Binnie File No. 19-1218

RAINWATER MANAGEMENT PLAN

Wesgroup Properties LP

910-1055 Dunsmuir Street, Vancouver

Rev 1 - August 11, 2020

Rev 2 - October 8, 2020

Prepared by:

Jon Bridle, P. Eng.

Design Engineer

R.F. BINNIE & ASSOCIATES LTD.

314-9440 202 Street

Langley, BC, V1M 4A6

Main: 604-574-3336

OQM CERTIFIED

BINNIE

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1 INTRODUCTION

R.F Binnie and Associates Limited (Binnie) has been retained by Wesgroup Properties LP to complete a rainwater management plan for the redevelopment of the lot at 1008 West 41st Avenue and 5763 Oak Street in Vancouver, BC. The proposed development consists of a 16-storey and 8-storey mixed use building with a 6 storey podium connecting the 2 buildings over a parkade. The total existing site area is approximately 3,427 sq. m and slopes from West to East.

As part of the rezoning application, the City requires projects submit a detailed rainwater management plan as part of the application package, which conforms to the requirements outlined in the City-wide Integrated Rainwater Management Plan and the Rainwater Bulletin, issued July 11, 2018.

The intent of the IRMP is to achieve/meet the following criteria:

1. To reduce per capita residential water consumption by 20% by 2020
2. To maintain clean water from watersheds to receiving environments
3. To reduce potable water demands
4. To connect people to urban and natural ecosystem functions

To comply with the City's rainwater management criteria presented in the IRMP, we have prepared this report to highlight the Best Management Practices (BMPs) being proposed for the site. The items in this report are to be reflected in the detailed design of the drainage facilities for the project. Conformance to the City's IRMP criteria also meets the City's 'Green Building Policy for Re-zonings' bylaw.

2 SITE CONDITIONS

2.1 Existing Conditions

The current lot is zoned C-1 and consists of two separate lots comprising of an existing low rise commercial building and a community garden. According to the City of Vancouver's GIS mapping, there is a 200mm diameter combined vitrified clay pipe along the lane to the west of the site, and a 450mm diameter combined main along the South side of 41st Avenue. On 42nd Avenue there is a 250mm diameter combined vitrified clay pipe that transitions to a 375mm diameter combined concrete pipe crossing oak street and continuing east. Refer to **Appendix A** for the Pre-Development Site Plan.

2.2 Proposed Development

The proposed redevelopment will consist of a 16-storey and 8-storey mixed use building with a 6-storey podium connecting the 2 buildings over a parkade complete with a road dedication along the east property line. The development will include landscaping items such as various hardscapes and softscapes. A storm service will be provided to service the new building (to the storm sewer on 42nd Street) and will require coordination with the mechanical consultant during the detailed design phase of the project. Refer to **Appendix B** for the Post-Development Site Plan.

3 ONSITE RAINWATER MANAGEMENT CRITERIA

The City of Vancouver's IRMP was adopted to provide long-term green infrastructure and to protect and improve the water quality in the waterbodies surrounding Vancouver. The plan requires projects to meet the following qualitative and quantitative targets:

1. Water Volume Reduction Target – Capture the first 24mm of rainfall in 24-hours from all pervious and impervious site areas, and infiltrate, evaporate, or reuse it. Landscape areas with adequate growing medium depth will meet the 24mm capture requirement.

2. Water Release Rate Target – The rainwater management system for the development shall be designed to ensure that the post-development peak discharge flow rate to the sewer is not greater than the pre-development peak discharge flow rate for a 5-year return period storm event. The City of Vancouver's 2014 intensity-Duration-Frequency curve (IDF) shall be utilized for the pre-development design flow calculations, and the City's 2100 IDF curve shall be utilized for the post-development design flow calculations, to account for the effects of climate change.

3. Water Quality Target – Treat the first 24mm of rainfall from all pervious and imperious surfaces to remove 80% Total Suspended Solids (TSS) by mass prior to discharge from the site. For impervious surfaces with high pollutant loads, including roads, driveways, and parking lots, the rainfall to be treated increases to the first 48mm of rainfall.

The intent of these targets is to mitigate the impacts of increased yearly precipitation due to climate change, increased development density, and decreased pervious surfaces that allow rainwater to infiltrate. The implementation of green infrastructure practices or source controls keeps harmful rainwater pollutants from entering the receiving waterways and adds resiliency to the City's drainage system.

4 ONSITE RAINWATER MANAGEMENT PLAN

The proposed development is subject to the rainwater management targets identified in the City of Vancouver's IRMP. To meet the City's quantitative and qualitative targets, the project site is proposing the rainwater management facilities as described in the following sections.

4.1 Water Volume Reduction Target

The City's IRMP requires that developments target to capture the first 24mm of rainfall in 24-hours from all pervious and impervious site areas and infiltrate, evaporate, or reuse it where possible.

The water volume reduction target for the proposed development after the road dedication is calculated as follows:

$$Volume = Site\ Area \times 24mm$$

$$Volume = 3{,}291m^2 \times 24mm = 79.0m^3$$

A target rainfall capture volume of $79.0m^3$ will need to be managed onsite. The following subsections will investigate the feasibility of the different tiers of water volume reduction measures as outlined in the City's Rainwater Management Bulletin. Refer to **Appendix C** for additional details.

4.1.1 Tier 1

Tier 1 systems consist of rainwater management strategies that utilize infiltration and/or re-use to manage runoff. Examples of Tier 1 strategies include bioswales, rain gardens, rainwater harvesting, and rooftop gardens. A green roof and garden planters have been proposed as Tier 1 strategies for this site.

Green roofs directly reduce the impermeable surface area on a roof and reduces the volume of runoff discharged to the storm system. Green roofs also increase the evapotranspiration from the site creating a more natural hydrological system compared to conventional roofs. A green roof provides an opportunity to reduce the size of any required on-site detention tanks.

An extensive green roof has been proposed as well as rooftop planters, as seen in **Appendix B**. The green roof will cover an area of approximately 151.4m^2, and rooftop planters will cover approximately 275.6 m^2. The landscape architect has specified mounds for varied plant materials and habitat for the green roof. With growing medium depths varying between a depth of 200mm to 400mm for the green roof, 610mm to 750mm for planters, and an 18% void space ratio for the soil, the growing medium can manage 10.1m^3 of runoff. This exceeds the volume reduction requirement for runoff landing directly on the green roof, such that no further management would be required in this area.

4.1.2 Tier 2

Tier 2 systems consist of rainwater management strategies that utilize non-infiltrating landscapes. Rainwater can be directed to absorbent landscaping on slab, closed bottom planters, and lined bioretention systems.

Soft landscape in the form of trees, shrubs and other planting boxes on slab and atop the podium have been proposed as Tier 2 strategies. Planters and soft landscaped surfaces provide aesthetic means of rainwater source control. Topsoil and other absorbent landscaping materials will provide capacity for runoff detention and treatment. The topsoil acts as a natural filter for the rainwater and the pervious material retains rainwater landing on the surface. This reduces the runoff rate during rainfall events

Based on the current landscape, garden plots and planter boxes cover 275.6m^2 and have a depth of 600mm and 760mm. The proposed planting would be able to manage a minimum 12.1m^3 including 65.0m^2 of structural soil at ground level. It is assumed that the planters and garden plots are raised, and additional runoff will not be able to be directed to them.

