legget Drive	EX. SAN MH B	SAN MH 3	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	26.7	250	PVC	0.25	31.02	0.61
*	KRP Site	SAN MH 3	SAN MH 2	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	50.4	250	PVC	0.50	43.87	0.87
*	KRP Site	SAN MH 2	SAN MH 1	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	44.0	250	PVC	0.50	43.87	0.87
*	KRP Site	SAN MH 1	EX. SAN MH D	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	9.1	250	PVC	1.00	62.04	1.22
	KRP Site (Tower C)	TOWER C	EX. SAN MH D	0.96	1.23	0.96	1.23	1.5	1.44	0.34	***1.79***	114.3	250	PVC	0.40	39.24	0.77
*	KRP Site	EX. SAN MH D	EX. SAN MH E	0.00	0.00	3.00	7.48	1.5	4.50	2.09	***6.60***	9.5	250	PVC	1.00	62.04	1.22
*	KRP Site	EX. SAN MH E	EX. SAN MH F	0.00	0.00	3.00	7.48	1.5	4.50	2.09	***6.60***	48.1	250	PVC	0.67	50.78	1.00
	KRP Site (Tower D)	TOWER D	EX. SAN MH F	0.96	3.37	0.96	3.37	1.5	1.44	0.94	***2.39***	34.0	200	PVC	1.30	39.01	1.20
*	KRP Site	EX. SAN MH F	EX. SAN MH G	0.00	0.00	3.96	10.85	1.5	5.95	3.04	***8.98***	61.9	250	PVC	0.35	36.70	0.72
†	KRP Site (Brookstreet Hotel)	HOTEL	EX. SAN MH G	2.21	4.49	2.21	4.49	1.5 - 4.0	7.07	1.26	***8.33***	22.0	200	PVC	0.90	32.46	1.00
*	KRP Site	EX. SAN MH G	EX. SAN MH H	0.00	0.00	6.17	15.34	1.5	9.26	4.30	***13.56***	21.0	250	PVC	0.38	38.24	0.75
	KRP Site (Parking Structure)	PRKG STRUCT	EX. SAN MH H	0.30	1.28	0.30	1.28	1.5	0.45	0.36	***0.81***	91.1	250	PVC	0.40	39.24	0.77
*	KRP Site	EX. SAN MH H	EX. SAN MH I	0.00	0.00	6.47	16.62	1.5	9.71	4.65	***14.36***	88.9	250	PVC	0.38	38.24	0.75
*	KRP Site	EX. SAN MH I	EX. 750 TRUNK	0.00	0.00	6.47	16.62	1.5	9.71	4.65	***14.36***	100.1	250	PVC	0.52	44.74	0.88

Notes:
1. Q(d) = Q(p) + Q(i) , where
   Q(d) = Design Flow (L/sec)
   Q(p) = Population Flow (L/sec)
   Q(i) = Extraneous Flow (L/sec)
2. Q(i) = 0.28 L/sec/ha
3. Daily Sewage Flow from Office Towers = 75 L/person/day (Appendix 4-A, Ottawa Sewer Design Guidelines)
4. Commercial Peaking Factor = 1.5 (Figure 4.3 Ottawa Sewer Design Guidelines)
5. Refer to Sanitary Drainage Area Plan (114060-SAN, C200) for details of drainage areas
6. Refer to the 'Sanitary and Storm Sewer Design Brief' for a breakdown of Daily Sewage Flow components and applicable peaking factors from the Brookstreet Hotel

* Denotes sewers applicable to this MOE ECA appplication. All other sewers shown on this design sheet are private sewers tributary to the sanitary trunk sewer under application for MOE approval and/or have MOE approval under an existing C of A.
** An existing C of A covers the sanitary stub from SAN MH B north approx. 16.1m to the existing cap. The 10.7m of proposed sewer from the cap to SAN MH 3 is applicable to the new MOE ECA application.
† Total peak sanitary flow from hotel site = 8.33 L/s, including Extraneous Flows (Also refer to Note 6 above for further details)

SANITARY TRUNK SEWER
Sanitary Sewer Design Sheet
POST CONDITIONS

PROJECT : 124045
DESIGNED BY: CJF
CHECKED BY: GJM
DATE: 16-Aug-24

NOVATECH
Engineers, Planners & Landscape Architects

	LOCATION			INDIVIDUAL		CUMULATIVE		PEAK FLOWS				PROPOSED SEWER						
	AREA	FROM MH	TO MH	FLOW RATE (L/s)	Infiltration Area (ha)	FLOW RATE (L/s)	Infiltration Area (ha)	PEAK FACTOR M	PEAK FLOW Q (p) (L/s)	PEAK EXTRAN.FLOW Q(i) (L/s)	***PEAK DESIGN FLOW Q (d) (L/s)***	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Q/Qfull
	528 March Road Site	SAN MH 4	EX. SAN MH A	0.35	2.20	0.35	2.20	5.7	2.00	0.62	***2.61***	25.4	250	PVC	0.50	43.87	0.87	
	Legget Drive	EX. SAN MH A	EX. SAN MH B	0.00	0.00	0.35	2.20	5.7	2.00	0.62	***2.61***	55.1	250	PVC	0.33	35.64	0.70	
	Legget Drive (Newbridge)	EX. SAN MH	EX. SAN MH C	1.69	4.05	1.69	4.05	1.5	2.54	1.13	***3.67***	60.3	250	PVC	0.31	34.54	0.68	
	Legget Drive	EX. SAN MH C	EX. SAN MH B	0.00	0.00	1.69	4.05	1.5	2.54	1.13	***3.67***	68.0	250	PVC	0.29	33.41	0.66	
**	Legget Drive	EX. SAN MH B	SAN MH 3	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	26.7	250	PVC	0.25	31.02	0.61	
*	KRP Site	SAN MH 3	SAN MH 2	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	50.4	250	PVC	0.50	43.87	0.87	
*	KRP Site	SAN MH 2	SAN MH 1	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	44.0	250	PVC	0.50	43.87	0.87	
*	KRP Site	SAN MH 1	EX. SAN MH D	0.00	0.00	2.04	6.25	1.5	3.06	1.75	***4.81***	9.1	250	PVC	1.00	62.04	1.22	
	KRP Site (Tower C)	**TOWER C**	**EX. SAN MH D**	**0.65**	**1.24**	**0.65**	**1.24**	**3.5**	**2.30**	**0.41**	***2.71***	**114.3**	**250**	**PVC**	**0.40**	**39.24**	**0.77**	
*	KRP Site	EX. SAN MH D	EX. SAN MH E	0.00	0.00	2.69	7.49	1.5	4.04	2.10	***6.13***	9.5	250	PVC	1.00	62.04	1.22	9.89%
*	KRP Site	EX. SAN MH E	EX. SAN MH F	0.00	0.00	2.69	7.49	1.5	4.04	2.10	***6.13***	48.1	250	PVC	0.67	50.78	1.00	12.08%
	KRP Site (Tower D)	TOWER D	EX. SAN MH F	0.96	3.37	0.96	3.37	1.5	1.44	0.94	***2.39***	34.0	200	PVC	1.30	39.01	1.20	6.11%
*	KRP Site	EX. SAN MH F	EX. SAN MH G	0.00	0.00	3.65	10.86	1.5	5.48	3.04	***8.52***	61.9	250	PVC	0.35	36.70	0.72	23.21%
†	KRP Site (Brookstreet Hotel)	HOTEL	EX. SAN MH G	2.21	4.49	2.21	4.49	1.5 - 4.0	7.07	1.26	***8.33***	22.0	200	PVC	0.90	32.46	1.00	25.65%
*	KRP Site	EX. SAN MH G	EX. SAN MH H	0.00	0.00	5.86	15.35	1.5	8.79	4.30	***13.09***	21.0	250	PVC	0.38	38.24	0.75	34.23%
	KRP Site (Parking Structure)	PRKG STRUCT	EX. SAN MH H	0.30	1.28	0.30	1.28	1.5	0.45	0.36	***0.81***	91.1	250	PVC	0.40	39.24	0.77	2.06%
*	KRP Site	EX. SAN MH H	EX. SAN MH I	0.00	0.00	6.16	16.63	1.5	9.24	4.66	***13.90***	88.9	250	PVC	0.38	38.24	0.75	36.35%
*	KRP Site	EX. SAN MH I	EX. 750 TRUNK	0.00	0.00	6.16	16.63	1.5	9.24	4.66	***13.90***	100.1	250	PVC	0.52	44.74	0.88	31.07%

Notes:
1. Q(d) = Q(p) + Q(i) , where
   Q(d) = Design Flow (L/sec)
   Q(p) = Population Flow (L/sec)
   Q(i) = Extraneous Flow (L/sec)
2. Q(i) = 0.28 L/sec/ha
3. Daily Sewage Flow from Office Towers = 75 L/person/day (Appendix 4-A, Ottawa Sewer Design Guidelines)
4. Commercial Peaking Factor = 1.5 (Figure 4.3 Ottawa Sewer Design Guidelines)
5. Refer to Sanitary Drainage Area Plan (114060-SAN, C200) for details of drainage areas
6. Refer to the 'Sanitary and Storm Sewer Design Brief' for a breakdown of Daily Sewage Flow components and applicable peaking factors from the Brookstreet Hotel

* Denotes sewers applicable to this MOE ECA appplication. All other sewers shown on this design sheet are private sewers tributary to the sanitary trunk sewer under application for MOE approval and/or have MOE approval under an existing C of A.
** An existing C of A covers the sanitary stub from SAN MH B north approx. 16.1m to the existing cap. The 10.7m of proposed sewer from the cap to SAN MH 3 is applicable to the new MOE ECA application.
† Total peak sanitary flow from hotel site = 8.33 L/s, including Extraneous Flows (Also refer to Note 6 above for further details)

LEGEND

- 2.02 / 101-103 / 1.5 | 2.6 — AREA IN HECTARES; AREA IDENTIFIER; PEAK FLOW RATE (L/s), incl. Extraneous Flows; PEAKING FACTOR
  *Refer to Sanitary and Storm Sewer Design Brief for detailed calculations of flow rates for each development
- SANITARY DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- SANITARY TRUNK SEWER AND MH
- TRIBUTARY SANITARY SEWER AND MH

MONMOUTH

MARCH ROAD

BROOKSTREET

LEGGET DRIVE

THE MARSHES GOLF COURSE

SELECTRON

1.23 TOWER 'C' 1.5 | 1.79

1.28 PARKING 1.5 | 0.36

4.49 HOTEL 1.5 | 0.40 | 8.33

4.05 NEWBRIDGE 1.5 | 3.67

3.37 TOWER 'D' 1.5 | 2.39

2.20 4-EX 'A' 5.7 | 2.62

PROPOSED 2-STOREY BUILDING FFE=80.00

EX. SAN INV=76.34

EX. SAN MH INV=75.94

EX. SAN INV=73.20

EX. SAN MH INV=70.29

EX. SAN MH INV=76.75

EX. SAN MH 'C' INV=76.68

EX. SAN INV=73.26

EX. SAN MH 'D' INV=75.13

EX. SAN MH 'E' INV=74.09

EX. SAN MH 'F' INV=73.74

EX. SAN MH 'G' INV=72.86

EX. SAN MH 'H' INV=72.74

EX. SAN MH 'I' INV=71.53

EX. SAN MH INV=70.11

SAN MH 1 INV=75.27

SAN MH 2 INV=76.04

SAN MH 3 INV=76.35

EX. SAN MH 'B' INV=76.44

EX. SAN MH 'A' INV=76.64

SAN MH 4 INV=76.80

SAN INV=77.00

EX. SAN INV=75.05

EX. SAN MH INV=69.93

EX. SAN MH INV=69.70

250mm-SANITARY SEWER

200mm-SAN SEWER

750mm-SANITARY SEWER

200mm SAN SERVICE

250 Ø SAN

CONC. PAD & BOLLARDS

FIRE ROUTE

No	DATE	EMISSION POUR / OBJECT
1	2014.05.28	ISSUED WITH DSS & SWM REPORT
2	2014.08.08	ISSUED WITH REVISED DSS & SWM REPORT
3	2014.09.25	ISSUED WITH REVISED DSS & SWM REPORT
4	2014.11.12	ISSUED FOR CITY / MOE APPROVAL

CLÉ / KEY :

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

MECHANICAL, ELECTRICAL ENGINEER :

CIVIL ENGINEER :

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

MECHANICAL, ELECTRICAL ENGINEER :

STRUCTURAL ENGINEER :

CLIENT :

ARCHITECT :

Architects
190 Somerset St. W
Suite 206
Ottawa , Ontario
K2P 0J4
T.613.695.6122
F.514.861.5383
www.rubinrotman.com
Rubin & Rotman architects

SEAL :

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041992
Nov. 12, 2014
PROVINCE OF ONTARIO

NOTE :

L'entrepreneur doit vérifier toutes les informations et dimension sur le site et aviser immédiatement l'architecte de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.

PROJECT NAME :

Sanmina
500 March Rd.
Kanata, Ontario

TITLE :

SANITARY DRAINAGE AREA PLAN

ISSUE DATE : 2014.11.12	DRAWN BY : SM
SCALE : 1 : 750	VERIFIED BY : FST
NECL FILE : 114060-SAN	DRAWING NO : C200
	REVISION : 4

M:\2014\114060\CAD\DESIGN\114060-SAN.DWG
Date de tracage : 2014/11/12
par dmb

Appendix D
Storm Servicing and Stormwater Management

Ottawa (Head Office)
1800 Bantree Street
Ottawa, Ontario K1B 5L6
☎ 613.745.2444
613.745.9994

Montreal
7562, Côte-de-Liesse
St-Laurent, Quebec H4T 1E7
☎ 514.738.2666
514.738.9762

www.cwwcanada.com
1.866.695.0155

CLEAN WATER WORKS INC.

