Schedule 5

CLIENT	# WESTURBAN DEVELOPMENTS LTD.
ADDRESS / CONTACT INFO.	111-2036 SOUTH ISLAND HIGHWAY, CAMPBELL RIVER, BC, V9W 0E8
PROJECT NAME	3601 OLYMPIAN WAY
DESCRIPTION	CIVIL
McELHANNEY PROJECT	2221-49657-04
OTHER REFERENCE	00000
STATUS	RE-ISSUED FOR BUILDING PERMIT



GENERAL NOTES

1. ALL WATER SYSTEM CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH THE CAPITAL REGIONAL DISTRICT WATER SERVICES (CRDWS) UNLESS OTHERWISE NOTED.
2. UNLESS OTHERWISE NOTED, ALL OFF-SITE CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD) - LATEST EDITION, VOLUME II AND ALL SUPPLEMENTARIES, CITY OF COLWOOD ENGINEERING SPECIFICATIONS AND STANDARD DRAWINGS.
3. IF A CONFLICT BETWEEN THE SPECIFICATIONS ARISES, THE MOST STRINGENT SPECIFICATION SHALL APPLY.
4. ENSURE MINIMAL DISRUPTION TO LOCAL TRAFFIC IN ACCORDANCE WITH CITY OF COLWOOD REQUIREMENTS.
5. OBTAIN A PERMIT TO CONSTRUCT WORKS ON A MUNICIPAL RIGHT OF WAY FROM CITY OF COLWOOD MINIMUM 48 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.
6. CONTACT THE CITY OF COLWOOD ENGINEERING DEPARTMENT 24 HOURS PRIOR TO BLASTING ON SITE, OBTAIN AND PAY FOR BLASTING PERMIT AND FEES. PROVIDE BLASTING PROCEDURES IN ACCORDANCE WITH MMCD SECTION 31 23 17 - ROCK REMOVAL.
7. MAINTAIN AN UP-TO-DATE SET OF REDLINE DRAWINGS FOR THE PREPARATION OF AS-CONSTRUCTED DRAWINGS. THE REDLINES ARE TO BE DELIVERED TO THE ENGINEER PRIOR TO SUBSTANTIAL PERFORMANCE. ALL DATA REQUIRED MUST BE ACCEPTABLE TO THE ENGINEER TO PREPARE THE AS-CONSTRUCTED DRAWINGS. MISSING OR INADEQUATE DATA TO BE PROVIDED BY THE CONTRACTOR OR BY AN INDEPENDENT SURVEYOR AT THE CONTRACTOR'S EXPENSE.
8. ENSURE EXISTING MONUMENTS AND IRON PINS ARE NOT DISTURBED DURING CONSTRUCTION. ANY MONUMENTS OR IRON PINS IN DANGER OF DISTURBANCE ARE TO BE REFERENCED AND, IF DISTURBED, BE REPLACED BY A BCLS AT THE CONTRACTORS EXPENSE.
9. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION LAYOUT, MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES FOR COORDINATING THE VARIOUS PARTS OF THE WORK IN THESE DRAWINGS, McELHANNEY WILL PROVIDE DIGITAL FILES FOR LAYOUT PURPOSES UPON REQUEST.
10. PRIOR TO THE START OF CONSTRUCTION, PROVIDE WRITTEN CONFIRMATION TO CITY OF COLWOOD AND McELHANNEY LTD. THAT THEY WILL ASSUME THE RESPONSIBILITIES OF THE PRIME CONTRACTOR AS OUTLINED IN THE WORKERS COMPENSATION ACT FOR THE DURATION OF THE PROJECT.
11. NO CONSTRUCTION TO TAKE PLACE UNLESS DRAWINGS ARE ISSUED FOR CONSTRUCTION AND ALL APPROVALS ARE IN PLACE. CONFIRM WITH ENGINEER.
12. ARRANGE A PRE-CONSTRUCTION MEETING PRIOR TO THE START OF CONSTRUCTION AND MUST INCLUDE THE ENGINEER AND CITY OF COLWOOD REPRESENTATIVE.
13. IN THE EVENT OF ANY CONFLICT BETWEEN THE EXISTING INFRASTRUCTURE AND THE DESIGN, NOTIFY THE ENGINEER IMMEDIATELY.
14. AFTER CONSTRUCTION, RESTORE WORK AREAS AND ALL EXISTING FEATURES TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF CITY OF COLWOOD AND/OR ENGINEER.
15. ADJUST ALL PROPOSED AND EXISTING APPURTENANCES TO MEET THE FINAL GRADES.
16. PROVIDE TRAFFIC MANAGEMENT PLAN FOR REVIEW AND APPROVAL. NO WORK TO OCCUR BEFORE TRAFFIC MANAGEMENT PLAN IS APPROVED.

TRENCHING, EXCAVATING AND BACKFILLING

1. EXCAVATE TO CONFIRM LOCATION AND ELEVATION OF EXISTING UTILITIES AT ALL CROSSINGS AND CONNECTION POINTS AND CONFIRM ELEVATIONS WITH THE ENGINEER PRIOR TO CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND ARE REQUIRED TO BE CONFIRMED IN THE FIELD. ANY DAMAGE OR REPAIR TO EXISTING UTILITIES SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.
2. DO NOT START ANY BACKFILL OPERATION DURING CONSTRUCTION PRIOR TO THE ENGINEER'S INSPECTION.
3. ENSURE THAT ALL THE EXISTING SERVICES REMAIN IN OPERATION DURING CONSTRUCTION.
4. ALL STORM DRAIN TRENCHING AND BEDDING TO BE IN ACCORDANCE WITH MMCD SECTION 31 23 01 - EXCAVATING, TRENCHING AND BACKFILLING.
5. ALL OTHER UTILITY TRENCHING TO BE IN ACCORDANCE WITH MMCD STD. DWG. SS G4 AND SECTION 31 23 01 - EXCAVATING TRENCHING & BACKFILLING AND/OR AS REQUIRED BY THE UTILITY COMPANY.
6. ALL GRANULAR WHERE A TRENCH IS UNDER OR WITHIN 1.0m FROM THE EDGE OF A ROAD OR DRIVEWAY, USE PIT RUN GRAVEL BACKFILL FROM THE TOP OF THE PIPE BEDDING TO THE TOP OF THE ROAD, PARKING OR DRIVEWAY SUBGRADE.
7. ALL EXCAVATION TO BE AS PER WORKSAFE BC REQUIREMENTS UNLESS OTHERWISE APPROVED IN WRITING BY A GEOTECHNICAL ENGINEER.
8. ALL GRANULAR BASE AND GRANULAR SUB-BASE TO BE IN ACCORDANCE WITH MMCD SECTION 31 05 17 - AGGREGATES (GRANULAR MATERIALS.
9. RETAIN AND PAY FOR THE SERVICES OF A QUALIFIED INDEPENDENT GEOTECHNICAL TESTING ENGINEER TO PROVIDE QUALITY CONTROL SERVICES DURING CONSTRUCTION AND SHALL PROVIDE THE FOLLOWING AT A MINIMUM UNLESS APPROVED IN WRITING BY A GEOTECHNICAL ENGINEER
   - 9.1. SIEVE ANALYSIS OF SANDS AND AGGREGATES SUPPLIED TO THE WORK.
   - 9.2. STANDARD PROCTOR DENSITY CURVES FOR BACKFILL MATERIALS.
   - 9.3. STANDARD PROCTOR DENSITY CURVES FOR APPROVED BORROW MATERIALS.
   - 9.4. TRENCH BEDDING DENSITY TEST (MAINLINE) - ONE FOR EVERY 75m OF TRENCH. MINIMUM ONE BETWEEN ANY TWO MANHOLES.
   - 9.5. TRENCH BACKFILL DENSITY TEST (MAINLINE) - ONE FOR EVERY 75m OF TRENCH AT EACH 1.0m FILL DEPTH. MINIMUM ONE BETWEEN ANY TWO MANHOLES (INCLUDING ONE AT SURFACE LEVEL).
   - 9.6. TRENCH BACKFILL DENSITY TEST (SERVICE) - ONE PER SERVICE AT EACH 1.0m FILL DEPTH (INCLUDING ONE AT SURFACE LEVEL).

ROADWORKS

1. ALL PAVING TO BE IN ACCORDANCE WITH MMCD SECTION 32 12 16 - HOT-MIX ASPHALT CONCRETE PAVING. MIX DESIGN TO BE APPROVED BY GEOTECHNICAL ENGINEER.
2. ALL CONCRETE WALKS, CURBS AND GUTTERS TO BE IN ACCORDANCE WITH MMCD SECTION 03 30 20 - CONCRETE WALKS, CURBS & GUTTERS, MIX DESIGN TO BE APPROVED BY GEOTECHNICAL ENGINEER.
3. ALL NON-MOUNTABLE CURB (NMC) AND MOUNTABLE CURB (MC) TO BE CONSTRUCTED AS PER MMCD STD, DWG, C4.
4. ALL GRANULAR BASE AND GRANULAR SUB-BASE TO BE IN ACCORDANCE WITH MMCD SECTION 31 05 17 - AGGREGATES & GRANULAR MATERIALS.
5. ALL TRENCH RESTORATION WITHIN THE ORIGINAL PAVED SURFACE SHALL BE AS PER MMCD DWG. G5 AND TO THE SATISFACTION THE CITY OF COLWOOD.
6. RETAIN AND PAY FOR THE SERVICES OF A QUALIFIED INDEPENDENT GEOTECHNICAL TESTING ENGINEER TO PROVIDE QUALITY CONTROL SERVICES DURING CONSTRUCTION AND SHALL PROVIDE THE FOLLOWING AT A MINIMUM UNLESS APPROVED IN WRITING BY A GEOTECHNICAL ENGINEER
   - 6.1. SIEVE ANALYSIS OF SANDS AND AGGREGATES SUPPLIED TO THE WORK.
   - 6.2. MODIFIED PROCTOR DENSITY CURVES FOR BACKFILL MATERIALS.
   - 6.3. MODIFIED PROCTOR DENSITY CURVES FOR APPROVED BORROW MATERIALS.
   - 6.4. COMPACTION CONTROL TESTS FOR BACKFILL AND EMBANKMENT MATERIAL INCLUDING:
     - 6.4.1. GRANULAR BASE (CURBS) - ONCE PER 50 LINEAL METRES OR PROOF ROLL TEST, FULL LENGTH.
     - 6.4.2. GRANULAR BASE (ROADS) - ONCE PER 50 LINEAL METRES OR PROOF ROLL TEST. FULL LENGTH.
     - 6.4.3. GRANULAR BASE (WALKWAYS) - ONCE PER 50 LINEAL METRES OR PROOF ROLL TEST, FULL LENGTH.
   - 6.5. CONCRETE MIX DESIGN AND TESTING
   - 6.6. CONCRETE STRENGTH TESTS (MINIMUM THREE SPECIMEN CYLINDERS IN ACCORDANCE WITH CSA A23.1) FOR THE FOLLOWING:
     - 6.6.1. CURB AND GUTTER - ONCE PER 150 LINEAL METRES (MINIMUM ONE PER DAY DURING CONCRETE PLACING)
   - 6.7. ASPHALT MIX DESIGN AND TESTING
   - 6.8. ASPHALT TESTS FOR THE FOLLOWING:
     - 6.8.1. AGGREGATE GRADATION TESTS - ONE PER 300 TONNES OF PRODUCTION (MINIMUM ONE PER DAY DURING ASPHALT PLACEMENT).
     - 6.8.2. MARSHALL TEST - THREE BRIQUETTES FOR EVERY 300 TONNES OF PRODUCTION (MINIMUM ONE PER DAY DURING ASPHALT PLACEMENT).
     - 6.8.3. COMPACTION - ONE CORE FOR EVERY 500sq.m PLACED.
7. BOULEVARDS TO BE TOPSOILED AND SODDED IN ACCORDANCE WITH MMCD SECTION 32 92 23 - SODDING.
8. SUBGRADE TO BE APPROVED BY GEOTECHNICAL ENGINEER, ANY FAILURE OF THE SUBGRADE AFTER APPROVAL IS THE RESPONSIBILITY OF THE CONTRACTOR, ANY MITIGATION PROCEDURES REQUIRED TO PROTECT THE SUBGRADE IS THE RESPONSIBILITY OF AND AT THE EXPENSE OF THE CONTRACTOR.
9. PROPOSED CURB/GUTTER GRADES ARE BASED ON AVAILABLE SURVEY, INCLUDING INTERPOLATION BETWEEN KNOWN POINTS, ROAD CROSSFALL AND LONGITUDINAL CURB GRADES ARE BOTH TO BE MAINTAINED – WITHOUT EXCESSIVE TRANSVERSE GRADES OR FLAT AREAS OF PAVEMENT RESULTING. THE CONTRACTOR IS TO CHECK CURB FORMS AND/OR STRING LINES TO ENSURE COMPATIBILITY WITH CROSS FALL OF THE EXISTING ROAD, INCLUDING ANY MILLED AREAS - NOTING THE ABOVE REQUIRED CONSTRUCTION PERFORMANCE OBJECTIVES. IF, ON THIS BASIS, CURB FORM AND/OR STRING LINE ADJUSTMENTS ARE NECESSARY, THE CONTRACTOR IS TO NOTIFY McELHANNEY, TO ALLOW FOR REVIEW AND DESIGN REVISIONS PRIOR TO CURB INSTALLATION. THE CONTRACTOR IS TO NOTIFY WHEN FINAL ADJUSTED CURB FORMS AND/OR STRING LINES ARE READY FOR REVIEW BY McELHANNEY – [FOLLOWING CROSSFALL CHECKS] - PRIOR TO CURB INSTALLATION.

