

TERMS OF INSTRUMENT – PART 2

DEVELOPMENT COVENANT

(section 219 *Land Title Act*)

This Agreement dated for reference the 28th day of June, 2021

BETWEEN:

DISTRICT OF WEST VANCOUVER750 17th Street
West Vancouver, BC V8V 3T3

(the “District”)

AND

0875410 B.C. LTD.8th Floor, 1080 Howe Street
Vancouver, BC V6Z 2T1

(the “Owner”)

GIVEN THAT:

- A. The Owner is the owner of land located at 657 Marine Drive, 675 Marine Drive and 660 Clyde Avenue in the District of West Vancouver and more particularly described as:

Address:	PID:	Legal Description:
657 MARINE DRIVE	014-020-840	LOT 52, EXCEPT, FIRSTLY; PART IN REFERENCE PLAN 2711, SECONDLY; PART ON HIGHWAY PLAN 30 DISTRICT LOT 1039 PLAN 2127
657 MARINE DRIVE	014-020-858	LOT 53, EXCEPT, FIRSTLY; PART IN REFERENCE PLAN 2711, SECONDLY; PART ON HIGHWAY PLAN 30, DISTRICT LOT 1039 GROUP 1 NEW WESTMINSTER DISTRICT PLAN 2127
675 MARINE DRIVE	009-125-680	LOT A DISTRICT LOT 1039 PLAN 11209
660 CLYDE AVENUE	014-020-785	LOT 44 DISTRICT LOT 1039 PLAN 2127

(collectively, the “Lands”);

- B. The Owner wishes to construct a development on the Lands consisting of an eight-storey residential building with approximately 89 units, and the retention and designation of the existing office building as a heritage resource, which would be operated as a temporary sales centre (the “Development”).

- C. The District's Council is considering an amendment to the District's Zoning Bylaw by way of "Zoning Amendment Bylaw No. 4662, 2010, Amendment Bylaw No. 5013, 2021" (the "**Amendment Bylaw**") to permit the Development on the Land;
- D. The Owner has offered to provide certain amenities to the District in conjunction with the Development, and has promised the District that no portion of the Development shall be constructed or occupied except generally in accordance with the plans submitted to the District in support of the Owner's zoning amendment application;
- E. The Owner has asked the District to consider adopting the Amendment Bylaw before all of the proposed amenities are provided, in exchange for the Owner's agreement to restrict the use and development of the Lands until the Owner has provided the promised amenities;
- F. Section 219 of the *Land Title Act* of British Columbia permits the registration of a covenant of a negative or positive nature in favour of a municipality in respect of the use of land, the building on land, the subdivision of land, and the preservation of land or a specific amenity on land; and
- G. The Owner wishes to grant and the District wishes to accept these covenants over the Lands restricting the use and subdivision of the Lands in the manner herein provided.

THEREFORE in consideration of the mutual promises exchanged in this Agreement, the parties agree pursuant to section 219 of the *Land Title Act* as follows:

1.0 DEFINITIONS AND INTERPRETATIONS

- 1.1** In this Agreement, in addition to the definitions set out in the recitals, the following words have the following meanings:

"Director of Planning and Development Services" means the District's Director of Planning and Development Services or his or her designate;

"Dwelling Unit" means a self-contained area or set of rooms comprising sleeping, cooking and washroom facilities, which is suitable and intended to be used for residential accommodation, and which, for clarity, may or may not be a strata lot under the *Strata Property Act*;

"Drainage Works" means a drainage collection and disposal system to manage and convey stormwater on and from the Lands, designed by a professional engineer in accordance with the Design Guidelines in the 2014 edition of the Master Municipal Construction Documents and the District's 2021 rainwater management guidelines attached to this Agreement as Schedule H (the "**Rainwater Design Guidelines**") , to convey the 1:10 year rainfall event within the collection system using the District's Intensity-Duration-Frequency curve for Municipal Hall for design calculations, including any upgrades required to the District's existing drainage infrastructure;

“Engineer” means the District’s Director of Engineering and Transportation or his or her designate;

“Frontage Works” means all of the following:

- (a) in respect of all public roads abutting or directly adjacent to the Lands, including Marine Drive, Clyde Avenue, and 6th Street, replacing the existing sidewalks, curbs and gutters, and repaving the entire curb lane, and in respect of any portion of public sidewalk or roadway that is disturbed or altered as a result of servicing the Lands, repaving the full width of a traffic lane or the sidewalk, including curb and gutter, or both;
- (b) replacing overhead wiring currently located on the sidewalk that is part of Marine Drive abutting or adjacent to the development with underground wiring; and
- (c) within the portion of Marine Drive that abuts the Lands, constructing and installing public realm features generally as shown in the drawing attached to this agreement as Schedule E (the **“Public Realm Plan”**), which features shall include, at a minimum, a 3.0 metre separated pedestrian path and a 1.8 metre separated cycling path, and the landscaping shown in the Public Realm Plan.

“Owner Works” means the Drainage Works, the Frontage Works and the Sewer Works.

“Parkette and Pathways” means the areas of the Lands proposed to be available for public access on and through the Lands, as shown outlined in heavy black, and hatched, on the drawing attached to this Agreement as Schedule A (the **“Location of Parkette and Pathways”**)

“Site Plans” means, collectively, the site plan and 13 pages of landscape drawings showing the proposed landscaping of the Parkette and Pathways, all attached to this Agreement as Schedule B (the **“Site Plans”**).

“Sewer Works ” means a sewage collection and disposal system, designed by a professional engineer, to manage and convey all sewage currently conveyed or required to be conveyed as a result of the occupancy of the Development through the District’s collection system (which is located within a statutory right of way over the Lands) to the downstream Metro Vancouver wastewater system on Taylor Way;

“Water System” means a water distribution system for the Development, including the installation of a new watermain along Clyde Avenue from Taylor Way to the northwest corner of the Lands and a hydrant to be located off of Taylor way at Marine Drive extending east to the southwest corner of the Lands, that provides water pressure of at least 22 psi during maximum day demand (MDD) plus fire flow, and at least 40 psi

during peak hour (PHD), and a minimum fire flow requirement of 200 litres per second for 2.5 hours, where MDD is defined as 993 L/c/d and PHD is defined as 1475 L/c/d. Maximum allowable velocities to achieve these flows are 3.5 m/s during fire flows.

2.0 SCHEDULES

The following Schedules are attached to and form part of this Agreement:

Schedule A – Locations of Parkette and Pathways

Schedule B – Site Plans

Schedule C – Public Access SRW Plan

Schedule D – SRW Sewer Plan

Schedule E – Public Realm Plan

Schedule F – Adaptable Design Guidelines

Schedule G1 – Baseline Adaptability Measures

Schedule G2 - Additional Adaptability Measures

Schedule H – Rainwater Design Guidelines

3.0 APPLICATION

3.1 This Agreement applies to the Lands, and to any parcel of land into which the Lands may be subdivided or consolidated, whether under the *Strata Property Act*, the *Land Title Act* or otherwise.

4.0 RESTRICTIONS ON USE, ALIENATION, DEVELOPMENT AND SUBDIVISION OF THE LAND

4.1 The Owner shall not start the construction of any building or structure on the Lands, until the Owner has:

- (a) consolidated the four legal parcels comprising the Lands into one legal parcel, having one title, and provided evidence of the consolidation to the District's Manager of Land Development;
- (b) granted to the District, in priority over any financial charges registered on the title to the Lands, a statutory right of way providing public access to, over and through the Parkette and Pathways as shown on the plan attached to this Agreement as Schedule C ("**Public Access SRW Plan**"), together with a covenant to maintain, in perpetuity, the surface treatments and landscaping elements for the Parkette and Pathways as shown in the Site Plans, which, for certainty, include but are not limited

to all hard and soft landscaping features and furnishings and durable all-weather surfacing appropriate for pedestrian, bicycle and wheelchair use, and which right of way and covenant shall be on terms satisfactory to the Director of Planning and Development Services, acting reasonably;

- (c) Submitted to the Engineer for approval, and received the Engineer's approval of, designs for the Water System and the Owner Works, which approval shall not be unreasonably withheld provided the designs are in accordance with any applicable District bylaws and good engineering practices (the "**Approved Designs and Specifications**");
- (d) Paid to the District 150% of the District's estimated costs of constructing and installing the Water System in accordance with the Approved Designs and Specifications, which costs shall include the District's actual costs of construction plus the costs of engineering, supervision, legal, contract administration, tendering, survey, other professional services, interest and all other costs reasonably required for completion of the Works, and entered into an agreement for the District to construct and install the Water System at the sole cost of the Owner, which agreement shall provide for the reimbursement to the Owner of any costs paid in excess of the District's reasonable costs to construct and install the water system;
- (e) Entered into an agreement under which the Owner shall, at its sole cost, construct and install the Owner Works in accordance with the Approved Designs and Specifications before using the Development or the Land for any residential purpose, and, at the District's sole discretion, registered the agreement on title as a covenant under section 219 of the *Land Title Act* and paid to the District the following:
 - i. security in the amount of 150% of the estimated cost of the Owner Works, a reasonable portion of which the District may hold for 1 year following completion of the Sewer and Drainage Works and the Frontage Works, and which the District may use during that period to perform maintenance or correct any deficiencies in the Sewer and Drainage Works or the Frontage Works if the Owner fails to do so;
 - ii. a non-refundable administration fee equal to 20% of the estimated cost of the Owner Works; and,
 - iii. a non-refundable servicing review fee equal to 4% of the estimated costs of the Owner Works; and,
- (f) Granted to the District, in priority over any financial charges registered on the title to the Lands, a statutory right of way for the Sewer Works over the portion of the Lands shown on the plan attached hereto as Schedule D (the "SRW Sewer Plan")

on terms satisfactory to the District's Engineer, acting reasonably, and, if necessary, delivered a registrable statutory right of way signed by owner of any adjacent land over which the District may reasonably require a statutory right of way for the Sewer Works.

- 4.2** Notwithstanding section 4.1, the Owner may commence demolition, excavation, shoring and other site preparation or safety work on the Lands, as well as the restoration of the existing office building on the Lands, pursuant to any authorized permits allowing such activities.
- 4.3** The Owner shall not subdivide the Lands by the deposit of a strata plan that designates parking stalls as limited common property for the exclusive use of residential strata lots, and the Owner shall not offer to any prospective purchaser or tenant of a Dwelling Unit in the Development the right to purchase or occupy the Dwelling Unit unless the Owner gives the prospective purchaser or tenant the option to take the Dwelling Unit with (subject to availability) or without access to a parking stall.

5.0 REQUIREMENTS AND STANDARDS FOR RESIDENTIAL CONSTRUCTION

- 5.1 Low Carbon Energy System** – In addition to complying with any District building regulations that apply when a complete building permit application is submitted, any building or structure on the Land other than the existing heritage office building shall be designed and constructed such that the energy sources for thermal conditioning and domestic water heating have a system seasonal average co-efficient of performance greater than 2, and a greenhouse gas intensity of no more than 3 kilograms of carbon dioxide emissions per square metre per year, and further, that any natural gas heating system for the building is used only to meet peak demands, and is appropriately sized for that purpose.
- 5.2 Level 2 Adaptable Design** – At least 18 residential dwelling units, or at least 20% of the residential dwelling units on the Land, whichever is a greater number, shall be designed and constructed to meet Level 2 of the City of North Vancouver Adaptable Design Guidelines, a copy of which guidelines is attached to this Agreement as Schedule F.
- 5.3 Basic Adaptable Design** – All dwelling units on the Land other than the dwelling units that are subject to section 5.2 shall be designed and constructed to incorporate all of the following adaptability features:
- (a) everything listed in the letter dated February 25, 2019 from Greg Santa to Lisa Berg, a copy of which attached to this Agreement as Schedule G1 (the “**Baseline Adaptability Measures**”); and,
 - (b) all of the features listed in Schedule G2 to this Agreement (the “**Additional Adaptability Measures**”).

- 5.4 Director approval for minor changes** – On written request from the Owner, the District’s Director of Planning and Development Services may in his or her sole discretion approve minor changes or deviations from the design and construction requirements set out in sections 5.2 and 5.3.

6.0 INDEMNITY AND RELEASE

- 6.1** The Owner shall indemnify and keep indemnified the District from any and all claims, causes of action, suits, demands, fines, penalties, costs, deprivation, expenses or legal fees whatsoever (collectively, “**Claims**”), whether based in law or equity, which anyone has or may have against the District or which the District incurs as a result of any loss, damage or injury arising out of or connected with or any breach by the Owner of this Agreement, except to the extent that such Claims are the result of the negligent acts or omissions or wilful misconduct on the part of the District or its personnel.

- 6.2** Owner hereby releases, save harmless and forever discharges the District of and from any Claims which the Owner can or may have against the District, whether based in law or equity, for any loss, damage or injury that the Owner may sustain or suffer arising out of or connected with this Agreement, including the restrictions and requirements of this Agreement and the development of the Lands as contemplated under this Agreement, or any breach by the Owner of any covenant in this Agreement, save and except as a result of any breach by the District of this Agreement or the negligent acts or omissions or wilful misconduct on the part of the District or its personnel.

- 6.3** The indemnity and release provisions of Sections 6.1 and 6.2 shall survive the expiry or termination of this Agreement.

7.0 OTHER

7.1 NOTICE

Any notice permitted or required by this Agreement to be given to either party must be given to that party at the address set out above, or to any other address provided in writing.

7.2 POWERS PRESERVED

Except as expressly set out in this Agreement, nothing in this Agreement shall prejudice or affect the rights and powers of the District in the exercise of its powers, duties or functions under the *Community Charter* or the *Local Government Act* or any of its bylaws, all of which may be fully and effectively exercised in relation to the Lands as if this Agreement has not been executed and delivered to the Owner.

7.3 BINDING EFFECT

This Agreement will enure to the benefit of and be binding upon the parties hereto and their respective heirs, administrators, executors, successors, and permitted assignees.

7.4 WAIVER

The waiver by a party of any failure on the part of the other party to perform in accordance with any of the terms or conditions of this Agreement is not to be construed as a waiver of any future or continuing failure, whether similar or dissimilar.

7.5 CUMULATIVE REMEDIES

No remedy for a breach of this Agreement is to be deemed exclusive but will, where possible, be cumulative with all other remedies at law or in equity.

7.6 SURVIVAL

All representations and warranties set forth in this Agreement and all provision of this Agreement, the full performance of which is not required prior to a termination of this Agreement, shall survive any such termination and be fully enforceable thereafter.

7.7 ENTIRE AGREEMENT

The whole agreement between the parties is set forth in this document and no representations, warranties or conditions, express or implied, have been made other than those expressed.

7.8 SEVERABILITY

Each article of this Agreement shall be severable. If any provision of this Agreement is held to be illegal or invalid by a Court of competent jurisdiction, the provision may be severed and the illegality or invalidity shall not affect the validity of the remainder of this Agreement.

7.9 COUNTERPARTS

This Agreement may be executed in counterpart with the same effect as if both parties had signed the same document. Each counterpart shall be deemed to be an original. All counterparts shall be construed together and shall constitute one and the same Agreement.

7.10 TERMINATION AND DISCHARGE

- a) This agreement shall terminate if the District's Council does not adopt the Amendment Bylaw by December 31, 2020.

- b) In the following circumstances, if the Owner delivers to the District a release of this Agreement in registrable form (the “**Release**”) together with a written request that the District sign the Release, the District shall sign and return the Release to the Owner within two weeks, for filing in the Land Title Office at the Owner’s cost:
- (i) this Agreement is terminated under section 7.10(a), above; or
 - (ii) the Owner fulfills all of its obligations under section 4.1 of this Agreement and provides the District, in registrable form, a replacement agreement under which the covenant set out in section 4.3 of this Agreement is registered as a charge on any titles in respect of which the Owner is requesting a discharge of this agreement (the “**Parking Stall Covenant**”), and an undertaking not to register the Release except together with the Parking Stall Covenant, in priority over any financial charges.

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the *Land Title Act* Form C and D which is attached to and forms part of this Agreement.

PRIORITY AGREEMENT

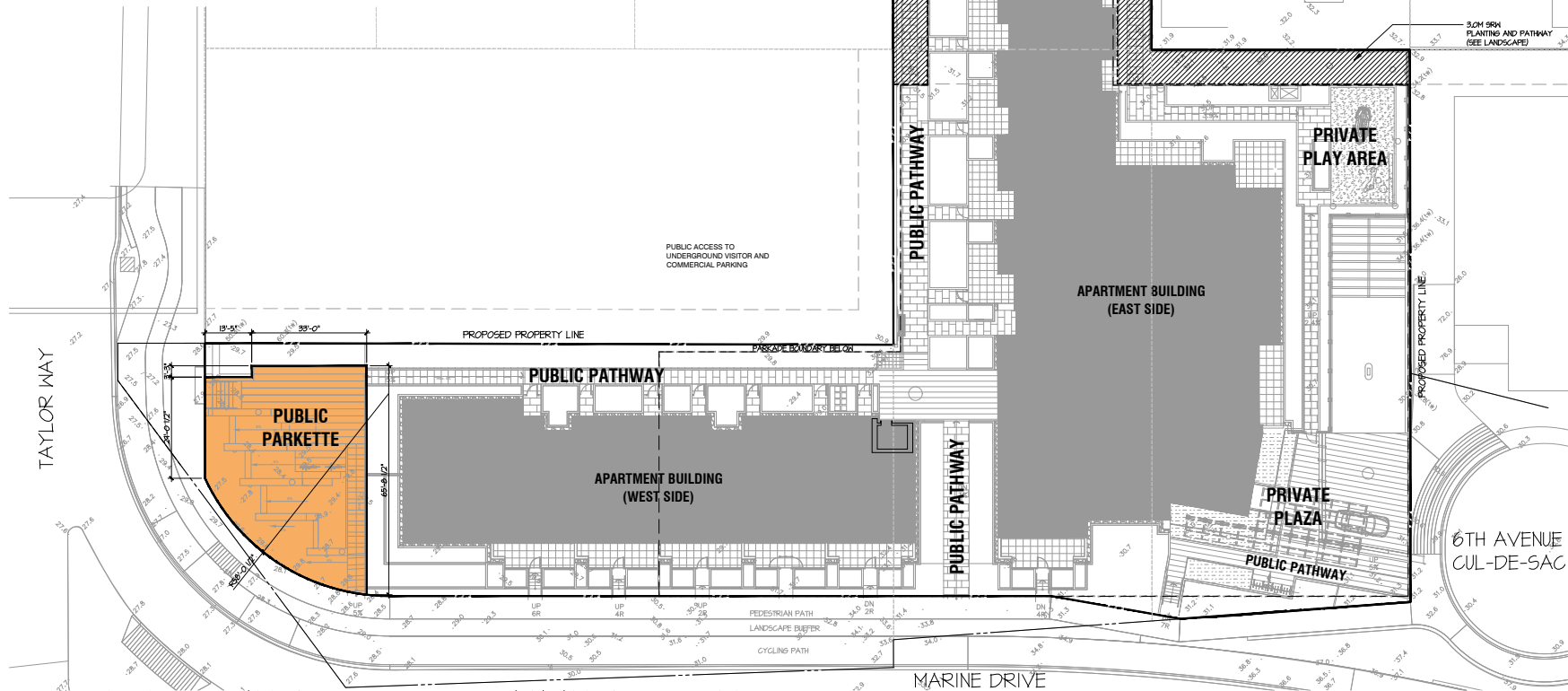
A. **COAST CAPITAL SAVINGS CREDIT UNION** (the “**Chargeholder**”) is the holder of a mortgage and assignment of rents (the “**Financial Charges**”) encumbering the Lands described in Item 2 of Part 1 of the Form C General Instrument to which this Priority Agreement is attached and which are registered in the Land Title Office as Mortgage CA5010382 and Assignment of Rents CA5010383, respectively.

B. A covenant is being granted pursuant to Part 2 of the Form C General Instrument to which this Priority Agreement is attached (the “**City’s Charge**”) which is registered against title to the Lands.

NOW THEREFORE for one dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged and agreed to by the Chargeholder, the Chargeholder hereby grants to the City priority for the City’s Charge over all the Chargeholder’s right, title and interest in and to the Lands as if the City’s Charge had been executed, delivered and registered prior to the execution and registration of the Financial Charges and prior to the advance of any monies pursuant to the Financial Charge. The grant of priority is irrevocable, unqualified and without reservation or limitation.

