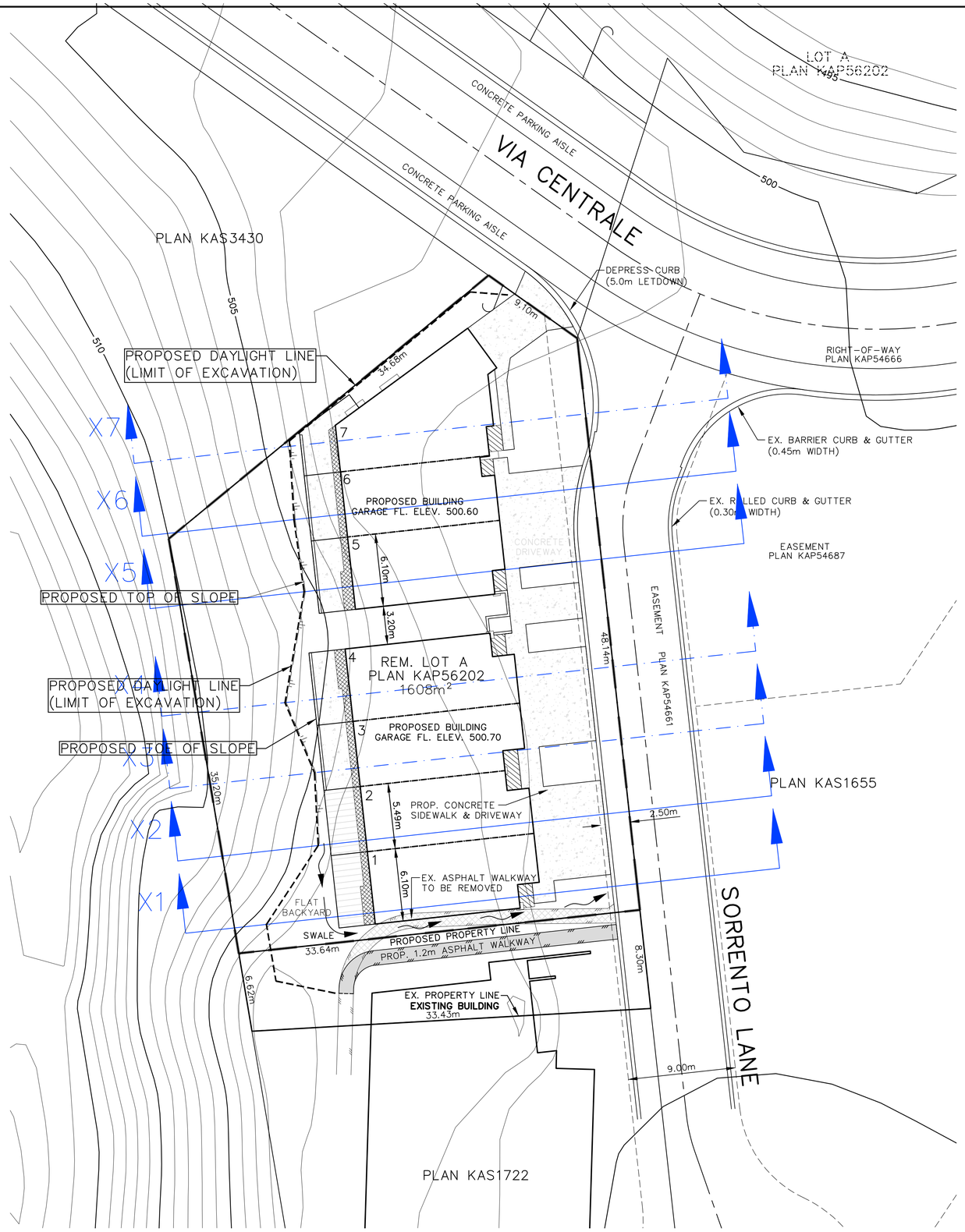

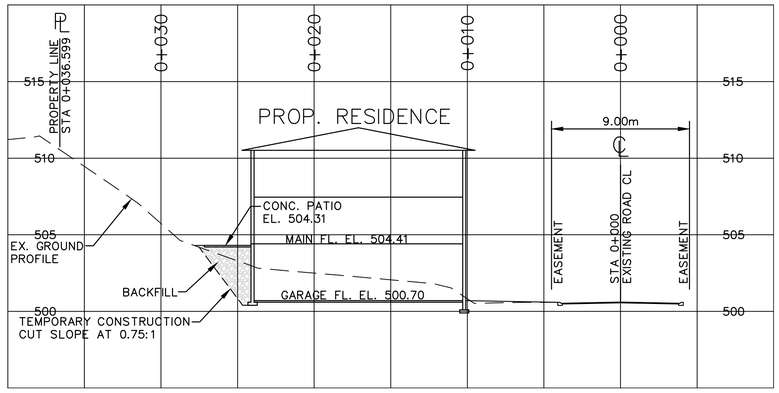

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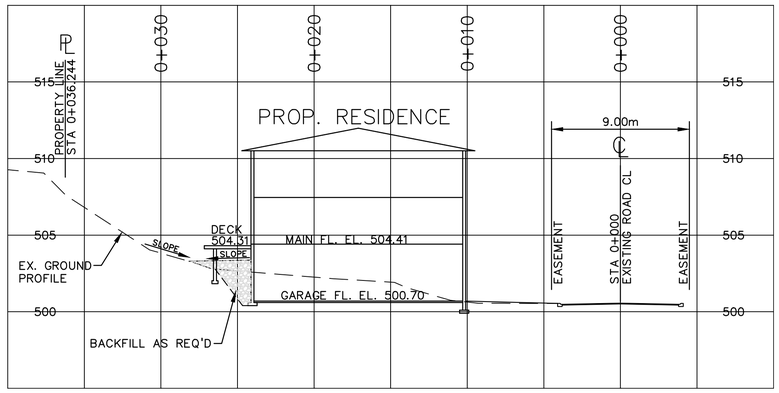

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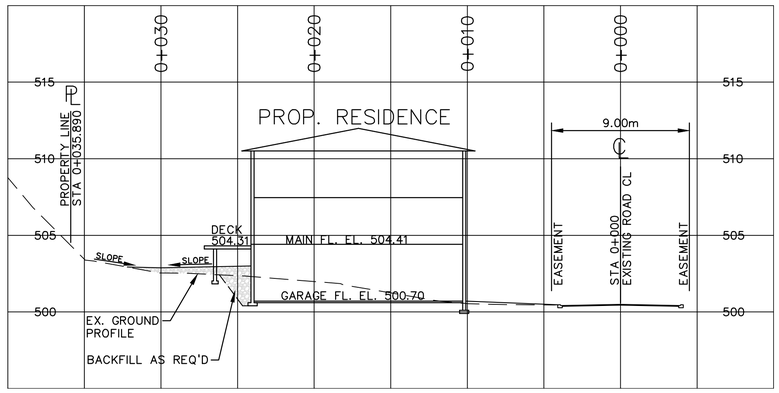


CROSS SECTION X1

LEGEND

CABLE TV	CAP	SAN	SANITARY MH (EXISTING)
GAS	CATCH BASIN	SAN	SANITARY MH (PROPOSED)
SAN. SEWER	ELECTRICAL BOX	STM	STORM MH (EXISTING)
STORM SEWER	HYDRANT	STM	STORM MH (PROPOSED)
U.G. ELECTRICAL	VALVE		TRANSFORMER
U.G. TELEPHONE	LAMP STANDARD		UTILITY JUNCTION BOX
WATER			

No.	MM/DD/YY DATE	BY	REVISION
5	06/14/23	G.E.R.	GENERAL REVISIONS
4	05/09/23	G.E.R.	GENERAL REVISIONS
3	11/17/21	G.E.R.	FOR DP SUBMISSION
2	08/21/21	G.E.R.	GENERAL REVISIONS
1	06/09/21	G.E.R.	GENERAL REVISIONS

ARDA CONSULTANTS LTD

DAVID R. PAULS, P. ENG.

DRAWN	G.E.R.
DESIGN	G.E.R.
APPROVED	
DATE	APR., 2021
SCALE	H=1:200 V=1:200

Arda Consultants Ltd.
275 NEAVE ROAD, KELOWNA BC, V1V 2L9
TEL: 250.807.7903
EMAIL: info@ardaconsultants.com

DRAWING NO. 1314.X1

THE CITY OF KELOWNA
ENGINEERING DEPARTMENT

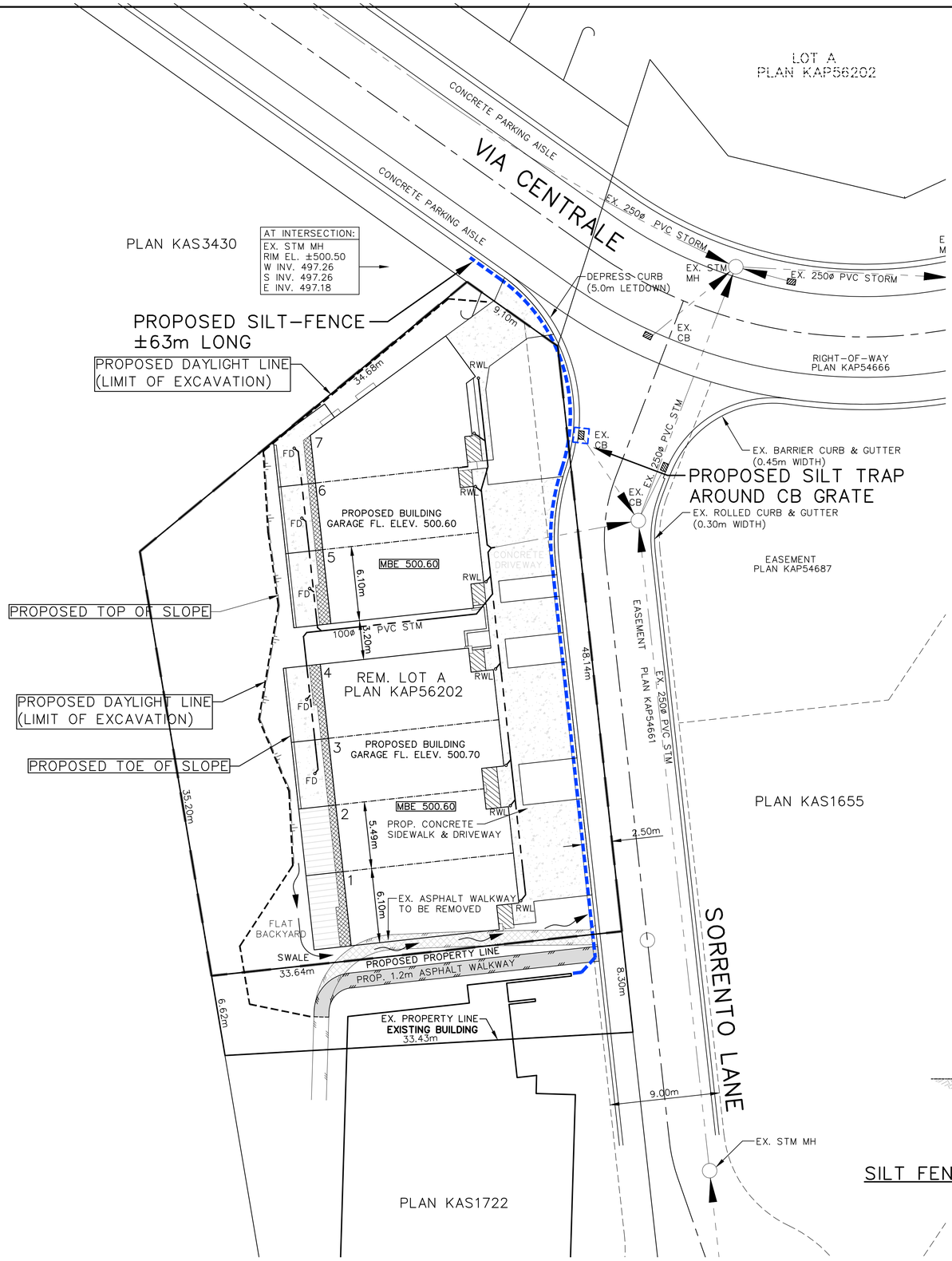
CITY FILE No. –

CARLISLE GROUP LTD.
3179 VIA CENTRALE
CROSS SECTIONS

DIVISION

REV. NO. 5

PLOT DATE:



LEGAL DESCRIPTION

PROPOSED DEVELOPMENT OF PART OF LOT A, PLAN KAP56202, SEC. 14 & 15, TP. 23, O.D.Y.D.

CIVIC ADDRESS: 7139 VIA CENTRALE

LEGEND

- PROPOSED SWALE OR DITCH BY DEVELOPER
- PRE-DEVELOPMENT CONTOUR (1.0m INTERVAL)
- 2.0% — POST-DEVELOPMENT DRAINAGE VECTOR
- MBE 350.0 — ABSOLUTE MIN. BASEMENT ELEVATION OR CRAWLSPACE TOP OF SLAB
- POST-ELEV. / PRE-ELEV. — SPOT ELEVATIONS
- RP 484.5 — ROCK PIT LOCATION AND ELEVATION OF EX. GROUND
- 100 YR. FLOOD ROUTE (SURFACE)
- 100 YR. FLOOD ROUTE (IN PIPE)
- PROPOSED LIMIT OF EXCAVATION (DAYLIGHT LINE)
- PROPOSED SILT FENCE (TEMPORARY)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE SIDEWALKS & PADS

* CONTRACTOR IS RESPONSIBLE FOR DUST & TRAFFIC CONTROL DURING CONSTRUCTION ACTIVITIES.

EROSION & SEDIMENT CONTROL

1) KEEP PAVED ROADS CLEAR OF SOIL.

2) OFF-SITE TRUCKS TO REMAIN ON PAVED AREAS OR USE COBBLE APRON AND/OR TIRE WASH.

3) RE-VEGETATE DISTURBED GROUND WITH NATIVE GRASSES ON LANDS THAT SLOPE DIRECTLY TOWARDS DRAINAGE COURSES.

4) TRENCH BACKFILL IN STEEP SLOPE AREAS (>30%) COMPACTED TO MIN. 90% STD. PROCTOR

5) REFER TO BC ENVIRONMENT/FISHERIES & OCEANS "LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT", SPECIFICALLY SECTIONS 3 & 5, ON EROSION & SEDIMENT CONTROL AND INSTREAM WORK.

6) REFER TO "DEVELOP WITH CARE" ENVIRONMENTAL GUIDELINES FOR URBAN AND RURAL LAND DEVELOPMENT IN BC. SPECIFICALLY SECTIONS 1, 3, & 5.3

CONSTRUCTION NOTES

THE SILT FENCE MAY BE CONSTRUCTED OF:

A) FILTER FABRIC ATTACHED TO 50x50mm WOOD POSTS WITH WIRE MESH. FILTER FABRIC TO BE BURIED A MINIMUM OF 150mm BELOW GRADE.

B) NILEX GEO-RIDGE SEDIMENT CONTROL BERM, INSTALLED IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS.

MAINTENANCE NOTES

1) IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT NO SILT, SEDIMENT, GRAVEL OR DEBRIS RESULTING FROM CONSTRUCTION WILL DISCHARGE FROM THE SITE WITHOUT FILTERING THROUGH THE SILT FENCE.

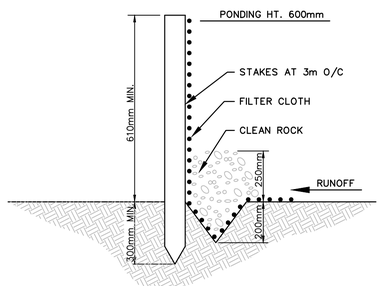
2) CONTRACTOR TO REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE HALF THE HEIGHT OF THE SILT FENCE.

3) CONTRACTOR TO INSPECT SILT FENCE PERIODICALLY AND/OR AFTER EVERY RAINFALL TO ENSURE PERFORMANCE

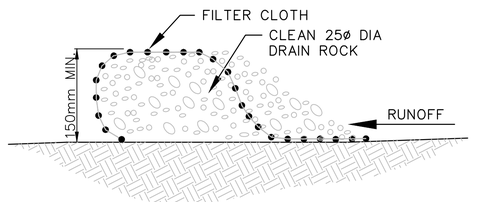
4) CONTRACTOR TO REPLACE SILT FENCE AS NECESSARY TO MAINTAIN ALL OF THE ABOVE CONDITIONS.

5) CONTRACTOR TO REMOVE SILT FENCE AFTER PAVING AND DITCH WORKS COMPLETED.

6) CONTRACTOR TO SUBMIT PHOTOS OF SITE EACH WEEK.



SILT FENCE TRENCH WITH GRAVEL DETAIL
N.T.S.



GRAVEL BERM SILT TRAP
N.T.S.

LEGEND

CABLE TV	CAP	SAN	SANITARY MH (EXISTING)
GAS	CATCH BASIN	SAN	SANITARY MH (PROPOSED)
SAN. SEWER	ELECTRICAL BOX	STM	STORM MH (EXISTING)
STORM SEWER	HYDRANT	STM	STORM MH (PROPOSED)
U.G. ELECTRICAL	VALVE		TRANSFORMER
U.G. TELEPHONE	LAMP STANDARD		UTILITY JUNCTION BOX
WATER			

No.	MM/DD/YY DATE	BY	REVISION
4	06/14/23	G.E.R.	GENERAL REVISIONS
3	05/08/23	G.E.R.	GENERAL REVISIONS
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ARDA CONSULTANTS LTD

DAVID R. PAULS, P. ENG.

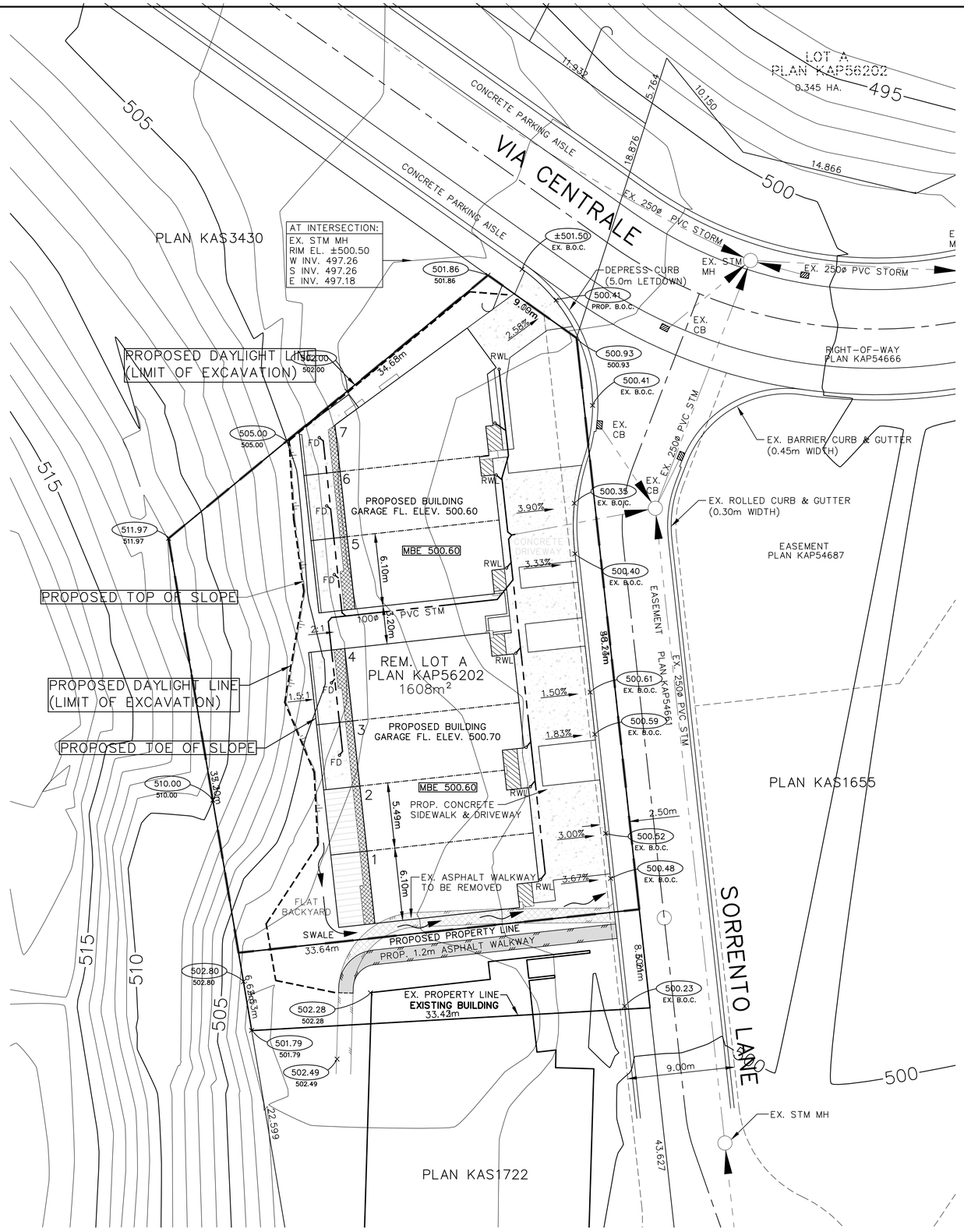
DRAWN	G.E.R.
DESIGN	G.E.R.
APPROVED	
DATE	APR., 2021
SCALE	1:200

Arda Consultants Ltd.
275 NEAVE ROAD, KELOWNA BC, V1V 2L9
TEL: 250.807.7903
EMAIL: info@ardaconsultants.com

THE CITY OF KELOWNA
ENGINEERING DEPARTMENT

CARLISLE GROUP LTD.
3179 VIA CENTRALE
EROSION & SEDIMENT CONTROL PLAN

DRAWING NO. 1314.D2
CITY FILE No. —
DIVISION
REV. NO. 4
PLOT DATE:



LEGAL DESCRIPTION

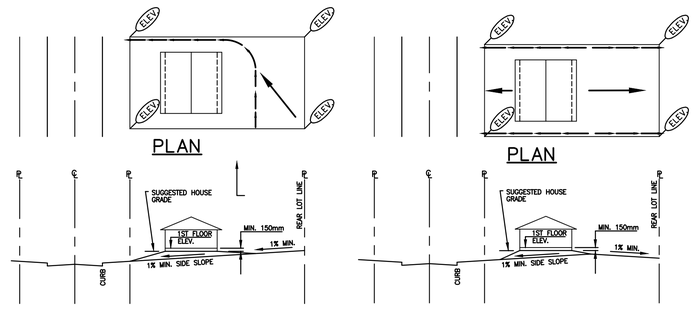
PROPOSED DEVELOPMENT OF PART OF LOT A,
PLAN KAP56202, SEC. 14 & 15, TP. 23, O.D.Y.D.

CIVIC ADDRESS: 7139 VIA CENTRALE

LEGEND

- PROPOSED SWALE OR DITCH BY DEVELOPER
- PRE-DEVELOPMENT CONTOUR (1.0m INTERVAL)
- 2.0% — POST-DEVELOPMENT DRAINAGE VECTOR
- MBE 350.0 — ABSOLUTE MIN. BASEMENT ELEVATION OR CRAWLSPACE TOP OF SLAB
- POST-ELEV. / PRE-ELEV. — SPOT ELEVATIONS
- RP 484.5 — ROCK PIT LOCATION AND ELEVATION OF EX. GROUND
- 100 YR. FLOOD ROUTE (SURFACE)
- 100 YR. FLOOD ROUTE (IN PIPE)
- PROPOSED LIMIT OF EXCAVATION (DAYLIGHT LINE)
- PROPOSED SILT FENCE (TEMPORARY)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE SIDEWALKS & PADS

* CONTRACTOR IS RESPONSIBLE FOR DUST & TRAFFIC CONTROL DURING CONSTRUCTION ACTIVITIES.



ELEVATION

TYPICAL SELF DRAINING LOT
FRONT LOT DRAINAGE
N.T.S.

ELEVATION

TYPICAL SELF DRAINING LOT
FRONT & REAR LOT DRAINAGE
N.T.S.

DRAINAGE NOTES

1. ROOF LEADERS TO DISCHARGE ON SPLASH PADS OR IN SPECIFIC SITUATIONS, CONNECTED TO STORM SYSTEM AS SHOWN.
2. TOE OF FILL OR CUT TO MEET EXISTING GROUND ELEVATIONS AT PROPERTY LINES OF ABUTTING PROPERTIES.
3. GENERAL CONTRACTOR IS RESPONSIBLE FOR ROUGH GRADING OF THE LOTS.
4. HOUSE BUILDER IS RESPONSIBLE FOR FINE LOT GRADING WHICH INCLUDES INDIVIDUAL SWALES ON EACH LOT.
5. MIN/MAX GARAGE ELEVATIONS TO BE PROVIDED BY OTHERS ON INDIVIDUAL LOT GRADING PLANS BASED ON ARCHITECTUAL CONSIDERATIONS AND DRIVEWAY LOCATIONS.
6. FOUNDATION DRAINS BY OTHERS (BASED ON GEOTECHNICAL RECOMMENDATIONS) TO BE CONNECTED TO ROCK PITS INDEPENDENT OF SURFACE DRAIN ROCK PITS.
7. CULVERTS (IF REQ'D) TO BE PLACED IN CONJUNCTION WITH LANDSCAPING TO ENSURE POSITIVE DRAINAGE.

LOT GRADING NOTES

1. SURFACE VEGETATION, TOPSOIL, & ANY OLD FILL SHOULD BE COMPLETELY REMOVED TO EXPOSE THE UNDERLYING NATURAL SOILS & SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER.
2. GOOD QUALITY STRUCTURAL FILL MATERIAL APPROVED BY THE GEOTECHNICAL ENGINEER SHOULD BE PLACED & COMPACTED IN MAXIMUM 300mm LIFT THICKNESSES TO AT LEAST 98% STANDARD PROCTOR DENSITY (SPD).
3. PROPOSED SOIL CUT & STRUCTURAL FILL SLOPES ARE TO BE CONSTRUCTED AT 2:1 WHEREVER POSSIBLE. MAXIMUM ALLOWABLE GRADE OF CUT & FILLS SLOPES ARE NOT TO EXCEED 1.5:1 AND ARE TO BE HYDROSEEDED TO PREVENT SURFACE EROSION.
4. TOE OF FILL OR CUT, TO MEET EXISTING GROUND ELEVATIONS AT PROPERTY LINES OF ABUTTING PROPERTIES.
5. GENERAL CONTRACTOR IS RESPONSIBLE FOR FINE GRADING OF THE LOT.
6. CONTRACTOR IS RESPONSIBLE FOR DUST & TRAFFIC CONTROL DURING CONSTRUCTION ACTIVITIES.

LEGEND

CABLE TV	CAP	SAN	SANITARY MH (EXISTING)
GAS	CATCH BASIN	SAN	SANITARY MH (PROPOSED)
SAN. SEWER	ELECTRICAL BOX	STM	STORM MH (EXISTING)
STORM SEWER	HYDRANT	STM	STORM MH (PROPOSED)
U.G. ELECTRICAL	VALVE		TRANSFORMER
U.G. TELEPHONE	LAMP STANDARD		UTILITY JUNCTION BOX
WATER			

No.	MM/DD/YY DATE	BY	REVISION
6	06/14/23	G.E.R.	GENERAL REVISIONS
5	05/08/23	G.E.R.	GENERAL REVISIONS
4	11/17/21	G.E.R.	FOR DP SUBMISSION
3	08/21/21	G.E.R.	GENERAL REVISIONS
2	06/09/21	G.E.R.	GENERAL REVISIONS
1	04/23/21	G.E.R.	GENERAL REVISIONS

ARDA CONSULTANTS LTD

DAVID R. PAULS, P. ENG.

