



COUNCIL REPORT

Regular Council

Report No. PDS 033-2024

Date: February 26, 2024

File No: 3100-05 PRJ22-037

To: Mayor and Council
From: Tahir Ahmed, Planner
Subject: Official Community Plan Amendment, Rezoning and Steep Slope Development Permit with Variance applications (34098, 34118, 34144, 34164 Maclure Road)

RECOMMENDATION

1. That Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024" be read a first time.
2. That, Council acknowledges that the City has referred Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024" to local First Nations and to School District No. 34 (Abbotsford) Board of Education and that Council deems such referral to satisfy the consultation requirements under sections 475 and 476 of the Local Government Act and that no further consultation is required.
3. That Council give second reading to Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024", having considered:
 - (a) The City of Abbotsford's Financial Plan;
 - (b) The City of Abbotsford's Wastewater System Master Plan;
 - (c) The JAMES Wastewater Master Plan;
 - (d) The Fraser Valley Regional District's Solid Waste Management Plan;
 - (e) The matters under sections 475(2) and 476(2) of the Local Government Act and is satisfied that the consultation with School District No. 34 (Abbotsford) Board of Education undertaken to date, including the consultation undertaken to date, plus the additional consultation directed above, meets the requirements of section 476 of the Local Government Act;
 - (f) The matters under section 475(2) of the Local Government Act and is satisfied that the consultation undertaken to date, plus the additional consultation directed herein, meets the requirements of section 475 of the Local Government Act.
4. That pursuant to section 477(3)(c) of the Local Government Act, Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024", be advanced to an upcoming Public Hearing.
5. That prior to adoption of Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024", the following conditions be satisfied:

- (a) consolidating the properties located at 34098, 34118, 34144, 34164 Maclure Road into one legal lot; and
 - (b) registering a Section 219 Covenant to limit the development to townhouses only.
6. That Bylaw No. 3511-2024, Abbotsford Zoning Bylaw, 2014, Amendment Bylaw No. 600", be given first and second readings;
7. That prior to adoption of Bylaw No. 3511-2024, "Abbotsford Zoning Bylaw, 2014, Amendment Bylaw No. 600", the following conditions be satisfied:
- (a) adoption of Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024";
 - (b) entering into a development agreement and/or providing cash-in-lieu to secure the required road dedication and utility upgrades and extensions, as detailed in the Works and Services Report and to the satisfaction of the General Manager of Engineering and Regional Utilities;
 - (c) providing a \$90,625 Community Benefit Contribution;
 - (d) obtaining Ministry of Transportation and Infrastructure approval of Bylaw No. 3511-2024, "Abbotsford Zoning Bylaw, 2014, Amendment Bylaw No. 600; and
 - (e) resolving all issues of funding for items not budgeted by the City.
8. That Development Permit with Variance No. 2445 be approved in principle.
9. That prior to issuance of Development Permit with Variance No. 2445 the following conditions be satisfied:
- (a) adoption of Bylaw No. 3512-2024, "Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024" and Bylaw No. 3511-2024, "Abbotsford Zoning Bylaw 2014, Amendment Bylaw No. 600";
 - (b) providing a security deposit for habitat enhancement, mitigation, monitoring and permanent fence installation, prepared by a qualified professional and to the acceptance of the General Manager, Planning and Development Services, in accordance with the Development Application Procedures Bylaw, 2016;
 - (c) payment of an environmental inspection fee, in accordance with the Development Application and Service Fee Bylaw, 2010;
 - (d) submitting and obtaining approval of an Erosion and Sediment Control Plan prepared by a qualified Civil Engineer;
 - (e) providing a security for erosion and sediment control in accordance with the Development Application Procedures Bylaw, 2016;
 - (f) providing an inspection fee for erosion and sediment control in accordance with the Development Application Procedures Bylaw, 2016;
 - (g) submission of a Planting Plan and Construction Environmental Management Plan (CEMP) prepared by a Qualified Environmental Professional;
 - (h) registering a Section 219 Covenant against the title of the subject property for Protection of the Streamside Protection and Enhancement Area as generally highlighted in Figure 11 of this report;
 - (i) installing the temporary protective fencing along the proposed Streamside Protection and Enhancement Area;
 - (j) providing three sets of signed, sealed development variance permit plans and reports;
 - (k) providing unsecured electronic copies of all final plans and reports; and

- (l) the owners providing written acknowledgment of the terms and conditions of the development variance permit in accordance with the Development Application Procedures Bylaw, 2016.

REPORT CONCURRENCE	
General Manager	City Manager
The General Manager concurs with the recommendation of this report.	The City Manager concurs with the recommendation of this report.

PURPOSE

To amend the Official Community Plan (OCP) land use designation from Suburban to Urban 2 – Ground Oriented with rezoning from Country Residential Zone (CR) to Multifamily Ground Oriented Zone (RMG) and to consider a Steep Slope Development Permit with Variance to the Streamside Protection Bylaw (SPB) for a 1,275 m² reduction to the Streamside Protection and Enhancement Area (SPEA) to facilitate a 145 unit townhouse development. The proposal provides a total of 2,932 m² of onsite riparian area restoration and enhancement for the proposed variance.

SUMMARY OF THE ISSUE

The applicant is proposing to amend the Official Community Plan (OCP) land use designation of the subject property from Suburban to Urban 2 – Ground Oriented with rezoning from Country Residential Zone (CR) to Multifamily Ground Oriented Zone (RMG) to facilitate the construction of a 145 unit townhouse development (see Figures 1 to 12 and Attachments A-K). The proposal also includes the consideration of a Steep Slope Development Permit with Variance to Streamside Protection Bylaw to reduce the SPEA to no less than the Riparian Area Protection Regulations (RAPR) requirements. The proposed variance of 1,275 m² will be offset by a compensation area equal to 2,932 m².

Staff support the proposed OCP amendment and rezoning to facilitate the construction of a 145-unit townhouse development. Staff also support the Steep Slope Development Permit with Variance to the SPB to reduce the SPEA given the proposed habitat compensation and restoration includes a 2:1 equivalent ratio for compensation and the proposed development generally adheres to the environmental guidelines of the OCP.

BACKGROUND

Applicant: Infinity Properties Ltd (Contact: Joshua Turner)

Owners: Maclure and Park Projects Ltd., Inc. No. BC1378736
(Director: Tim Bontkes)

Legal Descriptions: Parcel B (Explanatory Plan 10757) Lot 6 Except: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 8992;

Lot 6 Except: Firstly: Parcel B (Explanatory Plan 10757) Secondly: Parcel C (Explanatory Plan 12571) Thirdly: Parcel A (Reference Plan 13568) Fourthly: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 8992;

Parcel A (Reference Plan 13568) Lot 6 Except: Firstly: Part Subdivided by Plan 32019 Secondly: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 8992; and

Lot 93 Except: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 32019.

Existing OCP Designation: Suburban

Proposed OCP Designation: Urban 2 – Ground Oriented

Existing Zoning: Country Residential Zone (CR)

Proposed Zoning: Multifamily Ground Oriented Zone (RMG)

Site Area: 2.87 ha (7.09 ac)

Site Description: The subject site is situated northeast of the intersection between Highway 11 (Sumas Way) and Gladys Avenue, located to the south of Hazelwood Cemetery. Presently, its access is limited to a tunnel (Pratt Street) beneath Highway 11 (Sumas Way). The site consists of four large suburban lots containing individual single detached dwellings along with several accessory structures such as machine sheds. Certain sections of the property exhibit slopes exceeding 20%, necessitating compliance with the Steep Slope Development Permit requirements. The current structures are proposed to be demolished and lots will be consolidated into one property.

Surrounding Uses: N: Maclure Road and Hazelwood Cemetery designated Open Space (zoned P2) and Hazelwood Ave/Elmwood Dr beyond;
S: Highway No. 11 (Sumas Way) and residential lands beyond;
E: Townhouse development designated Urban 4 – Detached (zoned RM30) and single detached dwellings designated Urban 4 – Detached (zoned RS5-A) beyond; and
W: Properties containing single detached dwellings, designated Suburban (zoned CR) – currently under development application PRJ22-107 and Pratt Street beyond.

DISCUSSION

Context

1. The subject site is located as a relatively isolated parcel of land situated south of Hazelwood Cemetery on Maclure Road, northeast of the intersection of Highway 11

(Sumas Way) and Gladys Avenue. Presently, access for vehicles is confined to Pratt Street, accessed through a tunnel beneath Highway 11 (Sumas Way). Public and private cemeteries (Hazelwood and Mennonite Cemetery) are located to the north of the site. The Discovery Trail traverses east-west through Hazelwood Cemetery, situated north of the subject site (refer to Figure 2). The nearest commercial area lies approximately 1 km away, southeast of the subject site, with accessibility planned via the proposed Maclure Road/Elmwood extension. According to information from the Abbotsford School District website, the current catchment schools for these properties are Margaret Stenersen Elementary, Clayburn Middle, and Robert Bateman Secondary.

Official Community Plan (OCP)

2. As per the 2016 Official Community Plan (OCP) the subject properties are designated Suburban (Figure 3). This land use designation allows for residential developments comprising single detached dwellings with a maximum height density of 2.5 units per hectare.
3. The applicant is proposing an OCP amendment to change the land use designation from Suburban to Urban 2 – Ground Oriented, which allows multifamily housing of ground oriented multiplex, duplex, row or townhouses. The permitted densities range between 0.5 and 1.5 FSR with heights up to three storeys.
4. In 2018, subsequent to the adoption of the 2016 Official Community Plan (OCP) and during the preparation Transportation Master Plan, the subject properties underwent Council deliberations regarding a proposed modification to the land use designation to permit increased density.
5. According to Report No. 034-2018 presented to Council by staff regarding "Official Community Plan Housekeeping Amendment - Public Hearing Input," it is acknowledged that the low density designation of these properties reflects considerations of urban layout and challenges related to local access, particularly with vehicle movements limited to Pratt Street beneath Highway 11. Regarding the redevelopment potential of these properties, the report also highlights:

".....2016 OCP designation is appropriate based on the urban structure growth approach and existing access constraints of the site. However, this does not preclude changes to the area in the future. More detailed analysis of site access through Pratt Street is required to determine whether or not more density, and therefore more vehicle trips, could be accommodated. This analysis would be done through a site specific OCP amendment application rather than a broad housekeeping update".

(for details see Attachment D)

6. Additionally, as part of the preparation for the Transportation Master Plan, outlined in Report No. ENG 052-2018 titled "Maclure / Hazelwood Area Transportation Network," staff put forward the following observations regarding the future prospects of these properties:

"With the transportation network changes described in this report to enable better connections and more efficient vehicle movement, a land

use designation change (townhouses) to these properties may be appropriate when combined with its proximity to a Neighbourhood Centre (Immel). Staff recommends that an OCP amendment to change the land use designation should be considered in conjunction with a rezoning application reflecting the detailed development proposal for the subject area”.

(for details see Attachment E)

7. After careful consideration of the proposal within the framework of the policies, studies and reports considered by Council, and with the aim of facilitating improved vehicular and pedestrian connections through the neighbourhood, staff support the proposed amendment of the Official Community Plan from Suburban to Urban 2 – Ground Oriented for the following rationale:
 - a. The proposal is in accordance with the recommendations put forth by staff in both the Official Community Plan Housekeeping Amendment - Public Hearing Input (Report No. PDS 034-2018) and the Maclure/Hazelwood Area Transportation Network (Report No. ENG 052-2018), which were endorsed by Council. The project entails the construction of a Maclure Road extension, linking the current properties to Elmwood Drive, thereby establishing a connection to the nearby Neighbourhood Center (Immel Street).
 - b. The close proximity of the subject properties to Neighbourhood Center (Immel Street), Highway 11 and Discovery Trail, renders them highly suitable for multifamily density, ideally accommodating townhouses. Given that all off-site improvements are funded by the developer, the staff firmly believe that the proposed density, aimed at facilitating townhouse development, is the most fitting option for these properties.
 - c. The proposed development is also in keeping with the broad objectives and policies of the Urban Structure of the OCP by:
 - i. Focused Residential Growth – Focus an overall 75% of new residential growth (approximately 45,000 new residents) in centres and existing neighbourhoods, with the most intensification in the Urban Core;
 - ii. Housing Diversity – Support diverse housing types for a variety of household sizes, incomes, tenures, and preferences; and
 - iii. Residential Intensification – Focus residential intensification around the Urban and Neighbourhood Centers.
 - iv. Infrastructure; growth pays for itself – Infrastructure planning and development are intricately linked to the land use plan, ensuring that investments are made efficiently and that the expenses associated with servicing new developments are entirely covered by those who directly reap the benefits. The proposed development will be mandated to fully cover the expenses for off-site infrastructure capacity enhancements, which confer benefits to the wider community. These costs are separate from the obligatory Development Cost Charges (DCC).

OCP Amendment Consultation (Public Information Meeting)

8. Section 475 of the Local Government Act (LGA) states that when an amendment to an Official Community Plan (OCP) is proposed, the local government must provide an

opportunity it considers appropriate for consultation with persons, organizations and authorities it considers will be affected. This is in addition to a Public Hearing.

9. To align with this LGA requirement, Section 3.1 (Notification and Consultation) of the Development Application Procedures Bylaw outlines that OCP amendment applications be presented for public review at a City hosted information meeting, prior to proceeding for Council consideration. In this regard, both an in-person Public Information Meeting (PIM) and an online consultation opportunity, using the City of Abbotsford's 'Lets Talk Abbotsford' community engagement platform, were available for staff to receive public input on the proposal. The outcomes of these events are summarized below, and attached to the Council Report for Council's consideration.
10. For the online consultation, residents were invited to review the proposed OCP amendment and associated project details online from November 8, 2023 to November 29, 2023 (3 weeks) and complete a survey to identify key community concerns related to the OCP amendment. In accordance with the Development Application Procedures Bylaw, newspaper advertisements were published, and notification was mailed to residents within 250 m of the subject property.
11. During the three-week online consultation period, a cumulative of 16 online surveys were submitted. All respondents were identified as property owners and/or residents of Abbotsford. Among the total respondents, eight individuals (50%) expressed opposition to the proposed OCP Amendment, while seven respondents (43.8%) indicated their support. Only one respondent (6.3%) remained undecided.
12. The online feedback encompassed commentary on the newly proposed connection linking Maclure Road and Elmwood Drive, as well as considerations regarding tree preservation. Supporters of the proposed OCP amendment viewed the development favorably, citing it as a beneficial investment for the area and a valuable addition to the city's housing stock. However, several respondents expressed concerns about neighborhood traffic, particularly at the intersection of Old Clayburn Road and Immel Street. Additional remarks on the proposal are detailed in the attached Online PIM Survey Response Report (08 November 2023 - 29 November 2023) - Attachment F.
13. The in-person Public Information Meeting (PIM) took place on November 15, 2023, at Dr. Thomas A. Swift Elementary School, situated at 34800 Mierau Street. This PIM coincided with another PIM concerning an OCP Amendment (PRJ22-107) for neighboring properties located at 34010, 34024, 34040, 34056, and 34074 Maclure Road. However, each project was presented to the public independently, allowing for separate feedback sessions on each individual project.
14. At the PIM, a total of seven individuals were in attendance, and two comment sheets were submitted by Abbotsford property owners and/or residents. One comment sheet expressed support for the proposed OCP amendment, as well as for the associated rezoning amendment and the plan to develop the properties into townhouses. Conversely, the other comment sheet indicated uncertainty regarding the proposed OCP amendment, with no expressed support for the associated rezoning amendment or the development proposal. Detailed remarks are enclosed as Attachment G.

OCP Amendment Consultation (General)

15. Section 477(3) of the Local Government Act further requires that after the first reading of an OCP amendment bylaw, “the local government must do the following in the indicated order:
- a. First, consider the proposed Official Community Plan in conjunction with
 - i. Its financial plan, and
 - ii. Any waste management plan, under Part 3 (Municipal Waste Management) of the Environmental Management Act that is applicable in the municipality or regional district;
 - b. Next, if the Official Community Plan applies to land in an Agricultural Land Reserve, refer the plan to the Provincial Agricultural Land Commission for comment; and
 - c. Finally, hold a public hearing on the proposed official community plan in accordance with Division 3 (Public Hearings on Planning and Land Use Bylaws).
16. Accordingly, should Council grant first and second readings to the proposed OCP amendment bylaw, a recommendation is included in this report to consider the amendment in conjunction with the City of Abbotsford’s Financial Plan, Wastewater System Master Plan, JAMES Wastewater Master Plan, and the Fraser Valley Regional District’s Solid Waste Management Plan.

This proposal does not amend the City’s policies and targets related to solid waste and wastewater, and the development continues to meet the overall intent and direction of the City’s masterplans.

As the lands are located outside the Agricultural Land Reserve, referral to the ALC is not required.

17. Section 475 of the Local Government Act further stipulates that Council should: “consider whether consultation is required with the following:
- *The board of the regional district in which the area covered by the plan is located;*
 - *The board of the regional district that is adjacent to the area covered by the plan;*
 - *The council of any municipality that is adjacent to the area covered by the plan;*
 - *First Nations;*
 - *Boards of education, greater boards and improvement district boards; and*
 - *The provincial and federal governments and their agencies.”*
18. The subject property is not abutting local governments or First Nations and remains consistent with the FVRD Regional Growth Strategy. Furthermore, a referral of the application was sent to the Abbotsford School District and First Nations when this application was received, and staff did not receive any response. Accordingly, it is recommended that further consultation not be undertaken.

Affordable Housing Strategy

19. On May 25, 2020 the City adopted an updated Affordable Housing Strategy (AHS). This strategy contains two overarching policy topics; Housing Supply and Partnerships and Coordination. Under the category of Housing Supply, similar to the OCP objectives and policies, the AHS encourages the development of diverse housing options for all stages of

life across the housing continuum. The applicant's proposal is consistent with this policy objective.

Zoning

20. The subject property is currently zoned Country Residential (CR) as shown in Figure 4. If the proposed OCP amendment is approved, the applicant proposes to rezone the site to Multifamily Ground Oriented Zone (RMG) to facilitate the construction of a 145 unit townhouse development with an FSR of 0.81.
21. RMG Zone intends to accommodate townhouse developments up to three storeys in height for lands designated Urban 2 – Ground Oriented in the City's OCP. The RMG Zone fully aligns with the Urban 2 – Ground Oriented land use designation in the OCP, and staff, therefore, support the proposed rezoning.

Steep Slope Development Permit (SSDP)

22. As per the OCP, the portions of the subject properties are located within the Steep Slope Development Permit area, as shown in Figure 5. The Steep Slope Development Permit area guidelines are intended to allow land to be used for its intended purpose, while also protecting residents and property from the potential risk of natural hazards. In some cases, development on or near steep slopes is unavoidable and requires measures during site and building design, construction, and long-term maintenance to minimize the associated risks.
23. As Council is considering a variance to the Streamside Protection Bylaw, a Steep Slope Development Permit is also included in this consideration as the overall ground works are contingent on each other. The applicant has provided a Geotechnical Report with an Appendix D – Landslide Assessment Assurance Statement (dated August 23, 2023), prepared by GeoWest Engineering (Attachment H) which confirms that the proposed development is safe for the use intended with a registered covenant. The Development Permit with Variance No. 2445 includes this report as a schedule and all of the development on the subject properties needs to adhere to the recommendations of the Geotechnical engineering.
24. Staff support the proposed Steep Slope Development Permit in conjunction with Variance to the Streamside Protection Bylaw given that the design generally adheres to SSDP guidelines and the proposed habitat compensation and restoration includes a 2:1 equivalent ratio for compensation and the proposed development generally adheres to the environmental guidelines of the OCP.

Natural Environmental Development Permit (NEDP)

25. While the OCP does not specifically designate the subject properties for a Natural Environmental Development Permit (NEDP), an environmental assessment has revealed the presence of watercourses on these properties. According to the Environmental Report (Attachment I), Ditch 1 intersects with Willband Tributary A at the southwest portion, while Ditch 2 runs along the eastern property line (see Figure 11). All these water channels are categorized as non-fish bearing. Although Ditch 1 and Ditch 2 are deemed non-permanent features, Willband Tributary A is identified as a permanent

watercourse. The applicant is seeking variances to the applicable setbacks, as detailed in the subsequent sections.

Variance to Streamside Protection Bylaw (SPB)

26. The subject property is further subject to Streamside Protection Bylaw (SPB) for which the applicant is proposing a variance. As per the SPB, Ditch 1 requires a 2.0 m of Streamside Protection and Enhancement Area (SPEA) and 2.0 m of Riparian Areas Protection Regulation (RAPR) whereas Ditch 2 does not require any setbacks as it is a localized man-made drainage channel and classified as Non-Fish Habitat.
27. Tributary A, on the other hand, necessitates 30 meters of Streamside Protection and Enhancement Area (SPEA) along with 10 meters of Riparian Areas Protection Regulation (RAPR). Within the SPEA requirement, this translates to a total area of 3,783 m². The applicant is seeking variances to the Streamside Protection Bylaw (SPB), requesting a reduction of 1,275 m² to the SPEA to accommodate the construction of the proposed townhouse development. To compensate for this reduction, the proposal includes the provision of an enhancement area totaling 2,932 m², surpassing the 2:1 ratio (refer to Figure 11).
28. The applicant's Qualified Environmental Professional (QEP) also advises that the proposed 1,275 m² reduction in the SPEA remains consistent with the provincial RAPR requirements.
29. Staff support the proposed variance to the Streamside Protection Bylaw as the proposed rehabilitation/restoration meets the policies within the OCP and meets the provincial RAPR stream setbacks.

Habitat Compensation and Restoration Planting

30. A variance to the Streamside Protection Bylaw is typically accompanied by a habitat compensation/mitigation planting plan to offset the impacts resulting from the variance request and an associated monitoring program to ensure the works are successfully executed and maintained.
31. The City's current Streamside Protection Bylaw does not currently contain language regarding specific compensation ratios. However, the guidelines contained within the City's OCP NEDP indicate where the loss of riparian habitat is unavoidable; replace the value of lost habitat at a ratio of 2:1, which in this case equates to 2,550 m². As part of the proposed works, a total of approximately 2,932 m² of riparian habitat will be planted with native shrubs and trees which is slightly more than the required compensation area of 2,550 m² (at the rate of 2:1).
32. Prior to the issuance of Development Variance Permit No. 2445, the applicant will need to provide detailed final plans showing the proposed works within the habitat compensation and restoration area, existing trees, planting plan, cross sections and profile views. The applicant will need to submit a Construction Environmental Management Plan (CEMP) prior to the issuance of the Development Variance Permit, which will outline the proposed work in detail and how it will be carried out. All of these requirements have been included in the recommendations of this report.

33. The Environmental Coordinator reviewed the Environmental Impact Assessment report (Fish Habitat Assessment & Wildlife Habitat Report) for the proposed changes to Streamside Protection and Enhancement Areas, prepared by BlueLines Environmental Ltd. dated July 19, 2023 and concurs with the evaluation of the consultant and is of the opinion that the proposal meets the intent of the policies contained within the OCP.

Senior Agency Regulatory Considerations

34. The Environment Assessment Report also notes that the proposed development will include requirements for the installation of a single stormwater outfall. The storm outfall is proposed to connect to the head of the existing anthropogenic ditch (Ditch 1) and will receive drainage from onsite detention tanks situated below strata road surfaces. The storm outfall will require compliance with the Water Sustainability Act, Water Sustainability Regulation. A notification pursuant to Section 39 of the Regulation will be required with works completed under environmental monitoring supervision to ensure adherence with instream works standards and best practices.

Multi Family Form and Character Development Permit (F&C DP)

35. The proposed development is subject to the Multifamily Residential Development Permit guidelines contained within the OCP. The objectives of these guidelines are to encourage the construction of well-designed, attractive and livable residential developments.
36. The applicant has submitted architectural and landscape plans, prepared by Focus Architecture and VDZ+A Landscape Architects dated August 20, 2023 and September 1, 2023 respectively. The proposal consists of 145 townhouses (17 four-bedroom and 128 three-bedroom units) located within 29 three-storey buildings. The unit sizes range from 124 m² (1,336 f²) to 196 m² (2,119 f²) See attached Figures 6 – 9 for details. The proposal generally meets the F&C DP guidelines contained in the OCP.
37. As the proposal fully complies with the Zoning Bylaw (ZB) and no variances to ZB are proposed, following Council consideration of the OCP amendment, rezoning and Variance to SPB applications, the Multifamily Residential Development Permit for Form and Character will be reviewed for issuance by the Director, Development Planning in accordance with the delegation of powers contained within the Development Application Procedures Bylaw.

Access and Parking

38. Currently, the subject site's only vehicular access is via Maclure Road, using Pratt Street through a tunnel under Highway 11. As part of the off-site improvements, the developer is required to build a new road connection between Maclure Road and Elmwood Drive, as outlined in the Works and Services Report (See Figure 12 and Attachment J). This new connection will connect the subject site to the nearby Neighbourhood Center on Immel Street.
39. The Discovery Trail traverses through the Hazelwood Cemetery, situated north of the site. In accordance with Parks, Recreation & Culture requirements, the developer is required to relocate the Discovery Trail to the cemetery's edge to ensure its alignment

with the Maclure Road extension (see Figure 12). This adjustment of the Discovery Trail will result in a better alignment to ensure an enhanced user experience.

40. The above-mentioned off-site works, along with the rest of the off-site improvements required for the proposed development shall be secured through a Development Agreement under the Works and Services Requirements.
41. A 6.0 m wide access is proposed off Maclure Road, located in the middle of the subject site with internal strata lanes providing access to individual townhouse units. The units located within Buildings 1-4 are directly connected to City's sidewalk located on Maclure Road.
42. As required by the Zoning Bylaw, the development provides a total of 319 off-street parking spaces. Each unit includes the required two resident parking spaces within a garage, in a side-by-side configuration and a total of 33 visitor's parking spaces (0.2 visitor spaces required per dwelling unit) are provided throughout the development.

Tree Removal and Replacement / Landscaping

43. An Arborist report is submitted in conjunction with this application, which is prepared by Diamond Head Consulting Ltd. dated November 15, 2021 (see Attachment K). A total of 164 mature trees were assessed of which 106 are located on-site, 33 are located within Road ROWs and 25 trees are located at/shared with neighbouring properties.
44. In accordance with the Arborist's advice, a total of 102 trees on-site and one off-site tree (situated at 34074 Maclure Rd) need to be removed due to their presence within the proposed development area. The property at 34074 Maclure Road, which is also part of the development application (PRJ22-107), plans to remove the same tree.
45. The report also highlights the need to remove 28 trees situated along the frontage of Maclure Road. These trees are expected to be cleared as part of the future road widening project mandated by the Works and Services Requirements. Since their removal is tied to road and infrastructure enhancements, there is no obligation for replacement trees.
46. Consistent with the Tree Protection Bylaw, the removal of 131 trees will require the provision of replacement trees on-site or a cash contribution in lieu of replacement. Replacement trees are calculated at a 3:1 ratio for trees having a diameter greater than 30 cm DBH and at a 2:1 ratio for trees having a diameter of 20 – 30 cm DBH. Accordingly, staff anticipate 370 replacement trees being required in conjunction with the Development Permit. However, the landscape plan illustrates 162 trees to be planted on-site, the developer is anticipated to provide cash-in-lieu payment for 208 replacement trees (\$62,400). Tree removal/replacement and landscaping requirements will be secured at the time of the subsequent Multifamily Residential Development Permit.
47. As the tree removal is being authorized through the issuance of the Development Permit, protective fencing must be installed around any off-site trees identified for retention consistent with the Arborist Report in advance of DP issuance. Staff also note that the plantation under the SPEA is totally separate from this tree calculation above and shall be secured through separate security under DP with Variance No. 2445. In

conjunction with this development, street trees are required in accordance with the Development Bylaw and will be secured through the required works and services.

Community Benefit Contributions

48. On September 11, 2023, Council adopted Policy C007-11 which establishes and describes a Community Amenity Contributions (CAC) program for residential development applications that require rezoning. Under this policy, CAC's are defined as voluntary amenity contributions made by the developer as part of their rezoning proposal and are intended to offset the cost of providing community amenities associated with new residential development. With respect to residential developments, the voluntary cash-in-lieu contribution is \$5,000 with the funds being directed to the Affordable Housing Opportunities Reserve Fund (Affordable Housing), and a Community Amenities Reserve Fund (Recreation Amenities and Green Space, Cultural Amenities and Emergency Service Amenities). The policy applies to all new rezoning applications made after September 11, 2023. As the subject application was made prior to September 11, 2023, the applicant has proposed a community contribution under the previous Community Benefit Contribution (CBC) policy. The recommended CBC for this application is \$90,625 (\$625 per new unit).

Lot Consolidation

49. In order to facilitate the proposed development, staff recommend that all four properties be consolidated into one lot as a condition of the rezoning. Once the lots are consolidated the new legal property will receive a new civic address.

House Demolition

50. Given that there is a concurrent DP to redevelop the lands as a townhouse development, the demolition of the existing houses will be addressed with future approvals.

Ministry of Transportation and Infrastructure (MoTI) Approval

51. The subject property is located within 800 m of a controlled access intersection therefore, the proposed Bylaw No. 3211-2024, "Abbotsford Zoning Bylaw, 2014, Amendment Bylaw No. 600" requires approval from the Ministry of Transportation and Infrastructure (MoTI). MoTI has reviewed the proposal and indicated their support for the proposal. Should this bylaw receive three readings, MoTI will be required to sign the bylaw before the final adoption.

Site Development Considerations

52. A staff review of the Works and Services Requirements necessary to support this application has been completed and is outlined within Attachment J, the details of which will be incorporated into the Development Agreement, a prerequisite for the adoption of the rezoning bylaw. Some notable off-site requirements of the attached Works and Services Requirements are:
- a. Construction of a new intersection and connection of Maclure Road and Elmwood Drive to provide access to the proposed development. This road network was

- previously endorsed by Council through “Maclure / Hazelwood Area Transportation Network” in 2018. Please see the enclosed Report No. ENG 052-2018 (Attachment E); and
- b. Realignment of Discovery Trail through Hazelwood Cemetery to align it to the new Maclure Road/Elmwood connector. Refer to Figure 12.
53. The developer is responsible to adhere to all other legislation, which may apply to the land, including:
- a. complying with all applicable City bylaws, such as Official Community Plan Bylaw, Development Bylaw, Tree Protection Bylaw, Building Bylaw, Sign Bylaw, Erosion and Sediment Control Bylaw, and Development Cost Charges Imposition Bylaw administered by the City; and
 - b. obtaining all other necessary approvals and permits on such terms as they may be issued, including but not limited to a development permit, tree removal permit, subdivision approval, building permit, soil removal/deposit permit, Ministry of Health permit, Ministry of Transportation and Infrastructure approval and Ministry of Environment approval.

Communication Plan

If supported by Council, Bylaw No. 3512-2024, “Abbotsford Official Community Plan Bylaw, Amendment Bylaw No. 024” will proceed to a Regular Meeting of Council, where it will be considered for first and second readings. If the proposed OCP Amendment bylaw is supported by Council the Bylaw will then proceed to an upcoming Public Hearing. The City will notify, in writing, the owners and occupiers of land within a 250 meter radius of the property and copies of all correspondence received will be provided to Council. Two advertisements for the Public Hearing will be published in the City Page of the local newspaper.

The City received confirmation on July 18, 2023, that the applicant installed the required Development Notification Sign in accordance with the Development Application Procedures Bylaw, which requires the sign to be installed a minimum of 4 weeks in advance of Council’s consideration of the application.

FINANCIAL PLAN IMPLICATION

Any capital works implications arising from this application have been addressed through the OCP amendment and rezoning process.

Any fees and charges collected, as mentioned in the recommendation section, will be credited to City’s various revenue or deposit accounts.

Komal Basatia

Komal Basatia
General Manager, Finance and Procurement Services
Signed 2/20/2024 1:28 PM

IMPACTS ON COUNCIL POLICIES, STRATEGIC PLAN AND/OR COUNCIL DIRECTION

Although an Official Community Plan (OCP) amendment is proposed, it is staff's opinion that the proposal meets the goals and objectives identified in the 2016 Official Community Plan, the Affordable Housing Strategy, and Council's 2022-2026 Strategic Plan which identifies four Guiding Principles: Inclusive and Connected Community, Sustainable and Safe City, Vibrant and Growing Economy and Organizational Excellence and Integrity.

SUBSTANTIATION OF RECOMMENDATION

The proposed Official Community Plan (OCP) amendment for the subject properties from Suburban to Urban 2 – Ground Oriented remains consistent with the broader goals and objectives of the OCP and Council's Strategic Plan. Furthermore, the proposed rezoning from Country Residential Zone (CR) to Multifamily Ground Oriented Zone (RMG) is consistent with the proposed OCP amendment, and if supported by Council, a Steep Slope Development Permit with Variance to Streamside Protection Bylaw is also presented concurrently for Council consideration.

Staff are of the opinion that the proposal will provide housing capable of meeting a diversity of household sizes, incomes, tenures and preferences. As such, staff support this application subject to the conditions outlined in the recommendations section.

Tahir Ahmed

Tahir Ahmed
Planner
Signed 2/15/2024 4:15 PM

Blake Collins

Blake Collins
Director, Development Planning
Signed 2/16/2024 2:36 PM

Mark Neill

Mark Neill
General Manager, Planning and Development Services
Signed 2/20/2024 8:46 PM

ATTACHMENTS:

PRJ22-037 Figures 0-12

Attachment A - Draft Bylaw No. 3512-2024, Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024

Attachment B - Draft Bylaw No. 3511-2024, Abbotsford Zoning Bylaw, 2014, Amendment Bylaw No. 600

Attachment C - Draft Development Permit with Variance No. 2445

Attachment D - Report No. PDS 034-2018, Official Community Plan Housekeeping Amendment

Attachment E - Report No. ENG 052-2018, Maclure - Hazelwood Area Transportation Network

Attachment F - Online Public Information Meeting Survey Response Report

Attachment G - In Person Public Information Meeting Comments

Attachment H - Geotechnical Report

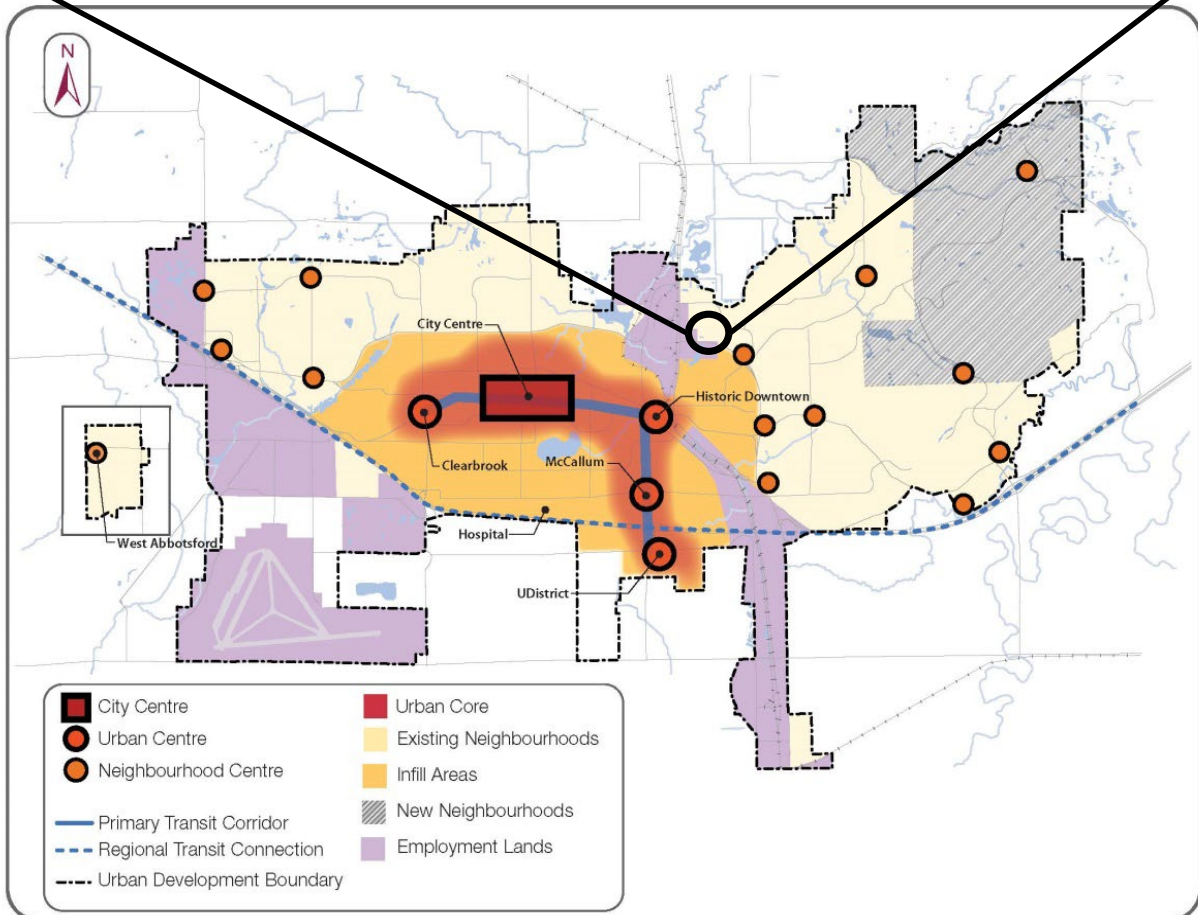
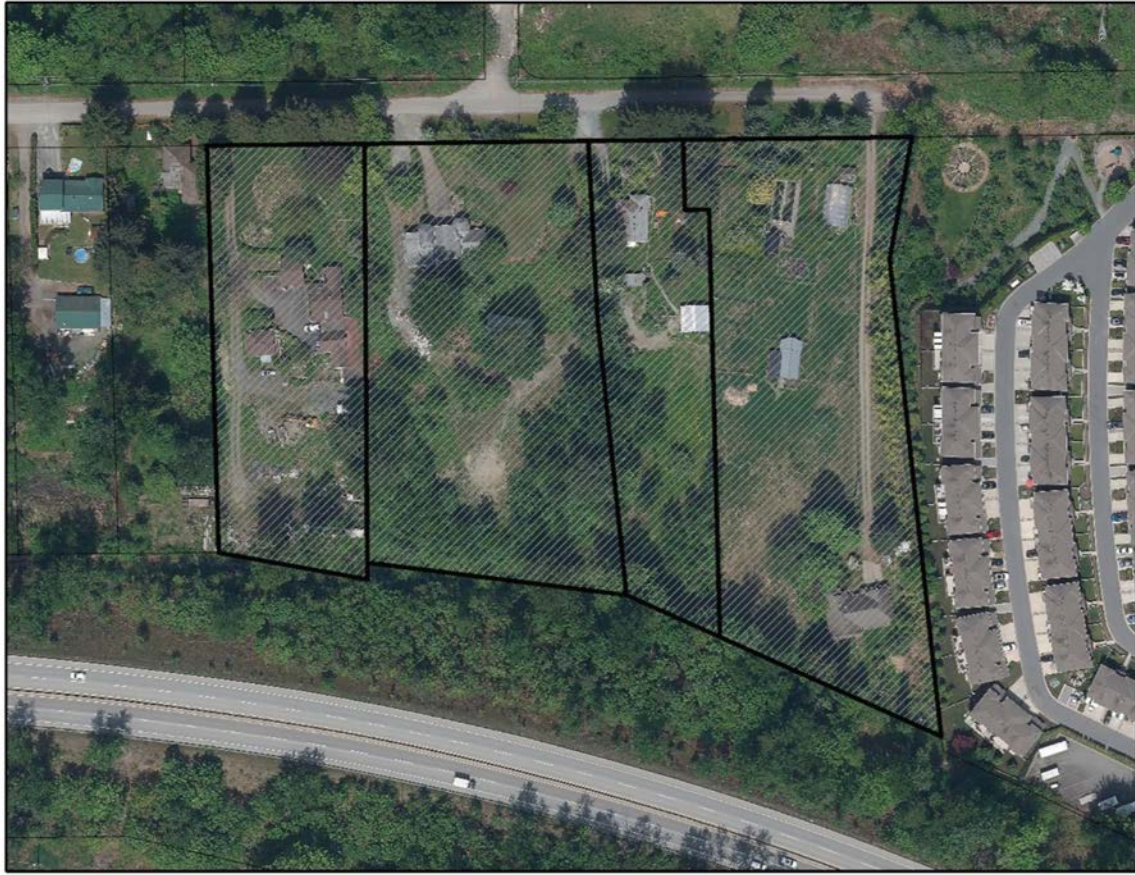
Attachment I - Environmental Assessment Report

Attachment J - Works and Services Requirements

Attachment K - Arborist Report

City Context Plan

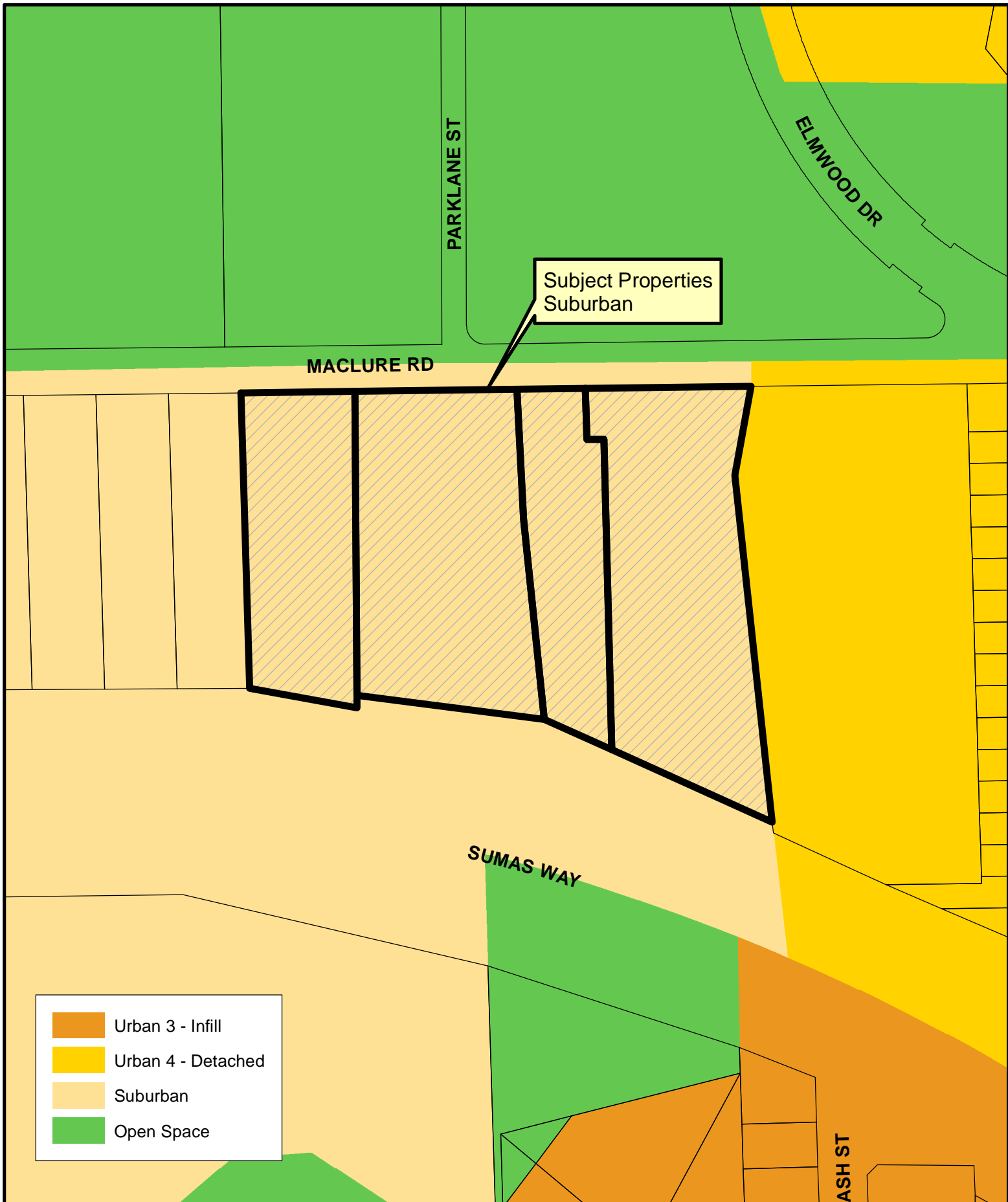
File: PRJ22-037 Location: 34098, 34118, 34144 and 34164 Maclure Road