INTEGRATED SEWER SOLUTIONS

NOVATECH ENGINEERING CONSULTANTS LTD.

535 LEGGET DRIVE
Ottawa, Ontario

SEWER CCTV INSPECTION REPORT

Report ID
140291ST1

Sewer Use
Storm

Completion Date
August 08, 2024

Inspected Length
21.40 meters

Table of contents

1. Index of pipes

1 item

Pipe	Start/End	Direction	Road	Date	Diameter	Inspected	Total	Page
BUILDING MHST56497	MHST56497 --> BUILDING	U - Upstream	535 Legget Dr.	08/08/2024 9:08 AM	200	21.4	0	5
						Total: 21.4		

2. Structural rating

1 item

5 - Most significant defect grade (1 of 1 items)

Score	Quick	Index	Pipe	Start/End	Direction	Street	Page
7	5121	3.5	BUILDING MHST56497	MHST56497 --> BUILDING	Against flow	535 Legget Dr.	5

3. O&M rating

1 item

5 - Most significant defect grade (1 of 1 items)

Score	Quick	Index	Structural	Pipe	Start/End	Direction	Street	Page
9	5141	4.5	5	BUILDING MHST56497	MHST56497 --> BUILDING	Against flow	535 Legget Dr.	5

4. Pipe summary and condition details

Pipe identification

Pipe:	BUILDING MHST56497	**Direction of inspection:**	MHST56497 --> BUILDING
Direction of flow:	BUILDING --> MHST56497	**Direction:**	Against flow

Pipe location

			UPSTREAM	DOWNSTREAM
Road:	535 Legget Dr.	**Easting (X):**		
Crossroad:		**Northing (Y):**		
Drainage Area:		**Elevation (Z):**		
City:	Kanata			
Location:	Parking Lot	**GPS Accuracy:**		
Owner:	Unknown	**Corrdinate System:**		
Road segment:		**Vertical Datum:**		

Pipe characteristics

Sewer Use:	Stormwater	**Inspected length:**	21.4
Height:	200	**Total length:**	0
Width:		**Rim/Inv.:**	
Shape:	Circular	**Grade/Inv.:**	
Material:	Polyvinyl Chloride	**Rim/Grade:**	
Lining:		**Rim/Inv.:**	
Joint length:	4	**Grade/Inv.:**	
Year laid:		**Rim/Grade:**	
Year renewed:		**Sewer category:**	

Additional details

Inspection standard:	PACP 6.0	**Location details:**	
Date:	08/08/2024 9:08 AM	**Surveyed by:**	Derek Jessup
Project Number:		**Certificate #:**	U06180703002192
Customer:	Novatech Engineering	**Pre-Cleaning:**	Jetting
PO number:		**Date cleaned:**	
Work order:	140291	**Unit of measurement:**	Metric
Purpose:		**Media label:**	
Weather:	Dry	**Sheet #:**	
Flow control:	Not Controlled		

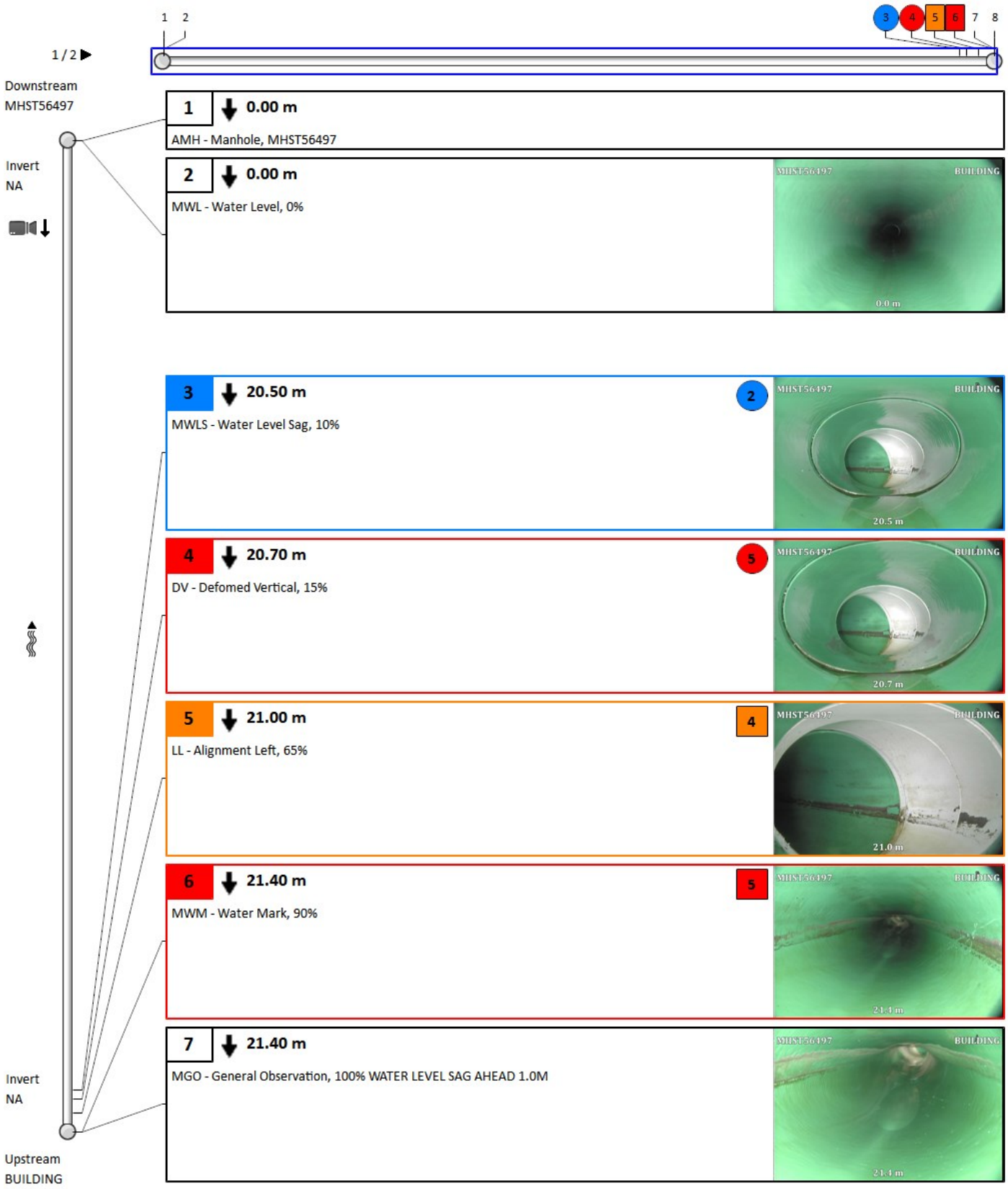
Structural rating		O&M rating		Overall rating	
Peak:	5	**Peak:**	5	**Peak:**	5
Quick rating:	5121	**Quick rating:**	5141	**Quick rating:**	5241
Score:	7	**Score:**	9	**Score:**	16
Index:	3.5	**Index:**	4.5	**Index:**	4

Additional information

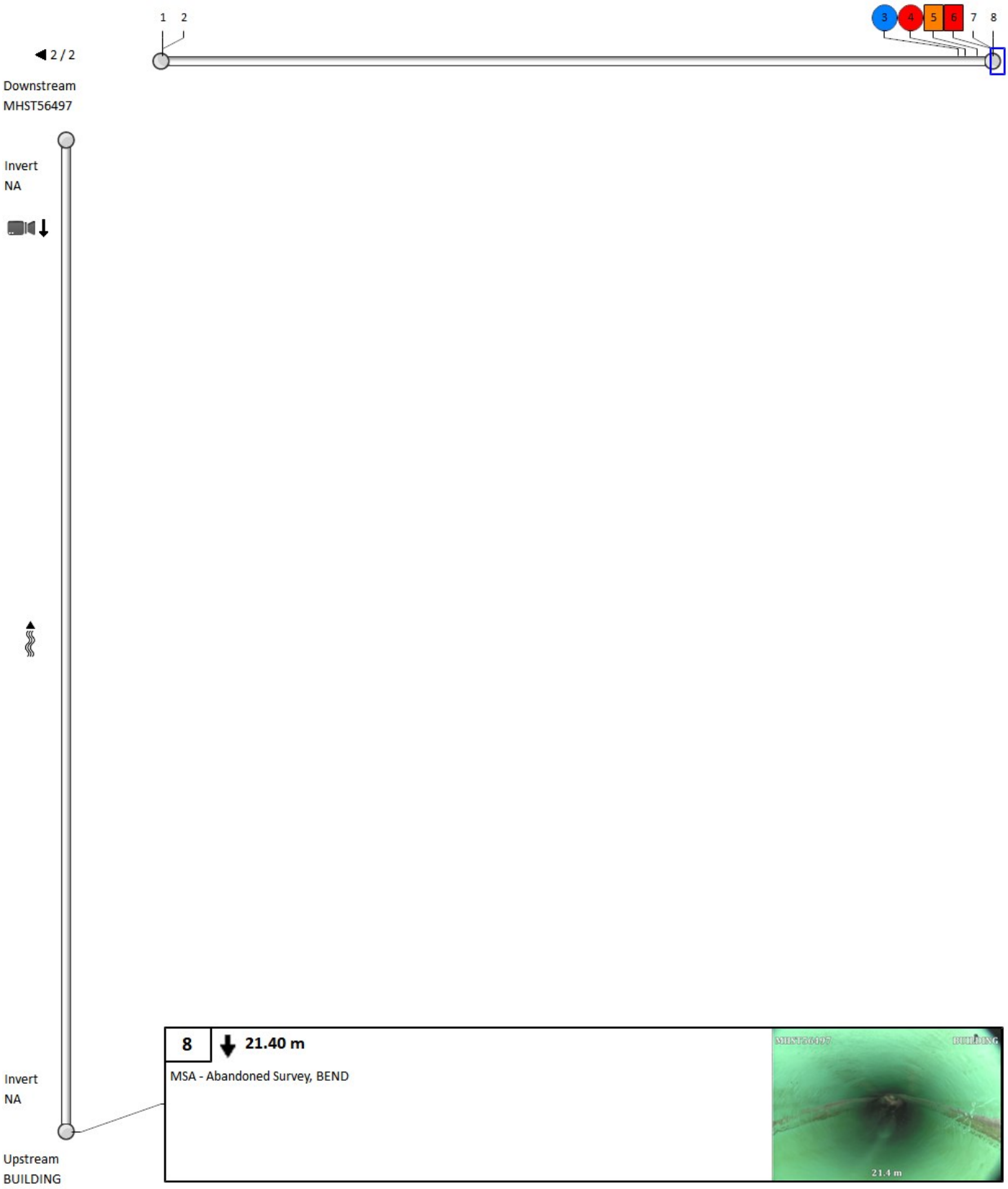
Other information

Report ID:	140291ST1	**Information 6:**	
Information 2:		**Information 7:**	
Information 3:		**Information 8:**	
Information 4:		**Information 9:**	
Information 5:		**Information 10:**	

4. Pipe summary and condition details



4. Pipe summary and condition details



FR

535 LEGGET DR

Show search results for **535 leggett**

375mmØ PVC

375mmØ PVC

535

250mmØ PVC

MHSA56271

IN92780

200mmØ PVC

MHST56497

250mmØ PVC

600mmØ P

IN92782

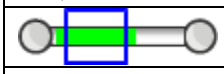
IN92781

prom. Legget Dr.

10m

-8451050.755 5676537.393 Meters

Vision Report© Legend

	The numbers sequentially identify each observation. They allow you to find complete descriptions and related photos throughout the pages. Note that when the pipe contains too many observations, the Vision© report hides the least important observations to optimize the display*.
60	A number with neither a square nor circle indicates a general observation.
	A circled number indicates a structural anomaly. The color of the circle indicates the severity of the anomaly on a scale of 1 to 5, 5 being the most severe: green=1, blue=2, magenta=3, orange=4 and red=5.
	A number in a square indicates an operation and maintenance anomaly. The color of the square indicates the severity of the anomaly on a scale of 1 to 5, 5 being the most severe: green=1, blue=2, magenta=3, orange=4 and red=5.
◀ 3 / 31 ▶	Indicates the current page number of the inspection report.
	The blue square indicates a section of the pipe; this section is covered in detail on the current page of the report.
	The green line indicates the inspected part of the pipe. The remaining white line indicates the uninspected part of the pipe.
	Indicates the hold points on the camera during an inspection.
	Indicates the hold points on the camera during the reverse inspection.
	Indicates that a reverse inspection was carried out, however the camera did not reach the initial inspection hold point. (the hold point of the initial inspection)
	Indicates that a reverse inspection was carried out and that it has joined (has arrived at) the initial inspection hold point.
401-059B	Identifies the start manhole number. Note that this manhole is not necessarily the upstream manhole of the pipe.
401-631	Identifies the end manhole number. Note that this manhole is not necessarily the downstream manhole of the pipe.
ou	A downward arrow indicates that the inspection was carried out in the direction of the current, whereas an upward arrow indicates an inspection against the current. Note that the manhole located on the upper left of the page is always the start manhole, but not necessarily the upstream manhole of the pipe.
	This camera followed by a downward arrow is located on the upper left of the vertical pipe; it indicates that an inspection was done from this manhole.
	When the second camera appears on the bottom left page it means that a reverse inspection was carried out. Information about the reverse inspection is included in the report, thereby combining both inspections.
Invert 3.40	The measurement shown under the word <Invert> indicates the measurements between the frame and the pipe captured during the inspection. This measurement is available at the top left for the start manhole and the bottom left for the end manhole. If the invert was not measured during the inspection, an <NA> mark will be displayed.
	The downward bold arrow to the right of the observation number indicates that this observation was captured during the initial inspection.
	The blank arrow pointing upwards and located to the right of the observation number indicates that this observation was taken during the reverse inspection period, thereby confirming that this report combined both inspections.
18.40 m	Located to the right of the observation number is a number identifying the observation distance in relation to the start of the pipe.
SRV - Armature visible	A full description of the observation code according to the protocol used.