SIGNING AND PAVEMENT MARKINGS

1. PAVEMENT MARKING MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH MMCD SECTION 32 17 23 - PAINTED PAVEMENT MARKINGS.
2. ALL SIGNAGE AND PAVEMENT MARKINGS TO BE AS PER THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA & TRANSPORTATION ASSOCIATION OF CANADA - PEDESTRIAN CROSSING CONTROL GUIDE. REFERENCE MANUAL OF STANDARD TRAFFIC SIGNS AND PAVEMENT MARKINGS (SEPTEMBER 2000). ALL SIGNS TO HAVE "DIAMOND GRADE" REFLECTIVE SHEETING.

HYDRO, TELEPHONE, STREETLIGHTING, CABLE & GAS

1. CONTACT "BC ONE CALL" AT 1-800-474-6886 A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION, REVIEW INFORMATION PRIOR TO START OF ANY EXCAVATION.
2. CONTACT BC HYDRO, TELUS, ROGERS AND FORTISBC 48 HOURS PRIOR TO THE START OF ANY EXCAVATION.
3. CONNECTION TO, OR ALTERATION OF, EXISTING BC HYDRO, TELUS, SHAW CABLE, FORTISBC, CRD OR OTHER UTILITIES WILL BE UNDERTAKEN BY THE APPROPRIATE UTILITY ONLY, PROVIDE SITE ACCESS TO ALL UTILITIES AS REQUIRED.
4. ANY BC HYDRO, TELUS, ROGERS OR FORTISBC FACILITIES SHOWN ON THE ENGINEERING DRAWINGS ARE SCHEMATIC ONLY, CONSTRUCT UNDERGROUND HYDRO, TELEPHONE AND CABLE AS SPECIFIED AND IN ACCORDANCE WITH BC HYDRO, TELUS AND ROGERS STANDARD SPECIFICATIONS AND DRAWINGS.
5. SEE DRAWINGS AND SPECIFICATIONS BY OTHERS, FOR HYDRO AND STREETLIGHTING.

WATER

1. ALL WATERWORKS CONSTRUCTION SHALL BE IN ACCORDANCE WITH CRD INTEGRATED WATER SERVICES (CRDWS) ENGINEERING SPECIFICATIONS AND STANDARD DRAWINGS.
2. PROVIDE MINIMUM 0.9m COVER FOR WATER MAINS, UNLESS OTHERWISE NOTED.
3. WHERE NEW CATCHBASIN (CB) LEADS DO NOT HAVE A 300mm VERTICAL SEPARATION, WRAP CB LEAD JOINTS WITH PETROLATUM TAPE.
4. MAINTAIN A MINIMUM OF 1.0m HORIZONTAL CENTER TO CENTER AND 150mm CLEAR VERTICAL SEPARATION BETWEEN WATER SERVICES AND ELECTRICAL CONDUITS, GAS MAINS AND TELEPHONE CONDUITS EXCEPT WHERE NOTED BY CRDWS.
5. PROVIDE 24 HOUR NOTICE TO CRDWS PRIOR TO PROCEEDING WITH ANY WATERWORKS.
6. CRDWS SHALL MAKE ALL CONNECTIONS TO EXISTING WATER MAINS AT APPLICANT'S EXPENSE. PROVIDE 48 HOURS NOTICE TO CRDWS FOR WORK REQUIRED BY CRDWS FORCES.

SANITARY SEWER & STORM DRAIN

1. ALL CATCHBASINS TO BE AS PER MMCD DWG, S11.
2. ENSURE ALL EXISTING SEWER AND STORM DRAIN SYSTEMS REMAIN IN USE DURING CONSTRUCTION AND RECONNECT EXISTING SERVICES TO PROPOSED MAINS AS REQUIRED.

ENVIRONMENTAL AND TREE PROTECTION

1. PROVIDE ALL EROSION AND SEDIMENT MEASURES INCLUDING, BUT NOT LIMITED TO, SILT FENCING, DEWATERING, CATCH BASIN FILTER SOCKS, ETC. ALL IN ACCORDANCE WITH REGULATORY AGENCY REQUIREMENTS. EROSION CONTROL MEASURES TO BE MONITORED AND REPAIRED AS REQUIRED.
2. OBTAIN PERMISSION FROM THE CITY OF COLWOOD PRIOR TO REMOVAL OF ANY TREES ON PRIVATE OR PUBLIC PROPERTY UNLESS SPECIFICALLY NOTED ON THESE DRAWINGS. TREES AND TREE ROOTS ARE TO BE PROTECTED DURING CONSTRUCTION, HAND DIG WHERE ROOTS OVER 50mm ARE ENCOUNTERED. TREE REMOVALS AND RETENTION MUST BE AS PER TREE PERMIT.
3. TREES THAT ARE TO BE RETAINED SHALL BE PROTECTED BY SNOW FENCING OR AS DIRECTED BY ARBORIST, ALL FENCING/HOARDING TO BE INSTALLED UNDER THE DIRECTION OF AN ARBORIST AND INSPECTED BY THE CITY OF COLWOOD PRIOR TO CONSTRUCTION.
4. STORMWATER MANAGEMENT PLAN AND EROSION AND SEDIMENT CONTROL MEASURES TO BE APPROVED BY CITY OF COLWOOD.

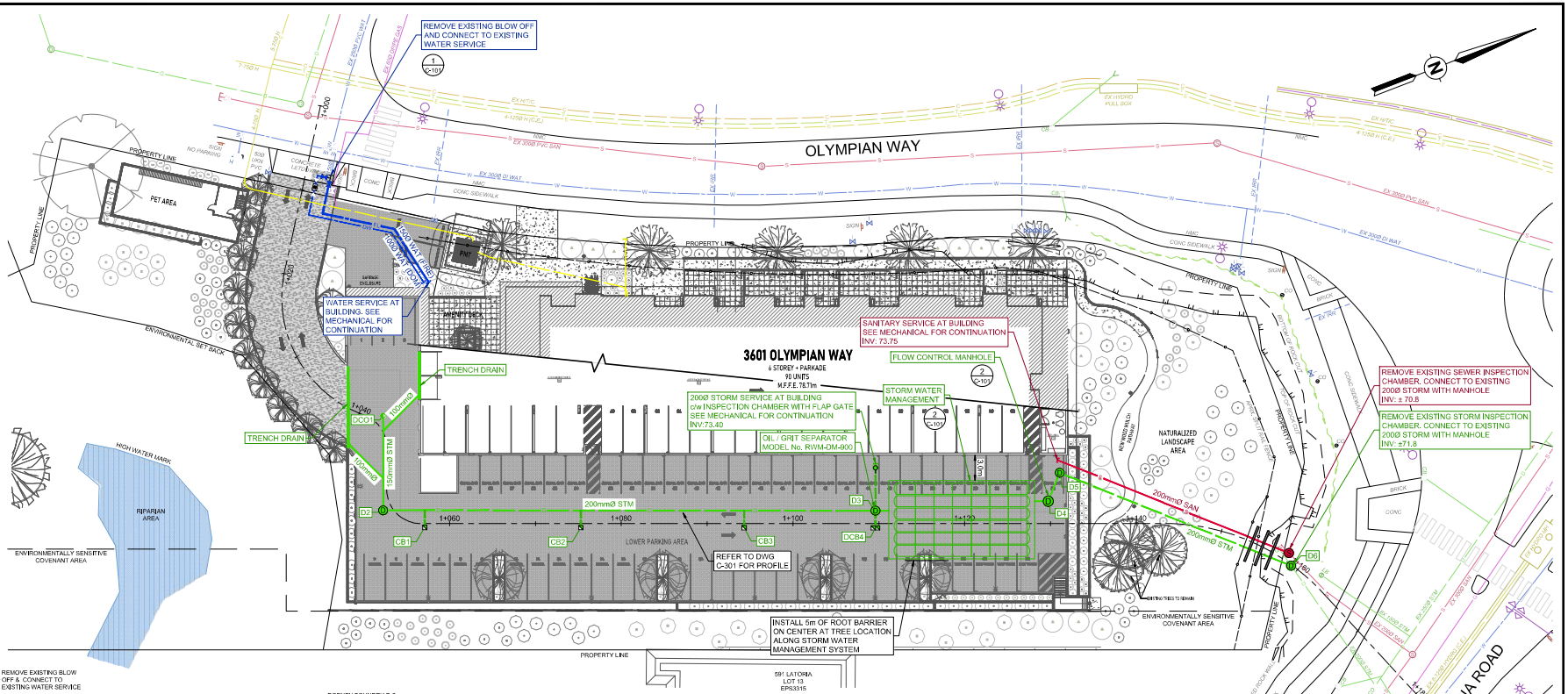
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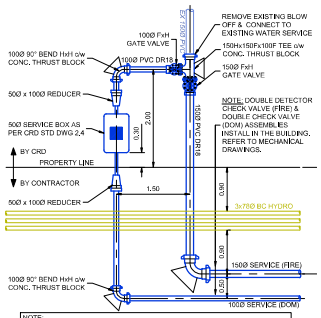
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C-001	COVER SHEET, GENERAL NOTES & LOCATION PLAN	X	X	X	X	X		
C-101	SITE SERVICING	X	X	X	X	X		
C-201	SITE GRADING	X	X	X	X	X		
C-301	ACCESS RAMP & LOWER PARKING AREA - PROFILE & SECTIONS	X	X	X	X	X		

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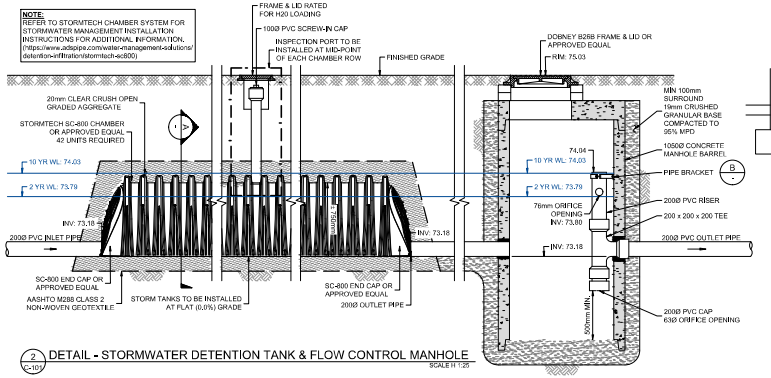
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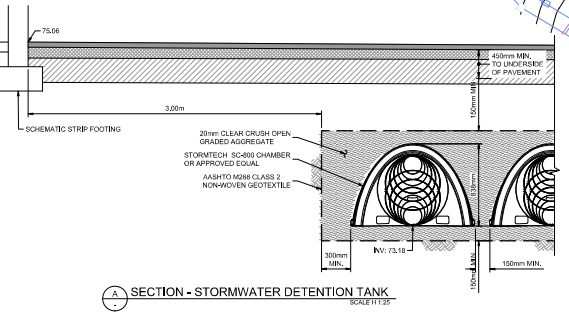




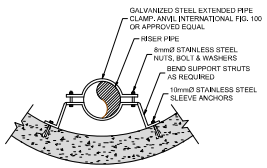
1 C-101 DETAIL - WATER SERVICE
SCALE H 1:50