DRAWN	G.E.R.
DESIGN	G.E.R.
APPROVED	
DATE	APR., 2021
SCALE	1:200

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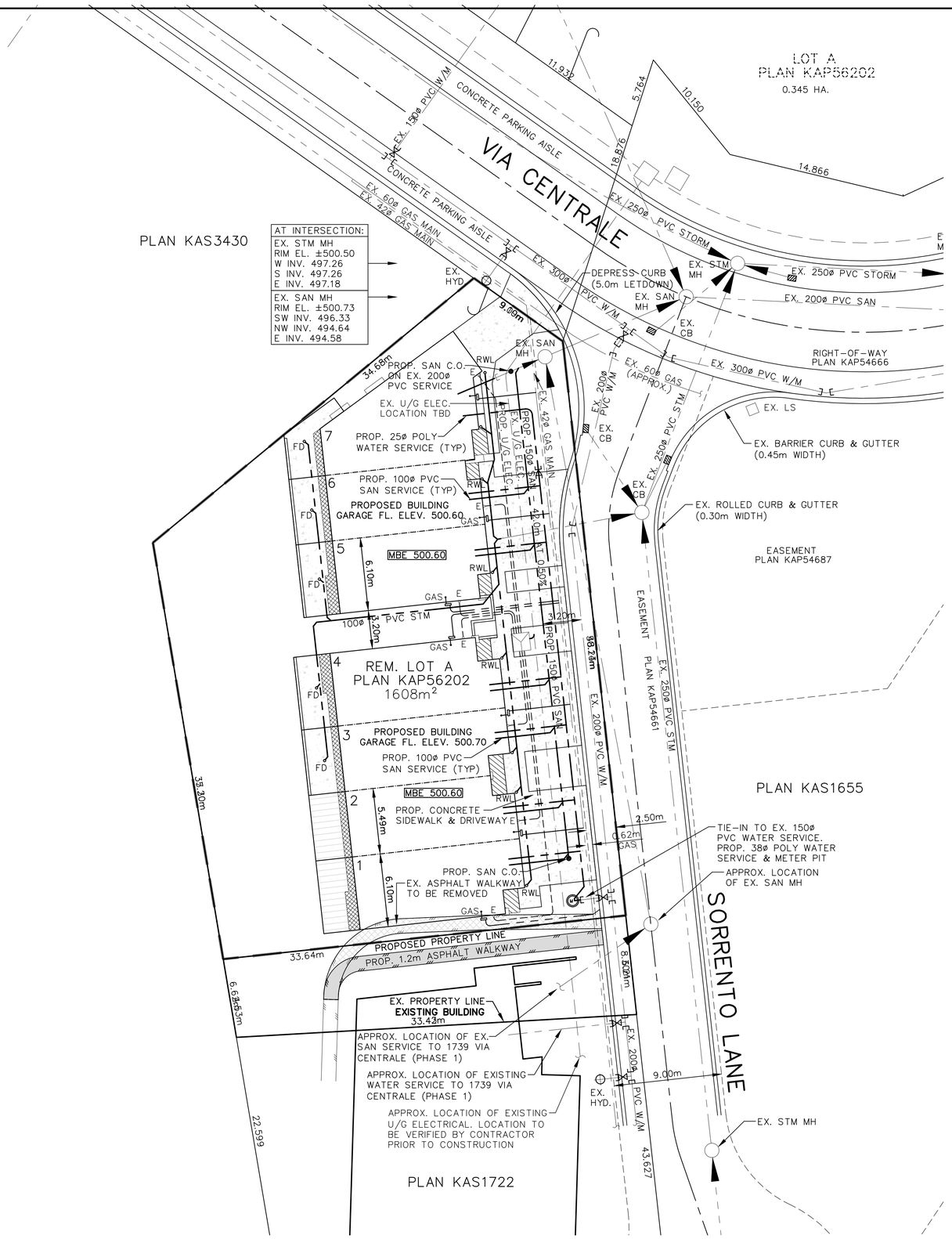
275 NEAVE ROAD, KELOWNA BC, V1V 2L9
TEL: 250.807.7903
EMAIL: info@ardaconsultants.com

THE CITY OF KELOWNA
ENGINEERING DEPARTMENT

CARLISLE GROUP LTD.
3179 VIA CENTRALE
LOT GRADING PLAN

DRAWING NO. 1314.D1
CITY FILE No. –
DIVISION
REV. NO. 6
PLOT DATE:



LEGAL DESCRIPTION

PROPOSED DEVELOPMENT OF PART OF LOT A, PLAN KAP56202, SEC. 14 & 15, TP. 23, O.D.Y.D.

CIVIC ADDRESS: 7139 VIA CENTRALE

LIST OF DRAWINGS

DWG. No.	DESCRIPTION
1314.C1	COMPOSITE UTILITY PLAN
1314.D1	LOT GRADING PLAN
1314.D2	EROSION & SEDIMENT CONTROL PLAN

CITY OF KELOWNA STD. DRAWINGS

STD. SS-G4 – TRENCH BACKFILL & SURFACE RESTORATION

STD. SS-S6 – CLEANOUT DETAIL
STD. SS-S11a – CATCH BASIN
STD. SS-S11b – CATCH BASIN CASTING – COMBINED SIDE & GUTTER INLET
STD. SS-S11c – CATCH BASIN – TOP SLAB
STD. SS-S51 – DRAINAGE DRYWELL
STD. SS-S52 – DRAINAGE DRYWELL INSTALLATION
STD. SS-S53 – PIPE PERFORATION & BEDDING DETAIL
STD. SS-S54 – CATCH BASIN TRAPPING HOOD

STD. SS-W2 – WATER SERVICE CONNECTION (POLYETHYLENE PIPE)
STD. SS-W4 – FIRE HYDRANT

STD. SS-C4 – CONCRETE BARRIER CURB

STD. SS-R4 – CLASS 2 LOCAL ROAD
STD. SS-R5 – CLASS 1 COLLECTOR ROAD
STD. SS-R17 – RESIDENTIAL CUL-DE-SAC

MMCD STD. DRAWINGS

STD. G8 – PIPE ANCHOR BLOCKS

STD. S3 – MANHOLE CONNECTION DETAILS – DROP & RAMP TYPE
STD. S4 – INSIDE DROP MANHOLE
STD. S7 – SANITARY SEWER SERVICE CONNECTION
STD. S8 – STORM SEWER SERVICE CONNECTION
STD. S9 – INSPECTION CHAMBER FOR SANITARY SEWER CONNECTION
STD. S12 – LAWN DRAINS
STD. S13 – STORM SEWER INLET WITH SAFETY GRILL

STD. W1 – TYPICAL THRUST BLOCK ARRANGEMENTS
STD. W3 – GATE VALVE INSTALLATION
STD. W6 – AIR VALVE ASSEMBLY
STD. W8 – BLOW-OFF

STD. C2 – CONCRETE SIDEWALK & BARRIER CURB
STD. C3 – CONCRETE SIDEWALK & ROLLOVER CURB
STD. C4 – CONCRETE ROLLOVER CURB
STD. C6 – CONCRETE MEDIAN & INTERIM CURBS
STD. C7 – DRIVEWAY CROSSING BARRIER CURB
STD. C9 – WHEELCHAIR RAMP FOR SIDEWALK & BARRIER CURB

NOTES

LOCATIONS AND OFFSETS OF EXISTING UTILITIES ARE COMPILED FROM CURRENT INFORMATION, BUT ARE NOT GUARANTEED ACCURATE. EXISTING UTILITIES MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ALL UTILITIES NOT NECESSARILY SHOWN.

THERE SHALL BE NO FIELD CONSTRUCTION CHANGE WHICH ALTERS THE DESIGN OR CONCEPT AS REPRESENTED BY THESE DRAWINGS, WITHOUT THE PRIOR CONSENT OF THE PROFESSIONAL ENGINEER.

THE ENGINEER SHALL BE NOTIFIED A MINIMUM OF 24 HOURS IN ADVANCE OF POURING CURB, GUTTER, OR SIDEWALK TO VIEW STRING-LINES OR FORMS.

ALL WORK TO BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF KELOWNA SUBDIVISION & DEVELOPMENT SERVICING BYLAW 7900 INCLUDING AMENDMENTS.

CONTRACTOR TO COMPLETE TIE-INS AND DISCONNECTIONS OF EXISTING SERVICES FOR CITY WATER, SANITARY, AND DRAINAGE IN THE PRESENCE OF THE CONSULTANTS REPRESENTATIVE AND IN THE PRESENCE OF CITY PERSONNAL AFTER APPROPRIATE CITY APPROVALS ARE OBTAINED. CONTACT THE UTILITY SERVICE PERSON AT 469-8501 TO COORDINATE ALL TIE-INS AND DISCONNECTIONS.

LEGEND

CABLE TV
GAS
SAN. SEWER
STORM SEWER
U.G. ELECTRICAL
U.G. TELEPHONE
WATER

CAP; CATCH BASIN; ELECTRICAL BOX; HYDRANT; VALVE; LAMP STANDARD; SANITARY MH (EXISTING); SANITARY MH (PROPOSED); STORM MH (EXISTING); STORM MH (PROPOSED); TRANSFORMER; UTILITY JUNCTION BOX

No.	MM/DD/YY DATE	BY	REVISION
4	06/14/23	G.E.R.	GENERAL REVISIONS
3	05/08/23	G.E.R.	GENERAL REVISIONS
2	11/17/21	G.E.R.	FOR DP SUBMISSION
1	08/21/21	G.E.R.	GENERAL REVISIONS

ARDA CONSULTANTS LTD

DAVID R. PAULS, P. ENG.

DRAWN G.E.R.
DESIGN G.E.R.
APPROVED
DATE APR., 2021
SCALE 1:200

Arda Consultants Ltd.
275 NEAVE ROAD, KELOWNA BC, V1V 2L9
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THE CITY OF KELOWNA
ENGINEERING DEPARTMENT

CARLISLE GROUP LTD.
3179 VIA CENTRALE
COMPOSITE UTILITY PLAN

DRAWING NO. 1314.C1
CITY FILE No. –
DIVISION
REV. NO. 4
PLOT DATE:

GEOPACIFIC

604.439.0922
1340 St Paul Street
Kelowna, BC V1Y 2E1

The Pointe at Quail LP
Suite 230, 2891 Sunridge Way NE
Calgary, AB
T1Y 7K7

September 1st, 2022
File: 20518

Attention: Gordon D. Mross

Re: Geotechnical Investigation Report: Proposed Multi-Unit Residential Development
Lot A, 3179 Via Centrale, Kelowna, B.C.

1.0 INTRODUCTION

We understand that The Pointe at Quail LP (The Pointe) proposes to develop a multi-unit residential development in Kelowna, BC. Based on the drawings provided by Brent Ellergodt Design (BE Design), dated May 6th, 2022, the proposed development will consist of two multi-unit residential buildings, with the lower level built into the adjacent existing slope and daylighting to the east. The multi-unit residential buildings will be surrounded with at grade parking, and associated utilities. We anticipate wood framed construction above-grade and reinforced concrete construction for foundation walls, floor-slabs, and footing elements. We understand that the development may require re-grading of the existing topography to achieve the desired design grades.

This report presents the results of a geotechnical investigation completed by GeoPacific (Formerly Cascade Geotechnical Ltd. [Cascade]) and describes the soil and groundwater conditions and makes geotechnical recommendations for the design and construction of the proposed development. This report was prepared exclusively for The Pointe, for their use, and for the use of others on their development team, and the City of Kelowna for use in the development and permitting process, but remains the property of GeoPacific Consultants Ltd. Any unauthorized use of this report is prohibited without written consent of GeoPacific.

2.0 SITE DESCRIPTION

The proposed development is located south of Via Centrale in Kelowna, BC. The proposed development area is bound by a slope followed by an existing apartment complex to the west, Sorrento Lane to the east, existing multi-family residential to the south, and Via Centrale to the north. The topography of the site is generally flat with a gentle slope to the east and is bounded by a steep slope/rock cut on the west side of the property. The slope is observed to vary between rock outcroppings to the south grading to a soil slope to the north. The natural slopes range between approximately 0.9 horizontal to 1 vertical (0.9H:1V) and 1.8H:1V generally grading flatter to the north. Based on available orthophotos from the Regional District of Central Okanagan's (RDCO) Geographic Information System (GIS) and our experience in the area, the property is currently undeveloped. The property is generally vegetated with grasses and brush, and several mature trees on the western side. The eastern side of the property consists of a cleared parking pad, surfaced with sand and gravel.

The location of the proposed development area and surrounding land are shown on the attached site plan, Drawing No. 20518-01, following the text of this report

3.0 FIELD INVESTIGATION

GeoPacific, formerly Cascade, completed a geotechnical site investigation at the property on February 20th, 2008. A total of 5 test pits were excavated using a Cat 308C tracked excavator supplied and operated by AG Appel Enterprises. The test pits were excavated to depths of up to 3.2 metres below existing site grades. The locations of the test pits are shown in Drawing No. 20518-01, following the text of this report.

Test pit logs are provided in Appendix A following the text of this report.

4.0 SUBSURFACE CONDITIONS

4.1 Soil Profile

The publication, "Late Glacial History and Surficial Deposits of the Okanagan Valley, British Columbia", by Hugh Nasmith (1962), Bulletin 46, Ministry of Energy, Mines, and Petroleum Resources, Province of British Columbia, indicates that the surficial geology in the project area consists of kettled outwash from the stage of glacial retreat, which is generally characterized by interbedded deposits of sand and gravel.

The subsurface materials at the test pit locations generally consisted of surficial topsoil, underlain by sands and gravels fill, natural sands, glacial till and bedrock.

TOPSOIL

The topsoil layer was generally less than 0.2 metres in thickness and is encountered in all test pits except test pit, TP-05. An additional layer of topsoil, approximately 0.1 m thick, was observed in test pit, TP-04, underlying the sand fill. The topsoil contains silty sand and is brown in colour.

SAND to SAND and GRAVEL [FILL]

The sand and gravel fill was encountered at all test pits except test pits, TP-04 and TP-05, at depths between 0.1 m and 2.6 m below existing site grades. The sand and gravel fill is generally fine to medium grained and loose to compact, containing mixed blast rock, some silt, occasional boulders and concrete, and frequent cobbles. The sand and gravel fill is damp and light grey to medium brownish grey in colour.

The sand fill was encountered at test pits, TP-04 and TP-05, at depths up to 0.7 m below existing site grades. The sand fill is generally fine grained and loose to compact, containing no silt to trace silt, and occasional pieces of plastic. The sand fill is damp to moist and medium brown to medium grey in colour.

SAND

The natural sand is encountered at all test pits except test pit TP-02, where bedrock was encountered, at depths between 0.8 m and 3.2 m below existing site grades. The sand is fine grained and loose to compact, containing some gravel and trace silt. The sand is damp and light to medium brownish grey in colour.

BEDROCK and TILL

Bedrock was encountered at test pit, TP-02 at a depth of 2.3 m. The excavator was unable to rip into the bedrock surface. Terraced bedrock was observed in the south portion of the property. However, a cut slope in test pit, TP-05, adjacent to the show home, revealed a dense silty sand and gravel till.

For a more detailed description of the subsurface conditions refer to the test pit logs in Appendix A.

4.2 Groundwater Conditions

No groundwater seepage was encountered in our test pits during the investigation. The static groundwater table is expected to be relatively deep and well below the development grades of the site. However, perched water should be expected to develop in the surficial fills and above dense deposits of glacial till or rock.

5.0 DISCUSSION

5.1 General Comments

As noted in section 1.0, the proposed multi-unit residential development is expected to include the construction of two 3-storey multi-unit residential buildings, each with 4 units, surrounded by at grade parking and associated underground utilities. The buildings are anticipated to be wood framed construction above grade and reinforced concrete construction below grade. The development may require some re-grading of the existing topography to achieve the proposed design grades. Cuts and fills may be required for the construction of lot platforms. Although structural loading has not been provided at the time of this report, we expect the loads to be relatively light with column and wall loads of less than 400 kN and 30 kN/m. Floor loading is not expected to exceed 5 kPa.

We expect that the contemplated structures can be supported on conventional spread and strip footings. We anticipate that the footings will be founded on *sand, bedrock, or engineered fill.*

We anticipate that some re-grading of the property will be completed to accommodate the development. Some of the underlying natural soils may be re-used subject to our comments in Section 6.11. The topsoil layers, all organic debris, and any soft, loose, wet, or disturbed soils must be stripped from the site prior to the placement of any new fills or the construction of any roads, utilities, buildings, and retaining walls. We expect that the existing loose to compact granular fills could be recompacted in place prior to placement of new fills.

The subsurface soils are not considered prone to liquefaction or other forms of ground softening under the design earthquake defined under the 2018 British Columbia Building Code.

Final grading plans should be provided to GeoPacific well in advance of construction to provide further recommendations for the design and construction of the proposed development, if necessary.

We confirm, from a geotechnical standpoint, that the proposed development is feasible provided that the recommendations outlined in Section 6.0 are incorporated into the overall design.

5.2 Slope Stability

As part of the report preparation a general site reconnaissance was also preformed to determine the suitability of the site for development with respect to slope stability. As described in Section 2.0, existing grades are relatively flat to the east at about an average elevation of 501 m geodetic and grade up to the west. On the west side of the site, the slopes were observed to range between 0.9H:1V to the south where the slope consists of exposed rock grading to a 1.6H:1V and flatter slope to the north, where the slope transitions to soil.

Where the slope consists of soil, the slope is generally covered with moderate vegetation consisting of mature trees, shrubs and grasses. At the time of reconnaissance, minor surficial sloughing was observed within the soil portions, however, no sloughed material was observed at the toe of the slope. The vegetation must be maintained and any disturbance to the slope or existing vegetation must be minimized.

Our slope stability assessment was undertaken in accordance with the BC Building Code (BCBC) 2018. The analysis indicates that for deep seated global failures, the Factor of Safety for the static and seismic condition are in excess of 1.5 and 1.1 respectively. Our analysis further indicates that the steeper portions of the slope, exceeding 1.75H:1V, may require ongoing maintenance of surficial sloughing to maintain the global factor of safety. Maintenance may include localized regrading and spoil removal. The slopes have been assessed in general accordance with the guidelines recommended by the association of Professional Engineers and Geoscientists of BC in the report "Guidelines for Legislated Landslide Assessments for Proposed Residential Developments in BC", dated May 2010.

For portions of the development adjacent to the soil slope we have further completed a runout assessment for the surficial sloughing on the slope in accordance with Hunter and Fell (2003). Based on our assessment, assuming a 10 to 13 m tall slope and an inclination of 1.6H:1V, the proposed habitable space must have a minimum setback of the greater of either a 3 m offset from the toe of the slope or be at a projection of 1.75H:1V from the crest of the slope. The offset from the toe of the slope could further be reduced by increasing the grades of the backyards. Alternatively, slope stabilization measures to mitigate surficial sloughing may be incorporated, which can be reviewed once final grading plans are available. Final grading plans and building location must be reviewed by GeoPacific well in advance of construction.

Where the development is proposed adjacent to the existing rock cut, rockfall mitigation measures must be considered. Rockfall mitigation measures typically consist of utilizing a number of measures including but not limited to maintaining a sufficiently large catchment area or offset from the exposed rock and periodically removing any rock accumulation, scaling of loose rock, constructing a suitable barrier such as a lockblock barrier or utilizing a rock fence. Rockfall mitigation measures can be reviewed during construction by a qualified rock specialist.

GeoPacific has visually reviewed the conditions of the slopes on the adjoining properties and have noted no signs of instabilities. However, it must be appreciated that GeoPacific has not investigated the soil conditions on the neighbouring properties and as a result our conclusions pertaining to the stability on the neighbouring properties is based on visual observation alone. GeoPacific accepts no responsibility for the future instability of the neighbouring properties, or impacts on the subject property, caused by third parties.

While our analysis shows the slope to be stable with respect to deep seated failures, including under seismic conditions, we recommend that the developer limits unnecessary disturbance on and around the slope. In particular drainage alteration, grade alterations, and retaining wall construction should only be done under the advice and recommendations of a Geotechnical Engineer with experience in slope stability evaluation.

6.0 RECOMMENDATIONS

6.1 Site Preparation

Prior to construction of foundations, utilities, grade supported slabs, and pavement structures, all vegetation, topsoil, soils containing organics and loose or otherwise disturbed materials should be removed to expose a subgrade of *compact fill, natural sand, or bedrock.*

Stripping should extend out beyond the building envelope and roads at a distance equal to the thickness of proposed engineered fill beneath the footings. For example, if 1 metre of engineered fill will underlie a footing then stripping should extend a minimum distance of 1 metre beyond the outer edge of that footing.

Stripping is not required in landscaped areas unless the criteria stated in the previous paragraph requires the removal of that material.

Should grade reinstatement be required, we recommend the use of engineered fill. "Engineered Fill" is defined as clean sand to sand and gravel containing silt and clay less than 5% by weight, compacted in 300 mm loose lifts to a minimum of 100% Standard Proctor Maximum Dry Density (SPMDD) in accordance with ASTM D698, and at a moisture content that is within 2% of optimum for compaction. We recommend the engineered fill be tested for compaction with in situ density tests prior to placing subsequent lifts.

Stripped subgrades and engineered fill materials and compaction must be reviewed by the geotechnical engineer.

6.2 Foundations

Footings which span across *bedrock and natural sand* may experience differential settlement. Thus, footings partially encountering *bedrock* are to be over-excavated by 0.3 m below footing grades, and reinstated to footing grades using engineered fill, as described in Section 6.1.

Footings which are founded on competent *sand or engineered fill,* can be designed on the basis of a SLS bearing pressure of 120 kPa for strip or pad footings.

Factored ultimate limit state (ULS) bearing pressures, may be taken as 1.5 x the SLS bearing pressure provided above. We estimate for foundations designed as recommended, settlements will not exceed 25 mm total and 1:500 differential.

Irrespective of the allowable bearing pressures given, pad footings should not be less than 600 mm by 600 mm and strip footings should not be less than 450 mm in width. Footings should also be buried a minimum of 600 mm below the surface for frost protection.

Foundation subgrades must be reviewed by the geotechnical engineer prior to footing construction.

6.3 Seismic Design of Foundations

We have considered the 2018 BCBC design earthquake with a 2% probability of exceedance over a 50 year period which equates to a return period of 2475 years. Accordingly, we have considered an earthquake having a peak horizontal ground acceleration of 0.064g for this site (Ref. National Resources Canada, Site Coordinates: 49.954 deg. North, 119.397 deg. West).

This site qualifies as "Site Class D" as defined in Table 4.1.8.4.A of the 2018 British Columbia Building Code (BCBC).

6.4 Lateral Earth Pressures

Foundation walls constructed below-grade will be subject to both static and seismic earth pressures. We anticipate that foundation walls will be backfilled with compacted engineered fill. Earth pressures are significantly lower where a normal active pressure distribution can be achieved compared with an at rest condition or a full compaction pressure condition. Assuming a partially sloped excavation backfilled with lightly tamped sand, yielding foundation walls, and no backslope above the wall, we would expect an earth pressure approximately equivalent to a full active condition and recommend the following earth pressures be used:

Static: 5.0H kPa triangular soil pressure where H is the total height of the wall in metres.

Seismic: 0.5H kPa inverted triangular soil pressure where H is the total height of the wall in metres.

Seismic loads should be added to the static loads. Any additional surcharge loads located near the foundation walls should be added to the earth pressures given. The provided loads are calculated based on unfactored soil parameters. Therefore, the loads should be assumed to be unfactored as well.

6.5 Slab-On-Grade Floors

Floor slabs should be underlain by a minimum of 100 mm of a free draining granular material, such as 19 mm clear crushed gravel (drain rock), compacted to a minimum of 95% SPMDD in accordance with ASTM D698, and at a moisture content that is within 2% of optimum for compaction. General grade reinstatement or backfill beneath slab on grade areas should be done with engineered fill, as described in Section 6.1. The under slab fill should be hydraulically connected to the perimeter drainage system to facilitate the removal of any water which accumulates under the slab.

Compaction of the slab-on-grade fill must be reviewed by the geotechnical engineer.

6.6 Radon

We recommend that site preparation for the floor slabs include a rough-in for a subfloor depressurization system to protect from soil gas ingress (radon) unless the associated testing is provided and indicates a radon abatement system is not required. Should radon testing not be completed or an abatement system is required, the abatement system is described in detail in Section 9.13.4. of the 2018 BCBC.

6.7 Site and Foundation Drainage Systems

A perimeter drainage system will be required for below grade structures (basements/crawlspaces) to prevent the development of water pressure on foundation walls and basement floor slabs. We recommend that a perforated, 100 mm diameter, PVC pipe be used as a perimeter drain (i.e. not Big-O pipe). The PVC pipe should be covered in 25 mm – 50 mm diameter rounded drain rock, and the drain rock should extend a minimum of 0.3 m above the perimeter drain. The drain rock should be wrapped in filter cloth. The remainder of the backfill can be any inorganic, clean, well graded, granular sand and gravel material, with no more than 5% passing the #200 sieve.

Where available, roof down spouts and foundation perimeter drains should be discharged to storm sewer connections. If a storm sewer connection is not available, at least one infiltration pit per building will be required. Locations and dimensions of infiltration pits should be determined during construction by a geotechnical engineer once final layout and grading has been determined. The pits should be filled with drain rock, then covered with filter fabric. The elevation of the top of the pit should be below the bottom of footing elevation, and be located a minimum of 5 m away from the building foundations and from the crest of slopes. GeoPacific can provide rock pit sizing under a separate cover.

6.8 Temporary Excavations and Stockpiles

We would expect that temporary slopes cut to a 1H:1V can be constructed in the existing surficial *sand and gravel fills and sand,* steeper cuts may be utilized in *bedrock* if encountered. Flatter cut slopes may be required in any loose soils, or soils with active seepage.

To maintain the stability of the excavated slopes, the slopes should be covered with a poly sheet to prevent additional drying of the material sand and erosion during wet weather conditions. Cobbles and boulders should be scaled from the excavation slopes prior to manned entry.

It should be appreciated that temporary cut slopes are only suitable when located a safe distance away from existing structures and/or utilities. Any excavations extending below a 2H:1V projection taken from the base of any adjacent footings or the crown of any pipes should be reviewed by GeoPacific prior to execution on site.

Excavations may encounter perched groundwater seepage and can be handled using sumps and sump pumps.

Storage of temporary fills and excavated soils should be setback from the slope crests in accordance with the latest Work Safe B.C. guidelines. Furthermore, stockpiles should be covered with poly sheeting to prevent erosion.

Temporary cut slopes in excess of 1.2 m in height must be covered in poly sheeting and require inspection by a professional engineer in accordance with Work Safe B.C. guidelines, prior to worker-entry.

6.9 Permanent Grading

We recommend that all permanent slopes within the development area be graded to a 2H:1V or flatter in *sand or engineered fill* slopes or new cut slopes within the existing slope west of the site.

All slopes should be permanently vegetated under the direction of a qualified landscape architect or protected by other means to prevent erosion.

We recommend that all exterior finished grades as well as hard surfaces, such as patios or slabs be graded such that all water runoff is directed away from the crest of slopes and into catch basins. Runoff should be discharged to the site's storm water disposal system.

The final grading plan must be reviewed by GeoPacific well in advance of construction to provide additional or revised recommendations, if necessary.

6.10 Existing Slope

Vegetation is critically important to increase the stability of the slope and protect it against shallow instabilities. The vegetation lowers water infiltration rates into the surficial soils and adds cohesion through the root systems. It is recommended that the slope's vegetative cover not be disturbed. Any vegetation loss of the slope within the property should be immediately replaced under the direction of an experienced landscape designer and/or slope bio-remediation expert. We recommend that the property owner conduct regular inspections of the slope vegetation to confirm that it remains healthy and well rooted.

The addition of large trees to the slope is not recommended as the increased weight would be far more detrimental than any benefit gained by the presence of the root structure.

It is not recommended to dispose of any debris and/or organic waste down the slopes. The debris increases the loading on the slope while also reducing the drainage capacity of the soil. This can potentially lead to slope stability issues. Any existing organic debris should be removed. Any soil or organic material removed from the slope must be removed and not relocated on the slope.

It is not recommended to place any fill on the slopes within the property or complete any regrading unless under the review of a qualified professional geotechnical engineer.

Furthermore, we recommend that all exterior finished grades as well as hard surfaces, such as patios or slabs, are graded such that all water runoff is directed away from the crest of the slope and into catch basins. Runoff should be discharged to the site's storm water disposal system.

6.11 Utilities

Utilities are expected to be underlain by the stripped subgrade soils as described in Section 6.1 or engineered fill which will provide satisfactory foundation support. For utilities bedded on these materials, settlements are anticipated to be negligible. Heavier groundwater seepage during and following wetter periods may need to be controlled using sumps and large pumps.

We recommend that any trenches be sloped or shored as per the latest Work Safe BC regulations. We recommend that all service trenches be backfilled with clean granular material, which conforms to municipal standards, compacted to 100% SPMDD in accordance with ASTM D698, with a moisture content within 2% of optimum for compaction.

6.12 Re-Use of Soils

Any organics or deleterious soil is considered unsuitable for re-use as engineered fill but may be used for general landscape purposes. The *natural sand, sand and gravel fill, and any blast rock* may be employed as engineered fill. However, any material with a nominal diameter greater than 200 mm should be removed.

If these soils are to be stockpiled for later use all topsoil must be removed from under the stockpiles and they must be completely covered in tarps or poly sheeting. Surficial runoff must also be directed away from the stockpiles. Despite these measures some moisture ingress into the soil is not uncommon during high humidity conditions, and thus some degradation of the surficial material of the stockpiles is possible.

The compaction requirements outlined Section 6.1 are also applicable to these materials.

Proposed engineered fill must be reviewed by the geotechnical engineer.