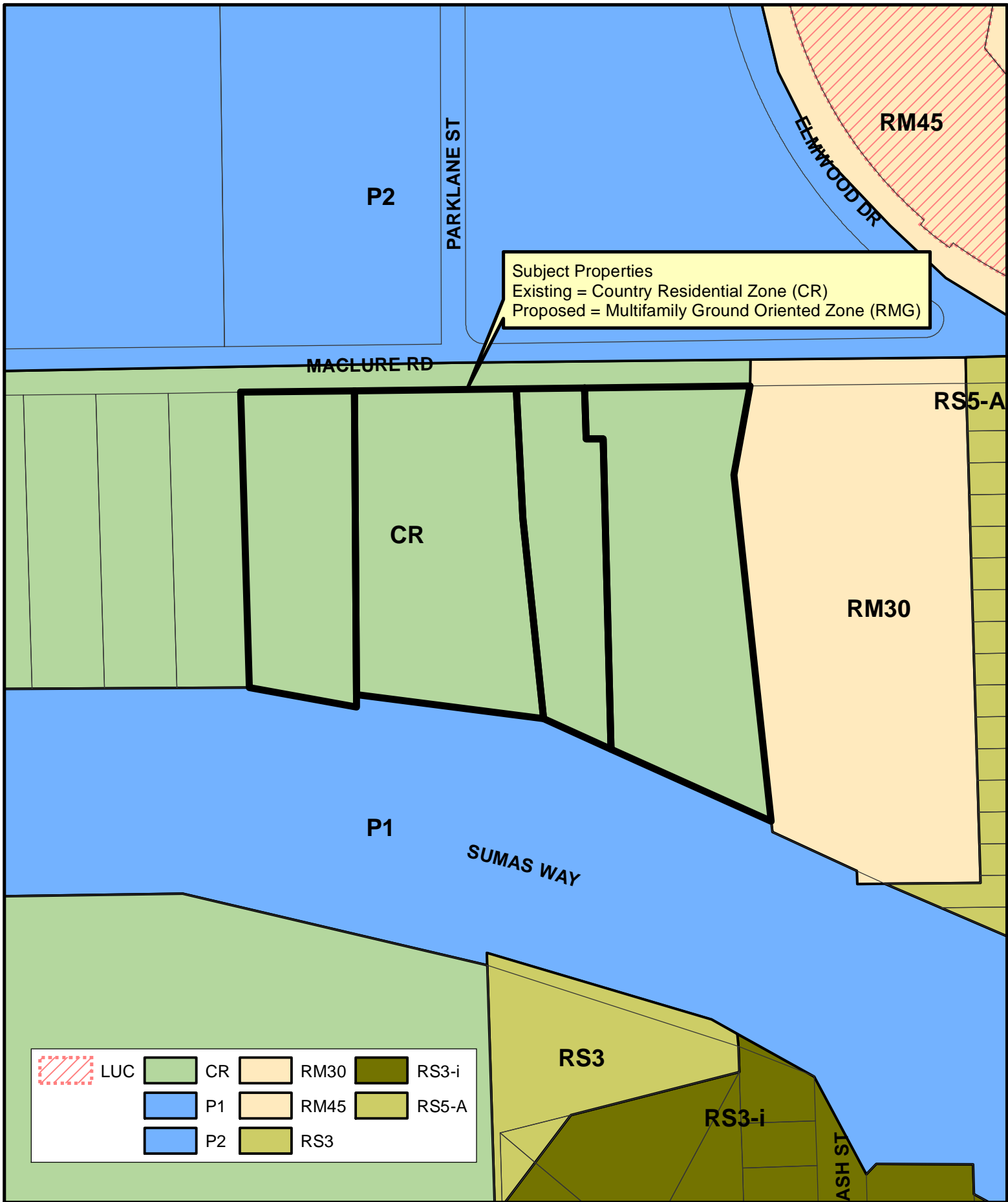


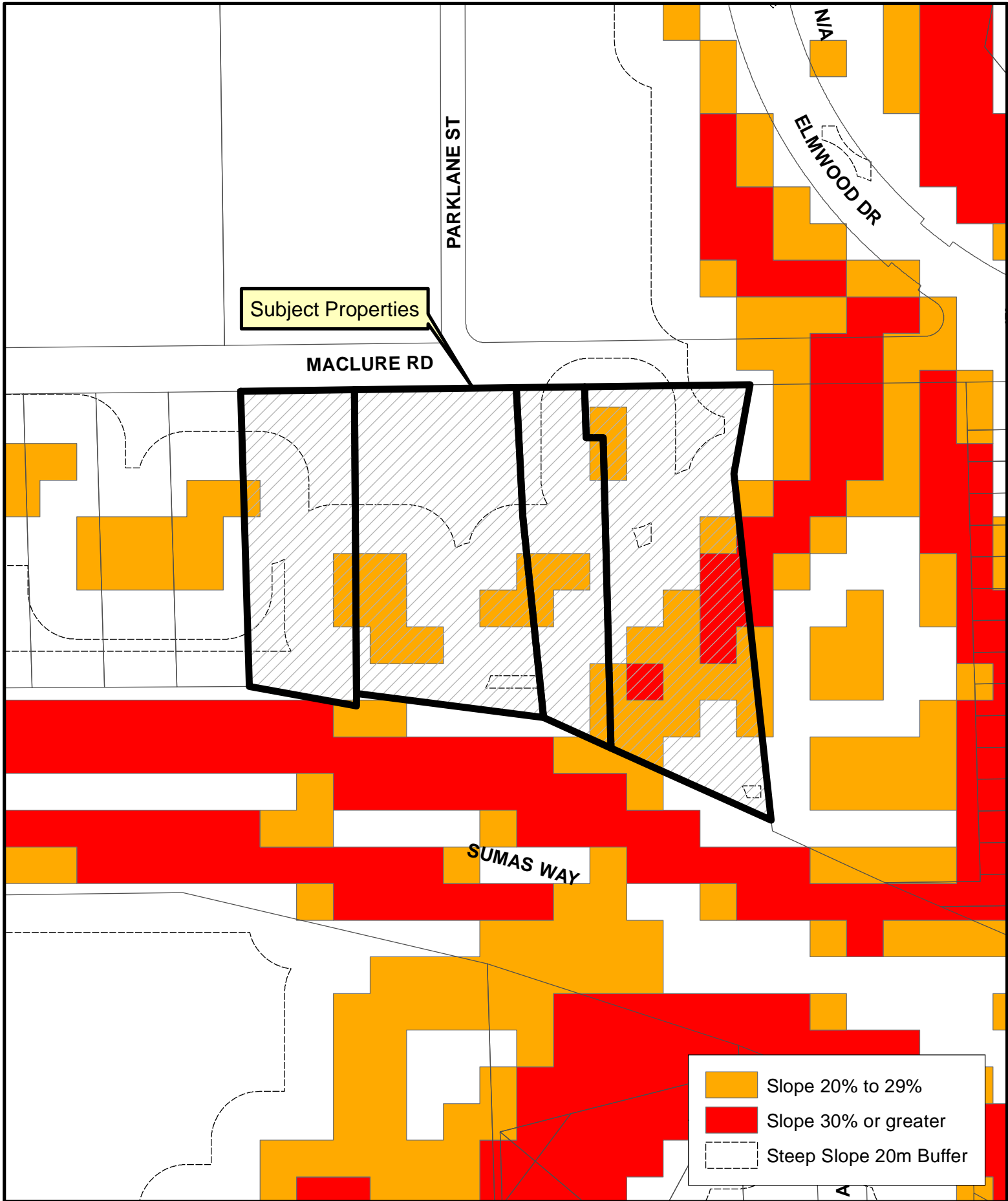


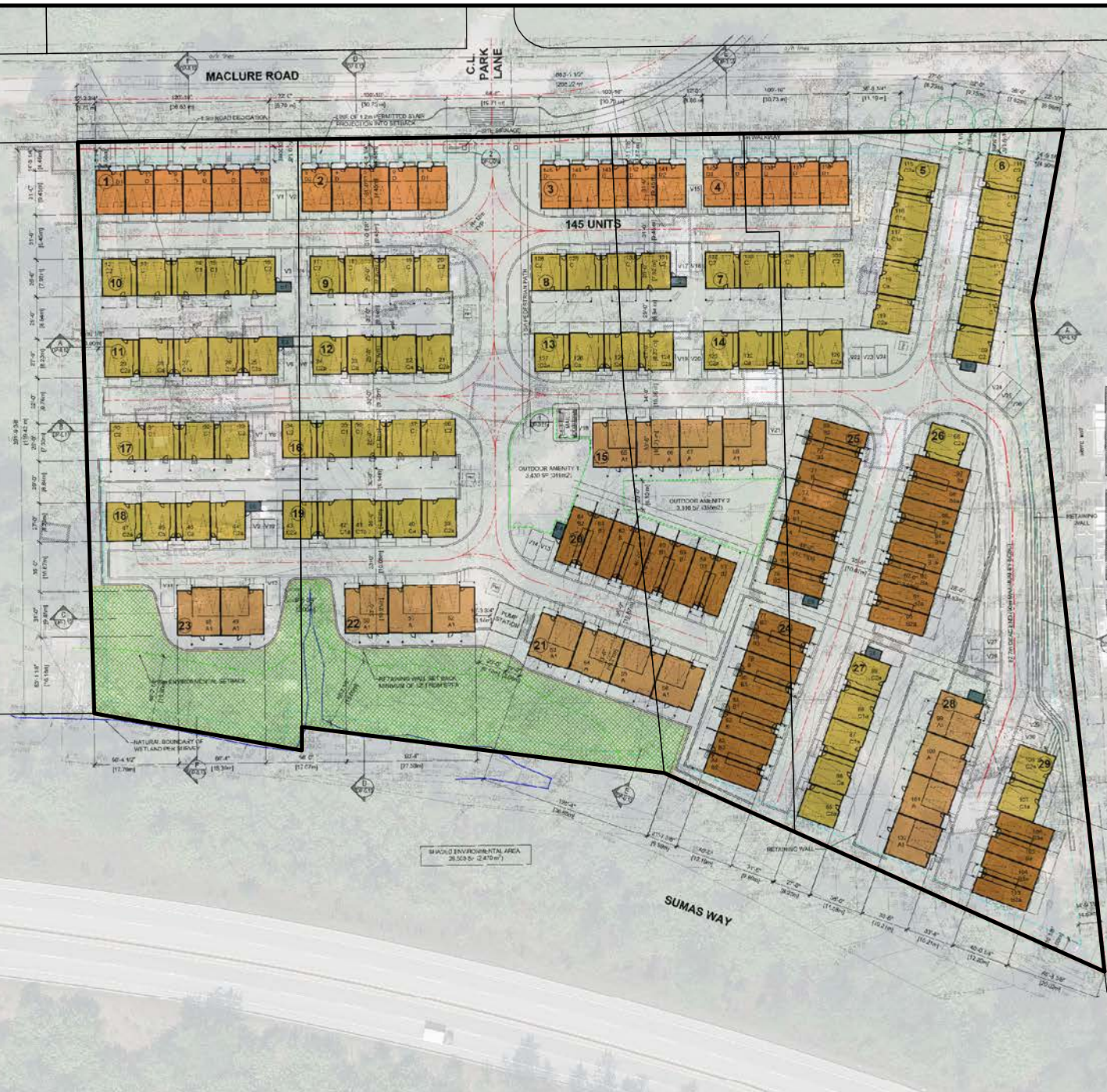














① OVERALL MACLURE RD. STREETSCAPE



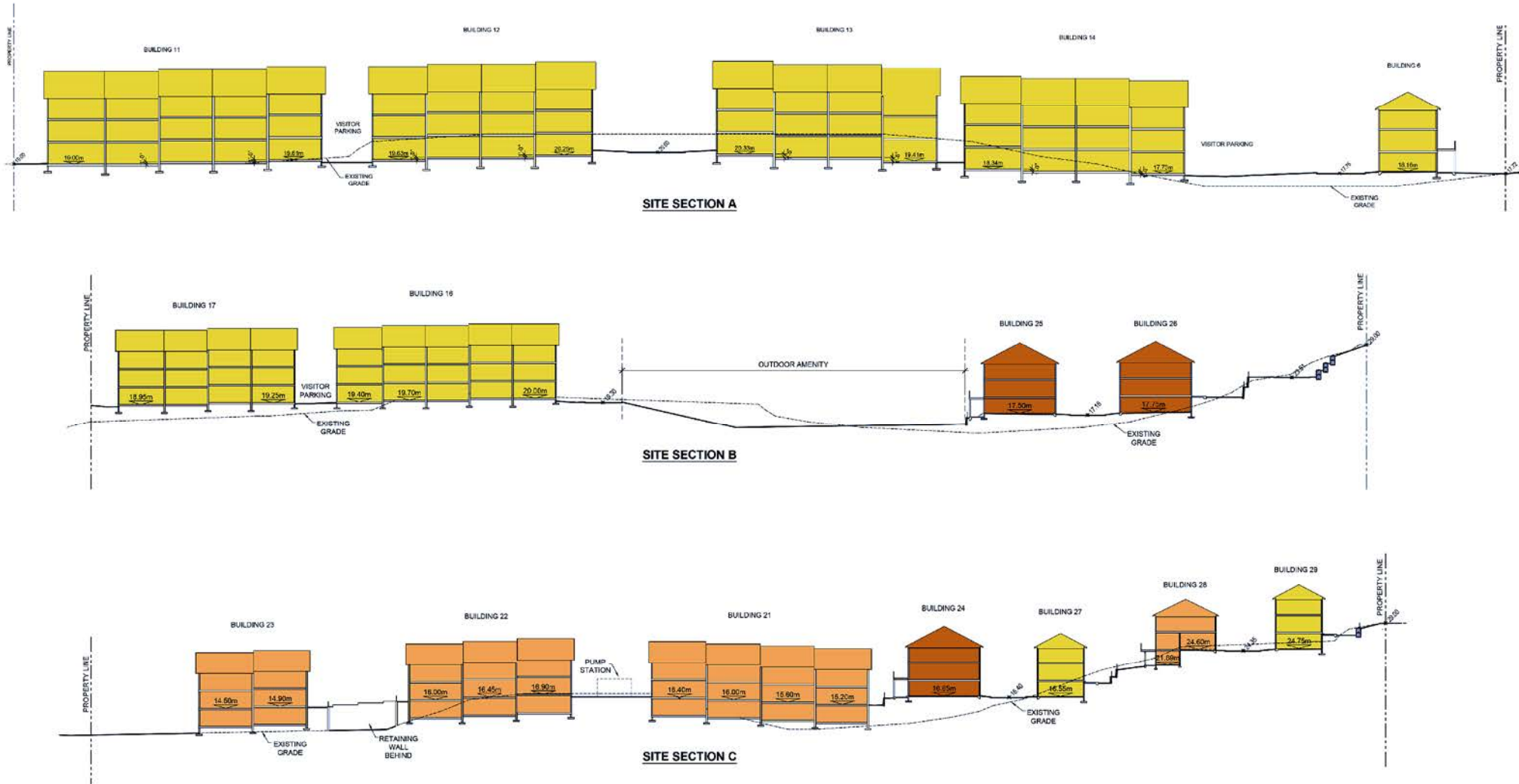
①.1 MACLURE RD. STREETSCAPE

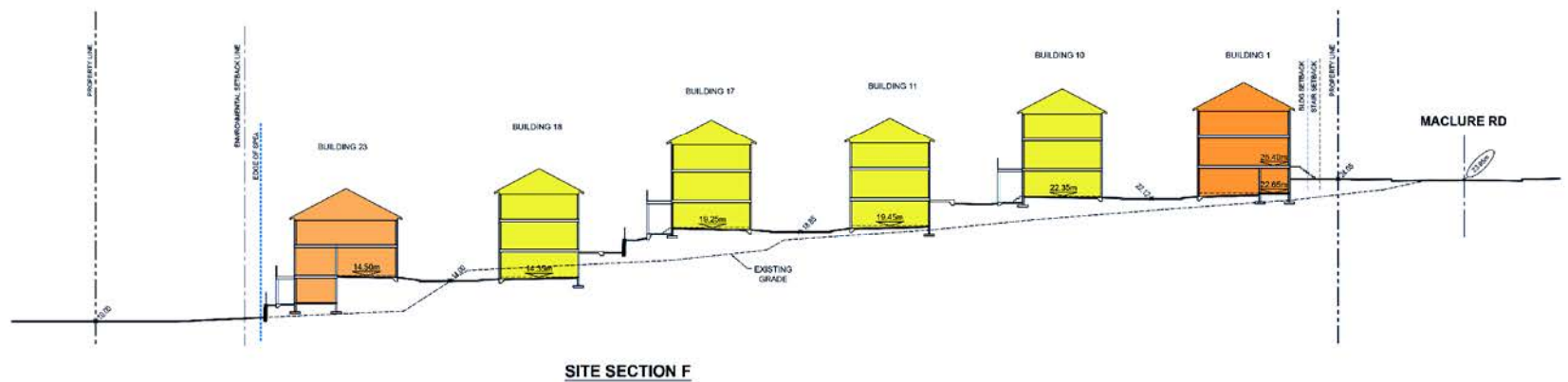
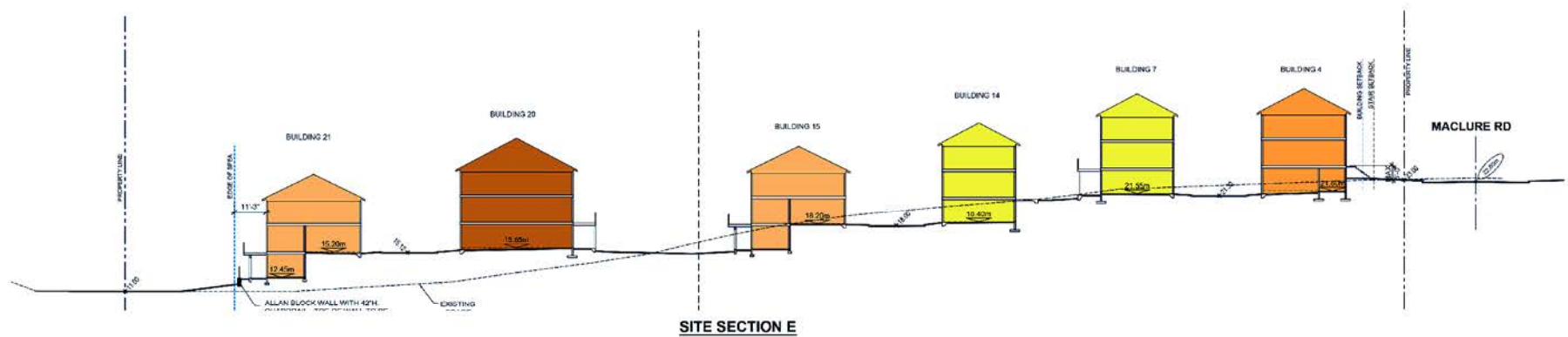
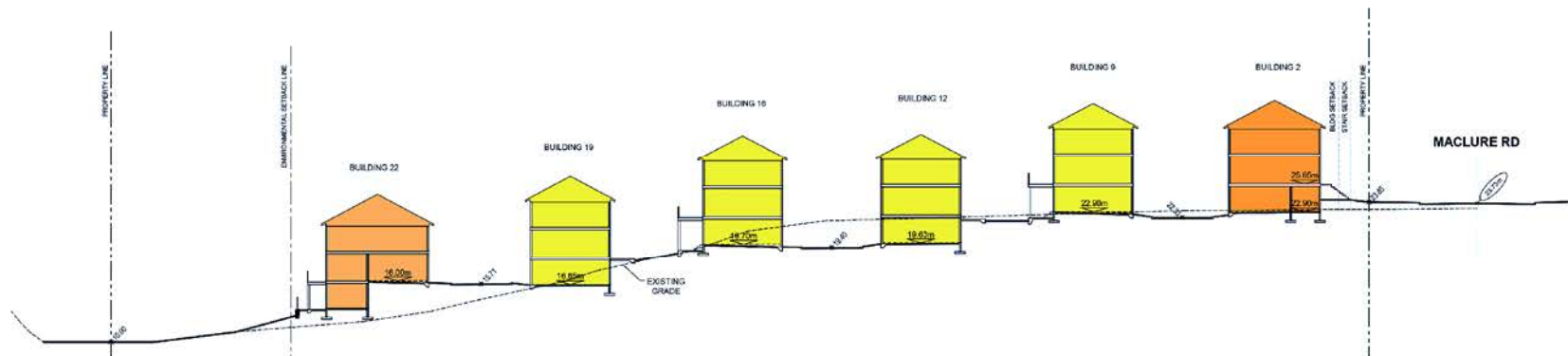


①.2 MACLURE RD. STREETSCAPE



①.3 MACLURE RD. STREETSCAPE



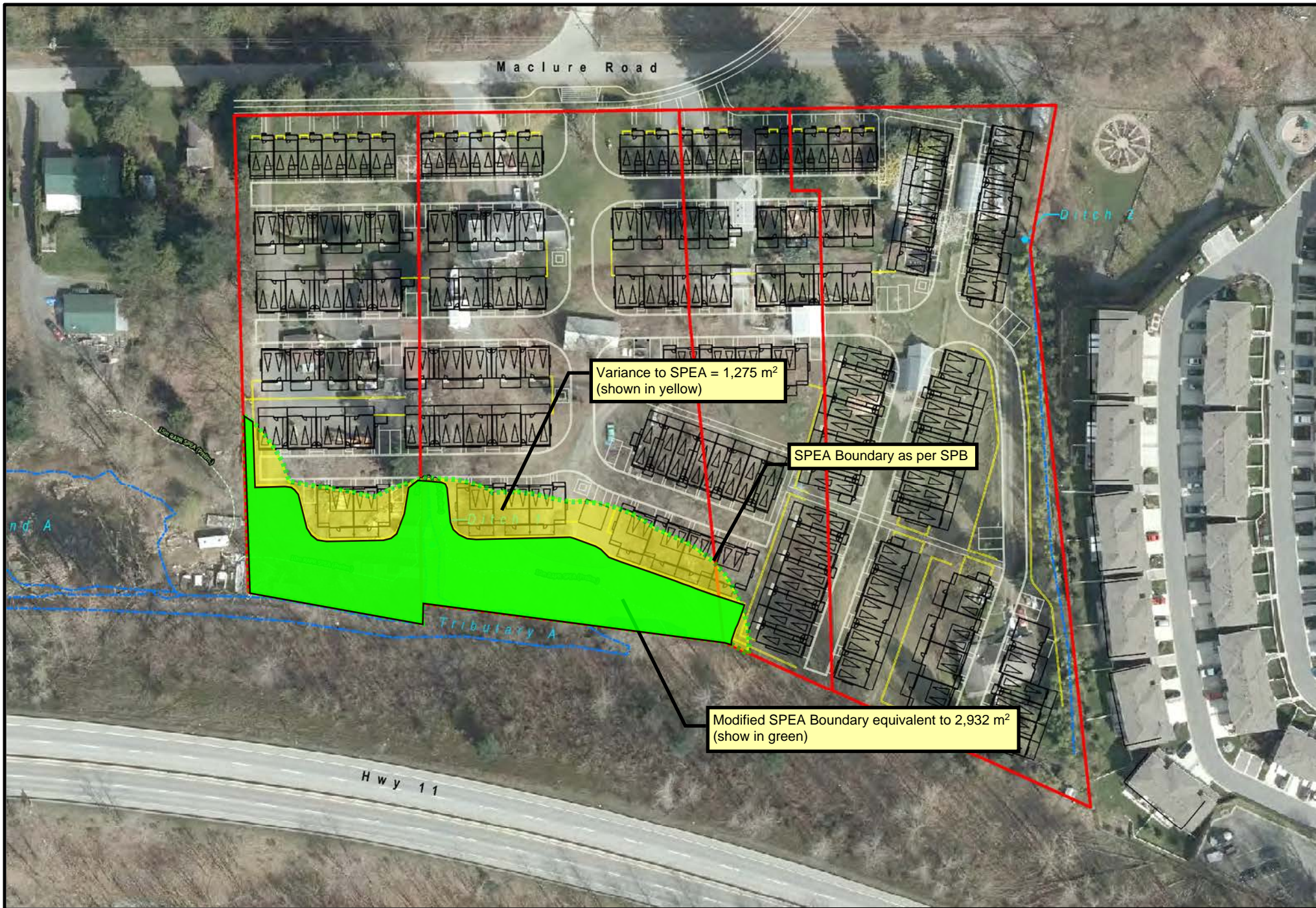


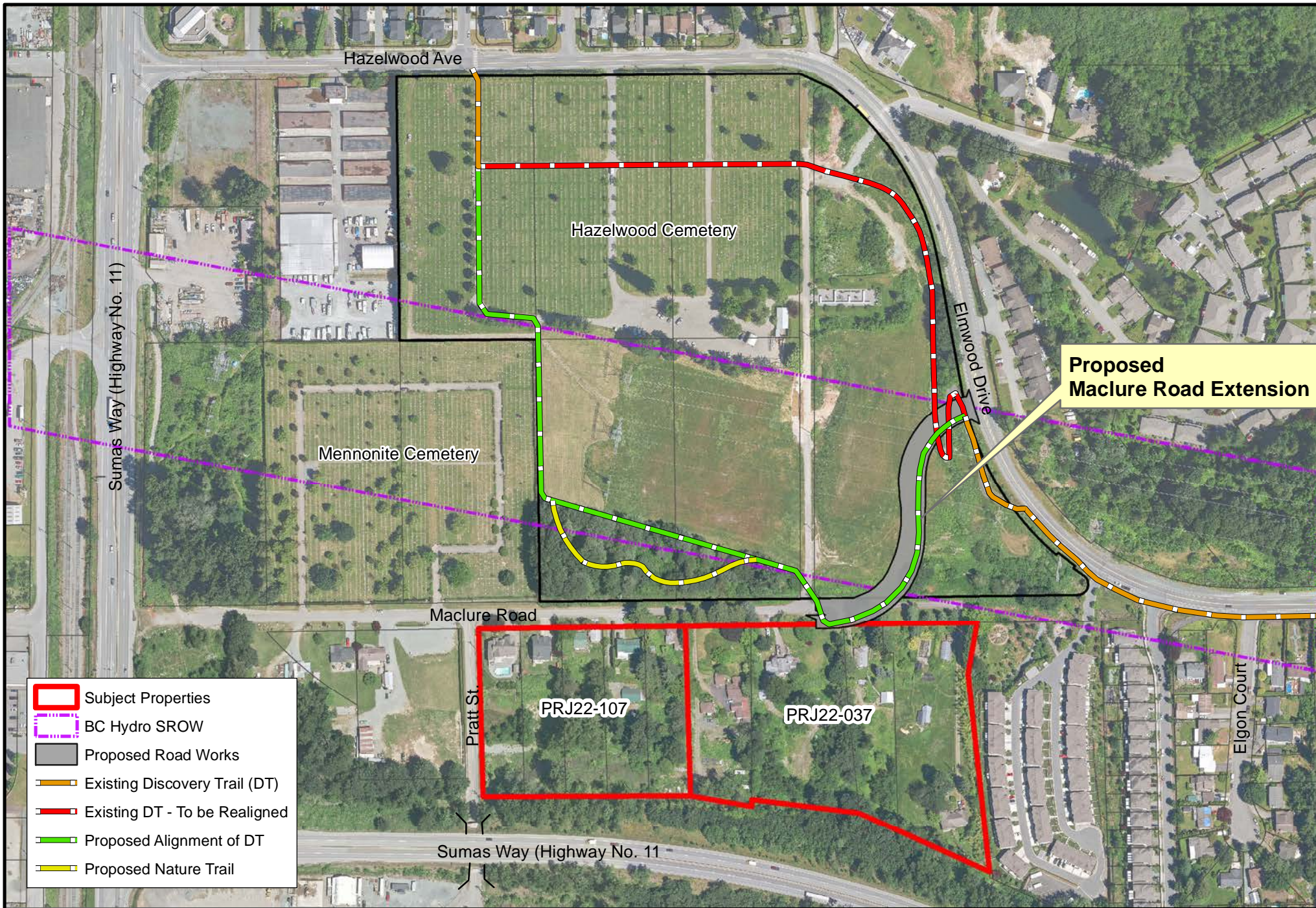




Tree Management Summary

No. of trees assessed: 164
 No. of trees to be removed: 134
 No. of trees to be retained: 30





CITY OF ABBOTSFORD

OFFICIAL COMMUNITY PLAN BYLAW, 2016, AMENDMENT BYLAW NO. 024

Bylaw No. 3512-2024

PRJ22-037

The Council of the City of Abbotsford, in open meeting assembled, enacts as follows:

1. CITATION

Bylaw No. 3512-2024 may be cited as “Official Community Plan Bylaw, 2016, Amendment Bylaw No. 024”.

2. CHANGES DESIGNATION

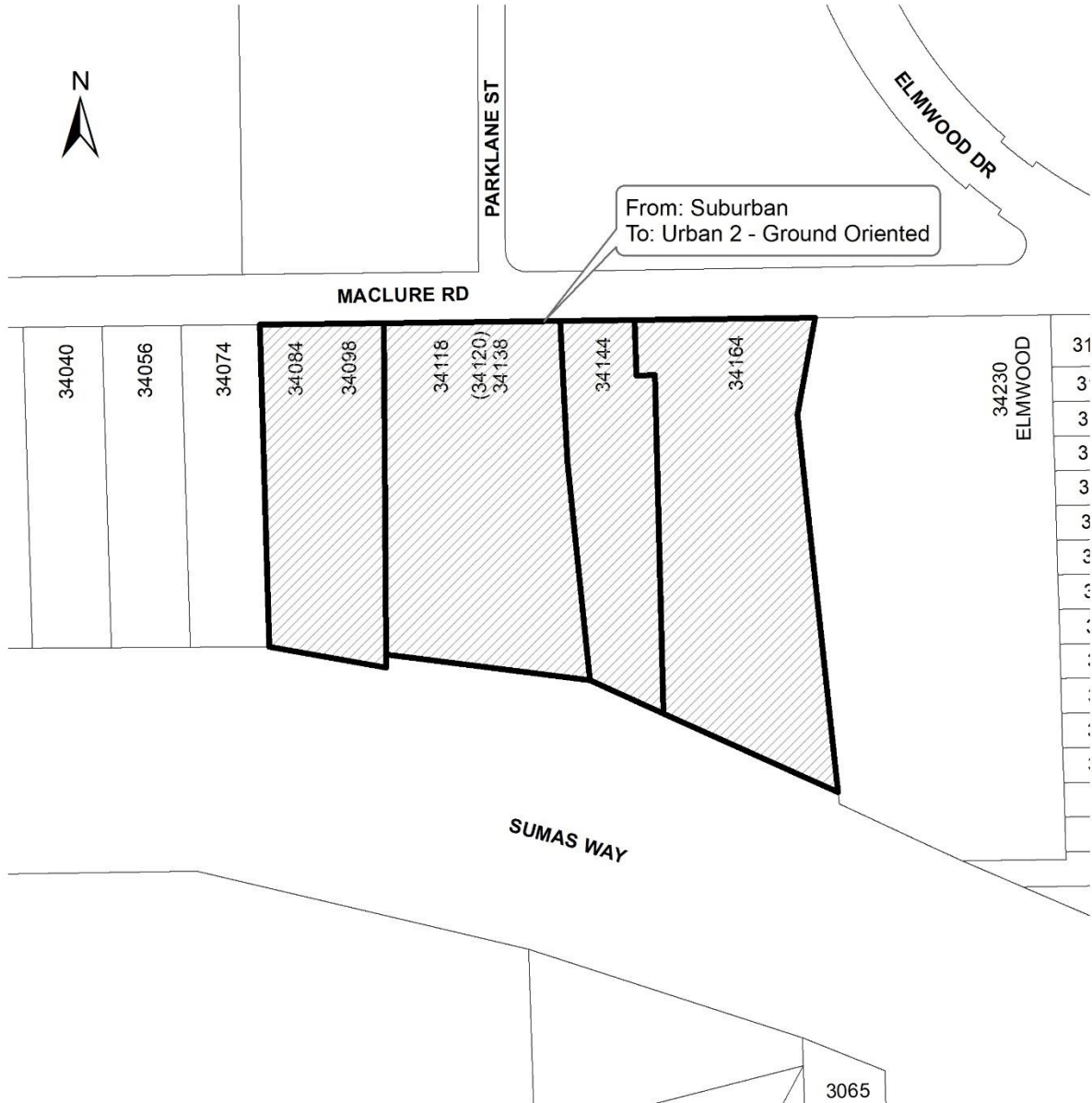
Official Community Plan Bylaw, 2016, as amended, is further amended, by changing the designation of the lands as set out in the attached Appendix “A” and located at 34098, 34118, 34144, 34164, Maclure Road:

From: Suburban

To: Urban 2 – Ground Oriented

READ A FIRST TIME this	day of	, 20__
READ A SECOND TIME this	day of	, 20__
PUBLIC HEARING HELD this	day of	, 20__
READ A THIRD TIME this	day of	, 20__
ADOPTED this	day of	, 20__

APPENDIX "A"



CITY OF ABBOTSFORD

ABBOTSFORD ZONING BYLAW, 2014, AMENDMENT BYLAW NO. 600

Bylaw No. 3511-2024

PRJ22-037

The Council of the City of Abbotsford, in open meeting assembled, enacts as follows:

1. CITATION

Bylaw No. 3511-2024 may be cited as “Abbotsford Zoning Bylaw, 2014, Amendment Bylaw No. 600”.

2. AMENDS ZONING MAPS

Abbotsford Zoning Bylaw, 2014, Schedule “D”, Urban Area Zoning, as amended, is further amended by changing the zoning of the lands as set out in the attached Appendix “A” and located at 34098, 34118, 34144, 34164 Maclure Road:

From: Country Residential Zone (CR)

To: Multifamily Ground Oriented Zone (RMG)

READ A FIRST TIME this	day of	, 20__
READ A SECOND TIME this	day of	, 20__
PUBLIC HEARING HELD this	day of	, 20__
READ A THIRD TIME this	day of	, 20__
APPROVED by the Minister of Transportation and Infrastructure this	day of	, 20__
ADOPTED this	day of	, 20__



**STEEP SLOPE DEVELOPMENT PERMIT NO. 2445 WITH VARIANCE TO STREAMSIDE
PROTECTION BYLAW**

1. This Development Permit No. 2445 with variance to Streamside Protection Bylaw as applied for under File No. PRJ22-037 is issued to the owner (the "Permittee") and shall apply only to that certain parcel or tract of land within the City of Abbotsford (the "City") described below, and any and all buildings, structures, and other development thereon and shall be binding on a purchaser of the Permittee's interest in the Lands, or portion thereof:

Parcel Identifier: 011-369-957, 000-759-252, 011-369-914, 006-657-541

Legal Description: Parcel B (Explanatory Plan 10757) Lot 6 Except: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 8992;

Lot 6 Except: Firstly: Parcel B (Explanatory Plan 10757) Secondly: Parcel C (Explanatory Plan 12571) Thirdly: Parcel A (Reference Plan 13568) Fourthly: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 8992;

Parcel A (Reference Plan 13568) Lot 6 Except: Firstly: Part Subdivided by Plan 32019 Secondly: Part on Statutory Right Of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 8992; and

Lot 93 Except: Part on Statutory Right of Way Plan 75994; Section 22 Township 16 New Westminster District Plan 32019

(the "Lands")

<to be updated after the consolidation>

2. This Development Permit with variance ("DP") is issued pursuant to the *Local Government Act* and the City of Abbotsford Official Community Plan and in accordance with the applicable bylaws of the City, except as specifically varied or supplemented by this Permit.

Development Permit

3. The following DP works, terms and conditions ("DP Measures") shall apply to the Lands:

Prior to Commencement

- a. No tree removal, site clearing, grubbing, stripping or mass grading shall be undertaken until:
 - i. the Erosion and Sediment Control (ESC) measures outlined in Section 3.c are installed by the Permittee or the Permittee's contractor and inspected by the ESC Supervisor;

- ii. the Certified Arborist and/or Qualified Environmental Professional (QEP) confirms with the City that tree protective fencing and/or environmentally sensitive area fencing has been installed in material conformance with the Arborist Report and the Environmental Assessment report attached as Schedules B and Schedule C of the Tree Protection Bylaw;
 - iii. a Tree Removal Authorization Sign is installed along the frontage of the property and is visible from the street; and
 - iv. a pre-construction meeting is held with the City, the Permittee, the Erosion and Sediment Control Supervisor, the Qualified Environmental Professional, and the Permittee's contractor(s), and the Permittee has agreed to the conditions of the pre-construction meeting as evidenced by the Permittee's signature(s) on the pre-construction notes.
- b. Prior to any development activities occurring on the property, the City must receive notice from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development that the Riparian Areas Protection Regulation Assessment Report submitted to them by the QEP meets the assessment and reporting criteria for the Riparian Areas Protection Regulation.

Erosion and Sediment Control

- c. Erosion and Sediment Control (ESC) measures shall be installed, monitored, and inspected in material conformance with the Erosion and Sediment Control Bylaw and the ESC Plan attached as Schedule(s) D (the "ESC Measures");

Tree Removal, Retention and Replacement

- d. Tree removal and retention, the installation of temporary protective fencing, and any onsite monitoring by the Certified Arborist shall be completed in material conformance with the Tree Protection Report attached as Schedule B (the "Tree Retention, Protection, and Replacement Measures").
- e. Tree replacement planting shall take place in material conformance with Schedule A, B and C;
- f. The Permittee must hire a Qualified Professional to conduct a post-construction windfirm and hazard tree assessment around the clearing boundary and along the trail alignments, and conduct necessary mitigation works to render the lands safe for the intended use prior to release of security. Where trees proposed for retention are required to be removed following the post-construction assessment, the trees shall be replaced in accordance with the replacement requirements of either the Tree Protection Bylaw or the Province's 1996 Tree Replacement Criteria, as directed by the City.
- g. All trees identified for retention must not be removed at any time unless the tree is deemed hazardous by a Certified Arborist and a Tree Cutting Permit is issued by the City.

Environmental Protection Measures

- h. Habitat protection, mitigation, and compensation works shall be constructed, coordinated, monitored and inspected in material conformance with the Environmental Assessment Report and the Construction Environmental Management Plan (CEMP) (including any amendments), attached as Schedules E (the "Environmental Protection Measures");

Regular environmental monitoring reports must be submitted to the City, as outlined within the CEMP. The City may request additional monitoring and reporting as it deems necessary.

- i. The Permittee or the Permittee's contractor shall take all necessary steps to avoid damaging any native vegetation within the streamside protection and enhancement area. If minor unanticipated temporary impacts occur, an assessment of the impacts will be undertaken by the Qualified Environmental Professional (QEP). The QEP will prepare a restoration, maintenance and monitoring plan for review and acceptance by the City. The City may withhold release of security until such time as the area is restored.
- j. The Permittee or the Permittee's contractor must hire a QEP to conduct environmental monitoring of the development authorized under this Permit and to ensure that all of the Environmental Protection Measures are adhered to. The QEP is responsible for observing the methods of construction and submitting regular reports to the City on the compliance of the construction activities. The QEP shall:
 - i. Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on fish and wildlife habitat as per the Environmental Protection Measures, as well as applicable senior government legislation such as but not limited to wildlife salvages and bird surveys;
 - ii. In the event of an environmental incident or non-compliance with any of the Terms and Conditions of this DP, notify the City within 1 business day; and
 - iii. Stop the work authorized under this Permit if deemed necessary to address risks to the environment. The QEP or their designate (specified in writing) must be on site during all phases of construction in and around the streamside protection and enhancement area to ensure compliance with the permit.
- k. The Permittee must ensure that the mitigation and compensation works (including planting, coarse woody debris placement, etc.) required as part of the Environmental Protection Measures are completed and inspected by the QEP and the City prior to final acceptance.
- l. The Permittee must ensure that all plants installed as part of the mitigation and compensation works achieve (100% survival for trees and 80% survival for shrubs OR other survivorship requirements recommended by QEP) during any year of the monitoring program. Should survival fall below this, the Permittee must immediately replant in order to meet the minimum survival rates.
- m. The Permittee must remove all invasive plant species listed in the BC Weed Control Act regulation or identified for removal in the Environmental Assessment Report, garbage, concrete, debris, old fencing, etc. from the natural open space areas in accordance with Schedule C and E (the "Environmental Protection Measures") and to the acceptance of the City, prior to Substantial Completion or Final Occupancy, whichever comes first.

Mass Grading, Retaining Walls, Geotechnical Structures and Geotechnical Recommendations

- n. Mass site grading, retaining walls, cut and fill slopes, and geotechnical structures shall be designed, installed, constructed and inspected by a Geotechnical Engineer and shall be in material conformance with the Mass Lot Grading Plan, Retaining Wall Plan and Mass Lot Grading Sections

attached as Schedule F and the Geotechnical Report attached as Schedule G (the "Geotechnical Measures"). All geotechnical structures and retaining walls exceeding 1.2m in height require issuance of a Building Permit from the City of Abbotsford.

- o. The Permittee must hire a Qualified Professional to:
 - i. conduct a pre-construction hazard and slope stability assessment for the trails and upslope conditions,
 - ii. provide recommendations for any necessary mitigating actions for trail construction or use, and;
 - iii. verify that in their opinion, the trails are safe for the intended use.

Fees and Securities

4. For the due and proper completion of the DP Measures the following fees and securities are required:

- a. For the due and proper completion of the DP Measures as set forth in Section 3.x to 3.x of this Permit, the Permittee shall deposit and maintain with the City security in the form of an irrevocable, auto-renewing letter of credit <in the sum of \$<> or provide cash in the same amount (the "Security"), as outlined in subsections <a-x> below, until all the DP Measures are certified as complete by an applicable Qualified Professional and confirmed by an inspection by the City.
 - i. For section 3.x, the sum of \$<>;
 - ii. For sections 3.x to 3.x, the sum of \$<>.

The Security associated with the DP Works may be reduced proportionately as works are certified complete by an applicable qualified professional, except as outlined in section 4(b).

- b. Upon City acceptance of the applicable monitoring reports from the QEP and confirmed by an inspection by the City, the Security associated with the Environmental Protection Measures may be reduced in the following stages:
- c.
 - i. Post construction: Upon completion of the initial mitigation and compensation works (including <site preparation, topsoil, fencing, signage, construction monitoring>)
 - ii. End of <x> year maintenance period: Following the final year of the maintenance and monitoring period, all remaining security (including <plant purchase and installation, annual maintenance, annual site monitoring>)

Despite the above, the City may consider an alternative security release schedule depending on the site specific conditions.

- d. In the event that the DP Measures are not completed as provided for in this Permit, the City may, at its option, enter upon the Lands to carry out, and complete the DP Measures, and recover the costs of so doing, including the costs of administration and supervision, from the Security deposited by the Permittee.

- e. In accordance with the Development Application and Service Fee Bylaw pay to the City, upon execution of this agreement, the sum of \$<> in payment of all environmental and engineering inspection and administration costs associated with the DP Measures.

Development Variances

5. Abbotsford Streamside Protection Bylaw, 2005 is varied as follows:
 - a. Eliminate approximately 1,275 m² of Streamside Protection and Enhancement Area in general compliance with the attached Schedule A.

Permit Limitations

6. This Permit does not constitute subdivision approval, a Soil Removal/Deposit Permit, a Building Permit or Sign Permit and does not entitle the Permittee to undertake any work without the necessary approvals or permits. Site work must be in compliance with the Soil Deposit/Removal Bylaw, the Erosion and Sediment Control Bylaw and the Blasting Regulation Bylaw; other works must be constructed in accordance with engineering plans and specifications acceptable to the City's General Manager of Engineering; and buildings and structures can only be altered, changed in occupancy or constructed in accordance with the B.C. Building Code following issuance of a Building Permit.
7. This Permit does not constitute an approval under, or relieve the Permittee from complying with, any and all federal, provincial or municipal statute, regulation or bylaw governing the Permittee's use and development of the Lands.
8. If trees on the Lands are proposed to be felled during the critical bird breeding windows:
 - General: March 1st to August 31st;
 - Bald Eagle: January 1st to August 31st;
 - Osprey: April 1st to September 14th;
 - Heron: January 16th to September 14th;
 - Other Raptors: March 1st to September 31st;

then an appropriately QEP must monitor compliance with all applicable provisions of the:

- *Wildlife Act*;
- *Migratory Birds Convention Act, 1994*;
- any other federal or provincial environmental legislation governing the Permittee's use and development of the Lands;
- the recommendations of the Provincial document, *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (2014)*; and
- The recommendations of the Provincial document, *Guidelines for Raptor Conservation during Urban and Rural Land Development in BC (2013)*.

The nests of an eagle, peregrine falcon, gyrfalcon, osprey, heron, or burrowing owl are protected under the *Wildlife Act*, regardless of nest activity (i.e. active or inactive) and as such, even if trees are proposed to be felled outside the critical bird breeding window, it is recommended that a QEP

undertake an assessment of the trees onsite to ensure that there are no nests of the aforementioned species.

Issuance / Expiry

9. This Permit expires if the permit holder does not substantially start any construction within two years from the date of issuance, in accordance with Section 504 of the *Local Government Act*.

AUTHORIZING RESOLUTION PASSED by Abbotsford City Council on the <> day of <>, 20<>.

THIS PERMIT IS ISSUED this day of , 20<>.