*Any hidden observations are readily accessible from the database as well as in other CTSpec report templates.

** CTSpec inc. reserves the right to modify, eliminate or add to the product features described in this pamphlet without notice.

Novatech Project #: 124045
Project Name: 535 Legget Drive
Date: 8/26/2024
Input By: Anjush Musyaju, E.I.T.
Reviewed By: Curtis Ferguson, E.I.T.
Drawing Reference: 124045-Post-STM

Storm Design Event = 2 Year

Location					
Development	**Area ID**	**Hardscape** **0.9**	**Landscape** **0.2**	**Area** **A (ha.)**	**Runoff Coefficient** **C**
535 Legget Drive	A-01	0.61	0.18	0.79	0.74
Totals				**0.79**	

Demand Equation / Parameters

1. Q = 2.78 ACI

Definitions

Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
C = Weighted runoff coefficient (increased by 25% for 100-year)
I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

EXISTING 535 LEGGET
11-STOREYS BUILDING
OFFICE TO RESIDENTIAL
FFE=79.80
BASEMENT FLOOR
ELEV.=76.80

535 LEGGET DRIVE
TOWER "C"

NEW ENTRANCE AND INTERIOR STAIRS FOR HOTEL

Finished Floor Elev.=79.82

Top Of Roof Elev.=123.56

Finished Floor Elev.=79.83

Top Of Roof Elev.=80.14

CONCRETE PAD

DRAIN PIPE

SOD

EX. CURB

CONCRETE SIDEWALK

INTERLOCK

Concrete Ramp

STM CAP INV.=76.15

MAIN ENTRANCE Elev.=79.80

EX. SIAMESE CONNECTION

ASPHALT

JOB BENCH MARK #3 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 80.60

OUTLINE OF UNDERGROUND PARKING

HYD.

CB T/G= 78.98 INV. SW=77.58

48.6m-375mmØ STM @ 0.6%

CBMH 4 T/G=79.17 INV.N=76.92 INV.S=76.75

@ 1.1%

CBMH 5 T/G=79.15 E.INV=77.20 EX.W INV=77.25

0.79
A-01
0.74

2.1m - 250mm Ø PVC DR-35 STM

T/G= 78.82 INV. S=76.15 INV. E= 75.85 INV. W=75.89 INV. N=77.48

95.3m-200mmØ PVC DR-35 STM @ 1.0%

45.0m - 600mmØ CONC. STM

CBMH T/G= 78.92 INV.E=75.66 INV.W.=75.68

13.0m-200mmØ PVC DR-35 STM @ 1.0%

CB T/G=79.07 INV.=77.70

1.0m - 200mmØ PVC DR-35 STM @ 1.0%

10m-200mmØ STM @1.0%

CB T/G=78.94 INV.=77.70

CB T/G=78.99

ASPHALT

SL

EX. CURB

CONCRETE SIDEWALK

INTERLOCK

MHYD

COMMUNICATION BOX

COMMUNICATION TRANSFORMER

EX. HYD.

V&VB

CB T/G=79.25

CB T/G=79.34

SAN MH T/G=79.48 INV. =76.75

JOB BENCH MARK #1 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 80.45

JOB BENCH MARK #2 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 80.39

EX. 60.25-250mmØ SAN SEWER @ 0.31%

STM MH T/G=79.40 INV. =77.48

EX. 65.57m-525mmØ STM SEWER @ 0.2%

LEGGET DRIVE

LEGEND

PROPERTY LINE

STORM DRAINAGE AREA BOUNDARY

0.2
A-02
0.2

AREA IN HECTARES

MANHOLE TO MANHOLE

COEFFICIENT

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

535 LEGGET DRIVE

PRE-DEVELOPMENT STORM DRAINAGE PLAN

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE SEPT 2024 | JOB 124045 | FIGURE PRE-STM

SHT11X17.DWG - 279mmX432mm

M:\2024\124045\CAD\Civil\124045-Post_STM.dwg, 11X17POST-STM, Aug 30, 2024 - 4:56pm, cferguson

Novatech Project #: 124045
Project Name: 535 Legget Drive
Date: 8/26/2024
Input By: Anjush Musyaju, E.I.T.
Reviewed By: Curtis Ferguson, E.I.T.
Drawing Reference: 124045-Pre-STM

Storm Design Event = 2 Year

Location					
Development	**Area ID**	**Hardscape** **0.9**	**Landscape** **0.2**	**Area** **A (ha.)**	**Runoff Coefficient** **C**
535 Legget Drive	A-01	0.60	0.19	0.79	0.73
Totals				**0.79**	

Demand Equation / Parameters

1. Q = 2.78 ACI

Definitions

Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
C = Weighted runoff coefficient (increased by 25% for 100-year)
I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

EX-LS

48.6m-375mmØ STM @ 0.6%

@ 1.1%

CBMH 4
T/G=78.17
INV.N=76.92
INV.S=76.75

CBMH 5
T/G=78.15
E.INV=77.20
EX.W INV=77.25

EX CBMH 6
T/G=78.14
INV.E=76.37
INV.W=76.48
INV.N=76.48

EX. CURB

SOD

Finished Floor Elev.=79.83

Top Of Roof Elev.=89.14

CONCRETE PAD

DRAIN PIPE

DRAIN PIPE

Finished Floor Elev.=79.82

535 LEGGET DRIVE
TOWER "C"

Finished Floor Elev.=79.82

Top Of Roof Elev.=123.56

INTERLOCK

INTERLOCK

EX. CURB

CONCRETE SIDEWALK

Concrete Ramp

ASPHALT

EX. SIAMESE CONNECTION

Finished Floor Elev.=79.84

Top Of Roof Elev.=123.57

INTERLOCK

INTERLOCK

CONCRETE SIDEWALK

CONCRETE SIDEWALK

CONCRETE SIDEWALK

ASPHALT

EX. CURB

ASPHALT

EX. CURB

INTERLOCK

MHYD

COMMUNICATION BOX

COMMUNICATION BOX

COMMUNICATION BOX

EX. HYD.

COMMUNICATION TRANSFORMER

EX.HYD.

EX. CURB

EX. CURB

CB T/G=79.25

V&VB

V&VB

EX. CURB

JOB BENCH MARK #1 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 80.45

JOB BENCH MARK #3 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 80.60

HYD.

OUTLINE OF UNDERGROUND PARKING

CB T/G= 78.98 INV. SW=77.58

CONCRETE SIDEWALK

ASPHALT

STM CAP INV.=76.15

25.0m-200mmØ PVC DR-35 STM @ 1.0%

21.0m - 200mmØ PVC DR-35 STM

T/G= 78.82
INV. S=76.15
INV. E= 75.85
INV. W=75.89
INV. N=77.48

ASPHALT

45.0m - 600mmØ CONC. STM

CBMH
T/G= 78.92
INV.E=75.66
INV.W=75.68

13.0m-200mmØ CL 52 DI @ 10%

CB T/G=79.07 INV.=77.70

0.79
A-01
0.73

11.0m - 200mmØ PVC DR-35 STM @ 1.0%

10m-200mmØ STM @1.0%

CB T/G=78.94 INV.=77.70

CB T/G= 78.99

ASPHALT

ASPHALT

ASPHALT

CB T/G=79.34

V&VB

SAN MH T/G=79.48 INV. =76.75

JOB BENCH MARK #2 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 80.39

EX. 60.25-250mmØ SAN SEWER @ 0.31%

STM MH T/G=79.40 INV. =77.48

EX. 65.57m-525mmØ STM SEWER @ 0.2%

EX. CURB

LEGGET DRIVE

LEGEND

PROPERTY LINE

STORM DRAINAGE AREA BOUNDARY

0.2
A-02
0.2

AREA IN HECTARES

MANHOLE TO MANHOLE

COEFFICIENT

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Website www.novatech-eng.com

535 LEGGET DRIVE

PRE-DEVELOPMENT STORM DRAINAGE PLAN

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE AUG 2024 | JOB 124045 | FIGURE PRE-STM

SHT11X17.DWG - 279mmX432mm

M:\2024\124045\CAD\Civil\124045-Pre_STM.dwg, 11x17PRE-STM, Aug 30, 2024 - 4:56pm, dferguson

TABLE 1A: Roof Allowable Flows

Outlet Options	Area (ha)	Q_{ALLOW} (L/s)
535 Legget Drive	0.134	**22.0**

Note; Allowable Release Rate from Novatech Orignal Report "Kanata Research Park - Tower C Stromwater Managment Report" December, 1998

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: August 29, 2024

TABLE 2A: Post-Development Runoff Coefficient "C" - R-03

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.006	0.90	0.90	1.00
0.006	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 2B: Post-Development R-03 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
KRP Pond	0.006	0.90	10	**1.1**	**1.5**	**2.9**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

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DATE PREPARED: August 29, 2024

TABLE 3A: Post-Development Runoff Coefficient "C" - R-04

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.006	0.90	0.90	1.00
0.006	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 3B: Post-Development R-04 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
KRP Pond	0.006	0.90	10	**1.1**	**1.5**	**2.9**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

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Engineers, Planners & Landscape Architects

DATE PREPARED: August 29, 2024

TABLE 4A: Post-Development Runoff Coefficient "C" - R-05

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.006	0.90	0.90	1.00
0.006	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 4B: Post-Development R-05 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
KRP Pond	0.006	0.90	10	**1.1**	**1.5**	**2.9**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

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DATE PREPARED: August 29, 2024

TABLE 5A: Post-Development Runoff Coefficient "C" - R-06

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.006	0.90	0.90	1.00
0.006	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 5B: Post-Development R-06 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
KRP Pond	0.006	0.90	10	**1.1**	**1.5**	**2.9**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: 535 Legget Drive, City of Ottawa

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DATE PREPARED: August 28, 2024

TABLE 6A: Post-Development Runoff Coefficient "C" - R-01

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.055	Roof	0.055	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 6B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-01

0.055 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	35	36.06	4.96	1.167	3.80	7.97
	40	32.86	4.52	1.167	3.36	8.05
	45	**30.24**	**4.16**	**1.167**	**2.99**	**8.09**
	50	28.04	3.86	1.167	2.69	8.08
	55	26.17	3.60	1.167	2.43	8.04

TABLE 6C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-01

0.055 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	40	44.18	6.08	1.406	4.68	11.22
	45	40.63	5.59	1.406	4.19	11.30
	50	**37.65**	**5.18**	**1.406**	**3.78**	**11.33**
	55	35.12	4.83	1.406	3.43	11.31
	60	32.94	4.53	1.406	3.13	11.26

TABLE 6D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-01

0.055 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	65	52.65	8.05	1.765	6.29	24.52
	70	49.79	7.61	1.765	5.85	24.57
	75	**47.26**	**7.23**	**1.765**	**5.46**	**24.58**
	80	44.99	6.88	1.765	5.12	24.55
	85	42.95	6.57	1.765	4.80	24.50

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 6E: Storage Provided - R-01

Area R-01: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.010	0.00	
0.025	16.537	0.21	
0.050	66.480	1.24	
0.075	148.297	3.93	
0.100	245.091	8.85	
0.125	367.175	16.50	
0.150	520.882	27.60	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

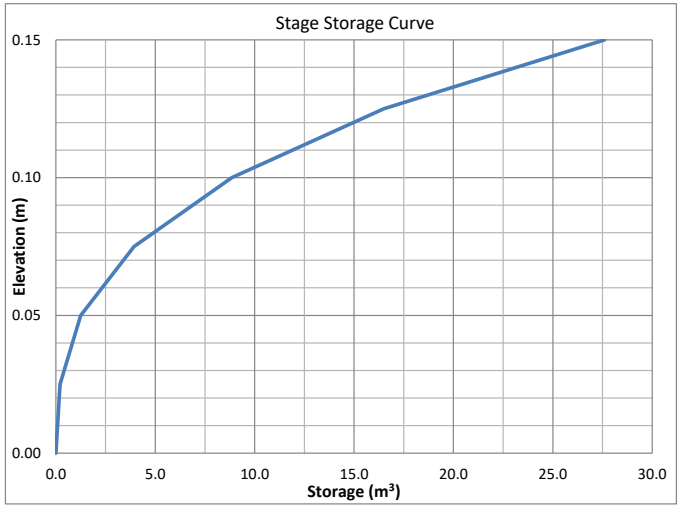


Table 6F: Roof Drain Flows

Roof Drains		
Roof Area	550.089	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	Full Open	
Design Head	0.05-0.15	m
Design Flow 1" of head (0.025m)	0.32	L/s (ea)
Design Flow 2" of head (0.051m)	0.63	L/s (ea)
Design Flow 3" of head (0.076m)	0.95	L/s (ea)
Design Flow 4" of head (0.102m)	1.26	L/s (ea)
Design Flow 5" of head (0.127m)	1.58	L/s (ea)
Design Flow 6" of head (0.152m)	1.89	L/s (ea)

Table 6G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-01	1.167	0.094	8.09
5 Year		1.406	0.113	11.33
100 Year		1.766	0.142	24.58

WATTS | Adjustable Accutrol Weir Tag: _____ | Adjustable Flow Control for Roof Drains

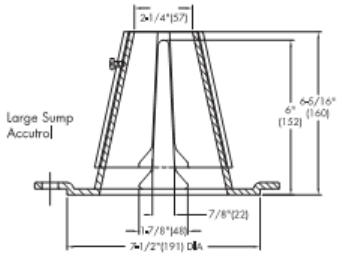
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

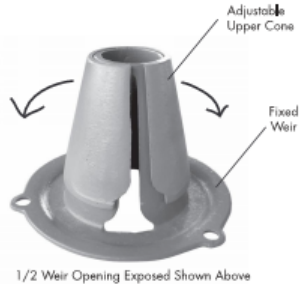
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the 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	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	5	5	5	5	5