7.0 DESIGN AND CONSTRUCTION REVIEWS

As required for Municipal "Letters of Assurance", GeoPacific Consultants Ltd. will carry out sufficient field reviews during construction to ensure that the geotechnical design recommendations contained within this report have been adequately communicated to the design team and to the contractors implementing the design. These field reviews are not carried out for the benefit of the contractors and therefore do not in any way effect the contractor's obligations to perform under the terms of his/her contract.

It is the contractors' responsibility to advise GeoPacific Consultants Ltd. (a minimum of 48 hours in advance) that a field review is required. Field reviews are normally required at the time of the following activities:

1. Stripping	– Review of stripping depth and subgrade
2. Subgrade	– Review of subgrade soils prior to foundation construction
3. Excavation/Shoring	– Review of slope cuts and excavations greater than 1.2 m deep requiring worker entry
4. Slab-on-Grade	– Review of slab-on-grade subgrade and fill material
5. Engineered Fill	– Review of fill material and compaction
6. Rock Fall Measures	- Review of rockfall stabilization measures

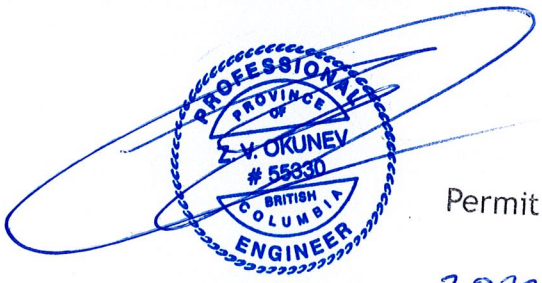
It is critical that these reviews are carried out to ensure that our intentions have been adequately communicated. It is also critical that contractors working on the site view this document in advance of any work being carried out so that they become familiar with the sensitive aspects of the works proposed.

It is the responsibility of the developer to notify GeoPacific Consultants Ltd. when conditions or situations not outlined within this document are encountered.

8.0 CLOSURE

We are pleased to assist you with this project and we trust this information is helpful and sufficient for your purposes at this time. However, please do not hesitate to call the undersigned if you should require any clarification or additional details.

For:
GeoPacific Consultants Ltd.



Permit to Practice EGBC
1000782
2022/04/06

Hanneke Byl, B.A.Sc.
Engineer-In-Training

Zakhar Okunev, B.Eng., P.Eng.
Geotechnical Engineer

LEGEND:

△ TP-# – TEST PIT (TP) LOCATION

——— – EDGE OF PROPERTY

SITE PLAN

*TEST LOCATIONS ARE APPROXIMATE

REFERENCE:

2022 RDCO ORTHOPHOTO & PROPERTY CADASTRAL, RDCO GIS

ORIGINAL PAPER SIZE 8.5"x11"

GEOPACIFIC CONSULTANTS

1779 West 75th Ave.
Vancouver, B.C. V6P 6P2
P 604.439.0922
F 604.439.9189

DATE:	09-01-2022	
DRAWN BY: HB	APPROVED BY: ZO	REVIEWED BY: ZO
SCALE:	NTS	

MULTI-UNIT RESIDENTIAL DEVELOPMENT
LOT A, 3179 VIA CENTRALE, KELOWNA, BC
TEST PIT SITE PLAN

FILE NO.: 20518

DWG. NO.: 20518-01

REVISIONS:
A.
B.
C.

APPENDIX A – TEST PIT LOGS

Project: Siena Terrace
Location: Sorrento Lane, Kelowna
Client: Pointe of View Developments
Cascade Project No: J08-0326

Log of Testpit TP-01

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL,*** and grass.			
1		***SAND AND GRAVEL (FILL),*** some silt, fine to medium grained, occasional boulders and concrete pieces, loose to compact, damp, light grey.			
3	1	-larger angular blast rock between 1.0 and 1.5 m.			
7	2	-piece of flagging at 2.5 m.			
9		***SAND,*** some gravel, trace silt, compact, damp, medium grey.			
10	3	***END OF TEST PIT AT 3.2 m.*** ***TEST PIT DRY UPON COMPLETION.***			
13					

Moisture Content: Percent 20 40 60 80

Investigation Date: February 20, 2008
Contractor: AG Appel Enterprises
Equipment: Cat 308C Excavator
Logged By: RC

Northing: 0
Easting: 0
Elevation: 0
Figure No: TP-01

Cascade Geotechnical Ltd.
202-475 Groves Avenue,
Kelowna, B.C

Project: Siena Terrace
Location: Sorrento Lane, Kelowna
Client: Pointe of View Developments
Cascade Project No: J08-0326

Log of Testpit TP-02

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL,*** and grass.			
1		***SAND AND GRAVEL (FILL),*** mixed with blast rock, occasional boulders to 0.6 m diameter, silty, loose to compact, damp, light grey.			
2					
3	1				
4					
5					
6					
7	2				
8		***END OF TEST PIT AT 2.3 m ON BEDROCK.*** ***TEST PIT DRY UPON COMPLETION.***			
9					
10	3				
11					
12					
13					

Moisture Content: Percent — 20, 40, 60, 80

Investigation Date: February 20, 2008
Contractor: AG Appel Enterprises
Equipment: Cat 308C Excavator
Logged By: RC

Northing: 0
Easting: 0
Elevation: 0
Figure No: TP-02

Cascade Geotechnical Ltd.
202-475 Groves Avenue,
Kelowna, B.C

Project: Siena Terrace
Location: Sorrento Lane, Kelowna
Client: Pointe of View Developments
Cascade Project No: J08-0326

Log of Testpit TP-03

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL,*** and grass.			
		SAND AND GRAVEL (FILL), some silt, fine to medium grained, occasional boulder, frequent cobbles, loose to compact, damp, light to medium brownish grey.			
4	1	-piece of blasting cord 1.2 m.			
7	2	***SAND,*** some gravel, trace silt, compact, damp, medium grey.			
8				G	
10	3	***END OF TEST PIT AT 3.1 m.*** ***TEST PIT DRY UPON COMPLETION.***			
13					

Moisture Content: Percent — 20, 40, 60, 80

Investigation Date: February 20, 2008
Contractor: AG Appel Enterprises
Equipment: Cat 308C Excavator
Logged By: RC

Northing: 0
Easting: 0
Elevation: 0
Figure No: TP-03

Cascade Geotechnical Ltd.
202-475 Groves Avenue,
Kelowna, B.C

Project: Siena Terrace
Location: Sorrento Lane, Kelowna
Client: Pointe of View Developments
Cascade Project No: J08-0326

Log of Testpit TP-04

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL,*** and grass.			
1		***SAND (FILL),*** trace silt, fine grained, occasional pieces of plastic, loose, damp, medium grey.			
2		***TOPSOIL,*** silty sand, brown.			
3	1	***SAND,*** fine grained, trace silt, compact, damp, light to medium brown.			
4					
5				G	
6		-fine to medium grained and trace gravel below 1.9 m.			
7	2				
8					
9		***END OF TEST PIT AT 2.6 m.*** ***TEST PIT DRY UPON COMPLETION***			
10	3				
11					
12					
13					

Moisture Content — Percent: 20, 40, 60, 80

Investigation Date: February 20, 2008
Contractor: AG Appel Enterprises
Equipment: Cat 308C Excavator
Logged By: RC

Northing: 0
Easting: 0
Elevation: 0
Figure No: TP-04

Cascade Geotechnical Ltd.
202-475 Groves Avenue,
Kelowna, B.C

Project: Siena Terrace
Location: Sorrento Lane, Kelowna
Client: Pointe of View Developments
Cascade Project No: J08-0326

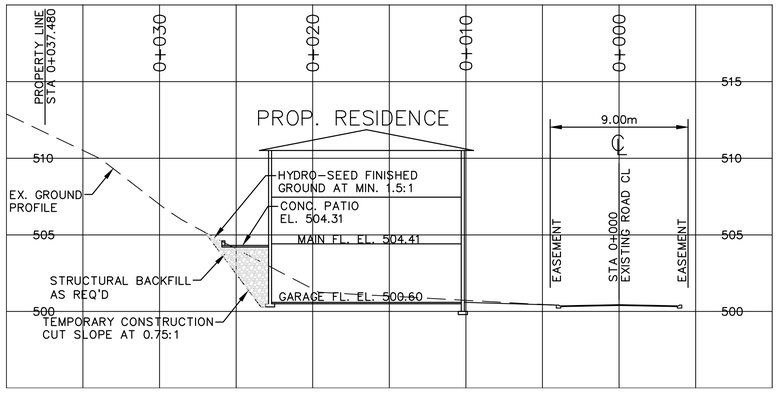
Log of Testpit TP-05

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			20 40 60 80
0	0	***SAND (FILL),*** loose to compact, moist, medium brown.			
1		***SAND,*** some gravel, fine grained, silty, compact to dense, damp, light to medium brown.			
2					
3	1				
4					
5					
6	2				
7					
8					
9					
10	3	***END OF TEST PIT AT 2.9 m.*** ***TEST PIT DRY UPON COMPLETION*** ***DENSE FINE GRAINED SAND TILL ENCOUNTERED ON THE WEST SIDE OF THE EXCAVATION.***			
11					
12					
13					

Investigation Date: February 20, 2008
Contractor: AG Appel Enterprises
Equipment: Cat 308C Excavator
Logged By: RC

Northing: 0
Easting: 0
Elevation: 0
Figure No: TP-05

Cascade Geotechnical Ltd.
202-475 Groves Avenue,
Kelowna, B.C



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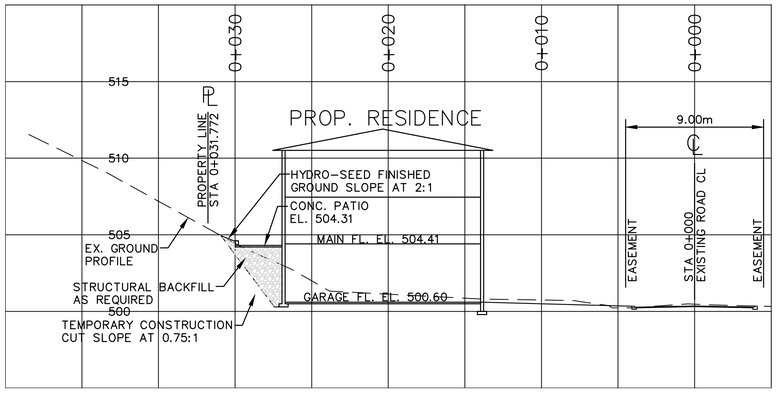

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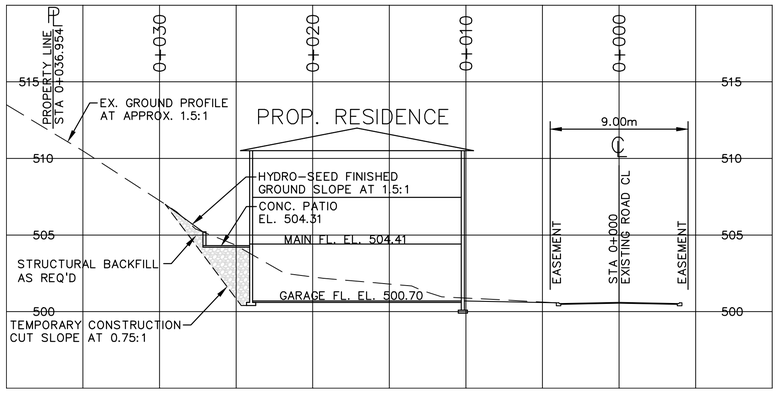

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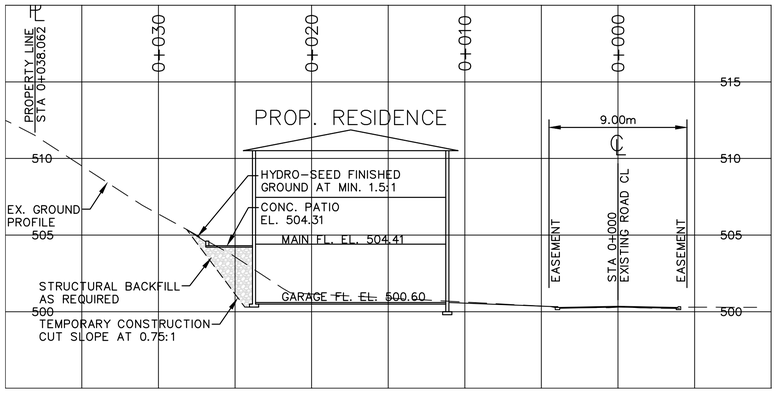

CROSS SECTION X6

LEGEND

CABLE TV	CAP	SAN	SANITARY MH (EXISTING)
GAS	CATCH BASIN	SAN	SANITARY MH (PROPOSED)
SAN. SEWER	ELECTRICAL BOX	STM	STORM MH (EXISTING)
STORM SEWER	HYDRANT	STM	STORM MH (PROPOSED)
U.G. ELECTRICAL	VALVE		TRANSFORMER
U.G. TELEPHONE	LAMP STANDARD		UTILITY JUNCTION BOX
WATER			

No.	MM/DD/YY DATE	BY	REVISION
3	05/09/23	G.E.R.	GENERAL REVISIONS
2	11/17/21	G.E.R.	FOR DP SUBMISSION
1	08/21/21	G.E.R.	GENERAL REVISIONS

ARDA CONSULTANTS LTD

DAVID R. PAULS, P. ENG.

DRAWN	G.E.R.
DESIGN	G.E.R.
APPROVED	
DATE	APR., 2021
SCALE	H=1:200 V=1:200

Arda Consultants Ltd.
275 NEAVE ROAD, KELOWNA BC, V1V 2L9
TEL: 250.807.7903
EMAIL: info@ardaconsultants.com

THE CITY OF KELOWNA
ENGINEERING DEPARTMENT

CARLISLE GROUP LTD.
3179 VIA CENTRALE
CROSS SECTIONS

DRAWING NO. 1314.X2
CITY FILE No. –
DIVISION
REV. NO. 3
PLOT DATE:

Environmental Assessment

3179 Via Centrale

City of Kelowna

Prepared By:

Ecoscape Environmental Consultants Ltd.

Prepared For:

The Pointe at Quail LP

August 4, 2023

3179 VIA CENTRALE

ENVIRONMENTAL ASSESSMENT

Prepared For:

The Pointe at Quail LP
Gordon Mross
Suite 230-2891 Sunridge Way NE
Calgary AB
T1Y 7K7

Prepared By:

Ecoscape Environmental Consultants Ltd.
2-2030 Matrix Crescent
Kelowna, B.C.
V1V 0G5

August 4, 2023
Version 2
File No. 21-3811

Version Control and Revision History				
Version	**Date**	**Prepared By**	**Reviewed By**	**Notes/Revisions**
A	July 4, 2023	LK	MAO	Draft for internal review
1	July 10, 2023	LK	TL	Final review, issued to client
1.1	August 2, 2023	LK	LM	Revised to include tree survey
2	August 4, 2023		TL	Revised to include landscape plan

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1.0 INTRODUCTION

Ecoscape Environmental Consultants Ltd. (Ecoscape) was retained by The Pointe at Quail LP (the Client) to provide an assessment of 3179 Via Centrale within the City of Kelowna (COK), and is legally described as Lot A, Plan KAP56202, Section 14&15, Township 23, Osoyoos Div of Yale Land District (subject property) (**Figure 1**). The subject property is 3,610 m^2 and is zoned as Parks/Open Space (P3) and Multi-Family Residential (RM3) by the COK and occurs within the Natural Environment Development Permit Area (DPA) as per the COK Official Community Plan (COK OCP Bylaw No. 12300, 2022). Land use surrounding the subject property includes a vegetated hillside to the west, a multi-family residential building to the south and east, and Via Centrale to the north.

The purpose of this report is to address the COK Natural Environment DP guidelines and their Terms of Reference. This report provides an assessment of existing terrestrial resource values including the potential for rare and/or endangered species and habitats to occur on site, provides an impact assessment for the proposed works, and provides recommendations for how to maintain the natural integrity of existing ecological communities. This report is bound by the terms and conditions found in **Appendix A**.

1.1. Proposed Works

The proposed works include the construction of a multi-family residential building and associated parking area along Via Centrale. The proposed residential buildings will occupy 703m^2 and the parking lot will occupy 338m^2, for a total development footprint of 1,382 m^2 (**Figure 2**). A site plan has been included in **Appendix B**.

1.2. Project Area

The subject property occurs within the Okanagan variant Very Dry Hot subzone of the Ponderosa Pine biogeoclimatic zone (PPxh1). The PP zone occupies low elevations within the very dry valleys of the southern Interior Plateau of BC and is generally the driest forested region in the province. The climate consists of hot dry conditions in the summer and cool conditions with little snow in the winter. Historically, fire has played an essential role in the ecology of this zone. The PPxh1 is dominated by open canopy forests of Ponderosa pine with a bunchgrass understory (Hope et al., 1991).

The subject property occurs within a residential area of Kelowna within the Quail Ridge community. One third (1/3) of the subject property consists of a graded gravel surface that is currently being used as parking/storage space for vehicles and trailers; one third (1/3) consists of sparse vegetation occupied primarily by non-native vegetation; and one third (1/3) is rock outcrop and vegetated hillside.

2.0 ENVIRONMENTAL ASSESSMENT INVENTORY

A site visit was conducted by Ecoscape Biologist Brie Fisette, R.B.Tech in Training, and Theresa Loewen, M.Sc., P.Ag., Agroecologist, at the subject property on May 11, 2022. Existing biological and physical conditions were documented at this time. Site photos are included in Appendix C.

A desktop review of published literature and data collected by government agencies was completed for the subject property and immediate surrounding area. The results with reference to the source of information are provided in each section below.

2.1. Ecosystem Communities

Terrestrial Ecosystem Mapping (TEM) polygons from the Sensitive Ecosystem Inventory (SEI) for Kelowna (Iverson and Uunila, 2008) were referenced to determine the ecosystems present within the subject property and modifications were made based on existing site conditions. The subject property is represented by three (3) polygons as shown in Table 1.

Table 1. Ecological communities occurring within the subject property.

Ecosystem Code	Polygon Number	Site Series	Site Series Name	BC List[1]
PF	2	04	Ponderosa pine – Bluebunch wheatgrass – Rough fescue	Red
UR	1	N/A	Urban	N/A
RW	3	N/A	Rural	N/A

[1]**Yellow**: Species and ecological communities that are apparently secure and not at risk of extinction. **Blue**: Ecological communities that are considered to be of Special Concern in British Columbia. **Red**: Ecological communities that are Extirpated, Endangered, or Threatened in British Columbia. **N/A (No Status):** Ecological communities that have not been ranked.

Polygon 1 represents an Urban (UR) classification. UR classifications are anthropogenic areas that are developed and have no current BC List status.

Polygon 2 represents a Ponderosa pine – Bluebunch wheatgrass – Rough fescue (PF) ecosystem. PF ecosystems are generally found in areas with moderate soil nutrients and moderate moisture. Typically, vegetation is composed of a moderately closed tree layer of a balance between ponderosa pine and Douglas-fir, a shrub layer of primarily saskatoon, birch-leaved spirea, and common snowberry, and a grass layer of primarily bluebunch wheatgrass. The herb layer is typically composed of primarily arrowleaf balsamroot, and mosses and lichens are typically composed of primarily of clad lichens, rusty steppe moss, and juniper haircap moss. PF ecosystems have a BC List status of Red (Extirpated, Endangered, or Threatened in British Columbia).

Polygon 3 represents a Rural (RW) classification. RW classifications are areas where there is a mix of anthropogenic disturbance such as development, disturbance of soils, or

establishment of invasive species interspersed with areas of native ecosystems or species. RW has no current BC List status.

2.2. Terrestrial Conditions

2.2.1 Vegetation

The subject property is comprised of a cleared area consisting of graded gravel surface with primarily non-native plants observed throughout and along the perimeter. No plant species-at-risk were observed within the subject property during the site visit.

A list of plant species found within the subject property is included in **Table 2**. A comprehensive vegetation survey was not conducted, therefore the presence or absence of native and non-native vegetation, including species-at-risk, could not be confirmed. As a result, these lists should not be considered exhaustive. Supplementing the above observations, the BC Conservation Data Centre (CDC) was accessed on May 27, 2022 and reviewed for at-risk ecological communities that occur within a 1.0 km radius of the subject property. No results were found for at-risk ecological communities were found.

Table 2. Native and exotic vegetation observed within the subject property.

Family	Scientific Name	Common Name	BC List[2]	COSEWIC[1]
Native Plant Species				
Asteraceae	*Balsamorhiza sagittata*	Arrowleaf balsamroot	Yellow	-
Berberidaceae	*Mahonia aquifolium*	Tall Oregon grape	Yellow	-
Caprifoliaceae	*Symphoricarpos alba*	Common Snowberry	Yellow	-
Pinaceae	*Pseudotsuga menziesii*	Interior Douglas-fir	Yellow	-
Pinaceae	*Pinus ponderosa*	Ponderosa pine	Yellow	-
Exotic Plant Species				
Asteraceae	Centaurea stoebe	Spotted Knapweed	Exotic, Provincially Noxious	-
Brassicaceae	Lepidium draba	Hoary Cress	Exotic, Regionally Noxious	-
Plantaginaceae	Linaria dalmatica	Dalmatian toadflax	Exotic, Provincially Noxious	-
Rosaceae	Potentilla recta	Sulfur Cinquefoil	Exotic, Regionally Noxious	-

[1]**COSEWIC status:** *NAR = Not at Risk:* A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances. *SC = Special Concern:* A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats. *E = Endangered:* A wildlife species facing imminent extirpation or extinction. *T = Threatened:* A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction. *DD = Data Deficient:* A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

[2]**BC List status:** Determined using The Field Guide to Noxious Weeds and other Selected Invasive Plants of British Columbia, 8th edition, 2014.

Table 2. Native and exotic vegetation observed within the subject property.

Family	Scientific Name	Common Name	BC List[2]	COSEWIC[1]

Note: Species status was determined using the BC Species and Ecosystems Explorer tool: https://a100.gov.bc.ca/pub/eswp/ on May 18th, 2023.

2.1. Pre-Development Tree Inventory

A site visit to conduct a tree inventory of the subject property was completed on July 26, 2023, by Ecoscape Biologist Lexee Kerry, B.Sc., B.I.T. As required by the COK Tree Protection Bylaw (Bylaw No. 8041, 2022), all lands designated as being within a Natural Environment/Hazardous Condition Development Permit Area require a Tree Inventory completed by a qualified person(s). The purpose of the tree inventory is to determine whether the proposed removal of tree(s) will create adverse impacts such as danger or flooding, erosion, land slip or contamination of watercourses. Data collected adheres to the COK Tree Protection Bylaw, No. 8041 (COK, 2022) and specifics provided from the COK (per. comm. Jen Miles). This bylaw also dictates the required tree replacement that must occur within a subject property, depending on the size, amount, and species of trees removed during development.

Within the subject property there will be an anticipated removal of 19 trees (**Table 3, Figure 4**). Of these trees, only species native to BC will require replacement, please refer to **Section 4.5.2** for additional information. No adverse impacts are anticipated as a result of tree removal within the subject property; the majority of trees within the disturbance limit are considered saplings or poles and pose no risk of erosion upon removal.

Trees 19 and 18 were documented as occurring outside of the limit of disturbance and outside of the subject property. These trees were included in the inventory due to potential proximity of their root systems to the limit of disturbance.

Table 3. Trees within the subject property

Number	Scientific Name	Common Name	DBH (mm)	Tree Condition	BC List[1]
1	*Pinus ponderosa*	Ponderosa pine	30	Healthy	Yellow
2	*Acer platanoides*	Norway maple	28	Healthy	Exotic
3	*Pseudotsuga menziesii*	Interior Douglas-fir	55	Healthy	Yellow
4	*Pseudotsuga menziesii*	Interior Douglas-fir	45	Healthy	Yellow
5	*Pinus ponderosa*	Ponderosa pine	130	Healthy	Yellow
6	*Pinus ponderosa*	Ponderosa pine	54	Healthy	Yellow
7	*Pinus ponderosa*	Ponderosa pine	34	Healthy	Yellow
8	*Pinus ponderosa*	Ponderosa pine	31	Healthy	Yellow

9	*Pinus ponderosa*	Ponderosa pine	5	Healthy	Yellow
10	*Pinus ponderosa*	Ponderosa pine	60	Healthy	Yellow
11	*Pseudotsuga menziesii*	Interior Douglas-fir	45	Healthy	Yellow
12	*Pinus ponderosa*	Ponderosa pine	70	Healthy	Yellow
13	*Pinus ponderosa*	Ponderosa pine	82	Healthy	Yellow
14	*Pinus ponderosa*	Ponderosa pine	24	Healthy	Yellow
15	*Pseudotsuga menziesii*	Interior Douglas-fir	223	Healthy	Yellow
16	*Pseudotsuga menziesii*	Interior Douglas-fir	242	Healthy	Yellow
17	*Pseudotsuga menziesii*	Interior Douglas-fir	28	Healthy	Yellow
18	*Pseudotsuga menziesii*	Interior Douglas-fir	134	Healthy	Yellow
19	*Pseudotsuga menziesii*	Interior Douglas-fir	159	Healthy	Yellow
20	*Pseudotsuga menziesii*	Interior Douglas-fir	79	Healthy	Yellow
21	*Ulmus pumila*	Siberian elm	158	Healthy	Exotic

[1]**Yellow**: Species and ecological communities that are apparently secure and not at risk of extinction. **Blue**: Ecological communities that are considered to be of Special Concern in British Columbia. **Red**: Ecological communities that are Extirpated, Endangered, or Threatened in British Columbia. **N/A (No Status):** Ecological communities that have not been ranked.

2.2. Wildlife

Detailed wildlife surveys were not conducted during the site visit; however, online species data sharing platforms, such as iNaturalist and the CDC were reviewed for wildlife occurrences within a 1.0 km radius of the subject property (CDC 2022; iNaturalist, 2022). Table 4 outlines wildlife occurrences within the search area.

Table 4. Wildlife occurrences within 1.0km of the subject property (CDC, 2022).

Family	Scientific Name	Common Name	BC List	MBCA[1]	COSEWIC
Colubridae	*Coluber constrictor*	Yellow Bellied Racer	Blue	NA	Threatened
Colubridae	*Hypsiglena chlorophaea*	Desert Nightsnake	Red	NA	Endangered
Scincidae	*Plestiodon skiltonianus*	Western Skink	Blue	NA	Special Concern
Fringillidae	*Spinus tristis*	Americn Goldfinch	Yellow	Yes	NAR
Trochilidae	*Calypte anna*	Anna's Hummingbird	Yellow	Yes	NAR

[1] **Yellow**: Not considered at risk. **Blue**: Of special concern. **Red**: Endangered or threatened. **Various**: May be one of multiple potential listings, depending upon more detailed taxonomic classification.

[2] **Migratory Birds Convention Act (MBCA):** whether a species is protected under the MBCA.
[3]**NAR = Not at Risk**: A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances. **SC = Special Concern**: A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats. **E = Endangered**: A wildlife species facing imminent extirpation or extinction. **T = Threatened**: A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation

Table 4. Wildlife occurrences within 1.0km of the subject property (CDC, 2022).

Family	Scientific Name	Common Name	BC List	MBCA[1]	COSEWIC

or extinction. **DD = Data Deficient**: A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

2.2.1 Species at Risk

The online British Columbia Conservation Data Centre (CDC, 2023) was accessed on May 18, 2023, and reviewed for at-risk ecological communities, plants and wildlife that occur within a 1 km radius of the subject property. The queried results include Species at Risk, Critical Habitat for Federally-listed Species, and Wildlife Species Inventories (WSI) of provincially Red- and Blue-listed species (those that are endangered, threatened, or of special concern according to their conservation priority status rank). Search results for species at risk occurrences are provided in Table 5 and critical habitat occurrences are provided in Table 6.

Table 5. BC CDC listed at-risk species occurrences within 1 km of the subject property (CDC, 2023).

Scientific Name[1]	Common Name	BC List	COSEWIC	Occurrence ID	Distance	Critical Habitat	Likelihood[2]
Taxidea taxus	American Badger	Red	Endangered	10214	Overlaps the subject property	Non-forested grassland and shrubland ecosystems, however their range is between 16 to 64 km^2 and can therefore migrate through a range of habitats[3]	Low

[1]**Species at risk occurrences** were determined using the BC CDC imap tool: http://maps.gov.bc.ca/ess/hm/cdc/ on May 18, 2023.
[2]**Likelihood**: an estimate determined by the qualified environmental professional of how likely a species or habitat will occur within the subject property taking into consideration the environmental features within the subject property.
[3]COSEWIC, 2012
[4]B.C. Conservation Data Centre. 2010. Species Summary: Coluber constrictor. B.C. Minist. of Environment. Available: https://a100.gov.bc.ca/pub/eswp/ (accessed Feb 28, 2023).
Note: Species status was determined using the BC Species and Ecosystems Explorer tool**:** https://a100.gov.bc.ca/pub/eswp/ on May 18, 2023.