2 C-101 DETAIL - STORMWATER DETENTION TANK & FLOW CONTROL MANHOLE
SCALE H 1:25



A SECTION - STORMWATER DETENTION TANK
SCALE H 1:25



B DETAIL - PIPE BRACKET
SCALE H NTS

Rev	Date	Description	Drawn	Design	Appd
1	2025-10-17	RE-ISSUED FOR BUILDING PERMIT	KB	DM	DC
0	2025-10-02	ISSUED FOR BUILDING PERMIT	KB	DM	DC
PC	2025-09-15	ISSUED FOR COORDINATION: 85%	KB	DM	DC
PB	2025-08-29	ISSUED FOR COORDINATION: 60%	PFE	DM	DC
PA	2025-08-18	ISSUED FOR COORDINATION: 30%	KB	DM	DC

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BENCHMARK
ALL ELEVATION REFER TO CONTROL MONUMENT: -
LOCATED AT: -
ELEVATION: -

0 1:250 10
ORIGINAL DWG SIZE: ANSI D (22" x 34")

McElhanney
1196 Dogwood Street,
Campbell River BC V9W 3A2
Tel. 250 287 7799

PERMIT TO PRACTICE
McElhanney Ltd.
PERMIT NUMBER: 1003299
Engineers and Geoscientists of BC

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D. R. CYBAK #51238 ENGINEERING
2025-10-20
Permit to practice #1003299
Approved Sealed

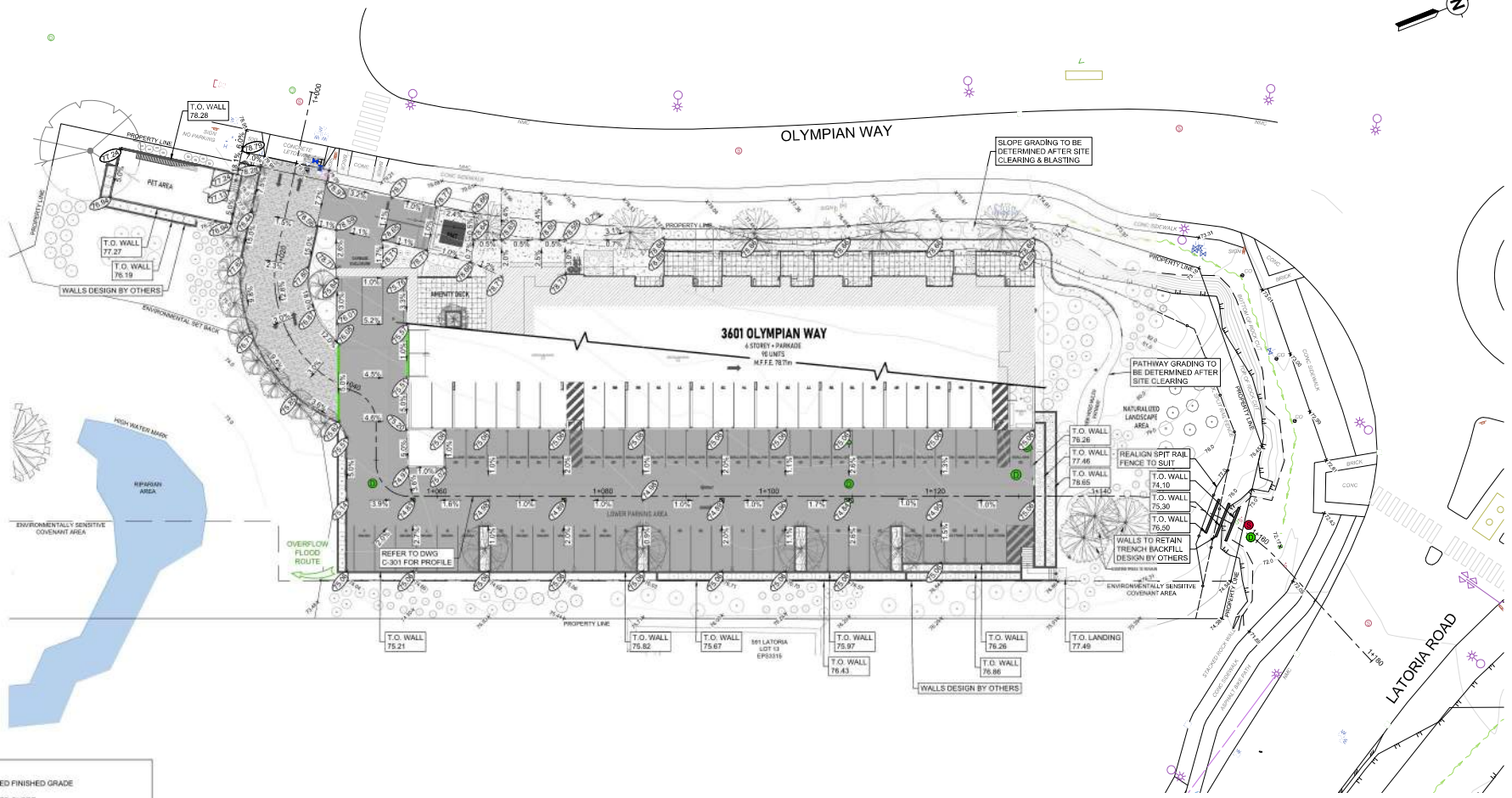
WESTURBAN DEVELOPMENTS LTD.
111-2036 SOUTH ISLAND HIGHWAY, CAMPBELL RIVER, BC, V9W 0E8

3601 OLYMPIAN WAY, COLWOOD
CIVIL
SITE SERVICING

Drawing No.
C-101

Project Number	Rev.
2221-49657-04	1

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DO NOT SCALE PRINTS. USE WRITTEN DIMENSIONS ONLY. ALL PRINTS ARE BEING PRINTED IN COLOUR.



LEGEND

- PROPOSED FINISHED GRADE
- PROPOSED SLOPE
- APPROXIMATE EXISTING GROUND ELEVATION
- APPROXIMATE EXTENT OF PROPOSED PAVING
- APPROXIMATE EXTENT OF PROPOSED CONCRETE

EXISTING CONTOURS SHOWN AT 1.0m INTERVALS

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Tel. 250 287 7799

PERMIT TO PRACTICE
McElhanney Ltd.
PERMIT NUMBER: 1003299
Engineers and Geoscientists of BC

D. R. CYSAK # 51236 — 2025-10-17 — ENGINEER — Permit to Practice: 1003299 — Professional Engineer — Approved Stamped

WESTURBAN DEVELOPMENTS LTD.
111-2036 SOUTH ISLAND HIGHWAY, CAMPBELL RIVER, BC, V9W 0E8

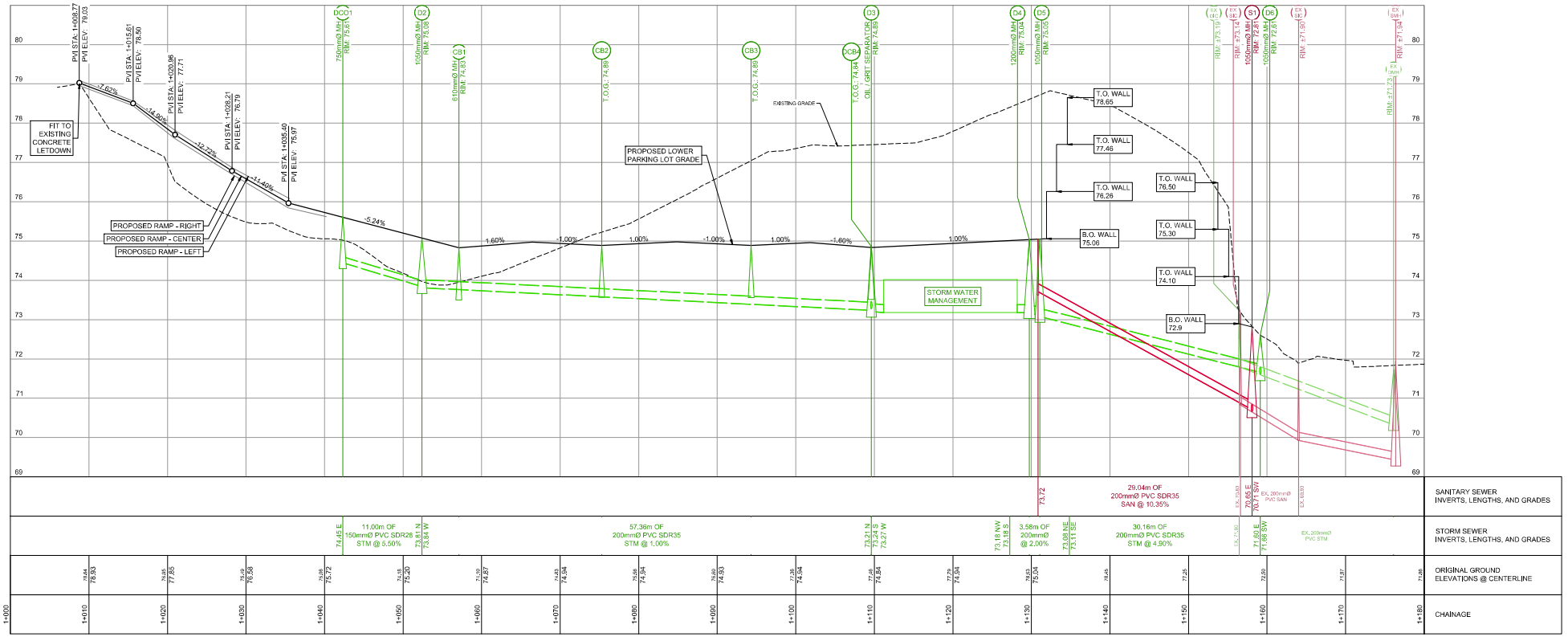
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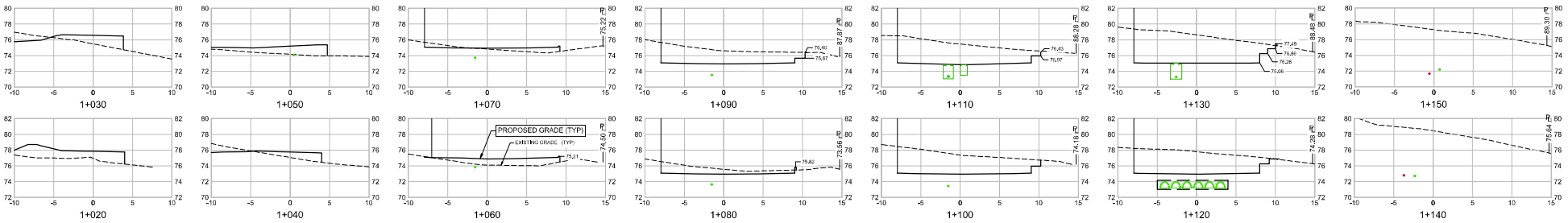
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BENCHMARK:
ALL ELEVATION REFER TO CONTROL MONUMENT: -
LOCATED AT: -
ELEVATION: -

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ORIGINAL DWG SIZE: ANSI D (22" x 34")

McElhanney
1196 Dogwood Street,
Campbell River BC V9W 3A2
Tel. 250 287 7799

PERMIT TO PRACTICE
McElhanney Ltd.
PERMIT NUMBER: 1003299
Engineers and Geoscientists of BC

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
D. R. CYBAK
51238
ENGINEER
2025-10-20
Permit to practice # 1003299
Engineers and Geoscientists of BC
Approved Sealed

WESTURBAN DEVELOPMENTS LTD.
111-2036 SOUTH ISLAND HIGHWAY, CAMPBELL RIVER, BC, V9W 0E8

3601 OLYMPIAN WAY, COLWOOD
CIVIL
ACCESS RAMP & LOWER PARKING AREA
PROFILE & SECTIONS

Drawing No.
C-301

Project Number: 2221-49657-04
Rev.: 1

DATE: 2025-10-20, 13:25, FILE: X:\2221\PRO\ECTS\222149657\04 West\Haw360 Olympian Way Collwood\C_DRAWING\001_Sheets\665-01-SHEETS.dwg
CHECK PRINT ALL PRINTS BEARING PREVIOUS REVISION

RYZUK GEOTECHNICAL
Engineering & Materials Testing
6-40 Cadillac Ave, Victoria, BC, V8Z 1T2 Tel: 250-475-3131 E-mail: mail@ryzuk.com www.ryzuk.com

June 27, 2024
File No: 8298-23

WestUrban Developments Ltd.
#21-3318 Oak Street
Victoria, British Columbia
V8X 1R1

Attn: Graeme O'Keefe ([redacted]

Re: Proposed Multi-Family Development
3601 Olympian Way – Colwood, BC.

As requested, and in accordance with our accepted proposal of May 15, 2024, we have completed a geotechnical assessment of the referenced site. The following letter summarizes the results of our investigation and associated recommendations as related to the proposed development. Our work has been carried out in accordance with, and is subject to, the previously provided Terms of Engagement.