The Corporate Seal of the CITY OF
ABBOTSFORD was hereunto affixed
in the presence of:

Mayor, Ross Siemens

City Clerk, Gabryel Joseph

Attachments:

[to be updated]

Schedule A: Draft DP with Variance No. 2445

Schedule B: Arborist Report prepared by Diamond Head Consulting Ltd. dated November 15, 2021

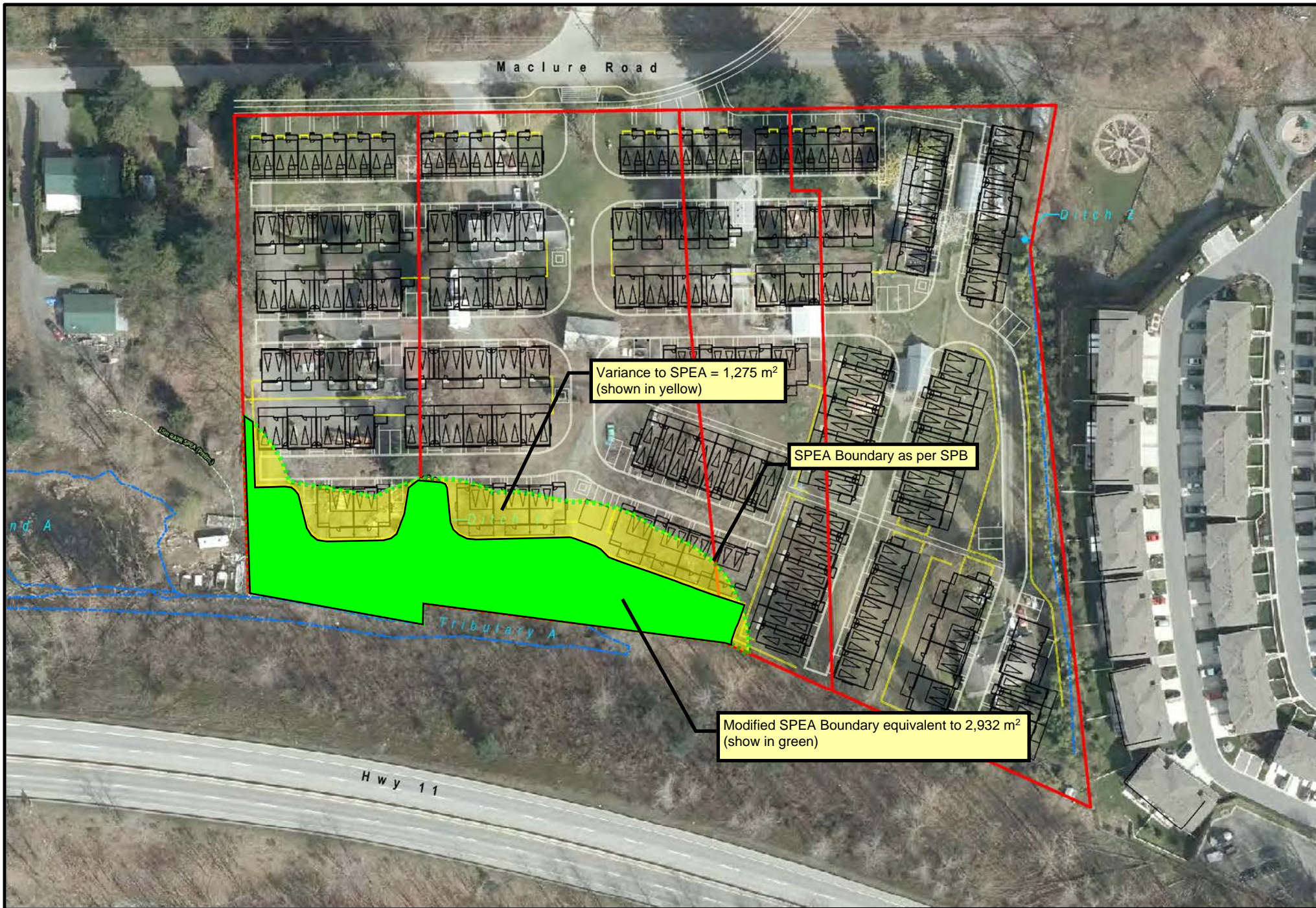
Schedule C: Environmental Impact Assessment Report (Fish Habitat Assessment & Wildlife Habitat Report) prepared by BlueLines Environmental Ltd. dated July 19, 2023

Schedule D: Erosion and Sediment Control Plan

Schedule E: Construction Environmental Management Plan (CEMP)

Schedule F: Lot Grading Plans

Schedule G: Geotechnical Report, prepared by GeoWest Engineering dated August 23, 2023





COUNCIL REPORT

Regular Council

Report No. PDS 034-2018

Date: March 14, 2018

File No: 3100-35 OCP-001

To: Mayor and Council
From: Reuben Koole, Senior Planner
Subject: Official Community Plan Housekeeping Amendment - Public Hearing Input

RECOMMENDATION

THAT the report from the Senior Planner, regarding the Official Community Plan housekeeping amendment Public Hearing input, be received for information.

REPORT CONCURRENCE	
General Manager The General Manager concurs with the recommendation of this report.	City Manager The City Manager concurs with the recommendation of this report.

PURPOSE

This report presents an analysis of items raised at the Public Hearing for the Official Community Plan housekeeping amendment (Bylaw No. 2721-2018).

SUMMARY OF THE ISSUE

At the Public Hearing for the Official Community Plan (OCP) housekeeping amendment (Bylaw No. 2721-2018) on March 5, 2018, several items were brought to Council's attention by members of the public. This report presents staff's analysis for Council's information.

BACKGROUND

Five items were raised by two speakers. Two of the items were related to regulations and policies, and three items were related to land use designations. They are all summarized below for Council's information, and excerpts of the housekeeping bylaw related to the items are attached to this report for reference.

DISCUSSION

Regulation and Policy

Home Occupation, live/work uses

A speaker questioned if owner occupied dwellings that included home occupation and live/work situations require the home owner to also be the business owner (Figure 1).

Staff note these regulations are intentionally broad in the OCP and there are no prescriptions about whether a home occupation must be done by an owner occupier, and this is not a proposed change with the housekeeping amendment bylaw.

The City has more detailed regulations in other land use tools such as the Zoning Bylaw and Business Licence Bylaw that would prescribe additional requirements related to home occupation and live/work situations.

Accessory units and density

A speaker questioned why accessory units were not considered 'units' when calculating density (Figure 2).

Staff note this is an intentional regulation in the OCP and is not a proposed change with the housekeeping amendment bylaw. The density approach in the OCP aligns with the density approach in other City regulations such as the Zoning Bylaw and Development Cost Charge Bylaw, where accessory units (e.g. secondary suite) is not counted as a 'unit'.

Land Use Designation

34247 Farmer Road

A speaker raised a question about why the subject property was being changed to Agriculture (Figure 3).

Bylaw page number:	30
Current land use designation:	High Impact Industrial
Amended land use designation:	Agriculture

Reason for the change: The Agricultural Land Commission noted in their response to the 2016 Official Community Plan that this property was not part of the exclusion for the neighbouring property at 34295 Farmer Road, and requested that it be designated back to Agriculture. Staff note this change accommodates the ALC request and corrects a mistake made in the preparation of the 2016 OCP.

Riverside Road, southeast panhandle (PID: 007-618-816)

A speaker raised a question about why the subject property was being changed to High Impact Industrial (Figure 4).

Bylaw page number:	32
Current land use designation:	Open Space

Amended land use designation: High Impact Industrial

Reason for the change: This property has a small panhandle at the southeast corner that is adjacent to the current BC Transit maintenance yard. The panhandle is currently used as a driveway for the transit yard and functions as an extension of the facility. Staff note the adjacent maintenance yard is designated High Impact Industrial, and this change recognizes the current use of the panhandle.

Maclure Road properties

(34010, 34024, 34040, 34056, 34074, 34098, 34118, 34144, and 34164)

A speaker requested that 9 lots on Maclure Road be included in the housekeeping amendment to change the land use designation from Suburban to Urban 1 – Midrise. Reasons for this proposed change included proximity to amenities and historical OCP land use designations.

Staff analysis

The 2005 OCP designated the subject properties “Urban Residential”, which had a maximum density of 16 units per hectare (uph), which increased to 30 uph along major roads. Sumas Way is identified as a major road so the subject properties had a maximum density of 30 uph in the 2005 OCP. This density would have allowed a compact lot single detached neighbourhood or low density townhouses (Figure 5).

The 2016 OCP established an urban structure based on a hierarchy of mixed use centres, supported by an urban core, and connected by a primary transit corridor. The intent of the structure was to grow in defined centres first, and support existing areas of amenities and services with greater population density.

The 2016 OCP designated the subject properties “Suburban”, which has a maximum density of 2.5 uph. This designation was a reduction in density and accounted for 1) the urban structure of growing in the centres first, and 2) local access challenges with vehicle movements restricted to Pratt Street under Highway 11 (Figures 6 and 7).

Staff conclusion

Staff conclude that the 2016 OCP designation is appropriate based on the urban structure growth approach and existing access constraints of the site. However, this does not preclude changes to the area in the future. More detailed analysis of site access through Pratt Street is required to determine whether or not more density, and therefore more vehicle trips, could be accommodated. This analysis would be done through a site specific OCP amendment application rather than a broad housekeeping update. Staff also note that if the property owner(s) submitted an OCP amendment application to request an Urban 1 – Midrise designation for apartments, it would likely not be supported.

FINANCIAL PLAN IMPLICATION

There are no Financial Plan implications with respect to this report.

Komal Basatia

*Komal Basatia
Director, Finance
Signed 3/12/2018 4:26 PM*

IMPACTS ON COUNCIL POLICIES, STRATEGIC PLAN AND/OR COUNCIL DIRECTION

The OCP housekeeping amendment meets Council's strategic plan.

SUBSTANTIATION OF RECOMMENDATION

Several speakers raised items at the public hearing for the OCP housekeeping amendment on March 5, 2018. At Council's request, staff have provided additional information related to the items raised for Council's consideration.

Reuben Koole

*Reuben Koole
Senior Planner
Signed 3/9/2018 2:40 PM*

Mark Neill

*Mark Neill
Director, Community Planning
Signed 3/12/2018 3:28 PM*

Siri Bertelsen

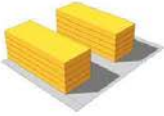
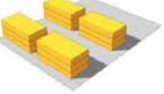
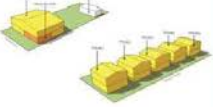

*Siri Bertelsen
General Manager, Planning and Development Services
Signed 3/13/2018 10:34 AM*

ATTACHMENTS:

- Figure 1 - Home Occupation**
- Figure 2 - Accessory Units**
- Figure 3 - Farmer Road**
- Figure 4 - Riverside Road**
- Figure 5 - 2005 OCP**
- Figure 6 - 2016 OCP**
- Figure 7 - Maclure Road Photos**

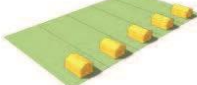

Appendix "T" (cont'd)

RESIDENTIAL NEIGHBOURHOODS

Name	Purpose and Description	Building Type and Height	Uses	Density (min and max)
Urban 1 – Midrise  Bylaw No. 2721-2018	<ul style="list-style-type: none"> Enable multifamily housing to strengthen and support the Mixed Use Centres, and Primary Transit Corridor 	Multi storey buildings including low and mid rises, and integrated ground oriented units. Heights are initially limited to 6 storeys (taller and varied building heights, and ground floor commercial, may be possible through a neighbourhood plan). Large sites (1 ha or greater) may incorporate ground oriented buildings	Multi unit residential Accessory commercial (associated with a residential care facility) Home occupation, live/work	1.0 to 2.0 FSR (up to 2.5 FSR on existing or consolidated properties that are 2,500m ² or less)
Urban 2 – Ground Oriented 	<ul style="list-style-type: none"> Enable multifamily housing to support Mixed Use Centres and/or to serve as transition areas near single detached neighbourhoods 	Ground oriented multiplex, duplex, row or townhouses. Heights are limited to 3 storeys. Large sites (1 ha or greater) may incorporate multi storey buildings up to 4 storeys	Multi unit residential Accessory commercial (associated with a residential care facility) Home occupation, live/work	0.5 to 1.5 FSR
Urban 3 – Infill 	<ul style="list-style-type: none"> Enable infill residential with density increases near City and Urban Centres and the Primary Transit Corridor in <i>Figure II.1</i> 	Single detached dwellings, with some ground oriented duplexes Large sites (1 ha or greater) may incorporate ground oriented buildings up to 3 storeys	Residential with accessory units Home occupation, live/work	refer to "infill guidelines" following this table
Urban 4 – Detached 	<ul style="list-style-type: none"> Enable low density single detached housing in neighbourhoods 	Single detached dwellings, with some ground oriented duplexes Large sites (1 ha or greater) may incorporate ground oriented buildings up to 3 storeys	Residential with accessory secondary suite Home occupation, live/work	max 25 units per hectare (uph)

Appendix "T" (cont'd)

CITY OF ABBOTSFORD – OFFICIAL COMMUNITY PLAN

Name	Purpose and Description	Building Type and Height	Uses	Density (min and max)
Urban large lot 	<ul style="list-style-type: none"> Enable single detached housing in a large lot format that may include modified municipal service standards such as water, sanitary, or roads 	Single detached dwellings	Residential with accessory unit Home occupation, live/work	max 6.5 uph (gross density)
Suburban 	<ul style="list-style-type: none"> Enable single detached housing with suburban character in limited areas that may include modified municipal service standards such as water, sanitary, or roads 	Single detached dwellings	Residential with accessory unit Home occupation, live/work	max 2.5 uph (gross density)

Appendix "T" (cont'd)

Calculating Slope

Slope is calculated based on a 15m grid using conditions from the City's 2013 contour data, and is shown on Map 14 with the following intervals:

- 20-29%
- 30% and greater

Development applications may provide an alternate slope analysis, to the satisfaction of the City.

Accessory Units

Accessory units, including secondary suites and detached suites, are not considered units when calculating density.

New Neighbourhoods

In the New Neighbourhoods area shown on Maps 1 and 2, development will be phased in a manner to ensure details relating to infrastructure, environment, and land uses can be coordinated and implemented in a cost efficient manner. Development may occur in accordance with existing zoning.

Rezoning proposals that are consistent with the building type and density of an existing zone may be supported. New rezoning proposals that are not consistent with the building type and density of an existing zone will only be considered following the adoption of a neighbourhood plan.

Neighbourhood plans for these areas will be developed following the Neighbourhood Planning Framework described in Part IV.

Within this same area on Maps 1 and 2, approximate developable area is shown for illustration purposes. Detailed stream, steep slope, and environmental area mapping will be completed through the neighbourhood plan, thereby determining specific net developable areas.

Accessory Units

Accessory secondary suites are supported in all single detached dwellings subject to the following criteria:

- Not be on a cul-de-sac bulb
- Not be in a bare land strata (except where road infrastructure meets City bylaw standards)
- Have a minimum frontage of 12m
- Have a minimum lot size of 400m²
- Be located on a Collector or Local road, as shown on Maps 4 and 5

Bylaw No.
2721-2018

In the 'Urban 4 – Detached' land use designation where a lot has lane access, the accessory unit may be detached instead of secondary, subject to the following criteria:

- Have a minimum frontage of 9m
- Have a minimum lot size of 300m²

Appendix "M"

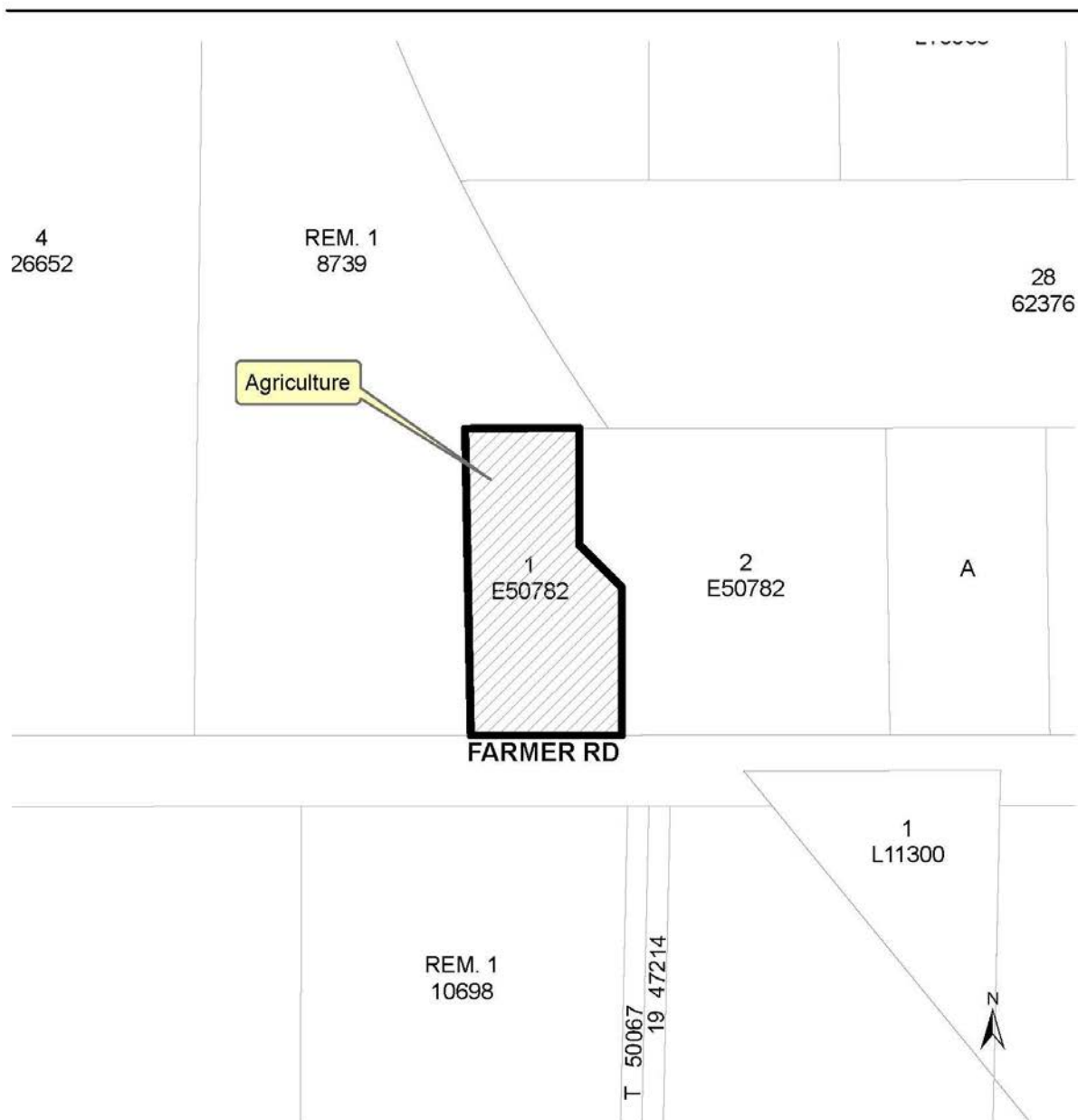
APPENDIX "M"

SCHEDULE BYLAW NO. **2721-2018**

BEING ABBOTSFORD OFFICIAL COMMUNITY PLAN BYLAW, 2016,
AMENDMENT BYLAW NO. 1

FROM: **High Impact Industrial**

TO: **Agriculture**



Appendix "O"

APPENDIX "O"

SCHEDULE BYLAW NO. **2721-2018**

BEING ABBOTSFORD OFFICIAL COMMUNITY PLAN BYLAW, 2016,
AMENDMENT BYLAW NO. 1

FROM: **Open Space**

TO: **High Impact Industrial**

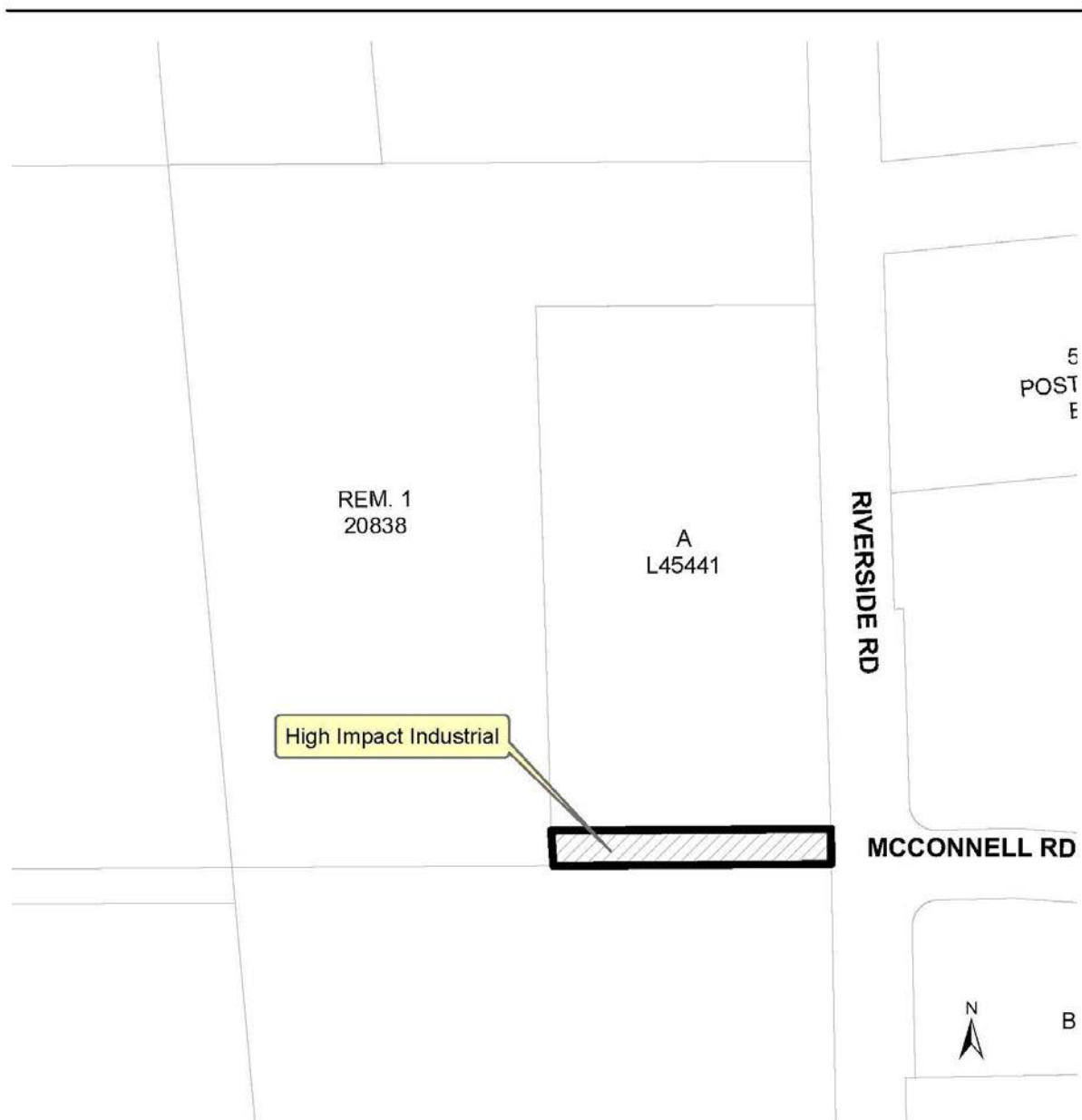
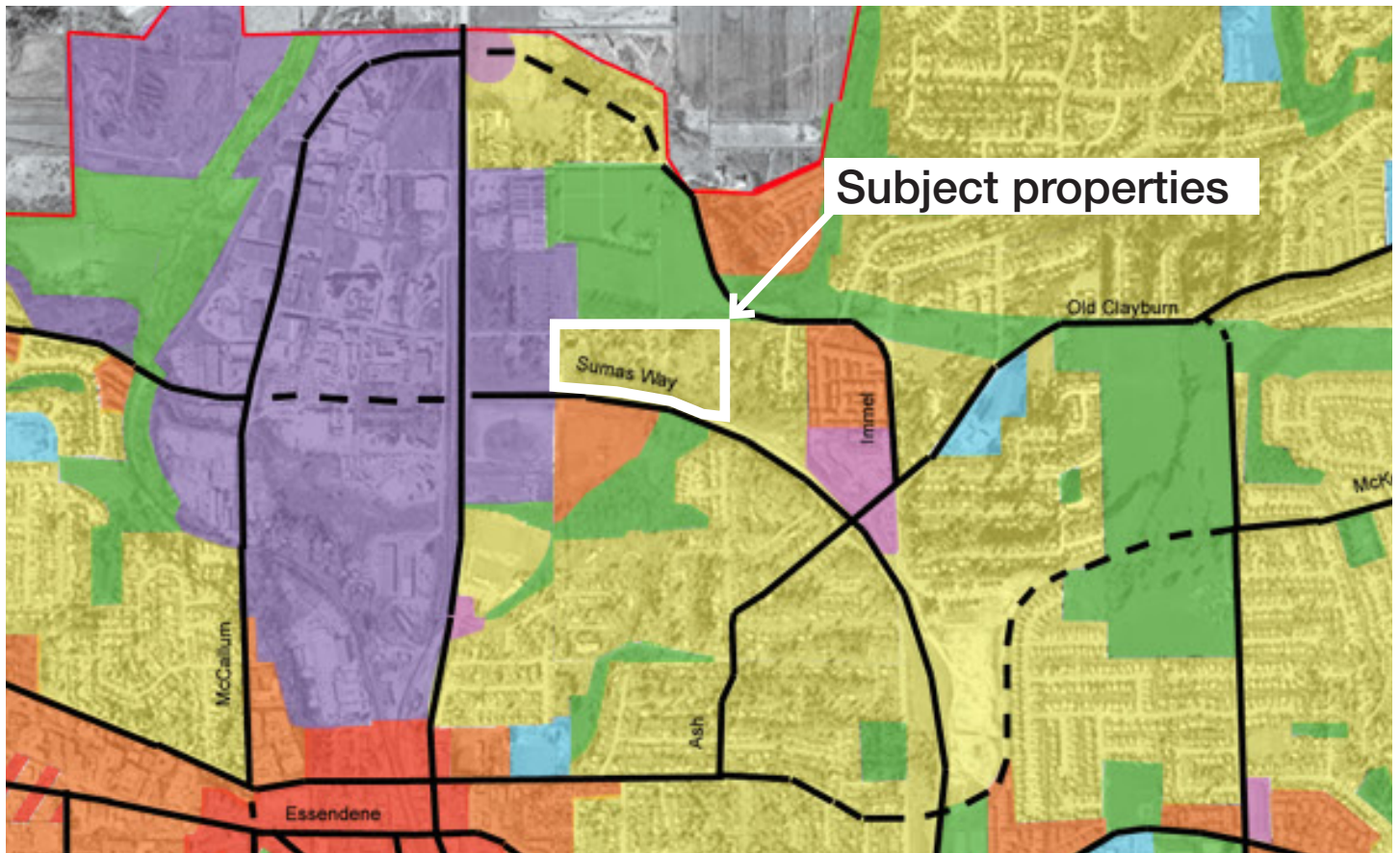


Figure 5.

2005 Official Community Plan

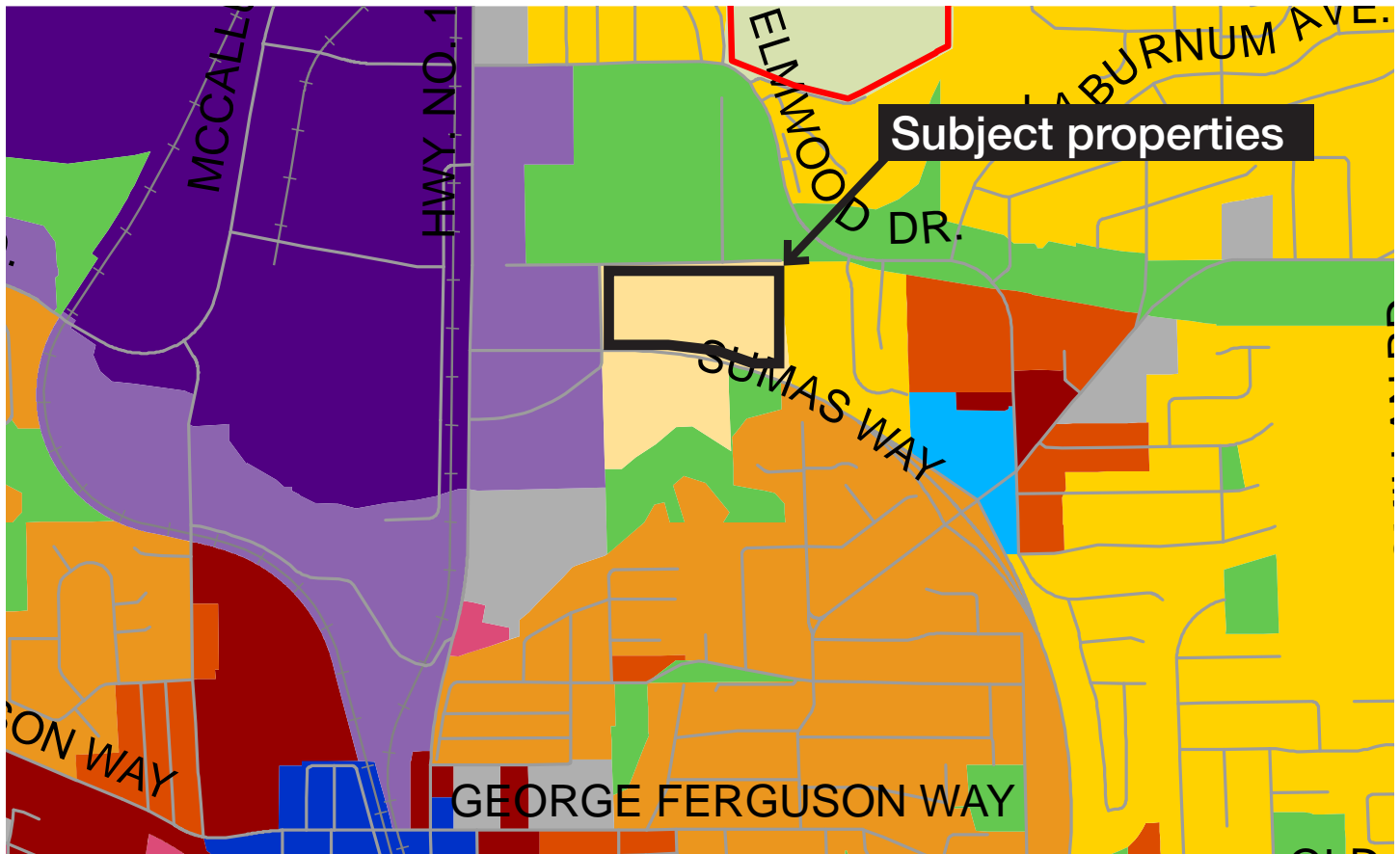


Land Use Designation: Urban Residential

Density: 16 units per hectare, 30 uph along major roads (black lines)

Figure 6.

2016 Official Community Plan



Land Use Designation: Suburban

Density: 2.5 units per hectare

Figure 7.

Site photos from March 9, 2018

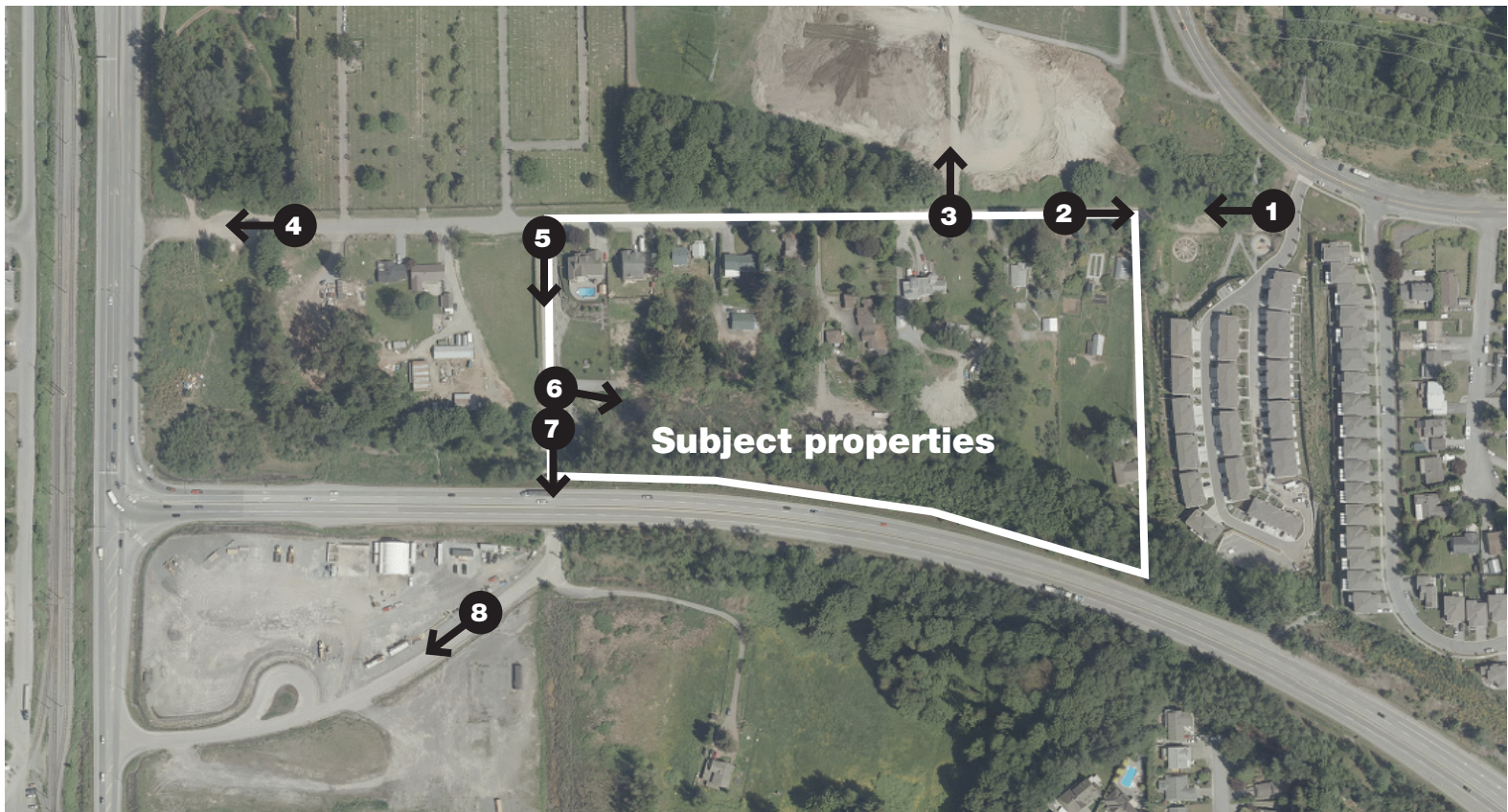


Photo 1: View west downhill from Maclure / Elmwood townhouses, approximately 20m above the location of Photo 2.

Photo 2: View east uphill from the end of Maclure Road, approximately 20m below the location of Photo 1.



Photo 3: View north along Park Lane into the Hazelwood Cemetery expansion.



Photo 4: View west to Highway 11, where there is a gate restricting Highway access.



Photo 5: View south down Pratt Street to the Highway 11 underpass, the only current access to the subject properties.



Photo 6: View east to the wetland area at the rear (south) of the subject properties.



Photo 7: Detailed view of the Highway 11 underpass.



Photo 8: View southwest along Pratt Street. The proposed new BC Transit maintenance yard will be located on the left side of the road.





COUNCIL REPORT

Executive Committee

Report No. ENG 052-2018

Date: September 19, 2018

File No: 2240-00

To: Mayor and Council
From: Tyler Bowie, Acting Director, Infrastructure Planning
Subject: Maclure / Hazelwood Area Transportation Network

RECOMMENDATION

THAT Council endorse the following steps for the Maclure Road / Hazelwood area:

1. Staff work towards a road closure bylaw for the permanent closure of Park Lane;
2. Staff develop and register a road dedication plan for the new Maclure Road Extension; and
3. That any future Official Community Plan amendment(s) for the Maclure Road properties only be considered in conjunction with a rezoning application for the subject area.

REPORT CONCURRENCE	
General Manager The Acting General Manager concurs with the recommendation of this report.	City Manager The City Manager concurs with the recommendation of this report.

SUMMARY OF THE ISSUE

At the April 9, 2018, Regular Council Meeting, Council directed staff to review the transportation network and potential impacts on future land use in the Maclure Road and Pratt Street area. This report provides recommendations on a future transportation network for the Maclure / Hazelwood area which is supported by the Transportation Master Plan and the Cemetery Master Plan.

BACKGROUND

At the April 9, 2018, Regular Council Meeting, Council directed staff to review the transportation network and potential impacts on future land use in the Maclure Road and Pratt Street area and bring back a report for Council consideration.

Currently the section of Maclure Road between Highway 11 and Elmwood Drive is serviced from Pratt Street through a tunnel underneath the Highway 11 bypass and connects to Gladys

Avenue. There is an existing emergency access gate onto Highway 11 at the west end of Maclure Road. The east end of Maclure Road connects with Park Lane which has been closed to public access since approximately 2006. Park Lane is a non-through road that was originally used to access the historic farmstead. Also, the east end of Maclure Road there are topographic constraints along the existing road right of way that prevent Maclure Road to connect to Elmwood Drive Attachment "A" shows the section of Maclure Road that is in question and the existing transportation network for the area.

DISCUSSION

During the development of the Transportation Master Plan, this area was reviewed and proposed improvements to the local transportation network were identified. Attachment "B" shows the future proposed road network for the Maclure Road / Pratt Street area. The improvements highlighted on the map are identified in the Transportation Master Plan including;

- Maclure Road Extension (Park Lane to Elmwood Drive), which will include closing the emergency access of Maclure Road at Highway 11;
- Hazelwood Avenue Extension to McCallum Road, which will include closing the Hazelwood Avenue connection to Highway 11; and
- Maclure Road Connector/ Overpass (Highway 11 to McCallum Road) which would include an Overpass over Highway 11 and interchange.

Maclure Road Extension

The Maclure Road Extension (Park Lane to Elmwood Drive) will have the largest impact to the existing neighborhood on Maclure Road as it will enhance the connectivity to the surrounding neighborhoods and provide a typical street connection, alleviating the need for primary access through Pratt Street. Pratt Street would still be used as the primary access for the new transit maintenance facility and secondary access once the Maclure Road Extension is completed. Attachment "C" shows the conceptual design of the proposed Maclure Road extension. The Maclure Road extension will also improve the long term accessibility to the Hazelwood Cemetery.

The Hazelwood Cemetery is currently bisected by Park Lane, a municipal road dedication that runs in a north-south direction which is currently closed to public access. The City began expanding the cemetery into the property east of Park Lane in 2012 with the development and construction of the columbarium. Also, the City has begun to developing the cemetery on both sides of the lane to develop future burial plots. However, with Park Lane bisecting the property the development of the cemetery is inefficient. By providing this new future Maclure Road extension, Park Lane can be permanently closed, resulting in more opportunity for space for burial plots. Discovery Trail, which currently runs through the cemetery, will also be realigned to follow the new road way to provide better connectivity. Parks, Recreation & Culture supports the closure of Park Lane and the future Maclure Road Extension.

Hazelwood Avenue Extension to McCallum Road

As part of the Transportation Master Plan a connection with McCallum Road and Hazelwood Avenue was identified. This connection will improve safety by removing the Hazelwood Avenue intersection with Highway 11 and provide a better east-west connection to Hazelwood Avenue.

Attachment “D” shows a conceptual layout of the connection between McCallum Road and Hazelwood Avenue.

Maclure Road Connector/ Overpass

Maclure Road is the City’s primary east-west arterial street in the north urban area, providing a connection from Highway 1 / Fraser Highway to Highway 11 via McCallum Road; however, there is a gap between McCallum Road and Highway 11. The Maclure Road Connector/ Overpass will provide a more direct east-west connection to and from the City’s core area. The improvements would include a new four lane urban arterial road connecting Maclure Road to Highway 11 Bypass with an overpass and interchange over Highway 11.

Staff has had discussions with MOTI, Planning and Development Services, the Abbotsford Fire Department, and Parks, Recreation and Culture, and they are all supportive of the transportation network changes noted above.

Official Community Plan

The land use designation of the Maclure Road properties (34010, 34024, 34040, 34056, 34074, 34098, 34118, 34144 and 34164) is Suburban Residential (2.5uph) in the 2016 Official Community Plan, which generally reflects existing conditions of the area (approximately 1-2 acre lots). Existing zoning is Country Residential Zone (CR) with a minimum lot size of 2.0 hectares (5 acres). As noted in a previous staff report (PDS034-2018) this land use designation is appropriate based on the urban structure and access constraints to the site.

The overall growth structure outlined in the OCP is defined by a hierarchy of mixed use centres (City Centre, 4 Urban Centres and 14 Neighbourhood Centres) envisioned to provide a mix of multifamily and commercial uses that function as neighbourhood gathering places, and destinations including shops, restaurants, cafes and services. With the transportation network changes described in this report to enable better connections and more efficient vehicle movement, a land use designation change (townhouses) to these properties may be appropriate when combined with its proximity to a Neighbourhood Centre (Immel). Staff recommends that an OCP amendment to change the land use designation should be considered in conjunction with a rezoning application reflecting the detailed development proposal for the subject area.

FINANCIAL PLAN IMPLICATION

There are no immediate financial implications on the Capital program. Staff can develop a road dedication plan for the Maclure Road Extension and road closure bylaw for Park Lane within the existing operating budget. Funding of the Hazelwood Extension and Maclure Extension road improvements should be developer driven funded. The Maclure Road Connector/ Overpass will potentially be funded through DCC’s, Grants, and Partnerships with senior levels of government or capital reserves. This will be reviewed as part of the long term financial plan.

Rajat Sharma

Rajat Sharma
General Manager, Finance and Corporate Services
Signed 9/12/2018 4:51 PM

IMPACTS ON COUNCIL POLICIES, STRATEGIC PLAN AND/OR COUNCIL DIRECTION

The proposed recommendations are supported by the Transportation Master Plan and the Cemetery Master Plan and the enhancements to the Transportation network in the area align with the Complete Community cornerstone by enhancing neighborhood connectivity.

SUBSTANTIATION OF RECOMMENDATION

At the April 9, 2018, Regular Council meeting, Council directed staff to review concerns raised regarding the transportation network in the area of Maclure Road and Pratt Street. Staff analyzed the area and as outlined in this report the Transportation Master Plan has identified several transportation network improvements. The plan includes the permanent closure of Park Lane that will support the cemetery Master Plan to better utilize the Hazelwood Cemetery and increase burial plots. Staff recommends that a road closure bylaw for Park Lane and a road dedication plan for the new Maclure Road Extension be developed and that any future OCP amendment for the Maclure Road properties be consider in conjunction with a rezoning application.