PUBLIC PARKETTE

01 Location of Public Parkette



PLOT STAMP: 2021-Jun-17 @ 1:05pm - P:\A215294 - Executive Group - Park Royal Site\CAD\SD\A215294_Rezoning.dwg - A0.18

SCHEDULE A (Location of Parkette and Pathways)

dys architecture
260 - 1770 Burrard Street Vancouver BC V6J 3G7
tel 604.669.7710 www.dysarchitecture.com

CLIENT



**EXECUTIVE
GROUP DEVELOPMENT**

NO. | DATE | ISSUE
01 | 2020.08.25 | ISSUED FOR CITY REVIEW
02 | 2021.05.31 | RE-ISSUED FOR CITY REVIEW
03 | 2021.06.16 | RE-ISSUED TO CITY - COVENANT

NO. | DATE | REVISION

PROJECT

**EXECUTIVE PARC
MARINE + TAYLOR RESIDENTIAL**

657 Marine Drive
West Vancouver BC

**LOCATION OF
PUBLIC PARKETTE**

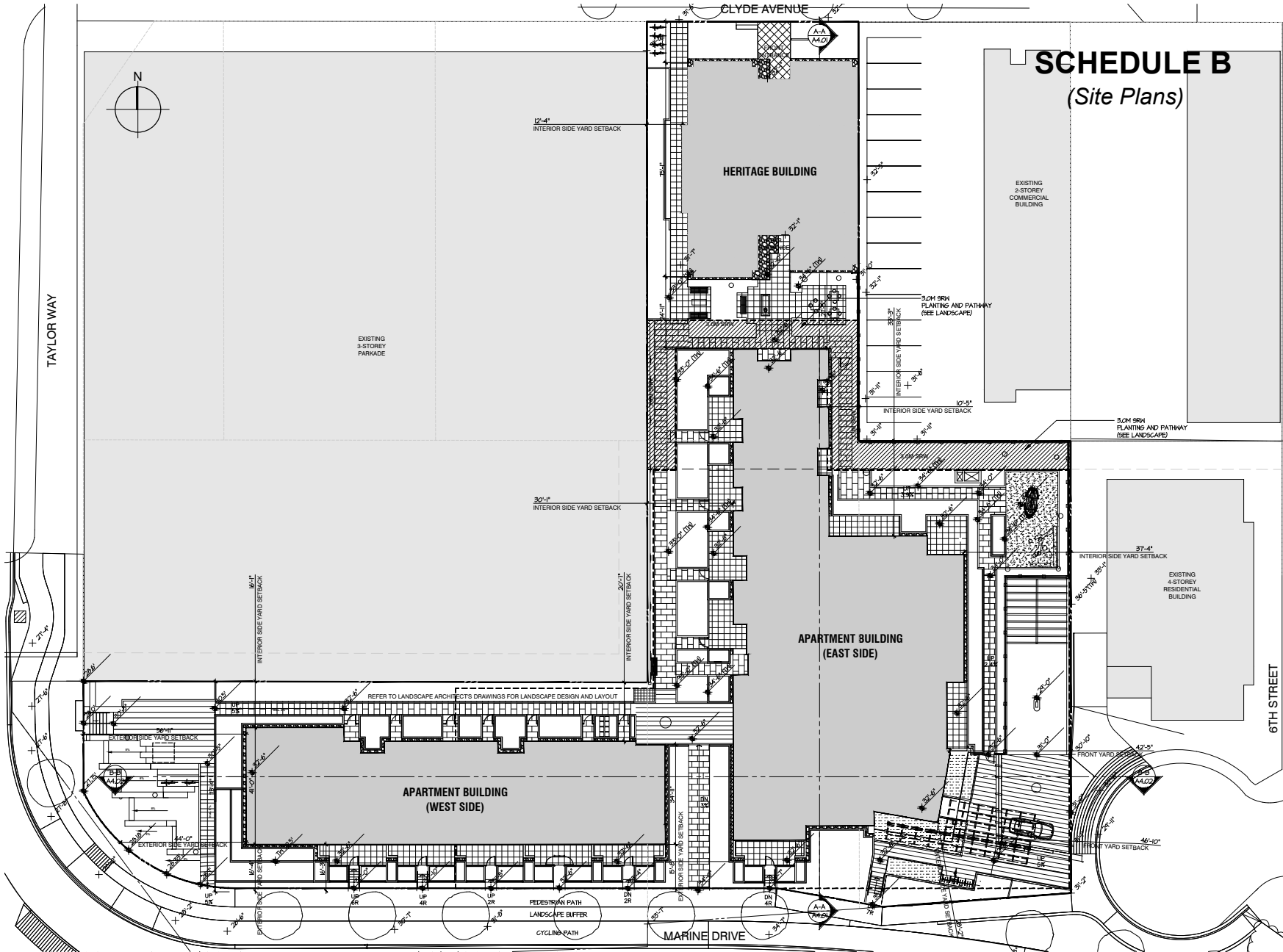
This drawing, as an instrument of service, is the property of the architect and may not be reproduced without their permission and provided always that any particular names, their name, all designs and other information shown on this drawing are not used on the specified project and shall not be used otherwise without written permission of the architect. Payment of all fees due to the architect as to the date of use of this drawing is a condition precedent to the use thereof.

Written dimensions shall have precedence over related dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job and the architect shall be informed of any variations from the dimensions and conditions shown on the drawings. Final drawings shall be submitted to the architect for review before proceeding with fabrication.

PROJECT A215294
DRAWN JL/SS CHECKED NC

SCALE 1/16" = 1'-0"
DATE AUG. 25, 2020

A0.18e



CLIENT



EXECUTIVE GROUP DEVELOPMENT

NO.	DATE	ISSUE
01	2018.05.17	ISSUED FOR DRG
02	2018.11.19	ISSUED FOR PCM
03	2019.03.28	RESPONSE TO MEMORANDUM
04	2020.08.25	REISSUED FOR CITY REVIEW
05	2020.09.14	REISSUED FOR CITY REVIEW
06	2021.02.18	REISSUED FOR CITY REVIEW
07	2021.03.22	ISSUED FOR CITY ENGINEERING
08	2021.03.26	ISSUED FOR REZONING

NO.	DATE	REVISION
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PROJECT

EXECUTIVE PARC MARINE+TAYLOR RESIDENTIAL

657 Marine Drive
 West Vancouver BC

SITE PLAN

This drawing, as an instrument of service, is the property of the architect and may not be reproduced without their permission and provided always that any particular names, their names, all designs and other information shown on this drawing are not used on the specified project and shall not be used otherwise without written permission of the architect. Payment of all fees due to the architect up to the date of use of this drawing is a condition precedent to the use thereof.

Written dimensions shall have precedence over related dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job and any variations shall be informed of any variations from the dimensions and conditions shown on the drawings. These drawings shall be submitted to the architect for review before proceeding with construction.

PROJECT A215294
 DRAWN JL CHECKED NC

SCALE 1/16"=1'-0"
 DATE FEB. 18, 2021

A1.01



PARKETTE
Feature stone fin walls project through the landscape giving a strong sense of place. Accessible ramp is provided from the South whilst steps provide another entry from the West. Tables and benches look out over the feature planting of perennials and grasses, and the feature striped paving. Trees planted to the North help screen the adjacent building.

See offsite sheet L-3 for boulevard planting and curb detailing with Dist or W. Van.

STREET FACING UNITS
Decorative screening helps define the boundary from public sidewalk to private units. Patterns and images on the screens add artistic detailing. Plants by feature walls give colour interest.

Coordinate streetscape sidewalk, boulevard planting and curb detailing with Dist or W. Van.

Re-instate heritage - feeling of new gardens on North side of heritage building using formal plantings. Repave area using exposed aggregate concrete surfacing to reflect original paving materials.

Machine access path to Sanitary Sewer ROW from Clyde Ave.

ZEN GARDENS
Reinstate original gravel & boulder zen gardens at north and south entry to the building

COURTYARD
A rectangular fountain in a modern Japanese style activates this courtyard resting spot. Planting adds to the gentle textures and style of the area and benches provide resting places with view of the water

Central artwork gives focal point to sunny seating area

Line of parkade slab below

Unit paver patios at grade with low picket style fencing to create private areas, planted with shade tolerant evergreen shrubs, grasses, and ferns. Feature boulders beneath flowering trees add drama to the gardens.

Seating area

Flush grill over mech room below

ENTRY AREA
Striped paving helps signify the community facility access area. Artwork gives a focal point.

Steps to upper level

Lock Block wall at base of parkade to raise grade of park space above street level.

Picket security fence and lockable gate at private entry areas

Line of parkade slab below

ENTRY AREA
Shade tolerant planting provides a welcoming entry walkway into the development. The planting of bulbs adds seasonal interest and surprise.

MEETING AREA
In the context of the courtyard area moveable tables and chairs provide a space for meetings. Shaded by trees, decorative lighting creates an intimate ambience.

Line of parkade slab below

Privacy gate - removable fence posts in SRW

SRW

Machine access path to Sanitary Sewer ROW from 6th Ave

Contemporary dark grey concrete bird bath to match and compliment courtyard water feature. Send shop drawings for approval by Landscape Architect

Bollard-type pathway lighting

6' non-climbable fence around

AMENITY PLAYSPACE
A feature playboat is proposed alongside boulders and logs for a natural play aesthetic. Safety surfacing indicating islands and water frames the play elements, table and seats.

Unit paver pathway at perimeter of tower for pedestrian circulation and maintenance access

Trellis structure to support climbing vines above ramp down to parkade

Picket style security fence with lockable gate

ENTRY PLAZA
Feature paving marks this lobby plaza and entrance. Waterfeature with falling water adds soothing sounds to the space, screening out traffic noise. Low concrete bollards define vehicular access, and bike racks are provided near building.

Line of parkade slab below

Pole mounted lighting at park space and roadways

Long ramp up to Marine Drive - connect bottom of ramp to plaza with new conc. sidewalk, see sheet L-3

Line of parkade slab below

Tall conifer planting - to frame corner of high rise tower from street



May 19 2021	Re-issue For Reasoning
April 29 2021	Issue For Reasoning
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 8 2018	Issue For DRC
May 8 2018	For Review
April 27 2017	For Review
Nov 7 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Revisions:

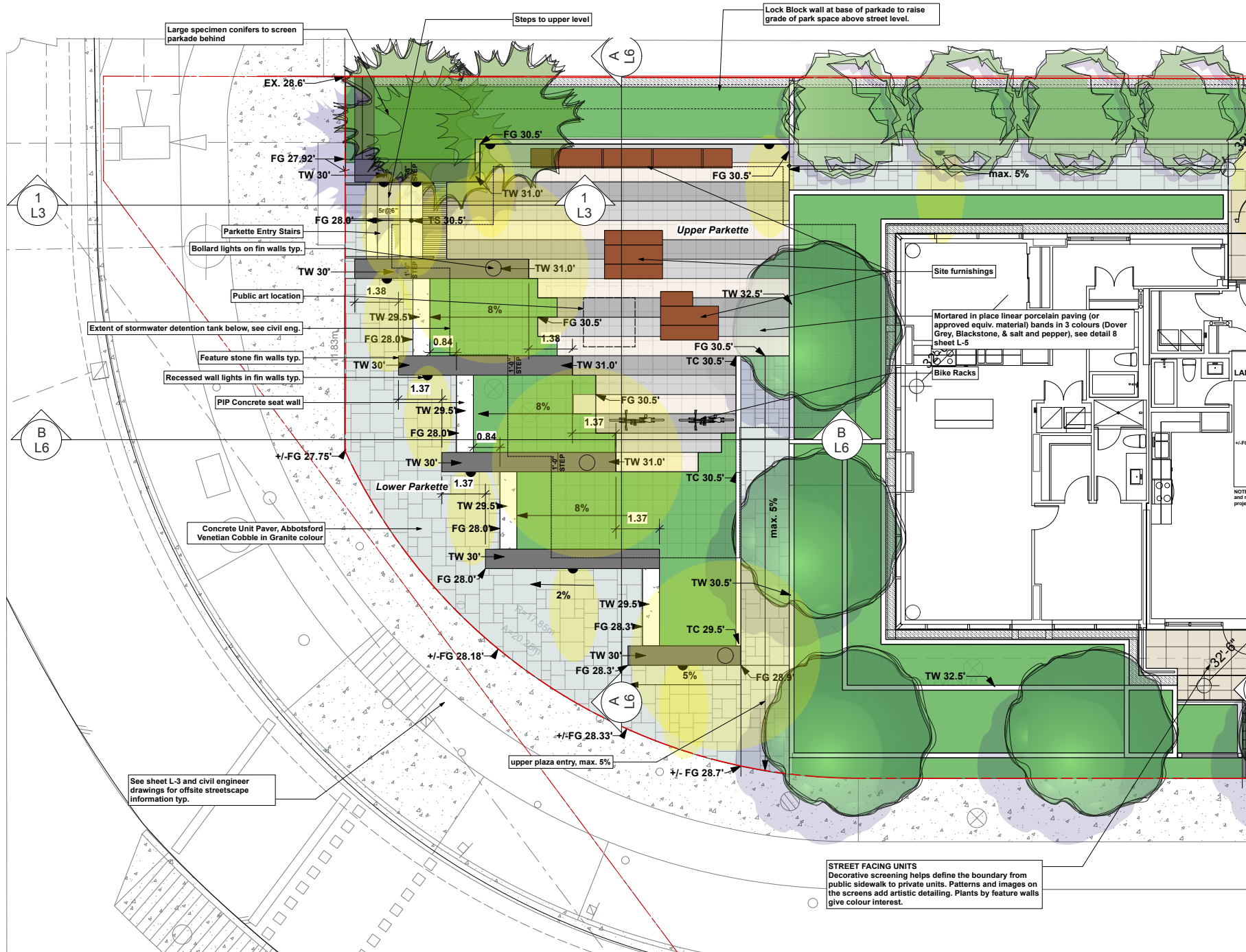
Prospect & Refuge
LANDSCAPE ARCHITECTS
Building 25 years of history in British Columbia
4100 West 24th Ave. | Vancouver BC V6V 2G3
1-604-681-1000 | www.prospectandrefuge.com | info@prospectandrefuge.com

Project:
**Residential Development
Clyde & 6th Street
West Vancouver, B.C.**

Sheet Title:
**Illustrative Landscape
Plan**

Scale:
1:200
Date: 2020-06-11
Project No:
2016-03

L-1



LANDSCAPE GRADING LEGEND:

TB 29.5'—X	Top of stairs
TC 29.5'—X	Top of curb
FG 28.0'—X	Finish Landscape Grade - see civil for bottom of footing grades
TW 30'—X	Top of wall
+/-FG 27.75'—X	Approximate finish Landscape Grade
8%	Direction of landscape slope
12" x 6"	Landscape trends - 12" run, 6" rise

NOTE: Proposed grades are conceptual and require further design development as project progresses.



May 19 2021	Re-issue For Reasoning
April 29 2021	Issue For Reasoning - see below plan only
June 11 2020	Issue For Review
May 9 2016	Issue For DRG
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
LANDSCAPE ARCHITECTS
 Building on 23 years of history in Vancouver, BC
 #603-661-0100 | www.prospectandrefuge.com

Project:
Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

Sheet Title:
Enlarged Parkette Layout and Conceptual Grading Plan

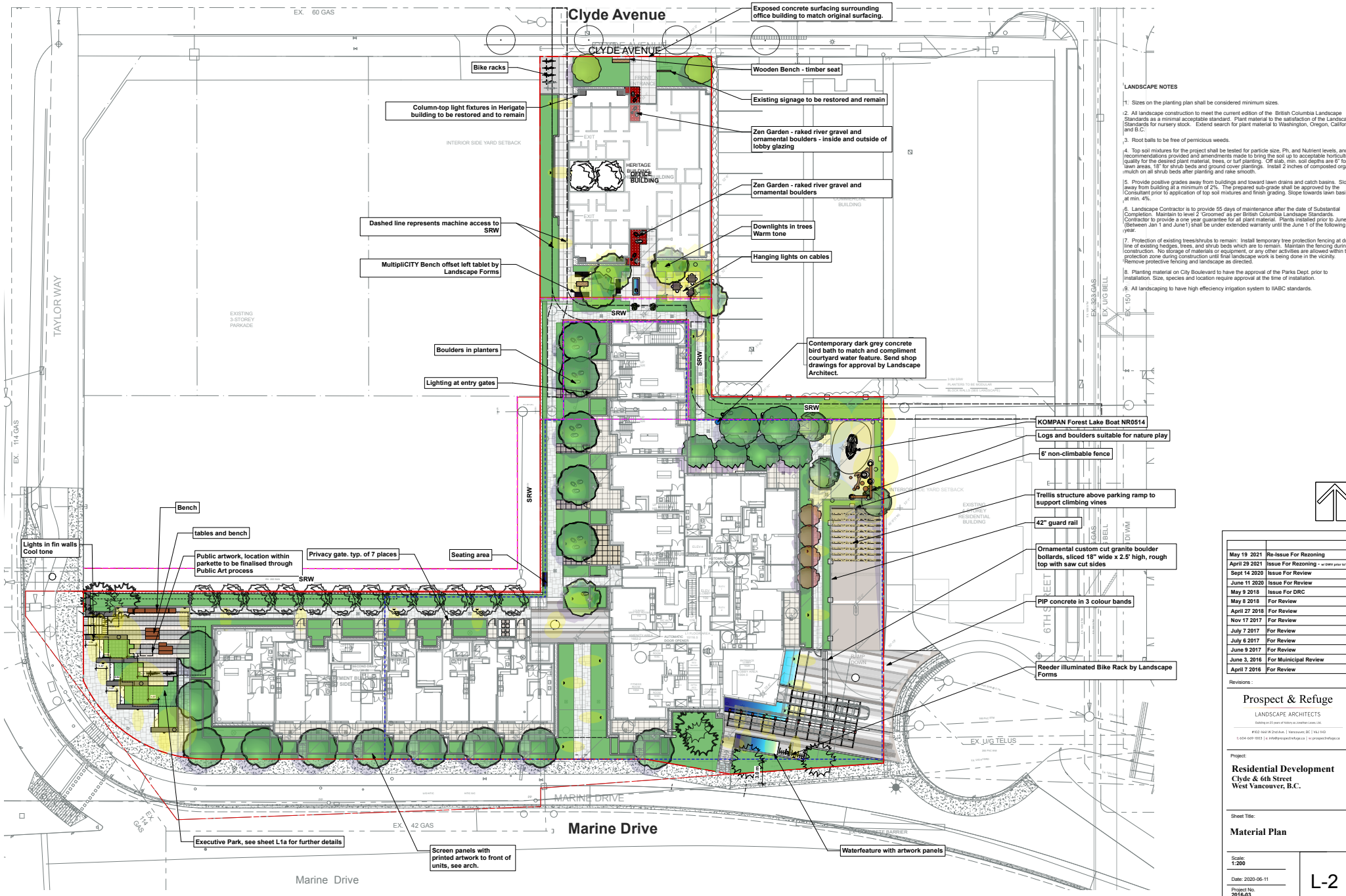
Scale:
1:50

Date: 2020-06-11
 Project No:
 2016-03

L-1a

STREET FACING UNITS
 Decorative screening helps define the boundary from public sidewalk to private units. Patterns and images on the screens add artistic detailing. Plants by feature walls give colour interest.

See sheet L-3 and civil engineer drawings for offsite streetscape information typ.



- LANDSCAPE NOTES**
- Sizes on the planting plan shall be considered minimum sizes.
 - All landscape construction to meet the current edition of the British Columbia Landscape Standards as a minimal acceptable standard. Plant material to the satisfaction of the Landscape Standards for nursery stock. Extend search for plant material to Washington, Oregon, California, and B.C.
 - Root balls to be free of pernicious weeds.
 - Top soil mixtures for the project shall be tested for particle size, Ph, and Nutrient levels, and recommendations provided and amendments made to bring the soil up to acceptable horticultural quality for the desired plant material, trees, or turf planting. Off slab, min. soil depths are 6" for lawn areas, 12" for shrub beds and ground cover plantings. Install 2 inches of composted organic mulch on all shrub beds after planting and rake smooth.
 - Provide positive grades away from buildings and toward lawn drains and catch basins. Slope away from building at a minimum of 2%. The prepared sub-grade shall be approved by the Consultant prior to application of top soil mixtures and finish grading. Slope towards lawn basins at min. 4%.
 - Landscape Contractor is to provide 55 days of maintenance after the date of Substantial Completion. Maintain to level 2 'Groomed' as per British Columbia Landscape Standards. Contractor to provide a one year guarantee for all plant material. Plants installed prior to June 1 (between Jan 1 and June 1) shall be under extended warranty until the June 1 of the following year.
 - Protection of existing trees/shrubs to remain: Install temporary tree protection fencing at drip line of existing hedges, trees, and shrub beds which are to remain. Maintain the fencing during construction. No storage of materials or equipment, or any other activities are allowed within the protection zone during construction until final landscape work is being done in the vicinity. Remove protective fencing and landscape as directed.
 - Planting material on City Boulevard to have the approval of the Parks Dept. prior to installation. Size, species and location require approval at the time of installation.
 - All landscaping to have high efficiency irrigation system to IAABC standards.