PROPOSED DEVELOPMENT

The project site is currently undeveloped, moderately forested and is bounded by Latoria Road to the north, residential properties to the east, vacant land to the south, and Olympian Way to the west. Topographically, the site slopes down from north to south for total relief of approximately 13 m over a distance of approximately 150 m.

We understand the building design is within the preliminary stages, however, based on the feasibility drawings prepared by Union Architecture (attached to our report for reference), we understand that the proposed development would consist of the construction of a six-storey multi-family residential building. The building as proposed would be comprised of 90 units, with parking provided below the building at grade. We anticipate the building would consist of conventional reinforced concrete for the parking area and suspended/podium slab with timber frame above.

INVESTIGATION PROCEDURE

Our geotechnical assessment consisted of a desktop study and a site reconnaissance. The desktop study included a review of our previously completed work in the area, as well as a review of available quaternary soil mapping, topographical mapping, water well data, and aerial/satellite imagery.

SURFACE AND SUBSURFACE CONDITIONS

Based on our review of available quaternary soils mapping of the area, we expect the soil conditions generally consist of a thin layer of glacial till comprised of a variable mixture of gravel/sand/silt/clay, atop shallow bedrock.

Based on our site reconnaissance, we confirm the presence of shallow bedrock. During our attendance, we observed a bedrock cut, approximately 7 m in height located adjacent to the north and east property lines, inclined at approximately 0.25H:1V (Horizontal to Vertical). Soil cover was generally shallow, and several bedrock outcroppings were observed within the center of the property. The central area of the site is a moderately forested area sloping from northeast to southwest comprised of coniferous and deciduous trees. The south area of the site is comprised of vacant land with a environmentally sensitive area within the northeast corner of site.

Long term groundwater observations were not undertaken as part of our work at this site. The relatively impermeable nature of glacial till and bedrock presence at depth precludes free water conditions. However, perched groundwater table conditions may be experienced during and after periods of prolonged precipitation within overburden fills/organic soils overlying the glacial till and bedrock.

GEOTECHNICAL ASSESSMENT AND RECOMMENDATIONS

On the basis of our desktop study and site observations, we consider the proposed development to be geotechnically feasible, and do not anticipate any unique geotechnical issues during construction.

EXCAVATION CONSIDERATIONS

Based on site topography and proposed road and utility elevations, we expect that temporary excavation cutslopes during construction may be on the order of 2.5 m. Given the soil conditions encountered, we expect cutslopes will be stable at the following configurations:

- 1.0 H : 1.0 V (Horizontal : Vertical) for topsoil/fills;
- 0.75H : 1.0V compact to dense brown silt and sand, trace gravel (Glacial Till);
- Near vertical for intact/fractured bedrock

Topsoil and fill soils should be pulled back from the excavations to eliminate any chance these materials from sloughing into the opening. Adjustments to the above may be required if variations of the soil conditions are observed. According to WorkSafeBC guidelines, excavations deeper than 1.2 m and steeper than 0.75H:1V must be inspected and approved by a qualified geotechnical professional prior to worker entry.

Considering the anticipated excavation depths and the observed shallow bedrock conditions, rock excavation may be required to achieve design grades, such as blasting.

Blasting operations will need to be conducted using controlled techniques to limit the intensity of the ground vibrations, in order to minimize/mitigate the potential for damage and/or adverse effects to adjacent buildings/infrastructure. Vibration monitoring should be completed to ensure that Peak Particle Velocities (PPV) are kept below damage threshold values relating to adjacent structures and infrastructure. It is probable that neighboring residents will raise concerns regarding vibrations, even if some are not structurally harmful, and a pre-blast analysis and survey is strongly recommended to later verify or alleviate such concerns. For preliminary review, we recommend PPV's are maintained below 50 mm/s as measured at property line. Completion of an assessment of surrounding structures is recommended prior to conducting the excavation/blasting works.

Areas of marginal rock stability will result from the vibrations induced by the blasting activities and removal of support by excavation of the rock. Although the contractor is ultimately responsible for construction safety, it is essential that procedures be in place to identify and rectify areas of potential instability at the earliest opportunity.

Bedrock cutslopes will need to be scaled thoroughly by an appropriately sized excavator following each blast and inspected by a qualified professional during removal of the rock and/or soon after to identify areas of potential instability. Where heavily fractured rock or unfavourable bedrock discontinuity orientations are encountered, it may be necessary to stabilize such by means such as shotcrete or rock bolts if vertical rock faces are required or there is no room to accommodate flatter cutslope geometry. We recommend carrying a contingency of roughly 10% of the overall excavation cost in the event rock stabilization measures are required.

SEISMIC CONSIDERATIONS

Greater Victoria is situated in a region of very high seismicity. Considerable earthquake risk exists, stemming from our proximity to the Cascadia subduction zone and numerous more local faults in southwestern BC and northwestern Washington State.

We anticipate that building foundations will be placed atop intact bedrock or engineered fill atop such. As such, a reasonable shear wave velocity in the upper 30 m (V_s^{30}) should be between 760 and 1500 m/s. This corresponds to a Site Classification for Seismic Site Response of 'B', in accordance with the current BC Building Code. If greater than 3 m of soil is present between the footings and bedrock, Site Class of 'C' should be used. The reference Site Class 'C' values for a 2% probability of exceedance in 50-year event for the site can be found on the attached 2015 National Building Code Seismic Hazard Calculation sheet. We note that the BC Building Code will adopt updated seismic regulations in March 2025. Building/Development permits submitted after March 2025 should

consider the updated seismic design values which can be attained using the 2020 National Building code Seismic Hazard Calculator.

We note that Site Class 'A' might be feasible depending on the bedrock conditions. Confirmation of such would require completion of a Downhole Seismic Test, which would require installation of a PVC casing to 30 m depth using an ODEX drill rig. Further details regarding completion of a downhole seismic test can be provided upon request, including scope and pricing.

The National Research Council of Canada (NRCC) has recently released an updated National Building Code (NBCC 2020) which was adopted by the Province of British Columbia for the BC Building Code on March 8, 2024 (BCBC 2024). However, the seismic changes of the new code will not come into effect until March 2025 which will fully adopt the NBCC 2020 Division B – 4.1.8. Earthquake Loads and Effects Section. The Structural Commentaries, which accompanies the new code have not been released; however, we can comment on the preliminary information available to date.

The new building code has significantly changed the seismic hazard within Southern Vancouver Island. This is due to an updated 6th generation seismic hazard model for Canada, which has incorporated the Leech River Valley/Devils Mountain Fault, in addition to the updated seismic hazard stemming from the proximity to an active tectonic plate boundary (Cascadia Subduction Zone). The new code has increased seismic response by a minimum of 15 to 50% depending on the Site Classification (Site Class), building period and specific location.

SETTLMENT CONSIDERATIONS

Provided adverse soils (i.e. topsoils/organics and fill) are removed from all building/foundation areas and roadways, we expect that settlement at this site will be minor, if any, and of minimal significance to the structural or geotechnical design.

FOUNDATIONS CONSIDERATIONS

We expect that conventional shallow foundations will be used to support the proposed six-storey building. We anticipate the materials present at the design foundation elevation will include either dense glacial till or bedrock. We consider the native soils present at the site will be capable of providing long term stable support to the proposed structure, however all existing topsoil and fill materials must be removed prior to placing footings or before recovering design footing grade with engineered fill. Provided the footings bear directly on the above noted undisturbed native subgrade and/or approved engineered fill placed atop such, footings may be sized using the Serviceability and Ultimate Limit State bearing resistances provided in Table 1:

Table 1: Limit State Bearing Resistances

Subgrade Soil	Limit State Design (LSD)	
	Strip Footing	Pad Footing
Clean intact bedrock	2,000 kPa (ULS)	2,400 kPa (ULS)
≤ 1 m of compacted blast rock atop bedrock	625 kPa (SLS) 935 kPa (ULS)	750 kPa (SLS) 1125 kPa (ULS)
Native dense glacial till or compacted over-blast	200 kPa (SLS) 300 kPa (ULS)	240 kPa (SLS) 360 kPa (ULS)

(*Higher bearing capacity may be available for bedrock pending location specific review)

LSD values use a geotechnical resistance factor of 0.5 as per the current Canadian Foundation Engineering Manual. The above values are provided for design, and all native soil in foundation areas will need to be inspected by the project geotechnical personnel to confirm the noted bearing resistances prior to placement of engineered fill or concrete for foundations. We recommend minimum footing widths of 400 mm and 600 mm for strip and pad footings, respectively. Any disturbance of subgrade soils during construction activity will need to be rectified. All foundation subgrade should be inspected and approved by a qualified geotechnical professional prior to placement of engineered fill or foundation concrete.

If Seismic Site Class 'A' is desired, all foundation elements must be poured directly atop bedrock. The bedrock must be cleaned of all loose rock fragments, soil, water, and sediment that may settle within the excavation.

For frost protection, the base of all footings should extend to a depth of at least 450 mm below adjacent finished grades to minimize the effects of seasonal frost; unless said footings are cast directly atop bedrock.

ENGINEERED FILL

Engineered fill, where required, should be placed upon approved subgrade, and must consist of select, well-graded, free draining granular material. The engineered fill must be placed and compacted in suitably thin lifts under the supervision of a geotechnical professional to at least 95% of the Standard Proctor Maximum Dry Density (SPMDD) value, or judged equivalent. The recommended lift thickness is dependent on both the type of material and the method of compaction, and such must be confirmed before placement of fill. The engineered fill must have a footprint that extends horizontally beyond the footings a distance equal to the thickness of the engineered fill, in order to provide adequate splay for foundation loads unless suitable splay is present within approved native soils. In perimeter areas, it is inadvisable to have splay extend beyond the property lines.

FOUNDATION DRAINAGE/PERMANENT DEWATERING

Conventional perimeter foundation drainage consisting of perforated drain pipe surrounded by free draining granular material containing low fines, tied into the recommended free draining backfill material is recommended. To prevent the migration of fine-grained soil particles into the drainage system, a layer of medium weight, non-woven geotextile should be placed between the clean drain rock around the perforated pipe and the granular backfill material. The geotextile should encompass the entire drain rock/drain pipe system.

Due to an expected high silt content and relatively impermeable nature of glacial till and shallow bedrock, we expect that inground dispersal trenches/rock pits discharging into the described soils will not be feasible.

SLAB ON GRADE

We consider the use of a reinforced concrete grade supported slab to be feasible. We recommend that all loose and deleterious material be removed to depth of approved native subgrade and be replaced with well compacted select granular fill beneath the suspended slab. We recommend a minimum of 150 mm of free draining granular fill beneath the slab. All imported sub slab fills must be compacted to a minimum of 95% of the SPMDD value, or judged equivalent by a qualified geotechnical professional.

PAVEMENT CONSIDERATIONS

In areas of light traffic, 75 mm of asphalt over 250 mm of 19 mm minus crushed rock containing low fines should be sufficient. It may be possible to go to a 50 mm of asphalt over 250 mm of crushed rock, as is typical for low volume roads, but such a structure will deteriorate quicker and may crack slightly more than the 75 mm.

For heavier traffic areas, we suggest 75 mm of asphalt over a minimum of 150 mm of 19 mm minus crushed rock above 150 mm of 75 mm minus crushed rock. Alternatively, 300 mm of 19 mm minus could be used provided it is low in fines for good water drainage.

We recommend installing concrete slabs where garbage and recycling trucks will service the development, and that transition areas be paved with 80 mm of asphalt.

Optimum water content of the replacement fill soils described above is critical to achieve good compaction. We suggest performing spot check in-situ density tests to ensure soils are suitably compacted below paved areas.

CLOSURE

In summary, we consider the proposed development to be feasible from a geotechnical perspective.

We trust the preceding is suitable for your purposes at present. Please don't hesitate to contact our office if we can be of further assistance.