At a minimum 600mm thickness, the landscaping will provide a deep enough filtering medium to also meet the City's requirements for rainwater quality, in accordance with the July 2018 Rainwater Management Bulletin discussed in **Section 4.3.** Landscape drawings were incorporated into **Appendix B**, which shows the proposed location for landscaped features.

4.1.3 Tier 3

Tier 3 systems consist of rainwater detention and mechanical treatment. The remaining runoff not managed by the proposed on-site landscaping will be managed via detention and released into the City's infrastructure.

The volume balance calculation is as follows:

Volume = 79.0 m^3 (total volume to be managed) – 12.1m^3 (volume managed via Tier 1 and Tier 2)

Volume = 66.9m^3

A detention system with a flow control device will be required to achieve the Water Volume Reduction targets. Likewise, detention will be required to restrict the rate of discharge to pre-development levels, as discussed in **Section 4.2**.

4.2 Water Release Rate Target

The peak flow of rainwater runoff for the pre- and post-development condition was calculated from using the rainfall intensity for the 5-year 10-minute events from the 2014 and 2100 City of Vancouver IDF curves. As per the IDF curves, the City recommends using 5-year recurrence interval and a 10-minute inlet time to calculate the peak rainwater discharge for residential areas and investigations. The City recommends using the 5-year storm for residential areas and investigations

The estimated pre-development runoff is approximately 0.77. Post-development, it is estimated that this will decrease to 0.74, based on the currently proposed landscape coverage. Refer to **Appendix D** for runoff coefficient calculations.

The Rational Method was used to calculate the peak pre-development and post-development rainwater discharges during the 5-year, 10-minute storm event. The peak pre-development discharge was

calculated as 37.4L/s. The peak post-development flow rate is estimated to be 47.4L/s. The rate of discharge from site will need to be restricted to a maximum of the pre-development runoff rate.

A detention facility connected to the building's plumbing system will be sized to restrict runoff being discharged from the site to pre-development levels. Runoff will then slowly be released to the City's infrastructure at a controlled rate. Controlling the runoff will prevent overloading the downstream storm system and prevent surcharging of the City's infrastructure. A downstream flow control device will be included in the systems configuration to control the release rate to pre-development rates. A detention tank with a minimum capacity of 6.86m^3 will be required to restrict the release rate to the 5-year 10-minute pre-development rate (37.4 L/s). A bypass will also be required for events exceeding the 5-year design storm.

An interior detention system within the parkade is proposed for the development, as the extents of the parkade encompass the entire site.

4.3 Water Quality Treatment Target

The target water quality treatment volume is derived from treating 48mm of rainfall per day that falls within the site in high pollutant areas such as driveways, parkade ramps, and loading bays, and 24mm from low polluting areas such as landscaped and building roof areas. The City requires 80% of TSS by mass be removed prior to discharge from the site. The target treatment flow rate is calculated as follows:

*Minimum Treatment Volume = (High Polluting Site Area * 48mm) + (Low Polluting Site Area * 24mm)*

*(504.9m^2 * 0.048m) + (2786.1m^2 * 0.024m) = 91.1 m^3*

Some runoff will be treated via the landscaping on site, assuming a soil thickness of at least 450mm as outlined in the July 2018 Bulletin.

A mechanical treatment system would be utilized to treat the remaining runoff prior to discharge into the City sewers. Per City requirements, the treatment system needs to be both Washington State Department of Ecology's Technology Assessment Protocol – Ecology Program (TAPE) and Environmental Technology Verification (ETV) Canada certified.

A Jellyfish Filtration System by Imbrium is recommended as the mechanical treatment system for this site, as it meets the required TSS removal specification and has received both Washington State Department of Ecology's Technology Assessment Protocol – Ecology Program (TAPE) and Environmental Technology Verification (ETV) Canada certification, as required by the July 2018 Bulletin.

The proposed system can treat runoff at a rate that exceeds the amount outlined by the IRMP and described above**.**

5 SYSTEM MAINTENANCE

Regular system maintenance helps to ensure that the rainwater management facilities remain in working order for the lifetime of the development. The owner should inspect the rainwater management system regularly to ensure that it is operating as designed.

5.1 Inspection Procedure

1. Conduct a visual examination of the roof and surface drains and check for debris that could restrict or block flow.
2. Remove access cover and conduct a visual examination of the detention tank, flow control manhole and any oil water separators. The separators should be checked for debris that could restrict or block flow, with attention to any inlets and outlets. Sediment should be removed from the separators once it has reached a depth of 100mm.
3. Remove grates and conduct a visual examination of all catchbasins and surface drains. Both should be checked for debris that could restrict or block flow, with attention to outlets. Sediment should be removed from the catchbasins once it has reached a depth of 100mm.
4. At least once a year conduct an observation of system performance of the entire rainwater management facilities during a significant rainfall event.

6 CONCLUSION

The redevelopment of the site at 1008 West 41st Avenue and 5763 Oak Street into a new multi-family and commercial building will cause a decrease in the site's imperviousness from 0.77 to an estimated 0.66. A green roof, Tier 2, and Tier 3 strategies are being proposed, include onsite landscaping, a detention system, and a mechanical treatment manhole. There is currently approximately 504.9sq. m of landscaping proposed (151.4m^2 of green roof and an additional 353.5m^2 of planting/landscaping), based on the landscape architect's drawings.

We trust you find the above suitable for your needs. Should you have any questions or comments on the information contained herein, please do not hesitate to contact the undersigned.

Prepared by:

R.F. Binnie & Associates Ltd.
EGBC Permit to Practice
Number 1001128

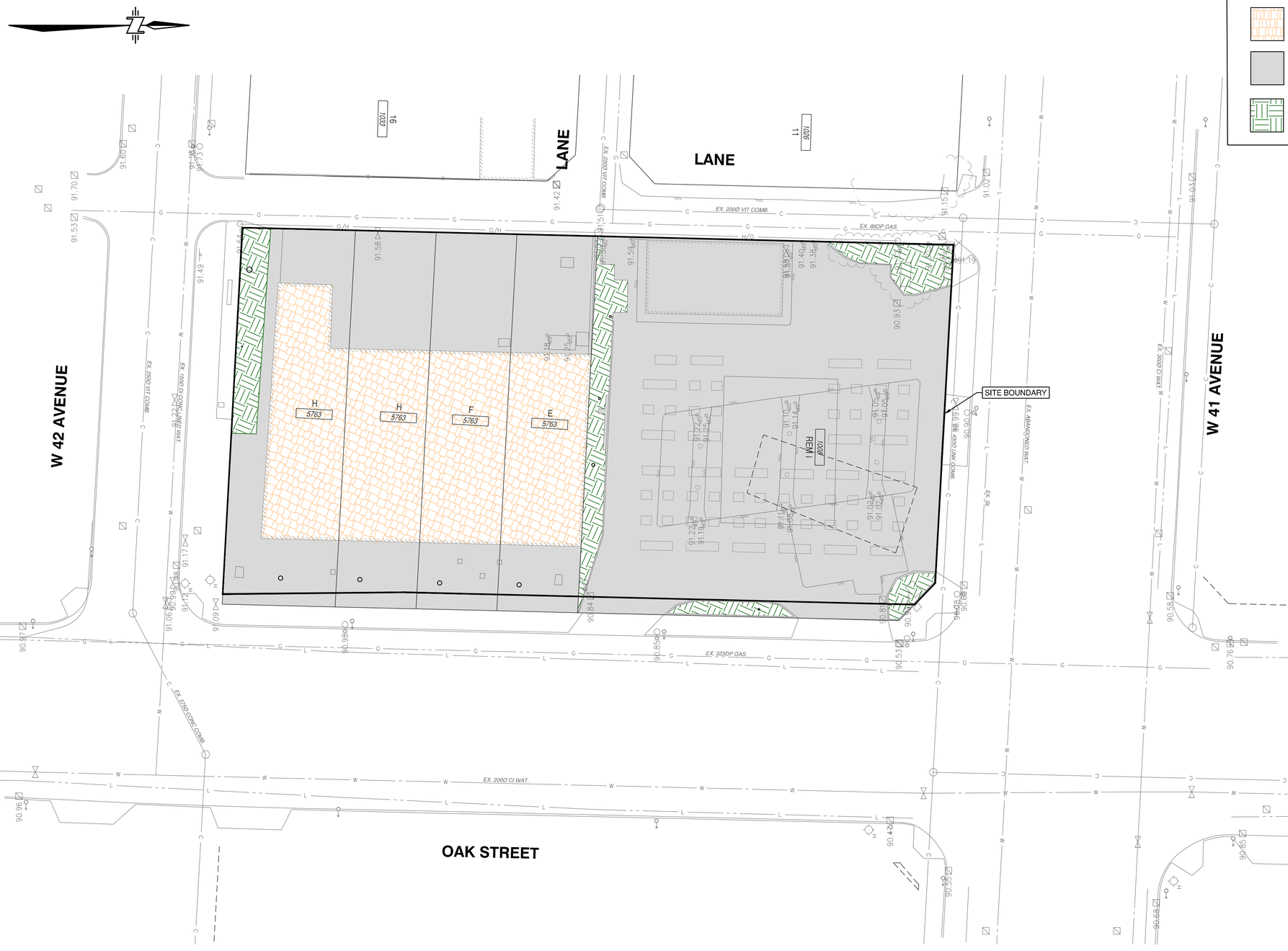
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. E. C. BRIDLE
46241

2021-10-08

Jon Bridle, P. Eng
Design Engineer

APPENDIX A

PRE-DEVELOPMENT SITE PLAN



LEGEND

- BUILDING ROOF (IMPERVIOUS)
- HARDSCAPE (IMPERVIOUS)
- LANDSCAPE (PERVIOUS)

BENCHMARK:
MON V-2246
N.W. CORNER OF OAK STREET & W 41ST AVENUE
90.770

SURVEYED BY:
UNDERHIL L GEOMATICS LTD.

CIVIC ADDRESS:
1008 W 41 STREET
5763 OAK STREET

LEGAL DESCRIPTION:
LOT I (SEE N8741L) EXCEPT FIRSTLY: PART IN PLAN 18850;
SECONDLY: PART SHOWN ON PLAN LMP36671; BLOCK 995,
DISTRICT LOT 526, GROUP 1, NEW WESTMINSTER DISTRICT, PLAN 20366
LOTS E-H OF LOTS 12 TO 15, BLOCK 995, DISTRICT LOT 526, PLAN 8152

SCALE:
0 1:250 12m

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ISSUED: M/D/Y	REVISION	DESCRIPTION
10/08/21	03	RE-ISSUED RAINWATER MANAGEMENT REPORT
08/11/20	02	REVISED SURVEY
07/10/20	01	RAINWATER MANAGEMENT REPORT

PROJECT:
OAK & 41ST RENTAL BUILDING

CLIENT:
WESTGROUP PROPERTIES LP

BINNIE
The people behind your infrastructure.
R.F. BINNIE & ASSOCIATES LTD.
314-9440 202 Street
Langley, BC V1M 4A6
TEL 604 574 3336
BINNIE.com

DATE: 07/03/20	SEAL:
DRAWN: BVR	
DESIGN: JEB	
CHECKED: JEB	
SCALE: 1:250	

SHEET TITLE:
RAINWATER MANAGEMENT PLAN PRE-DEVELOPMENT

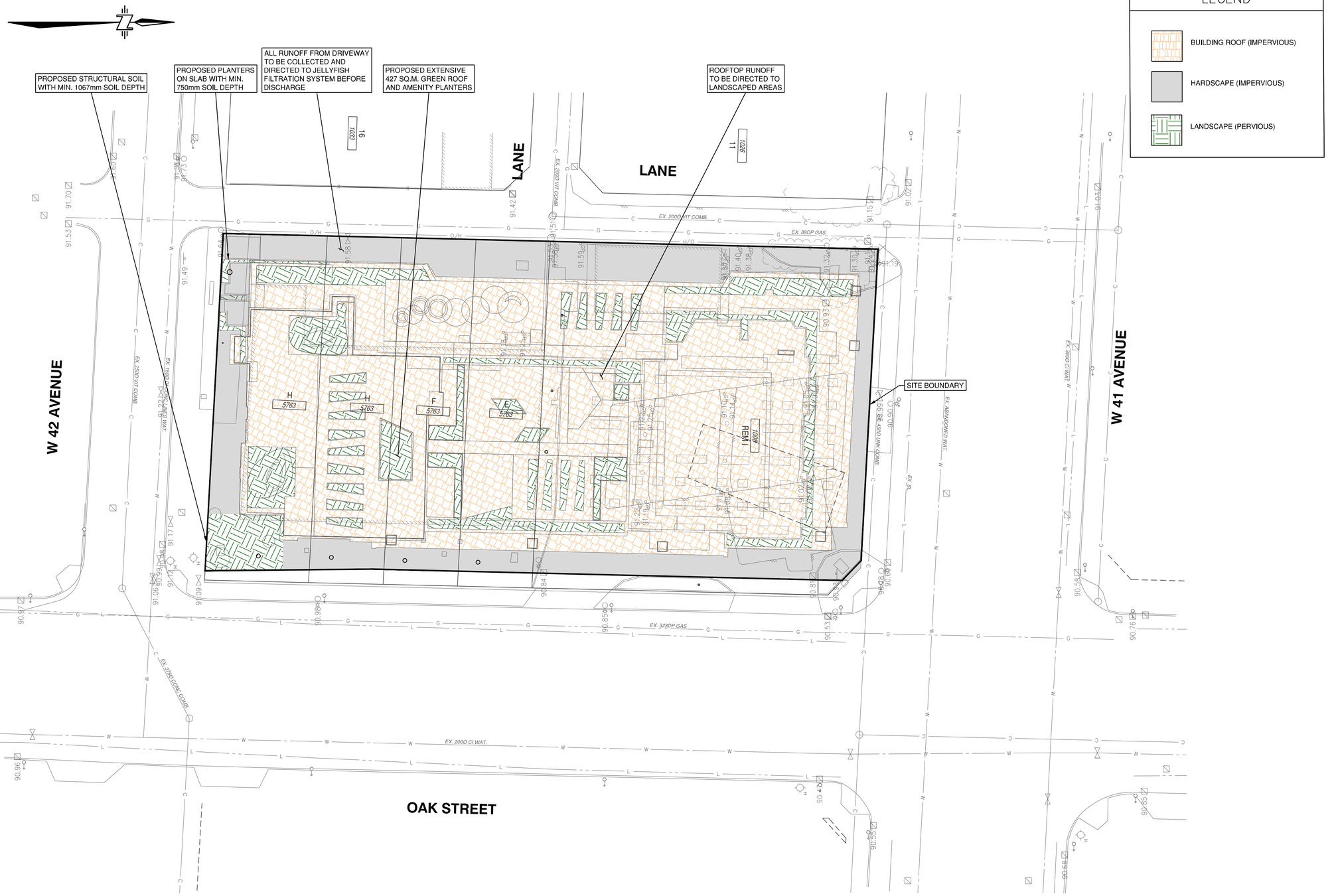
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C1	3
RFB JOB No. 19-1218	SHEET 1 OF 2