Date	Description
May 19 2021	Re-issue For Rezoning
April 29 2021	Issue For Rezoning - w SRW plan
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 9 2019	Issue For DRC
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
 LANDSCAPE ARCHITECTS
 6104 144th Street, West Vancouver, BC V8W 2K4
 1-604-699-1003 | info@prospectandrefuge.com | www.prospectandrefuge.com

Project:
Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

Sheet Title:
Material Plan

Scale:
 1:200

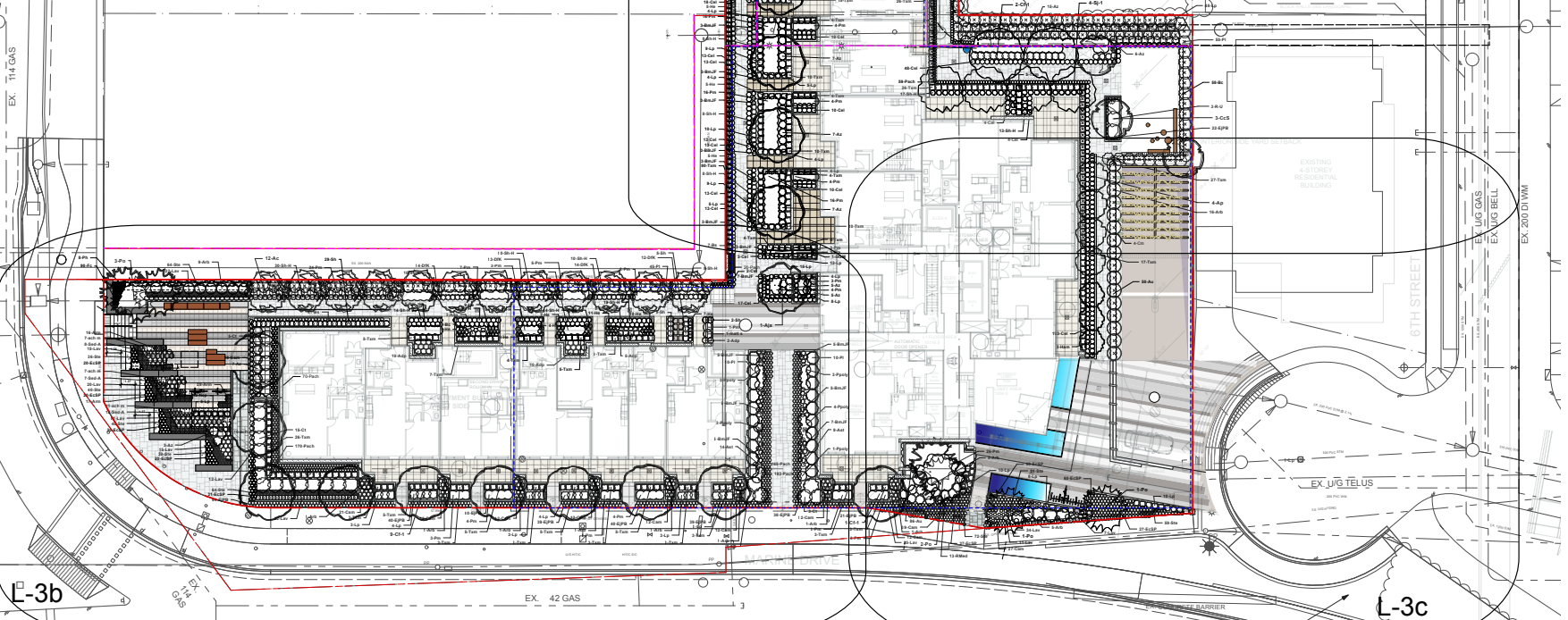
Date: 2020-06-11
 Project No:
 2016-03

EX. 60 GAS

LANDSCAPE NOTES

MASTER ORBIT PLANT LIST					
TYPE	Plant Name	Quantity	Size	Notes	Plant Source
Tree	Araucarioxylon t. arborescens	14	20 in.		B. B. B.
Tree	Juniperus horizontalis 'Spartan'	1	4m cal. #20 pot		Cont.
Tree	Araucarioxylon t. arborescens	4	2m tall		B.B.B.
Tree	Juniperus horizontalis 'Spartan'	7	1.5m cal. #20 pot		B.B.B.
Tree	Juniperus horizontalis 'Spartan'	9	1.5m cal.		B.B.B.
Tree	Juniperus horizontalis	17	3.0m cal.		B.B.B.
Tree	Juniperus horizontalis	1	1.5m cal.		B.B.B.
Tree	Juniperus horizontalis	4	1.5m pot		B.B.B.
Shrub	Arctostaphylos uva-ursi	15	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	12	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	12	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	135	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	61	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	64	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	23	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	66	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	67	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	19	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	132	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	13	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	149	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	189	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	90	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	4	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	53	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	110	#20		Cont.
Shrub	Arctostaphylos uva-ursi	295	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	173	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	50	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	3	#10 pot		Cont.
Shrub	Arctostaphylos uva-ursi	73	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	224	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	22	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	13	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	1	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	12	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	2518	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	8	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	288	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	14	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	147	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	12	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	5	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	13	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	144	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	175	#2 pot		Cont.
Shrub	Arctostaphylos uva-ursi	27	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	438	#1 pot		Cont.
Shrub	Arctostaphylos uva-ursi	176	#1 pot		B.B.B.
Shrub	Arctostaphylos uva-ursi	100	#1 pot		Cont.

Shrub coverages selected by Landscape Architect



- Sizes on the planting plan shall be considered minimum sizes.
- All landscape construction to meet the current edition of the British Columbia Landscape Standards as a minimal acceptable standard. Plant material to be the satisfaction of the Landscape Standards for nursery stock. Extend search for plant material to Washington, Oregon, California, and B.C.
- Root balls to be free of perennious weeds.
- Top soil mixtures for the project shall be tested for particle size, Ph, and Nutrient levels, and recommendations provided and amendments made to bring the soil up to acceptable horticultural quality for the desired plant material. Trees or turf planting. Off site, min. soil depths are 6' for lawn areas, 18' for shrub beds and ground cover plantings. Install 2 inches of composted organic mulch on all shrub beds after planting and rain smooth.
- Provide positive grades away from buildings and toward lawn drains and catch basins. Slope away from building at a minimum of 2%. The prepared sub-grade shall be approved by the Consultant prior to application of top soil mixtures and finish grading. Slope towards lawn basins at min. 4%.
- Landscape Contractor to provide 55 days of maintenance after the date of Substantial Completion. Maintain to level 2 'Groomed' as per British Columbia Landscape Standards. Contractor to provide a one year guarantee for all plant material. Plants installed prior to June (Between Jan 1 and June 1) shall be under extended warranty until the June 1 of the following year.
- Protection of existing trees/shrubs to remain. Install temporary tree protection fencing at drip line of existing hedges, trees, and shrub beds which are to remain. Maintain the fencing during construction. No storage of materials or equipment, or any other activities are allowed within the protection zone during construction until final landscape work is being done in the vicinity. Remove protective fencing and landscape as directed.
- Planting material on City Boulevard to have the approval of the Parks Dept. prior to installation. Size, species and location require approval at the time of installation.
- All landscaping to have high efficiency irrigation system to IPAC standards.

Note: See Sheet L-3 for offsite planting typ.

Date	Issue For Review	Issue For Review
May 19 2021	Re-Issue For Rezoning	
April 29 2021	Issue For Rezoning - 2nd review	
Sept 14 2020	Issue For Review	
June 11 2020	Issue For Review	
May 9 2018	Issue For DRIC	
May 8 2018	For Review	
April 27 2018	For Review	
Nov 17 2017	For Review	
July 7 2017	For Review	
July 6 2017	For Review	
June 9 2017	For Review	
June 3 2016	For Municipal Review	
April 7 2016	For Review	

Revisions:

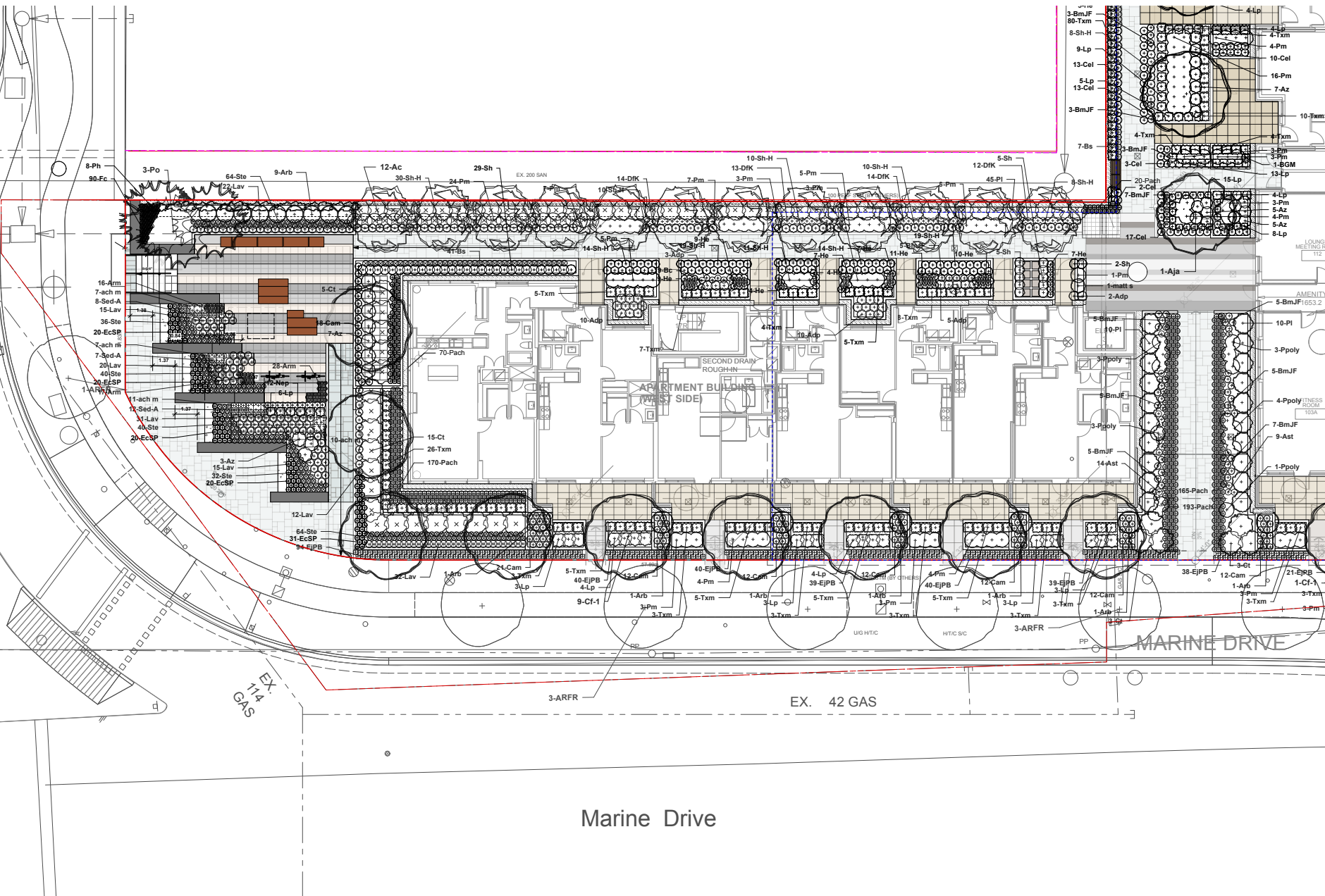
Prospect & Refuge
 LANDSCAPE ARCHITECTS
 1004 West 10th Avenue | Vancouver, BC V6H 1G5
 1-604-699-1003 | info@prospectandrefuge.ca | prospectandrefuge.ca

Project:
Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

Sheet Title:
Planting Plan Sheet
 Layout

Scale:
 1:200
 Date: 2020-06-11
 Project No:
 2016-03

L-3a



Date	Revision / Description
May 19 2021	Re-Issue For Rezoning
April 29 2020	Issue For Rezoning - (REVISED)
Sept 11 2020	Issue For Review
June 11 2020	Issue For Review
May 9 2018	Issue For DRC
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
LANDSCAPE ARCHITECTS
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Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

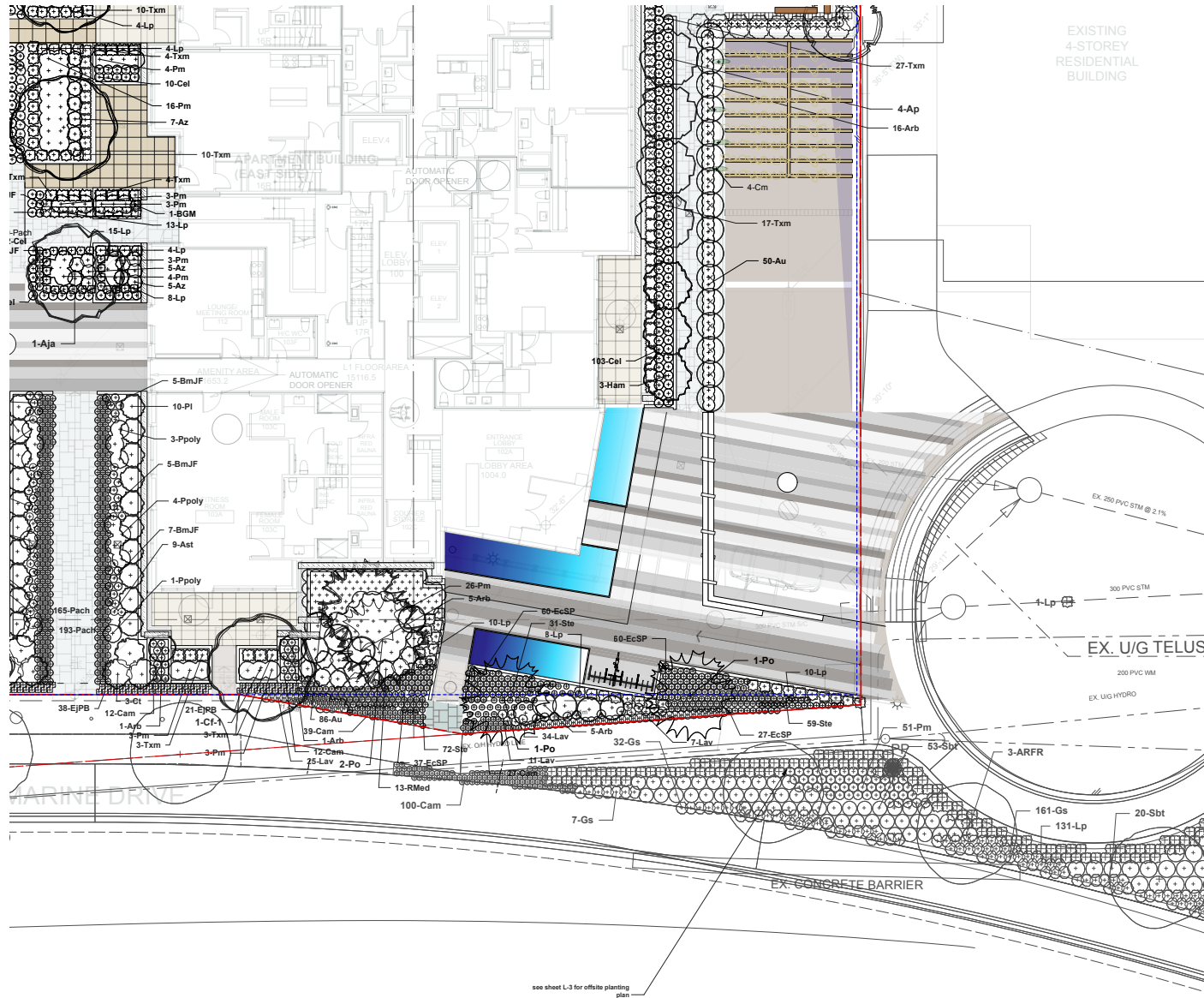
Sheet Title:
Planting Plan

Scale:
1:100

Date: 2020-06-11

Project No:
2016-03

L-3b



see sheet L-3 for offsite planting plan

May 19 2021	Re-Issue For Reasoning
April 29 2021	Issue For Reasoning - w/ DRC plan set
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 9 2018	Issue For DRC
May 8 2018	For Review
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July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3 2016	For Municipal Review
April 7 2016	For Review

Revisions:

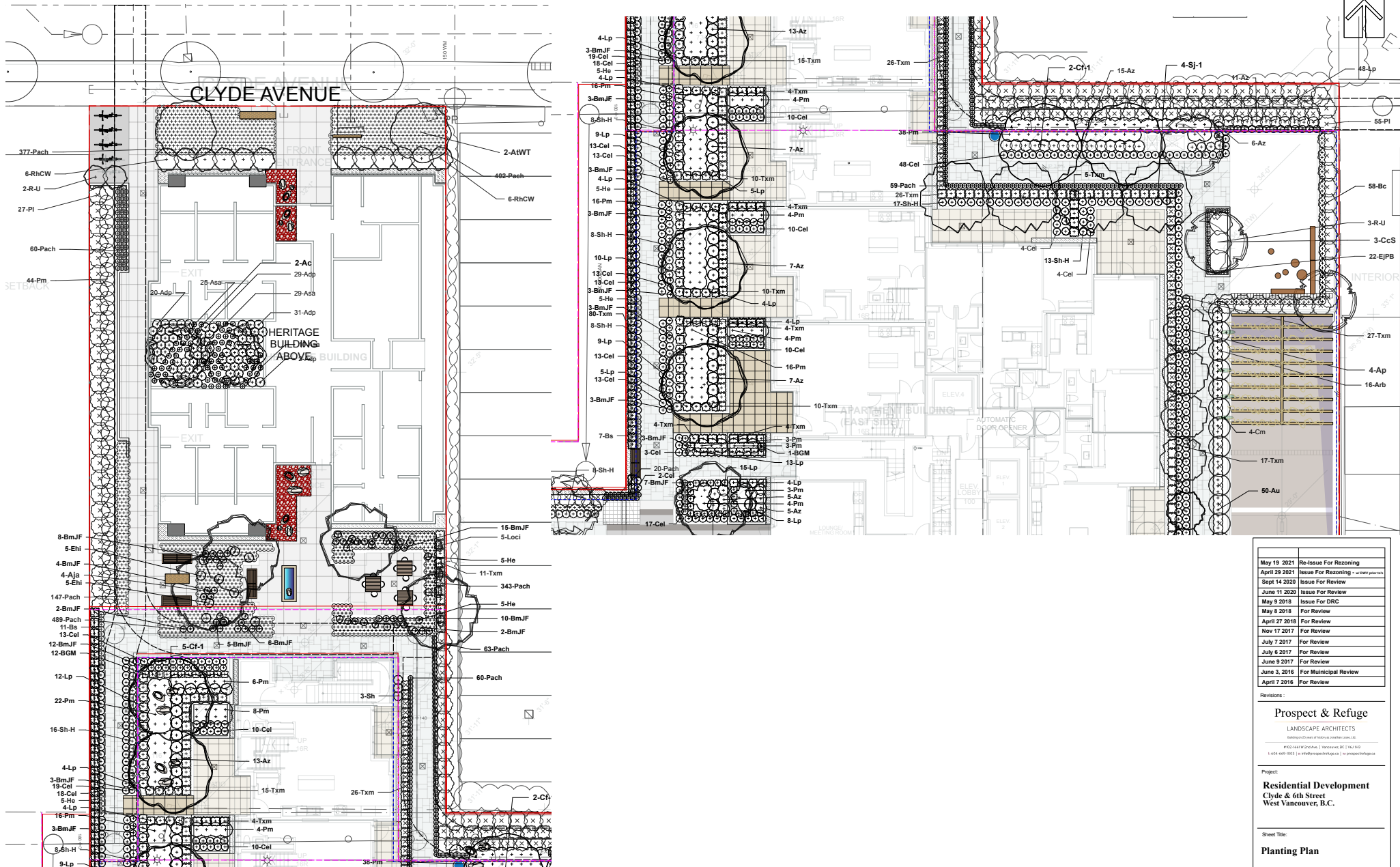
Prospect & Refuge
 LANDSCAPE ARCHITECTS
 4100 West Broadway | Vancouver, BC V6R 1B5
 1-604-699-7003 | www.prospectandrefuge.com | prospectandrefuge.com

Project:
Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

Sheet Title:
Planting Plan

Scale:
1:100
 Date: 2020-06-11
 Project No:
 2016-03

L-3c



May 19 2021	Re-Issue For Rezoning
April 29 2021	Issue For Rezoning - v. 000 plan set
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 9 2019	Issue For DRC
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
 LANDSCAPE ARCHITECTS
LANDSCAPE ARCHITECTS
 4100 West 10th Avenue
 Vancouver, BC V6M 1Y8
 Tel: 604-699-1003 | info@prospectandrefuge.com | prospectandrefuge.com

Project:
Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

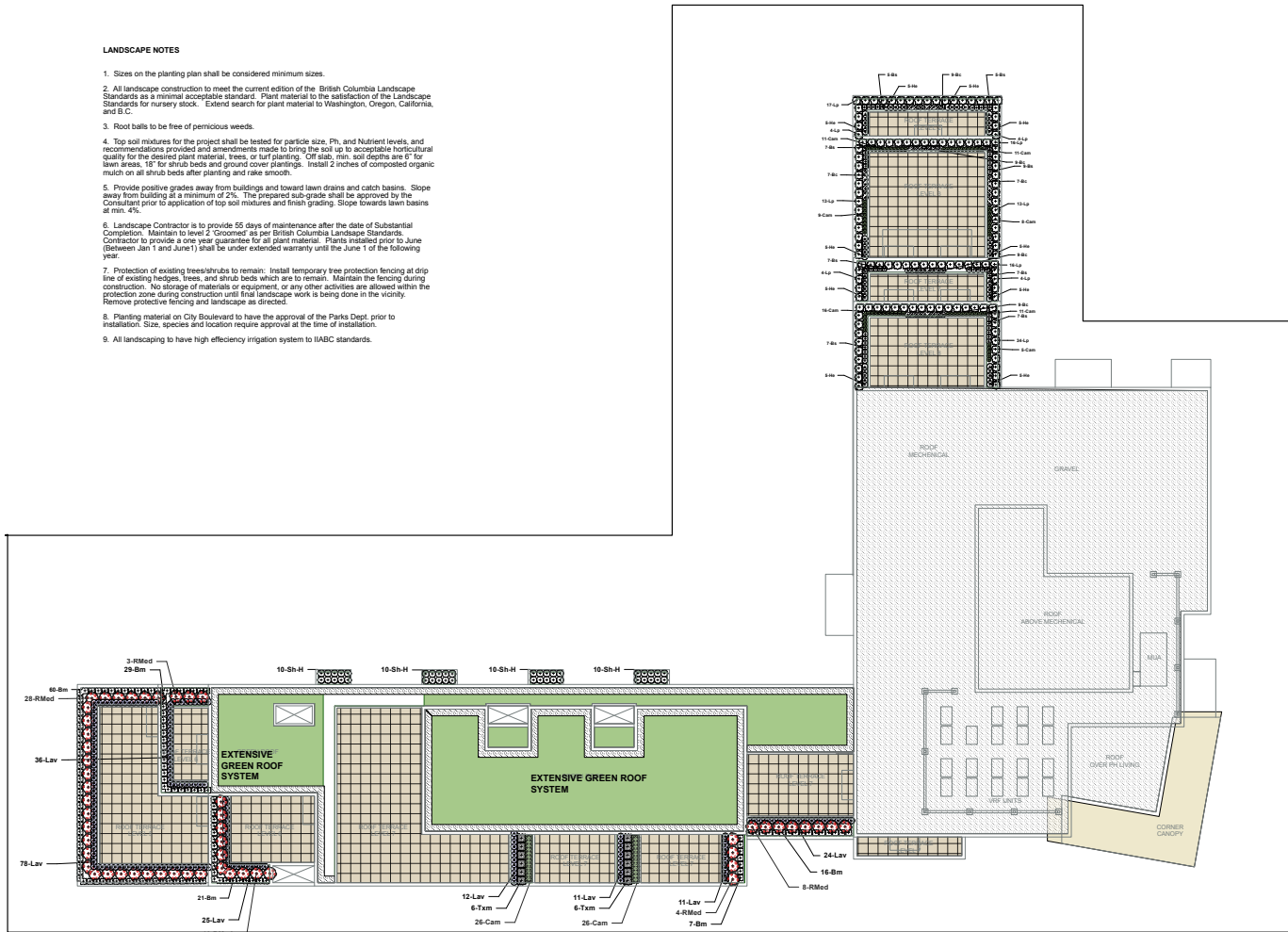
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Scale:
1:100
 Date: 2020-06-11
 Project No:
2016-03

L-3d

LANDSCAPE NOTES

- Sizes on the planting plan shall be considered minimum sizes.
- All landscape construction to meet the current edition of the British Columbia Landscape Standards as a minimal acceptable standard. Plant material to the satisfaction of the Landscape Standards for nursery stock. Extend search for plant material to Washington, Oregon, California, and B.C.
- Root balls to be free of pernicious weeds.
- Top soil mixtures for the project shall be tested for particle size, Ph, and Nutrient levels, and recommendations provided and amendments made to bring the soil up to acceptable horticultural quality for the desired plant material, trees or turf planting. Off slab, min. soil depths are 6" for lawn areas, 10" for shrub beds and ground cover plantings. Install 2 inches of composted organic mulch on all shrub beds after planting and rake smooth.
- Provide positive grades away from buildings and toward lawn drains and catch basins. Slope away from building at a minimum of 2%. The prepared sub-grade shall be approved by the Consultant prior to application of top soil mixtures and finish grading. Slope towards lawn basins at min. 4%.
- Landscape Contractor is to provide 55 days of maintenance after the date of Substantial Completion. Maintain to level 2 "Groomed" as per British Columbia Landscape Standards. Contractor to provide a one-year guarantee for all plant material. Plants installed prior to June (Between Jan 1 and June 1) shall be under extended warranty until the June 1 of the following year.
- Protection of existing trees/shrubs to remain. Install temporary tree protection fencing at drip line of existing hedges, trees, and shrub beds which are to remain. Maintain the fencing during construction. No storage of materials or equipment, or any other activities are allowed within the protection zone during construction until final landscape work is being done in the vicinity. Remove protective fencing and landscape as directed.
- Planting material on City Boulevard to have the approval of the Parks Dept. prior to installation. Size, species and location require approval at the time of installation.
- All landscaping to have high efficiency irrigation system to IABC standards.