Table 6. BC CDC listed critical habitat areas within 1 km of the subject property (CDC, 2023).

Scientific Name	Common Name	BC List	COSEWIC	Critical Habitat ID[1]	Critical Habitat Status	Distance	Critical Habitat	Likelihood
Pituophis catenifer deserticola	Great Basin Gophersnake	Blue	Threatened	30219	Final	10 km grid square overlapping the subject property	Rock outcrops, talus slopes, shrub-steppe, grassland, riparian, and open Ponderosa pine and Douglas fir forests[2]	Moderate
Taxidea Taxus	American badger	Red	Endangered	95839, 95635, 95626, 92361, 92353, 92360, 95630, 92343, 92391, 95624	Proposed Safe Movement and Core	Various detailed polygons within 1 km of the subject property.	Non-forested grassland and shrubland ecosystems, however their range is between 16 to 64 km^2 and can therefore migrate through a range of habitats[3]	Low

[1]**Critical Habitat Areas** were determined using the BC CDC imap tool: http://maps.gov.bc.ca/ess/hm/cdc/ on May 18, 2023.
[2]Environment and Climate Change Canada, 2019
[3]COSEWIC, 2012
[4]COSEWIC, 2014
Note: Species status was determined using the BC Species and Ecosystems Explorer tool**:** https://a100.gov.bc.ca/pub/eswp/ on May 18, 2023.

2.3. Environmental Sensitivity Analysis

An environmental sensitivity analysis (ESA) was conducted to categorize the subject property based on its degree of environmental sensitivity. Evaluation criteria considered in the analysis included provincial CDC status (i.e., Red or Blue listed), rare and endangered species habitat suitability, landscape condition (i.e., connectivity, fragmentation), and level of disturbance. ESA descriptions are taken from the COK Terms of Reference for professional reports:

- ESA-1 Very High Significance: These areas contain significant vegetation and wildlife characteristics representing a diverse range of sensitive habitat. These features contribute significantly to the overall connectivity of the habitat and ecosystems. Avoidance and conservation of ESA-1 designations should be the primary objective. If development should occur within these areas, compensation to promote no net loss of equivalent functioning habitat may be required only after it proves impossible or impractical to maintain the same level of ecological function.
- ESA-2 High Significance: These areas of moderate significance, contribute toward the overall diversity and contiguous nature of the surrounding natural features. If development is pursued in these areas portions of the habitat should be retained and integrated to maintain the contiguous nature of the landscape. Some loss to these ESAs can be offset by habitat improvements to the remaining natural areas found on property.
- ESA-3 Moderate Significance: These areas are typically polygons delineated as low significance representing disturbed habitats or fragmented features. These areas contribute to the diversity to the landscape, although based on the condition and adjacency of each habitat the significant function within the landscape is limited. If development is pursued in these areas the impacts should be offset by habitat improvements in other more sensitive natural areas found on the property.
- ESA-4 Low Significance: These delineated areas contribute little or no value to the overall diversity of vegetation, soils, terrain, and wildlife characteristics of the area. Development is encouraged to be focused to these sites before considering developing higher-rated sites in the area. These areas shall not be considered as areas for restoration and enhancement or as recruitment as higher value ESA in offsetting development in other areas.

The ESA composition of the subject property is comprised of 36% ESA-3 (Moderate) and 64% ESA-4 (Low), as summarized in **Table 7** and depicted in **Figure 4**. Moderate ratings represent the Red-listed PF ecosystem and vegetation within the RW classification, and Low ratings represent the UR classification with existing development.

Table 7. Area and percent composition of ESAs within the subject property.

ESA Value	Area outside proposed development (m^2)	Area within proposed development (m^2)	Total area (m^2)	Percentage of subject property (%)
Very High (ESA 1)	0	0	0	0
High (ESA 2)	0	0	0	0
Moderate (ESA 3)	297	992	1,289	36
Low (ESA 4)	1,926	390	2,315	64
Total	**2,222**	**1,382**	**3,604**	**100**

3.0 IMPACT ASSESSMENT

The proposed works include the construction of a multi-family residential building and associated parking area along Via Centrale. The proposed residential building will occupy 703m^2 and the parking lot will occupy 338m^2 for a total development footprint of **1,382m^2**. The proposed works will result in a loss of 28% ESA-3 and 11% of ESA-4 as shown in **Table 8** and **Figure 5**. The overall impact of the proposed works is **39%** (1,382m^2 out of 3,604 m^2).

Table 8. Impact assessment of the subject property.

ESA Value	Total ESA area (m^2)	Percentage of subject property (%)	ESA Area within the proposed development (m^2)	ESA relative loss (total development impact) (%)
Very High (ESA 1)	0	0	0	0
High (ESA 2)	0	0	0	0
Moderate (ESA 3)	1,289	36	992	28
Low (ESA 4)	2,315	64	390	11
Total	**3,604**	**100**	**1,382**	**39**

The following section discusses the potential environmental impacts associated with the proposed development. Ecoscape anticipates that if all recommendations and mitigation measures within this report are adhered to, the potential environmental effects of the works on the local flora and fauna will be minimized. However, if proper mitigation

measures are not adhered to during construction, the following environmental issues may occur:

- Potential to directly or indirectly impact wildlife and wildlife habitat during construction, including disruption of migration, breeding, or other behavior as a result of construction noise, impacts to air quality, and other alterations to existing wildlife habitat and cover. This includes herptiles and avian species that could potentially be foraging or nesting in the area;
- Potential for the release of fine sediments into natural areas and/or watercourses through erosive processes during construction activities;
- Potential for the release of other deleterious substances (e.g., fuel, oil, hydraulic fluid, construction materials, debris, concrete leachate) to the environment as a result of improper storage, equipment re-fueling, and/or poorly maintained equipment during mobilization and construction; and,
- Potential to introduce or facilitate the spread of invasive and noxious plant species resulting from ground disturbance and seed dispersal.

Our assessment does not consider the cumulative effects of the proposed development on a larger terrestrial area or the cumulative impacts originating from developments across the COK and similar proposals occurring within nearby habitats or within a specific municipality.

4.0 RECOMMENDED MITIGATION MEASURES

4.1. Applicable Regulations and Best Management Practices

Table 9 below depicts applicable Best Management Practices (BMP) recommended for the proposed works.

Table 9. Summary of applicable Best Management Practices (BMPs)

BMP	Organization[1]
Develop with Care Environmental Guidelines for Urban and Rural Development	MFLNRORD
Best Management Practices for Concrete Use (2022)	BC MOE
Requirements and Best Management Practices for making Changes in and About a Stream in BC (2022)	MFLNRORD
Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land	MFLNRORD
Best Management Practices for Amphibian and Reptile salvages in British	MFLNRORD
A Field Guide to Fuel Handling, Transportation and Storage (2002)	MWLAP
Habitat Officer's Terms and Conditions for changes in and about a stream	BC MOE
Approved Water Quality Guidelines for Turbidity	MFLNRORD

Table 9. Summary of applicable Best Management Practices (BMPs)

BMP	Organization[1]
Develop with Care Environmental Guidelines for Urban and Rural Development	MFLNRORD

[1]Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD); British Columbia Ministry of Environment (BC MOE); Department of Fisheries and Oceans Canada (DFO)

4.2. Environmental Monitoring

An environmental monitor (EM) should be retained to monitor works to document compliance with best management practices, mitigation measures, and other recommendations and to provide guidance for implementation of operational best practices (e.g., erosion and sediment control) during construction works. In the event that greater disturbance occurs due to unforeseen circumstances, the EM should recommend further measures to protect/restore the natural integrity of the site. The EM should be an appropriately Qualified Environmental Professional (QEP).

The EM's duties and schedule will include, as a minimum, the following:

- A pre-construction meeting prior to the implementation of works. During this visit, best management practices and erosion and sediment control measures will be reviewed;
- Visits should be conducted during construction and will target higher-risk activities. The EM should be notified prior to high-risk activities so they can schedule site visits; accordingly,
- EM reports will be generated for each visit and submitted to the client. These reports must be provided to the permitting municipality.
- Following completion of the project, a substantial completion report will be prepared.

4.3. Planning and Site Preparation

4.3.1 Work Timing Windows

4.3.1.1. Avian Nesting Periods

Avian nesting periods must be considered to protect nesting birds within and adjacent to the proposed work area. Further information and mitigation measures regarding the protection of avian species are as follows:

- Section 6 of the Federal *Migratory Birds Convention Regulation* protects both the nests and eggs of migratory birds. Section 34 of the Provincial *Wildlife Act* protects all birds and their eggs, and Section 34(c) protects their nests while they are

occupied by a bird or egg. The subject property falls within the Northern Okanagan Basin ecodistrict. The avian nesting period for all birds within this ecodistrict is February 18th to September 12th (Birds Canada, 2020);

- If vegetation clearing is required during the identified avian nesting period, pre-clearing nesting surveys must be conducted by the Environmental Monitor (EM) to identify active nests.
- A buffer around the proposed clearing activities should be created for surveys and should be established by the EM, based on expected bird species present, to ensure active clearing does not impact birds nesting adjacent to the site within the identified buffer area.
- If active nests are found within the clearing limits, a buffer will be established around the nest until such time that the EM can determine that nest has become inactive. The size of the buffer will depend on the species and nature of the surrounding habitat. Buffer sizes will generally follow provincial BMP guidelines or other accepted protocols (e.g., Environment Canada). In general, a minimum 20 m buffer will be established around songbird nests or other non-sensitive (i.e., not at risk) species.
- Clearing and other construction activities must be conducted within 72 hours following the completion of the pre-clearing nesting surveys. If works are not conducted in that time, the nesting surveys are considered to have expired and a follow-up survey will be completed to ensure that no new nests have been constructed.
- The nests of the Bald Eagle, Golden Eagle, Peregrine falcon, Gyrfalcon, Osprey and Burrowing Owl are protected year-round whether they are active or not as per Section 34(b) of the Wildlife Act. Best management practices relating to raptors and their nests can be found in Guidelines for Raptor Conservation during Urban and Rural Land Development in BC (2013).
- The nests of the Great Blue Heron as well as the Pileated Woodpecker (found within the Okanagan) are on a list of 18 species whose nests are protected year-round unless shown to be abandoned as per the *Migratory Birds Regulation 2022* (MBR, 2022). In order to be considered abandoned:
    - The Minister must be notified, via an online registration system (the Abandoned Nest Registry), that the nest does not contain a live bird of viable egg; and,
    - The nest is to remain unused by migratory birds during the designated wait time for that species.

- Wherever possible, trees with high wildlife value, such as veteran trees and large snags, must be conserved. Hazardous trees with wildlife value within the vicinity of the construction works should be assessed by a certified wildlife/danger trees assessor to determine levels of risk.

4.3.2 Work Limits and Protection of Sensitive Areas

- Prior to any disturbance within the site, the limits of disturbance must be clearly marked in the field by a legal surveyor and delineated to prevent unnecessary encroachment into adjacent areas.
- To mitigate the establishment of invasive plants and to maintain existing ecological value, native vegetation, including trees, shrubs, and groundcover, must be retained where possible;
- Standing dead trees (snags) and coarse woody debris should also be retained where they are deemed safe, for the critical wildlife habitat value they provide;
- Vegetation, soil, and rock excavated from the work footprint must be taken offsite and disposed of/recycled appropriately or stored onsite within disturbed areas of the repair work footprint if reuse onsite is proposed;
- No sidecasting of material over steep slopes or storage of material can occur outside of the work footprint. Exception: larger trees that require removal should be relocated on the site as coarse woody debris, where possible; this should be completed under the guidance of the QEP;
- In the event that land and/or natural vegetation is disturbed or damaged beyond the work footprint area, these areas must be restored and/or replanted with plants indigenous to the area under the direction of the QEP;
- Limit cuts and fills and wherever possible, alter the repair work to suit the local topography;
- Maintain natural drainage patterns where feasible;
- Prevention of the spread of invasive plants can be achieved by limiting disturbance to soils and native vegetation where possible. Areas that have previously been disturbed should be restored with native plantings or grass seeding. Infestation areas must be controlled with regular manual removal of weeds (e.g., mowing, pulling); and,
- Exposed soils must be seeded immediately following any activities that result in disturbance to native vegetation and soils. Grass seed mixes must be comprised of native species, appropriate for the environmental conditions and certified as Canada #1 Grade by Agriculture Canada to minimize the weed seed count. The QEP

must review all seed mixes prior to purchase and use. Ecoscape can provide the client recommendations regarding local suppliers who can provide appropriate upland seed mixes based on the ecological communities within the site. If hydroseeding is proposed, then it must be completed before installation of plantings, or in a way that will prevent smothering of plantings after application.

4.4. During Construction Works

4.4.1 Erosion and Sediment Control

The following section details the mitigations and recommendations related to erosion and sediment control (ESC) that must be adhered to throughout the duration of the project.

- The release of silt, sediment, sediment-laden water, raw concrete, concrete leachate, or any other deleterious substances into any drainage or areas of high environmental value (i.e., adjacent wetlands) must be prevented at all times;
- Silt fence must be installed between the proposed repair work and the roadway to mitigate the risks to aquatic resources associated with runoff and sediment transport. Silt fencing must be installed as directed by the QEP in a field-fit manner. ***Silt fence must be staked into the ground and trenched a minimum of 15 cm to prevent flow underneath the fence and must remain taut to prevent material from moving over the fence.*** Silt fencing should contain sufficient storage capacity to collect runoff and sediment deposition during storm events. Silt fencing will be monitored on a regular basis and any damages or areas where the integrity and function of the fencing has been compromised should be repaired or replaced promptly. Silt fence must remain in place where required until the completion of the project;
- No equipment refueling can take place within 30 m of any watercourse;
- Erosion and sediment control (ESC) should incorporate the measures described below to mitigate risks during construction works. The plan is generally based upon provincial BMPs and other specifications and includes the following principles:
    - Construction works should be conducted during periods of warm, dry weather with no forecasted precipitation;
    - Construction works should be scheduled to reduce the overall amount of time soils are exposed;
    - Natural drainage patterns should be maintained where possible;
    - Existing native vegetation should be retained where possible; and,
    - Stormwater and sediment-laden runoff should be directed away from exposed soils within the construction area.

- Exposed soils along slopes should be stabilized and covered where appropriate using geotextile fabric, polyethylene sheeting, tarps, or other suitable materials to reduce the potential for erosion resulting from rainfall, seepage, or other unexpected causes.

4.4.2 Waste Material and Spills

- Construction debris and stockpiled material must be beyond environmentally sensitive areas and be removed from the site regularly and disposed of appropriately;
- All potential wildlife attractants, including food, beverages, and other strong smelling or perfumed materials must be removed from the site daily;
- Spills of deleterious substances can be prevented through awareness of the potential for negative impact on sensitive habitats and with responsible housekeeping practices onsite and proper storage on the barge during equipment mobilization. Maintenance of a clean site and the proper use, storage and disposal of deleterious liquids and their containers are important to mitigate the potentially harmful effects of spills and/or leaks;
- Ensure equipment and machinery are in good operating condition, free of leaks, excess oil, and grease. Equipment needs to be pressure/steam-washed prior to use within close proximity of a watercourse;
- Spills occurring on dry land will be contained, scraped and disposed of appropriately. Contaminated material will be stored on tarps and covered to prevent mobilization and will be disposed of in accordance with the *Environmental Management Act*;
- Copies of contact phone numbers for notification of all of the required authorities in the event of a spill/emergency response should be posted and clearly visible at the site; and,
- Spill containment kits must be kept readily available onsite during construction in case of the accidental release of a deleterious substance to the environment. Any spills of a toxic substance should be immediately reported to the BC Emergency Management 24-hour hotline at 1-800-663-3456, as well as Ecoscape at 1-250-491-7337.

4.4.3 Air Quality

Dust control can be achieved by reducing the spatial extents and amount of time that soils are exposed to construction activities. Reducing traffic speed and volume can also reduce

dust concerns. Surface and air movement of smoke and dust during works can be mitigated through preventive measures and design criteria.

- Where suitable, exposed soils should be watered as required to suppress dust. Sediment-laden runoff water must not be conveyed to adjacent watercourses, off the project site, or over steep slopes. Oil and other petroleum products must not be used for dust suppression;
- Idle time of construction equipment and contractor vehicles should be kept to a minimum to reduce the release of greenhouse gases. The contractor should inform and educate employees and sub-contractors on the importance of minimizing idling time and develop guidelines to direct the practice of eliminating unnecessary idling;
    - All equipment not in use will be turned off;
    - Low sulphur fuels must be used;
    - Vehicles and equipment will be maintained in good working order and proactive maintenance must occur to reduce and prevent emissions; and,
    - All hauling equipment entering or exiting the site must have adequate free board to ensure that materials are not spilled or lost during transit.
- Dust generating activities should be ceased or avoided during periods of very low precipitation, unless appropriate dust suppressant activities are occurring in conjunction with the works;
- All soils, aggregates, and other construction materials must be handled as little as possible to reduce dust generation from construction activities. This also includes limiting drop heights from machinery during excavation and loading materials;
- Vehicle emissions must be reduced by;
    - Optimizing barge hauling routes to and from or within the construction site;
    - Perform routine maintenance checks of construction equipment and the vehicle fleets for the project.

4.4.4 Invasive Species Management

Exotic plants are those which are not native to BC, but have been introduced to the area through human activity. Invasive plants are exotic plants that are able to reliably outcompete native species, spreading into native areas and eroding the functionality of native ecosystems. Invasive plants must be managed as part of works. ***Successful management of invasive plants during the construction phase improves the success rate of the maintenance phase.***

Multiple plant species within the project area are designated as regionally noxious weeds. There is a duty to control noxious weeds under the BC *Weed Control Act*. As per Section 2 of the act, "In accordance with the regulations, an occupier must control noxious weeds growing or located on land and premises, and on any other property located on land and premises, occupied by that person." Consequently, these species should be given highest priority for management. A comprehensive list of plants designated as noxious weeds, both regionally and throughout BC, can be seen in Schedule A of the BC *Weed Control Regulation*.

The basic principles of the weed management plan include:

- Suppression of weed growth;
- Prevention or suppression of weed seed production;
- Reduction of weed seed reserves in the soil; and
- Prevention or reduction of weed spread.

Invasive plant species can be spread from a variety of mechanisms, including but not limited to:

- Entering the site on equipment that has worked in areas where invasive species have established through mud, debris, or other mechanisms;
- Establishment on the site following earth disturbances, where invasives tend to outcompete the native plant assemblage; and,
- From importation of soils, aggregates, or other materials onto the construction site.
- The following are specific recommendations to aid with invasive species control. These recommendations are not considered an invasive species management plan, which would be more inclusive and contain species-specific recommendations:
- Identification of existing weed populations and prevention of spread is the most efficient form of weed management. To this end, the QEP will employ the following weed management plan measures if appropriate:
    - The QEP will identify and delineate any existing species and populations of weeds present within the worksite;
    - The QEP will inform and educate the contractor about the weed species and locations on site. If necessary, weed-infested areas will be delineated with flagging tape or snow fencing to prevent access;
    - Where feasible, the existing weeds will be removed (by hand pulling) and disposed of offsite at an appropriate landfill;
    - Areas where weed populations have been identified will not be used for excavation and placement of fill;

  - If excavation of weed-infested areas is required, the soils will be disposed of offsite; and,
  - Pesticides, herbicides, or other chemical control measures will not be used.
- Prevention of the spread of invasive plant species can be achieved by limiting disturbance to soils and native vegetation:
  - Equipment used onsite must arrive with tracks free of soil and vegetation fragments to minimize the addition and spread of invasive plant species to the project area.
  - Works in areas with invasive species cover must be avoided if at all possible, and any materials contaminated with invasive seeds should be disposed of in an appropriate location, in discussion with the EM.
  - Contractor clothing should also be inspected daily for signs of weed seeds. If found, weed seeds should be disposed of in a contained refuse bin for offsite disposal.
  - Invasive species removal should occur before peak flowering times to avoid seed distribution and further spread of invasive species.
  - Pesticides, herbicides, or other chemical control measures must not be used in close proximity to watercourses. Invasive species are to be pulled by hand or mowed regularly.
  - Invasive species should be disposed of offsite at an appropriate landfill; however, invasive species material must not be composted in the yard waste section of the landfill. Invasive plant species must not be transported to or deposited in other natural areas.
  - The contractor's employees should be trained on invasive species identification and noxious weeds to help report occurrences to the EM and help prevent further establishment.

Types of Invasive Plants

- Some invasive plant species are annuals – meaning they only live for one year and die off over the winter. The seeds they drop are required to maintain the population into the next year. In a population of annual species, mowing, string-trimming, and other mechanical means may be used to cut the plants above the roots.
- Some invasive plant species are biennials – meaning they live for two years and die off before their third. Their first year is often focused on growth and does not produce seeds. During this time, it can often be recognized as a flat, radial growth of leaves called a "rosette". Because of this low growth habit, rosettes must be removed by hand and cannot be mowed or string-trimmed. In their second year they typically grow a tall stock which produces flowers and then seeds. In this

second year, the plant can be removed mechanically as normal, or, in some species, only the seed stalk can be cut, leaving the rest of the plant in the ground.

- Some invasive plant species are **perennials** – meaning they live for multiple years. In this case, the entire plant must be removed or it will continue to produce and drop seeds and continue to increase the size of the population. In this case, ***mowing and string-trimming will be ineffective at removing the population.***
- Some species, such as *Cirsium arvense* (Canada thistle) or *Rumex crispus* (curled dock), have specific management requirements, which can be communicated by the environmental monitor once these species have been identified.

Management Strategies & Activities

- Removing Whole Plants (ex. Manual Removal, Grubbing with Hoes, Scuffle Hoeing, Severing Roots, Whole Plant Removal with Large Equipment)
- Cutting (ex. Bladed Hand Tools, Pruners, Loppers, Shears, and Saws, Brushcutters and Stringtrimmers, Chainsaws, Mowing/Cutting with Larger Equipment, Stump Grinding)
- Covering with Sheet Barriers (ex. Mulching, tarping, solarizing)
- Community-Scale Control (ex. Competitive planting, burning, grazing, mechanized tilling)
- Biocontrol
- Chemical control (ex. Herbicide)
- A BC-licensed herbicide applicator should be consulted as to the legal requirements for application of herbicide on site.
- If topsoil is to be re-used from within the property, topsoil from areas with existing invasive plant populations should be noted. Areas where this topsoil is used for topdressing will require greater effort for invasive plant management due to existing invasive plant seed banks.

Timing

- ***It is important that invasive plants be removed before they have gone to seed***. Depending on the species, individual plants can produce thousands of seeds. Allowing these seeds to develop and enter the soil can prolong the restoration period.
- Invasive plant management visits should be documented. The labour required during each visit should decrease as invasive plant populations are removed.

4.5. After Construction Works

4.5.1 Site Cleanup

Site cleanup refers to activities used to return disturbed areas within the subject property to a state resembling the original habitat characteristics. Protection of existing ecosystems is generally much more efficient than ecosystem enhancement and restoration following construction as per the BC Environmental Mitigation Policy (BC MOE, 2014), therefore disturbance should be minimized during works as much as possible. Further, site restoration should occur as soon as possible following completion of construction to help prevent establishment of non-native or invasive species.

- Salvaged organic material and topsoil should be stockpiled onsite for top-dressing as needed and should be stored following recommended erosion and sediment control guidelines. It is recommended the application of suitable native grass seed mix will follow top dressing and will be monitored for invasive plants;
- Hydroseed and or hand broadcasted seed will be applied to exposed soils as soon as possible once final grading has been completed. No fertilizer is permitted in tackifier within 30 m of any watercourse. Grass seed mix must be Certified Canada Grade #1 to minimize the weed seed count. The seed mixture will include native species appropriate for the ecological conditions and will be reviewed by the QEP prior to application;
- Silt fencing and other temporary mitigation features will be removed upon substantial completion of works if the risk of surface erosion and sediment transport has been adequately mitigated with other permanent measures;
- All equipment, supplies, waste, and other non-biodegradable materials will be removed from the site by the contractor;
- If work is taking place during the winter months, it is recommended that these sites be re-evaluated in the spring/summer to determine further opportunities for restoration;
- All slopes slated for restoration shall:
    - Maintain the natural drainage patterns;
    - Be re-graded to as low a slope as possible;
    - Have appropriate surface roughening for grass seeding and revegetation; and,
    - Include minor slope breaks to help retain soil moisture that are parallel to the slope.

4.5.2 Habitat Restoration

A formal landscape plan has been prepared for the subject property by Ecora (Appendix D). As the landscape plan includes mainly non-native ornamental species, to enhance environmental values and limit the spread of invasive species, restoration efforts should be a combination of native restoration planting and invasive species management of the subject property to mitigate cumulative impacts. If additional disturbance occurs during works, a formal restoration plan may be required.

The total area to be restored and the location and distribution of plantings will be determined in a field-fit manner under the direction of the QEP at the time of implementation.

Recommended tree and shrub plantings for habitat restoration must be composed of species native to BC, as well as species appropriate for the desired ecosystem. Trees recommended are reflective of the COK Tree Protection Bylaw No. 8041 tree replacement criteria, which states that native species of trees that will be removed within the subject property, with a DBH greater than 151mm, will require the planting of two replacement trees. As such, a minimum of four replacement trees is recommended for the subject property based of the results of the tree inventory described in Section 2.1, where trees 15 and 16 meet the DBH threshold for replacement (Figure 4). Suitable replacement species as well as quantities based on the potential restoration area and bylaw are suggested below in Table 10.

Table 10. Recommended tree and shrub species for restoration areas.

Common Name	Scientific Name	Size	Number
Trees		1 gal	**5**
Ponderosa pine	*Pinus ponderosa*		
Interior Douglas Fir	*Psuedotsuga menziesii*		
Shrubs		1 gal	**15**
Oregon-grape, tall	*Berberis aquifolium*		
Arrowleaf balsamroot	*Balsamorhiza sagittata*		
Saskatoon	*Amelanchier alnifolia*		
Rose, Nootka	*Rosa nutkana*		
Snowberry, common	*Symphoricarpos albus*		
		TOTAL	**20**

All disturbed areas must be hydroseeded with tackifier or broadcast hand seeded with native grass seed. Seeding should occur in both spring and fall and may be required over multiple years to gain sufficient coverage. Grass seed must be Canada Agricultural Grade #1 to minimize weed seed counts and a native mix of hydroseed grasses. It is

recommended that the disturbed and temporarily disturbed areas be seeded with a target of 85% coverage.

The grass seed mix must be reviewed and approved by the QEP prior to application. The grass seed mix must not contain noxious or invasive species. Fodder species such as clover and alfalfa must not be included in the mixture. Grass seed mixes should be suitable for the dry, upland environmental conditions. Table 11 provides an example of a native grass seed mix for disturbed areas within the subject property. These recommendations may be given to a seed provider to determine the most appropriate species and percentage to provide.

Table 11. Recommended Native Grass Seed Mix for Disturbed Areas.

Common Name	Scientific Name	Percent
Bluebunch wheatgrass	*Elymus spicatus*	*25%*
Canada bluegrass	*Poa compressa*	*1%*
Idaho Fescue	*Festuca idahoensis*	*11%*
Junegrass	*Koeleria macrantha*	*1%*
Perennial rye	*Lolium perenne*	*10%*
Rough Fescue	*Festuca campestris*	*10%*
Sandberg bluegrass	*Poa secunda*	*2%*
Slender wheatgrass	*Elymus trachycaulus*	*15%*
Tall wheatgrass	*Thinopyrum ponticum*	*25%*

4.5.2.1. Native Plant Establishment

The following section provides specific recommendations to improve native plant establishment.

- Planted species must be native to the Okanagan and suited to the site conditions.
- Planting must occur in spring between April and June or fall between September and October when temperatures are cooler and many plants are dormant, to ensure greater planting success.
- Trees are to be planted at a density of 7 m^2, tall shrubs every 3 m^2, and low shrubs every 1.0 m^2.
- Plants should be installed in groups or clusters and make use of suitable micro-climates, such as moisture-receiving areas, coarse woody debris, and remnant patches of natural areas. Planting should not be completed in an evenly distributed, grid-like pattern. This will help prevent plant mortality by limiting competition with invasive species.