RAINWATER MANAGEMENT REPORT

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APPENDIX B

POST-DEVELOPMENT SITE PLAN



LEGEND

- BUILDING ROOF (IMPERVIOUS)
- HARDSCAPE (IMPERVIOUS)
- LANDSCAPE (PERVIOUS)

DETENTION FOR RELEASE RATE TARGET AND VOLUME REDUCTION TO BE LOCATED WITHIN PARKING STRUCTURE LIMITS.

JELLYFISH FILTRATION SYSTEM BY IMBRIUM OR APPROVED EQUIVALENT. SEE MECHANICAL DRAWINGS FOR PRODUCT DETAILS. JELLYFISH TO BE INSTALLED IN OFFLINE CONFIGURATION WITH EXTERNAL BYPASS WITHIN PARKING STRUCTURE LIMITS.

DETENTION SYSTEM TO BE WITHIN PARKING STRUCTURE LIMITS. REFER TO MECHANICAL DRAWINGS FOR DETAILS. DETENTION REQUIRED = 66.9cu.m

RAINWATER MANAGEMENT REPORT

BENCHMARK:
MON V-2246
N.W. CORNER OF OAK STREET & W 41ST AVENUE
90.770

SURVEYED BY:
UNDERHIL L GEOMATICS LTD.

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LOTS E-H OF LOTS 12 TO 15, BLOCK 995, DISTRICT LOT 526, PLAN 8152

SCALE: 0 1:250 12m

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ISSUED: M/D/Y	REVISION	DESCRIPTION
10/08/21	02	RE-ISSUED RAINWATER MANAGEMENT REPORT
07/10/20	01	RAINWATER MANAGEMENT REPORT

PROJECT:
OAK & 41ST RENTAL BUILDING

CLIENT:
WESTGROUP PROPERTIES LP

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The people behind your infrastructure.
R.F. BINNIE & ASSOCIATES LTD.
314-9440 202 Street
Langley, BC V1M 4A6
TEL 604 574 3336
***BINNIE**.com*

DATE: 07/03/20	SEAL:
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DESIGN: JEB	
CHECKED: JEB	
SCALE: 1:250	

SHEET TITLE:
RAINWATER MANAGEMENT PLAN POST-DEVELPOMENT

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RFB JOB No. 19-1218	SHEET 2 OF 2

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APPENDIX C

RAINFALL CAPTURE VOLUME

R.F. Binnie & Associates Ltd.
314 – 9440 202 Street
Langley, BC, V1M 4A6
Tel: 604-574-3336

Calculations

Project Name:	**Oak and 41st Rental Building**	**Project #:**	**19-1218**
Description:	**Target Rainfall Capture Volume**	**Date:**	**October 8, 2021**

Target: Capture the first 24mm of rainfall over a 24-hour period.

Post-Development Conditions:

Development Site Total Area	=	3291	m^2
Rooftop Amenity Planters	=	64.1	m^2
L9 Green Roof	=	135.1	m^2
L7 Amenity Planters	=	128.7	m^2
L2 Green Roof	=	99.2	m^2
L1 Structural Soil Onsite	=	65.0	m^2
L1 Planters	=	12.9	m^2
Hard Surface Area	=	2786.1	m^2
Target Rainfall Capture Volume =		**79.0**	**m^3**

Minimum Rainfall Capture Volumes Provided (based on 24mm over 24 hours):

Landscape/Planter Volume	=	6.5	m^3
Green Roof Capture Volume	=	5.6	m^3
Minimum Total Rainfall Capture Volume Provided	**=**	**12.1**	**m^3**

Rainfall Capture Volume (VBal) - Based on Min. Capture =	**66.9**	**m^3**

Maximum Rainfall Capture Volumes Provided (based on soil depths & infiltration):

L1 Structural Soil + Planters	=	14.2	m^3
L2 Green Roof	=	6.6	m^3
L7 Amenity Planters	=	16.5	m^3
L9 Amenity Green Roof and Planters	=	8.9	m^3
Rooftop Amenity Planters	=	8.0	m^3
Maximum Total Rainfall Capture Volume Provided	**=**	**54.2**	**m^3**

Rainfall Capture Volume (V_{Bal}) - Based on Max. Capture =	**24.8**	**m^3**

NOTES:
1. Post-development areas from Architectural Rezoning Application drawings
2. Assume landscape growing medium has porosity equal to 18% of medium volume.

APPENDIX D

RUNOFF COEFFICIENT CALCULATIONS

R.F. Binnie & Associates Ltd.
314 – 9440 202 Street
Langley, BC, V1M 4A6
Tel: 604-574-3336

Calculations

Project Name:	**Oak and 41 Rental Building**	**Project #:**	**19-1218**
Description:	**Runoff Coefficient Calculations**	**Date:**	**October 8, 2021**

5 – YEAR PRE-DEVELOPMENT

Area Type	Runoff Coefficient, R	Area, A (Hectares)	SAF	Rainfall Intensity, I (mm)	Flow, Q_2 (m^3/s)
Landscaping (2-7%)	0.23	0.024	1.0	53.0	0.0008
Building Roof	0.85	0.083	1.0	53.0	0.0104
Impervious Surface	0.80	0.236	1.0	53.0	0.0278
TOTAL		**0.343**			**0.0390**

Average Runoff Coefficient = 0.77 (Pre–Development Condition)

NOTES:
1. Rain fall Intensities taken from: Rainfall IDF Data – City of Vancouver 2014 IDF Curve
2. Time of Concentration Tc = 10 min
3. Refer to Appendix A and B for Pre- and Post-Development Site Plans