May 19 2021	Re-issue For Rezoning
April 29 2021	Issue For Rezoning - w/ new plan set
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 9 2019	Issue For DRG
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
 LANDSCAPE ARCHITECTS
 400 West 2nd Avenue | Vancouver, BC V6B 1G0
 1-604-699-7003 | info@prospectandrefuge.com | prospectandrefuge.com

Project:
Residential Development
 Clyde & 6th Street
 West Vancouver, B.C.

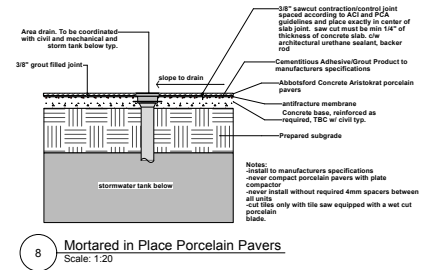
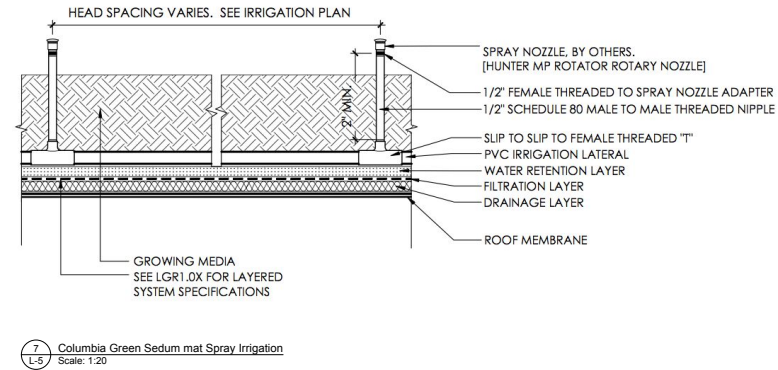
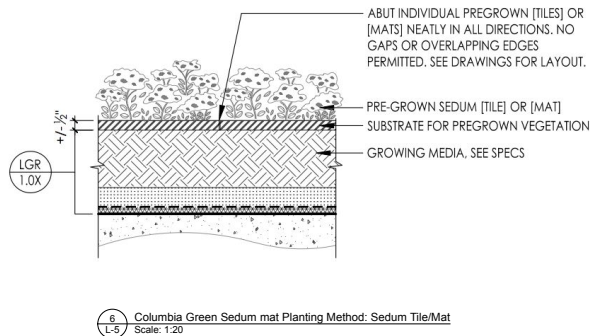
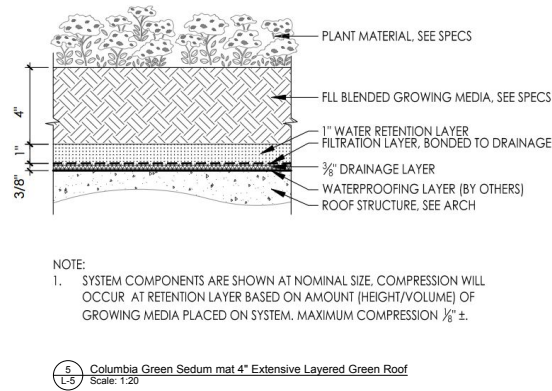
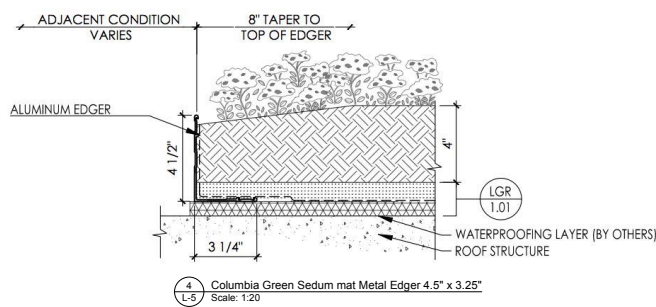
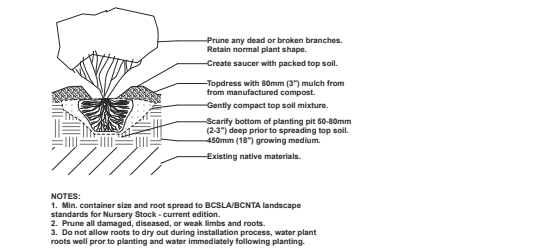
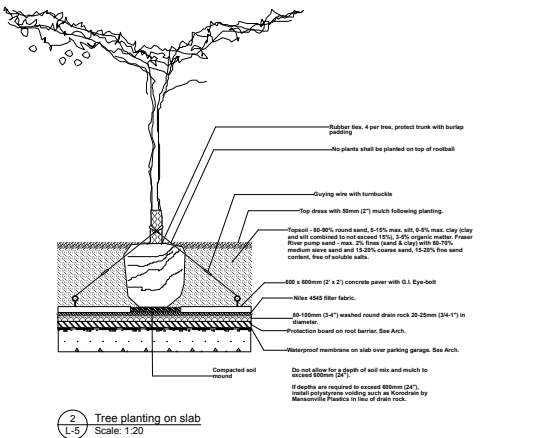
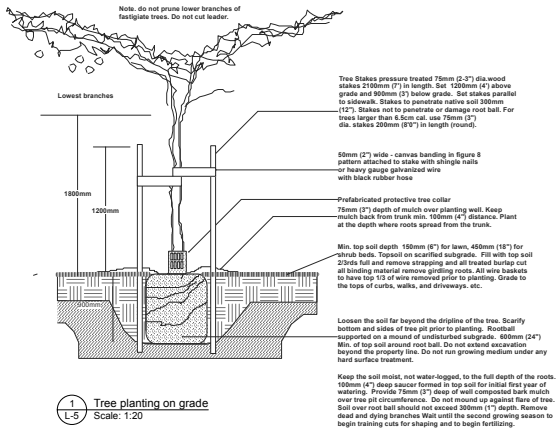
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Scale:
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Date: 2020-06-11

Project No.
 2016-03

L-4



May 19 2021	Re-Issue For Reasoning
April 29 2021	Issue For Reasoning - w/ design review
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 8 2018	Issue For DRC
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
LANDSCAPE ARCHITECTS
800 West 25th Street, Vancouver, BC, Canada V6Z 1R7
604-681-1000 | info@prospectandrefuge.ca | www.prospectandrefuge.ca

Project:
Residential Development
Chde & 6th Street
West Vancouver, B.C.

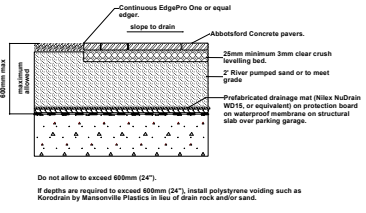
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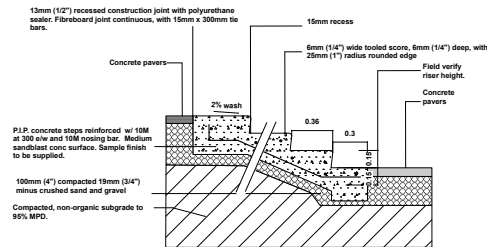
Date: 2020-06-11

Project No:
2016-03

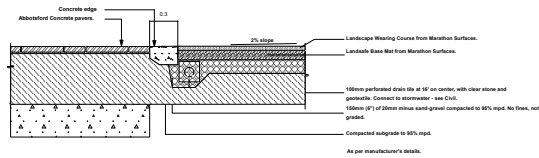
L-5



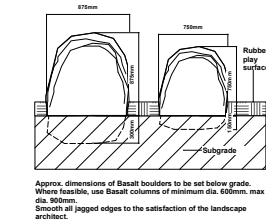
1 Concrete pavers on slab
Scale: 1:20



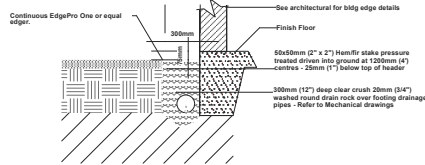
2 Concrete steps
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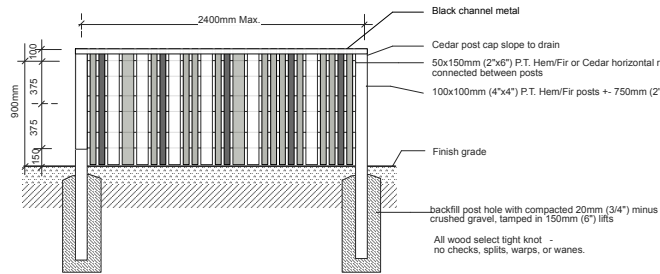
3 PIP Rubber Play Surface with Concrete Edge
Scale: 1:25



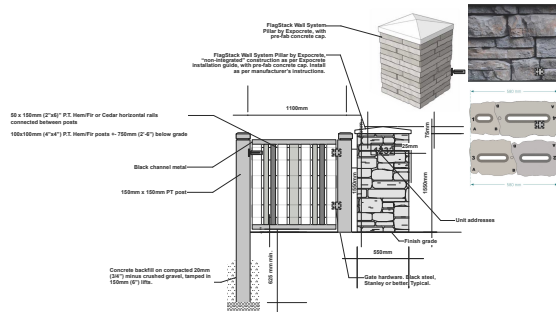
4 Boulders in play area
Scale: 1:25



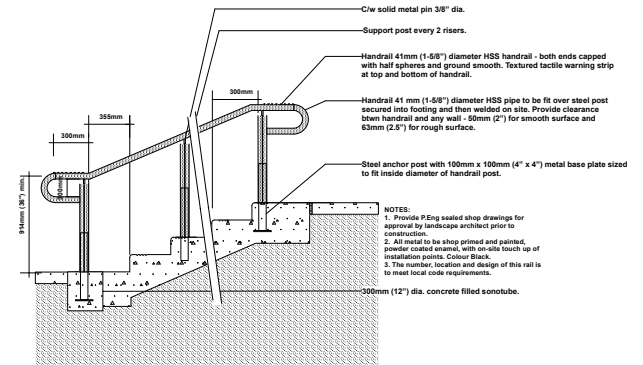
5 Gravel edging to buildings
Scale: 1:20



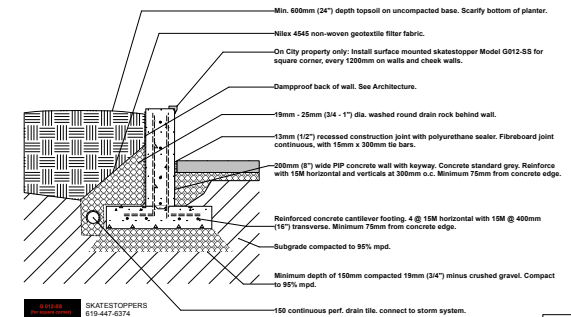
6 Screen fencing
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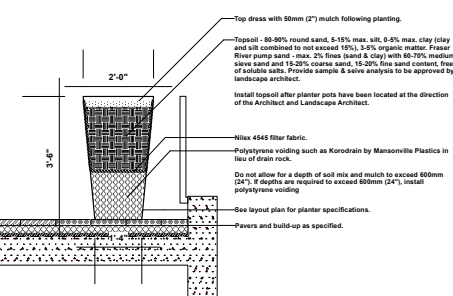
7 Gate and column to private entries
Scale: 1:25



8 Handrails to steps
Scale: 1:20



9 Concrete retaining wall
Scale: 1:20



10 Planter on rooftops
Scale: 1:20

Date	Issue
May 19 2021	Re-Issue For Reasoning
April 29 2021	Issue For Reasoning
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 8 2018	Issue For DRC
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
June 9 2017	For Review
July 6 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Revisions:

Prospect & Refuge
LANDSCAPE ARCHITECTS
Building 25 years of history at Jantzen.com, Ltd.
4147 N. Commercial St. Vancouver BC V6J 1K3
1-604-681-0000 | info@prospectandrefuge.com | www.prospectandrefuge.com

Project:
Residential Development
Chde & 6th Street
West Vancouver, B.C.

Sheet Title:
Landscape Details

Scale:
as noted

Date: 2020-06-11
Project No:
2016-03

L-5b



11 Reeder illuminated Bike Rack by Landscapeforms
L-5c NTS



2 MultiCITY Bench and Table by Landscape Forms or equal
L-5c NTS



4 Bollard Light GEORGE by Rotorgroup or approved equivalent
L-5c NTS



6 Boca 613 in-wall light
L-5c NTS



7 Wood and metal bench in parkette
L-5c NTS



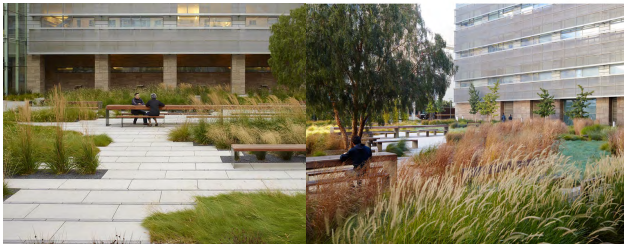
1 KOMPAN Forest Lake Boat NR0514
L-5c NTS



3 MultiCITY Bench offset left tablet by Landscape Forms or equal
L-5c NTS



5 Cambria 213 by Lumec in trees and overhead wires
L-5c NTS



8 Wood and metal table and bench in parkette
L-5c NTS

May 19 2021	Re-issue For Reasoning
April 29 2021	Issue For Reasoning - as drawn prior NTS
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 8 2018	Issue For DRG
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Revisions :

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#100 West 21st Ave. Vancouver BC V6B 1G3
1-604-681-0003 | info@landscapearchitects.com | www.prospectandrefuge.com

Project:
Residential Development
Clude & 6th Street
West Vancouver, B.C.

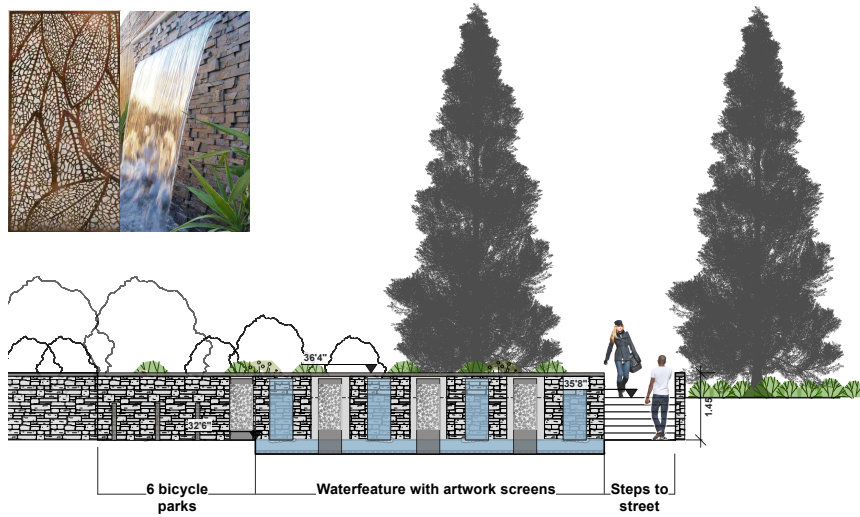
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Landscape Details

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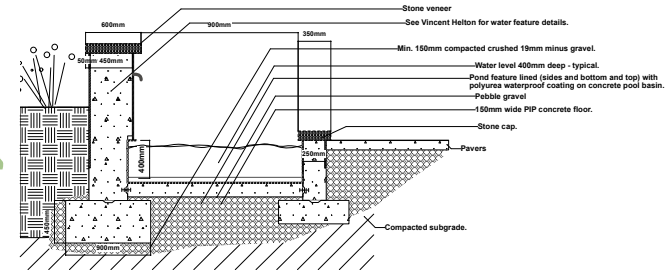
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Project No:
2016-03

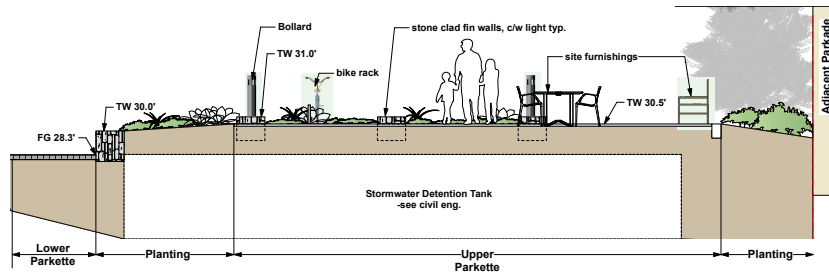
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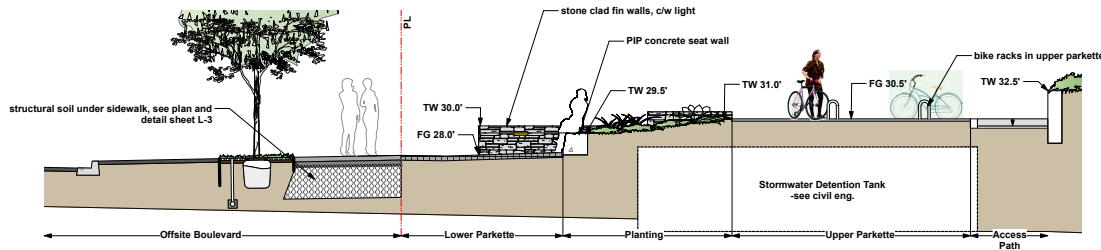
1 Section Elevation of water feature
L-6
Scale: 1:50



2 Water feature detail
L-6
Scale: 1:25



A Section A.A
Scale: 1:50



B Section B.B
Scale: 1:50

Revisions:	
May 19 2021	Re-Issue For Reasoning
April 29 2021	Issue For Reasoning
Sept 14 2020	Issue For Review
June 11 2020	Issue For Review
May 8 2018	Issue For DRC
May 8 2018	For Review
April 27 2018	For Review
Nov 17 2017	For Review
July 7 2017	For Review
July 6 2017	For Review
June 9 2017	For Review
June 3, 2016	For Municipal Review
April 7 2016	For Review

Prospect & Refuge
LANDSCAPE ARCHITECTS
1024-660-1002 | www.prospectandrefuge.ca | info@prospectandrefuge.ca

Project:
**Residential Development
Clyde & 6th Street
West Vancouver, B.C.**

Sheet Title:
**Landscape Sections and
Details**

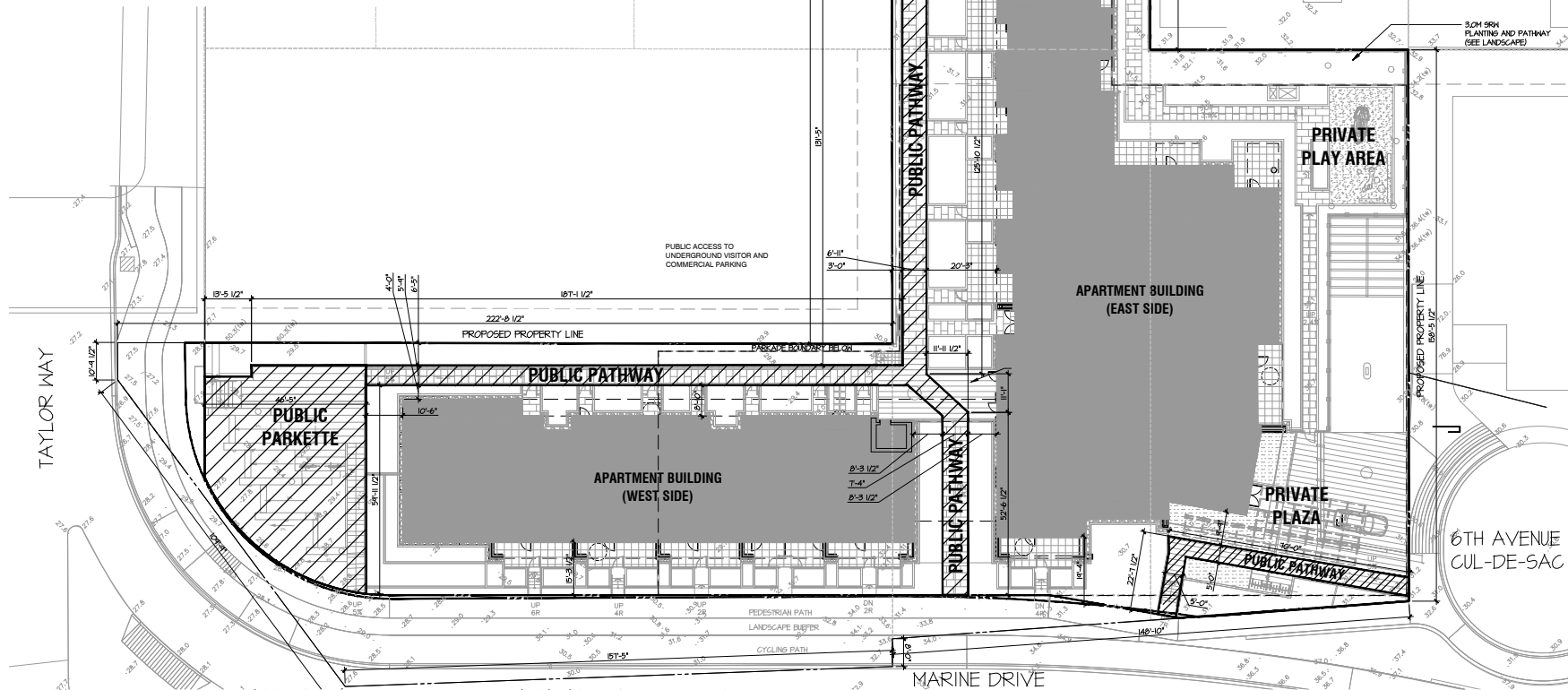
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as noted

Date: 2020-06-11
Project No:
2016-03

L-6

STATUTORY RIGHT OF WAY

01 Location of Parks and Pathways



PLOT STAMP: 2021-Jun-17 @10:57am - P:\A215294 - Executive Group - Park Royal Site\CAD\SD\A215294_Rezoning.dwg - A0.18

SCHEDULE C (Public Access SRW Plan)

dys architecture
260 - 1770 Burrard Street Vancouver BC V6J 3G7
tel 604.669.7710 www.dysarchitecture.com

CLIENT



**EXECUTIVE
GROUP DEVELOPMENT**

NO. | DATE | ISSUE
01 | 2020.08.25 | ISSUED FOR CITY REVIEW
02 | 2021.05.31 | RE-ISSUED FOR CITY REVIEW
03 | 2021.06.16 | RE-ISSUED TO CITY - COVENANT

NO. | DATE | REVISION

PROJECT

**EXECUTIVE PARC
MARINE+TAYLOR RESIDENTIAL**

657 Marine Drive
West Vancouver BC

**LOCATION OF
PARKS + PATHWAYS**

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Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job and dys architecture shall be informed of any variations from the dimensions and conditions shown on the drawings. These drawings shall be submitted to dys architecture for review before proceeding with fabrication.