Tyler Bowie

*Tyler Bowie
Acting Director, Infrastructure Planning
Signed 9/10/2018 8:58 AM*

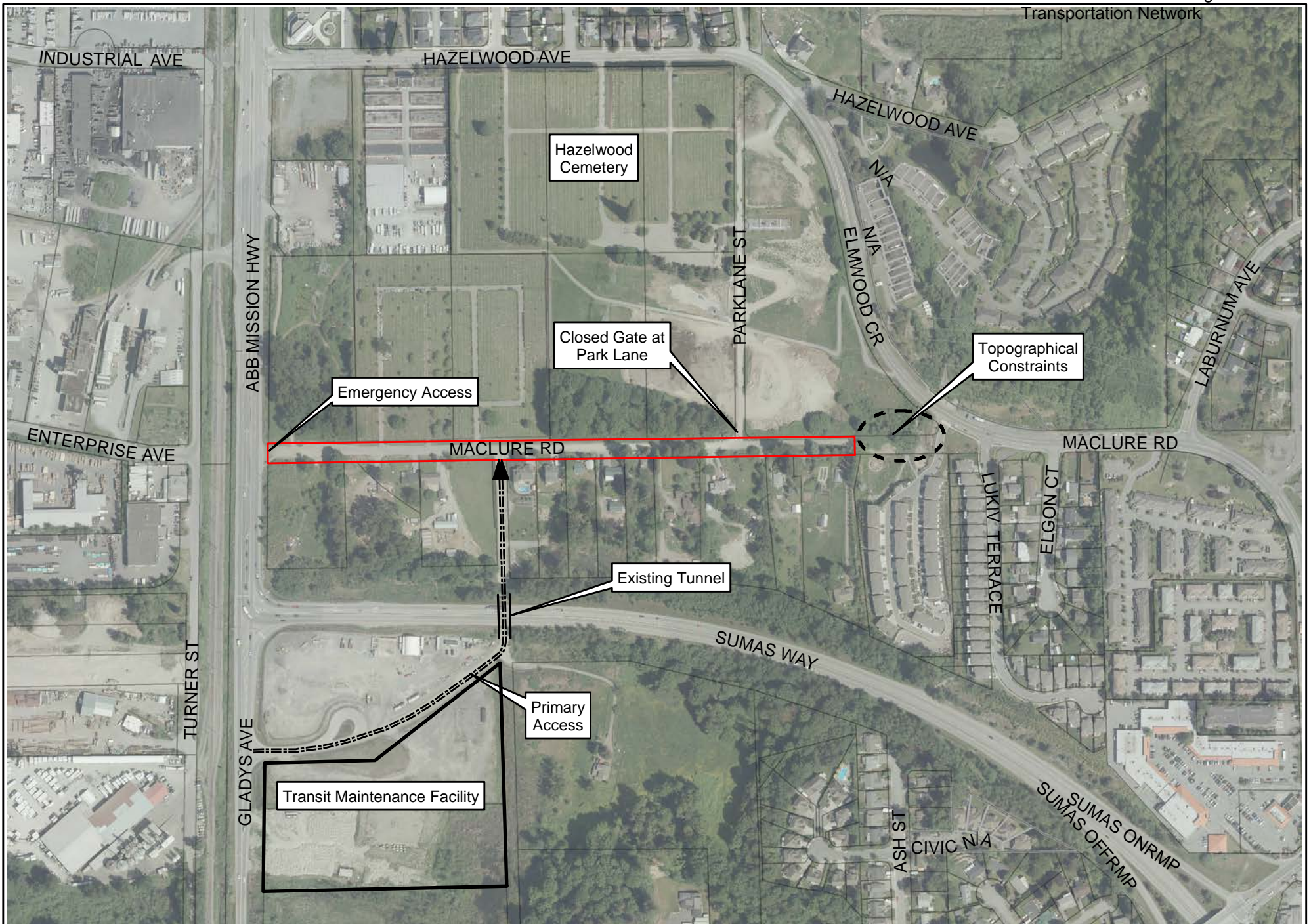
ATTACHMENTS:

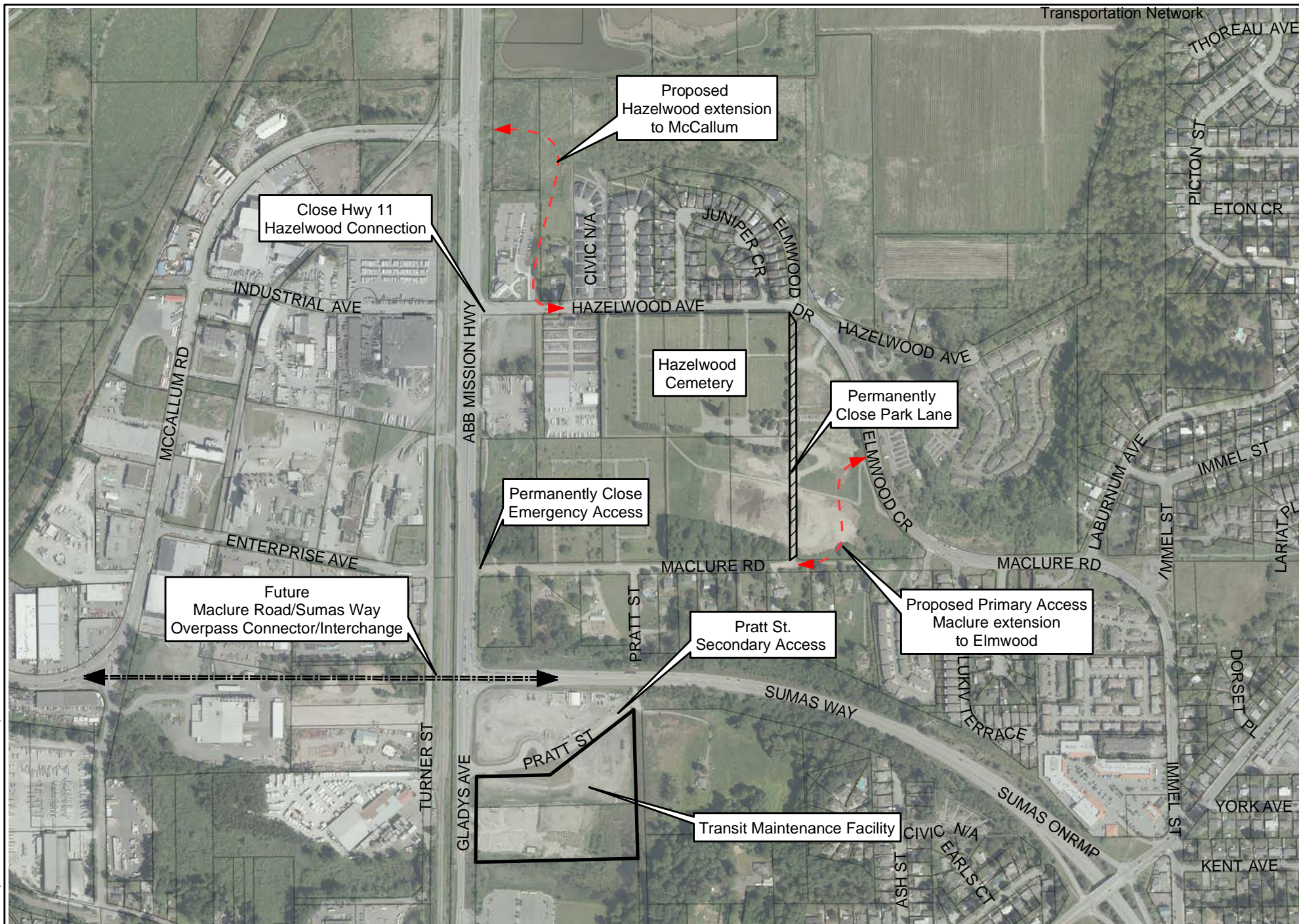
Attachment "A" - Existing Transportation Network

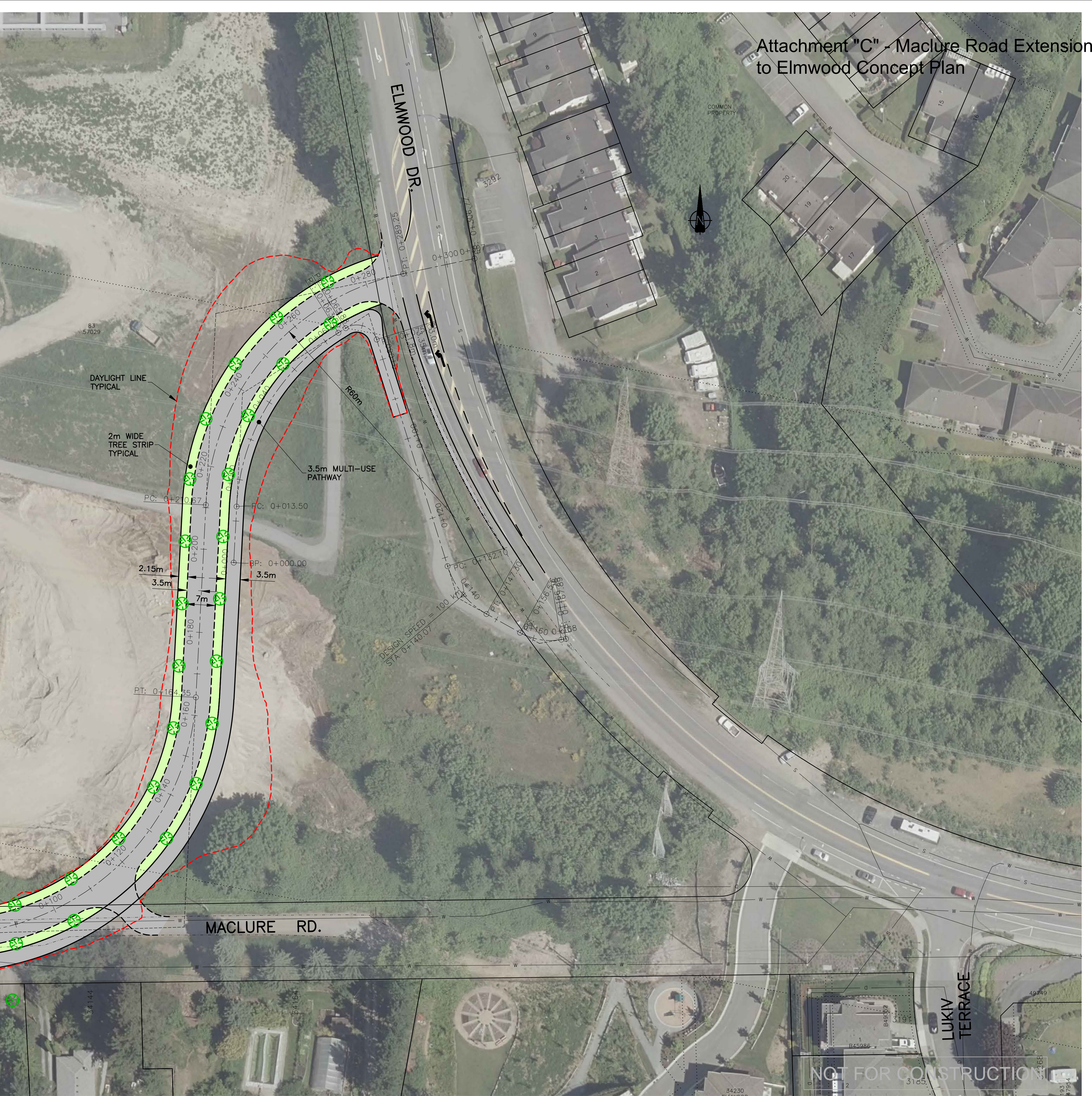
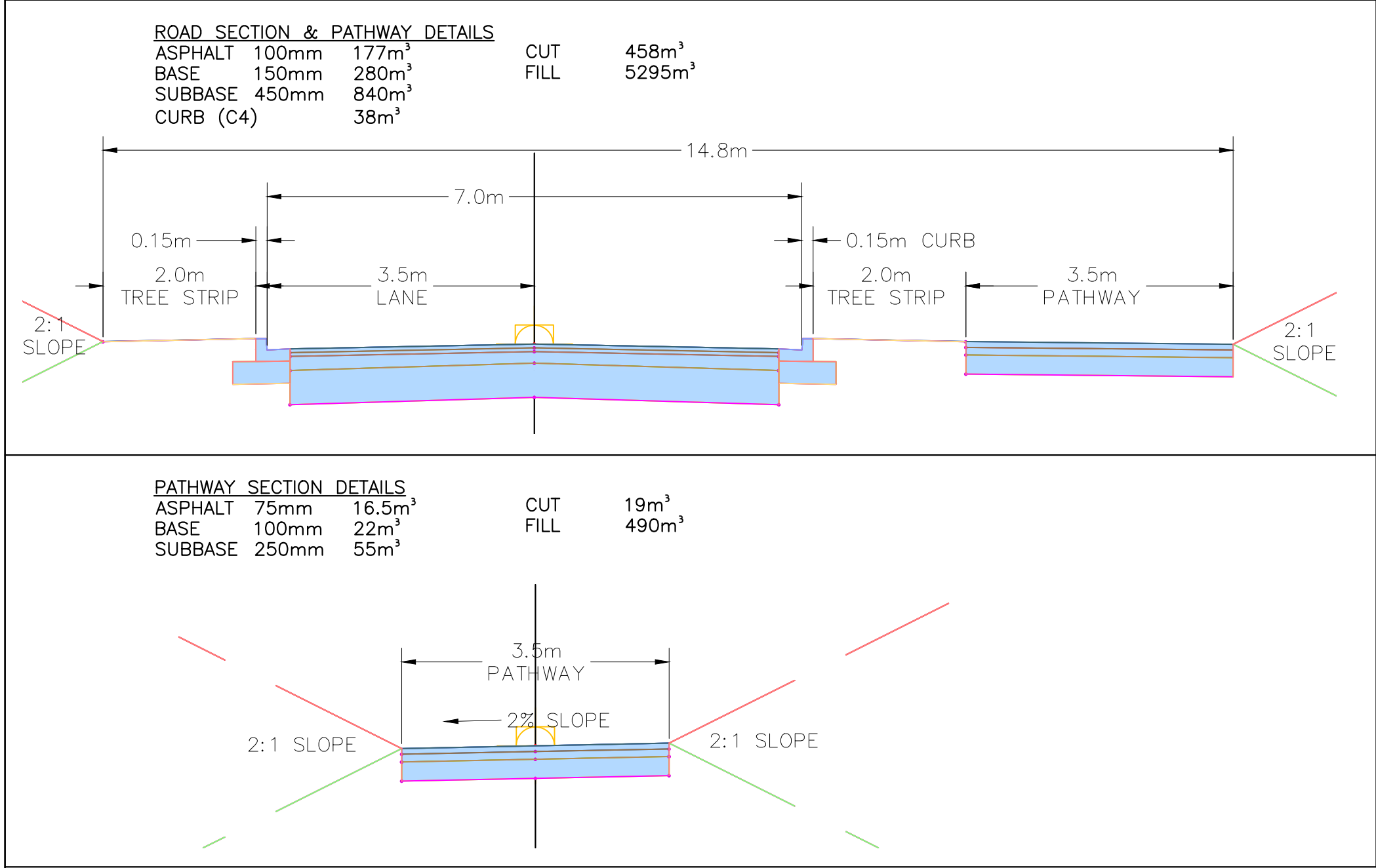
Attachment "B" - Future Transportation Network

Attachment "C" - Maclure Road Extension to Elmwood Concept Plan

Attachment "D" - Highway 11 at McCallum Road (Hazelwood Connection Concept)







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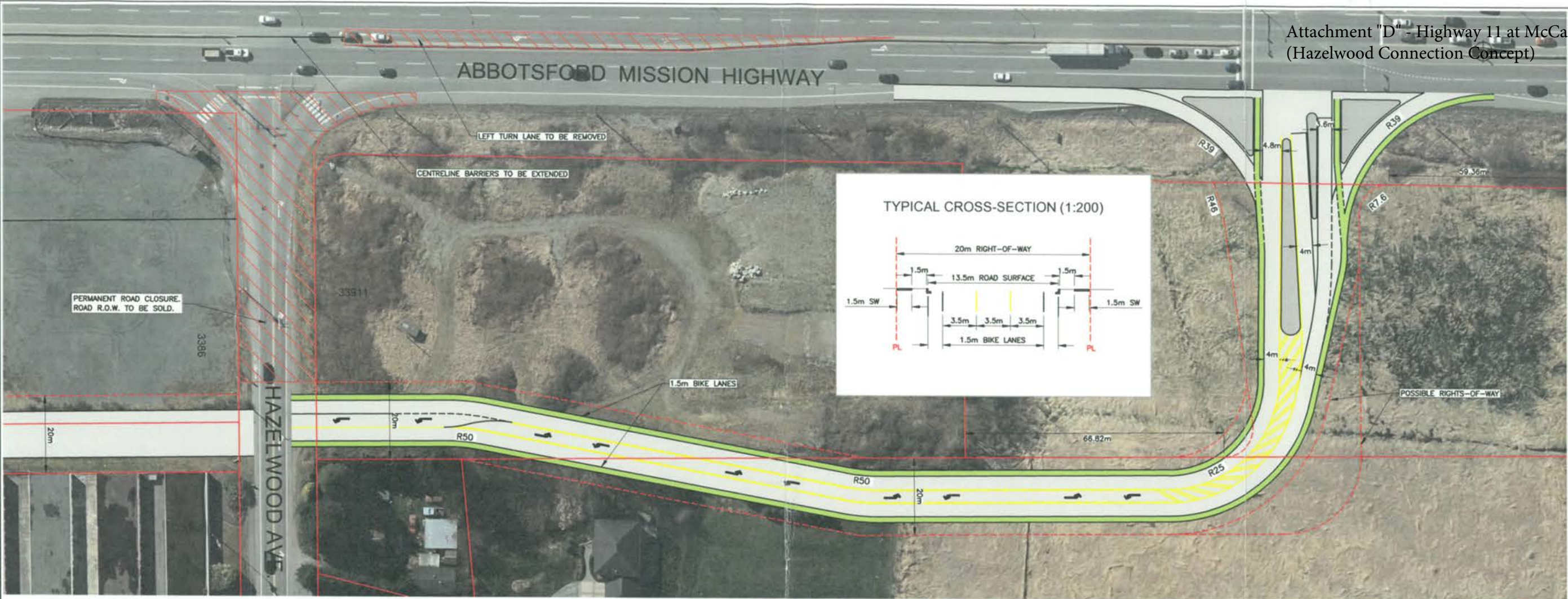
LOCATION FOR GAS, ELECTRICAL, TEL, & CABLE UTILITIES TO BE VERIFIED

NO.	DATE	BY	REVISIONS	TECH/ENG.

DATE:	2018 03 27	SURVEY JOB NO.:	2013 LIDAR
DRAWN:	MR	SURVEY CREW:	
DESIGN:	JL	SCALE	1 : 500
SAP WORK ORDER #		VERT.	



MACLURE RD. EXTENSION TO ELMWOOD DR.
(THROUGH HAZELWOOD CEMETERY)
PRELIMINARY ROAD DESIGN



NOT FOR CONSTRUCTION

LOCATION FOR GAS, ELECTRICAL, TEL. & CABLE UTILITIES ARE APPROXIMATE. CONTACT 'BC ONE CALL' TO CONFIRM LOCATIONS PRIOR TO DESIGN OR CONSTRUCTION.
BC ONE CALL: TICKET # _____ DATE: _____

NO.	DATE	BY	REVISIONS	TECH/ENG.

DATE: 2014 10 17
DRAWN: SD
DESIGN: JS
SAP WORK ORDER #

SURVEY JOB NO.:
SURVEY CREW:
SCALE:
HOR. 1 : 500
VERT. 1 : 50



MCCALLUM RD. AT HIGHWAY 11
FUTURE ROAD ALIGNMENT

GRID NO. E9 SHEET NO. 1 OF 1 DRWG. NO.

OCP Amendment Questions

SURVEY RESPONSE REPORT

08 November 2023 - 29 November 2023

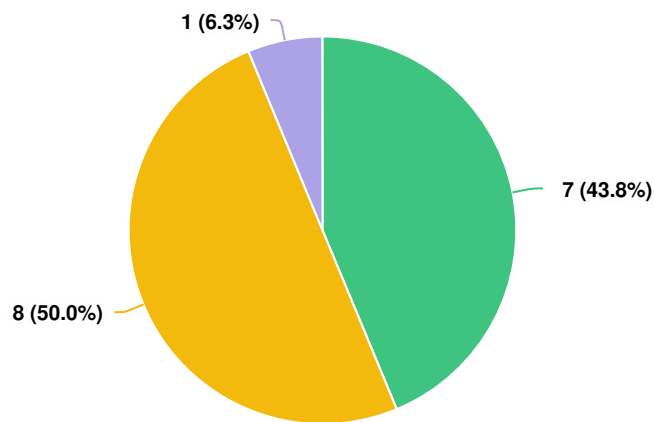
PROJECT NAME:

OCP Amendment Application for 34098, 34118, 34144 and 34164 Maclure Road (PRJ22-037)



SURVEY QUESTIONS

Q1 | Do you support the proposed OCP Amendment from Suburban to Urban 2 – Ground Oriented?



Question options

● Yes ● No ● Undecided

Mandatory Question (16 response(s))

Question type: Radio Button Question

Q2 | Do you have any further comments you would like to provide?

Anonymous

11/09/2023 10:33 PM

Would like to see a traffic impact study complete for this area. The Hazelwood/Elmwood/Maclure/Immel corridor is extremely congested and will only get worse with the mult-family apartment buildings to be built at Immel and Old Clayburn. The intersection is poorly designed and down the hill, on Hazelwood, the connection to Highway 11 is also congested and dangerous.

Anonymous

11/16/2023 09:19 AM

A couple of things need to be done for this to be feasible. Maclure Road needs to be connected to Highway 11 to help alleviate the significant increase in traffic which will otherwise hit the intersection of Maclure/Elmwood. There should be a highway crossing at Maclure which connects to Enterprise Ave. Right now there is a major problem with people crossing Highway 11, where they turn right off of Hazelwood and then immediately cross the lanes to turn left on McCallum. I've witnessed 3 accidents there and so many close calls, it's dangerous and will only become more dangerous as traffic increases. It's crazy that Hazelwood changes to Elmwood, then changes to Maclure, then changes to Immel all in the span of a couple of blocks just because the road curves. It's one road and should have one name, explaining to someone to turn to our house at the intersection of Lukiv Terrace and Maclure just confuses them, and now having the lower section of Maclure becoming a higher use area is just going to confuse things more. The naming of that road should be considered for a change. If these issues were addressed I would change my vote to support this amendment and development.

Anonymous

11/16/2023 10:05 AM

I believe the land is best suited to bring more homes to Abbotsford. I can't think of any other use of this land that would be more beneficial to local residents (ie not a great location for a park, storefront, etc. I also think the traffic burden of these extra homes would be minimal as its located right by multiple high-capacity highways.

Anonymous

11/16/2023 10:16 AM

It will be great to see more housing brought to market, and to have this area, currently underused and not very attractive, become a thriving community.

Anonymous

11/16/2023 11:58 AM

I currently own and live in a townhouse on the property directly east of the subject property. With the new development and reconfigured road infrastructure blocking off Pratt St and extending Maclure up to Elmwood Dr, what is being proposed for upgrades to the intersection

at Immel and Old Clayburn along with the Hwy 11 bypass? That intersection is already quite congested and backed up during morning and afternoon/evening rush hour. With the added loads of the two townhouse developments I'm concerned about the lack of infrastructure and ability to move traffic at those intersections.

Anonymous

11/16/2023 03:40 PM

With an additional proposed 214 units on Maclure Road will Immel Road be widened. There will be congestion getting up to Old Clayburn.

Anonymous

11/16/2023 06:34 PM

I support this rezoning for the purpose of addressing housing needs in Abbotsford. Increased density in central locations makes sense as access to transit, schools, and amenities already exists. My concern is the traffic plan with the "Multi-Family Local Road-Way standard, connecting the subject site to Elmwood Drive." Current traffic levels on Elmwood Drive combined with the proposed closure of Pratt Street access will increase existing risks to vehicle, bicycle, and pedestrian traffic. The Hazelwood-Elmwood-MacLure-Immel stretch of road, besides confusion over multiple names (please change to one name!), has seen increased traffic (vehicle, bicycle, and pedestrian) and congestion in the 10 years I have lived in the area. In mornings, vehicle traffic heading up the hill towards the Immel/Clayburn intersection see school, work, and general traffic converge, resulting in long line-ups and significant pedestrian risk (talk to crossing guards at Immel/Clayburn!). The connection of Hazelwood and Highway #11 has also become a primary route for many people in the area, with most vehicles dashing dangerously across traffic to make it into the left turn lane towards McCallum. Lastly, coming down the hill of Elmwood Drive towards Elgon Court, Lukiv Terrace, and Ten Oaks Townhouses has seen several rear-end collisions, close calls with pedestrians, and has bad visibility the further down the hill you go (visibility is especially low by proposed new access). I am worried that the proposed access will exacerbate these problems unless further action is taken in these surrounding streets. For example, the addition of street lights all the way down Elmwood Drive and a center turning lane would increase the safety of the street. Also, leaving the Pratt Street access open could alleviate the strain of traffic on Elmwood Drive from this new development. Alternatively, connecting Maclure Road to Highway #11 with a right turn access could reduce the amount of traffic making the difficult merge situation at Hazelwood and Highway #11 on their way to McCallum.

Anonymous

11/23/2023 07:06 PM

The proposal would devalue all units on the western side of 34230, replacing a quiet, peaceful property with dense family housing.

Anonymous

11/23/2023 07:09 PM

It is going to create too much density in what is a nice quiet area and devalue the property value of 34230 Elmwood drive.

Anonymous

11/26/2023 08:35 PM

As a resident of the Ten Oaks community overlooking this proposed development, I have serious concerns over the proposed Maclure road extensions ability to adequately handle the increased population of the area. Traffic will be a mess during construction and also once the new residents move in. The increased foot traffic on the trail would eliminate the peace and tranquility it currently offers. Finally, from a personal standpoint, the impact to view and green space, would likely be detrimental to the value of my property. I strongly oppose this proposal.

Anonymous

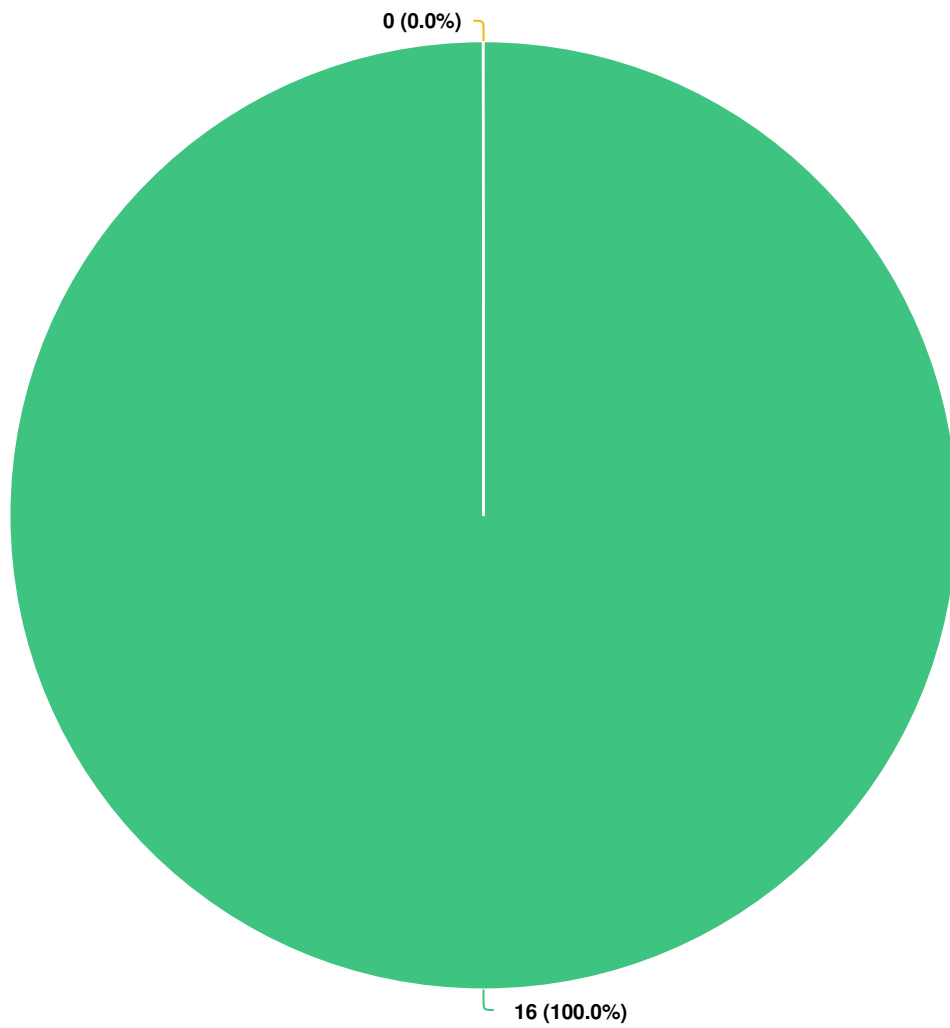
11/28/2023 09:23 PM

I have huge concerns for the traffic this will bring to an already busy hub at Old Clayburn and Immel street, the traffic in that intersection is already very busy and at times, people are very aggressive to try to get through the light. Before and afterschool is also busy with kids/parents walking and that makes it even more congested. Adding to that is the intersection on Old Clayburn and the exit off off Sumas Way, constantly people running that light and one of our family members was hit by another car running the light. Also long lines on Sumas Way trying to get through that intersection. Bottom line, so much traffic already and very little options to get in and out of that area. Add to that 215 townhomes and the multiple vehicles per home that brings, how are you going to manage this amount of traffic in that area? Being a resident in this area, unless you have multiple new ways to exit all these new residents from this development, I would not be in favour of this project moving forward. Please do not begin developments when the current roadways and infrastructure are already maxed out.

Optional question (11 response(s), 5 skipped)

Question type: Essay Question

Q3 Are you a resident or landowner in Abbotsford?



Question options

☒ Yes ☐ No

*Mandatory Question (16 response(s))
Question type: Radio Button Question*

PUBLIC INFORMATION MEETING: COMMENT SHEET (PRJ22-037)

Date: Wednesday, November 15, 2023 between 6:00 PM and 8:00 PM

Location: Dr. Thomas A. Swift Elementary School, 34800 Mierau Street

Properties: 34098, 34118, 34144 & 34164 Maclure Road



Thank you for attending this public information meeting. We would appreciate your comments on the proposed application. Please place your completed comment sheet in the comment box or return it to the City of Abbotsford by November 29, 2023 to the attention of:

Tahir Ahmed
Planning & Development Services
32315 South Fraser Way, Abbotsford, BC V2T 1W7

The applicant's proposal and related information can also be viewed by visiting the Let's Talk Abbotsford online engagement portal, during the online consultation period. There is an opportunity to provide comments at the end of the survey on the online engagement portal.

Engagement Portal: www.letstalkabbotsford.ca/OCPamendments

Consultation Period: November 8, 2023 (8:30 am) to November 29, 2023 (4:30 pm)

1. Do you support the proposed OCP Amendment from Suburban to Urban 2 - Ground Oriented?

☐ Yes

☐ No

2. Do you have any further comments you would like to provide?

Comments:

AS A RESIDENT OF TEN OAKS DIRECTLY ABOVE THIS DEVELOPMENT I HOPE
IF THIS DEVELOPMENT GOES AHEAD THERE WILL BE LOTS OF TALL TREES
GOING IN BETWEEN 10 OAKS & THE NEW DEVELOPMENT AS WE WILL BE
LOOKING DOWN INTO THIS NEW DEVELOPMENT.

OVER →

(Utilize the back of this form for any additional comments)

3. Are you a resident or land owner in Abbotsford?

☒ Yes

☐ No

Name:

M 22 (1) 0004

Email:

22 (1)

Address:

22 (1)

Phone:

Names and contact information of attendees given at public meetings are considered to be in the public domain. Public comment sheets may be appended to Council documents, reports, etc. If you have any questions about the collection and use of your personal information, please contact:

City of Abbotsford 32315 South Fraser Way, Abbotsford, BC V2T 1W7
Information & Privacy Coordinator at 604-864-5575

PUBLIC INFORMATION MEETING: COMMENT SHEET (PRJ22-037)

Comments:

WITH THE NEW ROAD ATTACHING TO ELMWOOD THERE SHOULD
BE A SEPARATE LEFT TURN LANE TO TURN INTO,
THERE SHOULD ALSO BE A LEFT TURN LANE INTO 10 OAKS
CURRENTLY THERE IS A DOUBLE YELLOW LINE TO
TURN INTO 10 OAKS DURING RUSH HOUR THERE IS
A LOT OF TRAFFIC COMING UP ELMWOOD AND ITS HARD
TO TURN LEFT WITH ALL THE ONCOMING TRAFFIC
I'VE BEEN BACKED UP THERE BEFORE THAT SAME
PROBLEM WILL EXIST TRYING TO TURN INTO THE
NEW ROAD



PUBLIC INFORMATION MEETING: COMMENT SHEET (PRJ22-037)

Date: Wednesday, November 15, 2023 between 6:00 PM and 8:00 PM

Location: Dr. Thomas A. Swift Elementary School, 34800 Mierau Street

Properties: 34098, 34118, 34144 & 34164 Maclure Road



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Consultation Period: November 8, 2023 (8:30 am) to November 29, 2023 (4:30 pm)

1. Do you support the proposed OCP Amendment from Suburban to Urban 2 - Ground Oriented?

☒ Yes

☐ No

2. Do you have any further comments you would like to provide?

Comments:

This development will be a wonderful addition to Abbotsford - Infinity is intentional about matching their project "feel" to the context that they're in, and this will be no exception!

(Utilize the back of this form for any additional comments)

3. Are you a resident or land owner in Abbotsford?

☒ Yes

☐ No

Name: ²² ⁽¹⁾ *Thruners*

Email: ²² ⁽¹⁾

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Phone:

Comments:

Feedback Form (P9J22-037)





GeoWest Engineering Ltd.
200 · 34425 McConnell Road, Abbotsford, BC V2S 7P1
www.geowestengineering.com
info@geowestengineering.com | 604-852-9088

August 23, 2023

GeoWest File: GA18-1325-02

Infinity Properties
#205 – 6360 – 202 Street
Langley, BC V2Y 1N2

Attention: Karsten Seidel, Senior Development Manager
Via e-mail: KSeidel@infinitygrp.ca

Project: Proposed Multi-Family Development – 34084 to 34164 Maclure Road, Abbotsford, BC

Subject: Geotechnical Assessment Report – Revision 2

1. INTRODUCTION

At the request of Infinity Properties (the Client), GeoWest Engineering Ltd. (GeoWest) provides herein a revised geotechnical assessment report for the construction of the proposed multi-family development at the above referenced addresses and shown in the attached Figure 1.

This revised geotechnical assessment report has been completed in accordance with our proposal P21-1264-00 dated February 2, 2022 and approved by the Client on the same day, and is based on the following additional information that has been provided to us:

1. Updated architectural drawings prepared by Focus Architecture Inc. (Focus) dated August 22, 2023.
2. Updated civil grading drawings prepared by Aplin and Martin Consultants Ltd. (A&M) dated July 18, 2023.

This revised geotechnical assessment supersedes our previous report dated March 9, 2022.

The purpose of the geotechnical assessment was to establish and assess the subsurface soil and groundwater conditions at the site and to provide related geotechnical discussion and recommendations for the design and construction of the proposed development. As well, a geotechnical landslide assessment has been completed based on the above referenced updated architectural and civil drawings.

In summary, it is GeoWest's opinion that the proposed development is feasible and safe for its intended use from a geotechnical perspective in accordance with the Community Charter Section 56 (2), subject to the commentary, findings, and incorporation of all recommendations provided herein and review of the geotechnical aspects of the construction by GeoWest as outlined in this report. Our confirmation of the safe intended use of the site is null and void if any geotechnical related works are conducted on the property in the future that are not specifically reviewed and approved in writing by GeoWest. These works include, but are not necessarily limited to, changes in site grading, drainage alterations, construction of other retaining walls, renovations/changes to the residential multi-family homes, and construction of additional structures. GeoWest also confirms that the

proposed development will not have any negative geotechnical impacts on surrounding properties, subject to the incorporation of all recommendations contained herein.

GeoWest is not aware of, and has not been provided with, any previous geotechnical assessments or reports completed by others for this development site.

An environmental assessment of the property has been completed by GeoWest. The results of that assessment have been provided under separate cover.

2. PROPOSED CONSTRUCTION

2.1 Multi-Family Site

The site plan from the Focus architectural drawing package referenced in Section 1 is attached in Appendix A of this report for reference and shows the development consisting of 29 townhouse buildings with two to eight units per building. The buildings will consist of three-storey, wood framed construction with slab-on-grade floors or two storeys of above grade construction with a partially buried level of basement. Specific buildings with partially buried levels include 1, 2, 4, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 26, 27, 28, and 29.

Structural loading is anticipated to be relatively light, with column, wall, and floor loading of less than 400 kN, 30 kN/m, and 5 kPa, respectively, with average loading within the building footprints of about 15 kPa. These values have been employed in our analysis and form the basis for the recommendations herein.

Considerable regrading of the property is required to accommodate the proposed development, which is indicated on the civil grading drawings attached to this report in Appendix B. Site grades are shown increased or decreased by about 3 m, except in the vicinity of Buildings 20, 21, 22, 23, and 24 where grade increases of up to about 5 m are proposed. A series of Allan Block retaining walls, varying in height between 0.3 and 1.8 m, are to be constructed on-site. In addition, a 3-tier SierraScape retaining wall with a total maximum height of 3.6 m will be constructed on the east side of the development where the neighbouring development to the east is topographically higher. GeoWest will provide retaining wall design drawings for the SierraScape walls under separate cover.

Slopes extending south towards the Streamside Protection and Enhancement Area (SPEA) are shown to be relatively shallow, varying from 3 to 15 percent or 33.3H:1V (Horizontal:Vertical) to 6.7H:1V.

2.2 Maclure Road Extension

The extension of Maclure Road will be constructed immediately fronting the north end of the development site and will tie into Elmwood Drive, based on information provided on the City of Abbotsford (the City) GIS. We understand that the road extension will comprise two asphalt paved travel lanes with a 3.5 m multi-use pathway. At the time of the preparation this revised report, no detailed civil grading design drawings for the road had been provided to us.

3. SITE DESCRIPTION

The development site consists of an assemblage of 4 residential acreage lots located east of the major intersection of Sumas Way and Abbotsford-Mission Highway (Highway 11), as shown in Figure 1. A topographic survey of the site completed by Onderwater Land Surveying Ltd. (their File #JA21-62_TP) dated April 20, 2021, that is attached in Appendix C, shows elevations on Maclure Road fronting the site varying from about 17 to 24 m, increasing towards the west. Elevations on site decrease from the north property line towards the south and from the east property line towards the west. The site is topographically lowest at elevations of approximately 10 m at the south end of 34084 and 34118 Maclure Road. Slopes within the northern and central portions of the site are generally about 4H:1V to 8H:1V. The slope on the east property line is generally about 2.5H:1V or flatter. Slopes at the south end of 34084 and 34418 are locally up to about 6 m in height and as steep as 1H:1V. These steep slopes have been formed by extensive filling of these properties.

Each of the existing properties are presently occupied by residential homes with separate garages and accessory buildings with typical surrounding residential landscaping and grassed yards. Some trees are located on the individual lots surrounding the homes, with a large stand of trees located along the topographically low southern end of the site. Each of the existing properties has driveway access to Maclure Road.

The presence of Sumas Way to the south of the development property has resulted in the formation of a topographically low area at the south end of the development that grades down towards the west. We were advised during our 2018 assessment of the site that localized flooding and ponding of water is common at the southwest corner of the development property during wetter periods of the year.

The location of the proposed Maclure Road extension north of the development site has been filled and was cleared at the time of our 2018 assessment, with no active development.

The site is bordered to the west by residential acreage properties, by Sumas Way to the south, and by Maclure Road to the north. A townhome development borders the property to the east, with the units constructed closest to the site built on top of a Sierra Scape retaining wall up to about 6 m in height. It is also understood that a stormwater infiltration system for the neighbouring development to the east is located in close proximity to the property line. The locations of the stormwater infiltration tanks correspond to the statutory rights-of-way shown on the topographic survey along the neighbour's west property line. Based on our 2018 assessment and field measurements, the bottom of the tanks were estimated to be buried about 2.7 m below the ground surface.

4. FIELD WORK

The site was originally investigated by GeoWest as part of a preliminary geotechnical assessment on November 27 and 30, 2018 for a different client with an alternate development concept. The site investigation at that time comprised a total of eight solid stem auger test holes. The proposed development at that time included the properties extending west of the currently proposed development site to 34010 Maclure Road.

GeoWest completed supplementary investigations of the site on May 27 and June 4, 2021, and February 11 and 16, 2022. The supplementary site investigations comprised of fifteen solid stem auger test holes that were completed for environmental and geotechnical assessment purposes on both the development property and the Maclure Road extension.

The approximate locations of the auger holes from our 2018, 2021, and 2022 site investigations are shown on the attached Figures 2 and 3.

The auger holes completed in 2018, 2021, and 2022 were conducted using a subcontracted track-mounted auger drill rig supplied and operated by Downrite Drilling Ltd. of Chilliwack, BC. The auger holes were drilled to depths of between 0.3 and 12.2 m below current local grades. Disturbed soil samples were collected from the auger flights and were submitted for routine laboratory moisture content analysis. The moisture content data is included on the soil logs.

A groundwater monitoring well was installed at AH22-01 to a depth of 9.1 m below the existing ground surface. The monitoring well consisted of 50 mm diameter PVC pipe with the lower 3 m of the well screened and backfilled in filter sand. A 0.3 m thick bentonite plug was placed above the filter sand followed by drill cuttings to within 0.45 m of the ground surface. An additional bentonite plug followed by the installation of a flush mounted well cover secured with concrete was placed at the ground surface.

The field work was supervised by a member of our engineering staff with the auger holes, except for AH22-01 with the monitoring well, backfilled immediately upon completion of testing, sampling, and logging the conditions in accordance with provincial groundwater protection regulations.

Dynamic Cone Penetration Tests (DCPTs) were conducted at borehole locations AH18-01, AH18-02, AH18-03, AH18-05, AH18-06, AH18-08, AH21-01, AH21-03, AH21-04, AH21-09, AH21-11, AH22-02, and AH22-04. The DCPT is widely used by local geotechnical practitioners and is conducted by advancing a steel cone with the same diameter as a standard split barrel sampler into the ground using an automatic trip hammer with a weight of 63 kg and a free-fall drop of 750 mm (the same driving energy used for the Standard Penetration Test [SPT]). The number of blows required for each 305 mm interval of depth of advancement of the cone is recorded. The blow counts for the DCPT provide a continuous indication of the *in-situ* relative density/consistency of the soils and provide an approximately 1:1 correlation with SPT blow counts within 7 to 9 m of the ground surface. The DCPT data is included on the relevant soil logs.

5. SITE CONDITIONS

5.1 Surficial Geology

According to Geological Survey of Canada (GSC) Surficial Geology Map 1485A, the site is underlain by Sumas Drift sediments (Sa) of "recessional channel and floodplain deposits laid down by proglacial streams; gravel and sand up to 40 m thick, normal range of thickness 5-25 m".

The drilling indicates the presence of the referenced Sumas Drift sediments as well as other glacially derived soils inferred to be glaciomarine in origin.

5.2 Soil Conditions

The soil logs should be referred to for the specific soil conditions at each auger hole location. The soil logs attached to this report provide description of the soil conditions encountered at discrete locations. Actual soil conditions remote from the auger holes may vary across the site. Contractors should make their own

interpretation of the soil logs and the site conditions for the purposes of bidding and performing work at the site. A summary of the conditions at the auger holes is provided below.

5.2.1 Fill & Topsoil

Topsoil was specifically observed at the ground surface at auger hole locations AH18-01, AH18-06, AH18-07, AH21-01, AH21-04, AH21-10, AH21-11, AH22-01, AH22-02, and AH22-03 and was grassed covered and was approximately 150 mm or less thick. Topsoil thicknesses will vary across the site and are likely to be thicker, for example, in the vicinity of existing stands of trees.

Auger hole AH21-08 was conducted at the eastern extent of the existing Maclure Road fronting the site and encountered approximately 75 mm of asphalt at the ground surface.

Fill was encountered at all auger hole locations on-site except AH18-06, AH18-07, AH21-01, AH21-04, AH22-01, AH22-02, and AH22-03. The nature and thickness of the fill on-site is highly variable, with extensive filling inferred to have been conducted at 34084, 34098, 34118, and 34138 Maclure Road based on the test hole information and the topographic survey attached in Appendix B. The fill was observed to vary primarily from silt to sand with varying gravel content. The fill was also observed to contain topsoil, wood debris, roots, other organic material, metal debris, asphalt debris, and other construction debris. The compact silty sand and gravel observed at a depth of 0.75 m at AH22-04 may be reworked native soils. The relative density of the fills based on the DCPT's varied from very loose or soft to compact to stiff, with *in-situ* moisture contents generally well in excess of the fill's optimum moisture content for compaction. The thickness of the fill at our auger hole locations varied from 0.2 to 8.2 m. Our site investigation data indicates that the fills present on-site were not placed in a controlled manner or with the intent of providing support for structures of the type contemplated for the proposed development.

Auger holes AH21-06 and AH21-07 were conducted for environmental purposes and were terminated within the fills at depths of 0.3 m and 1.5 m, respectively. Refusal of AH21-06 occurred at a depth of 0.3 m on what was inferred to be buried concrete.

Based on the presence of on-site roads and multiple accessory buildings, it is expected that additional fills are present on-site extending beyond our test hole locations. Additional fills should be expected on-site, for example, below and in the vicinity of any existing structures, driveways, on-site roads, within utility trenches, and fill slope locations.

Off-site fills within the proposed Maclure Road Extension (AH21-09 to AH21-11) comprised loose to dense sand with varying silt and gravel content, which extended to depths 1.5 to 2.4 m below current site grades.

The fill below the existing asphalt on Maclure Road at AH21-08 comprised compact sand and gravel with trace to some silt to a depth of about 1.5 m below the ground surface.

5.2.2 Sumas Drift

Sumas Drift deposits of compact to very dense sand to sand and gravel to gravel with some sand, all with varying silt content, were observed at all auger hole locations except AH18-05, AH18-08, AH21-05, AH21-06, AH21-07, and extended for the full depth of exploration at those locations. The deposits are interbedded

with 0.15 to 0.7 m thick layers of silt to silt with some sand at varying depths at boreholes AH18-02, AH18-03, AH18-04, and AH18-06.

Soils inferred to be glaciomarine in origin were observed immediately below the fill at AH18-01, AH18-02, AH18-03, AH18-05, AH18-08, AH21-02, AH21-03, AH21-05, AH21-08, and AH22-04 as well as immediately below the topsoil at AH18-06, AH18-07, AH21-01, AH21-04, and AH22-03. Glaciomarine deposits were also observed below the native sand deposits at AH21-09. The glaciomarine sediments range in thickness between about 0.4 and 8 m and are generally comprised of firm to hard silt with varying sand, gravel, and clay content. This deposit was only observed to be soft at AH18-05 and AH21-05, which may be a result of disturbance caused by the past fill placement activities at those locations.

The Sumas Drift deposits comprised predominantly of sand and gravel are expected to exhibit low compressibility under potential grading fill and structural loading from the development. The compressibility of the glaciomarine deposits is higher and has potential geotechnical design impacts on the development at the south end of the site where grade increases of up to 5 m are shown on the Focus drawings.

5.3 Groundwater Conditions

The static groundwater table was estimated at the time of our 2018 site investigation to be at an elevation of approximately 8 m, geodetic, based on the observations at our auger hole locations conducted at the topographically low south and west ends of the site (AH18-01, AH18-02, and AH18-05). Groundwater was also encountered during our 2021 and 2022 site investigations at AH21-01 and AH22-04 at approximately the same elevation. The static groundwater table should be expected to vary throughout year and will be influenced by seasonal and weather changes.

The groundwater monitoring well installed at AH22-01 was noted to be dry when measured a week after our 2022 geotechnical investigation.

Perched water was observed at AH18-08 within the thick variable fills at a depth of about 7 m, and at AH21-09 and AH22-03 within granular soils overlying relatively low permeability silt. Perched water should be expected to form within any higher permeability natural deposits or fills that are underlain by glaciomarine or other similarly low permeability soils. Surficial ponding can also occur where these low permeability deposits are present at or very near the ground surface. Perched groundwater and near surface ponding should be expected during the wetter months of the year.

6. DISCUSSIONS AND RECOMMENDATIONS

6.1 General

The contemplated development is considered geotechnically feasible subject to the incorporation of all recommendations contained herein. The topsoil and fills described in Section 5.2.1 are not suitable to support the proposed buildings and should either be stripped followed by grade reinstatement with “engineered fill” as defined in Section 6.4, or if the fills are left in place the proposed buildings should be constructed with pile supported foundations. Where fills are left in place there should be an expectation of some long-term settlement of these materials due to the variable composition and lack of proper compaction. The potential for

these settlements and magnitude cannot be readily predicted due to the variability of the composition and thickness of the material but may be on the order of 75 to 150 mm over the next 15 to 20 years based on our judgement and experience on other similar sites.