5 – YEAR POST DEVELOPMENT

Area Type	Runoff Coefficient, R	Area, A (Hectares)	SAF	Rainfall Intensity, I (mm)	Flow, Q_2 (m^3/s)
Landscaping (2-7%)	0.23	0.008	1.0	69.5	0.0003
Extensive Green Roof	0.23	0.043	1.0	69.5	0.0019
Building Roof	0.85	0.209	1.0	69.5	0.0343
Impervious Surface	0.80	0.070	1.0	69.5	0.0108
TOTAL		**0.329**			**0.0474**

Average Runoff Coefficient = 0.74 (Post–Development Conditions)

NOTES:
1. Rain fall Intensities taken from: Rainfall IDF Data – City of Vancouver 2100 IDF Curve
2. Time of Concentration Tc = 10 min
3. Flows based on Rational Method (Q=CIA)
4. N = 0.00278 for flow in cubic meters per second.
5. Refer to Landscape drawings for Landscaping details
6. Post development calculated with road dedication area removed

APPENDIX E

STORAGE VOLUME CALCULATIONS

R.F. Binnie & Associates Ltd.
300 - 4940 Canada Way
Burnaby, BC V5G 4K6
Tel: 604-420-1721 Fax: 604-420-4743

Calculations

Project Name:	**Oak and 41 Rental Building**	**Project #:**	**19-1218**
Description:	**Detention Volume Calculations**	**Date:**	**October 8, 2021**

5-YEAR PRE-DEVELOPMENT

Runoff Coefficient	R_{AVG} =	0.77	
Catchment Area	A =	0.329	ha
Time of Concentration	Tc =	10.0	minutes
Storm Frequency		5	year storm
Intensity	I =	53.0	mm/hr
Release Rate - 5 yr return	Q_D =	0.0374	m^3/s
Maximum Release Rate (Post = Pre)	Q_{rel} =	0.0374	m^3/s

5-YEAR POST-DEVELOPMENT

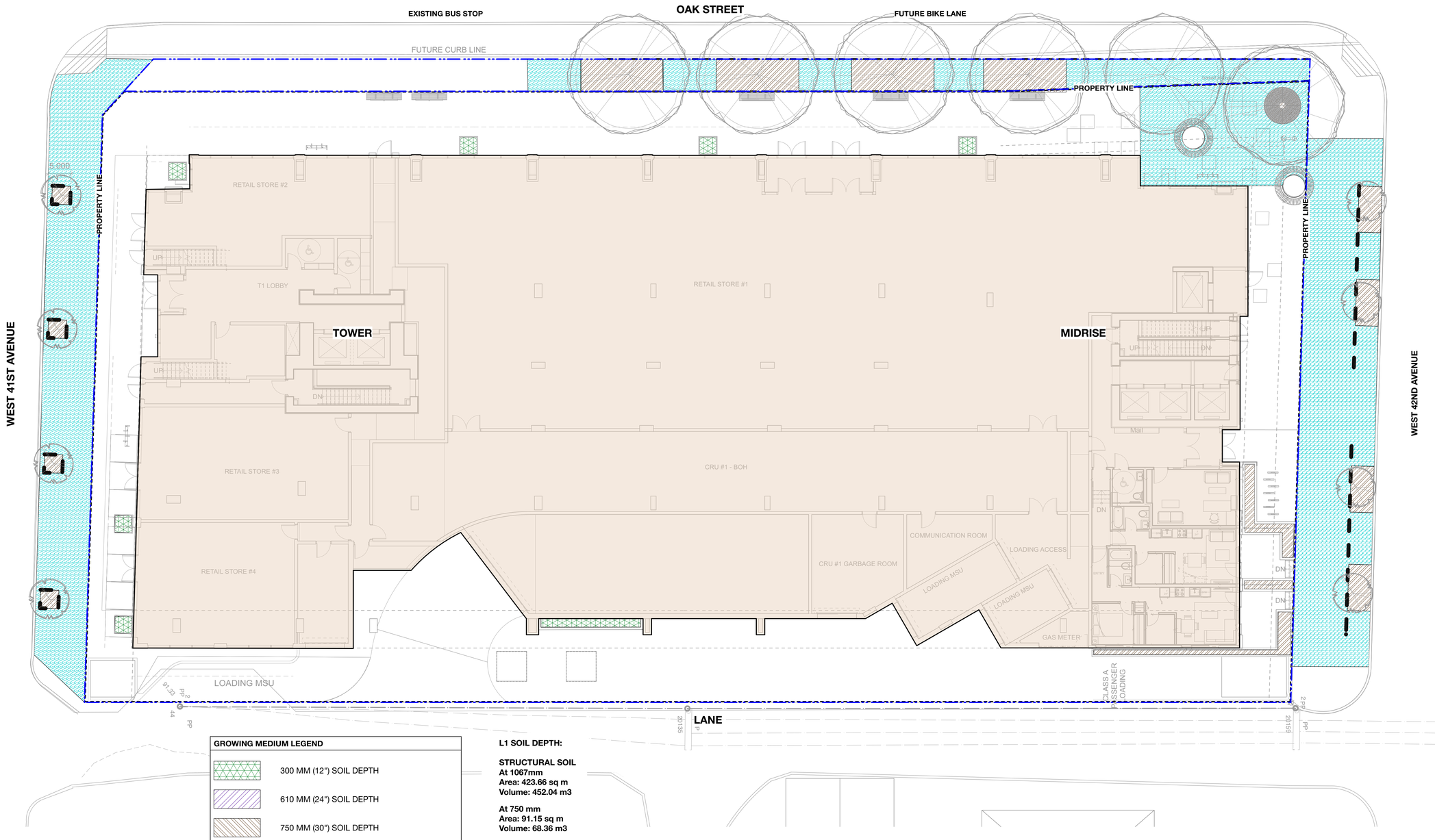
Runoff Coefficient	R_{AVG} =	0.74	
Catchment Area	A =	0.329	ha
Time of Concentration	Tc =	10.0	minutes
Storm Frequency		5	year storm

Hyd No.	Duration, Tr (minutes)	Rainfall Intensity, I (mm/h)*	Peak Flow, Q_p (m^3/s)	Inflow Runoff Volume (m^3)	Max Release Rate, Q_{rel} (m^3/s)	Required Storage Volume (m^3)
1	5	101.0	0.0688	20.6	0.0374	6.67
2	7	84.3	0.0574	24.1	0.0374	***6.86***
3	8	78.4	0.0534	25.6	0.0374	6.69
4	9	73.6	0.0501	27.1	0.0374	6.39
5	10	69.5	0.0473	28.4	0.0374	5.98
6	30	38.4	0.0262	47.1	0.0374	-
7	60	26.4	0.0180	64.8	0.0374	-
8	120	18.2	0.0124	89.1	0.0374	-
9	180	14.6	0.0099	107.3	0.0374	-
10	240	12.5	0.0085	122.5	0.0374	-
11	360	10.0	0.0068	147.7	0.0374	-
12	720	6.9	0.0047	203.1	0.0374	-
13	960	5.9	0.0040	231.9	0.0374	-
14	1200	5.2	0.0036	256.9	0.0374	-
15	1440	4.7	0.0032	279.4	0.0374	-

*** Formula for Rainfall Intensity: I = A * T^B where A and B are constants from 2100 IDF curve and T is time in hours.**