- The placement and distribution of plantings will be completed in a field-fit manner at the time of restoration through consultation with the Environmental Monitor (EM).
- Plantings should target depressions to capture local moisture from rain or runoff. Woody debris/wood fiber mulch spread around the base of plantings may help to deter establishment of and competition from invasive plant species.
- Flagging of native plants will be helpful for future monitoring purposes; flagging must not be tied around the main stem such that girdling of the plant will occur as it grows.
- Seed and plant material must be sourced from within the southern interior to avoid complications associated with transplanting coastal species or northern species into dry southern interior conditions.
- To promote germination and establishment of vegetation, irrigation should be supplied for at least the first two growing seasons. If no irrigation is proposed for restoration areas, it is recommended that regular maintenance is conducted to improve planting survival. This may include additional fertilizing, routine watering and/or replanting, and the removal of invasive species. Poor growth, elevated erosion problems, and/or animal intrusion should be mitigated to promote plant growth.
- A target of 80% plant survival is recommended after three (3) years. If the total number of plants drops below 80% of the original number planted, fill/replacement planting will be required.
- The contractor completing the restoration works should inspect plants monthly during the growing season, replacing any dead or diseased plants.
- No fertilizer should be used within environmental restoration areas. Fertilizer can favour the growth of early, annual species – many of which are invasive to the area. Fertilizing the restoration area can prolong the restoration period.
- Where applicable, logs should be conserved during tree removal and installed within the restoration area as course woody debris. Features such as these provide increased habitat value by diversifying the structural complexity and number of microhabitats present.
- Changes to the species list is permissible, but must be approved by the EM prior to substitution and plants must be native to the Okanagan. The proposed planting list and layout should be reviewed by the EM prior to planting, and all plants should be flagged to enable easier review during the maintenance period. Only native vegetation from local stock should be planted, unless approved by the EM.

- Upon the completion of the installation of the restoration plantings, invasive plant species should be removed from each of the restoration areas on a monthly basis, at minimum. Ongoing invasive weed management may continue to be required as necessary within the Project site. It is recommended that invasive species are pulled by hand or by mechanical means (i.e., tilling or mowing).
- Irrigation is recommended to be installed where appropriate. Irrigation should be timed to augment rainfall and a rainfall sensor would help to reduce water consumption. Hand watering and drip irrigation are both acceptable methods. Watering should occur for the first two growing seasons, until plants are established. Spring and fall watering, if necessary, should be timed to water every 3 or 4 days. In summer, watering should be deep, but infrequent – occurring once per week. Care should be taken during watering to ensure that overland flows do not result in sedimentation to surrounding watercourses.
- If additional disturbance occurs outside of the limit of disturbance or restoration areas, then additional plantings may need to be prescribed by the EM.
- BC Firesmart guidelines should be taken into account during landscaping and restoration within the project area.

All disturbed soils must be restored with native Grade A grass seed free of invasive species to minimize establishment of invasive plant species, erosion, and to restore the area to early successional conditions.

- Grass seed mixes must be approved by the EM before purchase and use.
- Grass mixes cannot include fodder species (such as clover) or species considered invasive within BC.
- Grass seed should be broadcast and hand-raked into the soil. For steep slopes or large areas, hydroseed may be used.
- Grass seed mixes should be suitable for the environmental conditions. These conditions may be given to a seed provider to determine the most appropriate species to provide.
- If additional disturbance occurs outside the development footprint, these areas will need to be addressed by the EM and restored with native plantings and/or hydroseeding.
- Irrigation should be provided to all native plantings for the first two years after planting to maximize the success of establishment. Irrigation should be done in such a way as to encourage deep root systems.
- Grass seed mixes should be certified as Canada #1 Grade by Agriculture Canada to minimize the weed seed count. Fodder species such as clover and alfalfa must not

be included in the mixture. Grass seed should not be applied during periods of extremely hot and/or dry weather (i.e., July and August).

- Where hydroseeding and plantings are recommended, hydroseeding must be applied to each restoration area **before** plantings are installed to prevent smothering of plantings. **Ecoscape can upon request provide recommendations regarding local suppliers who can provide appropriate upland seed mixes based on the ecological variables within the site.**

4.5.2.2. Revegetation of Slopes

For steep slopes, additional recommendations that enhance erosion control are required (i.e., hydroseeding, placement of woody debris, creation planting pockets, and overplanting). In order to achieve planting success, the following steps should be taken:

- **Surface roughening** helps trap water and create micro-basins that aid in seed germination and seedling establishment. Surface roughening and tillage is important for long-term control of soil erosion and re-establishment of native plant communities. The soil surface should be left as rough as possible. It will be extremely important to ensure that surface compaction does not occur during the process of surface roughening, if heavy equipment is used.
- **Benches or barriers** should be added to long slopes to prevent erosion and seed transport. Barriers in the form of fiber rolls, straw waddles, coarse woody debris, silt fences or compost berms are appropriate (see figure below). Coarse woody debris should be sporadically anchored across the slope, which will provide habitat complexity and facilitate creation of microsites and help with erosion control. Coarse woody debris pieces should be greater than 25 cm in diameter and should be 5 to 10 m tree lengths/boles. Placement may require securely anchoring with sufficient lengths of rebar/t-bar, with positioning such that logs will not roll down the hillslope.

***Figure 5.54** – Structures that shorten the slope length can slow surface runoff, collect sediments and increase soil moisture. Typical treatments include: a) placement of fiber rolls, logs, straw waddles, and compost berms; b) benches, steps, and trenches; c) willow waddles; and d) willow brush layers. Strategic placement of plants can take advantage of increased soil moisture by planting where roots can access the additional moisture. Most species do not respond well to being buried by sediment and should be planted above or below depositional areas (A and B). However, some species, such as willow, root where the stems are buried, and these species can be planted where sediments are expected to be deposited (C and D).*

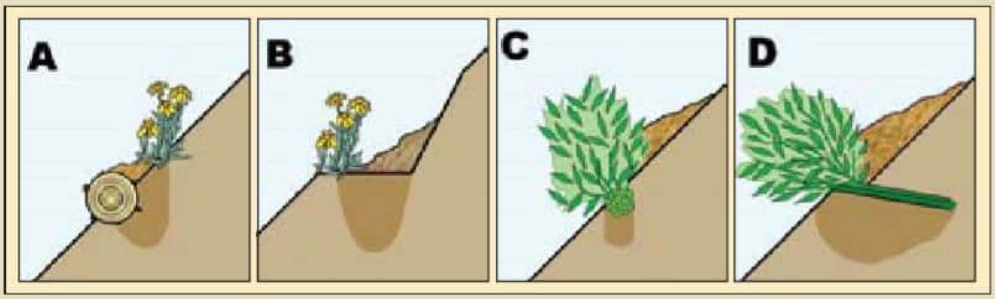

Figure taken from (Steinfield et al., 2007)

- The creation of planting pockets across the slope with clustered plantings is recommended. Planting pockets should be in-sloped to capture water runoff and provide a moisture receiving site that helps improve plant success. Berms should be placed on the contour and can be formed from soil, rock, woody debris or any of the structures depicted above. Clustering of the plantings will help for watering and will minimize inadvertent mortality resulting from mowing / trimming of invasive plant species.
- Plant spacing is generally recommended at 1 to 1.5 m on center for shrubs and 3 m on center for trees.
- Planting must occur in spring or fall when temperatures are cooler and many plants are dormant, to ensure greater success.
- Native plants must be flagged with flagging tape to aid in future plant counts. Flagging must not be tied around the main stem such that girdling of the plant will occur as it grows.
- Drought tolerant and/or shallow-rooting plants have been selected for restoration and are provided in Table [10] above.
- Watering is recommended during extreme hot periods and/or if planting success is determined to be poor during the maintenance period. If formal irrigation is not proposed, plant densities will be increased three-fold to account for anticipated losses. Additionally, mulch or compost may be utilized in planting pockets to retain moisture and commercially available slow water release packages may be

considered. The extremely dry nature of the Okanagan can dramatically affect survival and target coverages may be difficult to achieve without some water during plant establishment. For optimal success, watering should occur on an as-needed basis. Regular monitoring of the plantings will be required throughout the summer months to determine the need for watering. Photos should be collected and reviewed by the environmental monitor to determine if there is need for irrigation.

4.5.3 Bonding

Performance bonding may be required by COK to ensure that the recommended mitigation measures are adhered to, and that an EM is retained to document compliance with municipal and provincial guidelines. Bonding in the amount of 125% of the estimated value of the prescribed works (i.e., monitoring) and is generally required to ensure faithful performance and that all mitigation measures are completed and function as intended. Security deposits shall remain in effect until the COK has been notified, in writing, by the EM that the objectives have been met and substantial completion of the restoration works have been achieved.

Ecoscape estimates that the total cost for habitat restoration works (not inclusive of proposed development) will be approximately **$4,380.00**, not including GST. The bonding is estimated to be **$5,475.00** (125% of cost), as shown in **Table 12**.

Table 12. Bonding Cost Estimate

Item	Quantity	Cost per Unit	Material Cost	Installed Cost*
Trees and shrubs (2 gal)	20	$20.00	$400.00	$1,200.00
Grass seed mix (kg)	1	$60.00	$60.00	$180.00
Invasive Species Management (hand-pulling, mowing, etc.)				$1,000.00
Environmental monitoring** (includes substantial and total completion reports)				$2,000.00
			Total* **	$4,380.00
			Bond amount (125% of Total)	**$5,475.00**

*Installed costs are assumed to be based upon 3X the purchase price of materials. A landscaping company and distributor of native plant stock may be able to provide a more accurate estimate to complete the prescribed works.
**The above estimate for environmental monitoring is over the maintenance phase only.
***Costs provided are estimates for bonding purposes only. These costs may vary depending upon site conditions.

5.0 CONCLUSION

This report provides an assessment of existing terrestrial resource values including the potential for rare and/or endangered species and habitats to occur on site, provides an impact assessment for the proposed works, and provides recommendations for how to maintain the natural integrity of existing ecological communities. The proposed works include the construction of a multi-family residential building and parking lot that will result in the loss of ESA-4 (Low) and ESA-3 (Moderate) valued communities within the proposed footprint.

Ecoscape anticipates that if all recommendations and mitigation measures within this report are adhered to, the potential environmental effects of the works on the local flora and fauna will be minimized and is unlikely to result in a harmful alteration, disruption or destruction of the environment.

6.0 LIMITATIONS

This report has been prepared by Ecoscape and is intended for the sole and exclusive use of The Pointe at Quail LP, for the purposes set out in this report. Ecoscape has prepared this report with the understanding that all available information on the past, present, and proposed conditions of the subject property have been disclosed. Ecoscape has relied upon personal communications with The Pointe at Quail LP and other information sources to corroborate the documents and other records available for the subject property. The Pointe at Quail LP has also acknowledged that in order for Ecoscape to properly provide the professional service, Ecoscape is relying upon full disclosure and accuracy of this information.

Any use of this report by a third party, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Ecoscape accepts no responsibility for damages, if any, suffered by any third party as a result of actions or decisions made based on this report.

7.0 CLOSURE

We trust that this report satisfies the present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully Submitted

Ecoscape Environmental Consultants Ltd.,

Written By:

Lexee Kerry, B.Sc., B.I.T.
Natural Resource Biologist
Direct Line: (250) 938-2007

Reviewed By:

Theresa Loewen, M.Sc., P.Ag.
Agroecologist
Direct Line: (778) 940-1878

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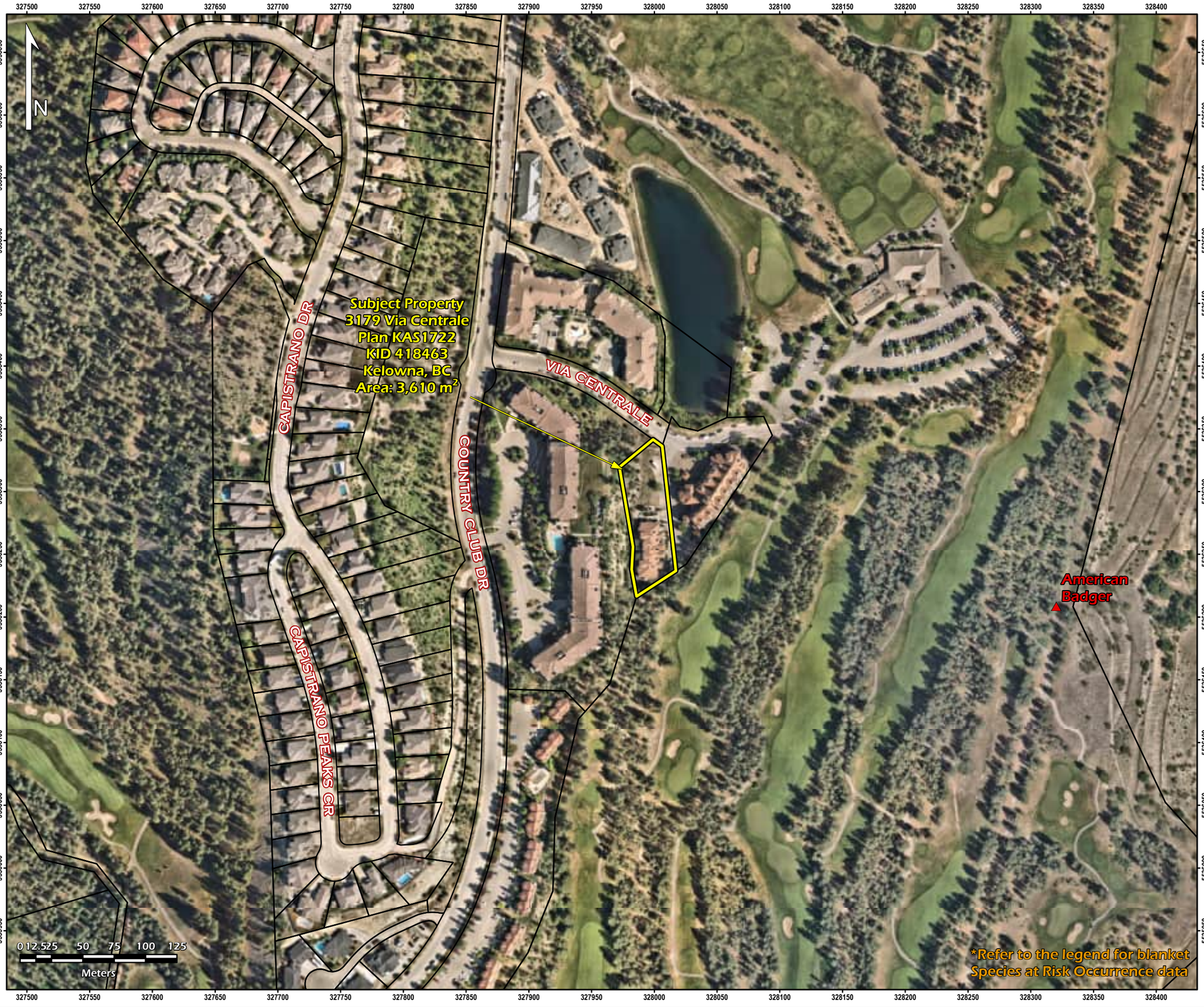
FIGURE 1

Site Location and Species at Risk Occurrences

Project:	Environmental Assessment
Location:	City of Kelowna
Project No.:	21-3811
Prepared for:	The Pointe at Quail LP
Prepared by:	Ecoscape Environmental Consultants Ltd.
	Dan Austin, GIS Specialist
Coordinate System:	NAD83-UTM Zone 11
Imagery:	Nearmap Kelowna 2023
Field Visit:	June 6, 2023
Map Date:	June 30, 2023

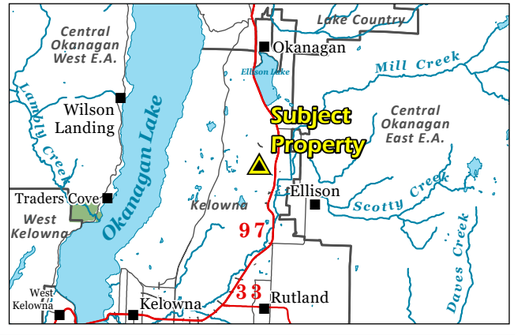


LEGEND

- Regional Location of Subject Property
- WSI Incidental
- WSI Survey
- Streams
- Okanagan Critical Habitat (Species at Risk)
- BC Conservation Data Center (CDC) Polygons
- Subject Property
- Cadastre

Large Conservation Data Center (CDC) polygons include:
- Great Basin Gophersnake (Pituophis catenifer deserticola)
-American Badger (Taxidea taxus)

Regional Location of Subject Property



DISCLAIMER
The data displayed is for conceptual purposes only and should not be interpreted as a legal survey or for legal purposes. If discrepancies are found between the data portrayed in this report and that of a legal survey, the legal survey will supersede any data presented herein.

ECOSCAPE Environmental Consultants Ltd.

21-3811 Via Centrale.mxd

FIGURE 2
Site Plan

Project:	Environmental Assessment
Location:	City of Kelowna
Project No.:	21-3811
Prepared for:	The Pointe at Quail LP
Prepared by:	Ecoscape Environmental Consultants Ltd. Dan Austin, GIS Specialist
Coordinate System:	NAD83-UTM Zone 11
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LEGEND

- Subject Property
- Proposed Parking
- Proposed Building
- Cadastre

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21-3811 Via Centrale.mxd

FIGURE 3
Ecosystem Polygons

Project:	Environmental Assessment
Location:	City of Kelowna
Project No.:	21-3811
Prepared for:	The Pointe at Quail LP
Prepared by:	Ecoscape Environmental Consultants Ltd. Dan Austin, GIS Specialist
Coordinate System:	NAD83-UTM Zone 11
Imagery:	Nearmap Kelowna 2023
Field Visit:	June 6, 2023
Map Date:	July 6, 2023

LEGEND

- Ecosystem Polygon
- Subject Property
- Cadastre

Ecosystem Polygon Key

Polygon Number
2402
Decile (60%) → 6PFks6C ← Stand Modifier
Ecosystem Unit → 2PFks3 ← Structural Stage
2FWwc6Ckc
Site Modifiers ← Seral Stage

Ecosystem Unit	
PF	FdPy - Pinegrass - Idaho fescue
RW	Rural
UR	Urban
Site Modifier	
s	shallow soils (20-100 cm)
Structural Stage	
4	Pole Sapling
Stand Modifier	
C	Coniferous

ECOSCAPE Environmental Consultants Ltd.

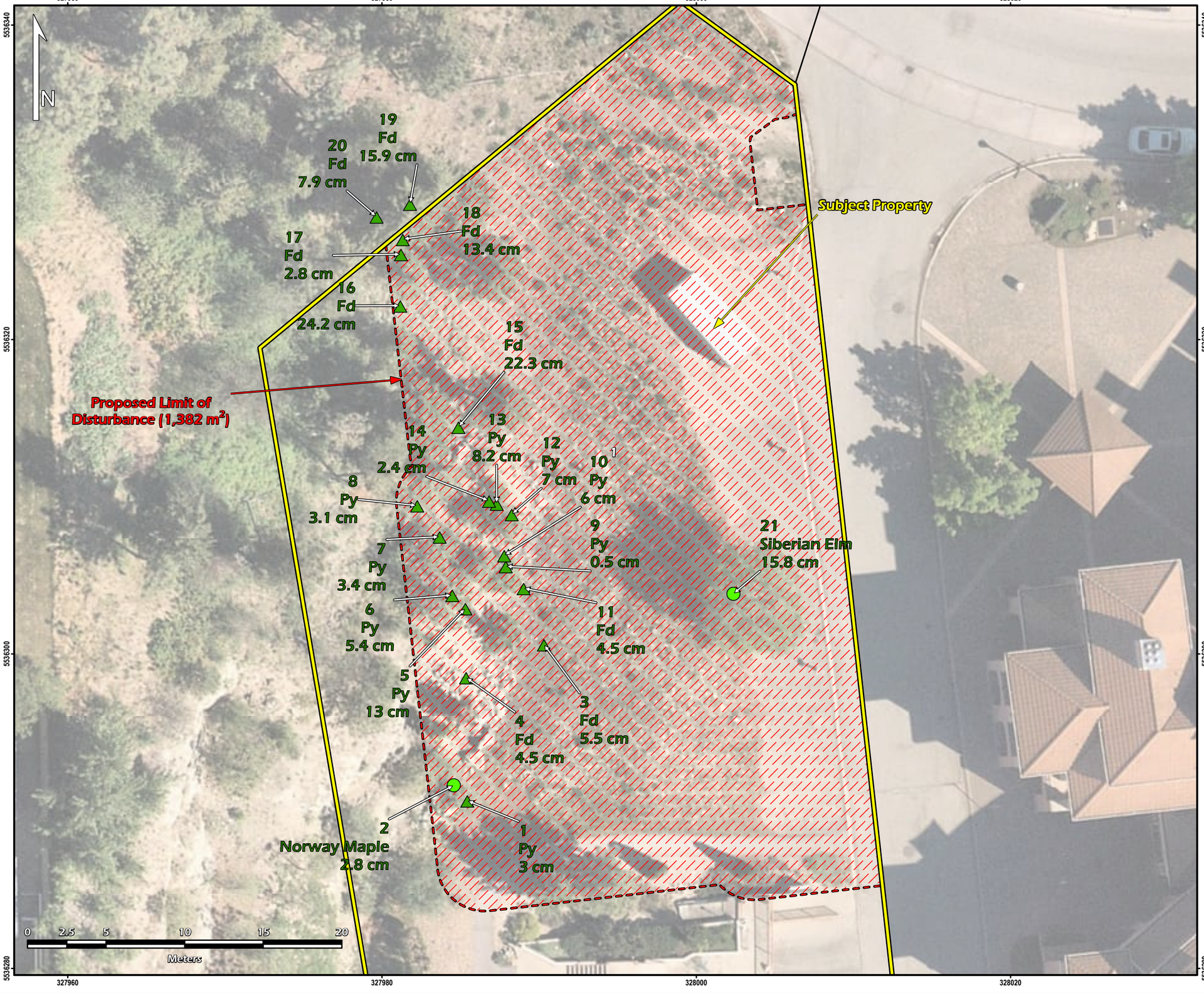


FIGURE 4
Tree Inventory

Project:	Environmental Assessment
Location:	City of Kelowna
Project No.:	21-3811
Prepared for:	The Pointe at Quail LP
Prepared by:	Ecoscape Environmental Consultants Ltd. Dan Austin, GIS Specialist
Coordinate System:	NAD83-UTM Zone 11
Imagery:	Nearmap Kelowna 2023
Field Visit:	June 6, 2023
Map Date:	August 3, 2023

LEGEND

- Deciduous Tree*
- Coniferous Tree*
- Approximate Limit of Disturbance
- Subject Property
- Cadastre

* +/- 5m

Tree Species

Fd	Douglas Fir
Py	Ponderosa Pine

ECOSCAPE
Environmental Consultants Ltd.

FIGURE 5
Environmental Sensitivity Analysis

Project:	Environmental Assessment
Location:	City of Kelowna
Project No.:	21-3811
Prepared for:	The Pointe at Quail LP
Prepared by:	Ecoscape Environmental Consultants Ltd. Dan Austin, GIS Specialist
Coordinate System:	NAD83-UTM Zone 11
Imagery:	Nearmap Kelowna 2023
Field Visit:	June 6, 2023
Map Date:	August 3, 2023

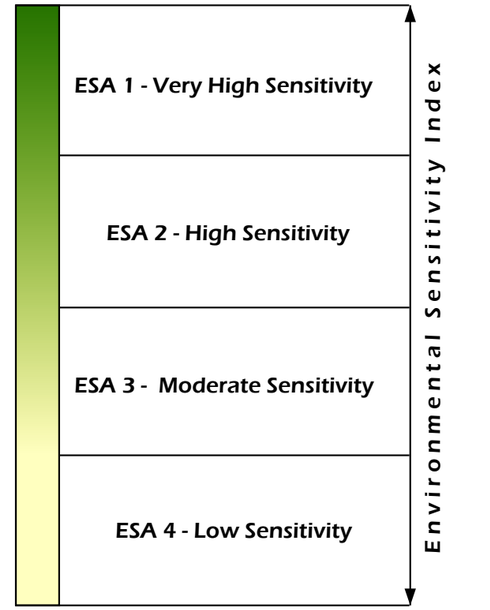
LEGEND

- '99' Ecosystem Polygon Number
- Streams
- Subject Property
- Cadastre

Environmental Sensitivity Rating

- Very High (ESA 1)
- High (ESA 2)
- Moderate (ESA 3)
- Low (ESA 4)

Environmental Sensitivity Gradient



ECOSCAPE
Environmental Consultants Ltd.

FIGURE 6
Impact Assessment

Project:	Environmental Assessment
Location:	City of Kelowna
Project No.:	21-3811
Prepared for:	The Pointe at Quail LP
Prepared by:	Ecoscape Environmental Consultants Ltd. Dan Austin, GIS Specialist
Coordinate System:	NAD83-UTM Zone 11
Imagery:	Nearmap Kelowna 2023
Field Visit:	June 6, 2023
Map Date:	August 3, 2023

LEGEND

- '99' Ecosystem Polygon Number
- Approximate Limit of Disturbance
- Subject Property
- Cadastre

Environmental Sensitivity Rating

- Very High (ESA 1)
- High (ESA 2)
- Moderate (ESA 3)
- Low (ESA 4)

Area (m2)	Outside Disturbance	Within Disturbance	Total
Very High (ESA 1)	0	0	0
High (ESA 2)	0	0	0
Moderate (EAS 3)	297	992	1,289
Low (ESA 4)	1,926	390	2,315
Total	2,222	1,382	3,604

ECOSCAPE
Environmental Consultants Ltd.

APPENDIX A: General Terms and Conditions

ECOSCAPE ENVIRONMENTAL CONSULTANTS LTD.
#2 – 2030 Matrix Crescent, Kelowna, BC., V1V 0G5

Tel: 250.491.7337
Fax: 250.491.7772
www.ecoscapeltd.com

General Conditions

This report applies and is subject to these "General Conditions".

Use of Report

This report concerns a specific site and a specific scope of work and is therefore not applicable to any other sites or any other developments not referred to in the report. Any deviation from the specific site or scope of work would require a supplementary investigation and assessment.

Conclusions and recommendations contained in this report are solely intended for the use of Ecoscape's client. Ecoscape bears no responsibility for the accuracy of information, the analysis of data or recommendations contained or referenced in this report when the report is utilized by or relied upon by any party other than Ecoscape's client unless otherwise authorized in writing by Ecoscape. Any unauthorized application of this report is at the discretion and sole risk of its user.

This report is subject to copyright, and therefore shall not be reproduced in part or in whole without prior written consent by Ecoscape. Additional copies of this report may be available upon request, if required, and will be supplied after receipt of payment for expenses associated with report production.

Limitations of Report

This report was derived solely from the conditions that were present on site during Ecoscape's investigation. The client, and any other parties making use of this report with the express written consent of Ecoscape and the client, are aware that conditions affecting the environmental condition of the site can vary both temporally and spatially, and that the conclusions and recommendations included in this report are temporally sensitive.

The client, and any other parties making use of this report with the express written consent of Ecoscape and the client, are also aware that conclusions and recommendations included within this report emanate from limited observations and information, and that both on-site and off-site conditions may vary, which in turn could affect the conclusions and recommendations that were made.

The client is aware that Ecoscape is not qualified to, nor is it making any recommendations in terms of purchase, sale, investment, or development of the subject property, as such decisions are the sole responsibility of the client.

Information Provided to Ecoscape by Others

During the extent of the preparation and work carried out in this report, Ecoscape may have relied upon information provided by parties other than the client. While Ecoscape strives to validate the accuracy of such information when instructed to do so by the client, Ecoscape accepts no responsibility for the validity of such information which may affect the report.

Limitation of Liability

The client acknowledges that property containing hazardous wastes and contaminants poses a high risk of claims brought by third parties stemming from the presence of those materials. Accounting for these risks, and in consideration of Ecoscape providing the requested services, the client agrees that Ecoscape's liability to the client, with respect to any issues relating to hazardous wastes or contaminants located on the subject property, shall be limited to the following:

With respect to any claims brought against Ecoscape by the client arising out of the provision or failure to provide services hereunder shall be limited to the amount of fees paid by the client to Ecoscape under this Agreement, whether the action is based on breach of contract or tort;

With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject property, the client agrees to indemnify, defend and hold harmless Ecoscape from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by Ecoscape, whether the claim be brought against Ecoscape for breach of contract or tort.

Disclosure of Information by Client

The client agrees to fully cooperate with Ecoscape with respect to the provision of all available information on the past, current, or proposed conditions on the site, including historical information respecting the use of the site. The client acknowledges that in order for Ecoscape to properly provide the service, Ecoscape is relying on full disclosure and accuracy of any such information. Ecoscape does not accept any responsibility for conclusions drawn from erroneous, invalid, or inaccurate data provided to us by another party and used in the preparation of this report.

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Fax: 250.491.7772
www.ecoscapeltd.com

Standard of Care

Services performed by Ecoscape for this report have been completed in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgement has been applied in developing the conclusions and/or recommendations made in this report. No warranty or guarantee, express or implied, is made concerning the results, comments, recommendations, or any other portion of this report.