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: 535 Legget Drive, City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: August 30, 2024

TABLE 7A: Post-Development Runoff Coefficient "C" - R-02

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90	0.90	1.00	1.00
0.055	Roof	0.055	0.90		1.00	
	Soft	0.000	0.20		0.25	

TABLE 7B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-02

0.055 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	35	36.06	4.96	1.167	3.80	7.97
	40	32.86	4.52	1.167	3.36	8.05
	45	**30.24**	**4.16**	**1.167**	**2.99**	**8.09**
	50	28.04	3.86	1.167	2.69	8.08
	55	26.17	3.60	1.167	2.43	8.04

TABLE 7C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-02

0.055 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	40	44.18	6.08	1.406	4.68	11.22
	45	40.63	5.59	1.406	4.19	11.30
	50	**37.65**	**5.18**	**1.406**	**3.78**	**11.33**
	55	35.12	4.83	1.406	3.43	11.31
	60	32.94	4.53	1.406	3.13	11.26

TABLE 7D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-02

0.055 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	65	52.65	8.05	1.765	6.29	24.52
	70	49.79	7.61	1.765	5.85	24.57
	75	**47.26**	**7.23**	**1.765**	**5.46**	**24.58**
	80	44.99	6.88	1.765	5.12	24.55
	85	42.95	6.57	1.765	4.80	24.50

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 7E: Storage Provided - R-02

Area R-02: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.010	0.00	
0.025	16.537	0.21	
0.050	66.480	1.24	
0.075	148.297	3.93	
0.100	245.091	8.85	
0.125	367.175	16.50	
0.150	520.882	27.60	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

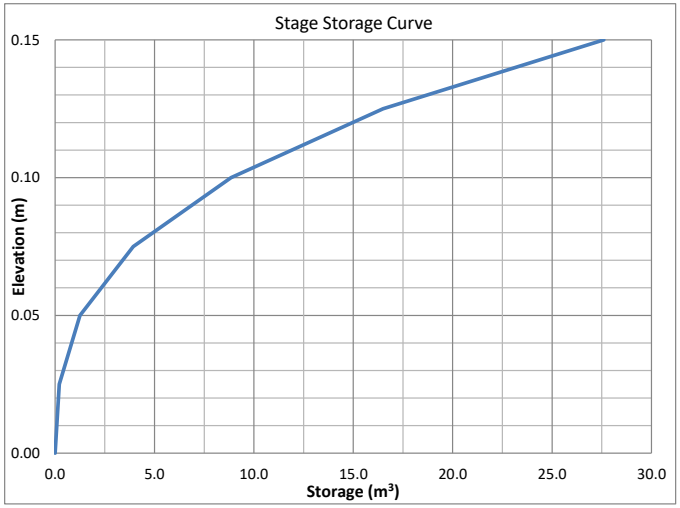


Table 7F: Roof Drain Flows

Roof Drains		
Roof Area	550.089	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	Full Open	
Design Head	0.05-0.15	m
Design Flow 1" of head (0.025m)	0.32	L/s (ea)
Design Flow 2" of head (0.051m)	0.63	L/s (ea)
Design Flow 3" of head (0.076m)	0.95	L/s (ea)
Design Flow 4" of head (0.102m)	1.26	L/s (ea)
Design Flow 5" of head (0.127m)	1.58	L/s (ea)
Design Flow 6" of head (0.152m)	1.89	L/s (ea)

Table 7G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-02	1.167	0.094	8.09
5 Year		1.406	0.113	11.33
100 Year		1.766	0.142	24.58

WATTS® | Adjustable Accutrol Weir Tag: _____ | Adjustable Flow Control for Roof Drains

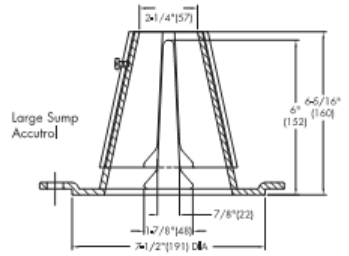
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

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	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	5	5	5	5	5

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 8A: Post-Development Runoff Coefficient "C" - R-07

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 8B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-07

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 8C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-07

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 8D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-07

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 8E: Storage Provided - R-07

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

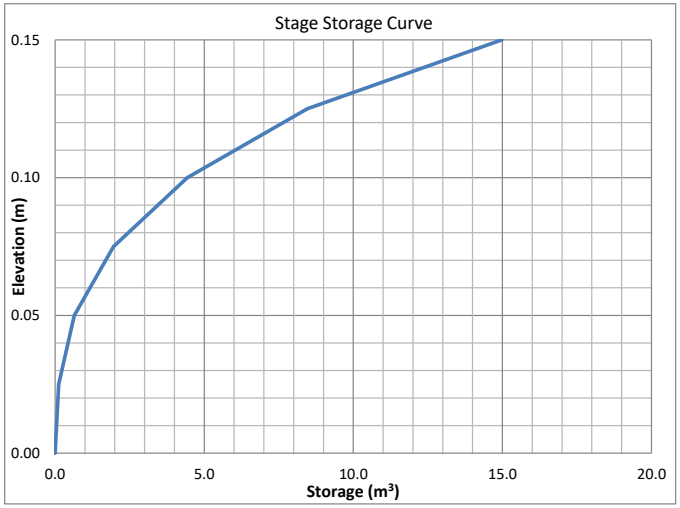


Table 8F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 8G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 9A: Post-Development Runoff Coefficient "C" - R-08

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 9B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-08

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 9C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-08

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 9D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-08

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 9E: Storage Provided - R-08

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

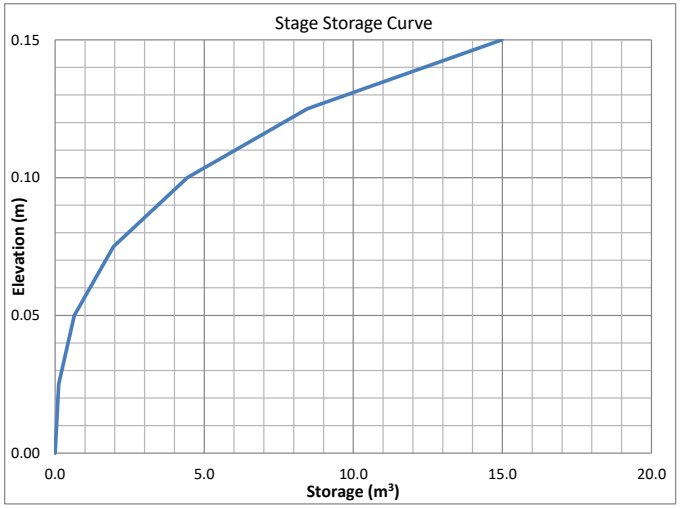


Table 9F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 9G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 10A: Post-Development Runoff Coefficient "C" - R-09

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 10B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-09

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 10C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-09

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 10D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-09

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 10E: Storage Provided - R-09

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

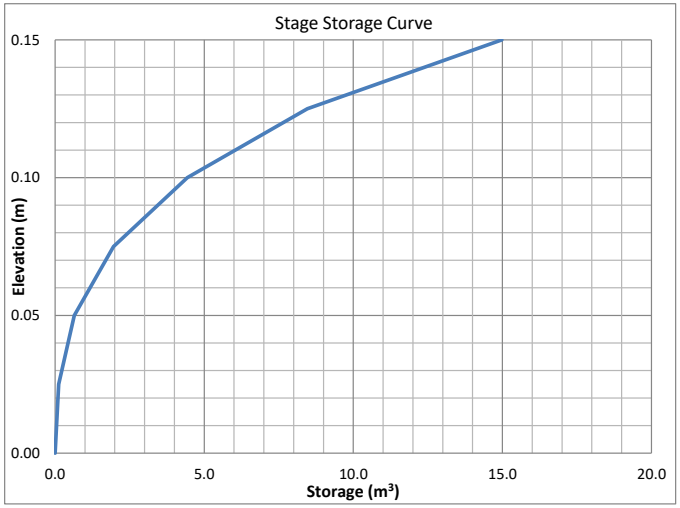


Table 10F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 10G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 11A: Post-Development Runoff Coefficient "C" - R-10

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 11B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-10

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 11C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-10

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 11D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-10

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 11E: Storage Provided - R-10

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

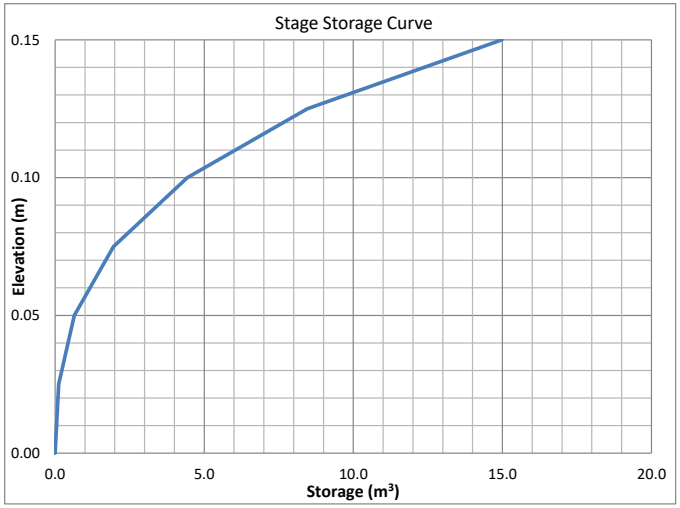


Table 11F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 11G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 8A: Post-Development Runoff Coefficient "C" - R-07

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 8B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-07

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 8C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-07

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 8D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-07

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 8E: Storage Provided - R-07

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

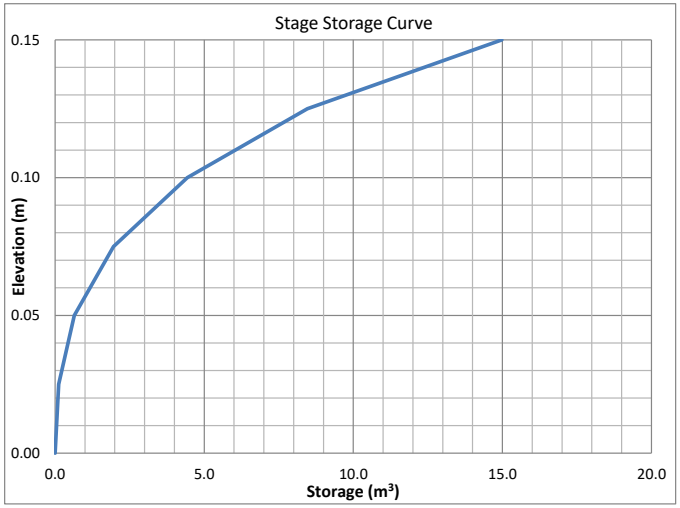


Table 8F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 8G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 9A: Post-Development Runoff Coefficient "C" - R-08

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 9B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-08

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 9C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-08

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 9D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-08

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 9E: Storage Provided - R-08

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

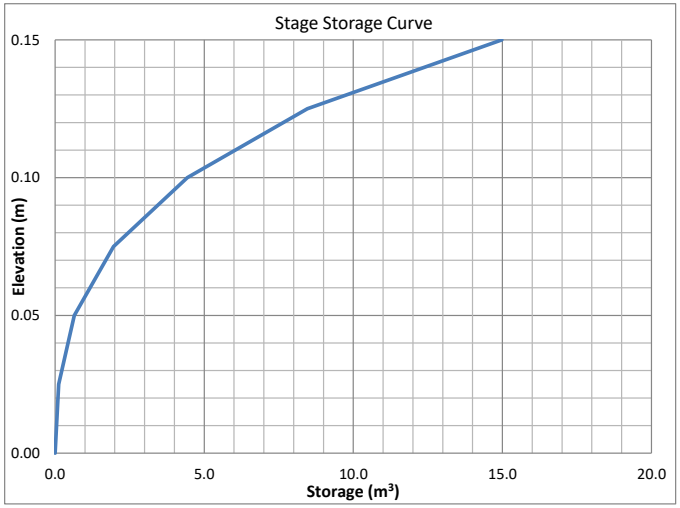


Table 9F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 9G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 10A: Post-Development Runoff Coefficient "C" - R-09

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 10B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-09

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 10C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-09

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 10D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-09

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 10E: Storage Provided - R-09

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

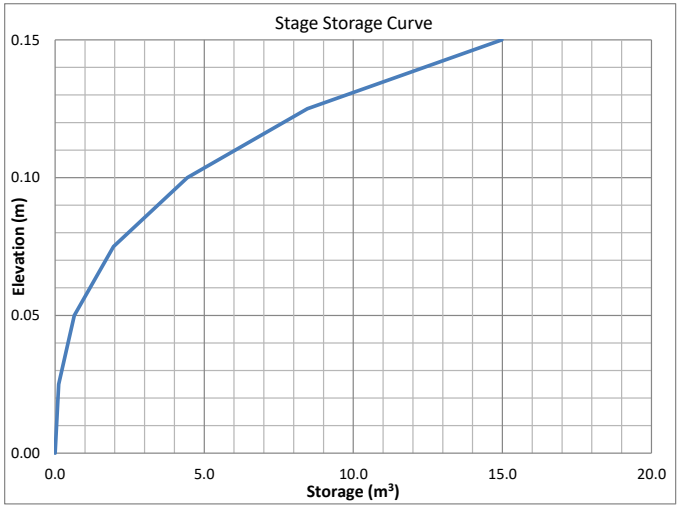


Table 10F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 10G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: October 8, 2024

TABLE 11A: Post-Development Runoff Coefficient "C" - R-10

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.000	0.90		1.00	
0.034	Roof	0.034	0.90	0.90	1.00	1.00
	Soft	0.000	0.20		0.25	