Sincerely,
Ryzuk Geotechnical
PTPN: 1002996

[redacted]

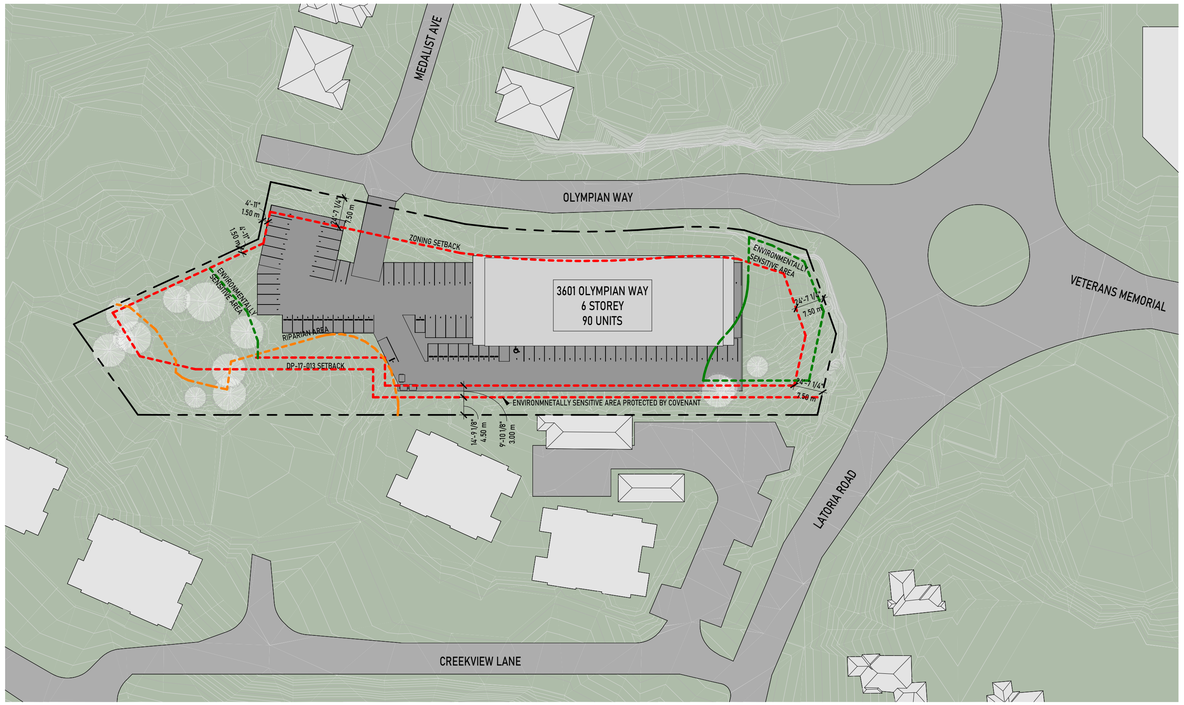
Alex Turner, B. Eng.
Junior Associate



[redacted]

Austin Baird, P.Eng.
Intermediate Geotechnical Engineer

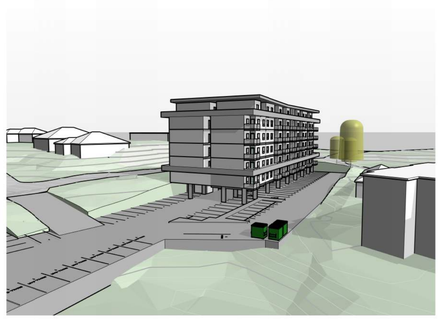
Attachments - Union Architecture Feasibility Drawings
- 2015 National Building Code Seismic Hazard Calculation



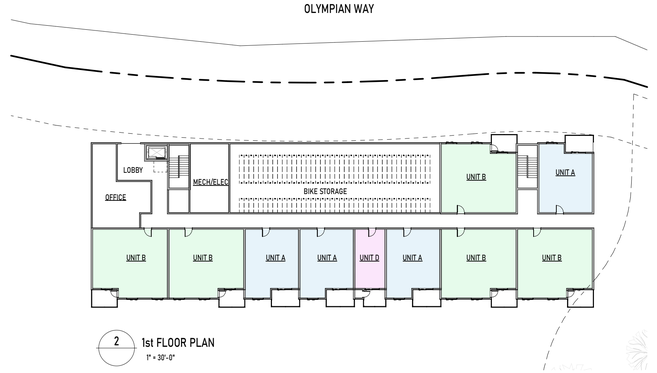
1 SITE PLAN
1" = 60'-0"



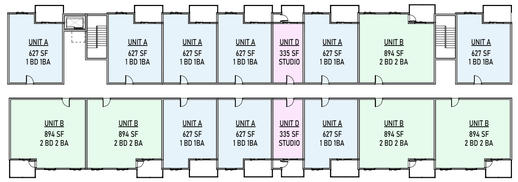
6 (SD) 3D Perspective 1



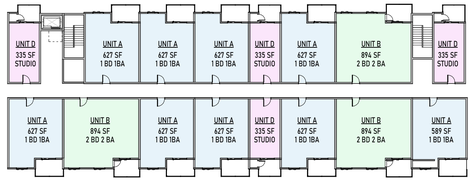
7 (SD) 3D Perspective 1 Copy 1



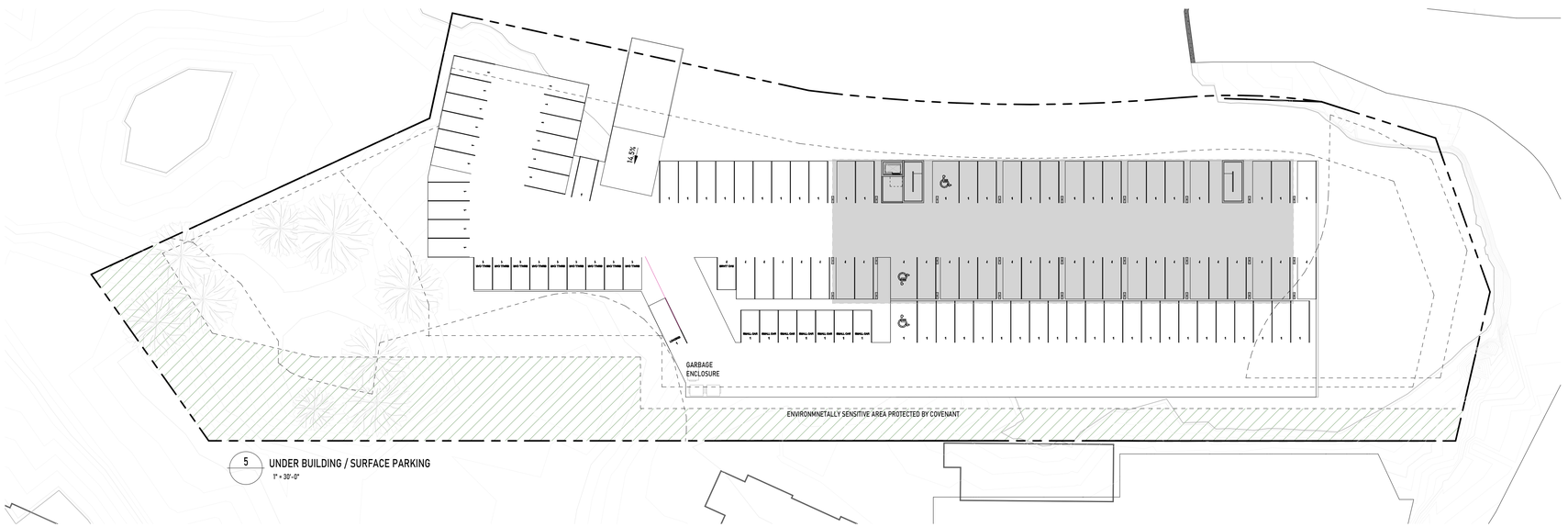
2 1st FLOOR PLAN
1" = 30'-0"



3 TYPICAL 2-5 FLOOR PLAN
1" = 30'-0"



4 6TH FLOOR PLAN
1" = 30'-0"



5 UNDER BUILDING / SURFACE PARKING
1" = 30'-0"

PROJECT STATISTICS

3601 OLYMPIAN WAY

DATE 25-Apr-2024

SITE INFORMATION						
CIVIC ADDRESS	3601 OLYMPIAN WAY					
	EXISTING		REQUIRED		PROPOSED	
ZONING	XX		XX		XX	
SITE AREA	8,570 m²	92,246 SF	8,570 m²	92,246 SF	8,570 m²	92,246 SF
FLOOR AREA RATIO (FAR)	-		X.XX		0.90	
SITE COVERAGE	-		0.0%		15.0%	
BUILDING HEIGHT			0.00 m (Max)	0.00' (Max)	6 STOREYS	
SETBACKS	FRONT (EAST)		0.00 m (Min)	0.00' (Min)	7.50 m	24.61'
	REAR (WEST)		0.00 m (Min)	0.00' (Min)	7.50 m	24.61'
	SIDE (NORTH)		0.00 m (Min)	0.00' (Min)	7.50 m	24.61'
	SIDE (FLANKING OLYMPIAN WAY)		0.00 m (Min)	0.00' (Min)	6.00 m	19.69'
	SIDE (SOUTH)		0.00 m (Min)	0.00' (Min)	1.50 m	4.92'

BUILDING DATA						
MULTIFAMILY UNITS	DESCRIPTION	# OF UNITS	AREA		TOTAL AREA	
UNIT A	1BR+1BATH	49	59 m²	639 SF	2,909 m²	31,311 SF
UNIT B (Standard)	2BR+2BATH	28	85 m²	912 SF	2,372 m²	25,536 SF
UNIT E	STUDIO	13	29 m²	309 SF	373 m²	4,017 SF
TOTALS		90			5,654 m²	60,864 SF
FLOOR AREAS			GROSS		NET	
PARKADE P1			0 m²	0 SF		
LEVEL 1			1,289 m²	13,874 SF		
LEVEL 2			1,289 m²	13,874 SF		
LEVEL 3			1,289 m²	13,874 SF		
LEVEL 4			1,289 m²	13,874 SF		
LEVEL 5			1,289 m²	13,874 SF		
LEVEL 6			1,289 m²	13,874 SF		
		TOTAL	7,734 m²	83,244 SF		
AMENITY SPACE			0 m²	0 SF		
BUILDING FOOTPRINT AREA			1,289 m²	13,874 SF		

PARKING DATA				
PARKING TYPE		REQUIRED	PROPOSED	
RESIDENTIAL	Parking Bylaw Reference	95.8	96	
VISITOR	Parking Bylaw Reference	13.5	13	
TOTAL PARKING		109.3	109	
LOADING STALLS	Loading Bylaw Reference	1	1	
BICYCLE PARKING	Bicycle Parking Bylaw Reference	120	120	

UNION ARCHITECTURE

FEASIBILITY

3601 OLYMPIAN WAY, COLWOOD, BC

SD1

06FEB2023

2015 National Building Code Seismic Hazard Calculation

INFORMATION: Eastern Canada English (613) 995-5548 français (613) 995-0600 Facsimile (613) 992-8836
Western Canada English (250) 363-6500 Facsimile (250) 363-6565

Site: 48.408N 123.509W

2024-06-27 20:40 UT

Probability of exceedance per annum	0.000404	0.001	0.0021	0.01
Probability of exceedance in 50 years	2 %	5 %	10 %	40 %
Sa (0.05)	0.717	0.510	0.370	0.161
Sa (0.1)	1.101	0.791	0.573	0.246
Sa (0.2)	1.321	0.949	0.693	0.300
Sa (0.3)	1.331	0.953	0.692	0.296
Sa (0.5)	1.185	0.836	0.597	0.243
Sa (1.0)	0.704	0.466	0.313	0.115
Sa (2.0)	0.418	0.267	0.172	0.060
Sa (5.0)	0.131	0.074	0.038	0.012
Sa (10.0)	0.046	0.025	0.013	0.004
PGA (g)	0.593	0.425	0.307	0.130
PGV (m/s)	0.850	0.577	0.394	0.146

Notes: Spectral (Sa(T), where T is the period in seconds) and peak ground acceleration (PGA) values are given in units of g (9.81 m/s^2). Peak ground velocity is given in m/s. Values are for "firm ground" (NBCC2015 Site Class C, average shear wave velocity 450 m/s). NBCC2015 and CSAS6-14 values are highlighted in yellow. Three additional periods are provided - their use is discussed in the NBCC2015 Commentary. Only 2 significant figures are to be used. **These values have been interpolated from a 10-km-spaced grid of points. Depending on the gradient of the nearby points, values at this location calculated directly from the hazard program may vary. More than 95 percent of interpolated values are within 2 percent of the directly calculated values.**

References

National Building Code of Canada 2015 NRCC no. 56190; Appendix C: Table C-3, Seismic Design Data for Selected Locations in Canada

Structural Commentaries (User's Guide - NBC 2015: Part 4 of Division B)
Commentary J: Design for Seismic Effects

Geological Survey of Canada Open File 7893 Fifth Generation Seismic Hazard Model for Canada: Grid values of mean hazard to be used with the 2015 National Building Code of Canada

See the websites www.EarthquakesCanada.ca and www.nationalcodes.ca for more information

TALMACK
URBAN FORESTRY
Consultants Limited

Victoria, BC, V8Z 7H6
TEL: 250-479-8733
EMAIL: trees@talmack.ca
www.treehelp.ca

3601 Olympian Way, Colwood

Tree Management Plan

PREPARED FOR: WestUrban Developments Ltd.
111-2036 South Island Highway
Campbell River, BC V8W 0E8

PREPARED BY: Talmack Urban Forestry Consultants Limited
Garrett Whelan
ISA Certified #ON-2772A
Tree Risk Assessment Qualified

DATE OF ISSUANCE: June 13, 2024

1. PROJECT OVERVIEW

Based on our review of the plans we received for the proposed project located at 3601 Olympian Way it is our understanding that many of the inventoried onsite trees will require removal. Of the forty-five (45) trees that were included in the inventory, we believe that twelve (12) may be possible for retention.