Notification of Authorities

The client acknowledges that in certain instances the discovery of hazardous materials, contaminants or conditions and materials may require that regulatory agencies and other parties be informed and the client agrees that notification to such parties or persons as required may be done by Ecoscape in its reasonably exercised discretion. Further, Ecoscape reserves the right to notify Provincial agencies when rare or endangered flora or fauna are observed, whether the species classifications are identified as such at the local, Provincial, or Federal levels of government.

Ownership of Instruments of Professional Service

The client acknowledges that all reports, plans, and data generated by Ecoscape during the performance of the work and other documents prepared by Ecoscape are considered its professional work product and shall remain the copyright property of Ecoscape.

Alternate Report Format

Where Ecoscape submits both an electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Ecoscape's instruments of professional service), the client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by Ecoscape shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the client agrees and waives all future right to dispute that the original hard copy signed version archived by Ecoscape shall be deemed to be the overall original for the Project.

The client agrees that both electronic file and hard copy versions of Ecoscape's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party other than Ecoscape. The client warrants that Ecoscape's instruments of professional service will be used only and exactly as submitted by Ecoscape.

The client recognizes and agrees that electronic files submitted by Ecoscape have been prepared and submitted using specific software and hardware systems. Ecoscape makes no representation about the compatibility of these files with the client's current or future software and hardware systems.

APPENDIX B: Site Plan

THE POINTE AT QUAIL

4- & 3-UNIT MULTI-FAMILY ATTACHED DWELLING

3179 VIA CENTRALE
KELOWNA, BRITISH COLUMBIA
PART OF LOT A, SEC. 14 AND 15, TP 23, ODYD, PLAN KAP56202

CARLISLE GROUP

NOTE: 3D RENDERS FOR REFERENCE ONLY. FINAL COLOURS MAY VARY BASED ON SPECIFICATION, MONITOR COLOUR SETTINGS, AND/OR PRINT QUALITY. DO NOT SCALE.

SHEET LIST	
SHEET NAME	PAGE #

GENERAL SITE INFO:

LEGAL ADDRESS: PART OF LOT A, PLAN KAP56202 SEC. 14 & 15, TP. 23, ODYD
MUNICIPAL ADDRESS: 7139 VIA CENTRALE
MUNICIPALITY: CITY OF KELOWNA

SITE COVERAGE:

SITE AREA: 1607.55 m²
(PROPOSED LOT LINES)

PROVIDED COVERAGE:

BUILDING 1
FOOTPRINT: 311.41 m²
DRIVEWAY PARKING AREA: 95.39 m²
DECKS & PATIO ABOVE 0.6m: 35.30 m²
BUILD-OUTS: 0.59 m²

BUILDING 2
FOOTPRINT: 243.43 m²
DRIVEWAY PARKING AREA: 82.62 m²
DECKS & PATIO ABOVE 0.6m: 16.94 m²
BUILD-OUTS: 0.97 m²

VISITOR PARKING AREA: 18.04 m²

TOTAL COVERAGE ON SITE: 804.69 m²
COVERAGE: 50.06 %

DENSITY:

SITE AREA: 0.1607 ha
UNITS: 7

DENSITY: 43.56 units / ha

AMENITY SPACE:

UNIT 1 (TOTAL): 35.40 m²
FRONT DECK: 16.82 m²
REAR PATIO: 18.58 m²
UNIT 2 (TOTAL): 33.35 m²
FRONT DECK: 16.63 m²
REAR PATIO: 16.72 m²
UNIT 3 (TOTAL): 33.35 m²
FRONT DECK: 16.63 m²
REAR PATIO: 16.72 m²
UNIT 4 (TOTAL): 35.40 m²
FRONT DECK: 16.82 m²
REAR PATIO: 18.58 m²
UNIT 5 (TOTAL): 30.10 m²
FRONT DECK: 11.52 m²
REAR PATIO: 18.58 m²
UNIT 6 (TOTAL): 27.03 m²
FRONT DECK: 10.31 m²
REAR PATIO: 16.72 m²
UNIT 7 (TOTAL): 41.75 m²
FRONT DECK: 24.81 m²
REAR PATIO: 16.94 m²

TOTAL AMENITY SPACE: 236.38 m²

BUILDING HEIGHT:

BUILDING 1
AVERAGE GRADE (4 CORNERS): 502.12
ROOF PEAK: 512.19
ROOF EAVE: 510.40
ROOF AVERAGE HIGH POINT: 511.30
BUILDING HEIGHT: 9.18m

BUILDING 2
AVERAGE GRADE (4 CORNERS): 502.15
ROOF PEAK: 512.19
ROOF EAVE: 510.06
ROOF AVERAGE HIGH POINT: 511.12
BUILDING HEIGHT: 8.97m

UNIT STATISTICS:

BUILDING 1 (TOTAL DEVELOPED): 6,002 SF
UNIT 1 (3-BED) 1,592 SF
UNIT 2 (2-BED) 1,409 SF
UNIT 3 (2-BED) 1,409 SF
UNIT 4 (3-BED) 1,592 SF

BUILDING 2 (TOTAL DEVELOPED): 5,137 SF
UNIT 5 (3-BED) 1,583 SF
UNIT 6 (2-BED) 1,400 SF
UNIT 7 (3-BED) 2,154 SF

OVERALL FRONT DECKS: 1,232 SF
OVERALL REAR DECKS: 1,364 SF
OVERALL GARAGES: 4,189 SF

GROSS FLOOR AREA (DEVELOPED): 11,139 SF
GFA 1,034.85 m²

FAR:

SITE AREA: 1607.55 m²
GROSS FLOOR AREA (ALL LEVELS): 1034.85 m²

FAR: 0.644

PARKING:

UNITS: 7
TOTAL PARKING STALLS PROVIDED: 14

UNIT 1: 2
2.0 INDOOR TANDEM STALLS
UNIT 2: 2
2.0 INDOOR TANDEM STALLS
UNIT 3: 2
2.0 INDOOR TANDEM STALLS
UNIT 4: 2
2.0 INDOOR TANDEM STALLS
UNIT 5: 2
2.0 INDOOR TANDEM STALLS
UNIT 6: 2
2.0 INDOOR TANDEM STALLS
UNIT 7: 1
1.0 INDOOR TANDEM STALLS

1.0 VISITOR OUTDOOR PARKING STALL 1

DISCLAIMER:

ALL SITE INFORMATION IS BASED OFF OFF THIRD PARTY DRAWINGS. ELLERGODT DESIGN TAKES NO REPSONSIBILITY FOR INACCURATE EXISTING SERVICE SIZES OR LOCATIONS, BUILDER TO VERIFY ALL CRITICAL DIMENSIONS ON SITE PRIOR TO STARTING CONSTRUCTION.

BUILDING AREAS

NAME	SQUARE FOOTAGE
UNIT 1- MAIN	136 SF
UNIT 1- UPPER	720 SF
UNIT 1- 3rd	736 SF
UNIT 1- GARAGE	656 SF
UNIT 1- FRONT DECK	181 SF
UNIT 1- REAR DECK	200 SF
UNIT 2- MAIN	132 SF
UNIT 2- UPPER	648 SF
UNIT 2- 3rd	629 SF
UNIT 2- GARAGE	598 SF
UNIT 2- FRONT DECK	179 SF
UNIT 2- REAR DECK	180 SF
UNIT 3- MAIN	132 SF
UNIT 3- UPPER	648 SF
UNIT 3- 3rd	629 SF
UNIT 3- GARAGE	598 SF
UNIT 3- FRONT DECK	179 SF
UNIT 3- REAR PATIO	180 SF
UNIT 4- MAIN	136 SF
UNIT 4- UPPER	720 SF
UNIT 4- 3rd	736 SF
UNIT 4- GARAGE	657 SF
UNIT 4- FRONT DECK	181 SF
UNIT 4- REAR PATIO	200 SF

BUILDING AREAS

NAME	SQUARE FOOTAGE
UNIT 5- MAIN	127 SF
UNIT 5- UPPER	720 SF
UNIT 5- 3rd	736 SF
UNIT 5- GARAGE	572 SF
UNIT 5- FRONT DECK	124 SF
UNIT 5- REAR PATIO	200 SF
UNIT 6- MAIN	123 SF
UNIT 6- UPPER	648 SF
UNIT 6- 3rd	629 SF
UNIT 6- GARAGE	524 SF
UNIT 6- FRONT DECK	111 SF
UNIT 6- REAR PATIO	180 SF
UNIT 7- MAIN	436 SF
UNIT 7- UPPER	856 SF
UNIT 7- 3rd	862 SF
UNIT 7- GARAGE	535 SF
UNIT 7- FRONT DECK	267 SF
UNIT 7 - REAR PATIO	182 SF

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113 7a STREET NE
CALGARY, ALBERTA
T2E 4E5
OFF. 403-242-2704 CELL. 403-804-9155
brent@beginwithdesign.com
www.beginwithdesign.com

CERTIFIED RESIDENTIAL DESIGNER (ASTTBC)
RESIDENTIAL DESIGNER (AIBC)
CERTIFIED SUSTAINABLE BUILDING ADVISOR
LEED HOMES
PROFESSIONAL SITE MANAGER (PHBIA)

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CLIENT & PROJECT

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PROJECT:	THE POINTE AT QUAIL
ADDRESS:	7139 VIA CENTRALE
LEGAL:	LOT A, PLAN KA56202
JOB NO. :	-

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REVISIONS

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11.10	MINOR REV.	RC
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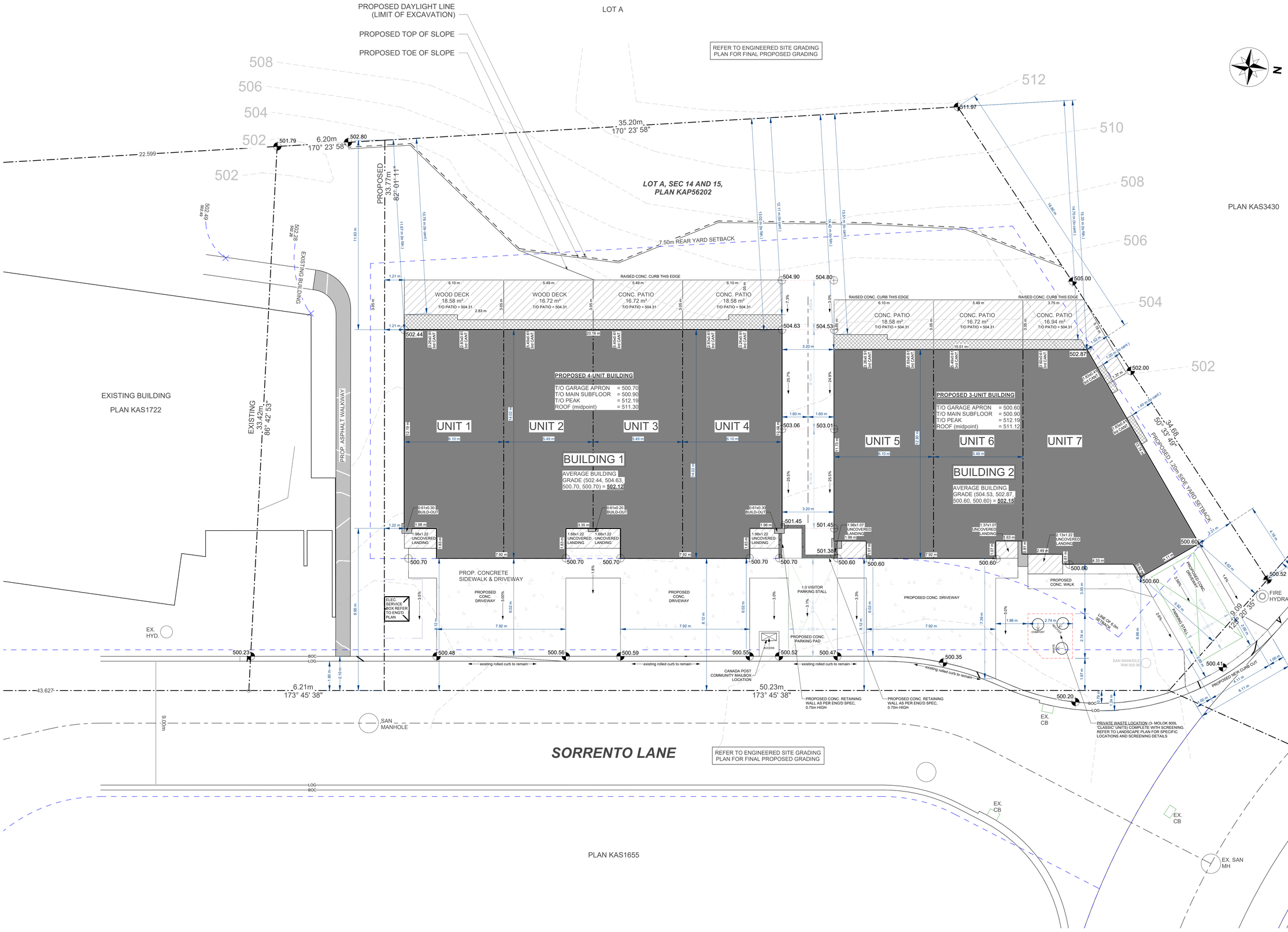
01.05	DP REVIEW	RC
03.23	UNIT 2/3 - 18' OPTION	RC
05.06	REVD DP	RC
06.15	PRELIMINARY PRICING	SL
11.23	REVD LOT LINES SITE PLAN	RC
03.27	DEVELOPMENT PERMIT	RC
05.05	DP ADJUSTMENTS	RC

BUILDING STATISTICS | A0.0



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113 7a STREET NE
CALGARY, ALBERTA
T2E 4E5
OFF. 403-242-2704 CELL. 403-804-9155
brent@beginwithdesign.com
www.beginwithdesign.com

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RESIDENTIAL DESIGNER (AIBC)
CERTIFIED SUSTAINABLE BUILDING ADVISOR
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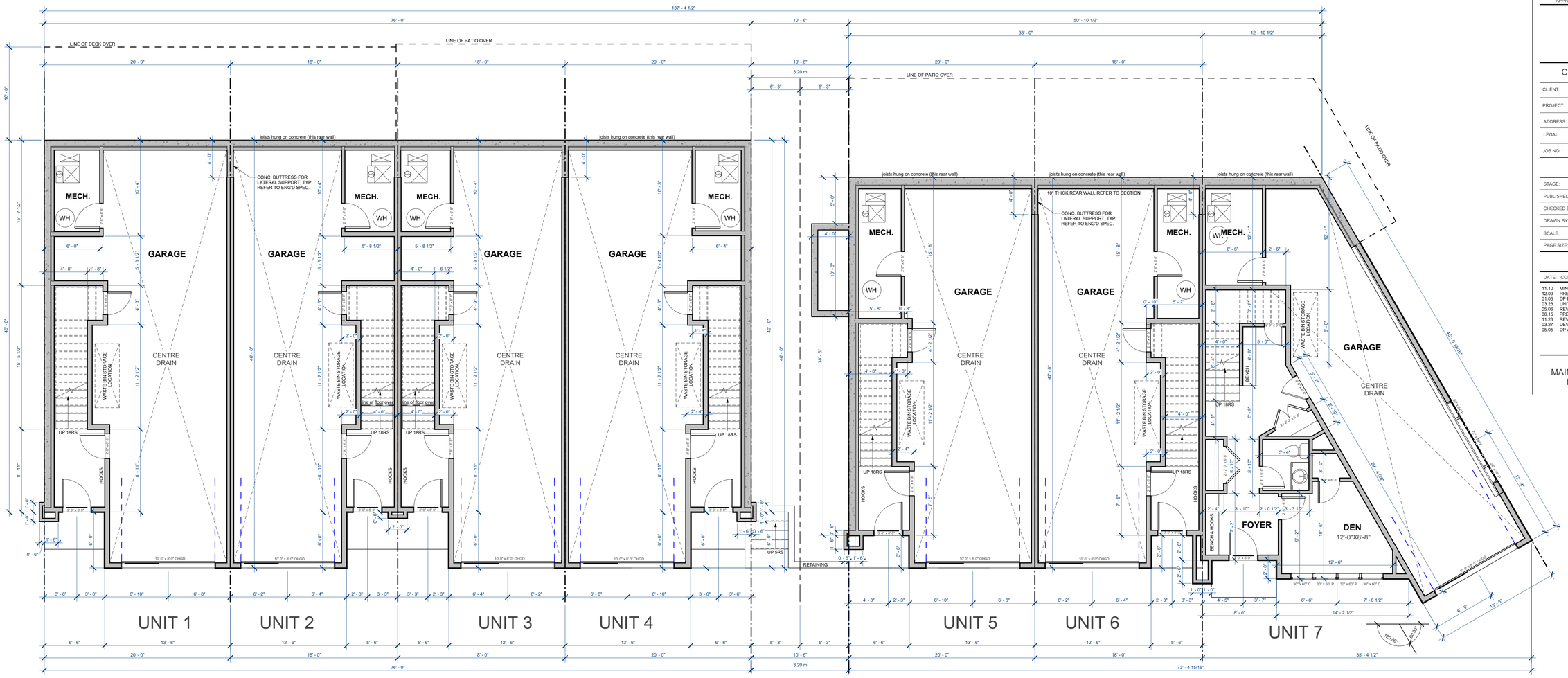
03.27	DEVELOPMENT PERMIT	RC
05.05	DP ADJUSTMENTS	RC

SITE PLAN | A0.1



1 PROPOSED MAIN FLOOR PLAN
3/16" = 1'-0"

10'-3 1/4" CLEAR MAIN FLOOR CEILING
- CEILINGS DROPPED FOR STRUCTURE OR MECH WHERE REQUIRED
- TOPS OF WINDOWS @ 8'-0" UNO
- ENG. HEADER FOR OPENINGS WIDER THAN 5'

ALL MECHANICAL EQUIPMENT IS SUBJECT TO SITE INSTALLATION ADJUSTMENTS,

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CALGARY, ALBERTA
T2E 4E5
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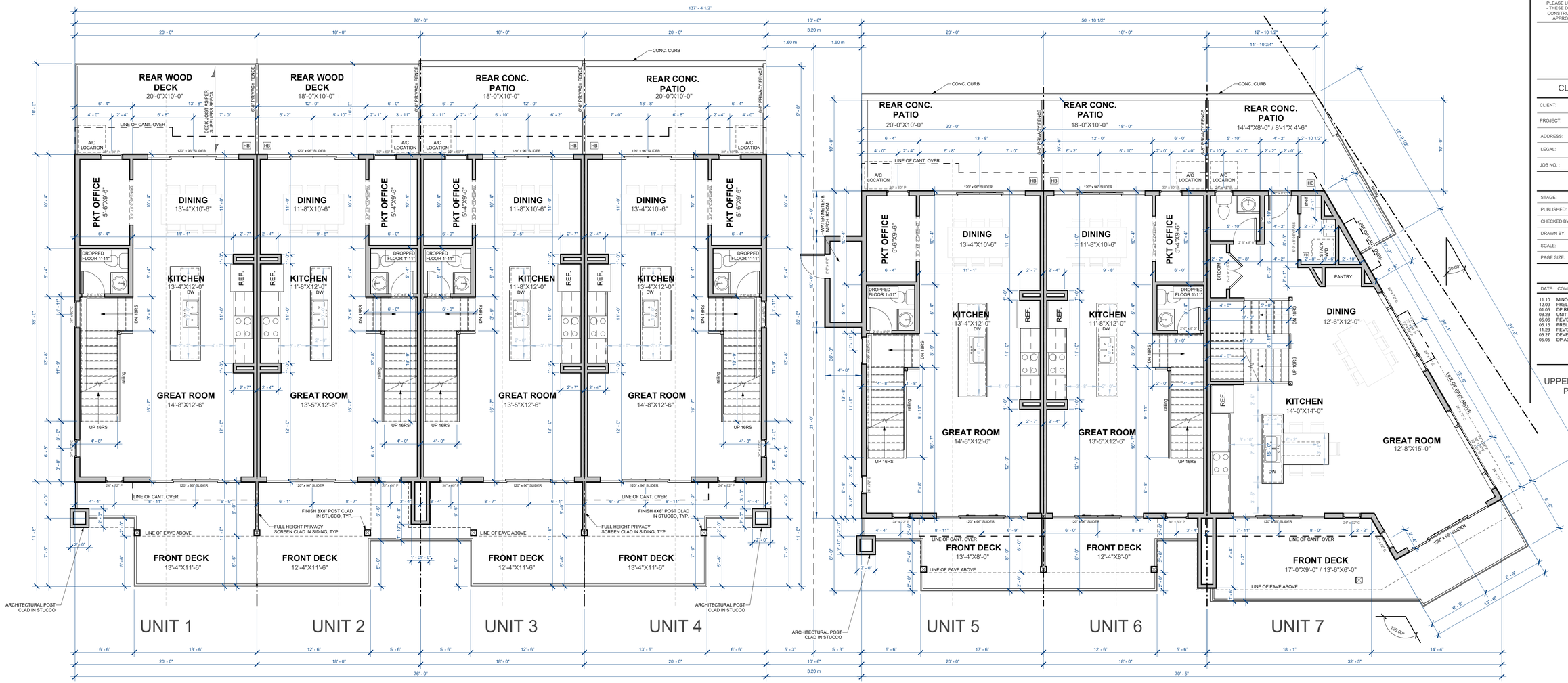
11.23	REVD LOT LINES SITE PLAN	RC
03.27	DEVELOPMENT PERMIT	RC
05.05	DP ADJUSTMENTS	RC

MAIN FLOOR PLAN | A1.1



1 PROPOSED UPPER FLOOR PLAN
3/16" = 1'-0"

9'-1" CLEAR UPPER FLOOR CEILING
- CEILINGS DROPPED FOR STRUCTURE OR MECH WHERE REQUIRED
- TOPS OF WINDOWS @ 8'-0" UNO
- ENG. HEADERS FOR OPENINGS WIDER THAN 5'

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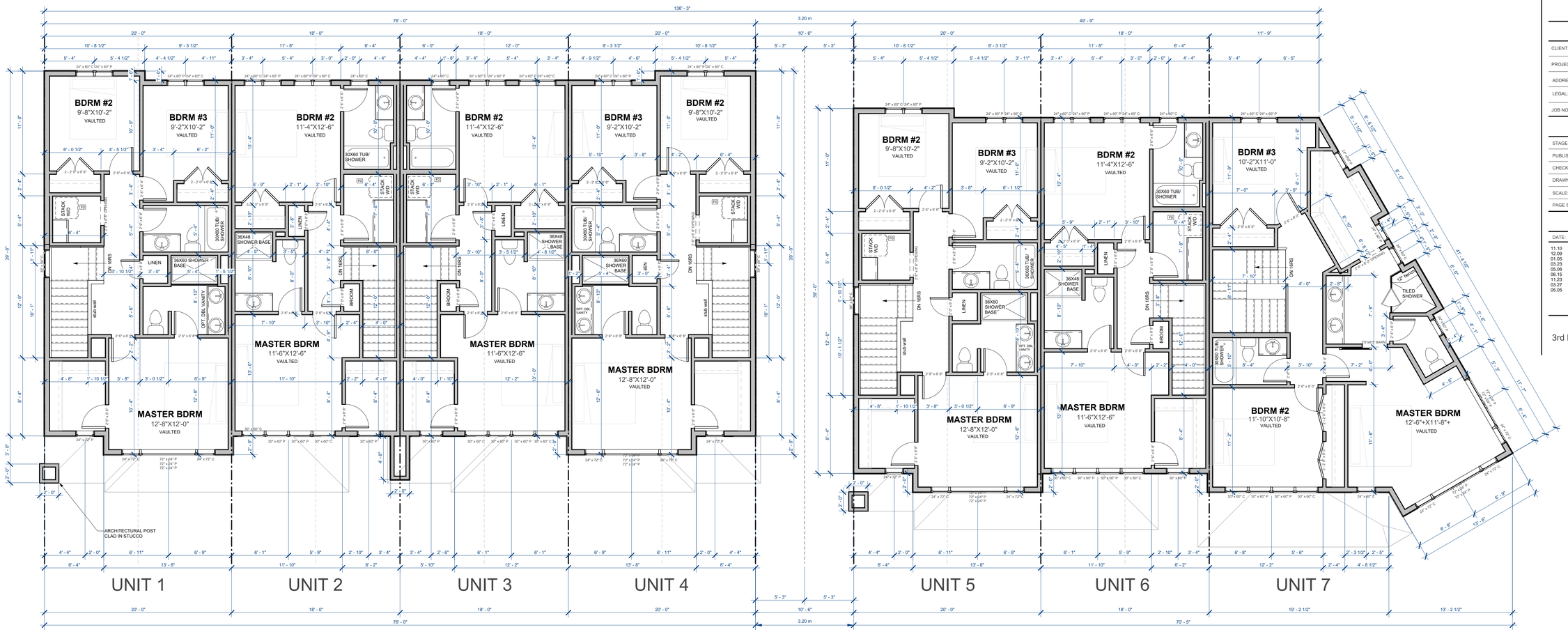
05.05	DP ADJUSTMENTS	RC

UPPER FLOOR PLAN | A1.2



1 PROPOSED THIRD FLOOR PLAN
3/16" = 1'-0"

8'-1" UPPER WALL HEIGHT
- TOPS OF WINDOWS ON ELEVATIONS
- ENG. HEADERS FOR OPENINGS WIDER THAN 5'

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CALGARY, ALBERTA
T2E 4E5
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PROJECT:	THE POINTE AT QUAIL
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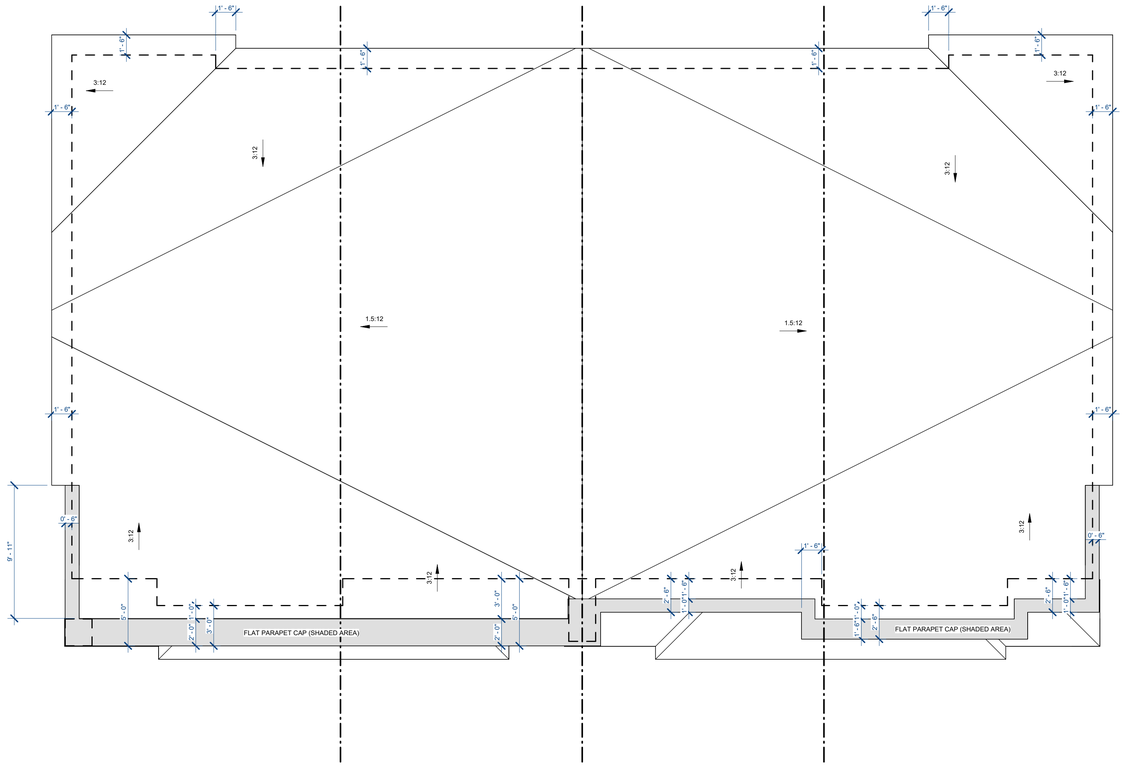
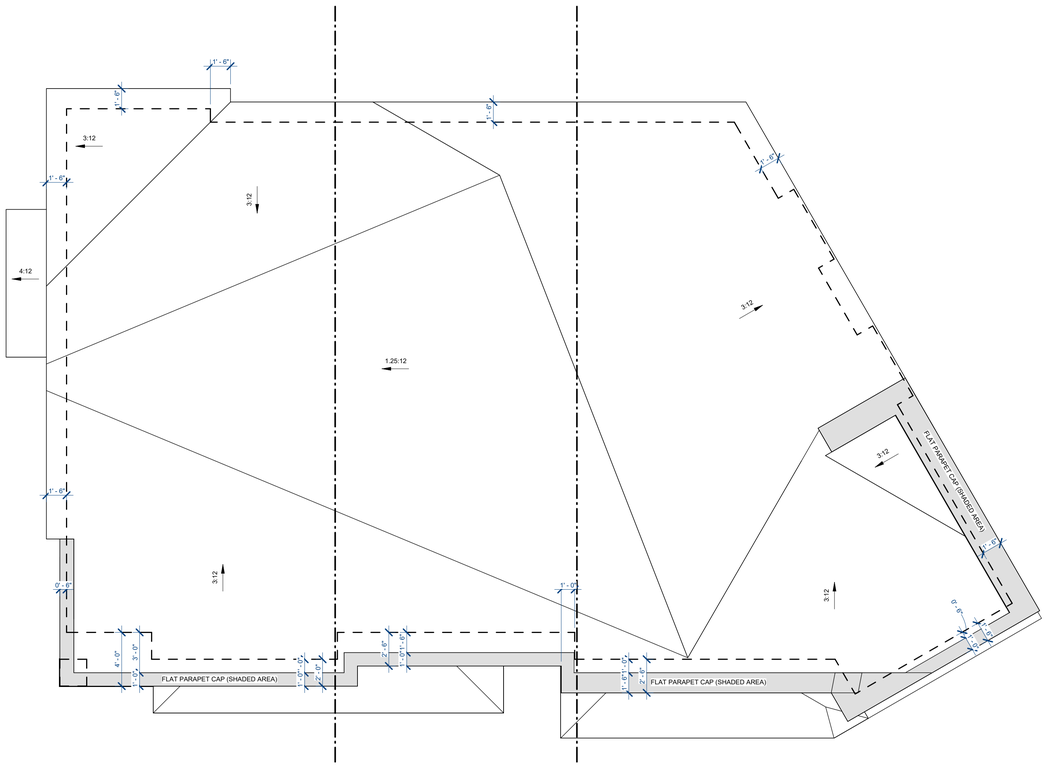
05.05	DP ADJUSTMENTS	RC