TABLE 11B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-10

0.034 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	3.84	1.038	2.80	4.20
	30	40.04	3.40	1.038	2.36	4.25
	35	**36.06**	**3.06**	**1.038**	**2.02**	**4.25**
	40	32.86	2.79	1.038	1.75	4.21
	45	30.24	2.57	1.038	1.53	4.13

TABLE 11C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-10

0.03394 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	25	60.90	5.17	1.325	3.85	5.77
	30	53.93	4.58	1.325	3.25	5.86
	35	**48.52**	**4.12**	**1.325**	**2.80**	**5.87**
	40	44.18	3.75	1.325	2.43	5.82
	45	40.63	3.45	1.325	2.13	5.74

TABLE 11D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - R-10

0.03394 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	40	75.15	7.09	1.572	5.52	13.24
	45	69.05	6.52	1.572	4.94	13.35
	50	**63.95**	**6.03**	**1.572**	**4.46**	**13.39**
	55	59.62	5.63	1.572	4.05	13.38
	60	55.89	5.27	1.572	3.70	13.33

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 11E: Storage Provided - R-10

Area R-03: Storage Table			
Head (m)	Area* (m^2)	Storage Volume (m^3)	
0.000	0.610	0.00	
0.025	8.983	0.12	
0.050	32.985	0.64	
0.075	72.071	1.96	
0.100	126.238	4.44	
0.125	195.489	8.46	
0.150	326.374	14.98	

* Area of ponding based on prelimnary roof plans. Areas and storage will be updated once a mechanical engineer is retained

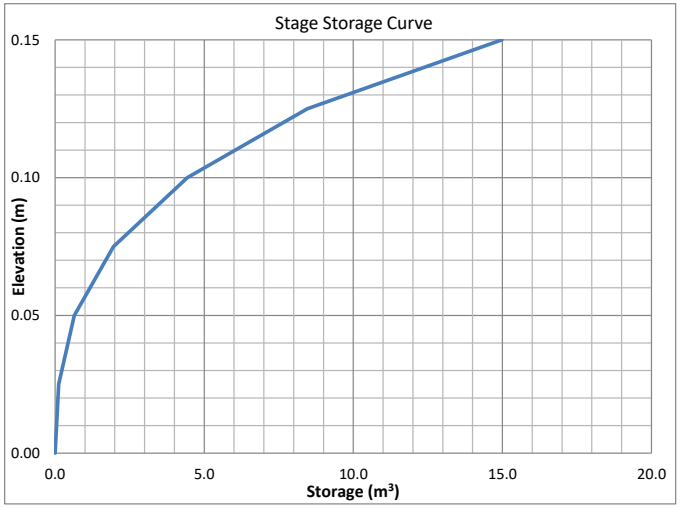


Table 11F: Roof Drain Flows

Roof Drains		
Roof Area	339.4	m²
Qty	1	
Type	Accutrol RD-100-A-ADJ	
Setting	3/4 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.87	L/s (ea)
Design Flow 4" of head	1.10	L/s (ea)
Design Flow 5" of head	1.34	L/s (ea)
Design Flow 6" of head	1.58	L/s (ea)

Table 11G: Total Roof Storage

Design Event	Roof Drain ID	Flow (L/S)	Head m	Required Volume
2 Year	R-07	1.038	0.099	4.25
5 Year		1.325	0.117	5.87
100 Year		1.572	0.147	13.39

PROJECT #: 124045
PROJECT NAME: 535 Legget Drive - KRP Tower C
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: August 30, 2024

Roof Post-Development Stormwater Management Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	1:100 Year Weighted Cw	Control Device		Outlet Location	2 Year Storm Event				5 Year Storm Event				100 Year Storm Event			
							Release (L/s)	Ponding Depth* (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)	Release (L/s)	Ponding Depth* (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)	Release (L/s)	Ponding Depth* (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)
R-01	0.055	0.90	1.00	Accutrol RD-100-A-ADJ	Full Open	KRP Pond	1.17	0.09	8.09	27.60	1.41	0.11	11.33	27.60	1.77	0.14	24.58	27.60
R-02	0.055	0.90	1.00	Accutrol RD-100-A-ADJ	Full Open	KRP Pond	1.17	0.09	8.09	27.60	1.41	0.11	11.33	27.60	1.77	0.14	24.58	27.60
R-03	0.006	0.90	1.00	N/A		KRP Pond	1.10				1.50				2.90			
R-04	0.006	0.90	1.00	N/A		KRP Pond	1.10				1.50				2.90			
R-05	0.006	0.90	1.00	N/A		KRP Pond	1.10				1.50				2.90			
R-06	0.006	0.90	1.00	N/A		KRP Pond	1.10				1.50				2.90			
R-07	0.034	0.90	1.00	Accutrol RD-100-A-ADJ	3/4 Open	KRP Pond	1.04	0.10	4.25	14.98	1.33	0.12	5.87	14.98	1.57	0.15	13.39	14.98
R-08	0.034	0.90	1.00	Accutrol RD-100-A-ADJ	3/4 Open	KRP Pond	1.04	0.10	4.25	14.98	1.33	0.12	5.87	14.98	1.57	0.15	13.39	14.98
R-09	0.034	0.90	1.00	Accutrol RD-100-A-ADJ	3/4 Open	KRP Pond	1.04	0.10	4.25	14.98	1.33	0.12	5.87	14.98	1.57	0.15	13.39	14.98
R-10	0.034	0.90	1.00	Accutrol RD-100-A-ADJ	3/4 Open	KRP Pond	1.04	0.10	4.25	14.98	1.33	0.12	5.87	14.98	1.57	0.15	13.39	14.98
Post-Development Flow							**10.9**	**-**			**14.1**	**-**			**21.4**	**-**	**49.2**	
Total Allowable Release Rate							**22.0**				**22.0**				**22.0**			

* Ponding depth is measured from the control device

Note Roof storage and flows are based on preliminary roof plans. Areas and storage will be updated once a mechanical engineer is retained, and final drawings are prepared.

0.034
R-07
0.9

0.034
R-08
0.9

0.006
R-03
0.9

0.006
R-04
0.9

0.055
R-01
0.9

0.055
R-02
0.9

0.006
R-05
0.9

0.006
R-06
0.9

0.034
R-10
0.9

0.034
R-09
0.9

STM CAP INV=76.15

INV. E=75.94
INV. W=75.89
INV. N=75.99

CB
T/G= 78.82
INV. S=76.15
INV. E=75.85
INV. W=75.89
INV. N=77.48

21.97m - 200mmØ PVC DR-35 STM

25.3m-200mmØ PVC DR-35 STM @ 1.0%

41.0m - 200mmØ PVC DR-35 STM @ 1.0%

10m-200mmØ STM @1.0%

LEGEND

PROPERTY LINE

STORM DRAINAGE AREA BOUNDARY

0.9
R-02
0.2

AREA IN HECTARES

MANHOLE TO MANHOLE

COEFFICIENT

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

535 LEGGET DRIVE

ROOF DRAINAGE PLAN

SCALE 1 : 250 (0 2 4 6 8 10)

DATE OCT 2024 | JOB 124045 | FIGURE ROOF

SHT11X17.DWG - 279mmX432mm

M:\2024\124045\CAD\Civil\124045-Roof.dwg, ROOF, Sep 11, 2024 - 5:00pm, cferguson

STORM SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124045
Project Name: 535 Legget - KRP Tower C
Date Prepared: 9/5/2024
Date Revised:
Input By: Curtis Ferguson, E.I.T.
Reviewed By: Greg MacDonald, P.Eng
Drawing Reference: 124045-ROOF

Legend:
- PROJECT SPECIFIC INFO
- USER DESIGN INPUT
- CUMILATIVE CELL
- CALCULATED DESIGN CELL OUTPUT
- USER AS-BUILT INPUT

LOCATION			DEMAND											CAPACITY							
			AREA							FLOW					PROPOSED SEWER PIPE SIZING / DESIGN							
From MH	To MH	Area ID	Hardscape	Landscaping	Total Area	Weighted Runoff Coefficient*	Indivi 2.78 AR	Accum 2.78 AR	Time of Concentration (min.)	Rain Intensity (mm/hr) 2yr	5yr	100yr	Peak Flow (L/s)	TOTAL UNRESTRICTED PEAK FLOW (QDesign) (L/s)	PIPE PROPERTIES LENGTH (m)	SIZE / MATERIAL (mm / type)	ID ACTUAL (m)	ROUGHNESS	DESIGN GRADE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min.)	QPEAK DESIGN / QFULL (%)
			0.90	0.20	(ha)																		
Private Storm Sewer																							
BUILDING	EX. CB	ROOF	0.108	0.000	0.108	0.90	0.27	0.27	10.00	76.81			20.75	**20.8**	25.4	200 PVC	0.2032	0.013	1.00	34.2	1.06	0.40	60.7%
			0.000				0.00	0.00	10.00				0.00										
			0.000				0.00	0.00	10.00				0.00										

DEMAND EQUATION
Q = 2.78 AIR

Where : Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
R = Weighted runoff coefficient (increased by 25% for 100-year)
I = Rainfall intensity in millimeters per hour (mm/hr)
Rainfall Intensity (I) is based on City of Ottawa IDF data presented in the City of Ottawa Sewer Design Guidelines (Oct. 2012)

CAPACITY EQUATION
Q full= (1/n) A R^(2/3)So^(1/2)

Where : Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A = Flow area (m^2)
R = Wetter perimenter (m)
So = Pipe Slope/gradient

1.3 CRITERIA

Review of available literature pertaining to Shirley's Brook indicates:

Water Quantity

"Water Management Plan for Shirley's Brook, Watts Creek, Kizell Drain and Harwood Creek Phase I and II ", (Robinson Consultants, December 1989)

- Post-development flow rates for developments within Kanata Research Park are to be controlled to pre-development levels.

Water Quality

"March Road Reconstruction Stormwater Management Strategy", (Robinson Consultants, August 1995)

- Shirley's Brook is assumed to be a Type II Habitat, requiring a 70 % removal rate of TSS; and,
- TSS is not to exceed 80 mg/L and SS are not to exceed 40 microns.

Erosion and Sediment Control

"Guidelines on Erosion and Sediment Control for Urban Construction Sites", (Government of Ontario, May 1987)

- The volume of erosion and sediment pre and post construction is to be minimized.

2.0 STORMWATER MANAGEMENT DESIGN

2.1 REVIEW OF STORMWATER MANAGEMENT ALTERNATIVES

The stormwater management practices (swmps), suggested in the SWMPPD manual (MOEE, June 1994), were evaluated based on site suitability, i.e. drainage area, topography, soil type, bedrock and groundwater elevation. Given the clay soils and high bedrock, infiltration swmps (infiltration trenches/basins, perforated pipes and catchbasins) were not considered feasible. On-site stormwater facilities (dry ponds, wetlands, wet ponds) are only recommended for drainage areas larger than 5.0 ha and are not suitable or economical for this 2.36 ha development. Filter/buffer strips were not feasible due to the site layout, layout of future developments and in-situ clay soils.

The preferred solution is on-site stormwater retention (i.e. parking lot and roof top storage) for quantity control and a Stormceptor for treatment of the first flush. Refer to Appendix A for details outlining the physical criteria for each of the swmps mentioned above.

Recent review of Stormceptors by the MOEE's Stormwater Assessment and Monitoring Performance Program indicated the larger Stormceptor units, may provide only 20% to 50% removal of TSS for drainage areas between 0.5 ha and 5.0 ha. Not withstanding their recent review and given that the following is an interim solution, a Stormceptor will provide some level of treatment of the first 10 mm of runoff from the impervious surfaces. Upon development of the remainder of the lands west of Shirley's Brook a permanent stormwater management facility (i.e. wet pond/or alternative solution) will be designed and constructed at which time on-site stormwater management measures will be abandoned.

2.2 PRE-DEVELOPMENT CONDITIONS

The pre-development flow rate was calculated using the Rational Method. Applying the Airport Formula, the time of concentration is approximately 33 minutes. Given the 5 and 100 year rainfall intensities of 50 mm/hr and 77.5 mm/hr and a runoff coefficient of 0.30, characteristic of flat pasture (0% to 5%) with clay and silt loam soils, the 5 year and 100 year pre-development flow rates are 98.4 L/s and 152.5 L/s.

2.3 POST-DEVELOPMENT CONDITIONS

2.3.1 POST-DEVELOPMENT RUNOFF QUANTITY CONTROL CRITERIA

The following criteria are used in the Tower "C" stormwater management design.

- 5-year flows conveyed to Shirley's Brook at a maximum allowable release rate of 98.4L/s.
- 100-year flows conveyed to Shirley's Brook at a maximum allowable release rate of 152.5L/s.
- Areas 1 and 6 will drain uncontrolled.
- Roof (Area 3) will be controlled to 9.6 L/s, as specified by the mechanical engineer.

The above criteria are achieved through the use of parking lot and roof top storage.

2.3.2 STORAGE ANALYSIS

The Modified Rational Method is used to calculate the storage volume required to detain the 5 year and 100 year post-development runoff to pre-development levels, and size the orifice openings. The procedure followed is summarized below:

i. separate the site into individual drainage areas;
ii. calculate the average runoff coefficients for each of the individual drainage areas;

$$C_{avg} = \frac{C_{impervious} \times A_{impervious} + C_{pervious} \times A_{pervious}}{\text{Drainage Area}}$$

iii. establish the release rate for each of the drainage areas;

$$Q_{release} = \frac{Q_{pre\text{-}development} - Q_{uncontrolled} - Q_{roof}}{\text{Drainage Area}}$$

$$= \frac{(98.4 L/s - 2.78 \times 0.51 \times 68.5 mm/hr \times 0.0368 ha - 2.78 \times 0.30 \times 68.5 mm/hr \times 0.07275 ha - 9.6 L/s)}{(2.36 ha - 0.0368 ha - 0.07275 ha - 0.1369 ha)}$$

$$= 38 L/s/ha$$

iv. use the modified rational method to calculate the storage required for each drainage area;
v. determine the stage storage curve for each drainage area;
vi. given the storage volume required and the stage storage curve, calculate the depth of ponding in each area; and,
vii. size the an orifice* opening for the depth of ponding and release rate required.