Temporary excavations for site stripping may be relatively deep. Perched groundwater water will likely be prevalent during the wetter months of the year near the surface. A combination of phased excavation and filling, perimeter swales, and sumps is likely to be necessary to facilitate the site preparation and construction.

Our review of the development design grading indicates that the storm water infiltration tanks located on the neighbouring property to the east, and shown on the attached 2021 topographic survey, will not be impacted by the proposed development, presuming they were constructed properly, based on the updated civil design grades. GeoWest provided recommendations during the design development process to raise proposed grades along the east property line to limit the total height of the tiered retaining walls to 3.6 m and avoid impacting the neighbour storm water infiltration system. This recommendation has been incorporated into the civil grading design.

6.2 Slope Stability and Permanent Slopes

The stability of the proposed site slope has been modelled with the 2D limit equilibrium modelling software Slide 2018, developed by RocScience. The slope has been assessed in accordance with the EGBC "Guidelines for Landslide Assessments in British Columbia" (March 2023) (the Guidelines).

The locations of our analysis sections are shown in Figure 2 and were chosen based on the steepness of the existing slopes as well as the presence of extensive thicknesses of poor-quality fills which are therefore expected to produce the most conservative analysis results. Soil strength parameters were determined based on our general experience and the site investigation data. Our analysis assumes that the existing variable fills will remain in place. For this case the buildings would be supported on piles. However, we have conservatively omitted the presence of the piles as they would increase the factors of safety of the slope, and the pile designs for the buildings have not been completed. Therefore, it was considered prudent not to incorporate the piles in the stability model. The soil parameters employed in our static and seismic analyses are shown in the attached Figures 4 through 7.

For the seismic analyses, the full design Peak Ground Acceleration (PGA) for this site of 0.31g has been considered, as is recommended for the initial seismic assessment of slopes in the Guidelines.

The factors of safety under static and seismic conditions for the proposed development grading are provided in Table 1.

Table 1: Slope Stability Analysis Factors of Safety				
Figure Number	Section	Slope Grading	Static Factor of Safety	Seismic Factor of Safety
4	A	Proposed	2.77	-
5	B	Proposed	1.72	-
6	A	Proposed	-	1.13
7	B	Proposed	-	1.00

The results of our analyses indicate that the static factor of safety at Section A and B meets the requirements of the Guidelines, which requires a minimum factor of safety of 1.5 under static conditions. The results of the seismic analyses also meet the Guideline requirements, as the factor of safety is 1.0 or higher at the building locations with the full PGA applied. Therefore, the proposed building locations and slope setbacks shown on the attached architectural and civil drawings are satisfactory from a slope stability perspective.

The presence of perched groundwater can not be accurately accounted for in the fill due to the interlayered nature of this material. However, it is our expectation that, during wetter periods of the year, perched water could accumulate in the fills, which would be expected to result in a reduction in the factor of safety values shown in Table 1 and could result in the levels of stability not meeting the Guideline requirements. Therefore, it is our opinion that mitigative measures are required to address the existing fill. We expect that the slope stability requirements set out in the Guidelines will be achieved subject to the incorporation of the site preparation and foundation recommendations contained herein, which include either:

1. Stripping of the existing poor-quality fills, replacement with engineered fill, and support of the buildings on conventional strip and pad foundations; or
2. Support of the buildings on piled foundations where underlain by poor-quality fills that will not be removed.

Recommendations for the above referenced site preparation and foundation options are provided in the proceeding sections of this report.

Regrading of the existing steeper slopes on the property is required to meet long-term stability requirements for the site. Permanent slopes should be graded at no steeper than 2H:1V. Flatter slopes of 4H:1V may be required for landscape purposes and ease of maintenance.

Slopes must be protected from erosion, and we recommend that all slope surfaces be permanently vegetated. The near surface stability of the slopes benefits from the presence of vegetation, with the root structures promoting binding of the surficial soil together and a reduction in pore water pressure by uptake of water by the roots. Any sloped areas which become denuded of vegetation for any reason should be replanted immediately. Based on the relatively flat slopes shown on the civil grading drawings, which are referenced in Section 2, GeoWest has no specific recommended slope stability restrictions for plant/tree species on these slopes. However, tree species that can grow large including, for example, firs, cedars, alders, and cottonwood trees should not be constructed within 3 m of any of the proposed retaining walls on the site. Plant selection for the site should be guided by an experienced landscape designer or slope bio-remediation expert.

The future strata should incorporate a maintenance plan into their yearly budget to inspect the slopes on their property following prolonged and intense rainfalls and rain on snow events for any indications of slope related damage, movement, or vegetation die-off. Irrespective of the frequency of the above referenced example events, it is our considered opinion that the slopes should be reviewed yearly at a minimum. If any slope related damages are observed, the strata should retain a Geotechnical Engineer to assess the slopes. Subject to the conditions at that time, the Geotechnical Engineer may recommend measures different from GeoWest. Any associated vegetation die-off should be replaced to minimize erosion.

GeoWest has attached a sealed Landslide Assessment Assurance Statement to this report.

6.3 Geohazard Assessment

The Hazard Acceptability Thresholds for Development Approvals by Local Governments (Revised November 1993), "Cave Report", was used as guideline for the GeoWest geohazard assessment. The primary geohazard is small-scale localized landslip comprising shallow failures. Other geohazards that must be considered include:

1. Mountain stream erosion or avulsion;
2. Debris flow/debris torrent;
3. Debris flood;
4. Snow avalanche;
5. Rockfall;
6. Major catastrophic landslide; and
7. Inundation by floodwater.

There is no apparent hazard from any of these geohazards at the subject property. The estimated annual probability of the occurrence of a small-scale localized landslip hazard impacting the proposed buildings is estimated to be less than 1:10,000, provided all of the recommendations in this geotechnical report, as well as any future recommendations issued by GeoWest, are incorporated into the design.

6.4 Subgrade Preparation for Conventional Strip and Pad Foundations

Stripping of all existing pavement, existing foundations and slabs, vegetation, topsoil, fill, other organic material, refuse, construction debris, or any other loose or otherwise disturbed materials must be conducted to expose a subgrade of firm to hard glaciomarine silt or compact to very dense sand to sand and gravel to silty sand and gravel. Stripping depths will vary across the site. The stripping depths at the individual test hole locations are provided in Table 2 for reference.

Table 2: Minimum Stripping Depths at the Auger Hole Locations	
Auger Hole Number	Stripping Depth (m)
AH18-01	1.2
AH18-02	0.5
AH18-03	3.6
AH18-04	1.8
AH18-05	1.2
AH18-06	0.2
AH18-07	0.2
AH18-08	8.2
AH21-01	0.1
AH21-02	0.75
AH21-03	1.1
AH21-04	0.15
AH21-05	0.85
AH21-06*	-
AH21-07*	-
AH21-08**	-
AH21-09**	-
AH21-10**	-
AH21-11**	-
AH22-01	0.15
AH22-02	0.15
AH22-03	0.6
AH22-04	0.8

*The bottom of the fill was not encountered at these auger hole locations

**Off-site auger hole locations

The stripped site should be graded to inhibit the ponding of water. Water should be directed to perimeter swales and sumps, as required, which is discharged to appropriate off-site facilities.

Where grade reinstatement is required after stripping, engineered fill should be employed. For the purposes of this report engineered fill is defined as well graded sand to sand and gravel, with less than 8% fines, compacted in 300 mm thick loose lifts to 100% SPD (Standard Proctor maximum dry density), in accordance with ASTM D698.

We expect that some of the existing fills and native soils present on-site may be re-used as engineered fill. The fill present on-site may be processed to separate the mineral fills from the observed topsoil, other organics, wood, metal, and construction debris which are not suitable to be present within the engineered fill. Once processed to remove these materials, moisture conditioning will be required to bring the fills to their optimum moisture content for compaction. Some moisture conditioning of the native soils will be required as well. Our test hole information suggests that the existing fills and portions of the native soil deposits are significantly wet of their optimum moisture content and would have to be dried prior to use. Drying and re-use of properly processed fill and native soil is likely to be restricted to the warmer and dryer months of the year. A relatively significant footprint on the property is likely to be required to spread the soils in sufficiently thin lifts (~ 300 mm)

to allow the soil to adequately dry. Note that any soils proposed for re-use that contain in excess of 8% fines are not suitable for any application requiring a free-draining soil. Compaction of the engineered fill should be confirmed by in-place soil density testing conducted by the Geotechnical Engineer and proof rolling under the review of the Geotechnical Engineer at the time of fill placement.

It is recommended in the areas where 5 m of grade increase is proposed that a series of settlement gauges be installed to assess the ground settlements induced by the filling process, as some settlement of the fill itself and consolidation of the underlying native soils is likely to occur. GeoWest should coordinate settlement gauge locations with the earthworks contractor at the time of construction. We recommend that the settlement gauges be monitored by a BCLS weekly during and following the filling process. The survey results should be provided to GeoWest for review and analysis. Building, utility, and road construction should not commence in this fill area until approved in writing by GeoWest.

6.5 Seismic Considerations

The Sumas Drift sediments are not considered liquefiable during the 2018 British Columbia Building Code (BCBC) design earthquake. Some of the existing very loose fills may be subject to strain softening if they become saturated during perched groundwater conditions, which could result in some settlement of these soils during the BCBC design earthquake. Removal of the fills or incorporation of pile foundations in conjunction with the recommended slope regrading provided in Section 6.2 will address this condition.

The seismic site class, in accordance with Table 4.1.8.4A of the 2018 BCBC, may be taken to be Site Class D. The Site Coefficient and PGA required for the seismic design requirements of the 2018 BCBC may be taken to be 1.6 and 0.31g, respectively. The PGA has been derived based on the 2015 National Building Code seismic hazard calculator provided by Natural Resources Canada for this specific site (Latitude 49.0597, Longitude -122.2807).

6.6 Conventional Strip and Pad Foundations

It is recommended that the shallow footings bearing on engineered fill or approved natural soils be designed using a Serviceability Limit State (SLS) soil bearing resistance of 100 kPa and a factored Ultimate Limit State (ULS) soil bearing resistance of 150 kPa.

The underside of the exterior wall footings should be located a minimum of 450 mm below the finished exterior grade for confinement and frost protection. The recommended minimum footing widths are 450 and 600 mm for continuous and spread footings, respectively.

Footings should be stepped at no steeper than 1H:1V. The underside of foundations should be located below a 1H:1V influence line taken up from the base of adjacent deeper excavations for other footings, utilities, etc. or the SLS and factored ULS soil bearing resistances provided above would need to be reviewed.

Post-construction total footing settlement is anticipated to not exceed 25 mm. Building differential settlements are expected to be less than L/500 on average.

6.7 Pile Foundations

Support of the buildings underlain by poor quality fills with piles will be required if stripping of the fills will not be conducted. It is our opinion that the most economical and practical piling options for this site include grouted screw piles or driven timber or steel pipe piles.

All piles should be designed as end-bearing piles, with the pile tips embedded in the dense Sumas Drift deposits. The fills at 34084, 34098, 34118, and 34138 Maclure Road are expected to thicken towards the south based on the test hole and the topographic survey information. Therefore, the piles should be expected to be correspondingly longer towards the south as well. It should be appreciated that embedment of the piles by 1.5 to 2 m into the Sumas Drift may be required to achieve suitable axial capacity.

For preliminary design purposes, a 200 mm diameter steel pipe or steel screw pile or 300 mm diameter timber pile driven into the Sumas Drift deposits may be assumed to achieve a factored ULS axial capacity of 375 kN and an SLS axial capacity of 250 kN. Other pile types and configurations are expected to be feasible and may be assessed by GeoWest upon request.

Due to the variability of the fills on-site, debris or obstructions may be encountered during pile installation that require pre-augering of the fills to facilitate the installation of some piles. Alternatively, pile relocation may be required in some instances.

All piles should be separated by a minimum distance of 3 pile diameters to avoid group affects. For screw piles, the pile diameter should be based on the diameter of the largest plate.

Steel piles will be subject to long-term corrosion. We recommend that the structural engineer employ a steel loss rate of 0.022 mm/year when designing for corrosion. Corrosion will occur on both in the outside and inside of the pipe piles unless the inside of the pipe is filled with concrete.

Piling of the structures will result in minimal post-construction ground settlements. However, gradual settlement of the land beyond the buildings may occur due to the variable content and poor compaction of the existing fills as outlined in Section 6.1. Grade changes between the buildings and surrounding land may develop over time that may require periodic repair. Flexible couplings on all utilities entering and exiting the pile supported buildings are recommended. Repair or replacement of the flexible couplings and pipes may be required in the future depending on the magnitude of differential settlement that occurs.

A pre-construction survey and vibration monitoring of structures surrounding the piling operation is recommended if driven piles are employed. Driving energies may have to be limited to avoid inducing excessive vibrations.

In accordance with the provisions of the 2018 BCBC the Geotechnical Engineer is to have a representative on-site on a full-time basis during the installation of pile foundations.

6.8 Slab-on-Grade and Suspended Floors

The following geotechnical recommendations are provided for slabs-on-grade:

- Concrete floor slabs-on-grade should be underlain with a minimum 150 mm thick layer of 19 mm clear crushed rock.
- The slabs should be provided with sufficient joints for control of cracks from slab settlement and from thermal expansion and contraction.
- The under-slab gravel should be hydraulically connected to the perimeter drainage system, discussed in Section 6.10, if required.

A vapour barrier below the townhouse slabs is not required for any geotechnical purposes. However, our experience has shown that the presence of a vapour barrier can reduce shrinkage cracking by providing a slip surface during the curing process between the concrete and underlying fill. The necessity for a vapour barrier should be discussed with your architect.

Floors of piled structures should be designed as suspended slabs or be pile supported. Utilities underlying suspended or piled slabs should be hung from galvanized steel hangers. Utilities supported by galvanized steel hangers should be bedded solely in pea gravel, with fill above the pipes comprising light weight materials only such as Styrofoam. The design of the under-slab utilities, including the support measures, should be completed by the mechanical engineer.

6.9 Methane and Radon Control

A methane ventilation system is not required for the proposed development.

On recent building projects in Abbotsford, the City has required that the mechanical engineer include a rough-in for a radon ventilation system below the slab-on-grade floors. The necessity of this system for this specific project will have to be confirmed by the City. If radon ventilation systems are required for the townhouse buildings, we recommend that the underslab fill comprise nominally compacted 19 mm clear crushed gravel.

6.10 Perimeter Drainage

Perimeter drainage is not required for any geotechnical purposes provided that:

- the interior slab-on-grade floor is constructed in accordance with our recommendations in Section 6.8;
- the top of slab is located above the surrounding finished grade;
- the roof drainage system is connected to non-perforated drainpipes connected to a storm water disposal system located away from the building; and
- the site is graded by at least 2% to direct surface flows away from the building.

Where all of these conditions cannot be met, a perimeter foundation drainage system should be installed. Perimeter drainage is specifically required for any structures with partially or fully buried basements or crawl spaces. Foundation drainage should also be provided for any retaining walls required for site grading purposes.

6.11 On-Site Asphalt Pavement Structure

For on-site parking areas and non-truck traffic roadways where all existing fills are removed, it is recommended that the pavement structure be constructed with a minimum section of:

- 65 mm of asphaltic concrete surface course; underlain by
- 100 mm of 19 mm minus crushed gravel base course which has been compacted to not less than 100% SPD; underlain by
- 200 mm of 75 mm minus pit run sand and gravel subbase course which has been compacted to not less than 100% SPD; underlain by
- Geotechnical Engineer approved subgrade or compacted engineered fill placed over Geotechnical Engineer approved subgrade.

The thickness of asphalt and base in drive aisles and any other areas subject to truck loading (such as fire truck or garbage truck accesses) should be at least 75 and 150 mm, respectively.

The existing fills present on-site can be left in place in roadways so long as they do not interfere with the stripping recommendations for building foundations provided in Section 6.4 and there is acceptance of some potential long-term settlement of the variable fills. Due to the variable nature of the fills, an increase in the thickness of the subbase to 650 mm will be required where these materials are left in place. The preceding recommendations for the thickness of asphalt and road base remain the same.

It is recommended that the granular base and subbase fills meet the gradation requirements stated in the Master Municipal Construction Documents (MMCD) Volume II. It is recommended that the Geotechnical Engineer review and approve all sources of candidate granular subgrade, subbase, and base fill materials prior to their placement at the site. This should include sieve analysis and Standard Proctor testing of representative samples of the candidate fill materials.

6.12 Off-Site Public Roads

We recommend that road widening areas of Maclure Road, and the new Maclure Road Extension be stripped of any vegetation, topsoil, debris, and any loose or otherwise disturbed soils to expose a subgrade of dense sand and gravel fill. Stripping depths at our off-site auger holes (AH21-08 to AH21-11) are approximately 100 mm, though stripping depths should be expected to vary between the test holes.

Prior to road construction the subgrade should be proof rolled with a large vibratory drum compactor under the review of GeoWest. Any soft/loose spots encountered during the proof roll must be stripped and be replaced with subbase fill.

Pavements structures should consist of the City of Abbotsford's standard pavement sections based on the proposed classification of the roads. The road classifications should be confirmed with the City.

Pavement structure fill gradation and compaction should conform to City and MMCD specifications.

6.13 On-Site Trench Bedding and Backfill

The utility trench bedding and backfill for on-site utilities should be in accordance with MMCD Drawing No. G4. Imported pipe bedding should meet the gradation requirements stated in MMCD Section 02226, Article 2.7 (Gold Edition), Type 2 bedding.

Imported trench backfill should meet the gradation requirements for the materials stated in MMCD Section 02223, Article 2.2.3, and the referenced articles in Section 02226 in paved areas. The utility trench backfill should be compacted to 100% SPD in hard surfaced areas. The compaction may be reduced to 92% SPD in soft landscape areas.

6.14 Storm Water Infiltration

Based on the variable soil conditions and the topography of the site it is our opinion that the site is not suitable for storm water infiltration purposes. The site is better suited to detention type applications.

6.15 Lateral Earth Pressures

Below-grade foundation walls and retaining walls required for site grading purposes will be subject to both static and seismic earth pressures. The earth pressures will be dependent on the rigidity of the walls as well as the presence of temporary shoring or slopes adjacent to the foundation walls.

Walls constructed against a backfilled slope will develop an “active” pressure distribution if the wall is designed to be flexible. A foundation wall/retaining wall is deemed to be flexible if it is capable of lateral movement of at least $0.002H$ (metres), where H is the height of the wall in metres. We recommend the following earth pressures be used for design for this case:

STATIC (active)	$5.5H$ (kPa) triangular soil pressure, where H is the total height of the wall in metres.
SEISMIC	$2.5H$ (kPa) <u>inverted</u> triangular soil pressure.

The structural engineer will have to confirm if the walls possess the required flexibility to utilize an active earth pressure distribution. Walls that are not sufficiently flexible should be designed for “at-rest” conditions and a static pressure distribution of $8.3H$ (kPa) triangular soil pressure.

The seismic pressure distribution was estimated using the pseudo-static Mononobe-Okabe¹ (M-O) equations employing 70 percent of the site PGA.

Additional surcharge loads will increase the lateral earth pressure on the foundation and retaining walls and will have to be reviewed by GeoWest on a case-by-case basis.

The earth pressures provided are based on unfactored soil properties and so the earth pressures should be considered unfactored as well. The earth pressures provided also assume fully drained conditions adjacent to

¹ Mononobe, N and Matsuo M (1929). “On the Determination of Earth Pressures During Earthquakes” Proc. World Eng. Congress, 9, pp 179 -187

the walls, so the walls are to be provided with a drainage mat and/or free draining backfill tied into the perimeter drainage system. The earth pressures also assume that the surface of the retained soil is horizontal.

Foundation wall and retaining wall backfill should comprise free draining sand to sand and gravel with a minimum angle of internal friction of 36 degrees and a compacted unit weight of 19.5 kN/m^3 . If backfill materials with differing properties are used, different earth pressures will be imposed on the walls, which will have to be re-assessed by GeoWest once the backfill material properties are defined.

For assessment of sliding resistance, a factored ultimate passive resistance based on an equivalent fluid pressure of 35 kPa/m and a factored coefficient of friction of 0.4 may be used where the foundation is constructed on a subgrade prepared in accordance with the recommendations in Section 6.4.

6.16 Geotechnical Review

As required for Municipal building permit "Letters of Assurance", GeoWest will carry out sufficient field reviews during site preparation and 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 affect the contractor's obligations to perform under the terms of their contract.

It is the contractors' responsibility to advise GeoWest (a minimum of 48 hours in advance) that a field review is required. Geotechnical field reviews are required at the time of the following work:

- | | |
|--------------------|---|
| 1. Stripping | – Review of stripping depth to suitable subgrade materials |
| 2. Subgrade | – Review of pavement subgrades prior to fill placement and footing subgrades prior to pour |
| 3. Engineered Fill | – Review of any engineered fill used to raise or restore grades for pavements or located below foundations or slabs |
| 4. Slab-on-Grade | – Review of slab fill and compaction |
| 5. Pavement | – Pavement subgrade stripping and proof rolling and pavement structure fill review and compaction |

As indicated above, full-time review of pile installation by the Geotechnical Engineer is required under the 2018 BCBC Letters of Assurance.

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 familiarised with the sensitive aspects of the works proposed. It is the responsibility of the developer and contractor to notify GeoWest when conditions or situations not outlined within this document are encountered.

7. CLOSURE

This revised geotechnical assessment report has been prepared by GeoWest Engineering Ltd. exclusively for Infinity Properties and those on their design team for this specific project. The report may also be relied upon

by the City of Abbotsford as part of their permitting process. The information contained in this revised report reflects our judgement in light of the information provided to us at the time it was prepared.

Any use of this report by third parties, or any reliance on or decisions made based on it, are the responsibility of such third parties. GeoWest does not accept responsibility for damages suffered, if any, by a third party as a result of their use of or reliance on this report.

The attached Terms of Reference form an integral part of this report.

GeoWest trusts this meets your immediate requirements. If you have any questions or require further information, please contact us.

Yours truly,
GeoWest Engineering Ltd.



2023-08-23

Per: John Carter, M.Eng., P.Eng.
Principal, Senior Geotechnical Engineer

REVIEWED BY:

Michael Gutwein, P.Eng.
Senior Geotechnical Engineer

JC/erc

Attachments: Terms of Reference
Figures 1 to 7
Soil Logs
Landslide Assessment Assurance Statement
Appendix A – Focus Architecture Site Plan
Appendix B – Aplin and Martin Civil Grading Plans
Appendix C – Topographic Survey

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FIGURES



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DATE: 2020		ADDRESS:		PROPOSED TOWNHOUSE DEVELOPMENT		DRAWN:		TS/BO		NTS	SCALE:
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				INFINITY PROPERTIES				1		ESBC PERMIT TO PRACTICE NO. 600887	

APPROXIMATE AUGER HOLE
AND DCPT LOCATION

T
 AH21-01/DCPT

APPROXIMATE AUGER HOLE LOCATION

AH21-02

ADAPTED FROM: COA WEBMAP		TITLE	
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REVIEW: SCALE:		REVIEW: JC	
DRAWN: TS/BO		DRAWN: FILE NO: NTS	
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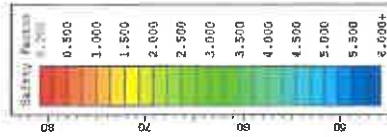


LEGEND

- APPROXIMATE AUGER HOLE AND DOPT LOCATION
- APPROXIMATE AUGER HOLE LOCATION

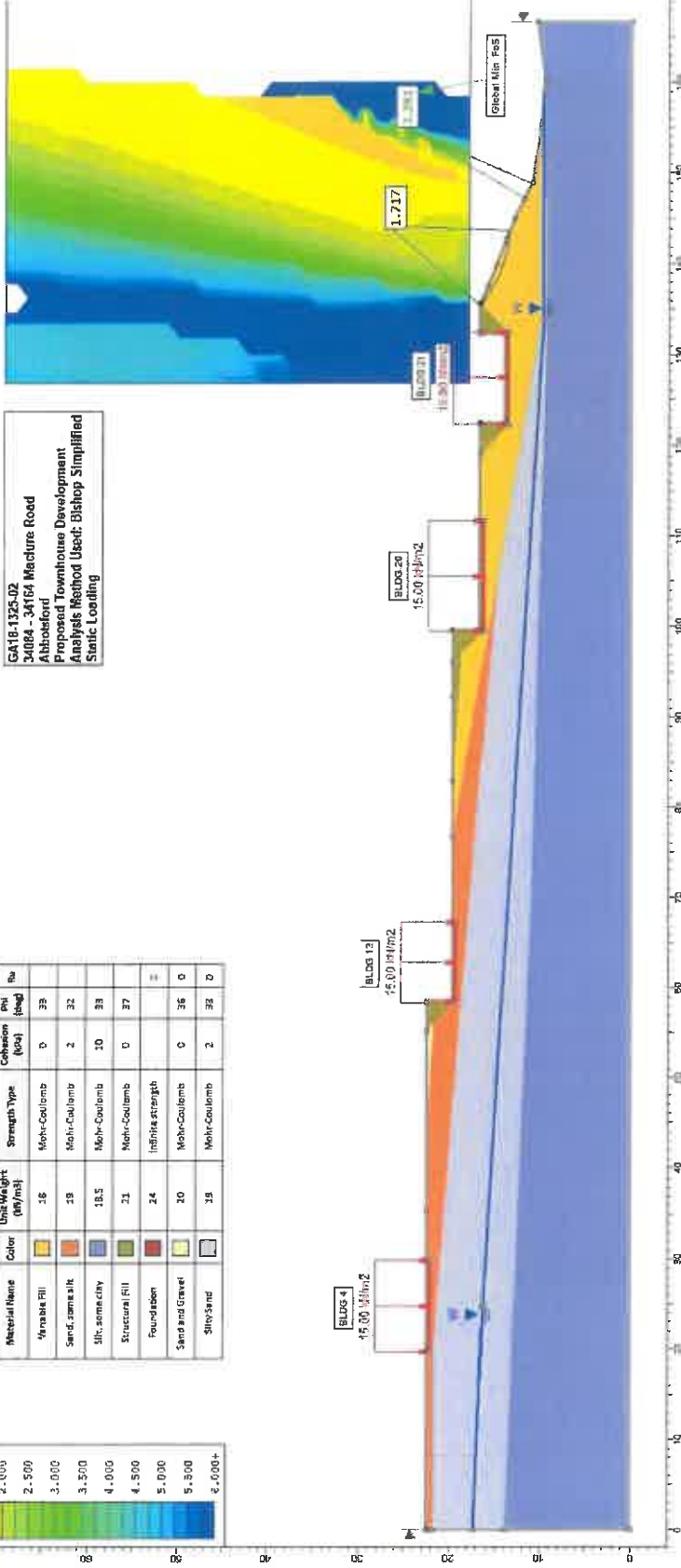


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DATE: 2020		ADDRESS: 34084 TO 34164 MACLURE ROAD, ABBOTSFORD, BC		ADDRESS: 34084 TO 34164 MACLURE ROAD, ABBOTSFORD, BC		DRAWN: TS/BO		Geowest ENGINEERING		FILE NO: GA18-1325-02	
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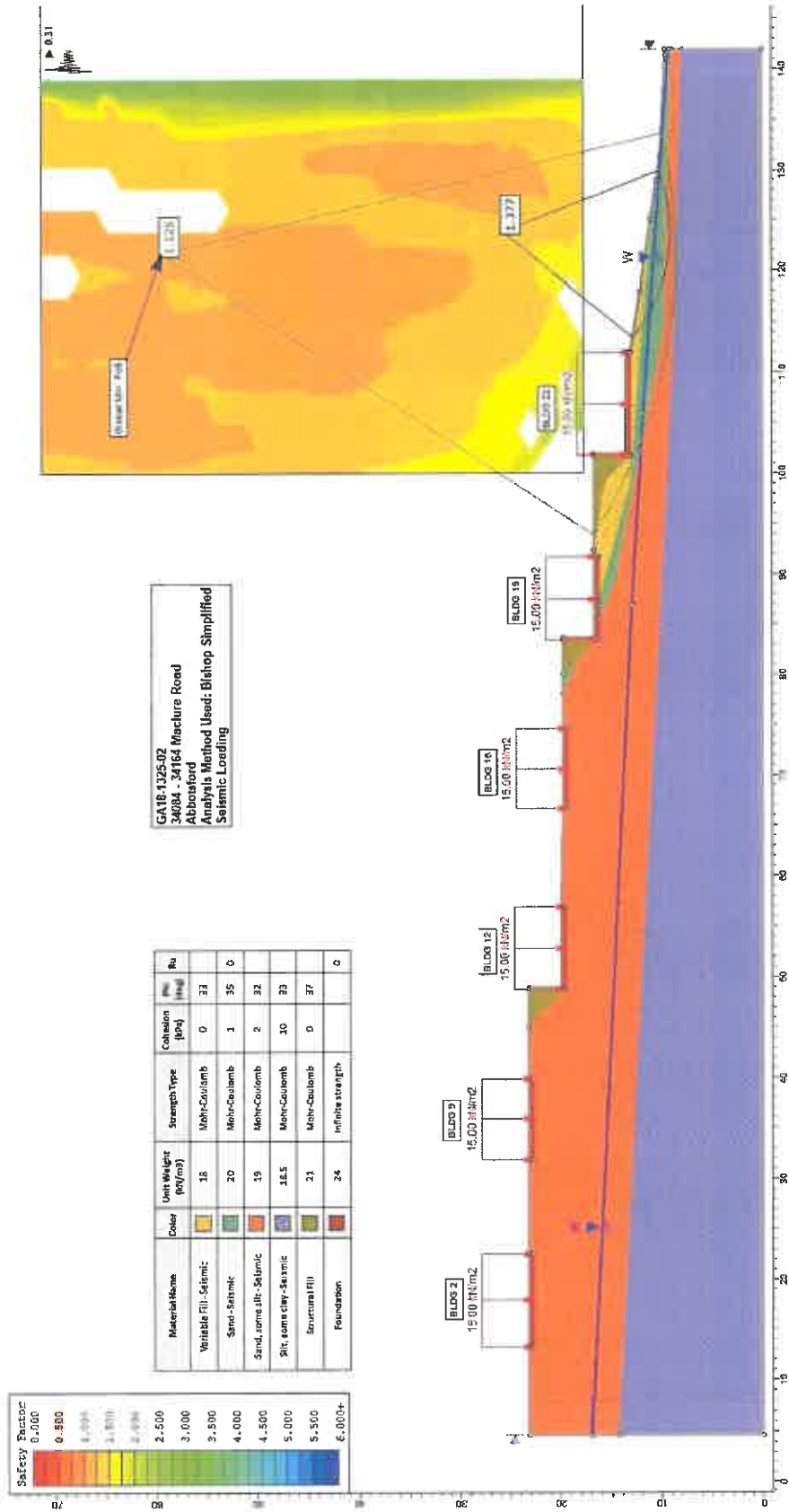








Material Name	Color	Unit Weight (pcf)	Strength Type	Cohesion (pcf)	Phi (deg)
Variable Fill		18	Mohr-Coulomb	0	33
Sand, James Mt		19	Mohr-Coulomb	2	32
Silt, some clay		18.5	Mohr-Coulomb	10	33
Structural Fill		21	Mohr-Coulomb	0	37
Foundation		24	Infinite strength		
Sand and Gravel		20	Mohr-Coulomb	0	36
Silty Sand		18	Mohr-Coulomb	2	33

GA18-1325-02
34084 - 34164 MacLure Road
Abbotsford
Proposed Townhouse Development
Analysis Method Used: Bishop Simplified
Static Loading

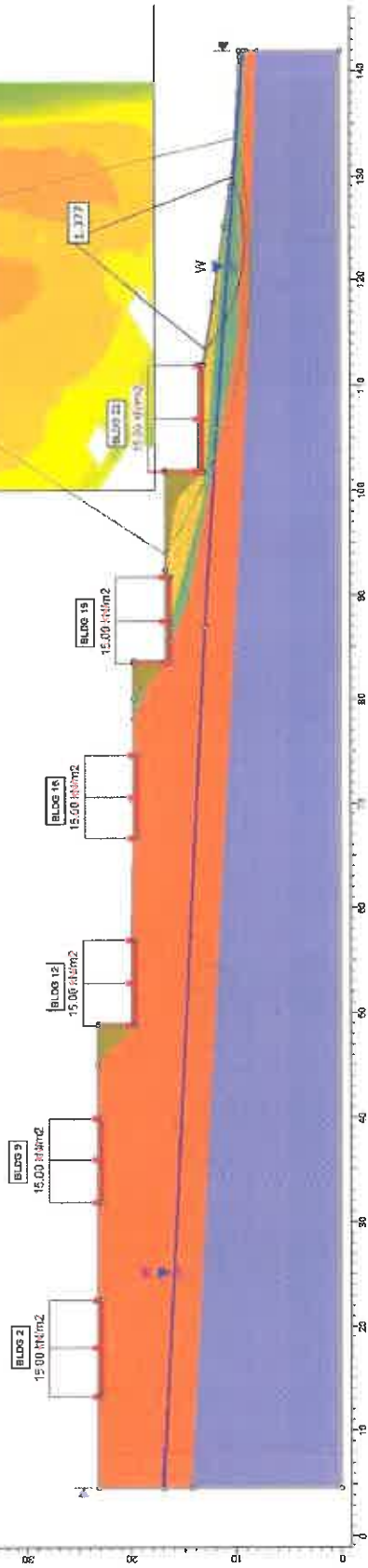


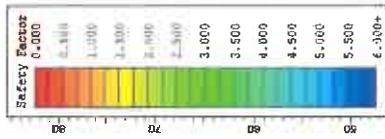
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TS/BO:		TS/BO FIG. NO.:		5	
Geowest ENGINEERING 200 - 34425 MCCONNELL ROAD ABBOTSFORD, BC V2S 7P1 TEL: 604-635-9685					
TITLE: GLOBAL STABILITY SECTION B - STATIC ANALYSIS PROPOSED TOWNHOUSE DEVELOPMENT			CLIENT: INFINITY PROPERTIES		
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Material Name	Color	Unit Weight (pcf/m3)	Strength Type	cohesion (pcf)	Ru
Variable Fill - Salinic		18	Mohr-Coulomb	0	33
Sand - Salinic		20	Mohr-Coulomb	1	35
Sand, some silt - Salinic		19	Mohr-Coulomb	2	32
Silt, some clay - Salinic		18.5	Mohr-Coulomb	10	33
Structural Fill		21	Mohr-Coulomb	9	37
Foundation		24	Infinite strength		0

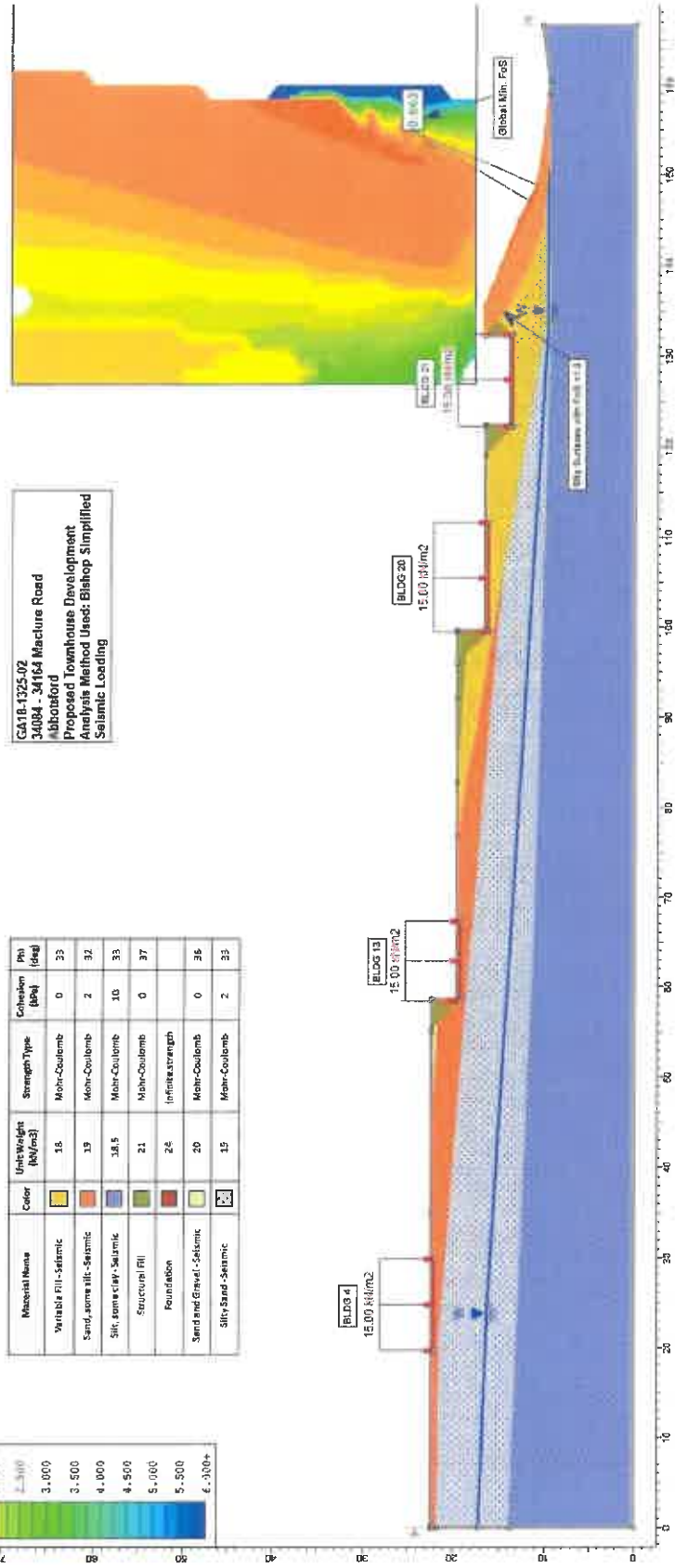
GA18-1125-02
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**Analysis Method Used: Bishop Simplified
Seismic Loading**





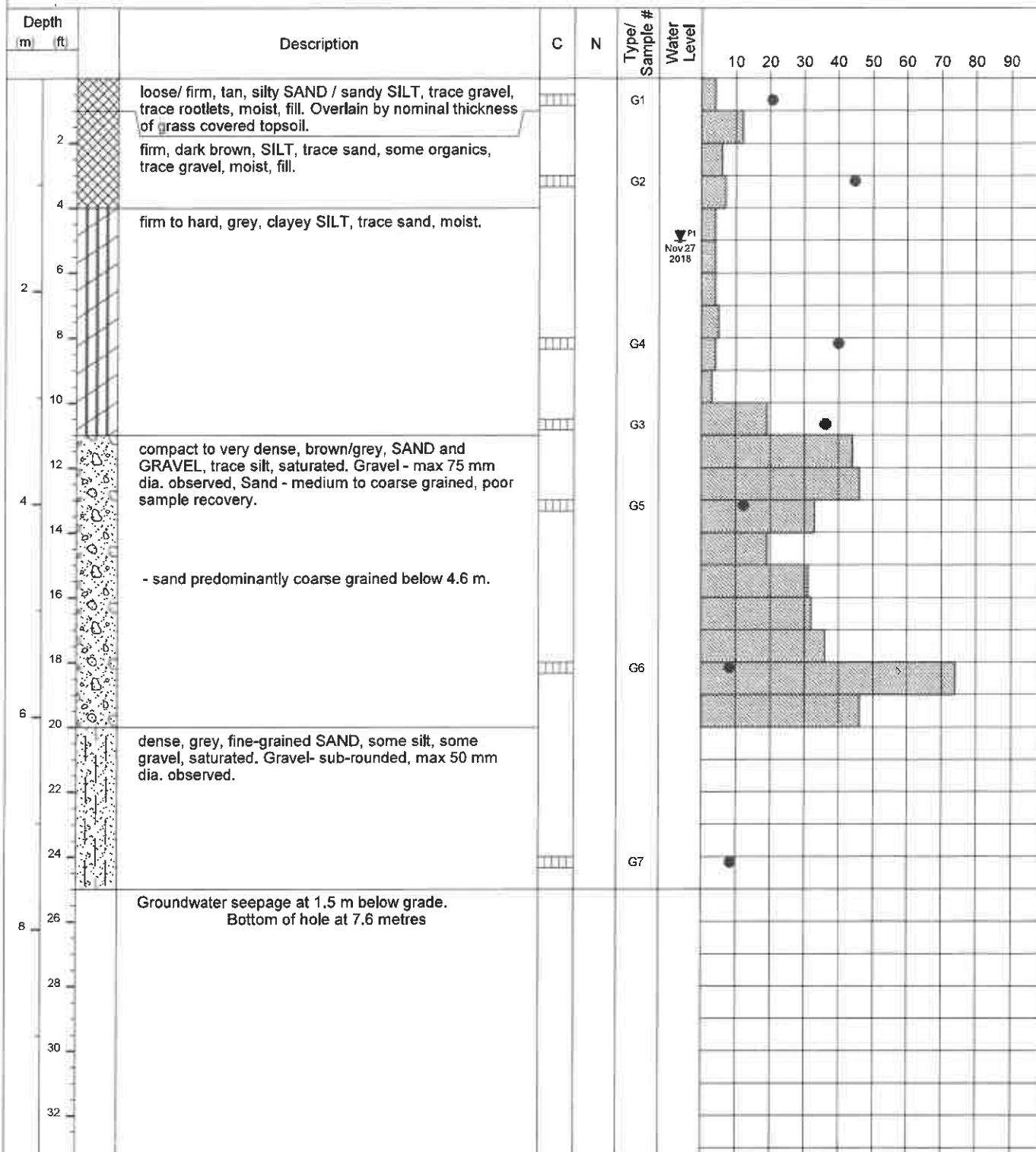
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Variable Fill - Seismic	[Yellow]	15	Mohr-Coulomb	0	33
Sand, some silt - Seismic	[Orange]	19	Mohr-Coulomb	2	32
Silt, some clay - Seismic	[Red]	18.5	Mohr-Coulomb	10	33
Structural Fill	[Green]	21	Mohr-Coulomb	0	37
Foundation	[Dark Green]	24	Infinite strength		
Sand and Gravel - Seismic	[Light Green]	20	Mohr-Coulomb	0	36
Silty Sand - Seismic	[Blue]	15	Mohr-Coulomb	2	33

GA18-1325-02
34084 - 34164 MacLure Road
Abbotsford
Proposed Townhouse Development
Analysis Method Used: Bishop Simplified
Seismic Loading



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PROJECT:		ADDRESS:		SEAL:	
DATE:		CLIENT:		Geowest ENGINEERING 200 - 34425 MCCONNELL ROAD ABBOTSFORD, BC V2S 7P1 TEL 604-655-6088	

SOIL LOGS



C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST ☐

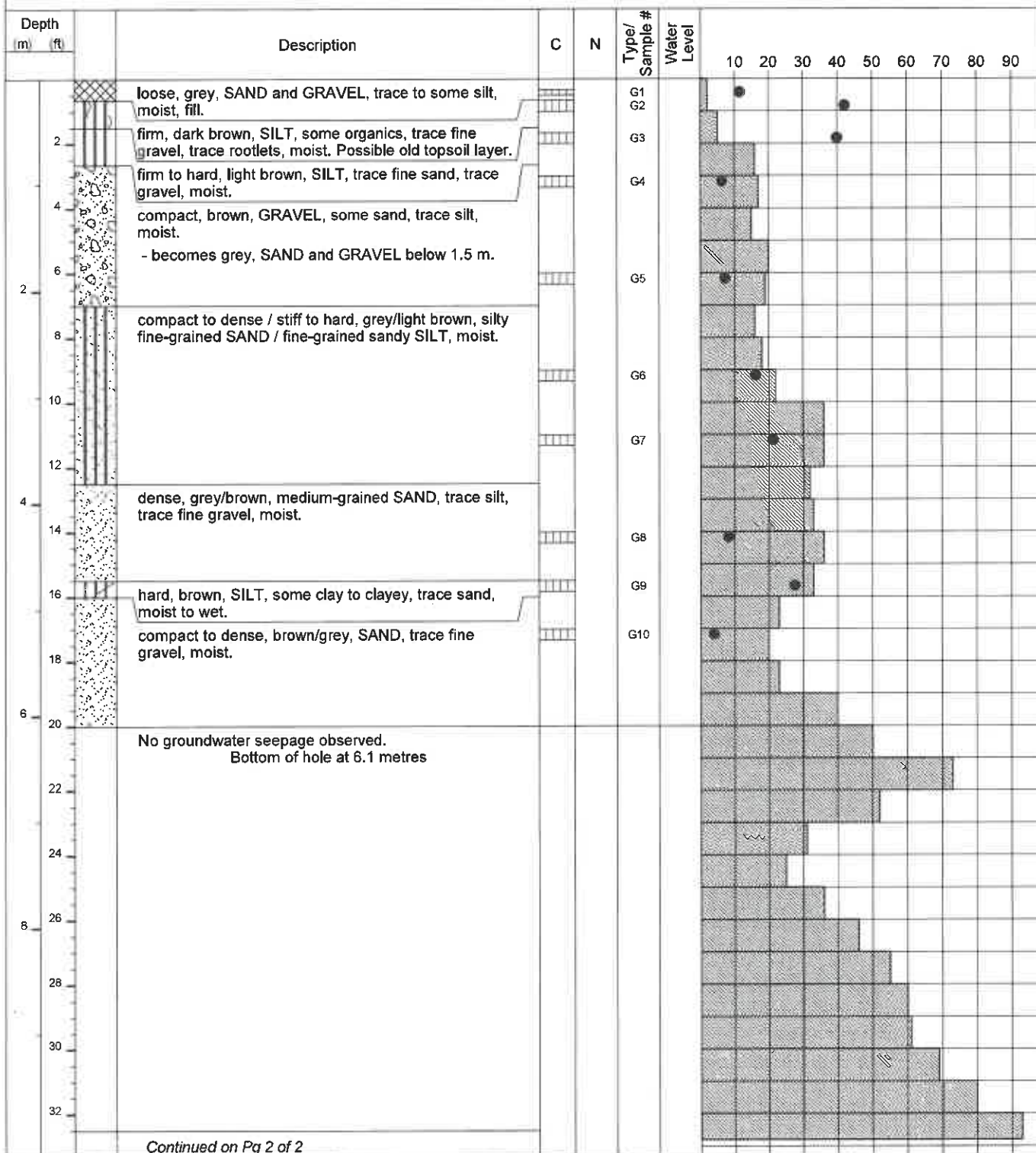
Plastic Limit (%) ☐ Liquid Limit (%) ☐
Moisture Content (%) ☐