3rd FLOOR PLAN | A1.3



UNIT 1 UNIT 2 UNIT 3 UNIT 4



UNIT 5 UNIT 6 UNIT 7

1 PROPOSED ROOF PLAN
3/16" = 1'-0"

ellergodt DESIGN

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CALGARY, ALBERTA
T2E 4E5
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brent@beginwithdesign.com
www.beginwithdesign.com

CERTIFIED RESIDENTIAL DESIGNER (ASTTBC)
RESIDENTIAL DESIGNER (AIBC)
CERTIFIED SUSTAINABLE BUILDING ADVISOR
LEED HOMES
PROFESSIONAL SITE MANAGER (PHBIA)

GENERAL NOTES:

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CLIENT & PROJECT

CLIENT:	CARLISLE GROUP
PROJECT:	THE POINTE AT QUAIL
ADDRESS:	7139 VIA CENTRALE
LEGAL:	LOT A, PLAN KA56202
JOB NO. :	-

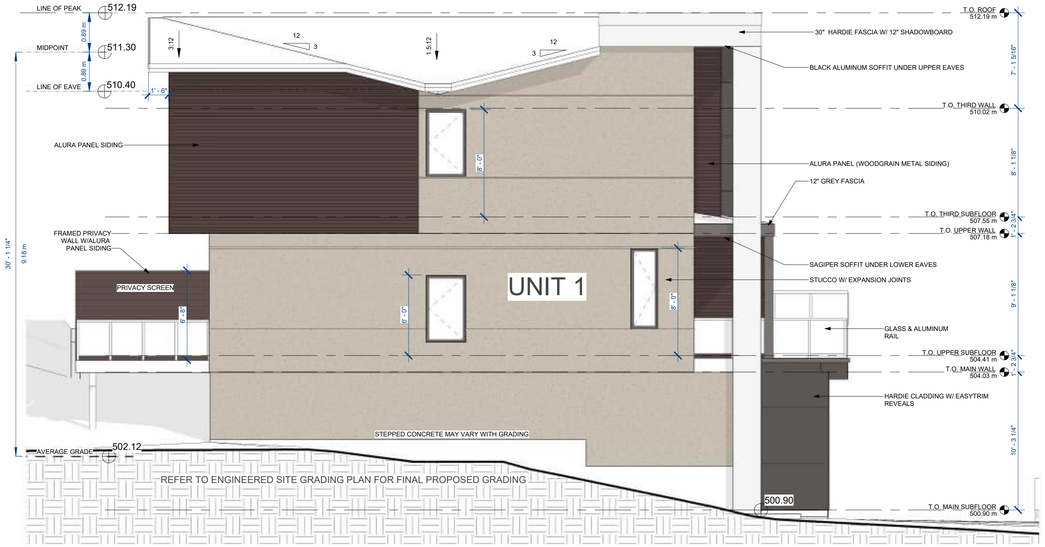
DRAWING

STAGE:	DEVELOPMENT PERMIT
PUBLISHED:	2023-05-05 12:06:58 PM
CHECKED BY:	B. ELLERGODT
DRAWN BY:	R. CAIRNS
SCALE:	3/16" = 1'-0"
PAGE SIZE:	ARCH D / 36" x 24"

REVISIONS

DATE:	COMMENTS:	BY:
11.10	MINOR REV.	RC
12.09	PRELIM DP REVIEW	RC
01.05	DP REVIEW	RC
03.23	UNIT 2/3 - 18' OPTION	RC
05.06	REVD DP	RC
06.15	PRELIMINARY PRICING	SL
11.23	REVD LOT LINES SITE PLAN	RC
03.27	DEVELOPMENT PERMIT	RC
05.05	DP ADJUSTMENTS	RC

ROOF PLAN | A1.4

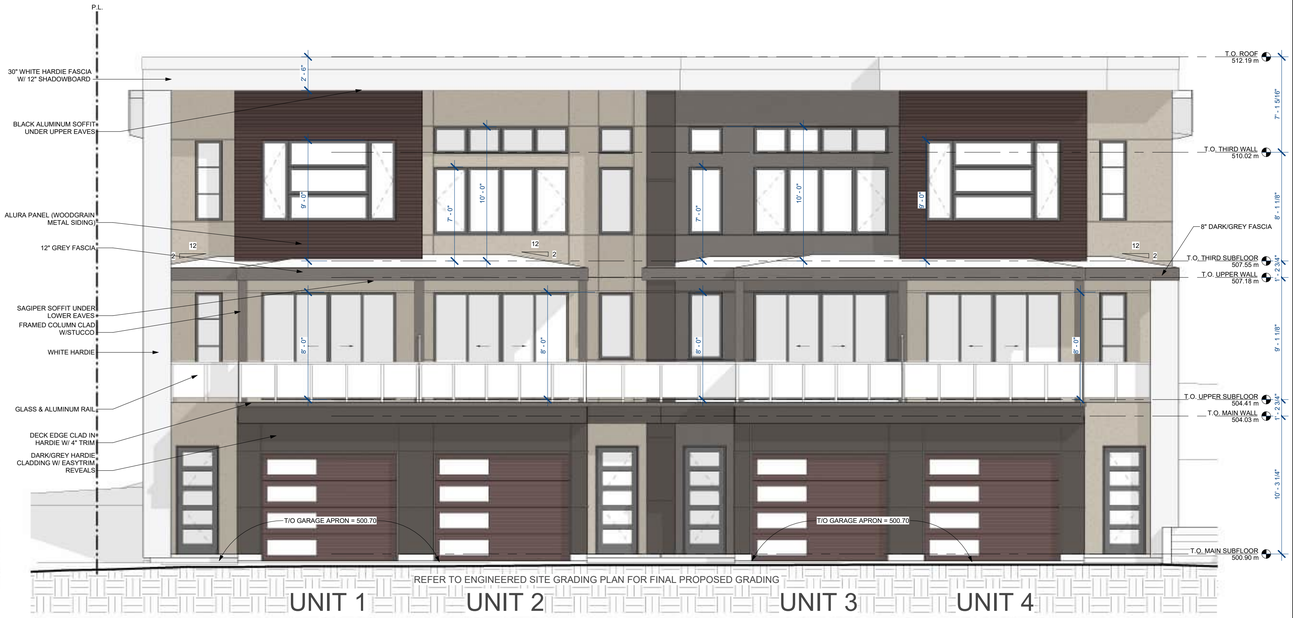


2 BLDG. 1 - LEFT ELEVATION (SOUTH)
3/16" = 1'-0"

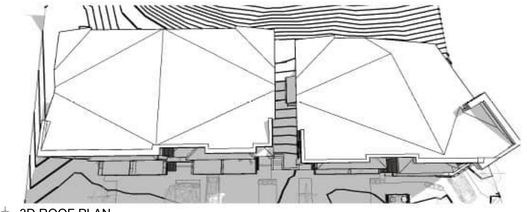
EXTERIOR CLADDING LEGEND

NOTE: REFER TO SPECIFICATION FOR FINAL APPROVED COLOURS AND MATERIALS

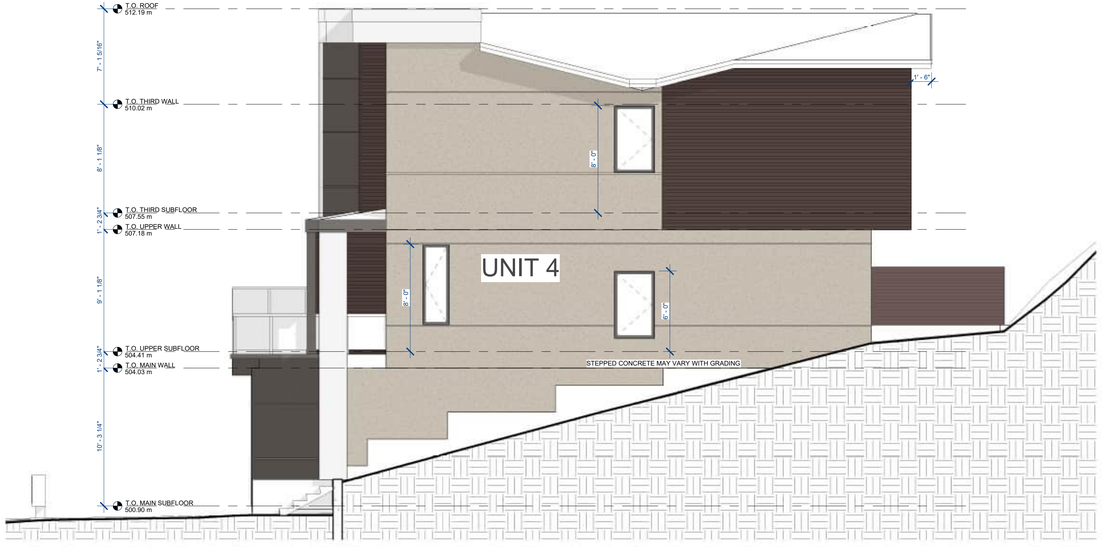
- JAMES HARDIE SIDING -- ARCTIC WHITE
- ACRYLIC STUCCO -- JH40-10 COBBLESTONE
- JAMES HARDIE SIDING -- AGED PEWTER WITH EASYTRIM REVEALS
- JAMES HARDIE SIDING -- RICH ESPRESSO WITH EASYTRIM REVEALS
- ALLURA SIDING -- CARIBOU TRAILS



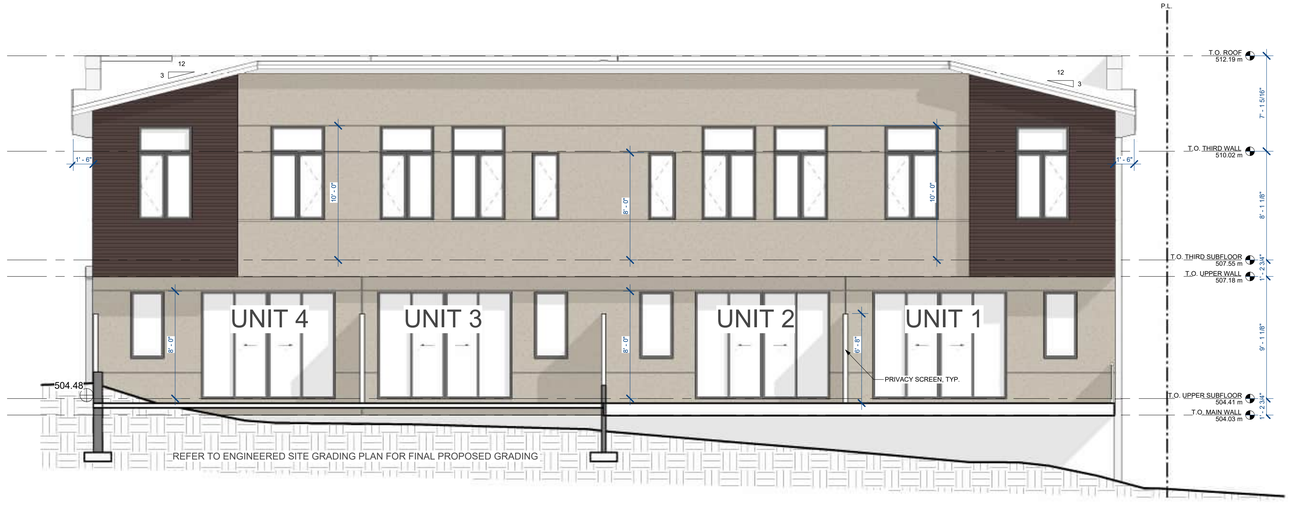
1 BLDG. 1 - FRONT ELEVATION (EAST)
3/16" = 1'-0"



5 3D ROOF PLAN



4 BLDG. 1 - RIGHT ELEVATION (NORTH)
3/16" = 1'-0"



3 BLDG. 1 - REAR ELEVATION (WEST)
3/16" = 1'-0"

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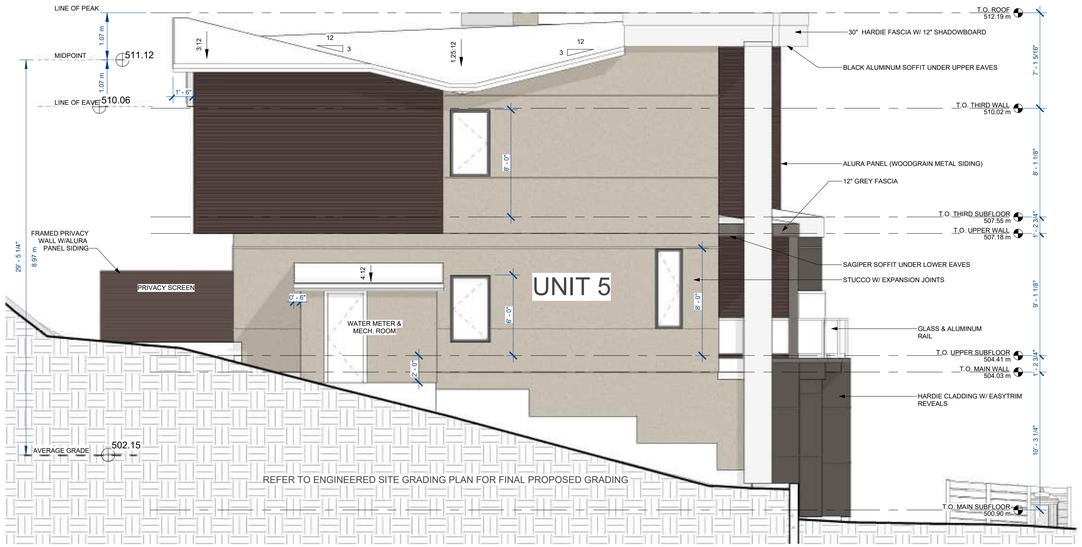
05.05	DP ADJUSTMENTS	RC

ELEVATIONS | A2.0



2 BLDG. 2 - LEFT ELEVATION (SOUTH)
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EXTERIOR CLADDING LEGEND

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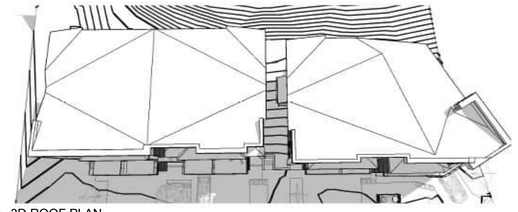
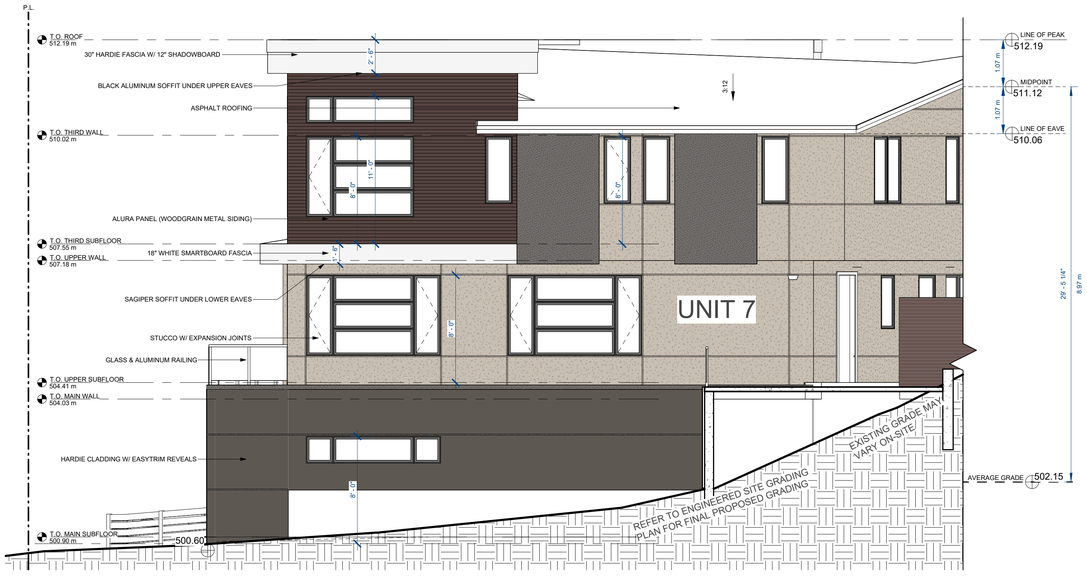
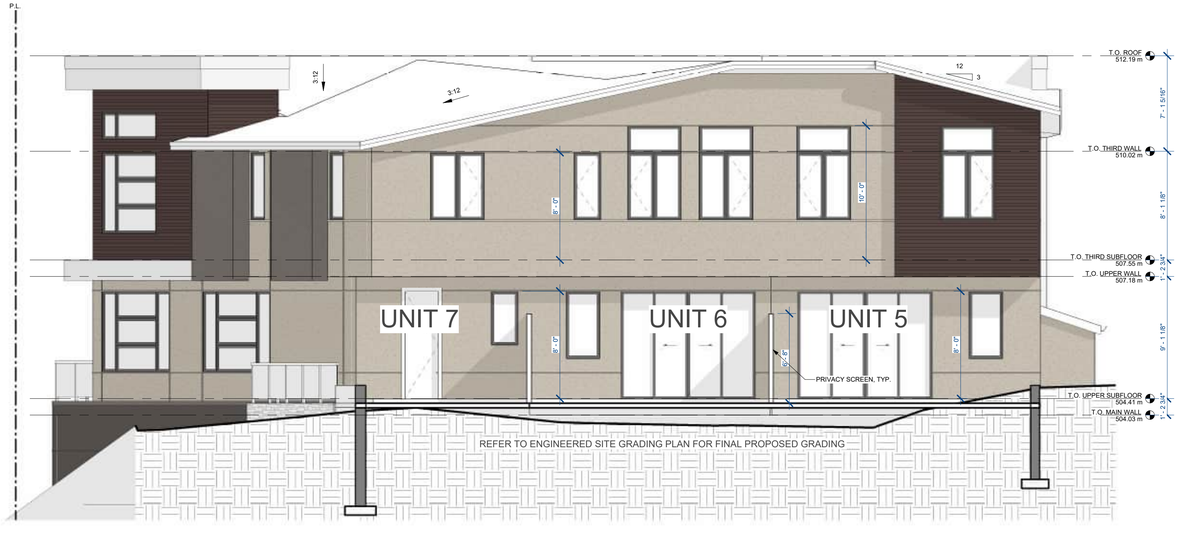


5 3D ROOF PLAN



4 PROPOSED RIGHT ELEVATION (NORTH)
3/16" = 1'-0"



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ELEVATIONS | A2.1

APPENDIX C: Photos

Photo 1. View facing south of the subject property of the RW and UR classifications. All photos taken May 11, 2022.

Photo 2. View facing north of the subject property.

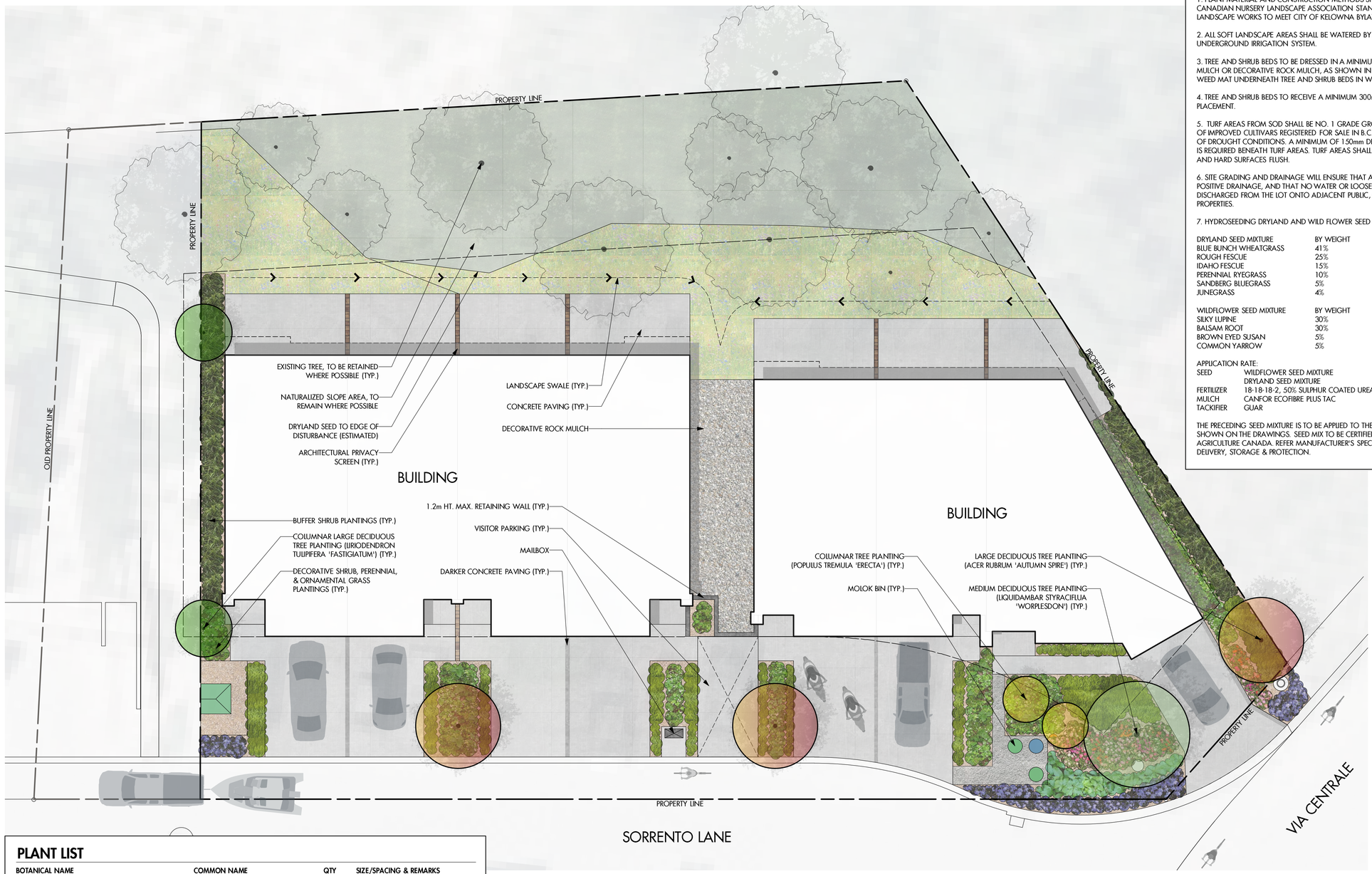
Photo 3. View facing west of the rock outcrop within the subject property and PF ecosystem.

Photo 4. View facing north of the subject property showing existing vegetation within the RW and PF ecosystems.

Photo 5. View facing west of the area of the subject property currently being used for parking at the time of the site visit, with the PF ecosystem upslope.

Photo 6. View facing north of the waterbody located north of the subject property.

APPENDIX D: Landscape Plan by Ecora



NOTES

1. PLANT MATERIAL AND CONSTRUCTION METHODS SHALL MEET OR EXCEED THE CANADIAN NURSERY LANDSCAPE ASSOCIATION STANDARDS. ALL OFFSITE LANDSCAPE WORKS TO MEET CITY OF KELOWNA BYLAW 7900 STANDARDS.

2. ALL SOFT LANDSCAPE AREAS SHALL BE WATERED BY A FULLY AUTOMATIC TIMED UNDERGROUND IRRIGATION SYSTEM.

3. TREE AND SHRUB BEDS TO BE DRESSED IN A MINIMUM 75mm BLACK WOOD MULCH OR DECORATIVE ROCK MULCH, AS SHOWN IN PLANS. DO NOT PLACE WEED MAT UNDERNEATH TREE AND SHRUB BEDS IN WOOD MULCH AREAS.

4. TREE AND SHRUB BEDS TO RECEIVE A MINIMUM 300mm DEPTH TOPSOIL PLACEMENT.

5. TURF AREAS FROM SOD SHALL BE NO. 1 GRADE GROWN FROM CERTIFIED SEED OF IMPROVED CULTIVARS REGISTERED FOR SALE IN B.C. AND SHALL BE TOLERANT OF DROUGHT CONDITIONS. A MINIMUM OF 150mm DEPTH OF GROWING MEDIUM IS REQUIRED BENEATH TURF AREAS. TURF AREAS SHALL MEET EXISTING GRADES AND HARD SURFACES FLUSH.

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7. HYDROSEEDING DRYLAND AND WILD FLOWER SEED AREAS

DRYLAND SEED MIXTURE	BY WEIGHT	BY SPECIES
BLUE BUNCH WHEATGRASS	41%	23%
ROUGH FESCUE	25%	20%
IDAHO FESCUE	15%	19%
PERENNIAL RYEGRASS	10%	7%
SANDBERG BLUEGRASS	5%	13%
JUNEGRASS	4%	18%

WILDFLOWER SEED MIXTURE	BY WEIGHT
SILKY LUPINE	30%
BALSAM ROOT	30%
BROWN EYED SUSAN	5%
COMMON YARROW	5%

APPLICATION RATE:

SEED	WILDFLOWER SEED MIXTURE	1 KG/HECTARE
	DRYLAND SEED MIXTURE	50 KG/HECTARE
FERTILIZER	18-18-18-2, 50% SULPHUR COATED UREA	400 KG/HECTARE
MULCH	CANFOR ECOFIBRE PLUS TAC	2,800 KG/HECTARE
TACKIFIER	GUAR	3% OF MIX

THE PRECEDING SEED MIXTURE IS TO BE APPLIED TO THE DRYLAND SEED AREAS SHOWN ON THE DRAWINGS. SEED MIX TO BE CERTIFIED #1 GRADE BY AGRICULTURE CANADA. REFER MANUFACTURER'S SPECIFICATIONS FOR PRODUCT DELIVERY, STORAGE & PROTECTION.