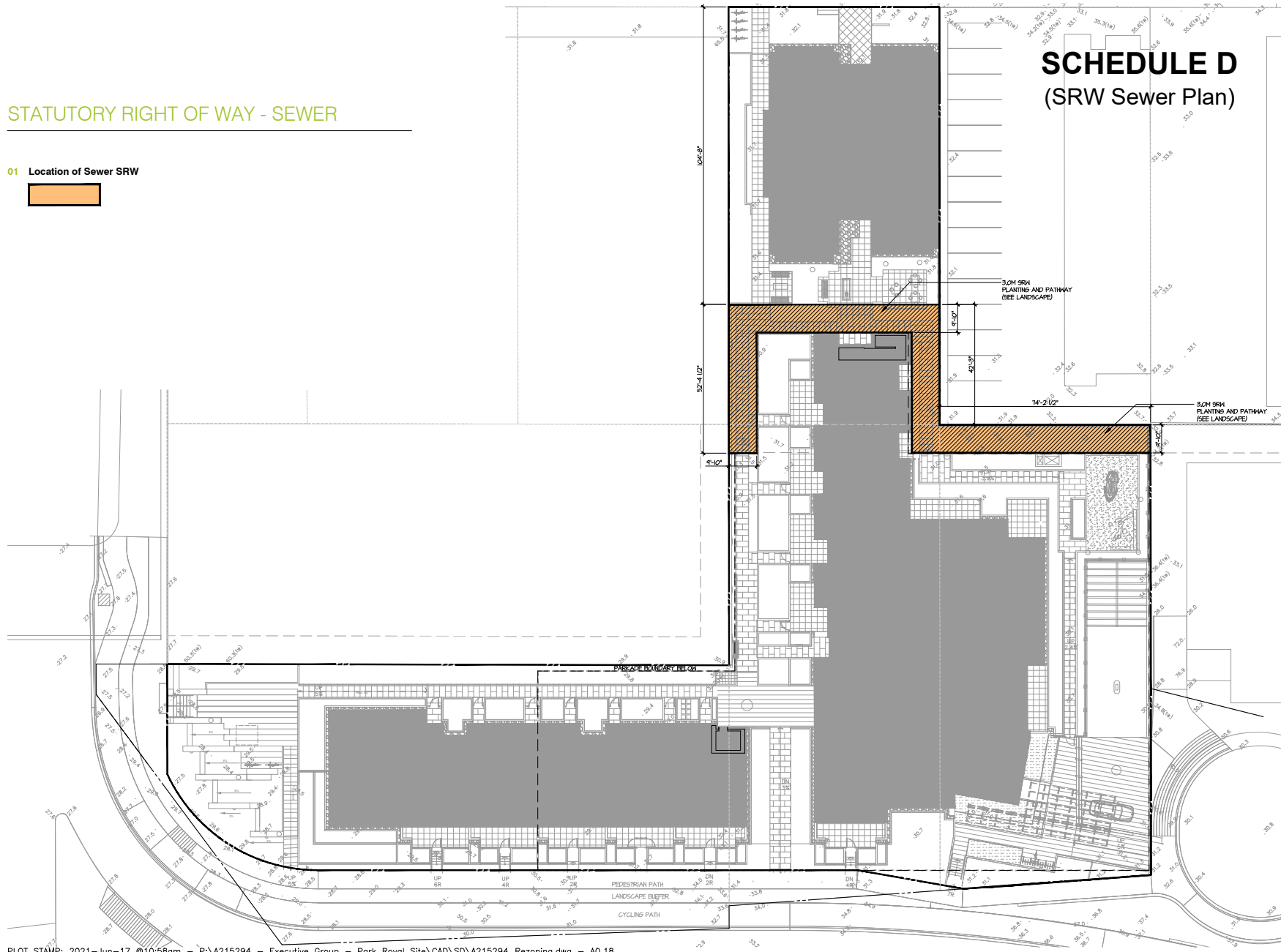
PROJECT A215294
DRAWN JL/SS CHECKED NC

SCALE 1/16" = 1'-0"
DATE AUG. 25, 2020

A0.18C

STATUTORY RIGHT OF WAY - SEWER

01 Location of Sewer SRW



PLOT STAMP: 2021-Jun-17 @10:58am - P:\A215294 - Executive Group - Park Royal Site\CAD\SD\A215294_Resoning.dwg - A0.18

SCHEDULE D (SRW Sewer Plan)

dys architecture
260 - 1770 Burrard Street Vancouver BC V6J 3G7
tel 604.669.7710 www.dysarchitecture.com

CLIENT



**EXECUTIVE
GROUP DEVELOPMENT**

NO. | DATE | ISSUE
01 | 2020.08.25 | ISSUED FOR CITY REVIEW
02 | 2021.05.31 | RE-ISSUED FOR CITY REVIEW
03 | 2021.06.16 | RE-ISSUED TO CITY - COVENANT

NO. | DATE | REVISION

PROJECT

**EXECUTIVE PARC
MARINE + TAYLOR RESIDENTIAL**

657 Marine Drive
West Vancouver BC

**LOCATION OF
SEWER SRW**

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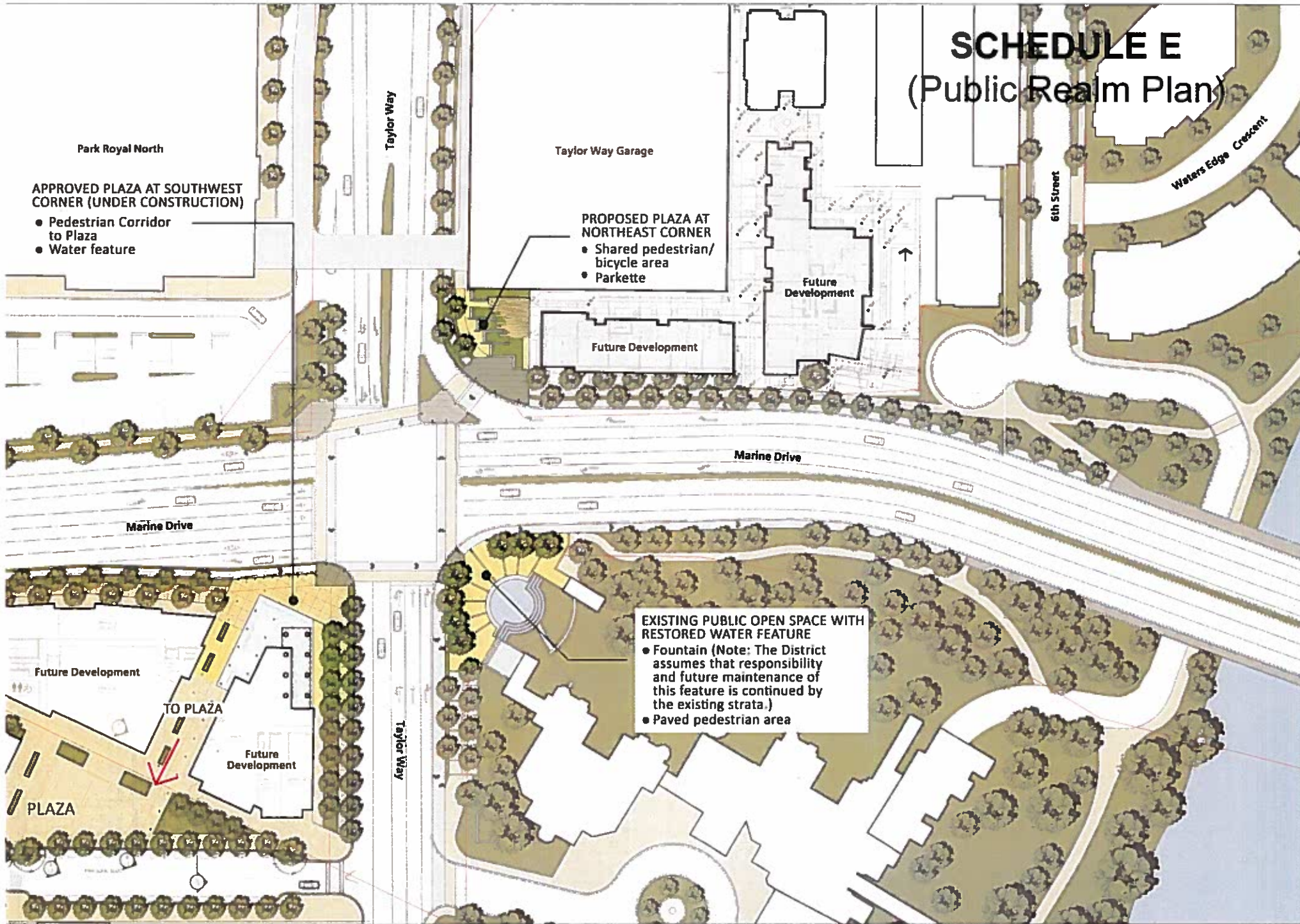
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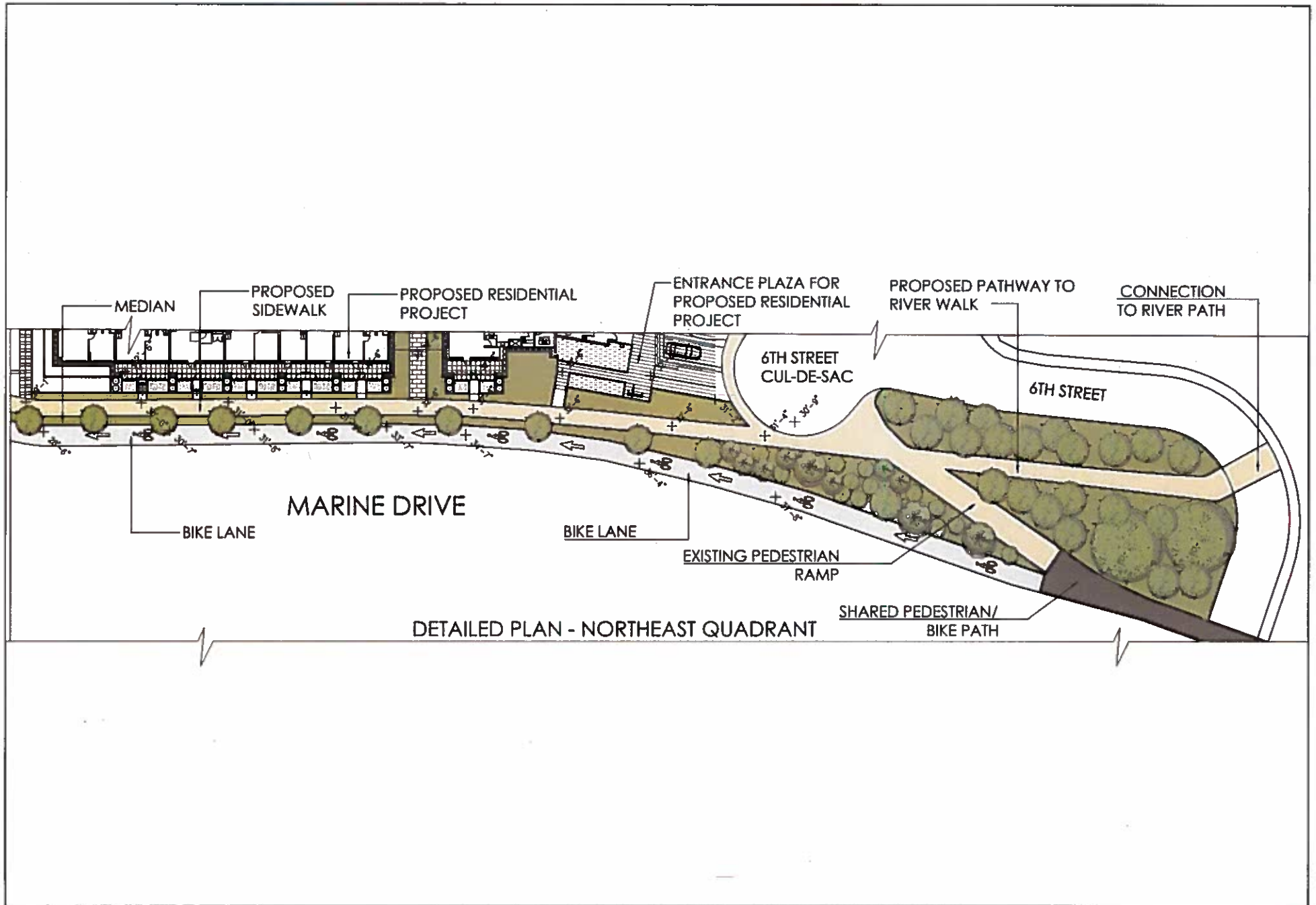
PROJECT A215294
DRAWN JL/SS CHECKED NC

SCALE 1/16" = 1'-0"
DATE AUG. 25, 2020

A0.18d

SCHEDULE E (Public Realm Plan)





ADAPTABLE DESIGN GUIDELINES

SCHEDULE F (Adaptable Design Guidelines)

Adaptable design creates liveable residences for a wider range of persons than current building codes require. By considering design features that can be easily and inexpensively incorporated at a future time, adaptable design also allows flexibility for residents whose needs may change over time.

The three levels of the **Adaptable Design Guidelines** are in addition to the Barrier-Free requirements of the current Building Code. **Level One** consists of basic design and features, and is required in all multiple unit buildings with common corridors (MUB). **Level Two** and **Level Three** elements provide for a greater range of adaptability. Level Two adaptable design is intended to provide persons who require a mobility aid with the ability to move easily in and out of the building, common areas and individual units. The degree of adaptability increases in Level Three Units, providing full access in all unit spaces.

The **Adaptable Design Policy (originally adopted in 1998)** was updated in January 2013 as follows:

- 25 percent units in a MUB must achieve Level Two;
- for each Level Two unit, 1.86 m² will be excluded from floor area calculations;
- for each Level Three unit, 4.19 m² will be excluded from floor area calculations.

In applying the Guidelines, the City will recognize that new developments and technology may result in equivalents that meet the intent of a specific requirement.

The Adaptable Design Guidelines are presented in two charts:

1. The **Design Elements Checklist** contains items related to initial design and construction phases.
2. The **Fixtures & Finishes Checklist** consists of items which are added during the finishing of a residential building or dwelling unit.

Drawings are available which illustrate the priority features of adaptable design to guide the design process.

Please note the following:

- * The 25 percent requirement for Level 2 Adaptable Design must include a mix of unit types;
- * Flooring examples for building entry and Level 2 and Level 3 kitchen and bathrooms must be provided;
- * One workable example of each adaptive device (window opener, pocket door latching hardware, etc.) must be provided;
- * Architectural drawings must include the following:
 - List of adaptable design elements under Level 1, Level 2, Level 3;
 - Project Summary Sheet to include information as per attached forms (AD Unit List; Residential Unit Summary, Adaptable Design Unit Calculation, Parking Calculation);
 - Door and Window schedules with specific Adaptable Design elements listed;
 - Cross-sections or details of transition from interior floor onto patio/balcony;
 - Scaled drawing of areas where ramps would be installed in future;
 - Cross-section of detail of curbs and ramps;
 - Illustration of future wheel-in shower installation;
 - Notations on drawings to label each unit (unit type, adaptable design level type 1, 2 or 3, sq. footage);
 - Unit plans prepared at ¼" to 1-0" foot or 1:50 (metric) for each adaptable design unit type, with critical dimensions provided.

Please refer to the 2014 Building Access Handbook for details on accessibility elements.

ADAPTABLE DESIGN GUIDELINES

DESIGN ELEMENTS

City of North Vancouver Zoning Bylaw, 1995, No. 6700 Amendment Bylaw No. 2005, No. 7721 - Figure 5 - 1

	LEVEL ONE	LEVEL TWO	LEVEL THREE
BUILDING ACCESS	Outside stairs – maximum degree of colour contrast on nosing of each stair	Outside stairs – maximum degree of colour contrast on nosing of each stair	Outside stairs – maximum degree of colour contrast on nosing of each stair
BUILDING ACCESS	Curb cuts have tactile and visual cues	Curb cuts have tactile and visual cues	Curb cuts have tactile and visual cues
BUILDING ACCESS	Unobstructed access to main building entrances from street/sidewalks	Unobstructed access to main building entrances from street/sidewalks	Unobstructed access to main building entrances from street/sidewalks
BUILDING ACCESS		Unobstructed internal access: <ul style="list-style-type: none"> - from parking levels containing accessible parking (5' or 1520mm corridors; 2' or 610mm clear wall space adjacent to door latch) * - garbage and recycling receptacles and storage lockers - no stairs within building circulation including corridors on residential levels - accessible storage lockers for each unit 	Unobstructed internal access: <ul style="list-style-type: none"> - from parking levels containing accessible parking (5' or 1520mm corridors; 2' or 610mm clear wall space adjacent to door latch) * - garbage and recycling receptacles and storage lockers - no stairs within building circulation including corridors on residential levels - accessible storage lockers for each Level 3 unit
BUILDING ACCESS	Canopy over main building entrances (3' or 915mm) and enterphone	Canopy over main building entrances (3' or 915mm) and enterphone	Canopy over main building entrances (3' or 915mm) and enterphone
BUILDING ACCESS		Provide automatic door opener for at least one building entry door at ground level as well as doors leading into the building on each underground parkade level where disability parking is provided	Provide automatic door opener for at least one building entry door at ground level as well as doors leading into the building on each underground parkade level where disability parking is provided
BUILDING ACCESS	Disability Parking provided in accordance with Zoning bylaw Figure 9-4 as attached	Disability Parking provided in accordance with Zoning bylaw Figure 9-4 as attached.	Disability Parking provided in accordance with Zoning bylaw Figure 9-4 as attached
BUILDING ACCESS		3' or 915mm building and suite entry doors	3' or 915mm building and suite entry doors
BUILDING ACCESS	Flush thresholds throughout the building (maximum ½" or 13mm height)	Flush thresholds throughout the building (maximum ½" or 13mm height)	Flush thresholds throughout the building (maximum ½" or 13mm height)
BUILDING ACCESS	Accessible building enterphone, call buttons and, where provided, suite door bells *	Accessible building enterphone, call buttons and, where provided, suite door bells *	Accessible building enterphone, call buttons and, where provided, suite door bells *