Ground Water Level ☒
Shear strength in kPa (Torvane) ☐
Pocket Penetrometer (compressive strength in kPa) ☐
Shear strength in kPa (Unconfined) ☐
Shear strength in kPa (Field vane) ☐
Remolded strength in kPa ☐
Percent Passing # 200 sieve ☐

Drill Method: Solid Stem Auger / DCPT
Date Drilled: 11/27/2018
Logged by: RK/BO
Checked by: JC

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Continued on Pg 2 of 2

C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU : Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer
(compressive strength in kPa)
X Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (Field vane)
⊠ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger / DCPT

Date Drilled: 11/27/2018

Logged by: BO/TS

Checked by: JC

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GeoWest Engineering Ltd
200-34425 McConnell Road
Abbotsford, BC V2S 7P1

Proposed Multi-Family Subdivision
34084 - 34164 Maclure Road, Abbotsford, BC
Infinity Properties

AH18-02/DCPT

Pg 2 of 2

Project No: GA18-1325-02

Depth		Description	C	N	Type/ Sample #	Water Level																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
(m)	(ft)						10	20	30	40	50	60	70	80	90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

C: Condition of Sample

Good ☐
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST ☐

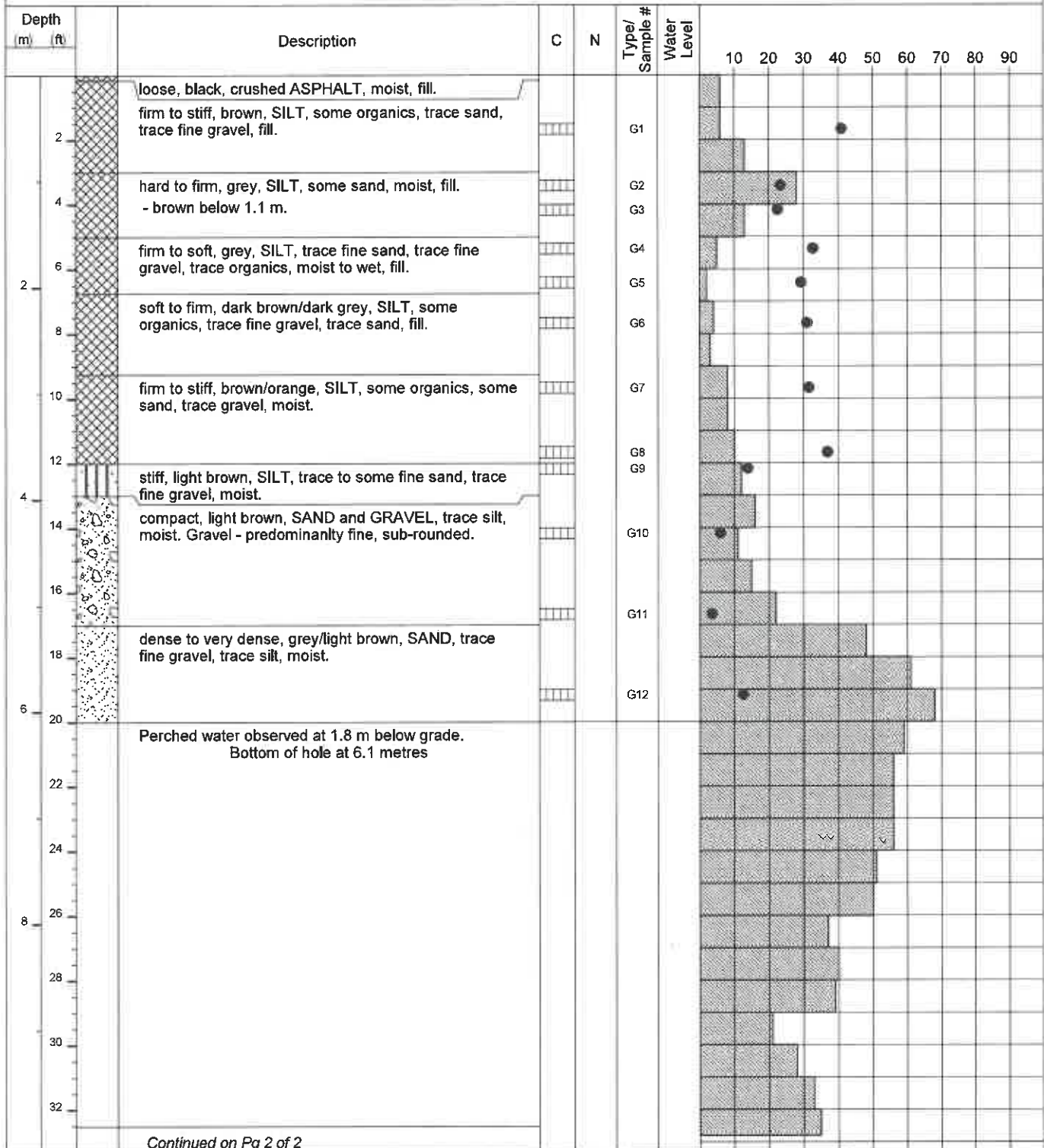
Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)

Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer
(compressive strength in kPa)
X Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger / DCPT
Date Drilled: 11/27/2018
Logged by: BO/TS
Checked by: JC

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Continued on Pg 2 of 2

C: Condition of Sample

Good 
Disturbed 
No Recovery 

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight







N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST 

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)

 Ground Water Level
 Shear strength in kPa (Torvane)
PP Pocket Penetrometer
(compressive strength in kPa)
 Shear strength in kPa (Unconfined)
 Shear strength in kPa (Field vane)
 Remolded strength in kPa
 Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger / DCPT

Date Drilled: 11/27/2018

Logged by: BO/TS

Checked by: JC

Depth (m) (ft)	Description	C	N	Type/ Sample #	Water Level	10	20	30	40	50	60	70	80	90
34														
36														
38														
40														
42														
44														
46														
48														
50														
52														
54														
56														
58														
60														
62														
64														

C: Condition of Sample

Good ☐
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST ☐

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)

- ☐ Ground Water Level
- ☐ Shear strength in kPa (Torvane)
- ☐ Pocket Penetrometer (compressive strength in kPa)
- ☐ Shear strength in kPa (Unconfined)
- ☐ Shear strength in kPa (Field vane)
- ☐ Remolded strength in kPa
- ☐ Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger / DCPT

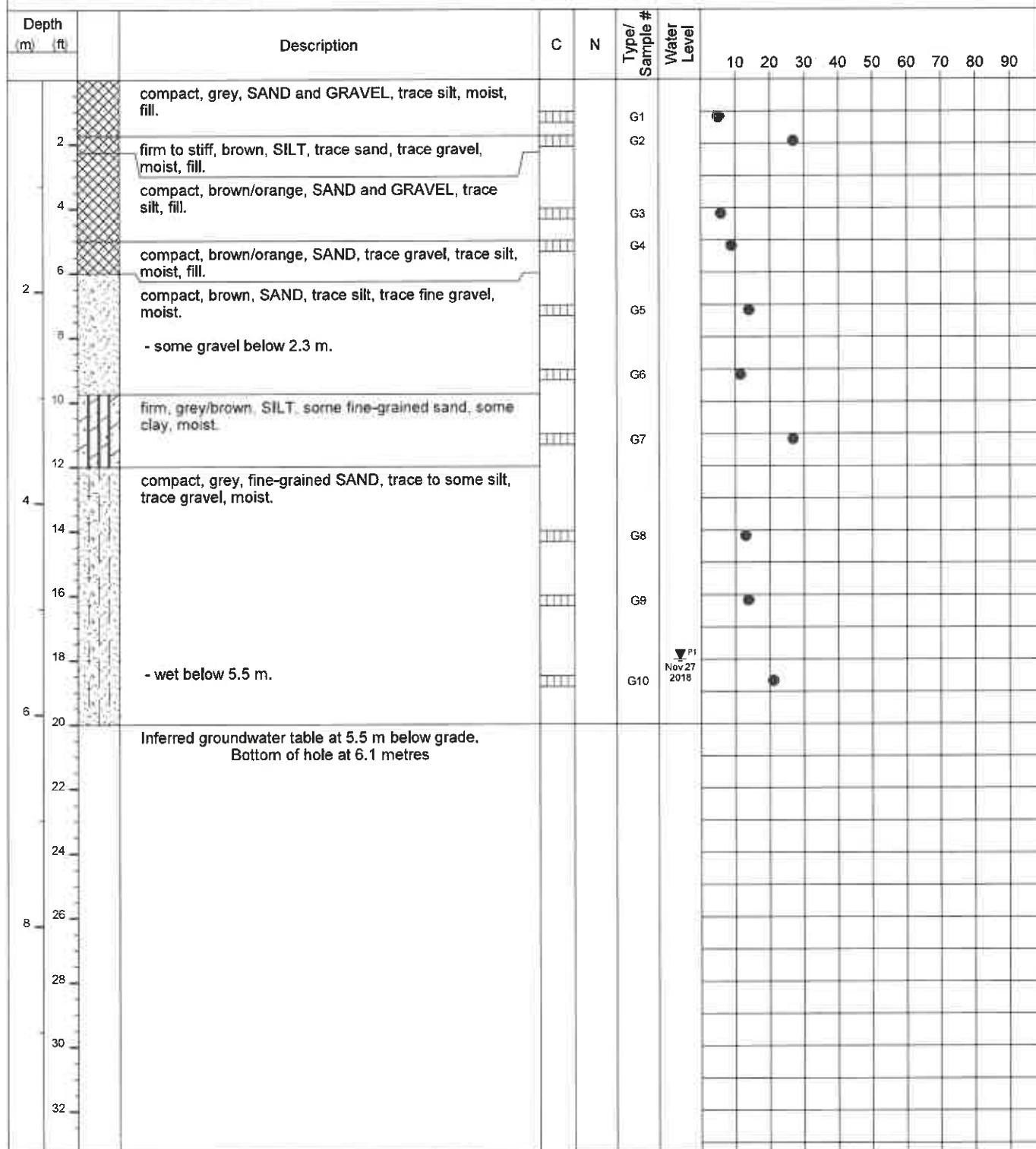
Date Drilled: 11/27/2018

Logged by: BO/TS




Checked by: JC

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C: Condition of Sample

Good 
Disturbed 
No Recovery 

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU : Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer
(compressive strength in kPa)
X Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (Field vane)
⊠ Remolded strength in kPa
■ Percent Passing # 200 sieve

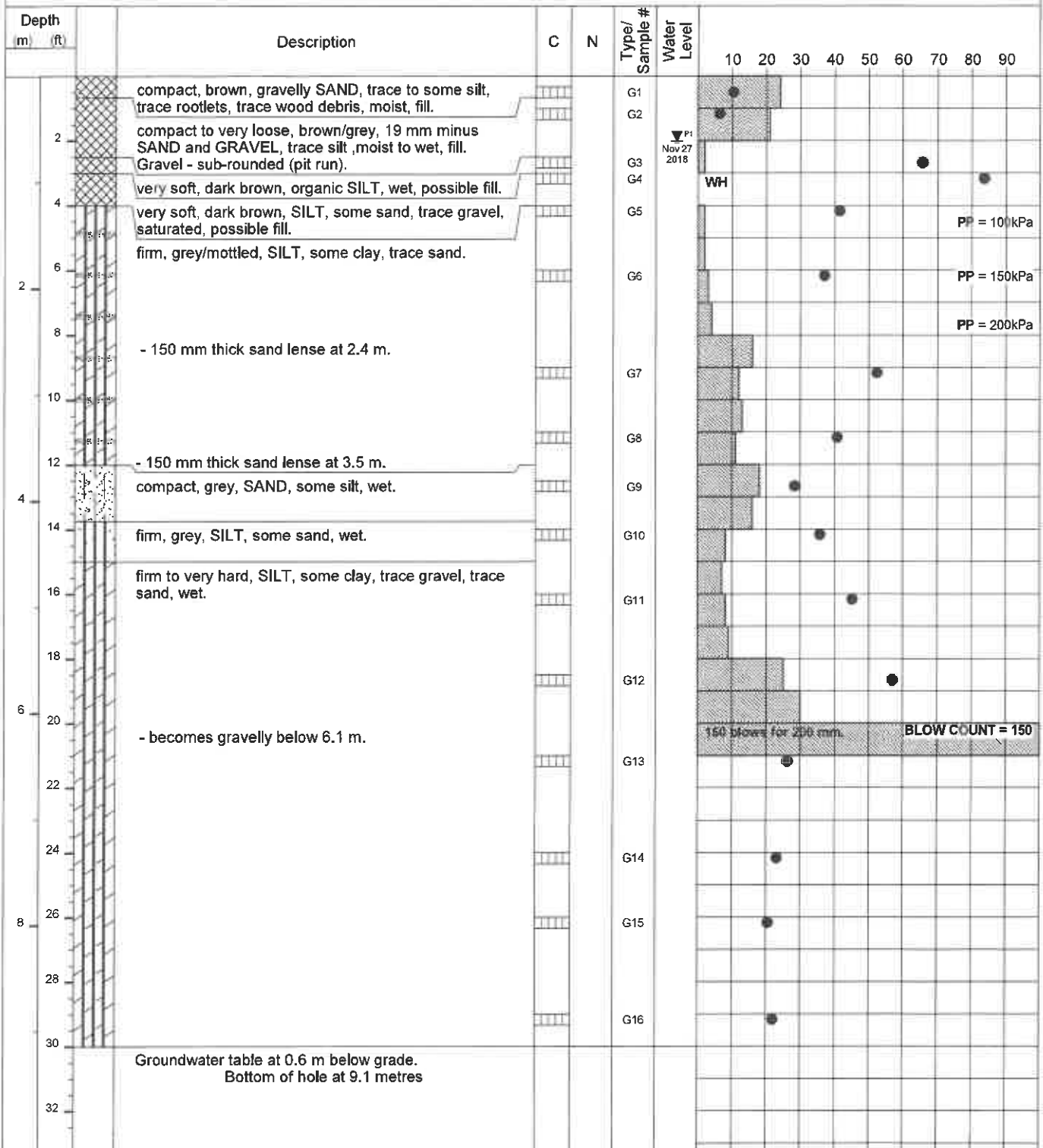
Drill Method:

Solid Stem Auger
Date Drilled: 11/27/2018
Logged by: BO
Checked by: JC




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DYNAMIC CONE PENETRATION TEST

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C: Condition of Sample

Good 
Disturbed 
No Recovery 

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST 

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)

Ground Water Level

Shear strength in kPa (Torvane)

Pocket Penetrometer

(compressive strength in kPa)

Shear strength in kPa (Unconfined)

Shear strength in kPa (Field vane)

Remolded strength in kPa

Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger / DCPT

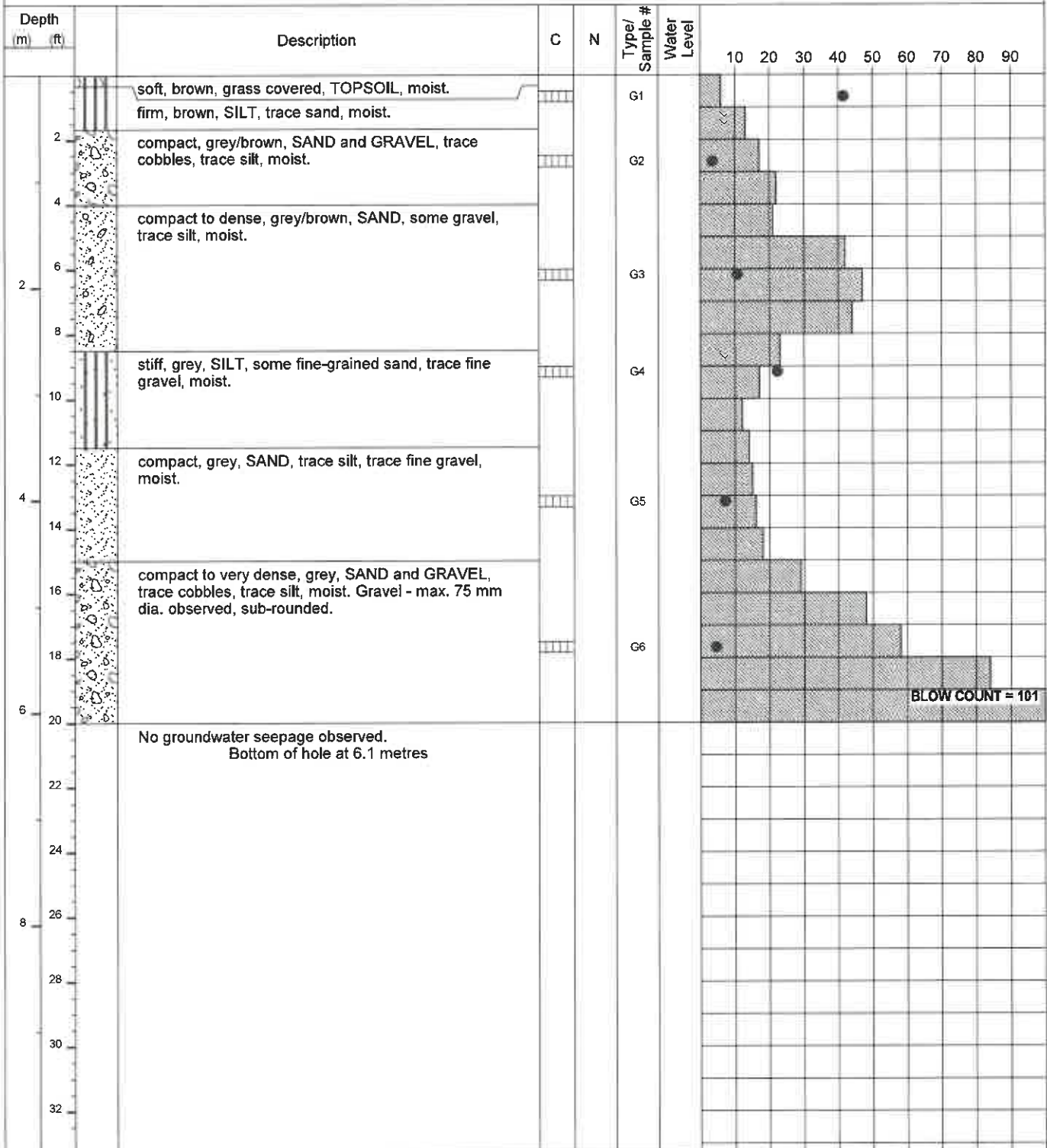
Date Drilled: 11/27/2018

Logged by: BO

Checked by: JC

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BLOW COUNT = 101

C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)

Ground Water Level
Shear strength in kPa (Torvane)
Pocket Penetrometer
(compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger / DCPT
Date Drilled: 11/27/2018
Logged by: BO/TS
Checked by: JC

SOIL CLASSIFICATION IN ACCORDANCE WITH THE CANADIAN
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DYNAMIC CONE PENETRATION TEST

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Depth m ft	Description	C	N	Type/ Sample #	Water Level	10	20	30	40	50	60	70	80	90
	soft, brown, grass covered, TOPSOIL, moist.			G1										
	firm, brown, SILT, trace fine sand, moist.													
2	compact, grey/brown, SAND and GRAVEL, trace cobbles, trace silt, moist.			G2										
4	compact, grey/brown, fine-grained SAND, trace gravel, trace silt, moist.			G3										
6	No groundwater seepage observed. Bottom of hole at 1.5 metres													
8														
10														
12														
14														
16														
18														
20														
22														
24														
26														
28														
30														
32														

C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

DYNAMIC CONE PENETRATION TEST

Plastic Limit (%) ——— Liquid Limit (%)
Moisture Content (%)

- ▼ Ground Water Level
- ∞ Shear strength in kPa (Torvane)
- PP Pocket Penetrometer (compressive strength in kPa)
- X Shear strength in kPa (Unconfined)
- ⊗ Shear strength in kPa (Field vane)
- ⊠ Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger

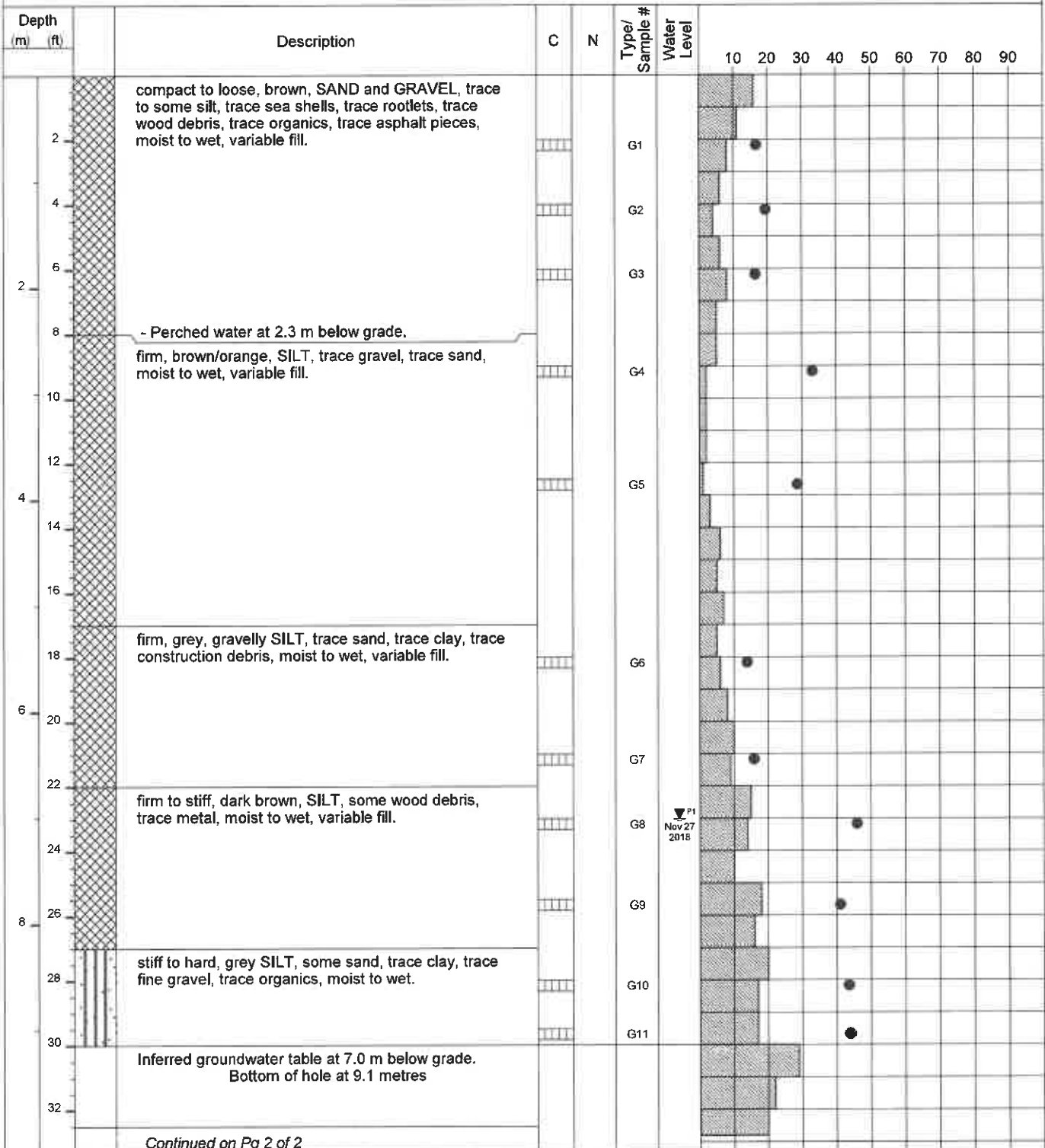
Date Drilled: 11/27/2018

Logged by: BO

Checked by: JC

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Continued on Pg 2 of 2

C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST ☐

Plastic Limit (%) ☐ Liquid Limit (%) ☐
Moisture Content (%) ☐

Ground Water Level ☐
Shear strength in kPa (Torvane) ☐
PP Pocket Penetrometer (compressive strength in kPa) ☐
X Shear strength in kPa (Unconfined) ☐
⊗ Shear strength in kPa (Field vane) ☐
⊠ Remolded strength in kPa ☐
■ Percent Passing # 200 sieve ☐

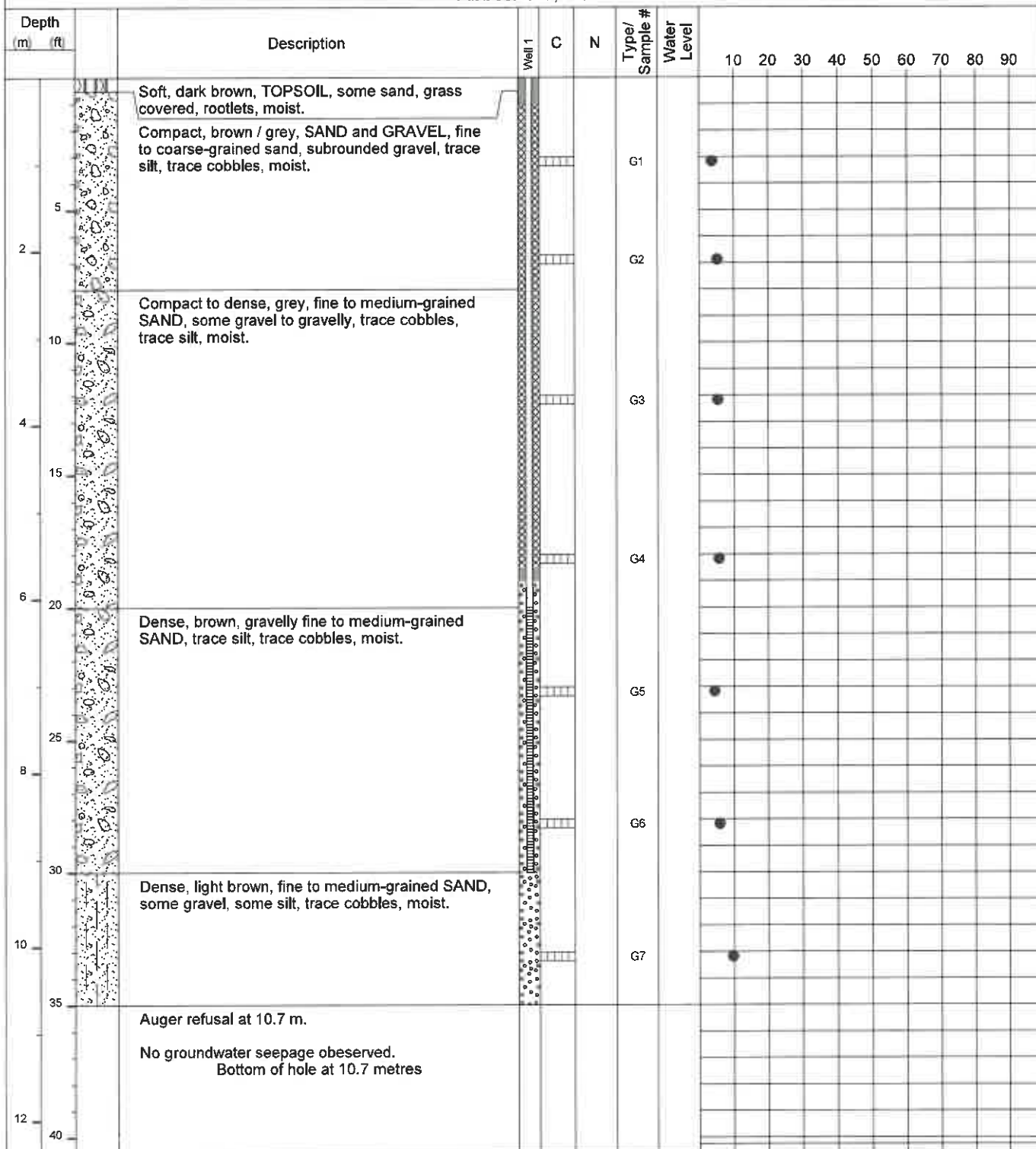
Drill Method: Solid Stem Auger / DCPT
Date Drilled: 11/27/2018
Logged by: BO/TS
Checked by: JC

1 LOG PER PAGE 6/24/21




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Depth m ft	Description	C	N	Type/ Sample #	Water Level	10	20	30	40	50	60	70	80	90
34														
36														
38														
40														
42														
44														
46														
48														
50														
52														
54														
56														
58														
60														
62														
64														

C: Condition of Sample Good <input checked="" type="checkbox"/> Disturbed <input type="checkbox"/> No Recovery <input type="checkbox"/>	Type: Type of Sampler SPT : 2 in. standard ST : Shelby G : Grab AU: Auger Flight	N: Number of Blows WH : Weight of Hammer WR : Weight of Rod Standard Penetration Test : ASTM D1586 Hammer Type: Trip Hammer	Plastic Limit (%) <input type="text"/> Liquid Limit (%) <input type="text"/> Moisture Content (%) <input type="text"/> ↓ Ground Water Level ⊗ Shear strength in kPa (Torvane) PP Pocket Penetrometer (compressive strength in kPa) X Shear strength in kPa (Unconfined) ⊗ Shear strength in kPa (Field vane) ⊗ Remolded strength in kPa ■ Percent Passing # 200 sieve	Drill Method: Solid Stem Auger / DCPT Date Drilled: 11/27/2018 Logged by: BO/TS Checked by: JC
---	---	--	--	--



C: Condition of Sample

Good 
Disturbed 
No Recovery 

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

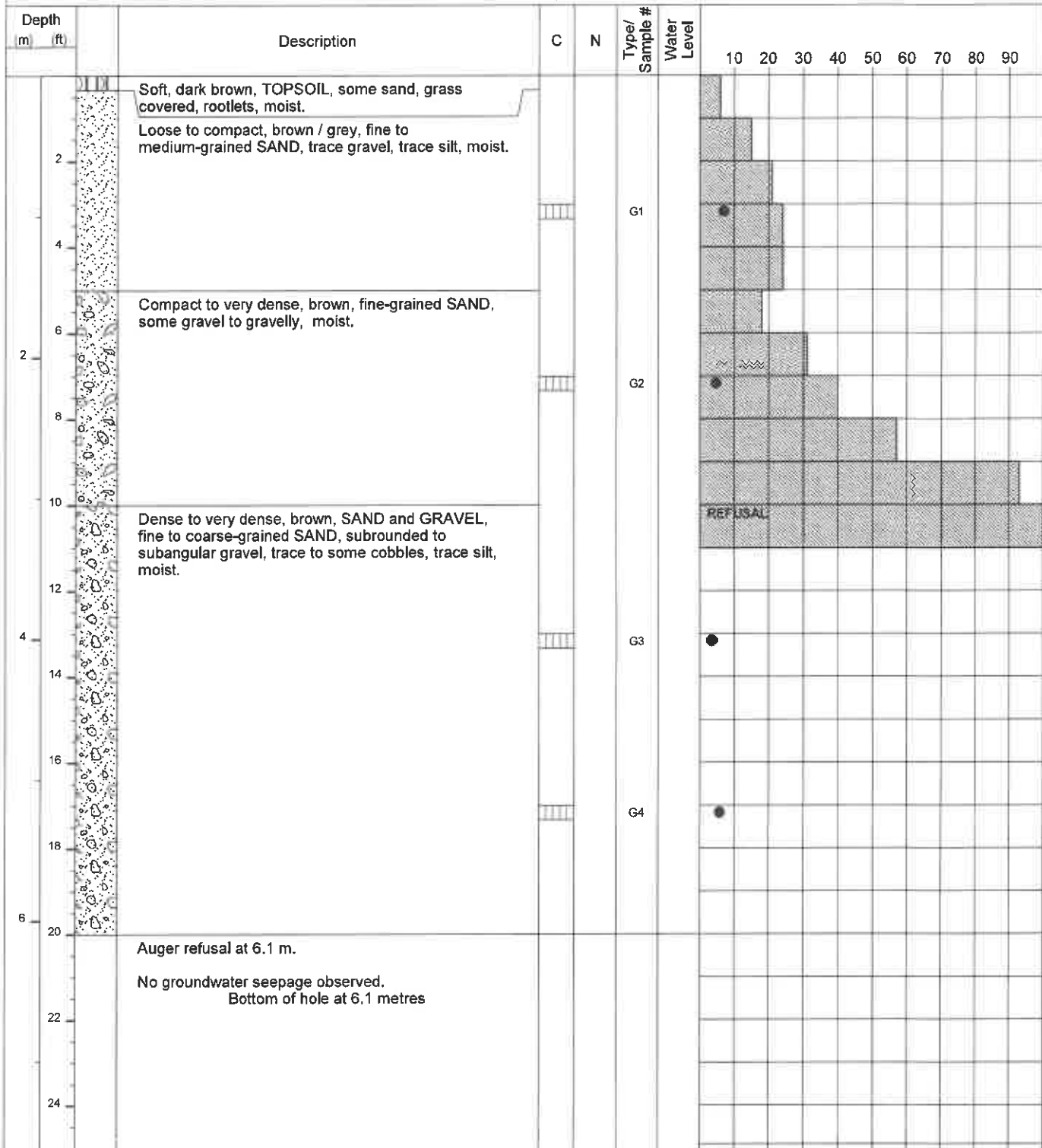
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
Pocket Penetrometer
(compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Bentonite/Grout Plug
Solid Pipe
Cuttings
Slotted Pipe
Sand/Pea-Gravel
Drill Method:
Solid Stem Auger
Date Drilled: 2/11/2022
Logged by: LA
Checked by: JC

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C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST ☐

Plastic Limit (%) ☐ Liquid Limit (%) ☐
Moisture Content (%) ☐

☒ Ground Water Level
☒ Shear strength in kPa (Torvane)
☒ Pocket Penetrometer
(compressive strength in kPa)
☒ Shear strength in kPa (Unconfined)
☒ Shear strength in kPa (Field vane)
☒ Remolded strength in kPa
☒ Percent Passing # 200 sieve

Drill Method: Solid Stem Auger / DCPT

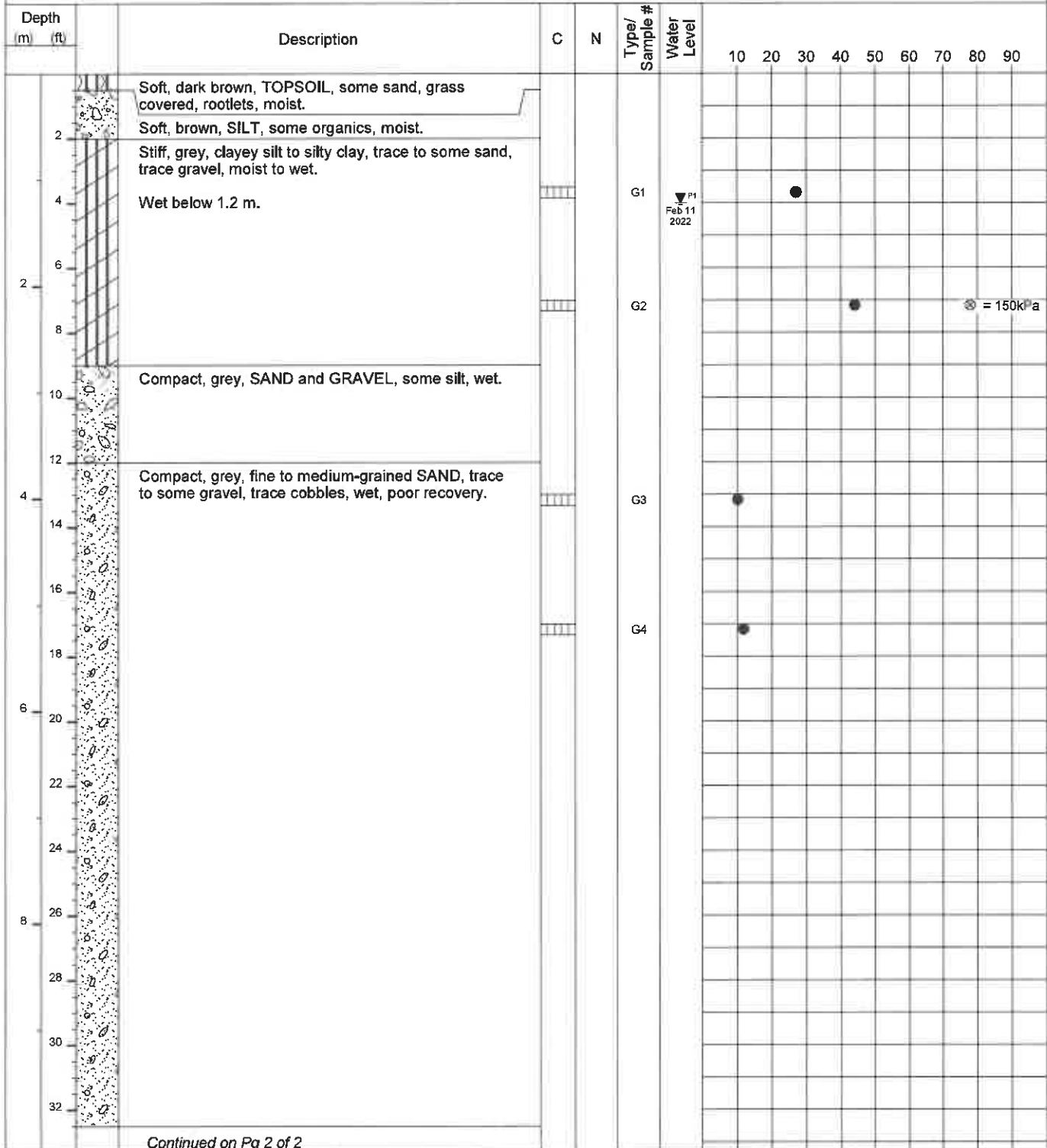
Date Drilled: 2/11/2022

Logged by: LA

Checked by: JC

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Continued on Pg 2 of 2

C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU : Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)

Ground Water Level

Shear strength in kPa (Torvane)

PP Pocket Penetrometer

(compressive strength in kPa)

X Shear strength in kPa (Unconfined)

Shear strength in kPa (Field vane)

Remolded strength in kPa

Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger

Date Drilled: 2/11/2022

Logged by:

Checked by:

LA

JC

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Depth m ft	Description	C	N	Type/ Sample #	Water Level	10	20	30	40	50	60	70	80	90
34	Compact, grey, fine to medium-grained SAND, trace to some gravel, trace cobbles, wet, poor recovery. (continued)													
36														
38	Stiff, grey, SILT, some sand, some gravel, moist.			G5										
40	Compact, grey, fine to medium-grained SAND, trace gravel, wet, poor recovery.													
42	Groundwater seepage at 1.2 m. Bottom of hole at 12.2 metres													
44														
46														
48														
50														
52														
54														
56														
58														
60														
62														
64														

C: Condition of Sample

Good ☒
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

DYNAMIC CONE PENETRATION TEST

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)

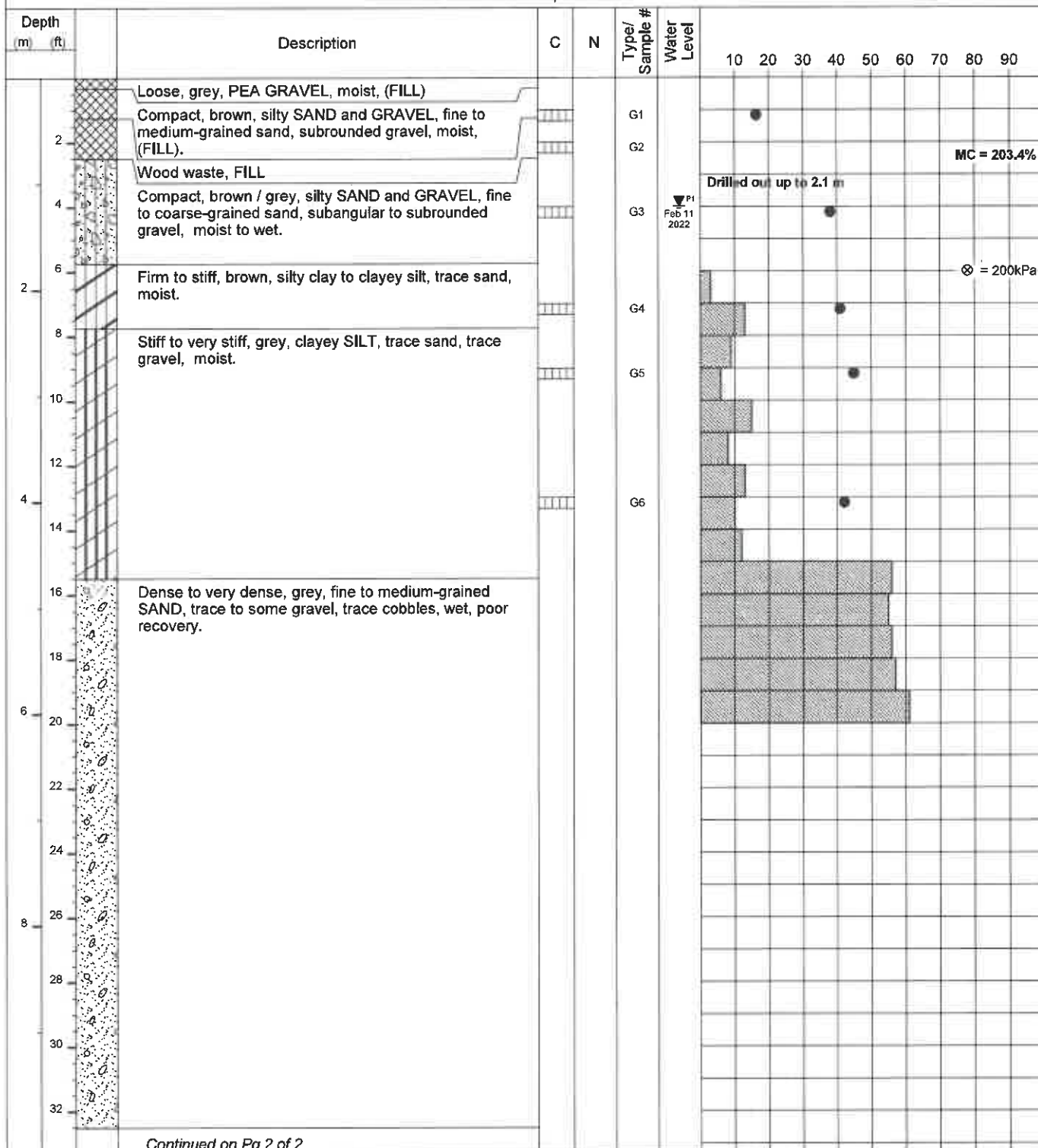
- ☒ Ground Water Level
- ☒ Shear strength in kPa (Torvane)
- ☒ Pocket Penetrometer (compressive strength in kPa)
- ☒ Shear strength in kPa (Unconfined)
- ☒ Shear strength in kPa (Field vane)
- ☒ Remolded strength in kPa
- ☒ Percent Passing # 200 sieve

Drill Method:

Solid Stem Auger
Date Drilled: 2/11/2022
Logged by: LA
Checked by: JC




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1 LOG PER PAGE 3/2/22

C: Condition of Sample

Good 
Disturbed 
No Recovery 

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU : Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer
(compressive strength in kPa)
X Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (Field vane)
⊠ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger / DCPT
Date Drilled: 2/16/2022
Logged by: LA
Checked by: JC

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Depth (m) (ft)	Description	C	N	Type/ Sample #	Water Level	10	20	30	40	50	60	70	80	90
34	Dense to very dense, grey, fine to medium-grained SAND, trace to some gravel, trace cobbles, wet, poor recovery. (continued)			G7										
36														
38	Stiff, grey, SILT, some sand, some gravel, moist.			G8										
40														
42	Groundwater seepage encountered at 1.2 m . Bottom of hole at 12.2 metres													
44														
46														
48														
50														
52														
54														
56														
58														
60														
62														
64														

C: Condition of Sample

Good ☐
Disturbed ☐
No Recovery ☐

Type: Type of Sampler

SPT : 2 in. standard
ST : Shelby
G : Grab
AU: Auger Flight

N: Number of Blows

WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

DYNAMIC CONE PENETRATION TEST ☐

Plastic Limit (%) Liquid Limit (%)

Moisture Content (%)
↓ Ground Water Level
⊗ Shear strength in kPa (Torvane)
PP Pocket Penetrometer
(compressive strength in kPa)
X Shear strength in kPa (Unconfined)
⊗ Shear strength in kPa (Field vane)
⊗ Remolded strength in kPa
■ Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger / DCPT
Date Drilled: 2/16/2022
Logged by: LA
Checked by: JC

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LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

Notes: This statement is to be read and completed in conjunction with the Engineers and Geoscientists BC *Professional Practice Guidelines – Landslide Assessments in British Columbia* (“the guidelines”) and the current *BC Building Code (BCBC)*, and is to be provided for Landslide Assessments (not floods or flood controls), particularly those produced for the purposes of the *Land Title Act*, *Community Charter*, or *Local Government Act*. Some jurisdictions (e.g., the Fraser Valley Regional District or the Cowichan Valley Regional District) have developed more comprehensive assurance statements in collaboration with Engineers and Geoscientists BC. Where those exist, the Qualified Professional is to fill out the local version only. Defined terms are capitalized; see the Defined Terms section of the guidelines for definitions.