*Note: $Q = C A \sqrt{2gH}$, where C = 0.61 and H is the depth of water above the orifice, the orifice rests 1.2 m below the top of grate and A is orifice area.

A summary of the storage volumes, release rates and orifice sizes required to control the 5 year and 100 year events are provided in Table 1 and 2.

Table 1: Storage Volumes, Release Rates, Ponding Depths and Orifice Sizes for the 5 yr. Event

Area	Release Rate (L/s)	Storage Volume Available (m^3)	Storage Volume Required (m^3)	Depth of Ponding (m)	Orifice Size (mm)
Area 1 (uncontrolled)	3.6	-	-	-	-
Area 2	10.3	71.3	43.2	0.23	63.7
Area 3 (Roof – controlled)	9.6	-	-	-	-
Area 4	4.7	4.6	3.4	0.12	43.9
Area 5	9.8	9.3	12.6	0.15	63.1
Area 6 (uncontrolled)	4.2	-	-	-	-
Area 7	24.1	109	88.8	0.27	96.8
Area 8	10.6	83	88.0	0.25	64.4
Area 9	21.6	276	93.9	0.21	92.6
Total	98.4	553.2	-	-	-
Max. Allowable Flow Rate	*98.4*	-			

Table 2: Storage Volumes, Release Rates, Ponding Depths and Orifice Sizes for the 100 yr. Event

Area	Release Rate (L/s)	Storage Volume Available (m^3)	Storage Volume Required (m^3)	Depth of Ponding (m)	Orifice Size (mm)
Area 1 (uncontrolled)	5.7	-	-	-	-
Area 2	10.6	71.3	80.4	0.30	63.7
Area 3 (Roof – controlled)	9.6	-	-	-	-
Area 4	4.8	4.6	9.1	0.15	43.9
Area 5	9.8	9.3	27.9	0.15	63.1
Area 6 (uncontrolled)	6.7	-	-	-	-
Area 7	24.1	109	164.7	0.30	96.8
Area 8	10.6	83	147.8	0.25	64.4
Area 9	22.6	276	276.0	0.35	92.6
Total	104.5	553.2			
Max. Allowable Flow Rate	*152.5*	-			

In the event of a 1 in 100-year rainfall, Areas 4 and 5 will overflow into Area 7, Area 2 will overflow into Area 8, at which time Area 7 will overflow into Area 8, then Area 9 and sheet drain to Shirley's Brook. The storage required for Area 9 includes the 152.7 m^3 of runoff that is expected to overflow from Areas 2, 4, 5 7 and 8. Refer to drawing 98066-SWM for drainage areas, orifice locations, and extent of ponding for 5 year and 100-year events and direction of major overland flow.

Refer to Appendix B for post-development flow calculations, stage storage curves and orifice details.

2.3.3 QUALITY CONTROL

Shirley's Brook is a Type II Habitat requiring Level 2 protection (i.e. 70 % removal of TSS). The Stormceptor units are designed to provide the appropriate level of protection given a specific impervious drainage area and habitat designation, in accordance with the MOEE SWMPPD manual.

The guidelines recommend the Stormceptor Model STC 5000 for a 1.84 ha impervious area discharging into a Type II watercourse. Refer to Appendix C for Stormceptor details.

Recent review of Stormceptors by the MOEE's Stormwater Assessment and Monitoring Performance Program indicated the larger Stormceptor units, may provide only 20% to 50% removal of TSS for drainage areas between 0.5 ha and 5.0 ha. Not withstanding their recent review and given that the following is an interim solution, a Stormceptor will provide some level

of treatment of the first 10 mm of runoff from the impervious surfaces. Upon development of the remainder of the lands west of Shirley's Brook a permanent stormwater management facility (i.e. wet pond/or alternative solution) will be designed and constructed at which time on-site stormwater management measures will be abandoned.

2.3.4 OVERALL SITE DRAINAGE

The principal elements of the stormwater management plan, as detailed on plan 98066-SWM, are as follows:

- Runoff from the parking area and roof will be collected via catchbasins and discharged into the proposed storm sewer and outlet into Shirley's Brook.
- The 1 in 5 year and 1 in 100 year storms will be stored on site via parking lot and roof top storage.
- In consultation with the mechanical engineer, the rooftop will be controlled to 9.6 L/s.
- Orifices are to be placed on catch basins leads and were sized to control the flows to the 5-year pre-development levels.
- In case of obstructions of the orifice plates or a major event, Area 2 will spill over into Area 8, Areas 4 and 5 will spill over into Area 7, at which time Area 7 will overflow into Area 8, then Area 9 and sheet drain to Shirley's Brook.
- A Stormceptor STC 5000 will be installed to treat the first 10 mm of runoff.

3.0 EROSION AND SEDIMENT CONTROL

The following erosion and sediment control measures will be implemented during construction in accordance with the *"Guidelines on Erosion and Sediment Control for Urban Construction Sites"*, (Government of Ontario, May 1987).

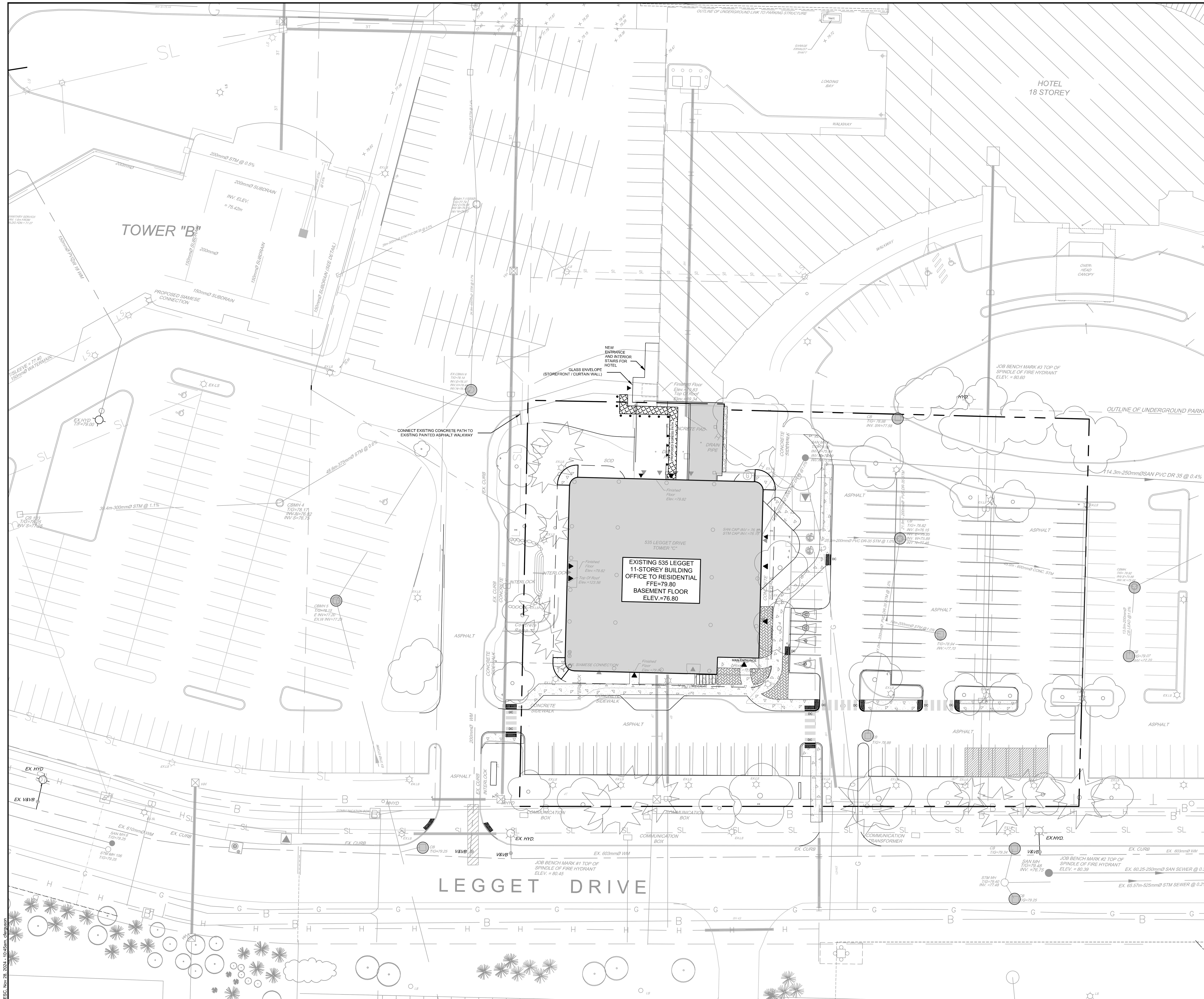
3.1 TEMPORARY MEASURES

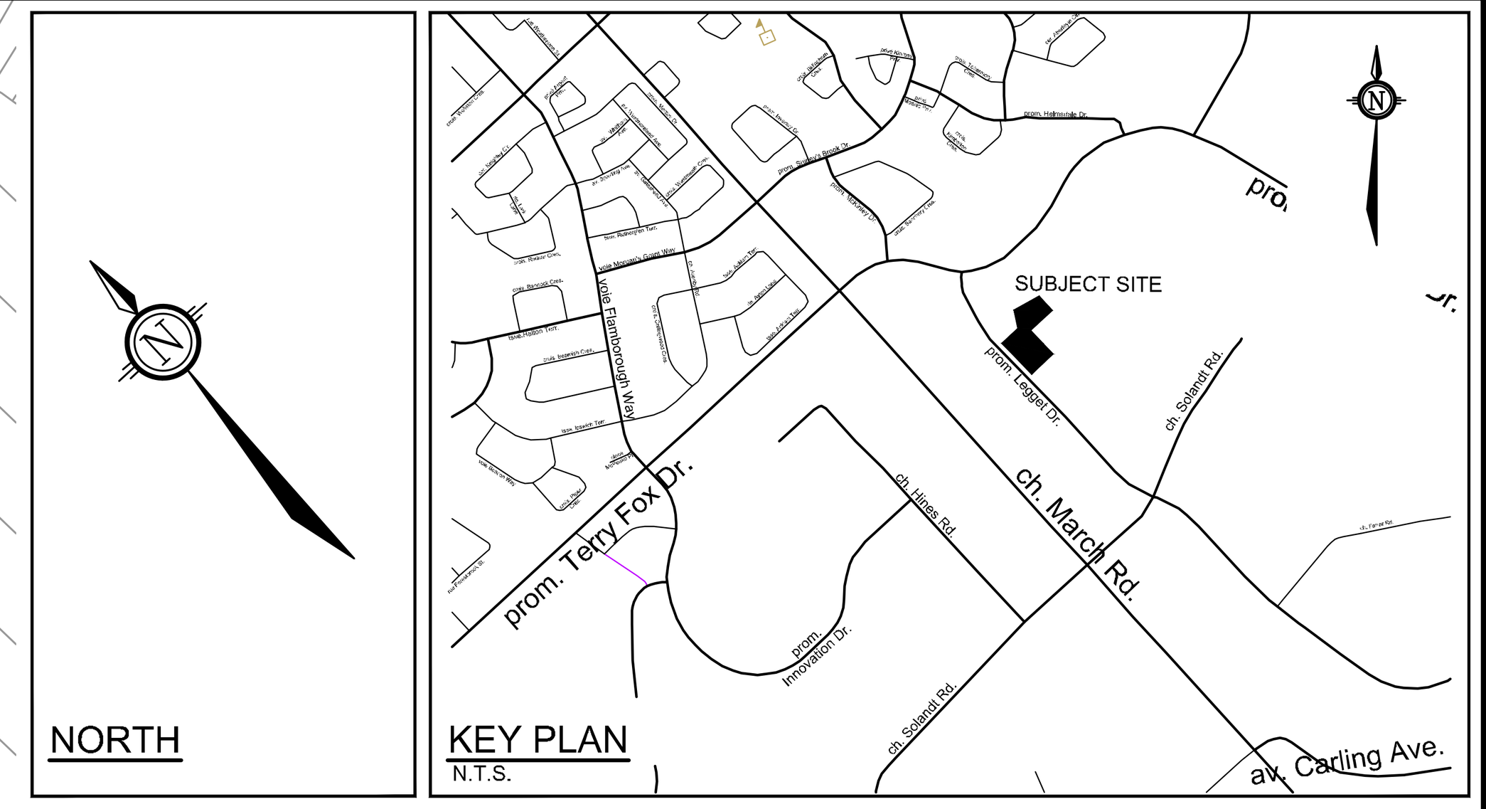
- Silt fences along the property line adjacent to Shirley's Brook.
- Filter fabric under all catchbasins and maintenance hatches.
- A sedimentation basin at the storm sewer outlet to intercept and retain any sediment laden runoff.
- A rock flow check at the upstream of the intersection of proposed ditch and Shirley's Brook to capture any remaining sediment prior to being discharged into Shirley's Brook.

3.2 PERMANENT MEASURES

- Rip rap at the storm sewer out fall.
- Proposed ditch will be lined with topsoil and seeded to trap sediment, discourage erosion and encourage nutrient absorption.

Appendix E
Drawings





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

LEGEND

Symbol	Description
— — —	PROPERTY LINE
═	PROPOSED CURB
DC	PROPOSED DEPRESSED CURB
○ (grey)	PROPOSED FILTER BAGS AT CATCHBASINS, CATCHBASIN MANHOLES AND TRENCHDRAINS
	TREE PROTECTION FENCING
●	PROPOSED BOLLARDS
STM MH ○	EXISTING STORM MANHOLE
CB 1 ▢	EXISTING CATCHBASIN
LS	EXISTING LIGHT STANDARD
— X —	EXISTING FENCE

EROSION AND SEDIMENT CONTROL NOTES:

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.

1) THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.

2) THE CONTRACTOR SHALL PLACE FILTER BAGS UNDER THE CATCHBASIN AND MANHOLE GRATES FOR THE DURATION OF CONSTRUCTION AND WILL REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION.

3) SILT FENCING FOR ENTIRE PERIMETER OF SITE, SHALL BE UTILIZED TO CONTROL EROSION FROM THE SITE DURING CONSTRUCTION.

4) THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

5) EROSION AND SEDIMENT CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.

No.	REVISION	DATE	BY
2.	RE-ISSUED WITH SITE PLAN APPLICATION	NOV29/24	GJM
1.	ISSUED WITH SITE PLAN APPLICATION	OCT9/24	GJM

SCALE 1:300

DESIGN	CJF
CHECKED	GJM
DRAWN	AM
CHECKED	CJF
APPROVED	GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
G.J. MacDONALD
Nov. 29 , 2024
PROVINCE OF ONTARIO

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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
535 LEGGET DRIVE

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

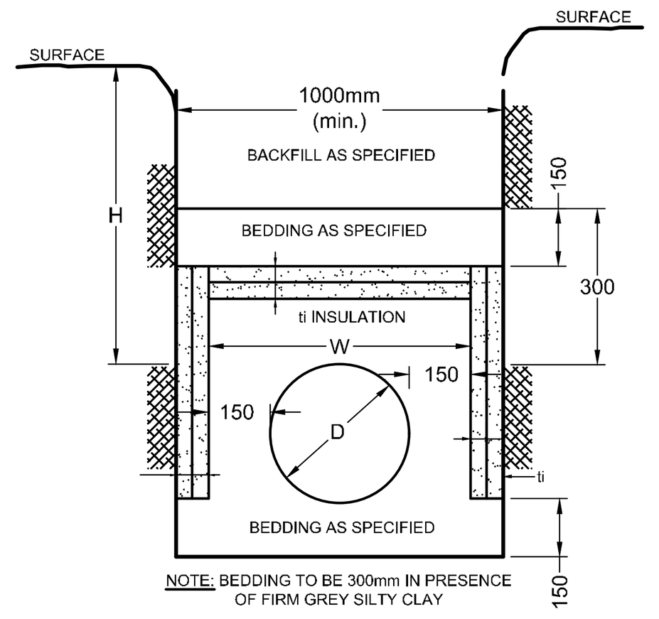
PROJECT No. 124045
REV # 2
DRAWING No. 124045-ESC

SEWER & WATERMAIN INSULATION NOTES:

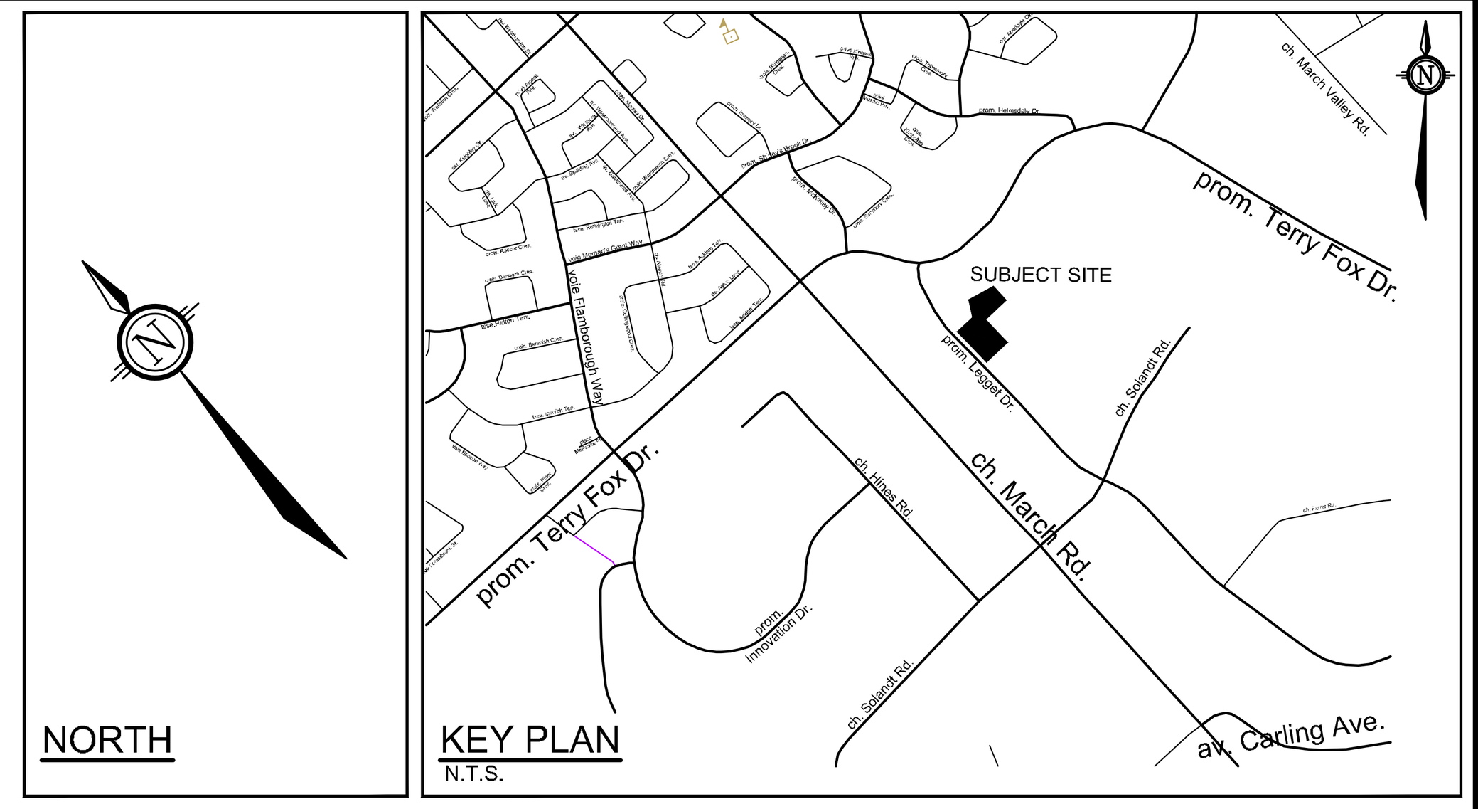
1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 2.0m COVER AND ALL WATERMAIN WITH LESS THAN 2.4m OF COVER WITH EXPANDED POLYSTYRENE INSULATION AS PER OPSD 1109.030.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER WITH 50mm MINIMUM (SEE TABLE)

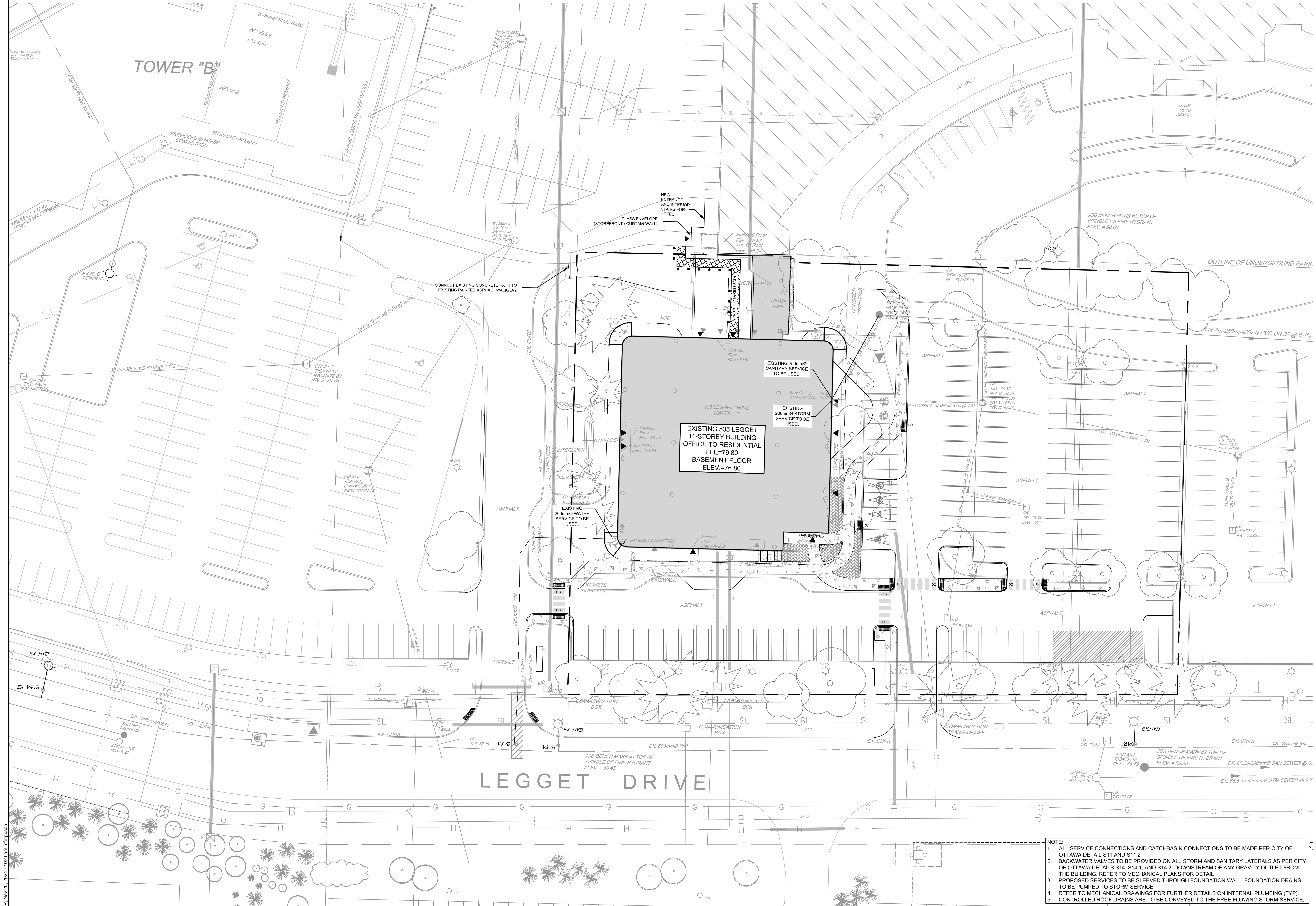
T = THICKNESS OF INSULATION (mm)
W = WIDTH OF INSULATION (mm)
W = D + 300 (1000 min.)
D = O.D OF PIPE (mm)

COVER SEWER / WATER (mm)	INSULATION THICKNESS (mm)
2000-1700 / 2400-2100	50
1700-1400 / 2100-1800	75
1400-1100 / 1800-1500	100



INSULATION DETAIL FOR SHALLOW SEWERS & WATERMAIN
N.T.S





LEGEND

- PROPERTY LINE
- PROPOSED CURB
- DC PROPOSED DEPRESSED CURB
- PROPOSED TWSI
- PROPOSED RETAINING WALL C/W GUARD RAIL
- PROPOSED CAP
- PROPOSED SANITARY SERVICE
- PROPOSED STORM SEWER
- PROPOSED WATER SERVICE
- PROPOSED HYDRANT c/w LEAD & VALVE
- V&VB PROPOSED VALVE AND VALVE BOX
- PROPOSED BUILDING ENTRANCE
- PROPOSED BIKE RACKS
- PROPOSED CROSSWALK PAINTING
- PROPOSED LINE PAINTING
- DIRECTION OF FLOW
- PROPOSED BOLLARDS
- EXISTING UTILITY POLE C/W GUY WIRES
- V&VC EXISTING WATERMAIN C/W VALVE & VALVE CHAMBER
- EXISTING HYDRANT C/W VALVE & LEAD
- SAN MH EXISTING SANITARY MANHOLE & SEWER
- STM MH EXISTING STORM MANHOLE & SEWER
- EXISTING CATCHBASIN
- EXISTING CULVERT
- EXISTING BUILDING SERVICES
- G EXISTING GAS MAIN
- H EXISTING HYDRO LINE
- JUT EXISTING JOINT UTILITY TRENCH
- EXISTING STREETLIGHT
- CB EXISTING ROAD SIGNAGE
- EXISTING PONDING LIMITS
- EXISTING NOISE WALL
- EXISTING PRIVACY FENCE
- EXISTING TREE

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF `ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
8. ALL ELEVATIONS ARE GEODETIC (CVGD28). THE SITE BENCHMARK IS CURRENTLY SET ON TOP OF THE FIRE HYDRANT SPINDLE (ELEV. = 80.45), LOCATED AT THE SOUTHWEST CORNER OF THE EXISTING ENTRANCE OFF LEGGET DRIVE. REFER TO THE FAIRHALL. MOFFATT & WOODLAND LIMITED TOPOGRAPHIC SURVEY OF PART OF LOT 8 CONCESSION 4, GEOGRAPHIC TOWNSHIP OF MARCH, CITY OF OTTAWA.
9. REFER TO GEOTECHNICAL REPORT (No. xxxx, DATED XXXX XX, 2024), PREPARED BY xxxxx, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO SERVICING AND STORMWATER MANAGEMENT REPORT PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD, R-2024-083 (DATED SEPTEMBER 13TH, 2024).
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE/PARKING PAINTING.
14. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
15. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER/ABOVE SEWER	W25 / W25,2	CITY OF OTTAWA
WATERMAIN	PVC DR 18	
HYDRANT	W19	CITY OF OTTAWA
VALVE AND VALVE BOX	W24	CITY OF OTTAWA

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED. ANY WATERMAIN WITH LESS THAN 2.4m COVER TO BE INSULATED PER THE SHOWN DETAIL.
4. PROVIDE MINIMUM 0.25m ABOVE, 0.5m IF BELOW, CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS PER CITY OF OTTAWA STANDARDS W25/W25.2
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.
6. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS CITY OF OTTAWA STANDARD DETAILS W-39, 40, 41, 42, 43 AND 44.
7. PROVIDE THERMAL INSULATION FOR WATERMAIN AT OPEN STRUCTURES PER CITY OF OTTAWA STANDARD DETAIL W-23.
8. IF WATERMAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
SEWER TRENCH	S6 & S7	CITY OF OTTAWA
STORM SEWER	PVC DR 35	
SANITARY SEWER	PVC DR 35	

INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION (REFER TO DETAIL).

2. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0% (2.0% IS PREFERRED).
3. SEWER SERVICE CONNECTIONS PER CITY OF OTTAWA DETAILS S11 AND S11.1.
4. PIPE BEDDING FOR SEWER AND WATER PIPES SHOULD CONSIST OF AT LEAST 150mm OF OPSS GRANULAR A. THE BEDDING LAYER THICKNESS SHOULD BE INCREASED TO A MINIMUM OF 300mm WHERE THE SUBGRADE WILL CONSIST OF GREY SILTY CLAY. THE MATERIAL SHOULD BE PLACED IN A MAXIMUM 225mm THICK LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 99% OF IT'S SPMDD. THE BEDDING SHOULD EXTEND AT LEAST TO THE SPRING LINE OF THE PIPE.
5. THE SEWER AND WATER PIPE COVER MATERIAL SHOULD CONSIST OF OPSS GRANULAR A, AND SHOULD EXTEND FROM THE SPRINGLINE OF THE PIPE TO AT LEAST 300mm ABOVE THE OBVERT OF THE PIPE. THE MATERIAL SHOULD BE PLACED IN MAXIMUM 225mm THICK LIFTS AND COMPACTED TO A MINIMUM OF 99% OF IT'S SPMDD.
6. WHERE HARD SURFACE AREAS ARE CONSIDERED ABOVE TRENCH BACKFILL, THE TRENCH BACKFILL MATERIAL WITHIN THE FROST ZONE (ABOUT 1.8m BELOW FINISHED GRADE) SHOULD MATCH THE SOILS EXPOSED AT THE TRENCH WALLS TO MINIMIZE DIFFERENTIAL FROST HEAVING. THE TRENCH BACKFILL SHOULD BE PLACED IN MAXIMUM 300mm THICK LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 95% OF THE MATERIALS SPMDD.
7. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
9. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.

NOTE:
1. ALL SERVICE CONNECTIONS AND CATCHBASIN CONNECTIONS TO BE MADE PER CITY OF OTTAWA DETAIL S11 AND S11.2
2. BACKWATER VALVES TO BE PROVIDED ON ALL STORM AND SANITARY LATERALS AS PER CITY OF OTTAWA DETAILS S14, S14.1, AND S14.2. DOWNSTREAM OF ANY GRAVITY OUTLET FROM THE BUILDING. REFER TO MECHANICAL PLANS FOR DETAIL
3. PROPOSED SERVICES TO BE SLEEVED THROUGH FOUNDATION WALL. FOUNDATION DRAINS TO BE PUMPED TO STORM SERVICE.
4. REFER TO MECHANICAL DRAWINGS FOR FURTHER DETAILS ON INTERNAL PLUMBING (TYP).
5. CONTROLLED ROOF DRAINS ARE TO BE CONVEYED TO THE FREE FLOWING STORM SERVICE.

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

No.	REVISION	DATE	BY
2.	RE-ISSUED WITH SITE PLAN APPLICATION	NOV29/24	GJM
1.	ISSUED WITH SITE PLAN APPLICATION	OCT9/24	GJM

SCALE 1:300
1:300 0 3 6 9 12

DESIGN CJF
CHECKED GJM
DRAWN CJF
CHECKED GJM
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER G.J. MacDONALD Nov. 29, 2024 PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
535 LEGGET DRIVE

DRAWING NAME
GENERAL SERVICING PLAN

PROJECT No. 124045
REV REV # 2
DRAWING No. 124045-GP

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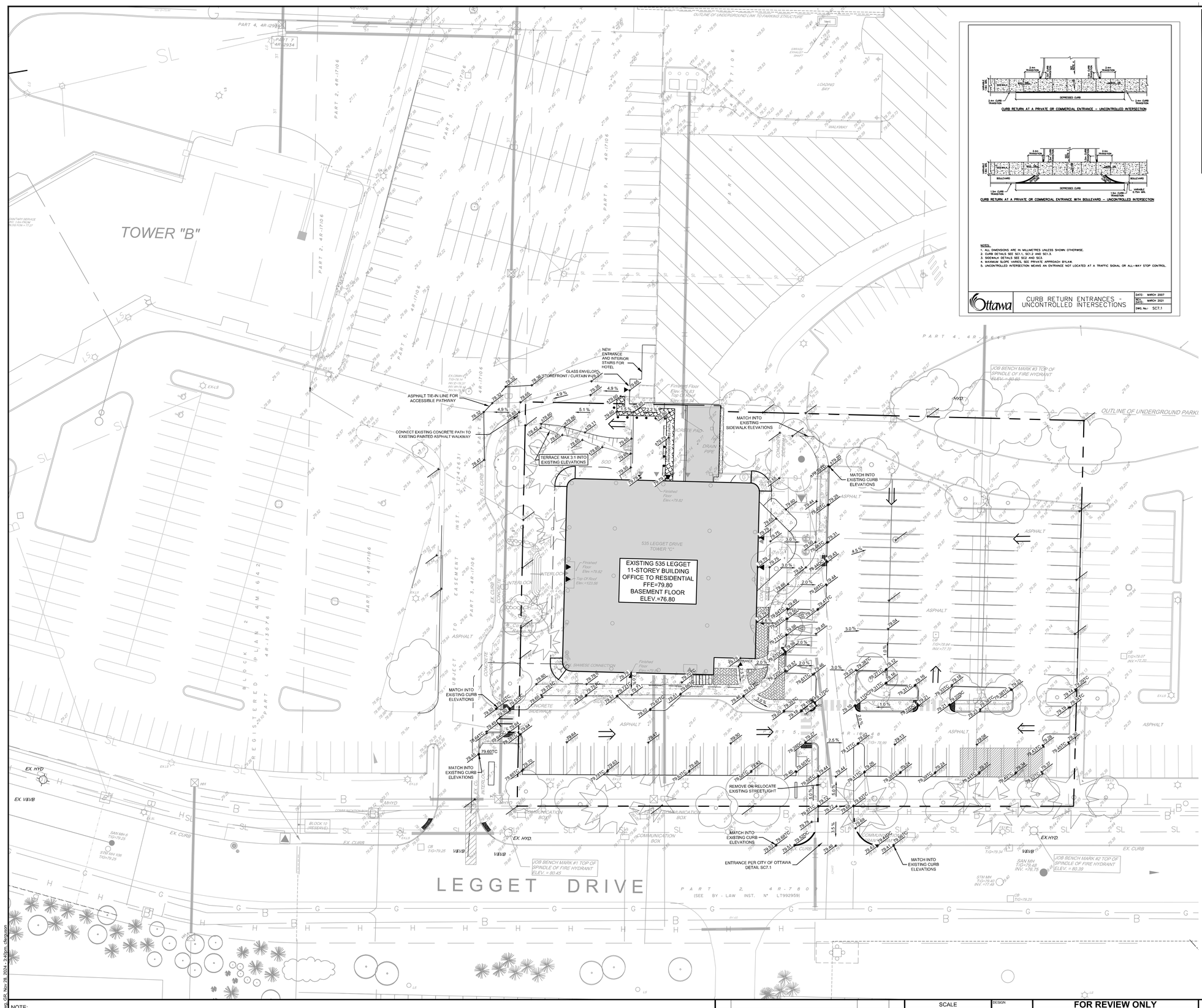

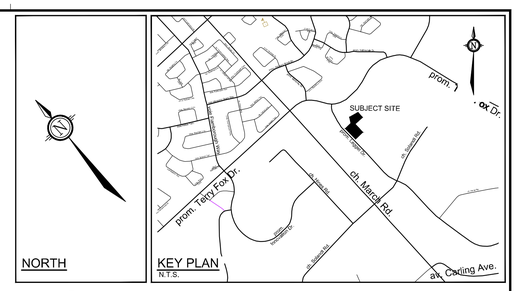

LEGEND

- PROPERTY LINE
- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- TWSI — PROPOSED TACTILE WALKING SURFACE INDICATOR (TWSI)
- 98.40 — PROPOSED ELEVATION
- x 98.40 — EXISTING TOPO SURVEY ELEVATION
- EX. 97.40 — EXISTING ELEVATION TO REMAIN
- 97.70DC — PROPOSED DEPRESSED CURB ELEVATION
- 97.88TC — PROPOSED TOP OF CURB ELEVATION
- V&VB — PROPOSED VALVE AND VALVE BOX
- PROPOSED BUILDING ENTRANCE
- 2.0% — SLOPE AND DIRECTION
- DIRECTION OF MAJOR OVERLAND FLOW
- PROPOSED BIKE RACKS
- PROPOSED CROSSWALK PAINTING
- PROPOSED LINE PAINTING
- PROPOSED HYDRANT & VALVE
- PROPOSED TERRACE
- PROPOSED BOLLARDS
- EXISTING VALVE & VALVE BOX
- EXISTING VALVE & LEAD
- SAN MH — EXISTING SANITARY MANHOLE
- STM MH — EXISTING STORM MANHOLE
- CB 1 — EXISTING CATCHBASIN
- EXISTING DITCH CENTERLINE
- UP — EXISTING UTILITY POLE
- EXISTING UTILITY POLE ANCHORS
- EXISTING STREETLIGHT
- EXISTING ROAD SIGNAGE
- EXISTING TREE
- B/CR — EXISTING DITCH/ BOTTOM OF SLOPE

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ' ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
8. ALL ELEVATIONS ARE GEODETIC (CVGD28). THE SITE BENCHMARK IS CURRENTLY SET ON TOP OF THE FIRE HYDRANT SPINDLE (ELEV. = 80.45), LOCATED AT THE SOUTHWEST CORNER OF THE EXISTING ENTRANCE OFF LEGGET DRIVE. REFER TO THE FAIRHALL MOFFATT & WOODLAND LIMITED TOPOGRAPHIC SURVEY OF PART OF LOT 8 CONCESSION 4, GEOGRAPHIC TOWNSHIP OF MARCH, CITY OF OTTAWA.
9. REFER TO GEOTECHNICAL REPORT (No. xxxx, DATED XXXX XX, 2024), PREPARED BY xxxxx, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO SERVICING AND STORMWATER MANAGEMENT REPORT PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD, R-2024-083 (DATED SEPTEMBER 13TH, 2024).
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE/PARKING PAINTING.
14. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
15. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. NON-SPECIFIED EXISTING FILL ALONG WITH SITE EXCAVATED SOIL COULD BE PLACED AS GENERAL LANDSCAPING FILL AND BENEATH EXTERIOR PARKING AREAS WHERE SETTLEMENT OF THE GROUND IS OF MINOR CONCERN, THESE MATERIALS SHOULD BE SPREAD IN MAXIMUM 300mm THICK LOOSE LIFTS AND COMPACTED BY THE TRACKS OF THE SPREADING EQUIPMENT TO MINIMIZE VOIDS. IF THE MATERIAL IS TO BE USED TO BUILD UP THE SUB-GRADE LEVEL FOR AREAS TO BE PAVED, IT SHOULD BE COMPACTED IN MINIMUM 300mm THICK LIFTS TO AT LEAST 95% OF THE MATERIALS SPMDD, THE PACEMENT OF SUB-GRDE MATERIAL SHOULD BE REVIEWED AT THE TIME OF PLACEMENT, BY THE GEOTECHNICAL ENGINEER'S PERSONNEL (PATERSON GROUP).
3. EXPOSED SUB-GRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
4. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
5. FILL USED FOR GRADING BENEATH THE BASE AND SUB-BASE LAYERS OF PAVED AREAS SHOULD CONSIST, UNLESS OTHERWISE SPECIFIED, OF CLEAN IMPORTED GRANULAR FILL, SUCH AS OPSS GRANULAR A, GRANULAR B TYPE II OR SELECT SUB-GRADE MATERIAL. THIS MATERIAL SHOULD BE TESTED AND APPROVED PRIOR TO DELIVERY TO THE SITE. THE FILL SHOULD BE PLACED IN LIFTS NO GREATER THAN 300mm THICK AND COMPACTED USING SUITABLE COMPACTION EQUIPMENT FOR THE LIFT THICKNESS. FILL PLACED BENEATH THE PAVED AREAS SHOULD BE COMPACTED TO AT LEAST 100% OF ITS SPMDD.
6. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
7. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
8. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
9. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED.
10. BACKFILL MATERIAL BELOW SIDEWALK AND WALKWAY SUB-GRADE OR OTHER SETTLEMENT SENSITIVE STRUCTURES WHICH ARE NOT ADJACENT TO THE BUILDINGS SHOULD CONSIST OF FREE DRAINING, NON-FROST SUSCEPTIBLE MATERIAL. THIS MATERIAL SHOULD BE PLACED IN MAXIMUM 300mm LOOSE LIFTS AND COMPACTED TO AT LEAST 98% OF ITS SPMDD UNDER DRY, AND ABOVE FREEZING, CONDITIONS.
11. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

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

No.	REVISION	DATE	BY
2.	RE-ISSUED WITH SITE PLAN APPLICATION	NOV29/24	GJM
1.	ISSUED WITH SITE PLAN APPLICATION	OCT9/24	GJM

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GRADING PLAN

PROJECT No. 124045
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