* Illustrations available

** Options considered

- 1 of 3-

Design Elements
July 2005

COMMON AREAS		Accessible mailboxes for all AD Level 2 units, and 5' or 1520mm turning radius in front *	Accessible mailboxes for all AD Level 3 units, and 5' or 1520mm turning radius in front *
CIRCULATION	Corridors minimum 4' or 1220mm wide (except for service access areas) *	Corridors minimum 4' or 1220mm wide (except for service access areas) *	Corridors minimum 4' or 1220mm wide (except for service access areas) *
CIRCULATION		Provide 5' or 1520mm turning radius inside and outside the entry corridor of each dwelling unit *	Provide 5' or 1520mm turning radius inside and outside the entry corridor of each dwelling unit *
SUITE CIRCULATION		Provide wiring for an automatic door opener for the suite entry door	Provide wiring for an automatic door opener for the suite entry door
SUITE CIRCULATION		Provide 2' or 610mm clear wall space adjacent to door latches where door swings toward user (pocket doors acceptable for bathrooms and bedrooms)*	Provide wiring for an automatic door opener for the suite entry door. Provide 2' or 610mm clear wall space adjacent to door latches where door swings toward user (pocket doors acceptable for bathrooms and bedrooms)*
DOORS		Minimum one bathroom, minimum one bedroom and storage room doors 2'-10" or 860mm clear opening"	Minimum one bathroom, minimum one bedroom and storage room doors 2'-10" or 860mm clear opening
PATIOS & BALCONIES		Minimum one door 2' - 10" or 860mm clear door opening	Minimum one door 2 - 10" or 860mm clear door opening
PATIOS & BALCONIES		Minimum one patio or balcony doorsill with maximum ½" or 13mm threshold**	Minimum one patio or balcony doorsill with maximum ½" or 13mm threshold **
PATIOS & BALCONIES		Minimum 5' or 1520mm turning radius on patio / balcony	Minimum 5' or 1520mm turning radius on patio / balcony
WINDOWS		Opening mechanism maximum 46" or 1168mm above floor (provide notation on window schedule)	Opening mechanism maximum 46" or 1168mm above floor (provide notation on window schedule)
WINDOWS		Provide minimum 6-0' or 1800mm horizontal windows in living room, dining room and minimum one bedroom where sills are not more than 2'- 6" or 750mm above the floor	Provide minimum 6-0' or 1800mm horizontal windows in living room, dining room and minimum one bedroom where sills are not more than 2'- 6" or 750mm above the floor
KITCHEN		Continuous counter between sink and stove*	Continuous counter between sink and stove*
KITCHEN			Sink cabinet minimum 2'8" or 810mm wide
KITCHEN			Provide sufficient space for future installation of cooktop and wall oven
KITCHEN			Provide for potential 2'8" or 810mm wide undercounter workspace
KITCHEN			Lower edge of upper cupboards 4'6" or 1350mm above floor

DESIGN ELEMENTS

* Illustrations available
 ** Options considered

KITCHEN			Minimum 4' or 1220mm floor space between base cabinets / walls (possible with removal of sink cabinet) *
MIN. ONE BATHROOM		Toilet located adjacent to wall (min 3' or 915mm length) *	Toilet located adjacent to wall (min 4'6" or 1370mm length) *
MIN. ONE BATHROOM		Provide turning radius within bathroom (may result from removal of vanity cabinet)*	Provide turning radius within bathroom (may result from removal of vanity cabinet)*
MIN. ONE BATHROOM		3' or 915mm clearance along full length of tub *	3' or 915mm clearance along full length of tub *
MIN. ONE BATHROOM		Tub control valve placed at outer edge of tub, with tub spout remaining in central position *	Tub control valve placed at outer edge of tub, with tub spout remaining in central position *
MIN. ONE BATHROOM		Accessible storage *	Accessible storage*
MIN. ONE BATHROOM			Provide pocket door or door swing out *
MIN. ONE BATHROOM			Space under sink minimum 2'8" or 810mm wide *
MIN. ONE BATHROOM			Provide for the possible future installation of an accessible shower stall, sized at least 3'-0" x 5'-0" or 910mm x 1500mm - refer to the 1998 BC Building Access Handbook for details
MIN. ONE BEDROOM			Sufficient manoeuvring room between closet and double bed *
MIN. ONE BEDROOM			Provide 3' or 915mm access to window opening *
LAUNDRY FACILITIES			Provide front loading side-by-side washer / dryer in-suite or in common area
LAUNDRY FACILITIES			4' or 1220mm manoeuvring space in front of washer / dryer

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* Illustrations available

** Options considered

- 3 of 3-

Design Elements
July 2005

Figure 9 – 4

Disability Parking Requirements
for Medium Density, High Density, and Accessory Apartment Residential Uses

REQUIRED number of Disability Parking Spaces to be provided for Level 1 Adaptable Design Dwelling Units		REQUIRED number of Disability Parking Spaces to be provided for Level 2 or 3 Adaptable Design Dwelling Units	
Total Required Parking Spaces	Required number of Disability Parking Spaces for Level 1 Adaptable Design Dwelling Units	Total Required Parking Spaces	Required number of Disability Parking Spaces for Level 2 and 3 Adaptable Design Dwelling Units
1 – 25	1	1 – 25	2
26 – 50	2	26 – 50	4
51 – 100	3	51 – 100	6
101- 150	4	101 – 150	8
151 – 200	5	151 – 200	10
201 –250	6	201 – 250	12
251– 300	7	251 – 300	14
301 – 350	8	301 – 350	16
351 – 400	9	351 – 400	18
401 – 450	10	401 – 450	20

- Calculation of Disability Parking Spaces is based on the required number of parking spaces rather than the total parking spaces provided.

Figure 9 - 5

Disability Parking Spaces Requirements for all other non-residential Uses:

Total Number of Required Parking Spaces	Required Number of Disability Parking Spaces
0-25	1
26-50	2
51-100	3
101-150	4
151-200	5
One Disability parking Space per 50 required parking spaces over 200 spaces.	

ADAPTABLE DESIGN GUIDELINES

6 of 11

FIXTURES AND FINISHES

	LEVEL ONE	LEVEL TWO	LEVEL THREE
BASIC	Easy to read building address numbers (min. 4" or 100mm high in contrasting colours)	Easy to read building address numbers (min. 4" or 100mm high in contrasting colours)	Easy to read building address numbers (min. 4" or 100mm high in contrasting colours)
BASIC	Lighting levels to a minimum of 100 lux outside and inside main building entries and suite entries	Lighting levels to a minimum of 100 lux outside and inside main building entries and suite entries	Lighting levels to a minimum of 100 lux outside and inside main building entries and suite entries
BASIC	No polished finish on building entry flooring (provide flooring samples)	No polished finish on building entry flooring (provide flooring samples)	No polished finish on building entry flooring (provide flooring samples)
BASIC	Except for pocket doors, sliding doors, or doors equipped with openers, lever door handles are required on all doors (provide notation on door schedule)	Except for pocket doors, sliding doors, or doors equipped with openers, lever door handles are required on all doors (provide notation on door schedule)	Except for pocket doors, sliding doors, or doors equipped with openers, lever door handles are required on all doors (provide notation on door schedule)
BASIC	Signage throughout common areas has well contrasted colours	Signage throughout common areas has well contrasted colours	Signage throughout common areas has well contrasted colours
BASIC	Elevators have well contrasted control buttons	Elevators have well contrasted control buttons	Elevators have well contrasted control buttons
CIRCULATION		Slip resistant flooring	Slip resistant flooring
CIRCULATION		Colour contrasting exit doors	Colour contrasting exit doors
BUILDING MEETING / AMENITY ROOMS		Provide carpet and drapes to absorb sound and decrease echoes	Provide carpet and drapes to absorb sound and decrease echoes
UNIT ENTRIES		Adjustable door closers to reduce force to open door to maximum 22N or 5 lbs.	Adjustable door closers to reduce force to open door to maximum 22N or 5 lbs.
UNIT ENTRIES		Door handle at 40" or 1000mm above the floor, with deadbolts placed immediately above or below	Door handle at 40" or 1000mm above the floor, with deadbolts placed immediately above or below
UNIT ENTRIES			Two door viewers: 3'5" or 1050mm and 5' or 1520mm
UNIT FLOORING		Non-slip flooring in kitchen and minimum one bathroom (provide flooring samples)	Non-slip flooring in kitchen and minimum one bathroom (provide flooring samples)
UNIT FLOORING		High density, low level loop carpet and underlay maximum ½" or 13mm height	High density, low level loop carpet and underlay maximum ½" or 13mm height
PATIOS AND BALCONIES		Outdoor light fixture provided	Outdoor light fixture provided
PATIOS AND BALCONIES		Electrical outlet provided	Electrical outlet provided

FIXTURES & FINISHES

* Illustrations available

	LEVEL ONE	LEVEL TWO	LEVEL THREE
ELECTRICAL		Switches, controls, thermostats and the highest breaker in the suite panel, to be installed no higher than 46" or 1170mm above finished floor	Switches, controls, thermostats and the highest breaker in the suite panel, to be installed no higher than 46" or 1170mm above finished floor
ELECTRICAL		Electrical outlets, cable outlets, telephone jacks not lower than 18" or 450mm above floor	Electrical outlets, cable outlets, telephone jacks not lower than 18" or 450mm above floor
ELECTRICAL	Within suites a duplex outlet is required within 8" or 200mm of a telephone jack	Within suites a duplex outlet is required within 8" or 200mm of a telephone jack	Within suites a duplex outlet is required within 8" or 200mm of a telephone jack
ELECTRICAL	Wiring for visual alarm system in living room and minimum one bedroom, connected to fire alarm system	Wiring for visual alarm system in living room and minimum one bedroom, connected to fire alarm system	Wiring for visual alarm system in living room and minimum one bedroom, connected to fire alarm system
ELECTRICAL		Rocker switches	Rocker switches
ELECTRICAL			Double bulb ceiling fixtures
ELECTRICAL			Provide wiring for automatic door opener and strike at unit entry
WINDOWS		Easily grasped and operated mechanism for opening and locking windows	Easily grasped and operated mechanism for opening and locking windows
KITCHEN		Task lighting of at least 100 lux level at sink, stove and work areas in addition to general overhead lighting	Task lighting of at least 100 lux level at sink, stove and work areas in addition to general overhead lighting
KITCHEN		Pull-out work boards at 2'8" or 810mm height *	Pull-out work boards at 2'8" or 810mm height *
KITCHEN		Lever handle faucets and cabinet handles which can be easily used with an open hand eg. "D" or "J" cabinet handles	Lever handle faucets and cabinet handles which can be easily used with an open hand eg. "D" or "J" cabinet handles
KITCHEN		Adjustable shelves in all cabinets	Adjustable shelves in all cabinets
KITCHEN			Drawer storage in key areas*
KITCHEN			Provision for removal of sink cabinet and lowering of counter height
KITCHEN			Provision in water supply and drain to allow for a 4" (100mm) drop in sink height (offset plumbing)
KITCHEN			Provision for the future installation of at least one counter receptacle in front of cabinets
KITCHEN			Where regular refrigerator installed initially, provide adequate space for side by side model
KITCHEN			Contrasting knobs on stove / cook top

* Illustrations available

	LEVEL ONE	LEVEL TWO	LEVEL THREE
MIN. ONE BATHROOM	Solid blocking provided in walls of tub / shower and toilet areas, and behind towel bars *	Solid blocking provided in walls of tub / shower and toilet areas, and behind towel bars *	Solid blocking provided in walls of tub / shower and toilet areas, and behind towel bars *
MIN. ONE BATHROOM	Pressure balanced tub / shower valves	Pressure balanced tub / shower valves	Pressure balanced tub / shower valves
MIN. ONE BATHROOM		Provision in water supply and drain to allow for a 4" (100mm) drop in vanity height (offset plumbing)	Provision in water supply and drain to allow for a 4" (100mm) drop in vanity height (offset plumbing)
MIN. ONE BATHROOM		Provision for vanity sink removal	Provision for vanity sink removal
MIN. ONE BATHROOM		Adjustable height shower head or hand-held shower head on adjustable bracket*	Adjustable height shower head or hand-held shower head on adjustable bracket *
MIN. ONE BATHROOM			Water temperature regulator on tub / shower faucet
LIVING ROOM		One switched electrical outlet	One switched electrical outlet
BEDROOMS		Three-way switched outlet at bed area and doorway	Three-way switched outlet at bed area and doorway
BEDROOMS		Provide light fixture in or adjacent to closet	Provide light fixture in or adjacent to closet
BEDROOMS	Telephone jack	Telephone jack	Telephone jack
IN-SUITE STORAGE		Provide light and electrical outlet	Provide light and electrical outlet

FIXTURES & FINISHES

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* Illustrations available

Adaptable Design Unit List

Unit Address	Unit Label	Unit Type (bedroom)	Level of Adaptable Design			Floor / Level	Unit Size (Sq. Ft.)	Excl. Floor Area	Comments
			1	2	3				
			1	2	3				
			1	2	3				
			1	2	3				
			1	2	3				
			1	2	3				
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			1	2	3				

RESIDENTIAL UNIT SUMMARY									
Level	Floors	Unit/Flr	Total Units	1 BR	1 BR + DEN	2 BR	2BR+ DEN	3 BR	3BR+ DEN
Total:									
%			100%	%	%	%	%	%	%
Area (SF)									

Note: All areas and calculations are preliminary and approximate.

Adaptable Design Unit Calculation						
Level	Floors	Unit/Flr	Total Units	AD Level 1	AD Level 2	AD Level 3
Lobby/Entry						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
Total Provided						
%			100%	%	%	%
Total Required				%	%	%

Note: All areas and calculations are preliminary and approximate.

PARKING CALCULATION

RESIDENTIAL: _____ Per Dwelling Unit = _____ (Total Est'd. # ____)

COMMERCIAL: _____ Per Square Foot = _____ (Total Est'd. # ____)

Level	RESIDENTIAL			COMMERCIAL			Total Residential	Total Commercial
	Full-Size	Small Car	Disability Parking Space	Full Size	Small Car	Disability Parking Space		
P1								
P2								
P3								
P4								
P5								
P6								
TOTAL								

PROJECT TOTAL	Total #'s	Percentage
Full Size		%
Small Car		%
Disability Parking Spaces		%
Visitors		%
Bicycle		
Storage Lockers		
Loading		



EXECUTIVE[®]
GROUP OF COMPANIES

February 25, 2019

Lisa Berg
Senior Community Planner
District of West Vancouver
750 17th Street, West Vancouver
V7V 3T3

Re: Response to the Advisory Committee on Disability Issues Recommendations – 657 & 675 Marine Drive and 660 Clyde Avenue

Dear Lisa,

In response to the Advisory Committee on Disability Issues (ACDI) Development and Inclusion Report, dated July 26, 2018, and the subsequent comments that were provided via email on November 22, 2018, Executive Park Limited Partnership summarizes below to undertake and incorporate these ACDI recommendations:

Tower:

- Automatic door openers will be added will be added at the following locations:
 - P2 – P202 3 vestibule doors
 - P1 – Garbage Room, P102 Vestibule 2 doors, Commercial access to Elevator 3
 - L1 – Main Entry Vestibule 2 doors, Aperture Entrance, Fitness Room, Lounge, H/C WC, Lobby Door to Units 117/118
- Room numbers and titles for amenities will be displayed with clear fonts, with a sufficiently large size and with good contrast
- A visual alarm system will be installed at minimum to compliment all the locations where automatic door openers will be added
- Mail box recommendations that they be made available at a lowered level and to have tactile raised letters/numbers with high contrast will be taken to Canada Post for review and approval, and will be incorporated consistent with Canada Post mail box guidelines

Adaptable Units:

- The accessible parking spaces will be matched to adaptable units
 - P2 – Stalls 43 & 49
- Parking spaces whose location provides additional space for loading, but do not meet the width requirements will be designated as “accessible” and will be referenced as “adaptable”. These adaptable parking spaces will be matched to adaptable units
 - P2 – Stalls 37, 51, 52, 80, 86 & 89
 - P1 – Stalls 28 & 33

- The adaptable units with balconies are proposed to have level access by way of a swing door
 - Units – 218, 318, 418, 518, 618 & 718
- The provision will be made for retractable cabinet doors at sink locations
- The provision will be made for side opening wall ovens with a pull out board underneath, provided a comparable unit to the marketed design appliances is available
- The provision will be made for 8 units to have side-by-side front loading washers and dryers, as the current layouts will not be significantly altered
 - Rental Units – 109 & 209
 - Market Units – 101, 203, 303, 403, 503 & 603
- There are no pocket doors presently proposed in the adaptable units - no provisions need to be made for pocket door hardware
- The provision will be made to rough in for a double drain, where required, to accommodate for any future conversions

Elevators:

- Automated floor verbal announcements will be installed in all the elevators

Public Realm:

- Tactile Walking Surface Indicators (TWSI) will be added at the top and bottom of the exterior stairs, colour to be coordinated with the District's standard specification
- At the 1 accessible public washroom, and the 2 Fitness Room change rooms, the most accessible hand dryers (Dyson), soap dispensers (automated), faucets (automated) and toilet flush options (handle) will be incorporated
- Gym to incorporate roll in showers, and if required, with a collapsible water dam
- A curb detail will be incorporated at the water features
- The play area surface treatment will allow for wheelchair and walker access
- Curb cut treatments will be incorporated as noted to comply with the City of Vancouver standards, unless superseded by a District of West Vancouver standard

We appreciate the input and recommendations provided by the Advisory Committee on Disability Issues, as they will enhance the overall development.

Regards,



Greg Santa
Development Manager

Development and Inclusion Report – 657 Marine Drive, District of West Vancouver

Report Date: July 26, 2018

Meeting Date: July 5, 2018

Meeting Time: 3:00 pm

Meeting Location: DNV – 355 West Queens Road, North Vancouver.

ACDI members in attendance: Amy Amantea, Alexis Chicoine, Gardiner Dye, Kamelia Adabi

ACDI Staff in attendance: Stina Hanson, Planning Analyst, DWV

Guests: Norm Chin, dys Architecture; Salim Sayani, Executive Group, James Allan, Senior Planner, District of West Vancouver

Author of Report: Amy Amantea, ACDI Chair

Discussion Topic: Development Project – 657 Marine Drive for Executive Group

Discussion Summary and background information on presented project:

Project Details:

The project proposed an 8-storey residential “L-shaped” building. Key features of the proposal are:

- 89 units (68 market condos, 21 market rental units);
- 18 units built to DNV Level 2 standards (16 condos, 2 rental);
- 112 underground parking spaces;
- 43 per cent site coverage;
- overall building height of approximately 29 meters (95 feet); and
- a Floor Area Ratio (FAR) of 2.0

The project includes the consolidation of three properties: 660 Clyde Avenue, 657 and 675 Marine Drive, which are currently zoned Commercial Restrict 1, Commercial 2 and Commercial Restricted 2 respectively. One site is currently vacant, one has a two storey commercial building and one (at 660 Clyde) is the site of a heritage building, designed by architects Fred Hollingsworth and Barry Downs. The assembly extends the full block between Marine Drive and Clyde Avenue and extends to the north eastern corner of the Marine Drive / Taylor Way intersection. Access to the development will be off of the existing 6th Street cul-de-sac. No vehicle access is proposed off Marine Drive.

Accessibility Features:

Site Plan: The site is surrounded by a pedestrian path network featuring gentle slopes (no grade at over 5%) and a children's play area (on the north side) and a public parklet at the Marine Drive and Taylor Way intersection. There are level entries to the front of the building (off of the 6th Street cul-de-sac), the back door, and front doors of all ground floor units. Due to the grade change and the location of the existing 6th Street cul-de-sac there are three sets of stairs at the exterior of the building: one at the far west leading from Taylor Way through the parklet (there is level access to the Parklet off of Marine Drive), one off of the building's gym/common space (there is level access to Marine Drive via a pedestrian "mall" that separates the two buildings) and also to Marine Drive to the west of the front building entrance (there is access to Marine Drive via an existing pathway from the 6th Street cul-de-sac). There is an automatic door opener and enter-phone on the main entry door.

Parking: The District of West Vancouver's Parking Bylaw requires that a total of 2 Accessible Parking stalls are provided: both will be located with the bulk of residential parking stalls on level P2. Additionally 2 accessible stalls will be located on level P1: 1 visitor stall and 1 commercial stall. Access to bike storage, storage lockers and elevators (note: there are two elevator locations) will be by fob with automatic door openers. All storage lockers are accessible.

Residential Building: Unobstructed access to the building entrance from the street and sidewalk will be ensured by way of curb cuts, flush thresholds, automatic door openers, and accessible building enter-phone system. The main amenity area is located on the ground floor and features a gym and two accessible bathrooms with showers and a changing area. Door to the amenity area will be openable by fob. The mail room is accessible with the mailbox design and configuration as per the Canada Post guidelines.

The building is broken into an "L-shaped" configuration: units facing Marine Drive have a single loaded corridor that is open to the elements, while the units located in the central "tower" portion of the building featuring a double loaded interior corridor. There are accessible units located in both areas of the tower with some accessible units facing along Marine Drive and others facing 6th Street. There is a fire door separating the two sections of the building. Note: the accessible unit on the ground-floor facing Marine Drive currently is showing three stairs between the patio and the sidewalk of Marine Drive (at the rear of the unit).

In addition to the units built to the DNV Level 2 standard, additional accessibility features will be included in all units including: blocking in one bathroom for future grab bars, bedroom door widths of not less than 31.5 inches, and outlets located between 18 and 48" above the floor.

Discussion Highlights:

The meeting covered all aspects of the proposed residential tower: site plan and public realm, parking levels, main floor, mailboxes and amenity spaces, and the floor plates of the tower. The applicant began the discussion by talking about the context of the site, including its configuration and location, the existing heritage building, and vehicular and pedestrian access.

ACDI highlighted the importance of being clear with terminology used to discuss accessibility as this should term should mean universal and that design elements and options must work for everyone, regardless of whether they have vision loss, use a mobility aid or are hard of hearing. ACDI acknowledges that it can be challenging to find systems that will accommodate everyone's needs, but the Committee believes that creative design solutions that enable universal access must be prioritized.

Site Plan: ACDI noted the lack of automatic door openers for the back door entry to the building and recommended that automatic door openers be added. Additionally these (automatic door openers) should be added to any doors leading to common spaces or entrances to the building, including the fire doors that separate the building's two sections.