To: The Approving Authority (or Client)

Date: August 23, 2023

City of Abbotsford

32315 South Fraser Way, Abbotsford, BC V2T 1W7

Jurisdiction/name and address

With reference to (CHECK ONE):

- ☐ A. *Land Title Act* (Section 86) – Subdivision Approval
- ☒ B. *Local Government Act* (Sections 919.1 and 920) – Development Permit
- ☐ C. *Community Charter* (Section 56) – Building Permit
- ☐ D. Non-legislated assessment

For the following property (the “Property”):

34084 to 34164 Maclure Road, Abbotsford

Civic address of the Property

The undersigned hereby gives assurance that they are a Qualified Professional and a professional engineer or professional geoscientist who fulfills the education, training, and experience requirements as outlined in the guidelines.

I have signed, authenticated, and dated, and thereby certified, the attached Landslide Assessment Report on the Property in accordance with the guidelines. That report must be read in conjunction this statement.

In preparing that report I have:

[CHECK TO THE LEFT OF APPLICABLE ITEMS]

- ☒ 1. Collected and reviewed appropriate background information
- ☒ 2. Reviewed the proposed Residential Development or other development on the Property
- ☒ 3. Conducted field work on and, if required, beyond the Property
- ☒ 4. Reported on the results of the field work on and, if required, beyond the Property
- ☒ 5. Considered any changed conditions on and, if required, beyond the Property
- 6. For a Landslide Hazard analysis or Landslide Risk analysis, I have:
 - ☒ 6.1 reviewed and characterized, if appropriate, any Landslide that may affect the Property
 - ☒ 6.2 estimated the Landslide Hazard
 - ☒ 6.3 identified existing and anticipated future Elements at Risk on and, if required, beyond the Property
 - ☒ 6.4 estimated the potential Consequences to those Elements at Risk
- 7. Where the Approving Authority has adopted a Level of Landslide Safety, I have:
 - ☐ 7.1 compared the Level of Landslide Safety adopted by the Approving Authority with the findings of my investigation
 - ☐ 7.2 made a finding on the Level of Landslide Safety on the Property based on the comparison
 - ☐ 7.3 made recommendations to reduce Landslide Hazards and/or Landslide Risks

LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

8. Where the Approving Authority has **not** adopted a Level of Landslide Safety, or where the Landslide Assessment is not produced in response to a legislated requirement, I have:
- ☒ 8.1 described the method of Landslide Hazard analysis or Landslide Risk analysis used
 - ☒ 8.2 referred to an appropriate and identified provincial, national, or international guideline for Level of Landslide Safety
 - ☒ 8.3 compared those guidelines (per item 8.2) with the findings of my investigation
 - ☒ 8.4 made a finding on the Level of Landslide Safety on the Property based on the comparison
 - ☒ 8.5 made recommendations to reduce Landslide Hazards and/or Landslide Risks
- ☒ 9. Reported on the requirements for future inspections of the Property and recommended who should conduct those inspections

Based on my comparison between:

[CHECK ONE]

- ☐ the findings from the investigation and the adopted Level of Landslide Safety (item 7.2 above)
- ☒ the appropriate and identified provincial, national, or international guideline for Level of Landslide Safety (item 8.4 above)

Where the Landslide Assessment is not produced in response to a legislated requirement, I hereby give my assurance that, based on the conditions¹ contained in the attached Landslide Assessment Report:

A. SUBDIVISION APPROVAL

- ☐ For subdivision approval, as required by the *Land Title Act* (Section 86), "the land may be used safely for the use intended"

[CHECK ONE]

- ☐ with one or more recommended additional registered Covenants
- ☐ without an additional registered Covenant(s)

B. DEVELOPMENT PERMIT

- ☒ For a development permit, as required by the *Local Government Act* (Sections 488 and 491), my report will "assist the local government in determining what conditions or requirements it will impose under subsection (2) of [Section 491]"

[CHECK ONE]

- ☒ with one or more recommended additional registered Covenants
- ☐ without an additional registered Covenant(s)

C. BUILDING PERMIT

- ☐ For a building permit, as required by the *Community Charter* (Section 56), "the land may be used safely for the use intended"

[CHECK ONE]

- ☐ with one or more recommended additional registered Covenants
- ☐ without any additional registered Covenant(s)

¹ When seismic slope stability assessments are involved, Level of Landslide Safety is considered to be a "life safety" criteria, as described in Commentary JJJ of the *National Building Code of Canada (NBC) 2015*, Structural Commentaries (User's Guide – NBC 2015: part 4 of division B). This states:

"The primary objective of seismic design is to provide an acceptable level of safety for building occupants and the general public as the building responds to strong ground motion; in other words, to minimize loss of life. This implies that, although there will likely be extensive structural and non-structural damage, during the DGM (design ground motion), there is a reasonable degree of confidence that the building will not collapse, nor will its attachments break off and fall on people near the building. This performance level is termed 'extensive damage' because, although the structure may be heavily damaged and may have lost a substantial amount of its initial strength and stiffness, it retains some margin of resistance against collapse."

LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

John Carter, M.Eng., P.Eng.

Name (print)

August 23, 2023

Date

200 - 34425 McConnell Road

Address

Abbotsford, BC V2S 7P1

604 852-9088

Telephone

jcarter@geowestengineering.com

Email



2023-08-23

(Affix PROFESSIONAL SEAL and signature here)

The Qualified Professional, as a registrant on the roster of a registrant firm, must complete the following:

I am a member of the firm **GeoWest Engineering Ltd.**

(Print name of firm)

with Permit to Practice Number **1000607**

(Print permit to practice number)

and I sign this letter on behalf of the firm.

APPENDIX A

FOCUS ARCHITECTURE SITE PLAN

LOT 8, SECTION 22, TOWNSHIP 18, RANGE 107S7
LOT 6, SECTION 22, TOWNSHIP 18, RANGE 107S2
LOT A, SECTION 22, TOWNSHIP 18, RANGE 106E8
LOT 53, SECTION 22, TOWNSHIP 18, RANGE 201S

ZONING INFORMATION:
34088, 34118, 34144, 34166 MACLURE ROAD, ABBOTSFORD BC

LOT AREA:
OR093 LOT AREA
ROAD DEDICATION
NET LOT AREA

- 369,270SF (7.18AC)(2.81HA)
- 1,520SF (0.03AC)(0.01HA)
- 367,700SF (7.08AC)(2.81HA)

AREA FOR FSR = NET LOT AREA - AREA9 THAT EXCEED 30% SLOPE
 = 2.68 Ha - 0.40 Ha = 2.28 Ha = 5.65 ACRES (56.4 AAS NP)
 SEE SURVEY BY UNDERWATER LAND SURVEY INC LTD)

ZONE:	EXISTING* PROPOSED:	CR RMG	A, P, - 4, 8, 16, 32
-------	------------------------	-----------	----------------------

UNIVERSITY	PERMITTED	0.0 - 1.5 FSR
	PROPOSED	210,501 sf / 764,845 sq ft = 0.281
	PROPOSED	140 UNITS / 7.69 ac = 20.0 UDS

BUCKETAGE	REQUIRED	PROPOSED
NORTH (MAQUINE RD)	3.0m	3.50m (AT PORCH)
EAST	4.5m	4.5m

PERMITTED 1m / 3.6m (NEVER EVER LESS)
HEIGHT

PERMITTED.	45%
PROPOSED	38.1% = 192,100 sq ft / 507,700 sq

OUTDOOR AMENITY SPACE

REQUIRED:	140 x 1m UNIT = 435 m ²
PROPOSED:	319 ÷ 355 = 674 m ²

PARKING:
RESIDENT REQUIRED 145 UNITS @ 2.0 STALL/UNIT = 290 STALLS

PROVIDED 290 STALLS IN GARAGE	VISITOR:
REQUIREMENT: 145 UNITS X 0.2 STALLS PER UNIT = 29 STALLS	PROVIDED: 33 STALLS

LOT COVERAGE SUMMARY

BLDG	# OF UNIT @	LOT COVERAGE
1	8	4,153 sq ft 3.11% 1st
2	5	3,240 sq ft 2.43% 2nd
3	5	3,455 sq ft 2.54% 3rd

4	3	324.0 m ²
5	3	280 m ²
6	0	440.7 m ²
7	4	290.6 m ²

1	4	2	2817 m
2	4	195	m
10	5	3	6 m
11	5	35	31 m
15	4	3 (23)	244.5 m

12	4	2 440 m ²	244,5 m ²
13	4	3 111 m ²	
14	4	3 111 m ²	
15	4	4 776 m ²	443,8 m ²
16	5	3 900 m ²	381,2 m ²

07	4	3 1.2 m	240.6 m
18	4	2 12 mA	251.8 m
19	5	3 204 m	1 m
		1 11 m	5.0 m
24	5	3 773 m	5 m

21	0.773	3	3	0.000	0.000
22	0.000	3	3	0.000	0.000
23	2.054	14.00	2	0.000	0.000
24	0.000	0.000	0	0.000	0.000
25	0.000	0.000	0	0.000	0.000

	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$
27	5	3	251	311208	
28	4	4	85148 ₆	6	100
29	4	66		3	10

TOTAL	448	192,100 uA	10,411.0 m ²
-------	-----	------------	-------------------------

SITE PLAN
SCALE: 1"=30'-0"



NORTH

LOT COVERAGE SUMMARY		LOT COVERAGE	
BUDG	LAIRS	1	2
1	5	4.133%	2.541%
2	5	3.658 wt.	2.287%
3	5	3.283%	2.064%
4	8	3.905%	2.406%
5	8	3.285%	2.064%
6	8	3.285%	2.064%
7	8	3.285%	2.064%
8	8	3.285%	2.064%
9	8	3.285%	2.064%
10	8	3.285%	2.064%
11	8	3.285%	2.064%
12	8	3.285%	2.064%
13	8	3.285%	2.064%
14	8	3.285%	2.064%
15	8	3.285%	2.064%
16	8	3.285%	2.064%
17	8	3.285%	2.064%
18	8	3.285%	2.064%
19	8	3.285%	2.064%
20	8	3.285%	2.064%
21	8	3.285%	2.064%
22	8	3.285%	2.064%
23	8	3.285%	2.064%
24	8	3.285%	2.064%
25	8	3.285%	2.064%
26	8	3.285%	2.064%
27	8	3.285%	2.064%
28	8	3.285%	2.064%
29	8	3.285%	2.064%
30	8	3.285%	2.064%
TOTAL	448	121.009 wt.	10.411 wt.

REF NAME		INT TYPE	# OF LOTS	GARAGE	LOWER	MAIN	UPPER	TL/LS AREA	SF TOTALS
A	4,650	7	39	968	93	908	2,968	1,656	
B	3,800	1	1	1	1	1	3	1	
C	3,800	1	1	1	1	1	3	1	
D	3,800	1	1	1	1	1	3	1	
E	3,800	1	1	1	1	1	3	1	
F	3,800	1	1	1	1	1	3	1	
G	3,800	1	1	1	1	1	3	1	
H	3,800	1	1	1	1	1	3	1	
I	3,800	1	1	1	1	1	3	1	
J	3,800	1	1	1	1	1	3	1	
K	3,800	1	1	1	1	1	3	1	
L	3,800	1	1	1	1	1	3	1	
M	3,800	1	1	1	1	1	3	1	
N	3,800	1	1	1	1	1	3	1	
O	3,800	1	1	1	1	1	3	1	
P	3,800	1	1	1	1	1	3	1	
Q	3,800	1	1	1	1	1	3	1	
R	3,800	1	1	1	1	1	3	1	
S	3,800	1	1	1	1	1	3	1	
T	3,800	1	1	1	1	1	3	1	
U	3,800	1	1	1	1	1	3	1	
V	3,800	1	1	1	1	1	3	1	
W	3,800	1	1	1	1	1	3	1	
X	3,800	1	1	1	1	1	3	1	
Y	3,800	1	1	1	1	1	3	1	
Z	3,800	1	1	1	1	1	3	1	
AA	3,800	1	1	1	1	1	3	1	
AB	3,800	1	1	1	1	1	3	1	
AC	3,800	1	1	1	1	1	3	1	
AD	3,800	1	1	1	1	1	3	1	
AE	3,800	1	1	1	1	1	3	1	
AF	3,800	1	1	1	1	1	3	1	
AG	3,800	1	1	1	1	1	3	1	
AH	3,800	1	1	1	1	1	3	1	
AI	3,800	1	1	1	1	1	3	1	
AJ	3,800	1	1	1	1	1	3	1	
AK	3,800	1	1	1	1	1	3	1	
AL	3,800	1	1	1	1	1	3	1	
AM	3,800	1	1	1	1	1	3	1	
AN	3,800	1	1	1	1	1	3	1	
AO	3,800	1	1	1	1	1	3	1	
AP	3,800	1	1	1	1	1	3	1	
AT	3,800	1	1	1	1	1	3	1	
AV	3,800	1	1	1	1	1	3	1	
AW	3,800	1	1	1	1	1	3	1	
AX	3,800	1	1	1	1	1	3	1	
AY	3,800	1	1	1	1	1	3	1	
AZ	3,800	1	1	1	1	1	3	1	
BA	3,800	1	1	1	1	1	3	1	
BB	3,800	1	1	1	1	1	3	1	
BC	3,800	1	1	1	1	1	3	1	
BD	3,800	1	1	1	1	1	3	1	
BE	3,800	1	1	1	1	1	3	1	
BF	3,800	1	1	1	1	1	3	1	
BG	3,800	1	1	1	1	1	3	1	
BH	3,800	1	1	1	1	1	3	1	
BI	3,800	1	1	1	1	1	3	1	
BJ	3,800	1	1	1	1	1	3	1	
BK	3,800	1	1	1	1	1	3	1	
BL	3,800	1	1	1	1	1	3	1	
BM	3,800	1	1	1	1	1	3	1	
BN	3,800	1	1	1	1	1	3	1	
BO	3,800	1	1	1	1	1	3	1	
BP	3,800	1	1	1	1	1	3	1	
BQ	3,800	1	1	1	1	1	3	1	
BR	3,800	1	1	1	1	1	3	1	
BS	3,800	1	1	1	1	1	3	1	
BT	3,800	1	1	1	1	1	3	1	
BU	3,800	1	1	1	1	1	3	1	
BV	3,800	1	1	1	1	1	3	1	
BW	3,800	1	1	1	1	1	3	1	
BX	3,800	1	1	1	1	1	3	1	
BY	3,800	1	1	1	1	1	3	1	
BZ	3,800	1	1	1	1	1	3	1	
CA	3,800	1	1	1	1	1	3	1	
CB	3,800	1	1	1	1	1	3	1	
CC	3,800	1	1	1	1	1	3	1	
CD	3,800	1	1	1	1	1	3	1	
CE	3,800	1	1	1	1	1	3	1	
CF	3,800	1	1	1	1	1	3	1	
CG	3,800	1	1	1	1	1	3	1	
CH	3,800	1	1	1	1	1	3	1	
CI	3,800	1	1	1	1	1	3	1	
CJ	3,800	1	1	1	1	1	3	1	
CK	3,800	1	1	1	1	1	3	1	
CL	3,800	1	1	1	1	1	3	1	
CM	3,800	1	1	1	1	1	3	1	
CN	3,800	1	1	1	1	1	3	1	
CO	3,800	1	1	1	1	1	3	1	
CP	3,800	1	1	1	1	1	3	1	
CQ	3,800	1	1	1	1	1	3	1	
CR	3,800	1	1	1	1	1	3	1	
CS	3,800	1	1	1	1	1	3	1	
CT	3,800	1	1	1	1	1	3	1	
CU	3,800	1	1	1	1	1	3	1	
CV	3,800	1	1	1	1	1	3	1	
CW	3,800	1	1	1	1	1	3	1	
CX	3,800	1	1	1	1	1	3	1	
CY	3,800	1	1	1	1	1	3	1	
CZ	3,800	1	1	1	1	1	3	1	
DA	3,800	1	1	1	1	1	3	1	
DB	3,800	1	1	1	1	1	3	1	
DC	3,800	1	1	1	1	1	3	1	
DD	3,800	1	1	1	1	1	3	1	
DE	3,800	1	1	1	1	1	3	1	
DF	3,800	1	1	1	1	1	3	1	
DG	3,800	1	1	1	1	1	3	1	
DH	3,800	1	1	1	1	1	3	1	
DI	3,800	1	1	1	1	1	3	1	
DJ	3,800	1	1	1	1	1	3	1	
DK	3,800	1	1	1	1	1	3	1	
DL	3,800	1	1	1	1	1	3	1	
DM	3,800	1	1	1	1	1	3	1	
DN	3,800	1	1	1	1	1	3	1	
DO	3,800	1	1	1	1	1	3	1	
DP	3,800	1	1	1	1	1	3	1	
DQ	3,800	1	1	1	1	1	3	1	
DR	3,800	1	1	1	1	1	3	1	
DS	3,800	1	1	1	1	1	3	1	
DT	3,800	1	1	1	1	1	3	1	
DU	3,800	1	1	1	1	1	3	1	
DV	3,800	1	1	1	1	1	3	1	
DW	3,800	1	1	1	1	1	3	1	
DX	3,800	1	1	1	1	1	3	1	
DY	3,800	1	1	1	1	1	3	1	
DZ	3,800	1	1	1	1	1	3	1	
EA	3,800	1	1	1	1	1	3	1	
EB	3,800	1	1	1	1	1	3	1	
EC	3,800	1	1	1	1	1	3	1	
ED	3,800	1	1	1	1	1	3	1	
EE	3,800	1	1	1	1	1	3	1	
EF	3,800	1	1	1	1	1	3	1	
EG	3,800	1	1	1	1	1	3	1	
EH	3,800	1	1	1	1	1	3	1	
EI	3,800	1	1	1	1	1	3	1	
EJ	3,800	1	1	1	1	1	3	1	
EK	3,800	1	1	1	1	1	3	1	
EL	3,800	1	1	1	1	1	3	1	
EM	3,800	1	1	1	1	1	3	1	
EN	3,800	1	1	1	1	1	3	1	
EO	3,800	1	1	1	1	1	3	1	
EP	3,800	1	1	1	1	1	3	1	
EQ	3,800	1	1	1	1	1	3	1	
ER	3,800	1	1	1	1	1	3	1	
ES	3,800	1	1	1	1	1	3	1	
ET	3,800	1	1	1	1	1	3	1	
EU	3,800	1	1	1	1	1	3	1	
EV	3,800	1	1	1	1	1	3	1	
EW	3,800	1	1	1	1	1	3	1	
EX	3,800	1	1	1	1	1	3	1	
EY	3,800	1	1	1	1	1	3	1	
EZ	3,800	1	1	1	1	1	3	1	
FA	3,800	1	1	1	1	1	3	1	
FB	3,800	1	1	1	1	1	3	1	
FC	3,800	1	1	1	1	1	3	1	
FD	3,800	1	1	1	1	1	3	1	
FE	3,800	1	1	1	1	1	3	1	
FF	3,800	1	1	1	1	1	3	1	
FG	3,800	1	1	1	1	1	3	1	
FH	3,800	1	1	1	1	1	3	1	
FI	3,800	1	1	1	1	1	3	1	
FJ	3,800	1	1	1	1	1	3	1	
FK	3,800	1	1	1	1	1	3	1	
FL	3,800	1	1	1	1	1	3	1	
FM	3,800	1	1	1	1	1	3	1	
FN	3,800	1	1	1	1	1	3	1	
FO	3,800	1	1	1	1	1	3	1	
FP	3,800	1	1	1	1	1	3	1	
FQ	3,800	1	1	1	1	1	3	1	
FR	3,800	1	1	1	1	1	3	1	
FS	3,800	1	1	1	1	1	3	1	
FT	3,800	1	1	1	1	1	3	1	
FU	3,800	1	1	1	1	1	3	1	
FV	3,800	1	1	1	1	1	3	1	
FW	3,800	1	1	1	1	1	3	1	
FX	3,800	1	1	1	1	1	3	1	
FY	3,800	1	1	1	1	1	3	1	
FZ	3,800	1	1	1	1	1	3	1	
GA	3,800	1	1	1	1	1	3	1	
GB	3,800	1	1	1	1	1	3	1	
GC	3,800	1	1	1	1	1	3	1	
GD	3,800	1	1	1	1	1	3	1	
GE	3,800	1	1	1	1	1	3	1	
GF	3,800	1	1	1	1	1	3	1	
GG	3,800	1	1	1	1	1	3	1	
GH	3,800	1	1	1	1	1	3	1	
GI	3,800	1	1	1	1				

APPENDIX B

APLIN AND MARTIN CIVIL GRADING PLANS



PROJECT NO: 21-113

DATE: 2023-09-18

DRAWN BY: JRM

SCALE: 1:250

SCALE: 1:250

SCALE: 1:250

CITY OF ABBOTSFORD

Engineering Department

Reviewed by: [Signature]

By: [Signature]

DATE: [Date]

REASON FOR REVISION: [Text]

REVISION: [Text]

NO. 1

BY

REV.

01 of 1

City of Abbotsford

Engineering Department

Reviewed by: [Signature]

By: [Signature]

DATE: [Date]

REASON FOR REVISION: [Text]

REVISION: [Text]

01 of 1

City of Abbotsford

Engineering Department

Reviewed by: [Signature]

By: [Signature]

DATE: [Date]

REASON FOR REVISION: [Text]

REVISION: [Text]

APLIN MARTIN

200-3800 220th Street, Surrey, BC V4A 4L4

PH: 604-333-6860

INFINITY PROPERTIES

200-3800 220th Street, Surrey, BC V4A 4L4

PH: 604-333-6860

GRADING PLAN - EAST

MACLURE MULTI-FAMILY

34084/34089/34118/34138/34144/34184

MACLURE ROAD, ABBOTSFORD, B.C.

25



INFINITY PROPERTIES
 200-8340 320th STREET, LAMBERT, B.C. V7Y1N2
 PH. 504-337-2666

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

CLIENT/PROJECT:

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

PROJECT NO: 21-113

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SHEET NO: 01 of 1

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

CITY: City of Abbotsford

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

DATE: 2022-07-18

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

DRAWN BY: JIF

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SECTION: RNS

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SCALE: HORIZ. 1:200

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SCALE: VERT. N/A

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

REVISIONS:

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

PROJECT NO: 21-113

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SHEET NO: 01 of 1

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

CITY: City of Abbotsford

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

DATE: 2022-07-18

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

DRAWN BY: JIF

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SECTION: RNS

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SCALE: HORIZ. 1:200

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

SCALE: VERT. N/A

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

REVISIONS:

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-437-0061
 E-mail: info@aplinsales.com

INFINITY PROPERTIES
 200-8340 320th STREET, LAMBERT, B.C. V7Y1N2
 PH. 504-337-2666

APLIN MARTIN
 6000 Avenue de l'Industrie, Suite 200
 Delta, B.C. V4L 2Y9
 Tel. 604-437-0060 Fax 604-43

APPENDIX C

TOPOGRAPHIC SURVEY

TOPOGRAPHIC AND TREE SURVEY PLAN OF
PARCEL 'B' (EX. PLAN 10757) LOT 6, PLAN 8992 EXCEPT: PART ON SRW PLAN 75984;
LOT 6, PLAN 8992 EXCEPT: FIRSTLY: PARCEL 'B' (EX. PLAN 10757), SECONDLY: PARCEL 'C' (REF. PLAN 13568)
THIRDLY: PARCEL 'A' (REF. PLAN 13568), FOURTHLY: PART ON SRW PLAN 75984;
PARCEL 'A' (REF. PLAN 13068) LOT 6, PLAN 8992 EXCEPT: FIRSTLY: PART SUBDIVIDED BY PLAN 32019
SECONDLY: PART ON SRW PLAN 75984;
LOT 93, PLAN 32019 EXCEPT: PART ON SRW PLAN 75984;
ALL OF SECTION 22, TOWNSHIP 16, N.W.D.

10 5 0 10
All Distances are in Metres.

[illegible]

Underwater Land Surveying Ltd.
B.C. Land Surveyors
#104 - 6050 170 'A' Street
Doverdale, B.C.
TEL: J421-0210

Maclure Road

Assembly

Fish Habitat Assessment & Wildlife Habitat Report

(Revision 1)


Prepared for:

Infinity Properties Ltd.
A400 – 20161 86th Avenue
Langley, BC
V2Y 2C1

Prepared by:

BlueLines Environmental Ltd.
1265 East 29th Ave.
Vancouver, BC
V5V 2T1
phone. 604-790-6845
email. info@bluelinesenviro.ca

July 19, 2023



Executive Summary

A desktop and field-based assessment has been completed in support of a Natural Environment Development Permit application in relation to a proposed multi-Family development involving 34098, 34138, 34144, and 34164 Maclure Road, Abbotsford BC.

Environmental resource values requiring explicit consideration are limited to modified natural stream and wetland complex and a minor drainage ditch. The aquatic and riparian ecosystem values are located at the immediate toe of slope of a substantial fill associated with Highway 11. As a result of the highway alignment the drainage is routed parallel to the north margin of the highway and drain west to a previously unmapped culvert crossing with confirmed connectivity to the Willband Creek system to the southwest.

The subject properties have been historically developed and include single-family residential land uses, agricultural uses, and ancillary uses (e.g. equipment storage) with fill placements and disturbances occurring within the applicable Natural environment Development Permit buffer area.

An evaluation and delineation of the aquatic habitat boundaries has been completed by a Qualified Environmental Professional and surveyed by a BC Land Surveyor to inform the streamside protection and enhancement area (SPEA) setback planning and evaluation of restoration opportunities. The proposed riparian boundary has been refined to yield a pragmatic development interface that achieves the minimum riparian protection standard pursuant to the Province of BC's Riparian Areas Protection Regulation and achieves the 2:1 habitat offsetting requirements of policy NE3 pursuant to the City of Abbotsford's Official Community Plan.

A SPEA variance of 1,275m² is requested based on historical impacts affecting the bylaw SPEA setback areas, with commitments to a full riparian area restoration and enhancement treatment that will yield a total riparian area of 2,508m². Enhancement of the proposed setbacks have been evaluated based on interpretation of historic disturbances and land uses with respect to habitat weighting factors per City of Abbotsford policy and are concluded to provide an offset for the requested SPEA variance equivalent to 2,932m².

Senior agency regulatory compliance will require the design and installation of a stormwater outfall under a *Water Sustainability Act*, Water Sustainability Regulation notification. A single stormwater outfall is proposed to connect to the existing head of an anthropogenic ditch with connection to the channelized stream/wetland complex. The storm outfall will convey site runoff following capture, treatment, and detention to be incorporated as structural BMPs within the project's civil servicing designs.

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1 Introduction

Infinity Properties Ltd. (Infinity) has retained the services of BlueLines Environmental Ltd. to prepare an environmental assessment in support of a proposed multi-family development proposed for the assembly of four (4) single-family properties located on Maclure Road (34098, 34138, 34144, 34164) Abbotsford BC.

The assessment presented herein has been completed by Mr. Ryan Preston, B.Sc, P.Ag, CPESC as a Qualified Environmental Professional (QEP) providing expertise in urban watershed management. The assessments, recommendations, and conclusions presented herein reflect best professional judgement based on the completion of seasonally representative surveys and review of published information from municipal and provincial databases and mapping resources.

The assessment is provided to satisfy requirements for the City of Abbotsford's Fish Habitat Assessment and Wildlife Habitat Assessment reporting requirements in support of a Natural Environment Development Permit (NEDP) application. The field and desktop studies summarize aquatic and riparian resource values requiring consideration for the purposes of establishing streamside protection and enhancement area (SPEA) setbacks pursuant to the City of Abbotsford's streamside protection bylaw no. 1465-2005 and to ensure compliance with the Province of BC's Riparian Areas Protection Regulation (RAPR).

1.1 Revision History

This report was revised in July of 2023 from the original iteration dated February 7, 2022. This revision relates to changes in the Site Plan to address City comments. Changes to the Site Plan included the following:

- Slight re-configuration of the SPEA boundary to yield a boundary with rounded edges which appear more natural.
- The eastern driveway was shifted to the west to make more space for retaining and protection of detention facilities on the adjacent site.
- Addition of pedestrian path from eastern units to central amenity, plus addition of pedestrian path north of building 5.
- Expanded Maclure Road dedication.
- Reconfiguration of buildings and the outdoor amenity space.
- Provision of a 0.3m construction and maintenance offset for the retaining walls from the proposed SPEA boundary.
- Buildings 48, 49, & 50 were relocated further away from the SPEA to preclude future conflicts with buildings and roots.

Changes to this report were required to reflect changes to the Site Plan and to address City comments. Changes to this report include:

- The habitat balance was updated to reflect an updated SPEA boundary.
- A section on impact mitigation was added.
- A section on SPEA Mitigation was added.
- A section on Aquifer Protection was added.
- Report figures were updated to reflect the new SPEA Boundary and include preliminary RAPR setbacks.

1.2 Summary of Proposed Development

The proposed development will include twenty nine (29) building structures yielding 145 dwelling units and associated access and parking surfaces. The proposed multi-family development will include requirements for site grading and civil servicing with drainage connections proposed to discharge to a single point of discharge following onsite detention and water quality treatment.

The development concept plan has been prepared by Focus Architecture in consultation with support from the project's multi-disciplinary team which includes the following:

- Aplin Martin – Civil Engineering.
- BlueLines Environmental Ltd. – Environmental Consultant.
- GeoWest Consultants Ltd. – Geotechnical.
- Onderwater Land Surveying – BC Land Surveyors.
- Diamond Head Consulting Ltd. - Arborist

The building siting requires the explicit consideration of the aquatic and riparian ecosystem values and a history of anthropogenic fill placements. Site grading will require the removal of anthropogenic fills unsuitable for development and construction of civil infrastructure, roadways, and residential structures. Notably, some of the historic fill placements define the surfaces upon which invasive species and self-seeding early seral broadleaf vegetation has become established within the streamside protection and enhancement area buffers.

SPEA setback requirements have been assessed based on interpretation of the watercourse origin/typology, assessment of hydroperiod, and potential fish bearing status based on detailed site assessment completed by a Qualified Environmental Professional (QEP).

1.3 Development Schedule

Subject to receipt of municipal approvals, works are anticipated to commence in Q4 of 2024.

Post construction monitoring will be applicable to the proposed riparian restoration works. Monitoring is proposed for a 5-year term and would commence in the first growing season following completion of planting.

2 Assessment Methods

BlueLines Environmental Ltd. (BlueLines) was engaged to prepare a detailed assessment and evaluation of aquatic and riparian resource values following completion of a due-diligence phase of study and the subject property being formally put under contract for purchase.

Field assessments were initiated in June 2021 through October 2021 and reflect analysis of aquatic habitats completed under seasonally representative conditions that reflect a typical ‘wet season’ hydrologic response. The detailed assessments presented herein were completed by Mr. Ryan Preston, a QEP with expertise and experience in the assessment, classification, and management of aquatic resource values and hillslope hydrologic processes to refine aquatic ecosystem mapping and development of the proposed aquatic and riparian management strategy.

2.1 Desktop Assessments

A pre-field desktop study was completed based on the acquisition of raw light detection and ranging (LiDAR) datasets provided by the City of Abbotsford to support development of a high-resolution digital elevation model (DEM). Desktop analysis included a review of available municipal watercourse mapping and colour aerial imagery to inform field assessments and interpretation of historic land-use changes.

In addition to review of municipal mapping datasets, Provincial mapping and databases were reviewed to assess the Property with respect to the following:

- Province of BC Aquifer Mapping (GWELLS¹)
- Province of BC Groundwater Well Mapping (GWELLS)
- Province of BC 1:50,000 watercourse mapping (iMAP BC²)
- Province of BC 1:20,000 TRIM watercourse mapping (iMAP BC)
- Province of BC ‘Non-Trim’ Hydrography mapping (iMAP BC)
- Province of BC Soils Mapping (Soils Information Finder Tool – SIFT³)
- Province of BC Habitat Wizard⁴ mapping.

¹ https://apps.nrs.gov.bc.ca/gwells/aquifers?map_centre=49.025897,-122.268923&map_zoom=13

² <https://maps.gov.bc.ca/ess/hm/imap4m/>

³ <https://governmentofbc.maps.arcgis.com/apps/MapSeries/index.html?appid=cc25e43525c5471ca7b13d639bbcd7aa>

⁴ <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/ecosystems/habitatwizard>

2.2 Field Assessments

Field assessments were completed to map and classify all aquatic ecosystem values to support determination of applicable riparian area setback requirements and to identify opportunities for riparian habitat restoration and enhancement.

Field assessments included evaluation of the hydrologic expression of discrete aquatic ecosystems located at the south boundary of the Properties and interpret the local hydro-dynamics driving the hydrology of and connectivity to offsite/downstream aquatic ecosystems.

Incidental observations of historic land uses, fill placements, disturbances, and the presence of noxious weeds was recorded via GPS. An assessment of wildlife habitat potential considering historic land use and ongoing agricultural land uses was completed through reconnaissance level survey as field transects and direct observation within the Properties.

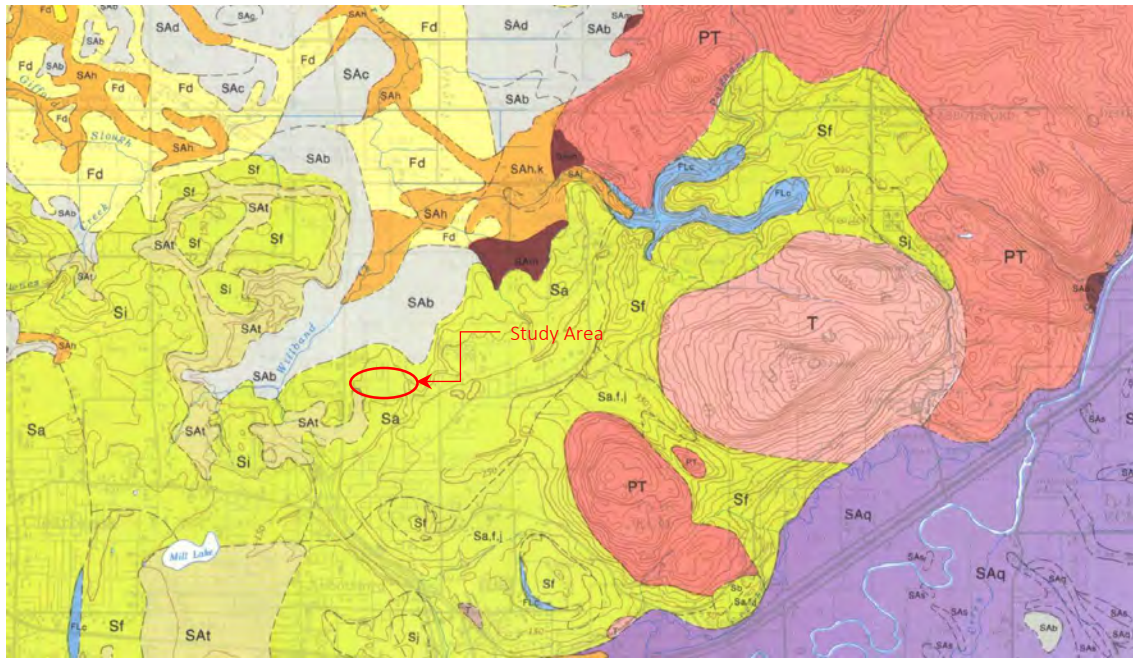
Mapping has been prepared to reflect a refinement of municipal watercourse datasets to reflect present-day site conditions and reflect the LiDAR based topographic model and survey datasets based on a BCLS topographic and legal survey prepared by Onderwater Land Surveyors.

3 Study Area Description

3.1 Quaternary Geology

The Property is located atop a Pleistocene era deposit of Sumas Drift, a recessional glaciofluvial deposit. Geological survey of Canada identifies the underlying geology as an 'Sa' map unit reflecting recessional channel and floodplain deposits laid down by proglacial streams characterized by gravel and sand up to 40m thick and a normal range of thickness from 5-25m.

The topography of the study area naturally slopes to the south with the lowlands having been historically traversed with the construction of Hwy 11. The topography and geology dictates that the south boundary of the Properties reflects a hydrologic receiving site.



Inset A - Geological Survey of Canada Map 1485A excerpt illustrating surficial geology of the Study Area.

3.2 Aquifer Mapping

The Quaternary geology of the surrounding landscape is directly related to the local area aquifer mapping. The study area overlies three (3) mapped aquifers:

- Aquifer #28 – a confined sand and gravel deposit consisting of a Fort Langley lithostratigraphic unit
- Aquifer #969 – a sedimentary rock formation of Kitsilano sandstone
- Aquifer #15 – an unconfined sand and gravel aquifer consisting of Sumas Drift.

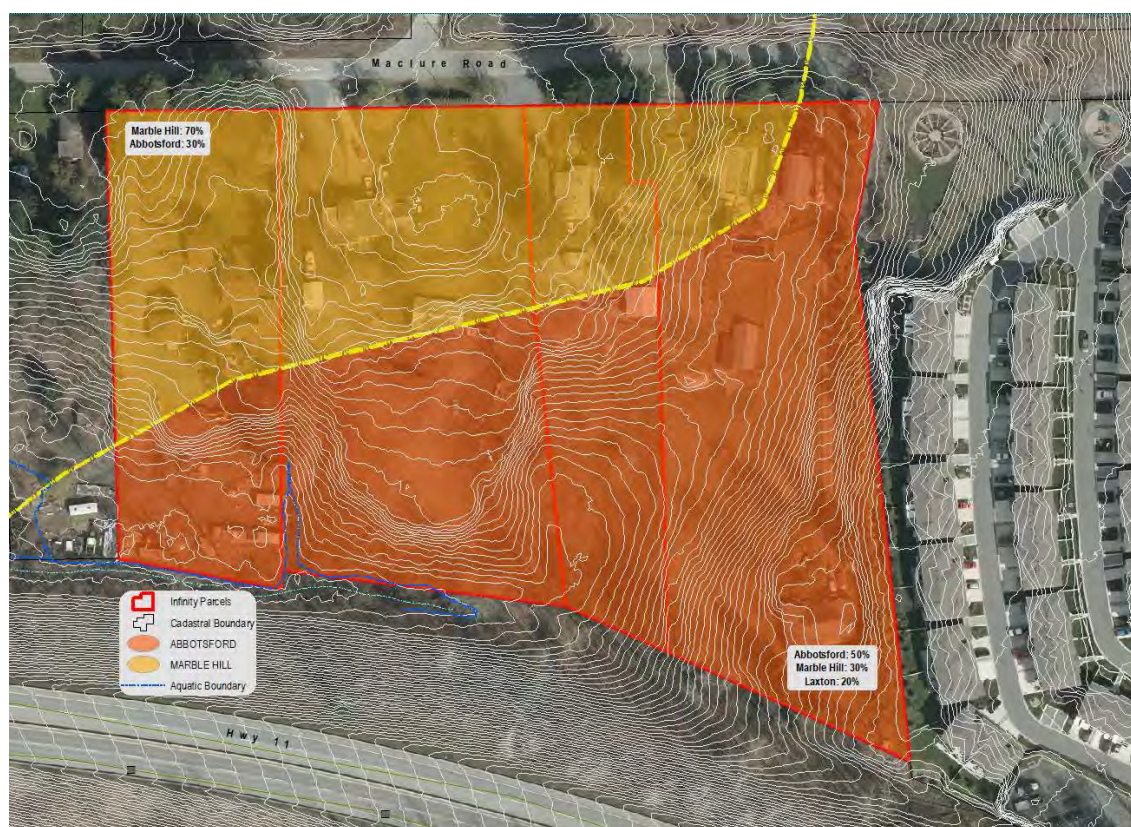
The proposed development and associated grading will directly interface with the unconfined sand and gravel defining the aquifer substrate of Aquifer #15 with the underlying materials associated with Aquifer #969 and #28 unlikely to be influenced by the proposed development.

The potential interaction with the aquifer will require consideration with respect to site grading and servicing with respect to incidental groundwater interactions and influences on site hydrology.

3.3 Soils Mapping

The Property includes two (2) mapped soil units. Inset B illustrates the location of the soil mapping polygons based on the Province of BC's Soils Information Finder Tool (SIFT) datasets. Generally, the soils mapping reflect pedogenesis atop the underlying parent materials and reflect inherent drainage conditions as dictated by the geologic materials and topography yielding orthic humo-ferric podzols. Soils drainage conditions are characterized as well drained with the parent materials reflecting an eolian deposit atop glaciofluvial sediments.

Inset B illustrates the soils mapping boundaries with respect to the study area boundaries. Table 1 summarizes the soils mapping information.



Inset B - Study area soils mapping boundaries

Table 1 – Maclure Road Assembly Soils Characteristics

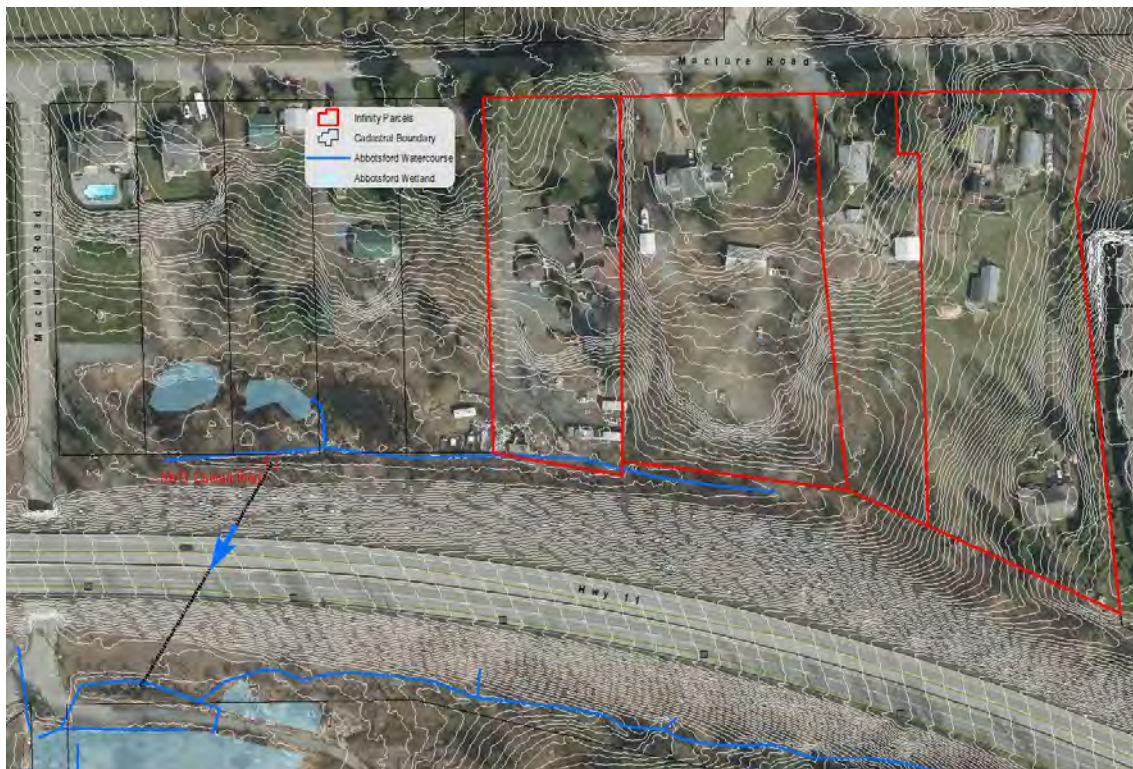
Soil Type	Soil Classification	Mode of Deposition	Soil Material	Water Table Present	Drainage	Texture
Abbotsford	Orthic Humo Feric Podzol	Eolian over Glaciofluvial	Mineral	Never	Well-drained	Silt Loam
Marble Hill	Orthic Humo Feric Podzol	Eolian over Glaciofluvial	Mineral	Never	Well-drained	Silt Loam
Laxton	Orthic Humo Feric Podzol	Eolian (mod. Coarse over Coarse)	Mineral	Never	Well-drained	Loam

3.4 Watercourse Mapping

Provincial watercourse mapping does not illustrate mapped drainage features within the Property. Municipal watercourse mapping illustrates a drainage channel flowing along the immediate north boundary of the toe of fill-slope of Highway 11 and the south boundary of the Properties.

The mapped watercourse is confirmed to drain west along the toe of slope within a channelized watercourse. The watercourse is interpreted to reflect groundwater interaction. Based on the topographic position, the watercourse is interpreted to reflect a historically modified wetland ecosystem.

Municipal drainage mapping datasets show no mapped drainage connections. Inset C illustrates the existing municipal watercourse mapping. Field investigations confirm the presence of a culvert conveying flows below the Highway 11 alignment.