We recommend the following actions to improve the likelihood of retention for the remaining on-site trees located within the “environmentally sensitive areas”:

1. Install tree protection fencing to restrict access of construction equipment or the storage of materials within the CRZs of retained trees.
2. Conduct the excavation within the CRZs of trees 779, 780, and 785 under the supervision of the project arborist and potentially float the parking over the root systems

Our inventory included the on-site surveyed trees that were greater than 60cm DBH. Some additional trees that were at least 60cm were included in the inventory but appear to have not been included in the survey. The locations of these trees has been estimated. The estimated locations should not be relied upon and should be considered inaccurate until confirmed by a BC Land Surveyor. Two additional trees that were less than 60cm DBH (trees 1967 and 1968) were included in the inventory. These two trees are located within the covenant along the eastern side of the lot. We recommend that these two trees be removed as their CRZs are likely to be impacted by the hard surfaces/construction traffic within their CRZs and they lean towards the neighbouring property.

2. IMPACT MITIGATION

Tree Protection Barrier: The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing. Where possible, fencing should be erected at the perimeter of the critical root zone. The barrier fencing to be erected must be a minimum of 4 feet in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e., demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

Arborist Supervision: All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. Any severed or severely damaged roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound. In particular, the following activities should be completed under the direction of the project arborist:

- All excavation with the critical root zones of retained bylaw protected trees
- Any pruning efforts should be completed under the direction of the project arborist and fulfilled by an ISA certified arborist
- Excavation for the installation of hard surfaces within the CRZs of protected trees

Methods to Avoid Soil Compaction: In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:

- Installing a layer of hog fuel or coarse wood chips at least 20 cm in depth and maintaining it in good condition until construction is complete.
- Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15 cm over top.

- Placing two layers of 19mm plywood.
- Placing steel plates.

Paved Surfaces Above Tree Roots:

If the new paved surfaces within the critical root zones of trees to be retained require excavation down to bearing soil and roots are encountered in this area, this could impact their health and structural stability. If tree retention is desired, a raised and permeable paved surface should be constructed in the areas within the critical root zone of the trees.

The objective is to avoid root loss and to instead raise the paved surface and its base layer above the roots. This may result in the grade of the paved surface being raised above the existing grade (the amount depending on how close roots are to the surface and the depth of the paving material and base layers). Final grading plans should take this potential change into account. This may also result in soils which are high in organic content being left intact below the paved area.

To allow water to drain into the root systems below, we also recommend that the surface be made of a permeable material (instead of conventional asphalt or concrete) such as permeable asphalt, paving stones, or other porous paving materials and designs such as those utilized by Grasspave, Gravelpave, Grasscrete and open-grid systems.

Mulching: Mulching can be an important proactive step in maintaining the health of trees and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. No mulch should be touching the trunk of the tree. See “methods to avoid soil compaction” if the area is to have heavy traffic.

Blasting: Care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibration, and overall impact on the surrounding environment. Only explosives of low phytotoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.

Landscaping and Irrigation Systems: The planting of new trees and shrubs should not damage the roots of retained trees. The installation of any in-ground irrigation system must take into account the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technician consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on tree health and can lead to root and trunk decay.

Arborist Role: It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:

- Locating the barrier fencing
- Reviewing the report with the project foreman or site supervisor
- Locating work zones, where required
- Supervising any excavation within the critical root zones of trees to be retained
- Reviewing and advising of any pruning requirements for machine clearances

Review and site meeting: Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained herein. It is also important that the arborist meet with the site foreman or supervisor before any site clearing, tree removal, demolition, or other construction activity occurs and to confirm the locations of the tree protection barrier fencing.

3. DISCLOSURE STATEMENT

This arboricultural field review report was prepared by Talmack Urban Forestry Consultants Ltd. for the exclusive use of the Client and may not be reproduced, used, or relied upon, in whole or in part, by a party other than the Client without the prior written consent of Talmack Urban Forestry Consultants Ltd. Any unauthorized use of this report, or any part hereof, by a third party, or any reliance on or decisions to be made based on it, are at the sole risk of such third parties. Talmack Urban Forestry Consultants Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report, in whole or in part.

Arborists are professionals who examine trees and use their training, knowledge, and experience to recommend techniques and procedures that will improve a tree's health and structure or to mitigate associated risks. Trees are living organisms whose health and structure change and are influenced by age, continued growth, climate, weather conditions, and insect and disease pathogens. Indicators of structural weakness and disease are often hidden within the tree structure or beneath the ground. The arborist's review is limited to a visual examination of tree health and structural condition, without excavation, probing, resistance drilling, increment coring, or aerial examination. There are inherent limitations to this type of investigation, including, without limitation, that some tree conditions will inadvertently go undetected. The arborist's review followed the standard of care expected of arborists undertaking similar work in British Columbia under similar conditions. No warranties, either express or implied, are made as to the services provided and included in this report.

The findings and opinions expressed in this report are based on the conditions that were observed on the noted date of the field review only. The Client recognizes that passage of time, natural occurrences, and direct or indirect human intervention at or near the trees may substantially alter discovered conditions and that Talmack Urban Forestry Consultants Ltd. cannot report on, or accurately predict, events that may change the condition of trees after the described investigation was completed.

It is not possible for an Arborist to identify every flaw or condition that could result in failure, nor can he/she guarantee that the tree will remain healthy and free of risk. The only way to eliminate tree risk entirely is to remove the entire tree. All trees retained should be monitored on a regular basis. Remedial care and mitigation measures recommended are based on the visible and detectable indicators present at the time of the examination and cannot be guaranteed to alleviate all symptoms or to mitigate all risk posed.

Immediately following land clearing, grade changes or severe weather events, all trees retained should be reviewed for any evidence of soil heaving, cracking, lifting or other indicators of root plate instability. If new information is discovered in the future during such events or other activities, Talmack Urban Forestry Consultants Ltd. should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein.

4. IN CLOSING

We trust that this report meets your needs. Should there be any questions regarding the information within this report, please do not hesitate to contact the undersigned.

Yours truly,

Talmack Urban Forestry Consultants Ltd.

Box 48153 RPO Uptown Victoria, BC V8Z 7H6
Ph: (250) 479-8733 ~ Fax: (250) 479-7050
Email: garrett@talmack.ca

Prepared by:



Garrett Whelan
ISA Certified Arborist: ON-2772A
TRA Qualified

APPENDIX A - TREE INVENTORY TABLE

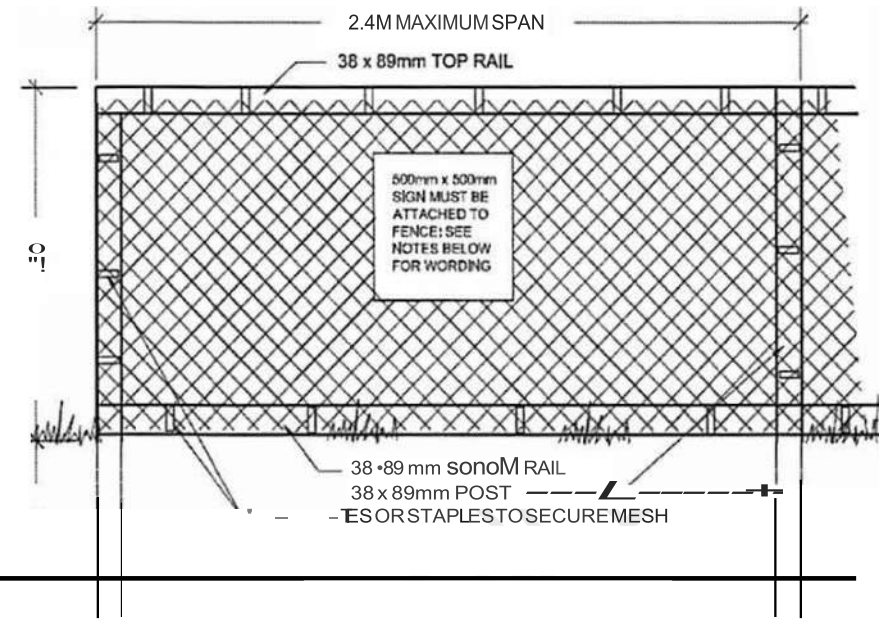
Table 2: Tree Inventory Table

Tag #	Surveyed? (Yes/No)	Location (On, Off, Shared, City)	Bylaw Protected ? (Yes/No)	Name		DBH (cm)	Crown Diameter (m)	Critical Root Zone Radius (m)	Condition		Relative Tolerance	General Field Observations/Remarks	Tree Retention/Location Comments	Retention status
				Common	Botanical				Health	Structural				
592	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	65	9	9.8	Poor	Fair	Poor	Sparse crown, dieback at branch tips	Monitor due to new exposure	Remove
593	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	65	9	9.8	Fair	Fair	Poor	Some evidence of stress. Epicormics on trunk. Asymmetrical canopy. 65% live crown ratio.	Remove due to new exposure	Remove
44 (1044 on survey)	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	93	10	14.0	Fair	Fair	Poor	Surface rooted on rock, evidence of drought stress, some branch tip dieback, large limb failure in lower crown, deadwood	Remove due to new exposure	Remove
594	No	On	Yes	Douglas fir	*Pseudotsuga menziesii*	85	11	12.8	Fair	Fair	Poor	Surface rooted on rock, some mechanical damage to surface roots on SE.	Remove due to construction	Remove
595	No	On	Yes	Douglas fir	*Pseudotsuga menziesii*	92	13	13.8	Fair	Fair	Poor	Branch tip dieback, likely caused by drought stress, epicormics on trunk.	Remove due to construction	Remove
596	Yes	On	Yes	Western red cedar	*Thuja plicata*	107	10	16.1	Fair/Poor	Fair/Poor	Poor	Codominant at 3m, sparse crown, top is dead	Remove due to construction	Remove
597	No	On	Yes	Western red cedar	*Thuja plicata*	78	8	11.7	Poor	Fair/Poor	Poor	Sparse canopy in upper crown, top has died	Remove due to construction	Remove
598	No	On	Yes	Western red cedar	*Thuja plicata*	99	10	14.9	Fair/Poor	Fair/Poor	Poor	Codominant at 2m with included bark and reaction wood below union with visible crack	Remove due to construction	Remove
752	Yes	On	Yes	Grand fir	*Abies grandis*		6	0.0	Removed	Removed	Poor	Removed	Remove due to construction	Remove
755	Yes	On	Yes	Grand fir	*Abies grandis*	72	8	10.8	Fair	Fair	Poor	Multiple tops	Remove due to construction	Remove
756	Yes	On	Yes	Grand fir	*Abies grandis*	78	8	11.7	Fair	Fair/Poor	Poor	Codominant at 2m	Remove due to construction	Remove
753	No	On	Yes	Grand fir	*Abies grandis*	74	7	11.1	Fair	Fair/Poor	Poor	Codominant at 4m, deflected tops	Remove due to construction	Remove
754	No	On	Yes	Western red cedar	*Thuja plicata*	82	9	12.3	Fair	Fair	Poor	Sparse upper crown, small secondary stem at base	Remove due to construction	Remove
47(1047 on survey)	Yes	On	Yes	Western red cedar	*Thuja plicata*	123	10	18.5	Fair	Fair/Poor	Poor	Top has failed.	Remove due to construction	Remove
764	No	On	Yes	Western red cedar	*Thuja plicata*	89	10	13.4	Poor	Fair	Poor	Some thinning foliage , has recently been exposed	Remove due to construction	Remove