Discussion turned to the exterior stair cases (three public ones in total) and the architect discussed the problems with the grade of the site and where accessible access points are located including the main pedestrian "mall" through the building, the access to the parklet at the corner of Taylor Way and Marine Drive and the Play Area. ACDI made the recommendation that for the stairs there must be yellow on the railing and bull-nosing and yellow on the stairs.

There was discussion about the water feature with the ACDI recommending that it be an elevated structure and/or clearly marked so those with vision loss will be able to navigate the feature without getting wet.

In terms of the Play Area, the ACDI recommended it have features that are accessible, particularly a ground treatment that can accommodate wheelchairs or walkers (not sand) allowing everyone to access this common amenity.

Curb cuts and their treatments were also discussed (particularly in relation to the 6th street cul-de-sac): ACDI recommended the continued use of the City of Vancouver standards, which includes a letdown and trawl lines, instead of the tactile warning indicator strips.

Parking: ACDI raised the issue of the variety of vehicle access needs, including vehicles with side ramps that require additional space to one side of the vehicle. The Committee recommended that the required accessible spaces be "paired" or assigned to the accessible units and that additional spaces (whose location provide additional

space for loading, but do not meet the width requirements to be designated “accessible”) should be referenced as “adaptable” and be paired/assigned to the remaining accessible units. These “adaptable” spaces include spaces numbered 28 and 33 on level P1 and spaces numbered 37, 51, 52, 80, 86, and 89 on Level P2. ACDI again recommended automatic openers for all the doors in the parking level, including those leading to storage areas.

Building:

Amenity Spaces/Mail Room: ACDI pointed out that while the room itself is accessible, the mail boxes typically are not. The architect confirmed they work with the Canada Post guidelines. The ACDI commented that those do not consider accessibility and recommended the use of tactile numbers and Braille to mark individual mailboxes.

Discussion shifted to the gym and washrooms: ACDI recommended the inclusion of a roll-in shower for both bathrooms. The representative of Executive Group suggested perhaps the use of a collapsible shower water dam for the showers. This keeps water from escaping the roll-in shower and improves drainage.

Unit layout and design: There was discussion on a number of aspects of the layout of the adaptable units including:

- level access to balconies;
- provision of roll in showers for the adaptable units;
- use of pocket doors (with truly adaptable hardware);
- retractable cupboard doors;
- side-opening wall ovens;
- side-by-side washer and dryers.

There was discussion about level balcony access for all units: the architect discussed issues of water infiltration and other envelope concerns. The ACDI pointed out that numerous other projects had included this as a feature of their designs and strongly recommended this issue be reconsidered, and level balcony access for all units be included.


There was discussion of the unit distributions and unit types: there are 18 level two units throughout the building: two are market-rental and 16 are market condos. The ACDI recommended that these include non-market units designated for people with disabilities. There was further discussion about the community amenity package for this building, which includes the preservation of the heritage building and other off-site improvements.


657 Marine Drive Project Recommendations:

Project title: 657 Marine Drive, West Vancouver

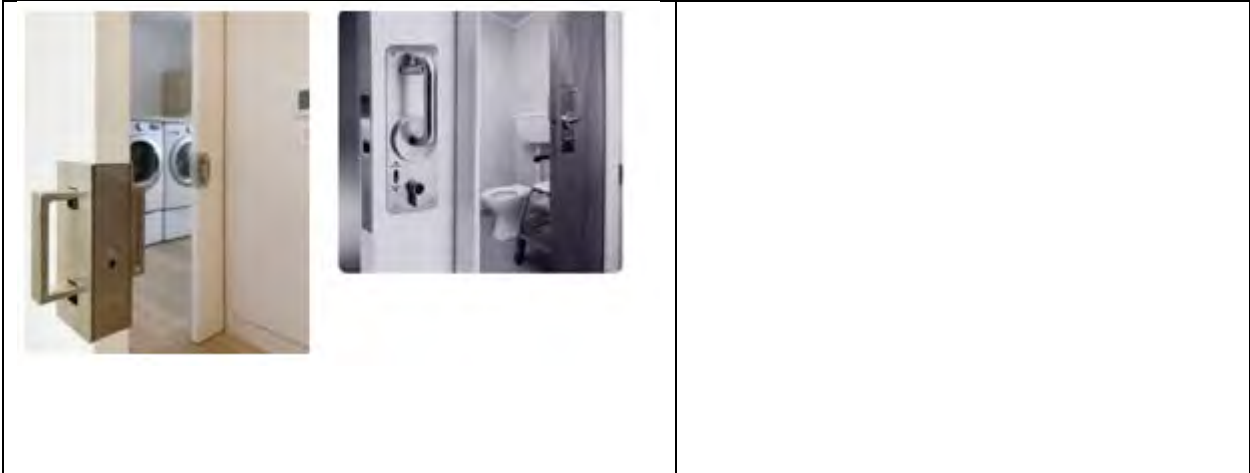
Staff names: James Allan, Senior Planner, District of West Vancouver

Recommendations by ACDI:

Specific Recommendation	Reason for Recommendations
<p>Automatic Door Openers should be added to all entrance doors as well as doors to amenity spaces, garbage, storage</p> <p>The larger to push button the more accessible and high contrast makes it most visible.</p> 	<p>To assist people with disabilities with easy access to spaces as well as those carrying large and heavy objects</p>
<p>There are 18 level two units throughout the building: two are market-rental and 16 are market condos.</p> <p>The units that are designed with accessible features should be attached to appropriate accessible parking and should get to the appropriate end users.</p>	<p>The ACDI recommended that these include non-market units designated for people with disabilities.</p> <p>Having a system or provision in place to allocate accessible parking spots and units to those who actually require their features</p>
<p>PARKING:A Accessible spaces be “paired” or assigned to the accessible units and that additional spaces (whose location provide additional space for loading, but do not meet the width requirements to be designated “accessible”) should be referenced as “adaptable” and be paired/assigned to the remaining accessible units</p>	<ol style="list-style-type: none"> 1. To make sure that those individuals who are eligible for an accessible parking stall with a designated SPARC parking pass get one 2. No all individuals who require an accessible parking stall need access for for a lift/side ramp so some of the larger stalls that don’t quite meet the “accessible” guidelines can be marketed as “adaptable” with a little extra space for maneuvering walkers etc. <p>These “adaptable” spaces include spaces numbered</p>

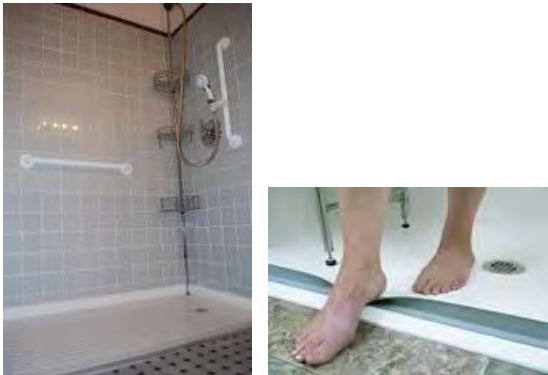
	<ul style="list-style-type: none"> • Level P1 - 28, 33 • Level P2 - 37, 51, 52, 80, 86, 89
<p>To increase accessibility for amenities make room numbers/titles with clear fonts (Ariel) and large size with good contrast (70%) – black letters on white doors for example. These letters should be tactile and raised. It is always better to have this information on a placard on the wall next to the door so that anyone who needs to read up close or feel the letters is not at risk of getting hit by opening/closing doors.</p>	<p>This will increase the level of accessibility for seniors and those with low eyesight. This information should be provided for all amenity spaces like: garbage room, parking area, storage, community spaces etc</p>
<p>A visual alarm system should be installed in all common spaces, hallways and parking garage.</p>	<p>This strobe works in tandem with the audible emergency alarm and will alert people who are deaf or hard of hearing of the same emergency being communicated to those with hearing.</p>
<p>To increase accessibility consider installing elevators that have an automated verbal floor announcement “ground floor, going up”</p>	<p>This will assist people with sight loss, seniors, cognitive disabilities, dementia etc with knowing which floor the elevator has stopped at.</p>
<p>All exterior stairs and hand rails should be painted in Yellow.</p> <p>A yellow TWSI should be installed at the top and bottom landing of each step and the nose of each step should also be painted yellow.</p>  <p>Similar to photo with yellow rails, nosing and truncated domes at top and bottom of stair landing</p>	<p>Yellow provides high contrast and is the most easily seen colour by individuals experiencing any level of sight loss. White will not be noticeable due to low contrast.</p> <p>Helps when you have low sight and those with total blindness can navigate the hazard with their cane by using the truncated domes at the top and bottom of the stair case landing.</p>
<p>Mail boxes should be made available at a lowered level for those using mobility devices. And tactile raiser letters/numbers with high contrast should be considered</p>	<p>The tactile and contrast numbers/letters Will increase accessibility for those who have a degree of sight loss.</p>

<p>Level access to balcony's – this is a must for universal access of all people including residents and visitors to units.</p>	<p>Most accessible for all residents and visitors using any mobility device or have mobility disabilities – it reduces the tripping hazard for seniors, children and creates universal access.</p>
<p>Provision of retractable cabinet doors for the adaptable units:</p> 	<p>Allows for the ability to access countertops by someone using a mobility device. If no mobility device is required it will still hide away stored items.</p>
<p>Provision of side opening wall ovens for the adaptable units: these have a pull out board underneath.</p> 	<p>This provision will allow for universal accessibility. Those using mobility devices can get under the oven and have a place to put a hot dish “hands free” so they can operate their mobility device. Also great for those with low vision as they can get close to eye level to the appliance which helps with operation of the controls if magnification is required or a close up view.</p>
<p>Provision of side by side and front loading washer and dryer for the adaptable units:</p> 	<p>Easy access for those using a mobility device or people who have trouble with mobility and dexterity. Also good for those with sight loss who may require the need of magnification or a close up view of the appliance controls.</p>
<p>Provision of pocket doors for the adaptable units – it is important to make sure that the handle is accessible because users may have trouble with their dexterity. Large and easy to grip handles: photo example below</p> 	<p>To make space for maneuvering with mobility devices (walkers, wheelchairs, scooters etc)</p>



provision of roll in showers for the adaptable units with central drains that run the length of the shower or collapsible shower water dam

For those using mobility devices.



SOME TIPS OF ACCESSIBLE PUBLIC WASHROOMS:

Is electronic hand dryers are going to be used choose option number one over option number 2. Option number one allows for someone with limited muscle done or dexterity to more comfortable use the dryer.

While BC Building code provides a basic foundation for accessible public washrooms, the lived experience of disability can highlight the small changes that make a big impact on how user friendly a facility is for a person with a disability.

They may not be able to lift their hands/arms to reach option number 2

Please consider these small changes in order to increase the level of accessibility and ease of use for all facility users.

Electronic Hand dryers:

<p>OPTION 1: Most accessible</p> 	<p>OPTION 2: Least accessible</p> 
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Soap Dispensers:

The same principle can be applied to soap dispensers. Automatic is the best option. Faucets also apply. Make sure the soap dispenser is not attached to the mirror, this is hard to find if you are blind and not easy to reach even with roll under counters – remember, not all people who use mobility devices have full range or arm motion. Attaching to the side wall close to the counter edge is the best place.

Toilet flush options:

For the same reason choose flushers that are larger in footprint and tactile and easy to grip or push with force.

<p>OPTION 1: Most accessible</p> 	<p>OPTION 2: Least accessible</p> 
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<p>OPTION 1: Most accessible</p> 	<p>OPTION 2: Least accessible</p>  
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Motion:

ACDI would like to thank the Executive Group and the District of West Vancouver for the opportunity to review the project at 657 Marine Drive. In the recommendations above the ACDI has included a number of recommendations required to improve and increase universal access: particularly the need to ensure that all entrances to adaptable units are accessible, the provision of universal access to all suite balconies and the assignment of the accessible and “adaptable” parking spaces to the adaptable units. Further, ACDI would like to see a written confirmation from the District of West Vancouver to share which improvements have/will be made to the project and which ones cannot/will not be included and the reasons for those decisions. ACDI looks forward to hearing back from the District of West Vancouver within 90 days of this report and is happy to look at the project again in future.



Greater Vancouver
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Technical Memorandum

DATE: January 29, 2021

TO: Jen Moller, P.Eng., Manager of Land Development Engineering, District of West Vancouver

FROM: Laurel Morgan, P.Eng.
Chris Johnston, P.Eng.

**RE: DISTRICT OF WEST VANCOUVER
Non-Single-Family Lot Redevelopment Rainwater Management Guidelines
Our File 409.091-300**

1. Introduction

1.1 Purpose

The purpose of this memorandum is to provide the District of West Vancouver (District) with:

- methodology in assessing the impacts from redevelopment of a non-single-family lot;
- design criteria for redevelopment of a non-single-family-residential lot; and
- design guidance for permit application.

This information is intended to be used as a guide to facilitate submission and evaluation of stormwater management plans for redevelopment of all lots that zoning land use other than single family residential. A professional engineer specializing in stormwater management will be required to seal all calculations and drawings for each application.

1.2 Limitations

This guide is for non-single-family-residential redevelopment including multi-family, industrial, commercial, and institutional land uses. For redevelopment of single-family lots, refer to the *Single-Family Lot Redevelopment Rainwater Management Guidelines*.

This guide applies to a majority of the existing non-single-family lots in West Vancouver where redevelopment is proposed. However, in areas of geotechnical concern (i.e. lots next to ravines or geotechnically significant slopes, etc.), a professional geotechnical engineer should be engaged by the applicant to review the applicability of surface and sub-surface infiltration. Areas of geotechnical concern may include, but are not limited to:

- lots close or adjacent to ravines;
- lots with geotechnically significant slopes or where the surface grade will be modified or controlled by retaining walls that require design by a professional geotechnical engineer;
- lots with surficial or near-surface bedrock; and
- lots with defined or potential geohazards such as unstable fills or slopes.



The decision to engage a professional geotechnical engineer should be made by the Civil Engineer of Record for the site servicing plans. Even in areas of geotechnical concern and where a geotechnical engineer determines that infiltration is not advisable, detention tanks should be used to provide the required level of flow control.

In areas where an Integrated Stormwater Management Plan (ISMP) has been completed, the ISMP will define the on-lot stormwater management criteria if the ISMP criteria is more stringent than this guideline. This guideline will be a minimum standard for the District.

2. Stormwater Management Requirements

The basic requirements of these guidelines are listed as follows:

1. Prior to carrying out any development and/or redevelopment, [the applicant] must submit a stormwater management plan for the site and must obtain the District's written approval of the plan.
2. For any development and/or redevelopment, the stormwater management system must be installed according to the plan and may be inspected by the District prior to approval of permit.
3. The site stormwater management plan should include:
 - A site plan showing the following:
 - overall site showing property boundaries, lot dimensions and area;
 - location of the District's storm sewer connection;
 - **existing** development including all buildings, patios, walkways, decks, driveways, and other impervious surfaces as well as gardens, lawn areas, and undisturbed forest areas. Areas must be labeled and their footprint area must be calculated in square metres. Existing surfaces should be shown by dashed lines;
 - **proposed** development including all buildings, patios, walkways, decks, driveways, and other impervious surfaces as well as gardens, lawn areas, and undisturbed forest areas. Areas must be labeled and their footprint area must be calculated and noted in square metres;
 - Storage volume required as described in Section 4 complete with dimensions and calculation for storage volume and orifice;
 - proposed drainage facilities including locations of roof leaders, splash pads, storage tanks, rock pits, overflow locations, lawn basins, etc.
 - upslope interception ditches (if applicable) to protect property from surface runoff potentially draining onto site from upslope (Note: interceptor ditches can't be used to intercept groundwater or interflow);
 - Area calculation (square metres) showing the proposed change in connected impervious area.
 - Calculation of volume (cubic metres) and rate of runoff (cubic metres / second) from the **existing** site (excluding natural forested areas).
 - Calculation of volume and rate of runoff from the **proposed** development on the site (excluding natural forested areas).
 - Calculation of storage volume required as shown in Section 4 complete with orifice dimensions and calculation.



- Description, drawing, and sizing of the stormwater source controls to be used including any tanks, infiltration systems, rain gardens, and permeable pavements.
- If an infiltration facility is proposed for the site, supporting documentation must be submitted including:
 - Infiltration testing in the vicinity of the proposed facility and at the bottom depth of the proposed facility to determine the design infiltration rate used to size the infiltration facility.
 - Confirmation by a qualified geotechnical engineer that the proposed infiltration is appropriate and safe for the site based on the available information if there are any areas of geotechnical concern (see section 1.2).
- A description of the applicable Operations and Maintenance (O&M) requirements for the stormwater management system in accordance with the District's Development Bylaw.
- The submission must include drawings, calculation notes, graphs, and digital spreadsheets, as needed to document the sizing and design of the proposed on-lot stormwater management facilities. The submission shall be sealed by a Profession Engineer registered in B.C. and specializing in stormwater management.

3. Stormwater Management Criteria – Non-Single-Family Redevelopment

There are three design criteria required under these guidelines to adequately address the development and redevelopment of non-single-family lots:

- Detention Storage for Rate Control,
- Volumetric Capture, and
- Water Quality treatment.

Both rate control and volumetric capture criteria are needed because they serve separate goals for stormwater management for the District. Detention storage provides rate control for the protection of downstream infrastructure. Volumetric capture retains a portion of the rainfall onsite by infiltrating it into the ground (or storing and releasing it at very low baseflow-equivalent rates) and provides a reduction in the total flow discharged for protection of fisheries values in the receiving creeks.

Detention storage applies to the NEW impervious surfaces proposed in the redevelopment plan, i.e. the incremental increase in impervious cover for the proposed development vs. the existing developed condition. **Should no new surfaces be planned, no detention storage will be required.**

Volumetric capture applies to ALL surfaces on the redeveloped site. Water quality treatment applies to ALL vehicle-accessible ground impervious areas, such as driveways, parking lots and interior roads.

3.1 Detention Storage Criteria

For redevelopment of non-single-family residential lots, there shall be no net increase in the rate of rainwater runoff from existing conditions. Under no circumstances shall the runoff exceed existing conditions unless approved by the District. Existing conditions are defined as the state of the land prior to any alterations proposed or undertaken as part of a permit application. Existing conditions include mature forest cover, grass/gardens, and impervious and semi-impervious areas.



Redevelopment of a site shall include design to handle any runoff increase above existing conditions during the 10-year, 5-year, and 2-year return period storm events on-site. Only the natural, forested areas can be excluded from the runoff calculations in both the existing and proposed development calculations.

All sites shall have one or more storage facilities to assist in attenuating rainwater runoff flows for the 10-year, 5-year, and 2-year return period events to their pre-development flow rates under six design storm durations ranging from 1-hour to 24-hours. Methodology in sizing of a tank is provided in Section 4 of this document.

Exception: In an area where an ISMP shows that there is downstream storm pipe capacity for future developed conditions including climate change, AND the downstream outfall is to the ocean rather than to a creek, the District may choose to waive the requirement for on-site detention.

3.2 Volume Capture Criteria

In addition to the detention storage, a volumetric capture is required for each site. This criterion is required to mitigate against increasing erosion in creeks and watercourses caused by increasing impervious surfaces. It also minimizes the damage to the aquatic environment and improves water quality along the beaches of the District.

Development or re-development of a site shall include the necessary measures to infiltrate or re-use the target amount of rainfall that falls on the site in a storm event of up to 24 hours duration. Note: If the design engineer prefers to use a continuous simulation water balance methodology, the target can also be expressed as capturing 75% of the average annual rainfall amount.

The volume capture criterion shall be applied to all surfaces, not just the new impervious surfaces. Redevelopment of a site shall include the necessary measures to infiltrate or re-use the captured runoff, assuming dry conditions:

- Below El. 100 m
 - the first 35 mm of rainfall falling on *impervious* surfaces; and
 - the first 50 mm of rainfall falling on *pervious* surfaces.
- Between El. 100 m and 400 m
 - the first 50 mm of rainfall falling on *impervious* surfaces; and
 - the first 72 mm of rainfall falling on *pervious* surfaces.

Exceptions for volumetric capture:

1. Geotechnical Concerns: In areas of geotechnical concern (see section 1.2, above), a professional geotechnical engineer should be engaged by the applicant to review the applicability of infiltration measures. In these areas, the detention storage requirements may be increased to accommodate a slow release of the capture volume to the storm system. The capture volume may be released at a rate-of-discharge that is equal to the infiltration rate of the native soil times the lot area (see Section 5.1: Slow Release Capture Alternative)
2. Roof Leaders: Currently, the District has a mandatory roof leader connection policy where all roof leaders must be connected to the municipal storm drainage system. Consequently, any increase in roof area must be offset by a decrease in the surface level impervious areas, the use of infiltration / re-use measures, or increased storage and slow-release of runoff.

Section 5 outlines the acceptable analysis measures for volumetric capture.



3.3 Water Quality Criteria

The water quality target is as follows:

- treat the first 35 mm of rain in 24 hours from all vehicle-accessible impervious surfaces. The treatment requirement is 80 % removal of all particles down to 50 microns. The removal should be calculated on the basis of a 24-hour storm event rather than on an annual basis.

If the volumetric capture target for such surfaces is met via infiltration through soil, then the water quality target will also be met at the same time.

For any areas where the water quality target will not be met by infiltration of the capture target volume, the professional engineer must provide a separate treatment method for the runoff from vehicle-accessible impervious surfaces. For small areas, this could be settling through an inlet sump, or for larger areas this could be a structural separator unit.

4. Volume Sizing for Detention Storage

Volume analysis shall be performed using a version of the Rational Method as described in this document. All calculations shall be performed and sealed by the Professional Engineer. Selection of runoff coefficients for each surface must be clearly identified.

Alternatively, the stormwater professional may choose to model the stormwater runoff from the development using suitable hydrologic/hydraulic modelling software.