APPENDIX F

LANDSCAPE DRAWINGS



GROWING MEDIUM LEGEND

- 300 MM (12") SOIL DEPTH
- 610 MM (24") SOIL DEPTH
- 750 MM (30") SOIL DEPTH
- 1015 MM (40") SOIL DEPTH
- STRUCTURAL SOIL
- ROOT BARRIER

L1 SOIL DEPTH:

STRUCTURAL SOIL
At 1067mm
Area: 423.66 sq m
Volume: 452.04 m3

At 750 mm
Area: 91.15 sq m
Volume: 68.36 m3

At 300 mm
Area: 11.25 sq m
Volume: 8.43 m3

0 20 30 40 50 FT

1 Ground Floor
Scale: 3/32" = 1'-0"

Revision

No.	Date	Revision Notes

Issue

No.	Date	Issue Notes
A	2019-12-19	Issue for LOE
B	2020-07-29	Issue for Progress
C	2020-08-19	Issue for Re-Zoning
D	2020-12-14	UDP Meeting on January 6th
E	2021-07-08	Issue for Progress
F	2021-10-01	Re-issue for Re-zoning

Professional Seal

eta landscape architecture

1690 West 2nd Avenue
Vancouver , BC , Canada , V6J 1H4

t | 604.683.1456
f | 604.683.1459
w | www.etala.ca

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Project

Oak & 41st Rental Bldg

1008 W 41st &
5763 Oak St

Drawing Title

Soil Depth Plan
Ground Level
-

Legal
Legal Address line 1
Legal Address line 2
Legal Address line 3

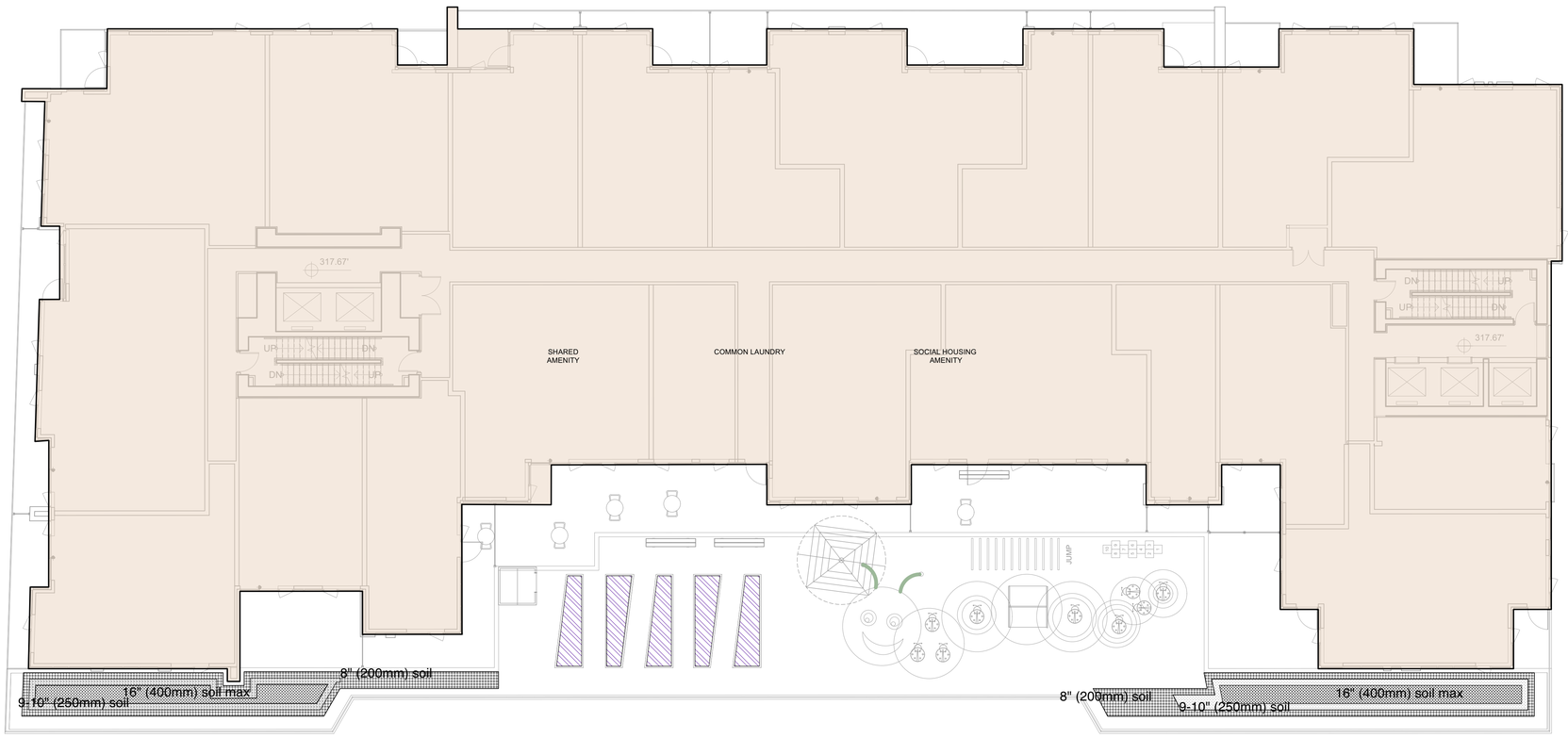
Project Manager	Project ID
NT	21941
Drawn By	Scale
Drawn By	as noted
Reviewed By	Drawing No.
Reviewed By	L6.1
Date	of
00/00/00	31

Plot Date:
21-10-6
21941 41st and Oak RZ.vwx

OAK STREET

WEST 41ST AVENUE

WEST 42ND AVENUE



LANE

GROWING MEDIUM LEGEND

- 300 MM (12") SOIL DEPTH
- 610 MM (24") SOIL DEPTH
- 750 MM (30") SOIL DEPTH
- 1015 MM (40") SOIL DEPTH
- STRUCTURAL SOIL
- ROOT BARRIER

L2 SOIL DEPTH
At 610mm
Area: 20.52
Volume: 12.31

At 200mm
Area: 42.57 sq m
Volume: 8.51 m3

At 250mm
Area: 33.64 sq m
Volume: 8.41 m3

At 400mm
Area: 23.52 sqm
Volume: 9.40 m3

0 20 30 40 50 FT

1 Level 2
Scale: 3/32" = 1'-0"

Revision

No.	Date	Revision Notes

Issue

No.	Date	Issue Notes
A	2019-12-19	Issue for LOE
B	2020-07-29	Issue for Progress
C	2020-08-19	Issue for Re-Zoning
D	2020-12-14	UDP Meeting on January 6th
E	2021-07-08	Issue for Progress
F	2021-10-01	Re-issue for Re-zoning