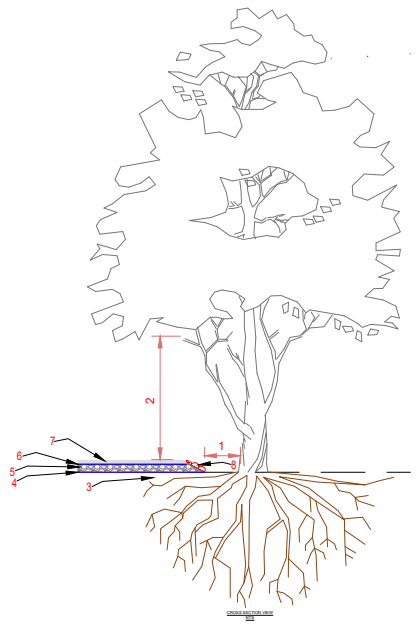
Tag #	Surveyed? (Yes/No)	Location (On, Off, Shared, City)	Bylaw Protected ? (Yes/No)	Name		DBH (cm)	Crown Diameter (m)	Critical Root Zone Radius (m)	Condition		Relative Tolerance	General Field Observations/Remarks	Tree Retention/Location Comments	Retention status
				Common	Botanical				Health	Structural				
765 (now tagged 1652)	No	On	Yes	Western red cedar	*Thuja plicata*	99	12	14.9	Fair/Poor	Fair	Poor	Some stress (likely drought related)	Remove due to construction	Remove
766	No	On	Yes	Western red cedar	*Thuja plicata*	69	9	10.4	Poor	Fair	Poor	Asymmetrical crown, drought stress	Remove due to construction	Remove
767	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	75	12	11.3	Fair	Fair	Poor	High crown	Remove due to construction	Remove
768	Yes	On	Yes	Western red cedar	*Thuja plicata*	105	15	15.8	Fair/Poor	Fair	Poor	Sparse upper canopy likely drought stress	Remove due to construction	Remove
769	Yes	On	Yes	Western red cedar	*Thuja plicata*	58, 43	10	12.6	Fair	Fair	Poor	Codominant at base, sparse upper canopy likely drought stress	Remove due to construction	Remove
770	Yes	On	Yes	Western red cedar	*Thuja plicata*	64	8	9.6	Fair	Fair	Poor	Asymmetrical canopy, sparse upper canopy, likely drought stress. Trunk deflection.	Remove due to construction	Remove
771	Yes	On	Yes	Western red cedar	*Thuja plicata*	111	12	16.7	Fair	Fair	Poor	Sparse upper canopy. Likely drought stressed	Remove due to construction	Remove
772	Yes	On	Yes	Western red cedar	*Thuja plicata*	86	10	12.9	Fair	Fair	Poor	Sparse upper canopy	Remove due to construction	Remove
773	Yes	On	Yes	Bigleaf maple	*Acer macrophyllum*	87, 49	18	17.4	Good	Poor	Poor	Likely growing from old stump, multiple stems, included bark	Remove due to construction	Remove
774	Yes	On	Yes	Western red cedar	*Thuja plicata*	114	11	17.1	Fair	Fair/Poor	Poor	Old tear out injury in trunk with decay cavity, multiple stems	Remove due to construction	Remove
775	Yes	On	Yes	Western red cedar	*Thuja plicata*	77	11	11.6	Fair	Fair	Poor	Some thinning at top	Remove due to construction	Remove
776	Yes	On	Yes	Western red cedar	*Thuja plicata*	126	14	18.9	Good	Good	Poor		Remove due to construction	Remove
777	Yes	On	Yes	Western red cedar	*Thuja plicata*	96	12	14.4	Good	Good	Poor		Remove due to construction	Remove
778	Yes	On	Yes	Western red cedar	*Thuja plicata*	81, 65, 63, 57, 51,etc	25	23.7	Fair	Fair	Poor	Cluster of red cedars	Remove due to construction	Remove
779	Yes	On	Yes	Western red cedar	*Thuja plicata*	81, 28	10	14.7	Fair	Fair	Poor	Surface rooted, codominant at 1m	Install tree protection fencing, likely impacts from parking	TBD
780	Yes	On	Yes	Western red cedar	*Thuja plicata*	119 below swelling.	12	17.9	Fair	Fair	Poor	Asymmetrical crown	Install tree protection fencing	Retain
781	Yes	On	Yes	Western red cedar	*Thuja plicata*	104	14	15.6	Fair	Fair	Poor	Codominant at 2m	Install tree protection fencing	Retain
782	Yes	On	Yes	Western red cedar	*Thuja plicata*	97	12	14.6	Fair	Fair	Poor		Install tree protection fencing	Retain

Tag #	Surveyed? (Yes/No)	Location (On, Off, Shared, City)	Bylaw Protected ? (Yes/No)	Name		DBH (cm)	Crown Diameter (m)	Critical Root Zone Radius (m)	Condition		Relative Tolerance	General Field Observations/Remarks	Tree Retention/Location Comments	Retention status
				Common	Botanical				Health	Structural				
783	Yes	On	Yes	Western red cedar	*Thuja plicata*	104	13	15.6	Fair	Fair/poor	Poor	2 stems that are fused, Dbh measured as 1 stem, larger stem has codominant tops at ~12m, smaller stem has multiple trunk deflections	Install tree protection fencing	Retain
784	Yes	On	Yes	Western red cedar	*Thuja plicata*	101	13	15.2	Fair	Poor	Poor	Multiple tops at ~8m	Install tree protection fencing	Retain
785	Yes	On	Yes	Western red cedar	*Thuja plicata*	115	13	17.3	Fair	Fair	Poor	Multiple stems, large surface root to SW.	Install tree protection fencing	Retain
786	Yes	On	Yes	Western red cedar	*Thuja plicata*	102	15	15.3	Fair	Fair/poor	Poor	Codominant at ~7m, smaller stem failure historically at base.	Install tree protection fencing	Retain
787	Yes	On	Yes	Western red cedar	*Thuja plicata*	105	16	15.8	Fair/Poor	Fair	Poor	stressed dieback and sparse upper canopy.	Install tree protection fencing	Retain
788	Yes	On	Yes	Western red cedar	*Thuja plicata*	112	14	16.8	Fair	Fair	Poor	Asymmetrical crown	Install tree protection fencing	Retain
789	Yes	On	Yes	Western red cedar	*Thuja plicata*	69	10	10.4	Fair	Fair	Poor	Asymmetrical crown, cavity at base (potentially undermined)	Install tree protection fencing	Retain
790	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	119	20	17.9	Fair	Fair	Poor	Large deadwood, high crown	Install tree protection fencing	Retain
1651	No	On	Yes	Western red cedar	*Thuja plicata*	73	10	10.95	Fair	Fair	Poor	Asymmetrical crown, high crown		Remove
1966	No	On	Yes	Western red cedar	*Thuja plicata*	60	8	9	Fair	Good/Fair	Poor	Sparse upper crown (likely drought stress)	Remove due to construction	Remove
1967	No	Covenant	Yes	Bigleaf maple	*Acer macrophyllum*	42	10	6.3	Good	Fair/Poor	Poor	Growing behind tree 1966, leans to the southeast towards neighbouring property, historical large limb failure, unlikely to tolerate exposure	Remove due to construction impacts	Remove
1968	No	Covenant	Yes	Douglas fir	*Pseudotsuga menziesii*	42	7	6.3	Good/Fair	Fair/Poor	Poor	Growing within covenant, leans to the southeast towards neighbouring property, likely to be impacted by parking area`	Remove due to construction impacts	Remove

APPENDIX B - TREE MANAGEMENT PLAN



HARD SURFACE ABOVE TREE ROOTS DETAIL



HARD SURFACE ABOVE TREE ROOTS NOTES

1. Maintain as large a setback between the fill encroachment and the root collar of the tree as possible.
2. Review any canopy clearance pruning requirements to accommodate vehicle or pedestrian clearances (Pruning to be performed to ANSI A300 standards).
3. Excavate the new footprint of the driveway or sidewalk under the supervision of the project arborist. Excavation will be limited to the removal of the existing sod layer. Excavation around root structures must be performed by hand, airspade, or hydroexcavation.
4. Install a two-dimensional (such as Combigrid 30/30) or Three-dimensional geogrid reinforcement.
5. Install a 150mm depth layer of clear crushed gravel (no fines) using 20mm and/or 75mm diameter material or approved equivalent. *Note - the depth may be less than 150mm in some situations (dependant on grading constraints).
6. Install 4 oz non woven geotextile over the clear crushed gravel layer to prevent fine particles of sand from infiltrating this layer.
7. The bedding or base layer and new driveway or sidewalk surface can be installed directly on top of the felted filter fabric.
8. Fill slopes - where possible install loose stacked boulders to reduce the footprint of the fill slopes that encroach within the critical root zone. Fill slope materials must be permeable to air and water. Do not pile fill material directly against the trunk of a tree.

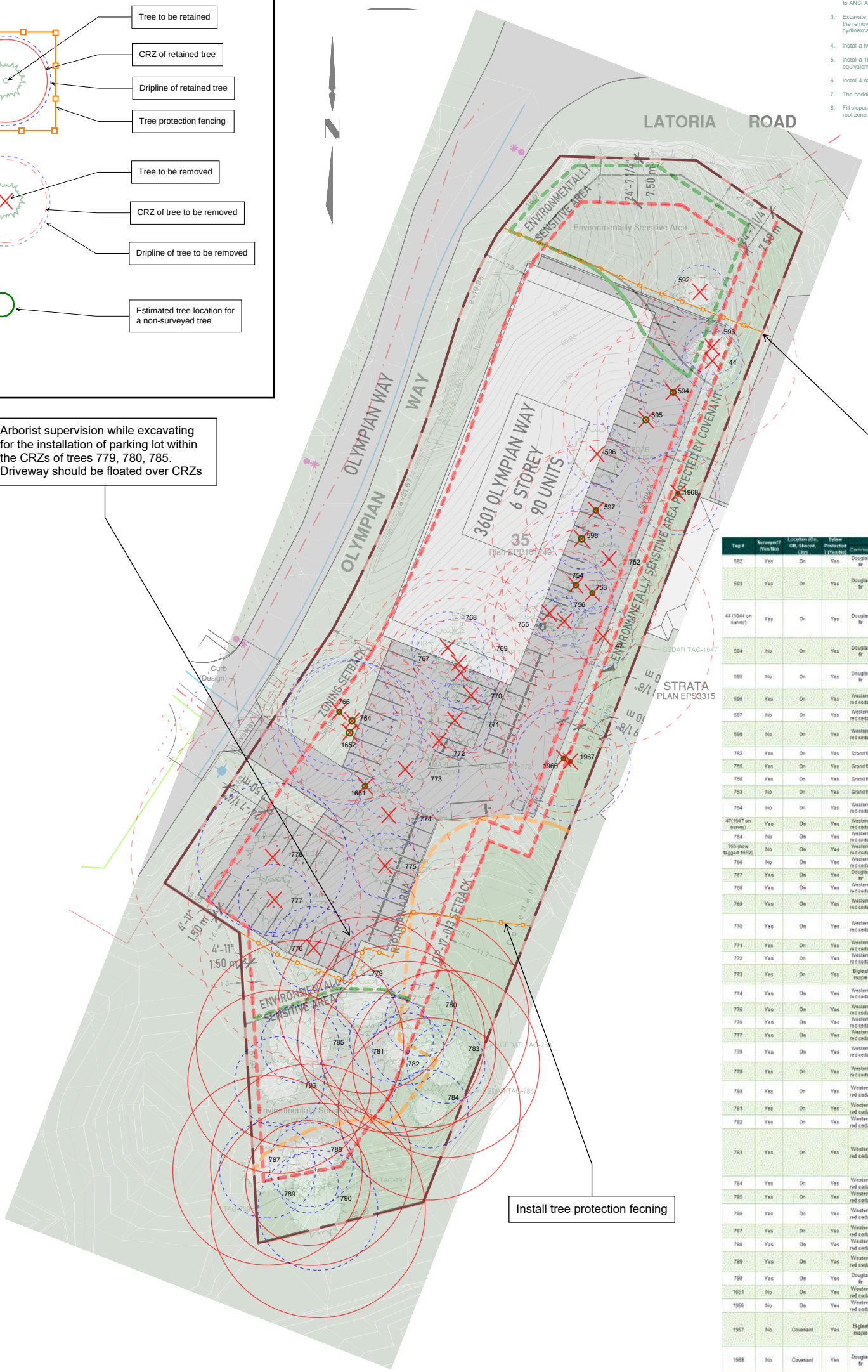
Legend

- Tree to be retained
- CRZ of retained tree
- Dripline of retained tree
- Tree protection fencing
- Tree to be removed
- CRZ of tree to be removed
- Dripline of tree to be removed
- Estimated tree location for a non-surveyed tree

Arborist supervision while excavating for the installation of parking lot within the CRZs of trees 779, 780, 785. Driveway should be floated over CRZs