4.1 Rational Method Style Calculation

The volume of runoff for any given time step on smaller properties can be calculated using the formula:

$$\text{Runoff Volume (cubic metres)} = C * R / 1000 * A \quad \text{Equation 1}$$

Where

- C = Runoff Coefficient (Table 1 below)
- R = Rainfall amount over a time interval (mm)
- A = Area (sq. m)

Note that Equation 1 uses rainfall amount in mm, not rainfall intensity.

The runoff coefficients are provided below.

Note: These coefficients differ slightly from those used for the traditional “Rational Method” calculation as they are used to calculate a volume rather than a peak instantaneous flow rate.



Table 1: Runoff Coefficient (C)

Surface	10 Year Runoff Coefficient
Driveway	0.95
Roof	1.0
Patio / Deck / Walkway / Artificial Turf ¹ Areas	0.95
Lawn (existing development)	0.65
Proposed Lawn (400 mm Topsoil)	0.3
Proposed Gardens (400+ mm Topsoil)	0.3
Pervious Paving	0.5
Natural Woodlands/Mature Forest	0.2

Selection of runoff coefficients for each surface must be clearly identified.

Multiple surfaces can be added together by performing the above equation for each surface then adding the flows together to represent the entire lot area (including undeveloped areas).

By applying the above Rational Method Style formula (Equation 1) for each rainfall time step, a runoff hydrograph can be created for both the existing development scenario and the redeveloped scenario.

Note: the above equation and coefficients should only be used for sites less than 2,500 sq.m in size. The rational method will overestimate runoff volume on larger sites. For larger sites, the Professional Engineer should use a model that will calculate the runoff using a hydrograph method and state all assumptions for the model for the District's review.

4.2 Rainfall and Elevation Correction

Rainfall amounts for the runoff calculations are provided in Table 2. These depths are derived from a rainfall Intensity-Duration-Frequency (IDF) curve for Metro Vancouver's District of West Vancouver Municipal Hall (VW14) rain gauge. Table 2 is valid for site elevations less than 100 m geodetic elevation within the District of West Vancouver.

Table 2 lists rainfall amounts for design storms ranging from 1-hour to 6-hours.

For higher elevations, an elevation correction factor shall be applied to adjust the rainfall depth to reflect actual conditions. For non-single-family residential lots located at elevations ranging from 100 m to 400 m, a factor of 1.45 shall be applied to the rainfall depths. For higher elevations ranging from 401 m to 950 m, a factor of 1.9 shall be applied to the rainfall depths. This is defined in the target amounts shown for volume capture in section 3.2.

¹ If the subgrade is unduly compacted, there is an impervious liner, or there is a hard surface below the artificial turf, then the area must be treated as an impervious patio area rather than as a permeable area. Artificial turf may be used in a similar manner to pervious paving if and only if it is installed with the same care and consideration to ensure that the subgrade below the installation is permeable and allows natural levels of infiltration into the subgrade soil.



4.3 Determination of Detention Storage Volume Required

The Rational Style Method described above, or a suitable hydrologic/hydraulic model, shall be used to calculate the storage volume required to detain excess runoff from the proposed development or redevelopment. Excess runoff is defined as the additional peak flow that would be flowing from the site in development or redevelopment conditions that exceeds the peak flow from the site under existing conditions.

To use a detention spreadsheet method, the spreadsheet should calculate the amount of runoff leaving the site in both existing conditions and proposed redevelopment conditions and take the difference between the two conditions. Only the natural, forested areas can be excluded from the runoff calculations in both the existing and proposed development calculations. The calculations will be performed using a time step approach whereby the flow leaving the site is calculated in 5-minute time steps.

Note: This methodology is NOT the “Modified Rational Method” found in textbooks and other guidance and the “Modified Rational Method” is not acceptable as a substitute for sizing the required detention storage volume.

The calculation approach requires the following steps to be carried out:

- Calculate the volume released in each 5-minute time step by using Equation 1 to calculate runoff volume for the rainfall amounts provided in Table 2.
 - This calculation should be done for the 6-hour storm duration for the existing development scenario, which is the target release rate for the site.
 - This calculation should be done for each of the storm durations in Table 2 from the 1-hour to the 6-hour for the proposed development scenario.
- Size an orifice and detention tank volume that limits the release rate in each of the 4 storm durations in the proposed development condition to no more than the 6-hour peak runoff rate in the existing development condition.
 - The calculated orifice flow should be within 10% of the target release rate for the site.
 - The orifice size should be determined by matching the flow through the orifice to the target existing development release rate when the water level is at the maximum head (H_{max}) in the storage unit.
 - The release rate of the 10-year, 6-hour storm can not exceed 31.8 L/s/ha under any circumstances.
 - To determine tank sizing, a spreadsheet should be used to calculate the water level in the tank during the storm event. Five minute time intervals corresponding to the rainfall time series should be used to calculate the water level in the tank.
 - An iterative process should be used to determine the optimum tank size by assuming a tank footprint and height and calculating the maximum water level, and then doing the calculation again using the calculated tank sizing until the process does not generate a different tank size.
 - The maximum tank size calculated for the 1-hour, 2-hour, 4-hour, or 6-hour event shall be the design tank size for the proposed development.
- If runoff from parts of the lot cannot be directed to the detention storage tank, it is acceptable to include a bypass flow for this amount in the calculation of a release rate, providing:



- The combined orifice flow from the storage tank and bypass flow from the remainder of the site cannot exceed the 6-hour existing development discharge flow for the site.
- To size the detention for multiple return periods, the sizing process should be repeated for the 5-year and 2-year events in addition to the 10-year event. The final detention size required will be the largest of the volumes determined for the three return periods.
 - Control of the 6-month event will be met by volumetric capture and sizing for detention for the 6-month event is not required.

In other words, the release rate from the storage tank through the orifice will be lower than the target release rate from the site.

This approach as outlined above will provide the tank and orifice size.

Detention is sized by this method for the incremental increase in impervious area on the site, however, the calculations for existing development and post-development conditions will be performed on the entire site (excluding only forested area that will remain unchanged) NOT the incremental difference in impervious area.

Figure 1 provides an example of what the results of this calculation process should look like for the 1-hour storm.

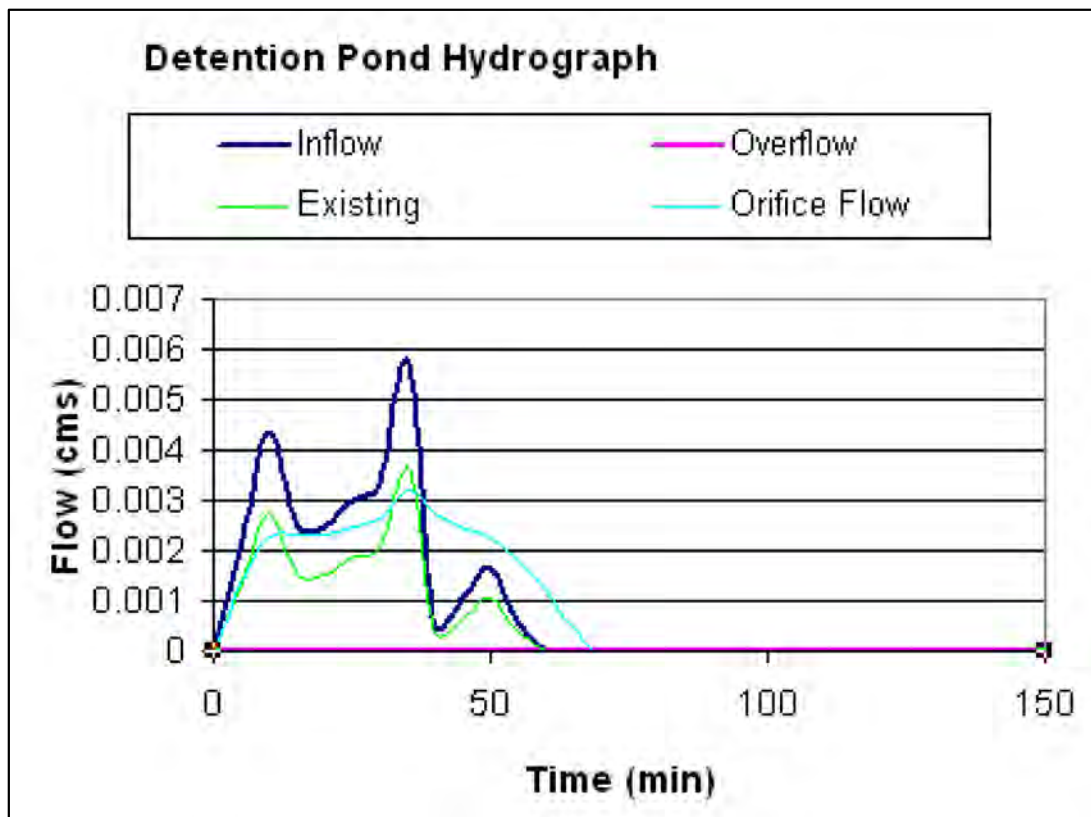


Figure 1: Example of detention pond hydrograph for 10-yr 1-hr storm



The Design Engineer must ensure all rainwater intercepted on site drains into the storage facility.

The storage facility will have an overflow outlet connected to the District's storm sewer or drainage system. The maximum hydraulic grade line (HGL) of the storage facility will be noted on the drawings along with the minimum building elevation. The minimum building elevation must be above the maximum HGL of the storage facility or there must be a backflow prevention device installed above the storage facility.

4.4 Orifice Outlet to Control Storage Release Rate

The Professional Engineer shall ensure that outlet flow from the storage facility is controlled to not exceed the allowable release rate (31.8 L/s/ha) by designing and sizing an orifice outlet to control outflows from the detention storage. The orifice shall be designed to be protected so as to avoid plugging by floatables and other materials. An access hatch shall be provided to maintain the orifice.

The release rate for the detention storage can be calculated using the standard orifice equation as follows:

$$\text{Release Rate } Q \text{ (m}^3\text{/s)} = 0.6 \times \text{Orifice Area (m}^2\text{)} \times (19.62 \times H \text{ (m)})^{0.5} \quad \text{Equation 2}$$

Where:

H = the height of water above the orifice centreline

The minimum size of an orifice will be 10 mm for the detention tank. Actual orifice size will be determined by an iterative process using the above calculations.

The easiest way to perform the above set of calculations is within a spreadsheet. As noted above, the calculation to size the orifice should assume the maximum head/water level in the tank. If a model is used to calculate the site runoff, the model may be used to size the orifice outlet for the storage volume.

In order to provide detention for all three design storm events, 10-year, 5-year and 2-year, the orifice sizing calculations should be performed for all three design storms. Multiple orifices, a compound orifice, or a non-circular shape outlet may be needed to create the desired outflow rates for the different design storm events using a combined storage volume.

The orifice shall be designed to be protected in such a way as to avoid plugging by floatables and other materials, e.g. by a wire basket that covers and holds debris away from the orifice. An access hatch shall be provided to clean out any debris and check and maintain the orifice.

4.5 Storage Facilities

The Professional Engineer shall select one or more storage facility (i.e., tank) that can detain stormwater on-site and limit runoff flows to not exceed existing conditions, using the methodologies described above.

The Professional Engineer must ensure all stormwater captured on site drains into the storage facility, or that bypass flows are accounted for in the sizing of the orifice and detention storage tank.

The storage facility will have an overflow outlet connected to the District's storm sewer or drainage system. The maximum hydraulic grade line (HGL) of the storage facility will be noted on the drawings along with the minimum building elevation. The minimum building elevation must be above the maximum HGL of the storage facility in order for the system to provide drainage by gravity only.



4.6 Pumping for Downslope Lots

For lots located downslope from the road and below the municipal storm drainage service line to which the lot will be connected, the proposed development will typically require a pump to lift the water up to the road and storm drainage service. If the grades allow, it is preferred to locate the pump upstream of the detention storage tank so that the tank drains by gravity to the municipal storm drainage service line and regulates the flow from the lot.

If it is not possible to achieve gravity drainage from the detention storage tank to the municipal storm service, then the pump may be located downstream of the stormwater detention tank, in a separate sump. The pump will have a higher rate of flow than the tank orifice outlet; it will cycle on and off and only be able to pump the volume of flow that is released from the detention storage tank.

4.7 Perimeter Drains

The sizing for the detention storage facility does not incorporate flow from the foundation perimeter drains. Perimeter drains shall not be connected to the storage facility. The surface collection system shall not be connected to the building footing drain system upstream of the storage facility as this could cause backflow into the perimeter drain system from the surface collection system. Flows from perimeter drains should be connected to the lot's storm service line downstream of the storage facility.

5. Analysis and Methods to Meet Volumetric Capture Criteria

This section provides the background information available to guide the design of the measures required to meet the volumetric capture criteria. The designer is also referred to the supporting documentation: Metro Vancouver Stormwater Source Control Guidelines 2012. Together, these documents form the requirements for achieving the volumetric capture criteria.

The following capture measures are available: Pervious Paving, Infiltration System, Rain Gardens, Green Roofs, and Rainwater Harvesting (aka Purple Pipe system). The Stormwater Source Control Guidelines 2012 provides specifications, design details, and sizing criteria for Pervious Paving, Infiltration Trench and Soakaway Infiltration Swale System, and Rain Gardens. Requirements for Green Roofs will rely on specifications from system manufacturers and designers. Purple pipe systems must be designed in accordance with the BC Building Code and other applicable standards.

No surface runoff shall be allowed to flow on to neighbouring properties. All surface runoff must be intercepted. As well, all trenches, rock pits, and other underground conduits must be appropriately sealed to prevent uncontrolled groundwater or interflow from leaving the subject property at rates greater than pre-developed rates. This can be accomplished through the use of low-permeability trench dams.

Slow-Release Capture Alternative

In areas where infiltration facilities such as infiltration trenches and rain gardens are not allowed due to geotechnical concerns, the volumetric capture criterion may be met via storage of the capture volume in a tank and release at a baseflow-equivalent rate of 0.25 L/s/ha. This release rate will be lower than the release rate for the detention storage and a separate orifice will be required. If a single tank is used for detention and for slow-release of the capture volume, the slow-release capture volume must be stored below the detention volume (i.e., below the elevation of the detention volume orifice). This means that the slow-release orifice will also be constructed below the detention volume orifice.



5.1 Absorbent Landscape

All cleared and landscaped areas not covered with hard surfaces shall have a minimum of 400 mm of topsoil and will be terraced as much as possible to maintain vegetated areas of 2% slope or flatter.

Topsoil may be an existing growing medium that was removed during construction, stockpiled, and replaced on the site, or it may be imported topsoil. Where topsoil is imported, it must be shown to meet appropriate landscape standards for organic content (see MMCD “Properties for growing medium”), and the other requirements contained in the “Absorbent Landscape” section of the *Stormwater Source Control Guidelines 2012*. Existing and imported topsoil must have a minimum of 3.5 mm/hr infiltration rate.

Where disconnected impervious surfaces are directed to absorbent landscaping, the ratio of impervious surface area to absorbent landscaping area may not exceed 2 (i.e., a maximum ratio of 2:1).

5.2 Forest Areas

The Design Engineer shall make every effort to limit the reduction of forest cover as much as possible. Tree canopies of mature, existing forest trees are valuable for rainwater management on any site. For the purposes of this guideline, it is assumed that natural forested areas meet the volumetric capture target and no further action is required.

Forested areas cannot be used as treatment measures for runoff from impervious areas.

5.3 Driveways and Patios

If the existing driveway will remain intact and will not be modified in any way, no new measures are required. However, if the driveway surface is increased or the surface is re-constructed, the volumetric capture criterion will apply to the increased impervious area. Volumetric capture methods for driveways could include:

1. Re-direction of runoff to adjacent absorbent landscaping consistent with the requirements for absorbent landscaping, above,
2. Construction of the driveway using pervious paving techniques, such as permeable pavers, permeable concrete, or permeable asphalt,
3. Capture of runoff and direction of flow to a sump for settling and cleanout of sediment and debris followed by an infiltration trench, or
4. Where infiltration is not allowed due to the presence of near-surface bedrock or geotechnical hazard, the driveway runoff may be collected and directed to a sump for settling of sediment and then discharge to a slow-release tank.

Note that the above options are listed in order of preference for water quality treatment of driveway runoff to remove pollutants prior to the runoff entering either an infiltration system or the municipal storm drainage system.

Patios, walkways, and other on-lot impervious surfaces should be sloped to drain to adjacent absorbent landscape areas wherever possible. For large patio areas, a rain garden could be used to provide storage and infiltration of runoff from a patio in a smaller footprint area than absorbent landscaping. If the runoff from patio and walkway areas cannot be directed to adjacent landscaping or a rain garden, then options 2 through 4 listed above for driveways may be used.



5.4 Roof Leaders

Currently, the District requires that all roof leaders must be directly connected to the municipal storm sewer system. This means that the roof leaders must be directly tied to the proposed storage tank and roof runoff cannot be distributed at the surface to be infiltrated into the ground. In order to meet the volume capture target, any increase in roof area must be offset by the reduction or disconnection of ground surface impervious area or the use of the “slow-release capture alternative”.

5.5 Parking Lots

Runoff from surface parking areas should be directed to treatment systems. This may take the form of:

- Underground structural treatment units or
- Treatment rain gardens with or without infiltration

Parking areas may be constructed of permeable paving as an alternative, however the property owner must commit to maintaining the permeable paving to retain its permeable capacity.

Runoff from the incremental increase in impervious area must also be captured.

5.6 Infiltration Systems

Direct connection of any ground level impervious surfaces to infiltration trenches (rock pits) and rain gardens is prohibited. Water entering an infiltration trench or rain garden from ground level impervious surfaces must first flow overland through pervious vegetation (minimum travel length 4.0 m).

Infiltration trenches and rain gardens shall be designed with the following features:

- A minimum 600 mm diameter sump c/w 500 mm (minimum) sediment trap and floatables protection must be installed upstream of the infiltration trench. Floatables protection shall be accomplished using a 150 mm diameter tee on the outlet connection.
- A perforated drain shall be installed at the top of the rock layer below the growing medium and must be connected directly to the storage facility;
- The base of the rock layer cannot be more than 2 m below the ground surface;
- Appropriate filter fabric shall be used on the top of the infiltration trench to prevent migration of fines from the topsoil layer (growing medium) to voids in the rock material; and,
- Infiltration testing of native sub-surface soil conditions should be carried out in the area of the proposed infiltration trench. **Under no circumstances will an infiltration trench or rain garden be designed to exfiltrate more than 3.5 mm/hr.** Infiltration trenches and rain gardens must be constructed in native material and cannot be bisected by utility trenches or highly permeable soils. In cases where this cannot be avoided, trench dams comprised of low permeability material can be used to prevent the trench from exfiltration at rates greater than 3.5 mm/hour.

In some cases, blasting of the bedrock may be required to allow for the construction of the storage layer. Raising the ground elevation with imported fill is also acceptable provided that the fill material does not allow the infiltration to exceed 3.5 mm/hr. This will require a lower permeability fill material.



6. Greenfield Development Considerations

There are limited areas of the District where greenfield development is occurring or planned to occur. In these areas, the application of stormwater management will differ from the re-development situation.

In particular, in areas served by flow diversions intended to protect the receiving creeks from increased flows due to development, the detention storage requirement does not apply. This assumes that the diversion is diverting flows from the storm sewer network before the increased flows enter and impact the creeks.

Even where there are diversions to mitigate the increase in flow, volumetric capture must be applied to the development lots and to the same level as specified in Section 3.2.

Water quality improvement must be applied for all on-lot vehicle-accessible surfaces such as driveways and surface parking lots.

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Attachments: Table 2

Statement of Limitations

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.



Table 2: Rainfall Amounts

	10-yr 1-hr	10-yr 2-hr	10-yr 4-hr	10-yr 6-hr
Time (minutes)	Rain (mm)	Rain (mm)	Rain (mm)	Rain (mm)
0	0.00	0.00	0.00	0.00
5	1.53	0.00	0.00	0.00
10	3.06	1.11	0.00	0.00
15	1.72	1.11	0.00	0.00
20	1.72	2.21	0.72	0.00
25	2.10	2.21	0.72	0.00
30	2.29	1.24	0.72	0.50
35	4.01	1.24	0.72	0.50
40	0.38	1.24	1.44	0.50
45	0.76	1.24	1.44	0.50
50	1.15	1.52	1.44	0.50
55	0.38	1.52	1.44	0.50
60	0.00	1.66	0.81	0.58
65	0.00	1.66	0.81	0.58
70		2.90	0.81	0.58
75		2.90	0.81	0.58
80		0.28	0.81	0.58
85		0.28	0.81	0.58
90		0.55	0.81	0.83
95		0.55	0.81	0.83
100		0.83	0.99	0.83
105		0.83	0.99	0.83
110		0.28	0.99	0.83
115		0.28	0.99	0.83
120		0.00	1.08	0.41
125			1.08	0.41
130			1.08	0.41
135			1.08	0.41
140			1.89	0.41
145			1.89	0.41
150			1.89	0.58
155			1.89	0.58
160			0.18	0.58
165			0.18	0.58
170			0.18	0.58
175			0.18	0.58
180			0.36	1.16
185			0.36	1.16
190			0.36	1.16
195			0.36	1.16
200			0.54	1.16
205			0.54	1.16



Time (minutes)	10-yr 1-hr Rain (mm)	10-yr 2-hr Rain (mm)	10-yr 4-hr Rain (mm)	10-yr 6-hr Rain (mm)
210			0.54	0.74
215			0.54	0.74
220			0.18	0.74
225			0.18	0.74
230			0.18	0.74
235			0.18	0.74
240			0.00	0.83
245				0.83
250				0.83
255				0.83
260				0.83
265				0.83
270				0.74
275				0.74
280				0.74
285				0.74
290				0.74
295				0.74
300				0.74
305				0.74
310				0.74
315				0.74
320				0.74
325				0.74
330				0.58
335				0.58
340				0.58
345				0.58
350				0.58
355				0.58
360				0.58
365				0.58
370				0.58
375				0.58
380				0.58
385				0.58
390				0.00