Professional Seal

eta landscape architecture

1690 West 2nd Avenue
Vancouver , BC , Canada , V6J 1H4

t | 604.683.1456
f | 604.683.1459
w | www.etala.ca

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Project

Oak & 41st Rental Bldg

1008 W 41st &
5763 Oak St

Drawing Title

Soil Depth Plan
Level 2
-

Legal
Legal Address line 1
Legal Address line 2
Legal Address line 3

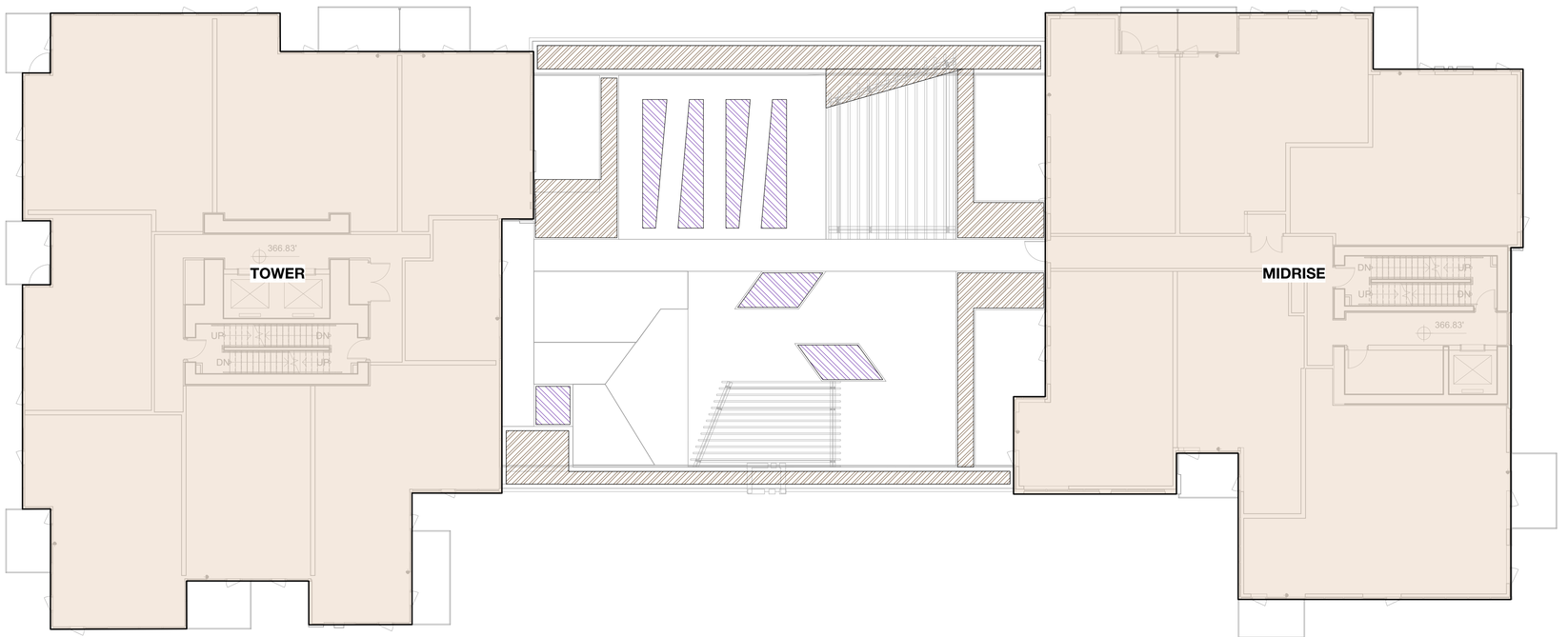
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NT	21941
Drawn By: Drawn By	Scale: as noted
Reviewed By: Reviewed By	Drawing No. L6.2
Date: 00/00/00	of 31

Plot Date:
21-10-6
21941 41st and Oak RZ.vwx

OAK STREET

WEST 41ST AVENUE

WEST 42ND AVENUE



LANE

GROWING MEDIUM LEGEND

- 300 MM (12") SOIL DEPTH
- 610 MM (24") SOIL DEPTH
- 750 MM (30") SOIL DEPTH
- 1015 MM (40") SOIL DEPTH
- STRUCTURAL SOIL
- ROOT BARRIER

L7 SOIL DEPTH

At 610mm
Area: 34.80 sq m
Volume: 21.22 m3

At 760mm
Area: 92.15 sq m
Volume: 70.03 m3

0 20 30 40 50 FT

1 Level 7
Scale: 3/32" = 1'-0"

Revision

No.	Date	Revision Notes

Issue

No.	Date	Issue Notes
A	2019-12-19	Issue for LOE
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1690 West 2nd Avenue
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t | 604.683.1456
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Project

Oak & 41st
Rental Bldg

1008 W 41st &
5763 Oak St

Drawing Title

Soil Depth Plan
Level 7
-

Legal
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Legal Address line 2
Legal Address line 3

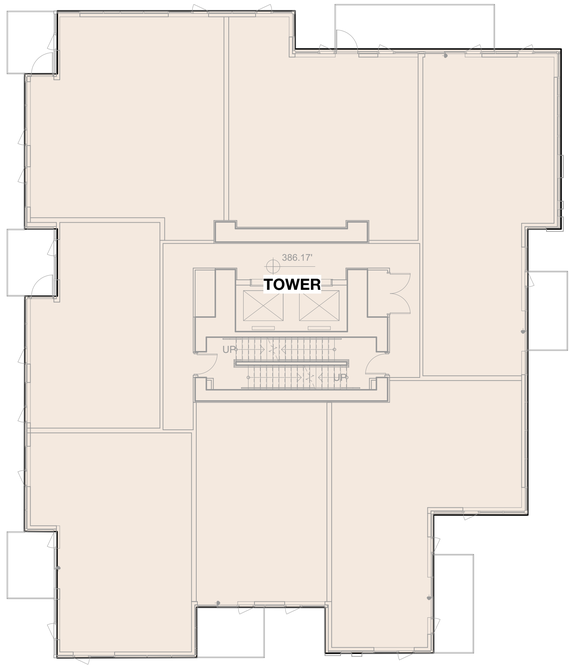
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NT	21941
Drawn By	Scale
Drawn By	as noted
Reviewed By	Drawing No.
Reviewed By	**L6.3**
Date	of
00/00/00	31

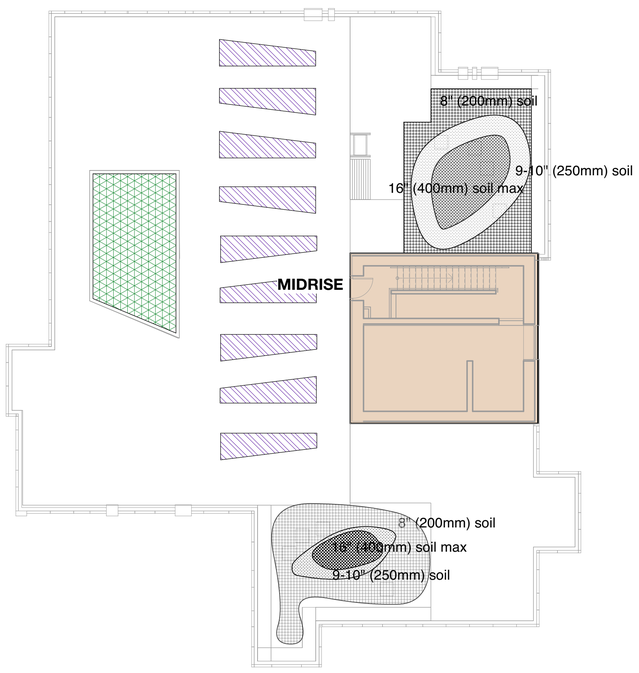
Plot Date:
21-10-6
21941 41st and Oak RZ.vwx