Install tree protection fecning

Install tree protection fecning



Tag #	Surveyed? (Yes/No)	Location (On, Off, Shared, City)	Bylaw Protected ? (Yes/No)	Name: Common	Name: Botanical	DBH (cm)	Crown Diameter (m)	Critical Root Zone Radius	Condition: Health	Condition: Structural	Relative Tolerance	General Field Observations/Remarks	Tree Retention/Location Comments	Retention status
592	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	65	9	9.8	Poor	Fair	Poor	Sparse crown, dieback at branch tips	Monitor due to new exposure	Remove
593	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	65	9	9.8	Fair	Fair	Poor	Some evidence of stress. Epicormics on trunk. Asymmetrical canopy. 65% live crown ratio.	Remove due to new exposure	Remove
44 (1044 on survey)	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	93	10	14.0	Fair	Fair	Poor	Surface rooted on rock, evidence of drought stress, some pranch tip dieback, large limb failure in lower crown, deadwood	Remove due to new exposure	Remove
594	No	On	Yes	Douglas fir	*Pseudotsuga menziesii*	85	11	12.8	Fair	Fair	Poor	Surface rooted on rock, some mechanical damage to surface roots on SE.	Remove due to construction	Remove
595	No	On	Yes	Douglas fir	*Pseudotsuga menziesii*	92	13	13.8	Fair	Fair	Poor	Branch tip dieback, likely caused by drought stress, epicormics on trunk.	Remove due to construction	Remove
596	Yes	On	Yes	Western red cedar	*Thuja plicata*	107	10	16.1	Fair/Poor	Fair/Poor	Poor	Codominant at 3m, sparse crown, top is dead	Remove due to construction	Remove
597	No	On	Yes	Western red cedar	*Thuja plicata*	78	8	11.7	Poor	Fair/Poor	Poor	Sparse canopy in upper crown, top has died	Remove due to construction	Remove
598	No	On	Yes	Western red cedar	*Thuja plicata*	99	10	14.9	Fair/Poor	Fair/Poor	Poor	Codominant at 2m with included bark and reaction wood below union with visible crack	Remove due to construction	Remove
752	Yes	On	Yes	Grand fir	*Abies grandis*		6	0.0	Removed	Removed	Poor	Removed	Remove due to construction	Remove
755	Yes	On	Yes	Grand fir	*Abies grandis*	72	8	10.8	Fair	Fair	Poor	Multiple tops	Remove due to construction	Remove
756	Yes	On	Yes	Grand fir	*Abies grandis*	78	8	11.7	Fair	Fair/Poor	Poor	Codominant at 2m	Remove due to construction	Remove
753	No	On	Yes	Grand fir	*Abies grandis*	74	7	11.1	Fair	Fair/Poor	Poor	Codominant at 4m, deflected tops	Remove due to construction	Remove
754	No	On	Yes	Western red cedar	*Thuja plicata*	82	9	12.3	Fair	Fair	Poor	Sparse upper crown, small secondary stem at base	Remove due to construction	Remove
47(1047 on survey)	Yes	On	Yes	Western red cedar	*Thuja plicata*	123	10	18.5	Fair	Fair/Poor	Poor	Top has failed.	Remove due to construction	Remove
764	No	On	Yes	Western red cedar	*Thuja plicata*	89	10	13.4	Poor	Fair	Poor	Some thinning foliage , has recently been exposed	Remove due to construction	Remove
765 (now tagged 1652)	No	On	Yes	Western red cedar	*Thuja plicata*	99	12	14.9	Fair/Poor	Fair	Poor	Some stress (likely drought related)	Remove due to construction	Remove
766	No	On	Yes	Western red cedar	*Thuja plicata*	63	9	10.4	Poor	Fair	Poor	Asaymetrical crown, drought stress	Remove due to construction	Remove
767	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	75	12	11.3	Fair	Fair	Poor	High crown	Remove due to construction	Remove
768	Yes	On	Yes	Western red cedar	*Thuja plicata*	105	15	15.8	Fair/Poor	Fair	Poor	Sparse upper canopy likely drought stress	Remove due to construction	Remove
769	Yes	On	Yes	Western red cedar	*Thuja plicata*	58, 43	10	12.6	Fair	Fair	Poor	Codominant at base, sparse upper canopy likely drought stress	Remove due to construction	Remove
770	Yes	On	Yes	Western red cedar	*Thuja plicata*	64	8	8.6	Fair	Fair	Poor	Asymmetrical canopy, sparse upper canopy, likely drought stress. Trunk deflection.	Remove due to construction	Remove
771	Yes	On	Yes	Western red cedar	*Thuja plicata*	111	12	16.7	Fair	Fair	Poor	Sparse upper canopy. Likely drought stressed	Remove due to construction	Remove
772	Yes	On	Yes	Western red cedar	*Thuja plicata*	95	10	12.9	Fair	Fair	Poor	Sparse upper canopy	Remove due to construction	Remove
773	Yes	On	Yes	Bigleaf maple	*Acer macrophyllum*	67, 49	18	17.4	Good	Poor	Poor	Likely growing from old stump, multiple stems, included bark	Remove due to construction	Remove
774	Yes	On	Yes	Western red cedar	*Thuja plicata*	114	11	17.1	Fair	Fair/Poor	Poor	Old fearout injury in trunk with decay cavity, multiple stems	Remove due to construction	Remove
775	Yes	On	Yes	Western red cedar	*Thuja plicata*	77	11	11.6	Fair	Fair	Poor	Some thinning at top	Remove due to construction	Remove
776	Yes	On	Yes	Western red cedar	*Thuja plicata*	126	14	18.9	Good	Good	Poor		Remove due to construction	Remove
777	Yes	On	Yes	Western red cedar	*Thuja plicata*	96	12	14.4	Good	Good	Poor		Remove due to construction	Remove
778	Yes	On	Yes	Western red cedar	*Thuja plicata*	81, 65, 63, 57, 51,etc	25	23.7	Fair	Fair	Poor	Cluster of red cedars	Remove due to construction	Remove
779	Yes	On	Yes	Western red cedar	*Thuja plicata*	81, 28	10	14.7	Fair	Fair	Poor	Surface rooted, codominant at 1m	Install tree protection fencing, likely impacts from parking	TBD
780	Yes	On	Yes	Western red cedar	*Thuja plicata*	119 below swellin	12	17.9	Fair	Fair	Poor	Asymmetrical crown	Install tree protection fencing	Retain
781	Yes	On	Yes	Western red cedar	*Thuja plicata*	104	14	15.6	Fair	Fair	Poor	Codominant at 2m	Install tree protection fencing	Retain
782	Yes	On	Yes	Western red cedar	*Thuja plicata*	97	12	14.6	Fair	Fair	Poor		Install tree protection fencing	Retain
783	Yes	On	Yes	Western red cedar	*Thuja plicata*	104	13	15.6	Fair	Fair/poor	Poor	2 stems that are fused. Dbh measured as 1 stem, larger stem has codominant tops at ~12m, smaller stem has multiple trunk deflections	Install tree protection fencing	Retain
784	Yes	On	Yes	Western red cedar	*Thuja plicata*	101	13	15.2	Fair	Poor	Poor	Multiple tops at ~8m	Install tree protection fencing	Retain
785	Yes	On	Yes	Western red cedar	*Thuja plicata*	115	13	17.3	Fair	Fair	Poor	Multiple stems, large surface root to SW	Install tree protection fencing	Retain
786	Yes	On	Yes	Western red cedar	*Thuja plicata*	102	15	15.3	Fair	Fair/poor	Poor	Codominant at ~7m, smaller stem failure historically at base.	Install tree protection fencing	Retain
787	Yes	On	Yes	Western red cedar	*Thuja plicata*	105	16	15.8	Fair/Poor	Fair	Poor	stressed dieback and sparse upper canopy	Install tree protection fencing	Retain
788	Yes	On	Yes	Western red cedar	*Thuja plicata*	112	14	16.8	Fair	Fair	Poor	Asymmetrical crown	Install tree protection fencing	Retain
789	Yes	On	Yes	Western red cedar	*Thuja plicata*	69	10	10.4	Fair	Fair	Poor	Asymmetrical crown, cavity at base (potentially undermined)	Install tree protection fencing	Retain
790	Yes	On	Yes	Douglas fir	*Pseudotsuga menziesii*	119	20	17.9	Fair	Fair	Poor	Large deadwood, high crown	Install tree protection fencing	Retain
1651	No	On	Yes	Western red cedar	*Thuja plicata*	73	10	10.95	Fair	Fair	Poor	Assymetrical crown, high crown		Remove
1966	No	On	Yes	Western red cedar	*Thuja plicata*	50	8	9	Fair	Good/Fair	Poor	Sparse upper crown (likely drought stress)	Remove due to construction	Remove
1967	No	Covenant	Yes	Bigleaf maple	*Acer macrophyllum*	42	10	6.3	Good	Fair/Poor	Poor	Growing behind tree 1966, leans to the southeast towards neighbouring property, historical large limb failure, unlikely to tolerate exposure	Remove due to construction impacts	Remove
1968	No	Covenant	Yes	Douglas fir	*Pseudotsuga menziesii*	42	7	6.3	Good/Fair	Fair/Poor	Poor	Growing within covenant, leans to the southeast towards neighbouring property, likely to be impacted by parking area	Remove due to construction impacts	Remove

TREE PROTECTION NOTES

Tree protection barrier: The areas, surrounding the trees to be retained, should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the critical root zone. The barrier fencing to be erected must be a minimum of 1200mm in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

Arborist supervision: All excavation occurring within the critical root zones of protected trees must be completed under the supervision of the project arborist. Any severed or severely damaged roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound.

Demolition: The demolition of the existing houses, driveways, and any services that must be removed or abandoned must take the critical root zone of the trees to be retained into account. If any excavation or machine access is required within the critical root zones of trees to be retained, it must be completed under the supervision of the project arborist. If temporarily removed for demolition, barrier fencing must be erected immediately after the supervised demolition.

Methods to avoid soil compation: In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:

- Installing a layer of hog fuel or coarse wood chips at least 20cm in depth and maintaining it in good condition until construction is complete.
- Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15cm over top.
- Placing two layers of 19mm plywood.
- Placing steel plates.

Mulching: Mulching can be an important proactive step in maintaining the health or trees and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. No mulch should be touching the trunk of the tree. See "methods to avoid soil compaction" if the area is to have heavy traffic.

Pruning: We recommend that any pruning of bylaw-protected trees be performed to ANSI A300 standards and Best Management Practices.

Paved surfaces above tree roots: Where paved areas cannot avoid encroachment within critical root zones of trees to be retained, construction techniques, such as floating permeable paving, may be required. The "paved surfaces above tree roots" detail above offers a compromise to full depth excavation (which could impact the health or structural stability of the tree). The objective is to avoid root loss and to instead raise the paved surface above the existing grade (the amount depending on how close roots are to the surface and the depth of the paving material and base layers). Final grading plans should take this potential change into account. This may also result in soils which are high in organic content being left intact below the paved area. To allow water to drain into the root systems below, we also recommend that the surface be made of a permeable material (instead of conventional asphalt or concrete) such as permeable asphalt, paving stones, or other porous paving materials and designs such as those utilitzed by Grasspave, Gravelpave, Grasscrete and open-grid systems.

Blasting and rock removal:Care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibrations and overall impact to the surrounding environment. Only explosives of low phytotoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.

Scaffolding:This assessment has not included impacts from potential scaffolding including canopy clearance pruning requirements. If scaffolding is necessary and this will require clearance pruning of retained trees, the project arborist should be consulted. Depending on the extent of pruning required, the project arborist may recommend that alternatives to full scaffolding be considered such as hydraulic lifts, ladders or platforms. Methods to avoid soil compaction may also be recommended (see "Minimizing Soil Compaction" section).

Landscaping and irrigation systems: The planting of new trees and shrubs should not damage the roots of retained trees. The installation of any in-ground irrigation system must take into account the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technical consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on the tree health and can lead to root and trunk decay.

Arborists role: It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:

- Locating the barrier fencing.
- Reviewing the report with the project foreman or site supervisor.
- Locating work zones and machine access corridors where required.
- Supervising excavation for any areas within the critical root zones of trees to be retained including any proposed retaining wall footings and review any proposed fill areas near trees to be retained.

TREE MANAGEMENT PLAN

3601 Olympian Way

Colwood, BC

June 12, 2024

Prepared for: WestUrban Developments

Scale: 1:800 @11" X 17"

Drawn By: GW

Reference Drawings: Site Survey Plan (GeoVerra, March 2021), and Site Plan (Kasian Architecture, April 25, 2024)

TALMACK URBAN FORESTRY Consultants Limited
Victoria, BC, V8Z 7H6
TEL: 250-479-8733
EMAIL: trees@talmack.ca
www.treehelp.ca