PLANT LIST

BOTANICAL NAME	COMMON NAME	QTY	SIZE/SPACING & REMARKS
TREES			
ACER RUBRUM 'AUTUMN SPIRE'	AUTUMN SPIRE RED MAPLE	3	5cm CAL.
LIQUIDAMBAR STYRACIFLUA 'WORPLESDON	WORPLESDON SWEETGUM	2	4cm CAL.
LIRIODENDRON TULIPIERA 'FASTIGIATUM'	COLUMNAR TULIP TREE	2	5cm CAL.
POPULUS TREMULA 'ERECTA'	COLUMNAR SWEDISH ASPEN	2	4cm CAL.
SHRUBS			
CORNUS SERICEA 'KELSEYI'	KELSEY DOGWOOD	12	#01 CONT. /1.2M O.C. SPACING
EUONYMUS ALATUS 'SELECT'	DWARF BURNING BUSH	8	#01 CONT. /1.5M O.C. SPACING
HYDRANGEA PANICULATA 'JAN'	LITTLE LIME HYDRANGEAA	12	#01 CONT. /1.2M O.C. SPACING
PINUS ABIES 'NIDIFORMIS'	NEST SPRUCE	8	#01 CONT. /1.5M O.C. SPACING
SPIREA BUMALDA 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	12	#01 CONT. /1.2M O.C. SPACING
SYRINGA MEYERI 'PALIBIN'	DWARF KOREAN LILAC	8	#01 CONT. /1.5M O.C. SPACING
PERENNIALS, GRASSES & GROUNDCOVERS			
ARCTOSTAPHYLOS UVA-URSI	KINNICKINNICK	15	#01 CONT. /0.9M O.C. SPACING
CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER REED GRASS	15	#01 CONT. /0.9M O.C. SPACING
ECHINACEA 'CHEYENNE SPIRIT'	CHEYENNE SPIRIT CONEFLOWER	15	#01 CONT. /0.9M O.C. SPACING
PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS	8	#01 CONT. /1.2M O.C. SPACING
PEROVSKIA ATRIPLICIFOLIA	RUSSIAN SAGE	12	#01 CONT. /1.0M O.C. SPACING
SEDUM SPECTABILE 'AUTUMN JOY'	AUTUMN JOY STONECROP	15	#01 CONT. /0.9M O.C. SPACING

ecora
200-2045 Enterprise Way
Kelowna, BC V1Y 9T5
T (250) 469-9757
www.ecora.ca

N

PROJECT TITLE

3179 VIA CENTRALE

Kelowna, BC

DRAWING TITLE

CONCEPTUAL LANDSCAPE PLAN

ISSUED FOR / REVISION		
1	21.12.20	Issued for Development Permit
2	21.12.22	Issued for Development Permit
3	23.05.31	Issued for Development Permit
4		
5		

PROJECT NO.	21-097
DESIGN BY	FB
DRAWN BY	NG
CHECKED BY	FB
DATE	MAY 31, 2023
SCALE	1:100
PAGE SIZE	24x36"

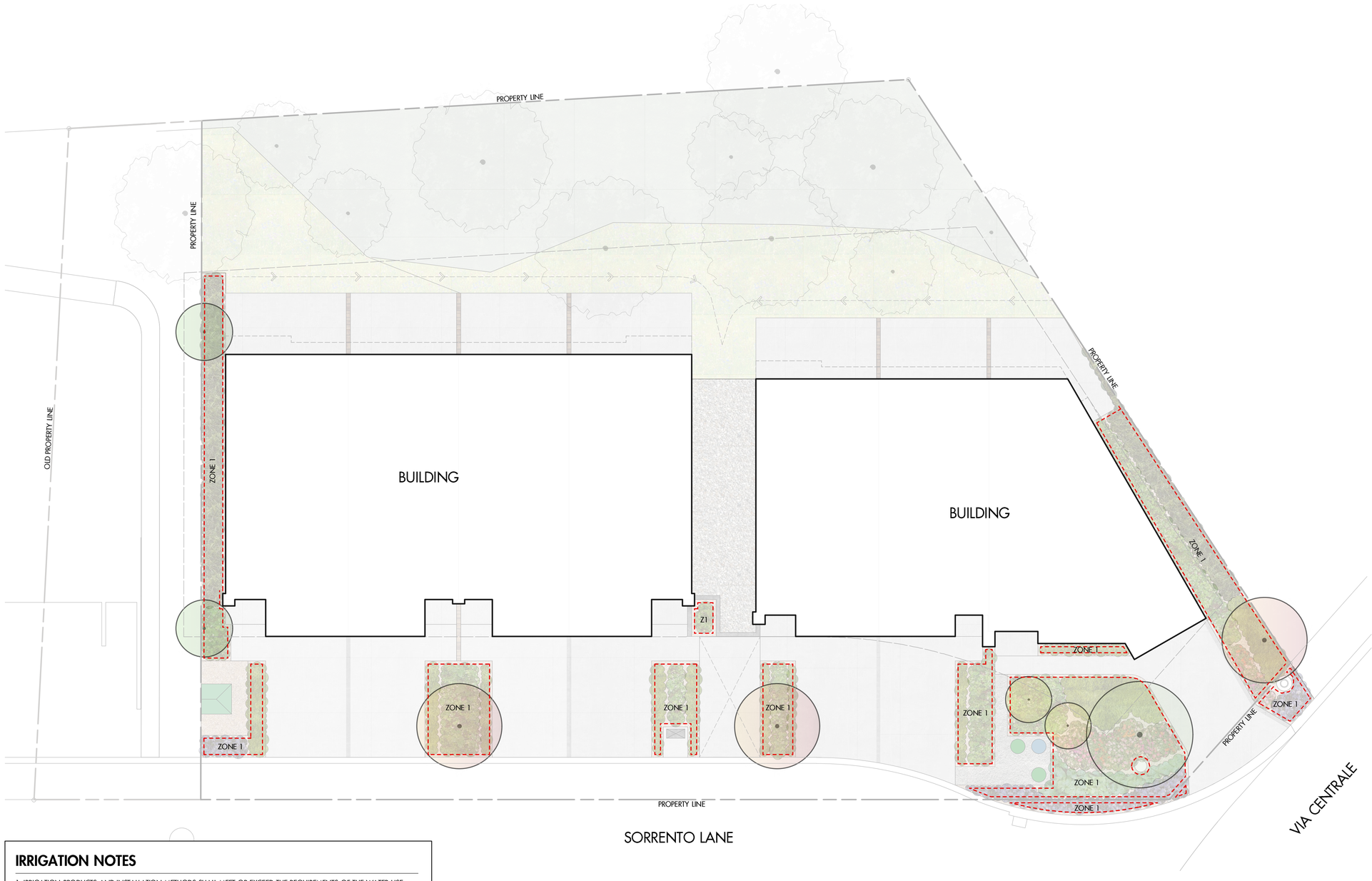
SEAL

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS
REGISTERED MEMBER
FIONA BARTON
334

DRAWING NUMBER

L 1/2

NOT FOR CONSTRUCTION



IRRIGATION NOTES

1. IRRIGATION PRODUCTS AND INSTALLATION METHODS SHALL MEET OR EXCEED THE REQUIREMENTS OF THE WATER USE REGULATION BYLAW NO. 10480 AND THE SUPPLEMENTARY SPECIFICATIONS IN THE CITY OF KELOWNA BYLAW 7900 (PART 6, SCHEDULE 5).

2. THE IRRIGATION SYSTEM SHALL MEET THE REQUIREMENTS, REGULATIONS, AND BYLAWS OF THE WATER PURVEYOR.

3. THE IRRIGATION SYSTEM SHALL BE EQUIPPED WITH AN APPROVED BACKFLOW PREVENTION DEVICE, WATER METER, AND SHUT OFF VALVE LOCATED OUTSIDE THE BUILDING ACCESSIBLE TO THE CITY.

4. AN APPROVED SMART CONTROLLER SHALL BE INSTALLED. THE IRRIGATION SCHEDULING TIMES SHALL UTILIZE A MAXIMUM ET VALUE OF 7" / MONTH (KELOWNA JULY ET), TAKING INTO CONSIDERATION SOIL TYPE, SLOPE, AND MICROCLIMATE.

5. DRIP LINE AND EMITTERS SHALL INCORPORATE TECHNOLOGY TO LIMIT ROOT INTRUSION.

6. IRRIGATION SLEEVES SHALL BE INSTALLED TO ROUTE IRRIGATION LINES UNDER HARD SURFACES AND FEATURES.

7. IRRIGATION PIPE SHALL BE SIZED TO ALLOW FOR A MAXIMUM FLOW OF 1.5m /SEC.

8. A FLOW SENSOR AND MASTER VALVE SHALL BE CONNECTED TO THE CONTROLLER AND PROGRAMMED TO STOP FLOW TO THE SYSTEM IN CASE OF AN IRRIGATION WATER LEAK.

IRRIGATION LEGEND

ZONE #1: HIGH EFFICIENCY SUBSURFACE DRIP IRRIGATION FOR MODERATE WATER USE PLANTING AREAS
TOTAL AREA: 171 sq.m.
MICROCLIMATE: NORTHWEST EXPOSURE, PARTIALLY SHADED BY TREES & BUILDING
ESTIMATED ANNUAL WATER USE: 57 cu.m.

WATER CONSERVATION CALCULATIONS

LANDSCAPE MAXIMUM WATER BUDGET (WB) = 368 cu.m. / year
ESTIMATED LANDSCAPE WATER USE (WU) = 57 cu.m. / year
WATER BALANCE = 311 cu.m. / year
*REFER ATTACHED IRRIGATION APPLICATION FOR DETAILED CALCULATIONS

ecora
200-2045 Enterprise Way
Kelowna, BC V1Y 9T5
T (250) 469-9757
www.ecora.ca

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PROJECT TITLE
3179 VIA CENTRALE

Kelowna, BC

DRAWING TITLE
WATER CONSERVATION/ IRRIGATION PLAN

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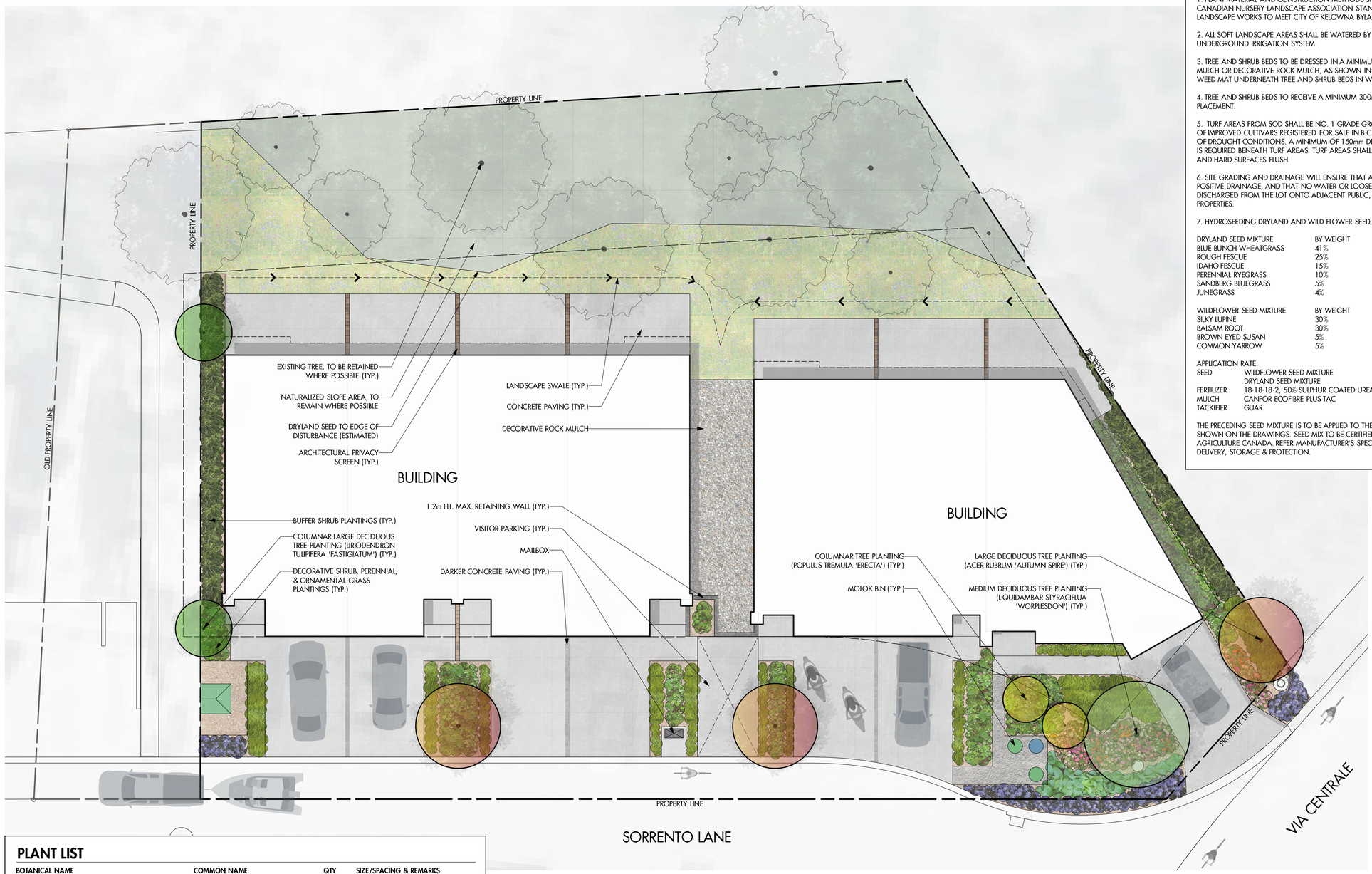

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SHRUBS			
CORNUS SERICEA 'KELSEYI'	KELSEY DOGWOOD	12	#01 CONT. /1.2M O.C. SPACING
EUONYMUS ALATUS 'SELECT'	DWARF BURNING BUSH	8	#01 CONT. /1.5M O.C. SPACING
HYDRANGEA PANICULATA 'JAN'	LITTLE LIME HYDRANGEAA	12	#01 CONT. /1.2M O.C. SPACING
PINUS ABIES 'NIDIFORMIS'	NEST SPRUCE	8	#01 CONT. /1.5M O.C. SPACING
SPIREA BUMALDA 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	12	#01 CONT. /1.2M O.C. SPACING
SYRINGA MEYERI 'PALIBIN'	DWARF KOREAN LILAC	8	#01 CONT. /1.5M O.C. SPACING
PERENNIALS, GRASSES & GROUNDCOVERS			
ARCTOSTAPHYLOS UVA-URSI	KINNICKINNICK	15	#01 CONT. /0.9M O.C. SPACING
CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER REED GRASS	15	#01 CONT. /0.9M O.C. SPACING
ECHINACEA 'CHEYENNE SPIRIT'	CHEYENNE SPIRIT CONEFLOWER	15	#01 CONT. /0.9M O.C. SPACING
PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS	8	#01 CONT. /1.2M O.C. SPACING
PEROVSKIA ATRIPLICIFOLIA	RUSSIAN SAGE	12	#01 CONT. /1.0M O.C. SPACING
SEDUM SPECTABILE 'AUTUMN JOY'	AUTUMN JOY STONECROP	15	#01 CONT. /0.9M O.C. SPACING

ecora
200-2045 Enterprise Way
Kelowna, BC V1Y 9T5
T (250) 469-9757
www.ecora.ca

N

PROJECT TITLE

3179 VIA CENTRALE

Kelowna, BC

DRAWING TITLE

CONCEPTUAL LANDSCAPE PLAN

ISSUED FOR / REVISION		
1	21.12.20	Issued for Development Permit
2	21.12.22	Issued for Development Permit
3	23.05.31	Issued for Development Permit
4		
5		

PROJECT NO.	21-097
DESIGN BY	FB
DRAWN BY	NG
CHECKED BY	FB
DATE	MAY 31, 2023
SCALE	1:100
PAGE SIZE	24x36"

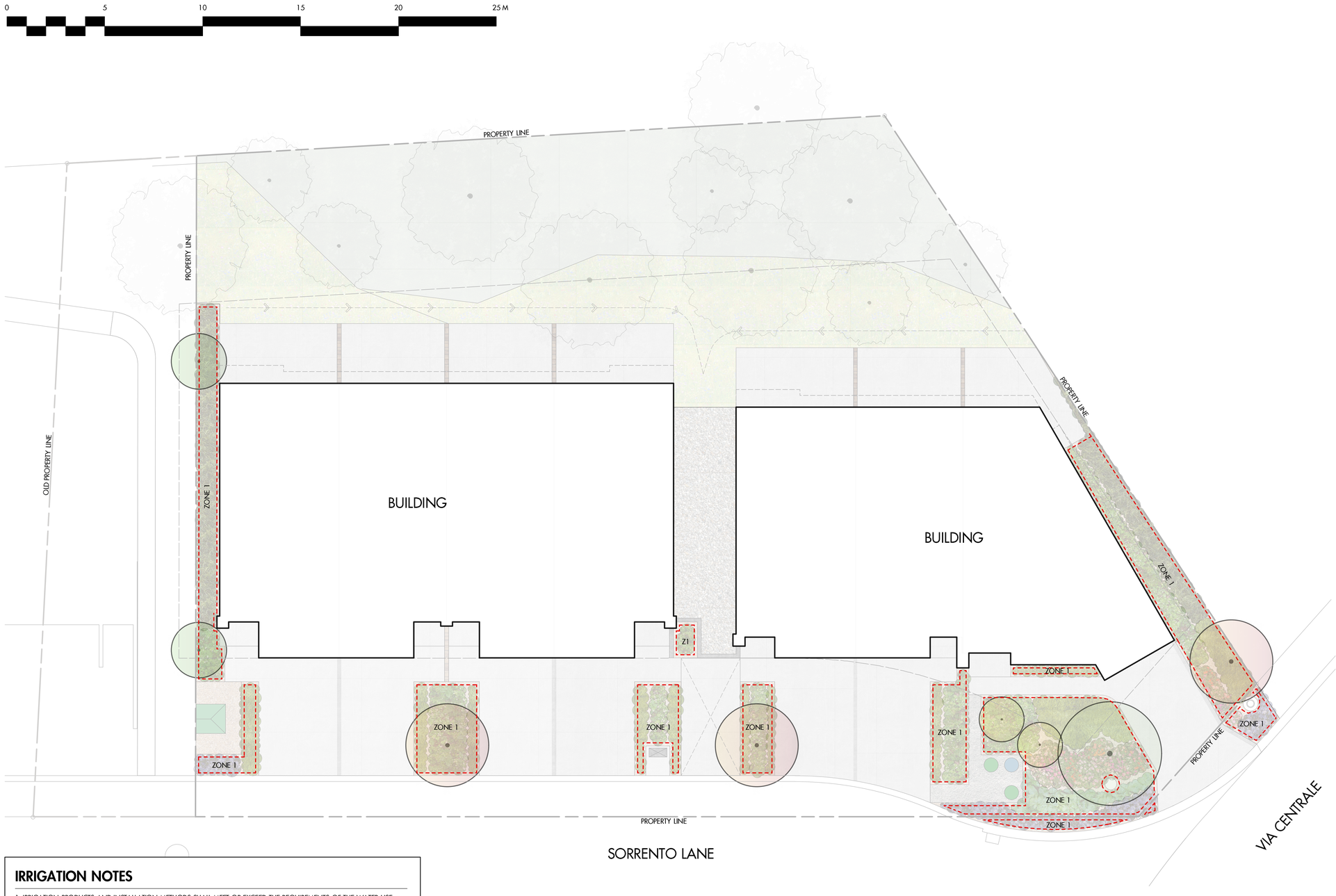
SEAL

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS
REGISTERED MEMBER
FIONA BARTON
334

DRAWING NUMBER

L 1/2

NOT FOR CONSTRUCTION



IRRIGATION NOTES

1. IRRIGATION PRODUCTS AND INSTALLATION METHODS SHALL MEET OR EXCEED THE REQUIREMENTS OF THE WATER USE REGULATION BYLAW NO. 10480 AND THE SUPPLEMENTARY SPECIFICATIONS IN THE CITY OF KELOWNA BYLAW 7900 (PART 6, SCHEDULE 5).

2. THE IRRIGATION SYSTEM SHALL MEET THE REQUIREMENTS, REGULATIONS, AND BYLAWS OF THE WATER PURVEYOR.

3. THE IRRIGATION SYSTEM SHALL BE EQUIPPED WITH AN APPROVED BACKFLOW PREVENTION DEVICE, WATER METER, AND SHUT OFF VALVE LOCATED OUTSIDE THE BUILDING ACCESSIBLE TO THE CITY.

4. AN APPROVED SMART CONTROLLER SHALL BE INSTALLED. THE IRRIGATION SCHEDULING TIMES SHALL UTILIZE A MAXIMUM ET VALUE OF 7" / MONTH (KELOWNA JULY ET), TAKING INTO CONSIDERATION SOIL TYPE, SLOPE, AND MICROCLIMATE.

5. DRIP LINE AND EMITTERS SHALL INCORPORATE TECHNOLOGY TO LIMIT ROOT INTRUSION.

6. IRRIGATION SLEEVES SHALL BE INSTALLED TO ROUTE IRRIGATION LINES UNDER HARD SURFACES AND FEATURES.

7. IRRIGATION PIPE SHALL BE SIZED TO ALLOW FOR A MAXIMUM FLOW OF 1.5m /SEC.

8. A FLOW SENSOR AND MASTER VALVE SHALL BE CONNECTED TO THE CONTROLLER AND PROGRAMMED TO STOP FLOW TO THE SYSTEM IN CASE OF AN IRRIGATION WATER LEAK.

IRRIGATION LEGEND

ZONE #1: HIGH EFFICIENCY SUBSURFACE DRIP IRRIGATION FOR MODERATE WATER USE PLANTING AREAS
TOTAL AREA: 171 sq.m.
MICROCLIMATE: NORTHWEST EXPOSURE, PARTIALLY SHADED BY TREES & BUILDING
ESTIMATED ANNUAL WATER USE: 57 cu.m.

WATER CONSERVATION CALCULATIONS

LANDSCAPE MAXIMUM WATER BUDGET (WB) = 368 cu.m. / year
ESTIMATED LANDSCAPE WATER USE (WU) = 57 cu.m. / year
WATER BALANCE = 311 cu.m. / year
*REFER ATTACHED IRRIGATION APPLICATION FOR DETAILED CALCULATIONS

ecora
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T (250) 469-9757
www.ecora.ca

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PROJECT TITLE
3179 VIA CENTRALE

Kelowna, BC

DRAWING TITLE
WATER CONSERVATION/ IRRIGATION PLAN

ISSUED FOR / REVISION		
1	21.12.20	Issued for Development Permit
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REGISTERED MEMBER
FIONA BARTON
334

DRAWING NUMBER
L2/2

ISSUED FOR REVIEW ONLY

City of Kelowna

1435 Water Street
Kelowna, BC V1Y 1J4
250 469-8500
kelowna.ca

Landscape Water Conservation Report

APPLICANT INFORMATION

Owner	The Pointe at Quail LP	Contractor co. name	Ecora Engineering & Resource Group Ltd.
Project address	3197 Via Centrale	Contractor contact name	Fiona Barton
City	Kelowna	Contractor phone #	250-469-9757
Owner phone #	(403) 990-8871	Contractor email	fiona.barton@ecora.ca
Owner email	gm@carlisleg.ca		
Province	BC	Postal Code:	

Preferred contact Owner ☐ Contractor ☐

NOTE: ALL 3 PAGES OF THE APPLICATION MUST BE COMPLETED AND SUBMITTED

LANDSCAPE AND IRRIGATION CHECKLIST

The Applicant in submitting this application, has adhered to:

- ☑ Applicable elctrical standards, plumbing standards, and backflow prevention standards
- ☑ Bylaw 7900 Schedule 4 and 5
- ☑ Requirements of Water Regulation Bylaw

Where an exemption is required (e.g. golf course or large school field), contact the Water Smart program directly.

Note that checklists for selecting an irrigation contractor are available through the IIABC or the IA. Below is the link to the IIABC checklist.

https://www.irrigationbc.com/page/selecting-a-contractor

☐

Applicant notes pertaining to the application:

City of Kelowna

1435 Water Street
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kelowna.ca

Landscape Water Conservation Report

LANDSCAPE WATER USE AREA

Applicant: The Pointe at Quail LP | Address: 3197 Via Centrale

Step 1: Measure Total Landscape Area (LA)

Area of site that will absorb water: 614 sq.m. (over 100 square meters)

Note: Include boulevard, and proposed lawn, plants, mulch, pervious decks or paving stones. Do not include areas that are not pervious such as buildings, paved driveways, concrete patios etc.

Step 2: Divide Into Landscape Treatments*		Plant Factor	Irrig Efficiency	Hydrozone Area	% of Total LA	Estimated Water
Note: each of the areas below are a 'HYDROZONE'		(PF)	(IE)	(HA)		(WU)
Unwatered Pervious Areas (not impervious paving)						
Mulch (Stone, bark or sand)		N/A	N/A	38	6%	N/A
Pervious deck (Spaced wood deck)		N/A	N/A		0%	N/A
Pervious paving (ie: AquaPave, Rima Pave)		N/A	N/A		0%	N/A
Naturalized meadow (wildflowers)		N/A	N/A	163	27%	N/A
Naturalized area (Existing natural area)		N/A	N/A	242	39%	N/A
Other:		N/A	N/A		0%	N/A
Swimming or ornamental pool		1	1		0%	0
Watered Planting Beds (shrubs or groundcover)						
Planting Type	*Irrig Efficiency*					
Low water use plants	High (Drip or Bubbler)	0.3	0.9		0%	0
Low water use plants	Moderate (Spray orRotor)	0.3	0.7		0%	0
Moderate water use plants	High (Drip or Bubbler)	0.5	0.9	171	28%	57
Moderate water use plants	Moderate (Spray orRotor)	0.5	0.7		0%	0
High water use plants	High (Drip or Bubbler)	0.7	0.9		0%	0
High water use plants	Moderate (Spray orRotor)	0.7	0.7		0%	0
Watered Mown Lawn Areas	Moderate (Spray orRotor)	1	0.7		0%	0
Special Landscape Areas (SLA)						
Vegetable Garden	High (Drip or Bubbler)	1	0.9		0%	0
Vegetable Garden	Moderate (Spray orRotor)	1	0.7		0%	0
Commercial sportsfield turf	Moderate (Spray orRotor)	1	0.7		0%	0
Rainwater or Recycled Water Use		0.3	1		0%	0
Totals				614	100%	57
Special Landscape Area (SLA) Sub total				0		

*If proposed design conditions are not shown on the form please contact Water Smart 250-469-8502

City of Kelowna

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kelowna.ca

Landscape Water Conservation Report

Applicant:	The Pointe at Quail LP	Address:	3197 Via Centrale

CALCULATE & COMPARE WATER BUDGET TO ESTIMATED WATER USE

Total Landscape Area	614	sq.m.
Landscape Water Budget (WB)	368	cu.m./yr.
Estimated Landscape Water Use (WU)	57	cu.m./yr.
Under (-OVER) Budget (Must be under Water Budget WB)	311	cu.m./yr.
	OK	

I confirm by completing the attached Landscape Water Conservation Report, that the project will conform to industry best practices for landscape and irrigation installation in Kelowna. I also acknowledge that the landscape treatments of the project will conform to the Hydrozone areas as identified in the Landscape Area Water Use Area table.

Name of Applicant (person submitting the form)

Date:

FOR CITY OF KELOWNA OFFICE USE ONLY

The calculations above satisfy the requirements of the Water Regulation Bylaw 10480 Section 4.4.2 and 4.4.3.and the application is hereby APPROVED with the signature of the Water Manager or designate.

Name of Kelowna Water Smart designate
For Water Manager

Date:

SKETCH PLAN TO ACCOMPANY A FORM 'P' SHOWING A THREE PHASE STRATA ON LOT A, SEC 14 AND 15, TP 23, ODYD, PLAN KAP56202 AND AN UNDIVIDED $^{12}/_{72}$ SHARE IN LOT 2, PLAN KAP54660 (SEE PLAN AS TO LIMITED ACCESS).

BCGS 82E.083
SCALE 1:600 METRIC

0 12 36 60

The intended plot size of this plan is 280mm in width by 432mm in height (B-size) when plotted at a scale of 1:600 METRIC.

PHASE 1 - Strata Lots 1 - 12
PHASE 2 - None
PHASE 3 - Strata Lots 13 - 24

REM A
PLAN KAP56201

STRATA PLAN
KAS2698

PHASE 3

PLAN KAP56202

STRATA PLAN
KAS1655

STRATA PLAN
KAS3430

PHASE 2

PHASE 1

COMMON LOT
PLAN KAP54660

EASEMENT PLAN KAP54665

EASEMENT PLAN KAP54663

EASEMENT PLAN KAP54662

EASEMENT PLAN KAP54666

SRW PLAN KAP54661

EASEMENT PLAN KAP54687

164°15'50" 17.318
179°38'05" 19.842
124°29'50" 70.730
178°51'40" 32.444
3°20'05" 39.921
25°14'40" 11.731
11.933
123°32'10" 5.764
55"
139°07'25" 10.150
14.866
101°38'50" 25.450
63°27'05"
00.
18.876
16°
123°32'10" 9.098
48°41'40" 34.675
35.193
168°
82°01'11" 33.767
6.619
36'
8.296
55'
33.428
84°54'21"
22.602
05"
48.150
171°
43.627
35"
"00'61°1 18.117
168°01'10" 21.715
37.490
55°25'05"

DA Goddard Surveys
1315 St. Paul Street, Kelowna BC
File: 421074-SD October 17, 2022