OAK STREET

WEST 41ST AVENUE

WEST 42ND AVENUE





LANE

GROWING MEDIUM LEGEND	
	300 MM (12") SOIL DEPTH
	610 MM (24") SOIL DEPTH
	750 MM (30") SOIL DEPTH
	1015 MM (40") SOIL DEPTH
	STRUCTURAL SOIL
	ROOT BARRIER

L9 SOIL DEPTH

At 300mm
Area: 24.31 sq m
Volume: 7.293 m3

At 610mm
Area: 37.04 sq m

At 200mm
Area: 40.05 sq m
Volume: 8.01 m3

At 250mm
Area: 17.50 sq m
Volume: 4.38 m3

At 400mm
Area: 14.38 sqm
Volume: 38.8 m3

0 20 30 40 50 FT

1 Level 9
Scale: 3/32" = 1'-0"

Revision

No.	Date	Revision Notes

Issue

No.	Date	Issue Notes
A	2019-12-19	Issue for LOE
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F	2021-10-01	Re-issue for Re-zoning

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eta landscape architecture

1690 West 2nd Avenue
Vancouver , BC , Canada , V6J 1H4

t | 604.683.1456
f | 604.683.1459
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Project

Oak & 41st
Rental Bldg

1008 W 41st &
5763 Oak St

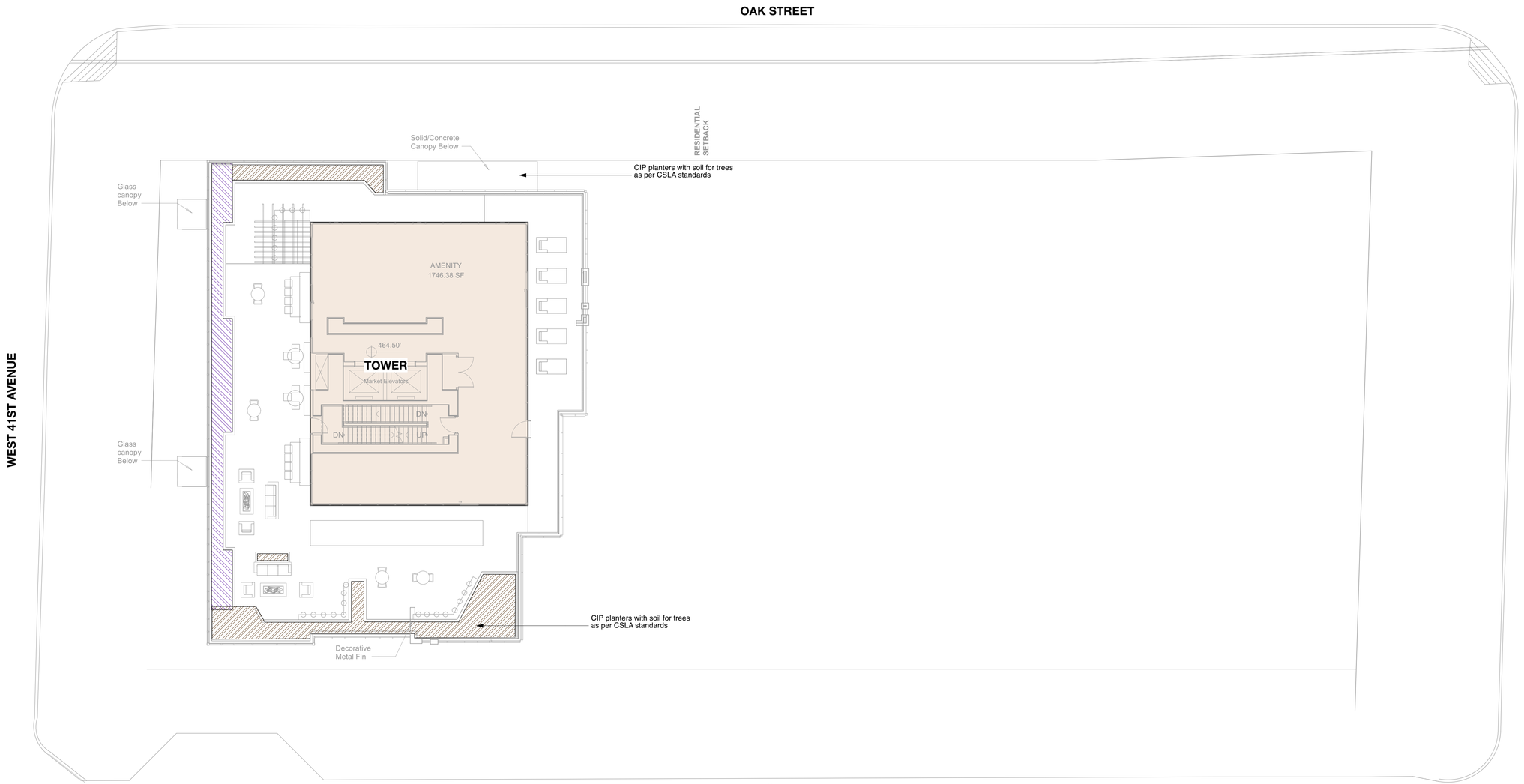
Drawing Title

Soil Depth Plan
Level 9
-

Legal
Legal Address line 1
Legal Address line 2
Legal Address line 3

Project Manager	Project ID
NT	21941
Drawn By	Scale
Drawn By	as noted
Reviewed By	Drawing No.
Reviewed By	L6.4
Date	of
00/00/00	31

Plot Date:
21-10-6
21941 41st and Oak RZ.vwx



GROWING MEDIUM LEGEND

- 300 MM (12") SOIL DEPTH
- 610 MM (24") SOIL DEPTH
- 750 MM (30") SOIL DEPTH
- 1015 MM (40") SOIL DEPTH
- STRUCTURAL SOIL
- ROOT BARRIER

AMENITY SOIL DEPTH

At 610 mm
Area: 26.51 sq m
Volume: 16.17 m3

At 760 mm
Area: 38.49 sq m
Volume: 29.25 m3

0 20 30 40 50 FT

1 Roftop Amenity
Scale: 3/32" = 1'-0"

Revision

No.	Date	Revision Notes

Issue

No.	Date	Issue Notes
A	2019-12-19	Issue for LOE
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Vancouver , BC , Canada , V6J 1H4

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Project

Oak & 41st
Rental Bldg

1008 W 41st &
5763 Oak St

Drawing Title

Soil Depth Plan
Roof Amenity
-

Legal
Legal Address line 1
Legal Address line 2
Legal Address line 3

Project Manager	Project ID
NT	21941
Drawn By	Scale
Drawn By	as noted
Reviewed By	Drawing No.
Reviewed By	L6.5
Date	of
00/00/00	31

Plot Date:
21-10-6
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