Inset C - City of Abbotsford Watercourse Mapping

4 Aquatic & Riparian Habitat Management Strategy

The subject property is located in a geographically distinct position with the south facing aspect of a natural hillslope dictating a natural receiving site at the toe of slope. The receiving site dynamics have been directly modified by the construction of Highway 11 separating the natural toe of slope from the lowlands to the south and an extensive wetland ecosystem providing headwaters to the Willband Creek system.

4.1 Aquatic Habitat Values

Figure 1 presents the watercourse typology and recommended fisheries resource classification based on field observations and interpretations of hydrologic and geomorphic processes.

Table 2 presents the recommended watercourse classification with respect to fisheries resource values and to inform riparian setback requirements (See Section 4.2).

Table 2 – Fisheries Resource Values: Watercourse Classification

Watercourse ID	Fish Bearing Status	Permanence	Channel Type	Classification
Willband Tributary A	Non Fish Bearing	Permanent	Modified Wetland	Class B
Wetland A	Non-Fish Bearing	Permanent	Wetland	Class B
Ditch 1	Non-Fish Bearing	Non-Permanent	Ditch	Class B
Ditch 2	Non-Fish Bearing	Non-Permanent	Ditch	Non Fish Habitat

4.1.1 Tributary A

Despite the separation from the natural wetlands to the south, wetland ecosystem values remain in the vicinity of the subject Properties. A distinct shallow open water, marsh, and swamp ecosystem complex is located to the immediate west of the Properties, with the south boundary recommended for management as a modified linear wetland drainage feature parallel to the Highway 11 fill materials.

Notwithstanding the linearity of the drainage feature, the topography and interpretation of hydrodynamics are concluded to reflect a modified wetland ecosystem rather than a typical ‘stream’ insofar as typical lotic ecosystem conditions of a headwater stream. The modified wetland has been formally channelized historically, but as a receiving site accumulation of organic materials and a low energy hydrologic regime yields what is recommended for management as a linear swamp with hydrology directly reflecting groundwater expression resulting from lateral subsurface flow emergence at the toe of slope and impounded by the fill materials associated with Highway 11.

Municipal drainage mapping does not illustrate any confirmed surface water connectivity to offsite drainages. Field assessments confirm the presence of a single unmapped corrugated metal pipe culvert. The culvert condition is poor, with evidence of surcharge at the inlet suggesting possible drainage obstruction. The culvert inlet is located within the Ministry of Transportation and Infrastructure (MoTI) highway right-of-way and is not mapped within the City of Abbotsford’s drainage datasets. Field assessments confirmed the location of the culvert outlet on the south of the Highway 11 alignment. GIS

analysis reveals a culvert length of ~92 linear meters, with the outlet largely submerged at the right bank of a wetland ecosystem adjacent to the boundaries of 3044 Pratt Street.

BlueLines consulted with MoTI representatives and confirmed that the Ministry has no mapping records of the culvert. The culvert condition suggests that drainage improvements may be required to ensure resilience of the future drainage conditions insofar as potential hydrologic changes associated with proposed developments to the north of Highway 11.

The confirmed drainage connectivity via the MoTI culvert confirms the applicability of the City of Abbotsford's streamside protection bylaw.



Photograph 1 - Upstream view of channelized stream located parallel to toe of Hwy 11 fill.



Photograph 2 – Illustration of unmapped CMP culvert crossing of Hwy 11 under low water conditions (June 2021).

4.1.2 Wetland A

Wetland A is a wetland complex consisting of shallow open water, marsh, and swamp ecosystem types. A formal delineation of the wetland was completed based on field assessment to interpret physical evidence of hydrodynamics, vegetation indicators, and soils.

The delineation included the initial flagging of wetland hydrology through interpretation of visible saturation and rafted organics, interpretation of obligate hydrophytes, and micro-topography. The boundary was subsequently refined through soils investigation utilizing a Dutch auger to assess the depth

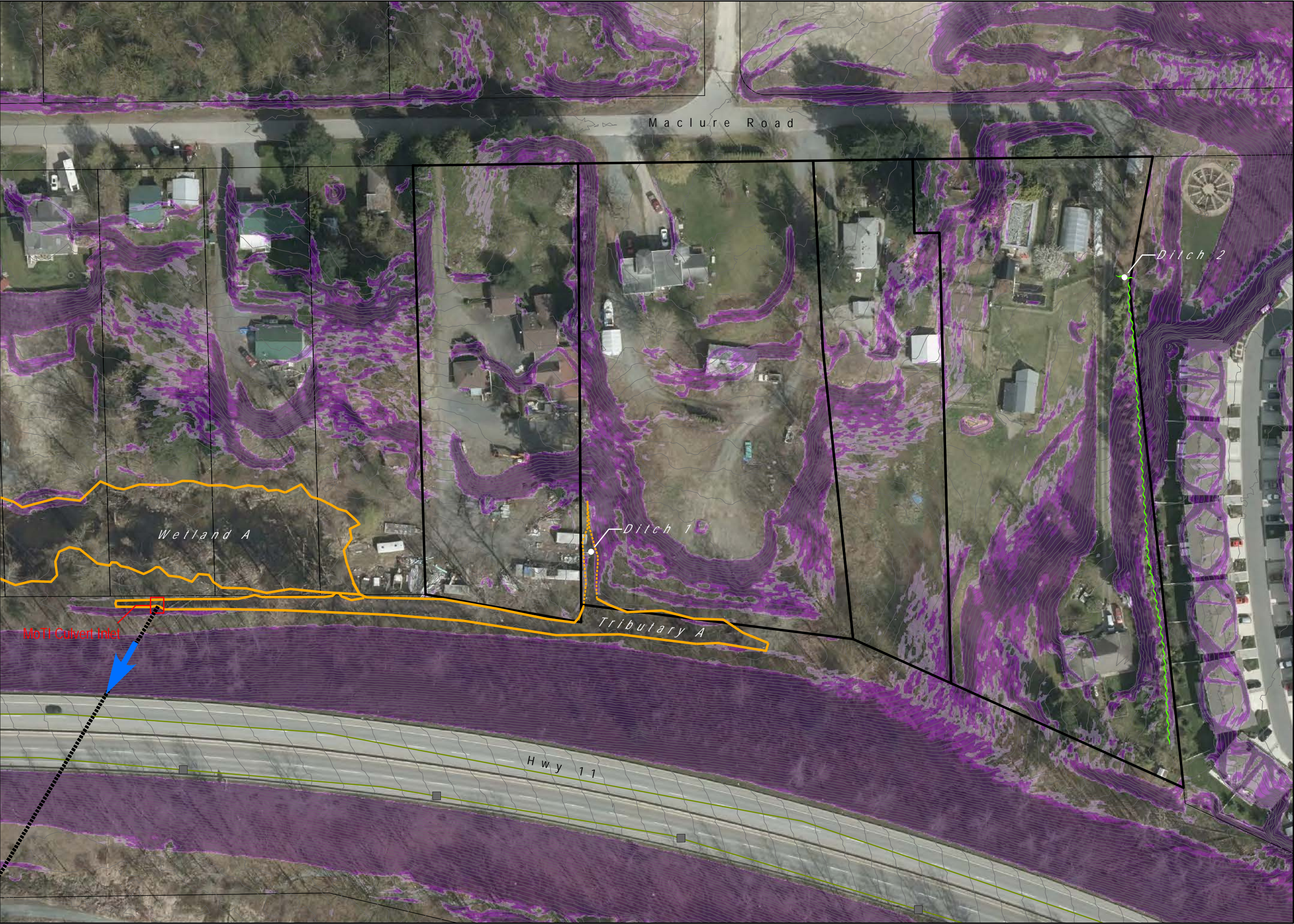
to water table and evidence of redoximorphic conditions or clear evidence of hydric soils properties. A formal wetland boundary was field delineated and surveyed by a BC Land Surveyor. The wetland boundary is located offsite to the immediate west of the subject Properties but will directly influence the riparian setback constraints applicable to the southwest boundary of 34098 Maclure.

Evidence that the southern portions of 34098 Maclure may have historically included similar palustrine ecosystem conditions includes the relatively flat site topography associated with the clear placement of fill materials and site grading. The flat toe-of-slope surfaces include residual geotextile and geo-grid materials typically included with fill placements atop soft or compressible soils.

The depth to groundwater is evidenced by the nominal grade differential to the channelized stream/modified wetland beyond the south property boundary, and the ditch separating the adjacent east parcel.



Photograph 3 - West view across marsh wetland ecosystem at Wetland A adjacent to proposed development area (October 2021)



Streamside Protection Area Setback Planning

Client:
Infinity Properties

Legend

Infinity Parcels

Cadastral Boundary

LiDAR Contour
(50cm)

Watercourse Class

Non Fish Habitat

Permanent Non-Fish
Bearing

Permanent Non-Fish
Bearing - Ditch

Slope Gradient (%)

0 - 20%

20 - 25%

25 - 33%

>33% symbol"/>

>33%

Figure 1

Scale - 1:1,000

BlueLines Environmental

Drawing Revisions:

4.1.3 Manmade Ditch (Ditch 1)

A property line drainage ditch feature is present at the southeast property boundary of 34098 MacLure Road. The ditch reflects a purpose-built drainage feature defined by the clear boundaries between historic fill placements and grading at 34098 Maclure, and a more substantial fill placement defining the southern portions of 34198 Maclure.

The ditch lacks any formal surface water connections or water sources beyond seasonal groundwater interception and conveyance along the shared property boundary. The ditch does not include natural top of bank; the banks are defined by anthropogenic fill.

4.1.4 Non-Fish Habitat Ditch (Ditch 2)

A separate manmade drainage feature was identified along the immediate east margin of the driveway access at 34164 Maclure Road. The driveway, a gravel road surface, provides access to a single-family residence at the southeast corner of the property. The driveway transects the natural hillslope and runs generally parallel to the slope contours. A vertically excavated nominal interceptor ditch has been excavated to provide a seasonal drainage function. The ditch is interpreted to capture seasonal or event-specific runoff, and/or interflow associated with the well-drained glaciofluvial materials mantling the hillslope.

Assessment of the ditch revealed no evidence of significant hydro-geomorphic process and confirmed that the ditch lacks any surface water connectivity to Tributary A. Drainage crosses the driveway in a PVC pipe and disperses to the agricultural field areas and infiltrates to ground near an existing barn structure.

The interpretation of hydrodynamics and the lack of surface connectivity is concluded to preclude any further consideration for management as fish habitat or a regulated watercourse. The ditch is recommended for classification and management as a ‘non fish habitat’ drainage feature.

Notably, the ditch is located parallel to the east property boundary and is directly below adjacent stormwater infrastructure constructed as infiltration galleries in association with the adjacent townhome developments. The ditch does not include any evidence of significant groundwater interaction or evidence of interception of stormwater from the adjacent infiltration infrastructure, nor is there any evidence of ‘breakout’ of the stormwater infiltration on the slopes below the driveway and ditch.



Photograph 4 - North view of excavated ditch located along east property boundary exhibiting no evidence of hydro-geomorphic process.

4.2 Riparian Setback Strategy

Based on the proposed watercourse typology and ecosystem classifications summarized above, the Tributary A/Wetland A drainage system will require the establishment of streamside protection and enhancement area (SPEA) setbacks.

Riparian area setback requirements applicable to the proposed development have been evaluated pursuant to Section 4 of the Streamside Protection Bylaw 1465-2005. Generally, 'ditch' streamside protection and enhancement area (SPEA) setbacks will be defined pursuant to the Riparian Areas Protection Regulation (RAPR); however, natural or channelized streams receive setbacks based on the QEP evaluations of stream permanence and fish bearing status.

All study area watercourses located north from the Highway 11 fills and the MoTi culvert are proposed for management as non-fish bearing; however, the groundwater dynamics are concluded to dictate a 'permanent' (e.g. hydrologic expression of streamflow/surface water for periods >6 months).

Table 3 summarizes the applicable streamside protection and enhancement areas.

Table 3 – Streamside Protection & Enhancement Area Setback Summary

Watercourse ID	Fish Bearing Status	Watercourse Type	Channel Width (m)	RAPR SPEA (m)	Bylaw SPEA (m)
Tributary A	Non-Fish Bearing	Permanent Channelized Stream	2.64	10	30
Wetland A	Non-Fish Bearing	Wetland	N/A	15m (30m South Shade ZOS)	30
Ditch 1	Non-Fish Bearing	Ditch	<1	2	2
Ditch 2	NFH	Ditch	<1	N/A	N/A

4.2.1 Mitigation Hierarchy

The project has avoided aquatic impacts and does not propose watercourse or wetland infill or relocation.

Much of the onsite SPEA setbacks have been historically disturbed by residential and agricultural land uses limiting functional riparian vegetation within the Property. Provision of the full SPEA setbacks pursuant to Bylaw 1465 would result in development constraints limiting housing and providing no significant benefits to ecosystem values. Consultation with City of Abbotsford staff confirmed that opportunities for a SPEA variance subject to formal restoration and enhancement would yield a mutually beneficial outcome with respect to development objectives and community objectives insofar as meaningful habitat gains through restoration planting and commitments to ongoing maintenance to establish a ‘free to grow’ status.

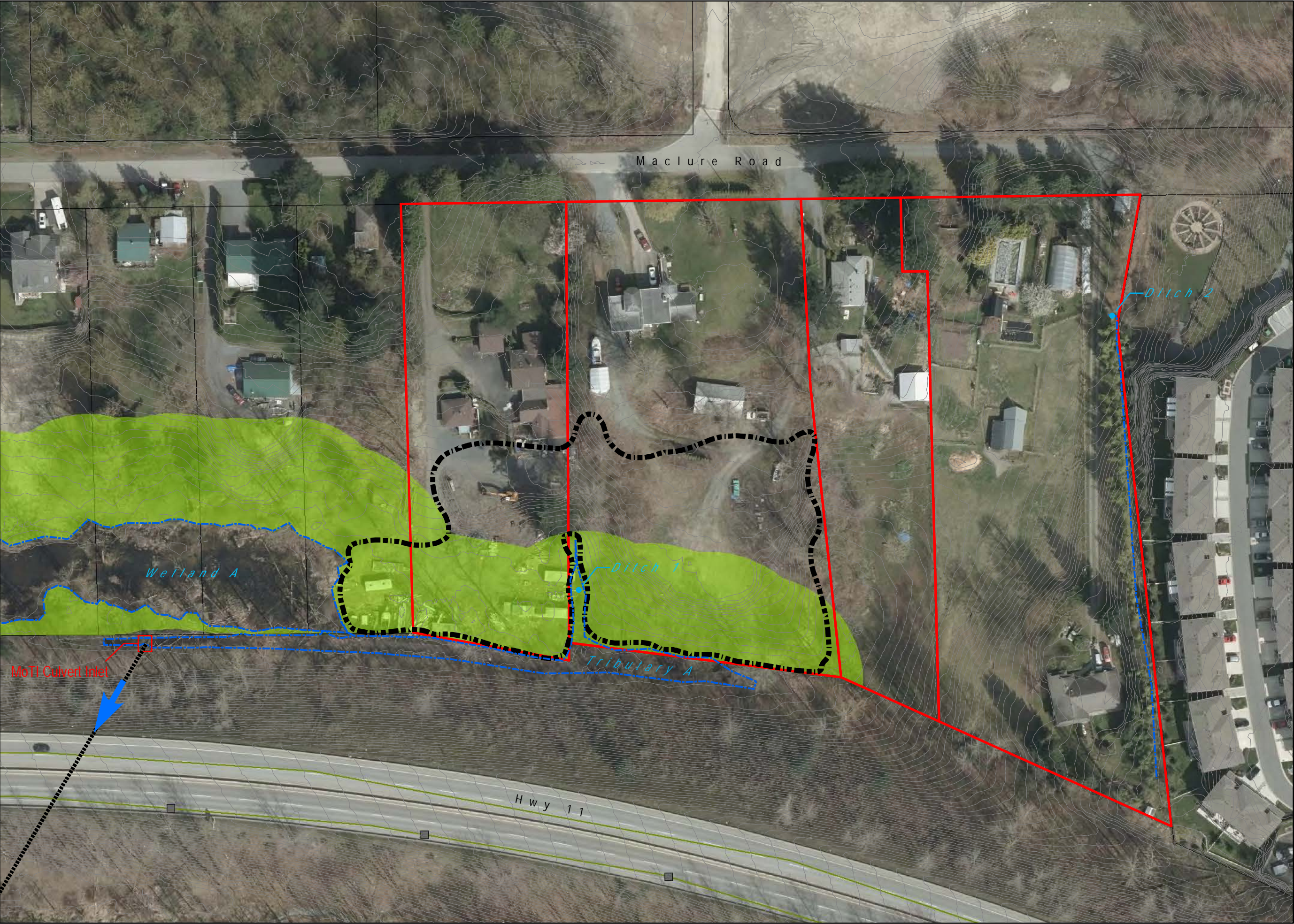
With respect to the City’s mitigation hierarchy, the proposed development footprint does avoid the 30m SPEA setbacks associated with Tributary A. Mitigation and Compensation is proposed for the affected SPEA of Wetland A through adoption of 15m setbacks from the natural boundary⁵ which exceeds the provincial riparian protection standard. Compensation is proposed through a formal restoration and enhancement planting treatment of the proposed riparian areas.

4.2.2 SPEA Setback Variance

The history of site disturbances, notably fill placements associated with historic land use has yielded extensive disturbance within the Bylaw SPEA setbacks. Significant opportunity for restoration and enhancement exists. Furthermore, the removal of historic fill materials is required to support redevelopment in relation to building siting and suitable sub-grade.

Figure 2 presents the Bylaw SPEA setback requirements with interpretation of the historic fill placements and grading disturbances yielding disturbed surfaces, invasive species establishment, or early-seral stage revegetation with pole sapling Red alder (*Alnus rubra*). The full Bylaw SPEA setback requirements within the Properties includes an area of 3,783m².

⁵ Note: top of bank is absent at Wetland A. SPEA setbacks have been modelled from QEP flagged and BCLS surveyed natural boundary.



Streamside Protection Area Setback Planning

Client:
Infinity Properties

Legend

- Infinity Parcels
- Cadastral Boundary
- LiDAR Contour (50cm)
- Aquatic Boundary
- Fill Boundary
- Bylaw Setbacks (30m)

Figure 2

Scale - 1:1,000

BlueLines Environmental

Drawing Revisions:

A request for SPEA setback variances is proposed with consideration of the restoration and enhancement opportunities to achieve improved riparian habitat function. The proposed setback boundary has been established based on recognition of the mitigation hierarchy and avoidance of the RAPR equivalent setbacks to ensure compliance with or exceedance of the Province of BC's riparian protection standard.

The proposed variance is acknowledged to require formal habitat offsetting to achieve a 2:1 ratio pursuant to the City of Abbotsford's OCP and Natural Environment Development Permit Area guidelines, specifically policies NE2 & NE3:

- **NE2** - No Net Loss. Ensure development results in no net loss of habitat area.
- **NE3** - Habitat Replacement and Restoration. Where loss of habitat is unavoidable, replace the value of lost habitat at a ratio of 2:1.

Pursuant to City of Abbotsford guidance materials for Developing Near Streams and Ravines inclusive of Appendix A, the existing riparian habitat conditions have been assessed to evaluate the relative habitat weighting factors to inform the proposed riparian habitat balance.

Figure 3 presents the proposed riparian area setbacks with classification of the existing vegetation status and ground conditions with respect to historic fill, site grading, and compaction relevant to the classification as impervious or semi-impervious surfaces capable of natural vegetation recruitment.

Table 4 presents the riparian habitat balance with consideration of the historic disturbances and existing site conditions. Table 5 presents the habitat weighting factor evaluation based on existing site conditions.

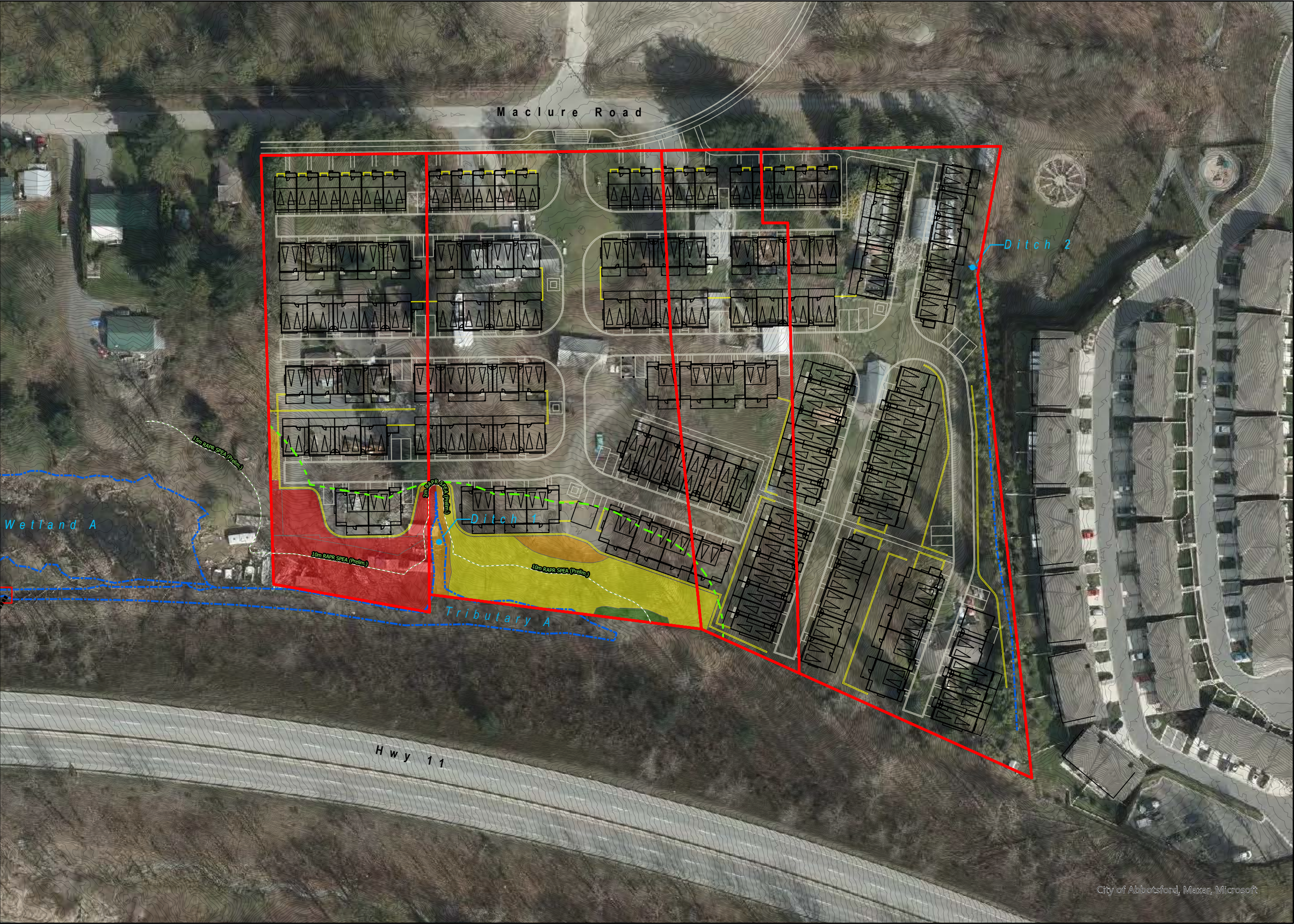
Table 4 – OCP Natural Environment NE3 Policy Evaluation

Habitat Balance	[A] Bylaw SPEA (m ²)	[B] Proposed SPEA (m ²)	[C] Variance Area (m ²) (A – B)	[D] 2:1 Offsetting Requirement
NE3 Area Calculation	3783	2508	1,275	2,550

Table 5 – Habitat Weighting Factor Summary

SPEA Summary	SPEA Setback Area (m ²)	Habitat Weighting Factor (m ²)	Equivalent Area of Weighted Habitat Gain (m ²)
Disturbed/Compacted Fill Area Enhancements	1005	2x	2091
Invasive/Unvegetated	320	1x	281
Understory Enhancements	1154	0.5x	560
SPEA Equivalence			2,932

The proposed SPEA setback boundary with consideration of the habitat weighting factors is concluded to suitably offset the requested variance (1,275m²) to achieve an area exceeding the 2:1 ratio requirement of Policy NE3. A setback area of 2,508m² is proposed for formal restoration and enhancement. Consideration of habitat weighting factors achieves equivalence of 2,932m² of additional habitat value. The riparian area enhancements will be subject to a long-term monitoring program to ensure compliance with maintenance requirements, plant survivorship criteria, and achieve riparian ecosystem function.



SPEA Restoration & Enhancement.
Habitat Weighting Factor

Client:
Infinity Properties

Infinity Parcels

--- Aquatic Boundary

--- Bylaw Setback (30m)

--- RAPR Setbacks (Prelim.)

Proposed Design

--- Retaining Walls

--- Buildings

--- Roads

--- las_cont10cm

Habitat Weighting Factor

■ 0x (Existing Native Plants)

■ 0.5x (Sparse + Invasive Understory - Pole Sapling)

■ 1x (Disturbed Surfaces)

■ 2x (Impervious + Engineered Surfaces)

Figure 3

Scale - 1:1,000

Drawing Revision:
Rev 1

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The evaluation of the relative contribution of the enhancement of the historic fill placements within 34118 Maclure Road is based on existing conditions; however, it is important to recognize that the fill materials will require excavation and re-grading to achieve geotechnical requirements for development. The existing conditions include a pole-sapling red alder plant community with negligible shrub layer vegetation dictating the enhancement evaluations based on a 0.5x habitat weighting factor. Following bulk excavation and re-grading the fill slope areas would be fully disturbed and subject to a comprehensive riparian area restoration and enhancement treatment that would be equivalent to the restoration treatments applicable to a fully disturbed or impervious area (e.g. riparian areas associated with 34098 Maclure Road).

The following summarizes the riparian area restoration treatment criteria recommended for application to the south boundary watercourse/wetland ecosystem's riparian buffer zones:

1. Bulk excavation and re-grading of fill materials as prescribed by Geotechnical Engineering Consultant
2. Invasive species treatment/removal;
3. Scarification of final ground surface elevations
4. Augmentation of restoration planting areas with 300-450mm of growing medium (e.g. 3P growing medium per BCLNA standards)
5. Stabilization of exposed ground surfaces with a low-growing reclamation seed mix including shrub and wildflower seed;
6. Terrestrial habitat complexing with Coarse Woody Debris (CWD) features;
7. Installation of boulder cluster features;
8. Installation of nest boxes;
9. Planting of riparian area with native tree, shrub, and groundcover (Max. 1m centers);
10. Installation of formal boundary encroachment fencing;
11. Signage designating no-entry and environmental sensitive area;
12. Commitment to long-term maintenance and survivorship monitoring (5 years);

Pending endorsement of the proposed riparian area management strategy and habitat balance per policy NE3, a detailed restoration planting plan will be prepared and submitted for review and approval by City of Abbotsford planning staff.

4.3 SPEA Protection Measures

The proposed SPEA setbacks exceed the Province of BC riparian protection standard based on application of the RAPR detailed assessment methods. The proposed development will include activities falling within the 30m riparian assessment area (RAA) and as such, requires consideration of additional ‘measures’ to protect the integrity of the SPEA.

Table 6 presents a summary of the relevant measures pursuant to the RAPR detailed assessment methods; however, it must be acknowledged that the historic residential, agricultural, and ancillary activities limit the risks of development with respect to riparian ecosystem integrity. Key measures requiring consideration are largely limited to construction phase activities.

Table 6 – RAPR SPEA ‘measures’ Summary

Measures	Summary/Comment
Danger Trees	Diamond Head Consulting (DHC) completed an arboricultural inventory and report for the Property. The report includes assessments of tree risks. DHC concluded that “There were no trees on this site that posed a <i>high</i> or <i>extreme</i> risk at the time of assessment.” No danger tree treatments are required.
Windthrow	Windthrow considerations are not applicable to the proposed SPEA setbacks based on the lack of existing tree cover. No new vegetation boundaries will be created in relation to the proposed development or SPEA setback variance.
Slope Stability	The flat topography of the study area and SPEA setbacks interfacing with the development footprint preclude considerations of slope stability measures.
Protection of SPEA Trees	Temporary construction fencing will be installed to define and protect areas of existing native trees and shrubs within the SPEA. This fencing will generally define the limits or anthropogenic fill removal within the SPEA, invasives removals, as well as the limits of riparian plantings. Future tree plantings will be protected through establishment of encroachment fencing (see below).
Encroachment Prevention	The SPEA boundary is to be physically located on the ground by a BCLS prior to site disturbance. Encroachment prevention will be established along the development facing edge of all SPEA setback area. As per CoA specifications, the fence must be at least 1.8m high and composed of chain link, or post and rail with wire mesh affixed to the back of the fence. Encroachment fencing shall include signage denoting the environmental sensitivity of the areas and protection through registration of a Land Title Act, Section 219 covenant. All fencing will be located immediately outside the SPEA (ie: 50mm offset).

Measures	Summary/Comment
Erosion & Sediment Control	<p>The natural site topography and proposed grading will limit ESC considerations to the south and east development interfaces. A formal ESC plan will be developed by Aplin & Martin which will address the following:</p> <ul style="list-style-type: none"> • Access/Egress Control • Vegetation Retention • Vehicle Use Restrictions • Site Dewatering, Runoff Detention, Treatment, and Filtration • Working Surface Augmentation • Disturbed Surface Protection (Temporary) • Disturbed Surface Protection (Permanent) <p>Environmental monitoring of construction phase works to assess compliance with ESC plan requirements and water quality criteria will be completed on a weekly basis through wet season operations and bi-weekly during drier season operations, or following significant rain events.</p>
Stormwater Management	<p>The Preliminary Servicing Concept drawing produced by Aplin & Martin shows that the development will include two large “Brentwood” stormwater detention tanks to mitigate peak stormwater flows to the Willband Creek watershed. The tanks discharge to Ditch 1 via a proposed stormwater outfall headwall.</p>
Floodplain Concerns	<p>Wetland A and Ditch 1 pose no significant risk of floodplain inundation or lateral channel migration.</p>

Prior to issuance of the development permit, it is acknowledged that temporary construction-phase fencing must be installed at the boundary of the proposed SPEA setbacks. It is also acknowledged that riparian enhancements will require machine access to the SPEA for the purposes of removal of invasive vegetation, soil preparation, and placement of soil amendments. This work will be completed under direction and supervision of an environmental monitor.

4.4 Aquifer Protection Measures

The proposed development and associated grading will directly interface with the unconfined sand and gravel defining the aquifer substrate of Aquifer #15 (Abbotsford-Sumas aquifer). The aquifer is highly vulnerable to contamination from surface sources and activities as per the aquifer summary by the Province of BC⁶. The following measures will be followed to prevent the risk of groundwater contamination:

- 1) Construction Environmental Management Plan (CEMP): a CEMP will be developed by a Qualified Environmental Professional (QEP) which will outline environmental sensitivities and environmental

⁶ <https://apps.nrs.gov.bc.ca/gwells/aquifers/15>

protection measures inclusive of aquifer/groundwater protection. The CEMP will be produced prior to NEDP permit issuance.

- 2) Spill prevention and control: the project will utilize spill drip trays during refuelling at designated refuelling locations. Fuel, lubricants, and hazardous materials will be stored in a designated location. Spill kits will be kept in all machines, spill carts will be available at fuel storage and refueling locations.
- 3) Chemical handling and storage: Fuels and other potentially hazardous substances will be stored in secure containers and designated areas with secondary containment systems to prevent leaks or spills.
- 4) Training: Site staff will be trained on proper handling and storage procedures, in addition to spill response measures to minimize the risk of groundwater contamination.
- 5) Monitoring: Site inspections will be conducted as part of regular ESC inspections to review for compliance to spill prevention measures.

4.5 Senior Agency Approval Requirements

The proposed riparian area setbacks have been prepared based on a minimum 15m setback boundary from the stream/wetland boundaries to ensure strict compliance with RAPR. The request for a variance from the Streamside Protection Bylaw is understood to require the formal submission and review of the proposed setbacks to the Province of BC per RAPR assessment methods and reporting requirements.

A formal RAPR notification will be prepared and submitted for technical review and endorsement by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) RAPR office.

5 Wildlife Habitat Values

The subject Properties provide limited wildlife habitat values due to the history of site disturbances including fill placements, grading, and ongoing agricultural operations in addition to habitat fragmentation associated with the construction of Highway 11. Notwithstanding the limited direct habitat values, the riparian setback areas provide significant opportunity for restoration and enhancement to improve intrinsic wildlife habitat values in conjunction with enhancements to riparian area features functions and conditions. Through riparian restoration and establishment of a protected SPEA the project will protect terrestrial habitat and yield additional functional habitat area through conversion of disturbed active areas to functional fish & wildlife habitat. Furthermore, the establishment functional/vegetated SPEA areas will serve to reduce pollution to aquatic habitat over and above the existing condition through sediment deposition/filtration, nutrient uptake, and other biological process such as volatilization by plants.

An evaluation of historic species occurrence records was completed pursuant to the City of Abbotsford's wildlife assessment report guidelines⁷. A Query of Provincial datasets available from the BC Conservation Data Centre (CDC) within 2.5km of the study area reveals historic wildlife occurrence records as summarized in Table 6.

Table 6 – Conservation Data Centre spatial query results (2.5km occurrences)

Common Name	Scientific Name	BC Status	Cosewic Status	SARA Schedule
Oregon forestsnail	<i>Allogona townsendiana</i>	Red	E	1
Western painted turtle	<i>Chrysemys picta bellii</i>	Red	E	1
Mountain beaver	<i>Aplodontia rufa</i>	Yellow	SC	1

In addition to the species at risk occurrences, the study area falls within a broad mapping polygon for a masked species at risk occurrence. Information on the masked occurrence has not been pursued through the Conservation Data Centre at this time, but generally corresponds with species occurrences with a fixed geographic location such as rare and endangered plant species or nest/natal site locations (e.g. raptors or bat species).

Field assessments confirm the presence of suitable Oregon forestsnail (OFS) habitat within the relatively undisturbed forested areas associated with the north facing fill-slopes of Highway 11. The headwater origin of the modified wetland/watercourse includes Bigleaf maple (*Acer macrophyllum*) and Stinging nettle (*Urtica dioica*) with lesser sword fern (*Polystichum munitium*), which is concluded to provide potentially suitable habitat for the gastropods. One homogenous patch of Stinging nettle is present within the study area at a topographic low point; however, field assessments yielded no observations of live snails or shells suggesting confirmed habitat use.

Notwithstanding the lack of observation of OFS, the habitat suitability and proximity to documented occurrences will dictate that vegetation clearing and site grading should be completed following comprehensive transect surveys to support salvage and translocation.

Figure 4 illustrates the location of suitable OFS habitat.

5.1.1 Critical Habitat Mapping

The study area includes mapped polygons designating both 'posted' and 'proposed' critical habitat for OFS and Western painted turtle. The critical habitat polygons reflect a GIS based buffer based on the CDC occurrence records and historic aquatic habitat mapping.

⁷<https://www.abbotsford.ca/sites/default/files/docs/community-events/Wildlife%20Assessment%20Report%20Guidelines.pdf>

No designated or proposed critical habitat mapping polygons are directly associated with the Properties (Figure 4).

5.1.2 Breeding Bird/Nesting Considerations

Historic site clearing and land uses limit much of the study area's suitability as nesting habitat for migratory birds, nonetheless, seasonal nesting potential will require explicit consideration with respect to site clearing and grading operations to achieve the development objectives.

Any vegetation clearing proposed during the typical nesting season (e.g. March 1 through August 30) will pose a risk of contravention of Section 34 of the BC *Wildlife Act*. Vegetation removals are recommended to be completed outside the typical nesting season. If vegetation removals are required during the typical breeding bird nesting season, comprehensive assessments evaluating direct observations of nesting and breeding bird activity are recommended, with direct environmental monitoring supervision of vegetation removal activities by a QEP.

6 Invasive Species Occurrences

Occurrences of knotweed species (*Reynoutria sp.*) are confirmed within the subject Properties and along the north margin of Maclure Road.

The approximate location and extent of knotweed within the study area is illustrated in Figure 4. The observed occurrences are generally associated with the shared property boundary between 34144 and 34118 Maclure Road. The onsite occurrence of knotweed was estimated in the field to include an area of ~75m². Treatment of onsite knotweed with glyphosate by a licenced pesticide applicator has commenced as of the week of July 10, 2023. Treatment is expected to continue throughout the 2023/2024 growing seasons or until eradicated.

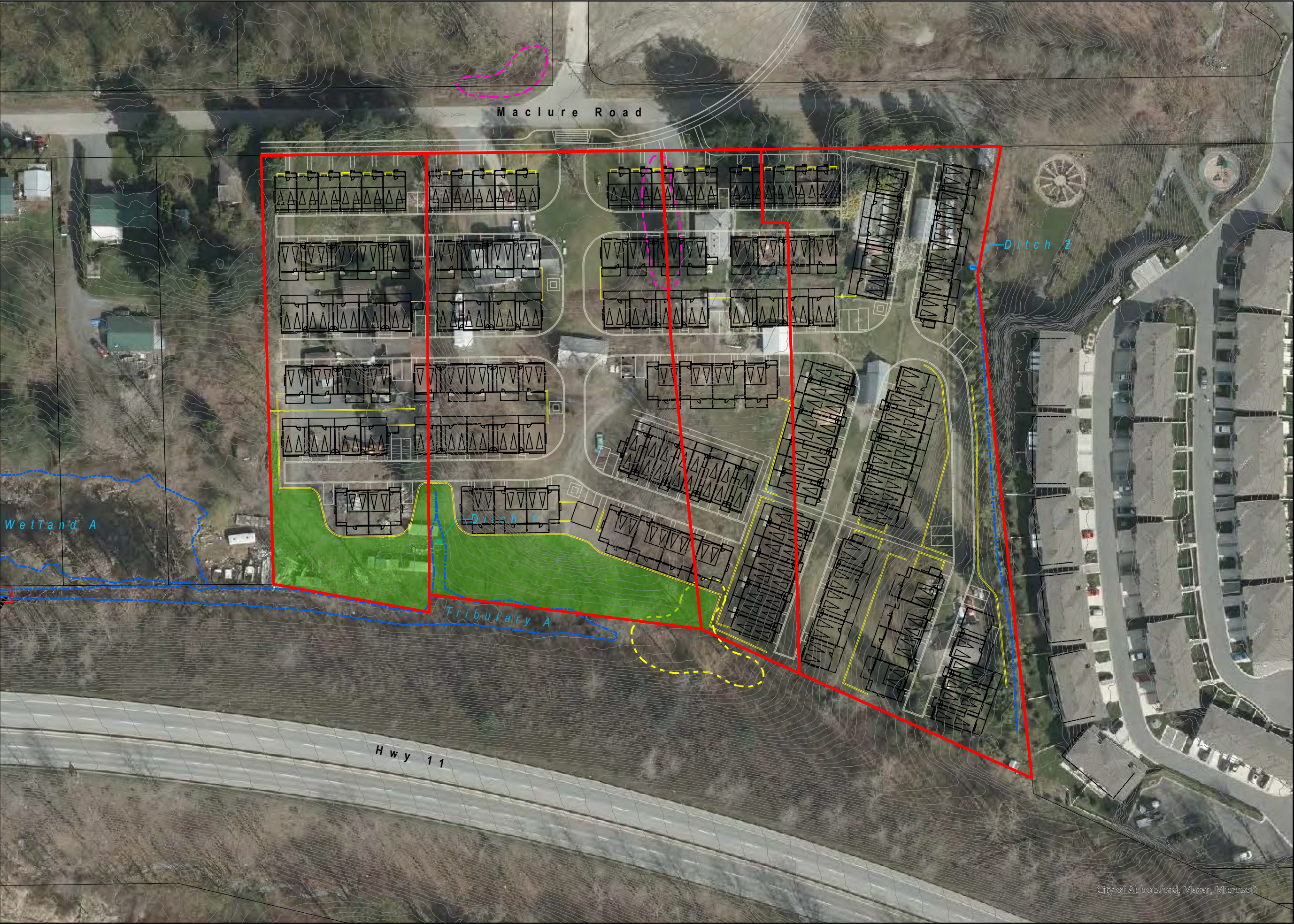
The offsite occurrences were observed at the entrance road to the cemetery lands to the north, proximal to the onsite knotweed occurrences.



Photograph 5 - Knotweed occurrence observed along shared property boundary.



Photograph 6 - Knotweed occurrence observed along north margin of Maclure Road.



Proposed SPEA Setbacks

Client:
Infinity Properties

Infinity Parcels

Cadastral Boundary

Aquatic Boundary

LiDAR Contour (50cm)

OFS Habitat Potential

Knotweed Occurrences

Proposed Design

Retaining Walls

Buildings

Roads

Proposed SPEA (2,508 m2)

Figure 4

N

Scale - 1:1,000

Drawing Revisions:
Rev 1

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7 Summary & Recommendations

The proposed townhome development layout has been developed with the explicit recognition of the value of the modified wetland/stream ecosystem defining the southern property boundaries and consideration of the significant riparian area restoration opportunities.

The proposed development will require the removal of historic fill placements to address geotechnical requirements for development. Graded fill placements proximal to the aquatic habitats will require formal improvements to scarify compacted surfaces and augment growing medium to support riparian revegetation. Opportunities to complex the proposed riparian restoration areas with terrestrial habitat features benefiting amphibian and small mammal cover elements will be incorporated into the restoration design and plant selections will prioritize species benefiting Oregon Forestsnail based on nearby species occurrences and potentially suitable habitats within the upper limits of the riparian corridor.

Where possible, organic soil horizons associated with the mapped Marble Hill and Abbotsford Soil types are recommended for salvage and re-use within the riparian restoration areas.

The proposed streamside protection and enhancement boundary will require endorsement by City of Abbotsford staff and approval by Council. A variance equivalent to 1,275m² is requested to achieve the proposed development boundary. Evaluation of existing site conditions has concluded that the proposed scope of restoration and enhancements would achieve equivalence to 2,932m² which exceeds the requirements of the Natural Environment DP policy NE3.

Subject to review and endorsement of the watercourse and riparian management strategy by the City of Abbotsford, a detailed riparian area restoration planting plan will be prepared inclusive of encroachment fencing, environmentally sensitive area signage, and a calculation of environmental securities for bonding purposes.

Stormwater management considerations have been incorporated into site design with onsite detention proposed to address rate control and water quality prior to discharge to the receiving environment. The proposed development is planned to discharge via an existing manmade ditch to connect to the channelized stream segment and will be conveyed to the previously unmapped MoTI culvert crossing of the Highway 11 alignment.

7.1 Senior Agency Regulatory Considerations

The proposed development will include requirements for the installation of a single stormwater outfall. The storm outfall is proposed to connect to the head of the existing anthropogenic ditch and will receive drainage from onsite detention tanks situated below strata road surfaces. Structural best management practices (BMPs) will be incorporated to mitigate water quality risks to the receiving environment.

The storm outfall will require compliance with the *Water Sustainability Act*, Water Sustainability Regulation. A notification pursuant to Section 39 of the Regulation will be required with works completed under

environmental monitoring supervision to ensure adherence with instream works standards and best practices.

Site grading requirements will yield a temporary disturbance of riparian areas and poses a potential risk to water quality values in relation to earthworks. A referral to Fisheries and Oceans Canada to summarize the restoration objectives and present key BMPs and a construction environmental management plan will be required to ensure compliance with fish habitat protection provisions of the federal *Fisheries Act*.

8 Closure

The environmental assessment report and mapping presented herein are provided to support the City of Abbotsford's review and comment on the proposed townhome development application and the formal request for variance with respect to the Streamside Protection Bylaw, 2005 and Natural Environment Development Permit requirements. The proposed aquatic and riparian management strategy reflects the results of detailed field evaluations and interpretations of hydrologic function and ecosystem values completed by a Qualified Environmental Professional.

The interpretations of aquatic habitat and riparian ecosystem values represent professional judgement and interpretation of hydrologic dynamics, ecosystem values, habitat suitability, and analysis of available databases and mapping resources to support the sustainable management of aquatic and riparian resource values.



It is the opinion of the QEPs that the proposed development provides an opportunity to achieve meaningful improvements to both aquatic and riparian habitat values that will provide a net gain to ecosystem function.

If there are any questions related to the assessment or recommendations presented herein, please do not hesitate to contact us.

Sincerely,




Ryan Preston, B.Sc, P.Ag, CPESC
Principal | BlueLines Environmental Ltd.

Mike Carter, B.Sc, RP. Bio.
Senior Biologist | BlueLines Environmental Ltd.



DEVELOPMENT ENGINEERING DIVISION

REVISED REZONING WORKS AND SERVICES REQUIREMENTS

File No:	PRJ22-037
Planner:	Tahir Ahmed, Planner
Prepared By:	Kim Fleming, Development Technologist II
Approved By:	 Sarb Toor, Senior Manager, Development Engineering 24/02/21
Date:	February 15, 2024
Applicant:	Joshua Tuner, Infinity Properties Ltd.
Development Property:	34164, 34144, 34118, and 34098 Maclure Road

The Local Government Act authorizes local governments to require development to meet current works and services standards as set out in the City's Development Bylaw and Policies.

This report includes the Works & Services **Requirements** to meet the applicable bylaws and policies and **Future Considerations** that may apply to the next phase of development.

Please have your consulting engineer contact Kim Fleming, Development Technologist II at 604-864-5689 or via email at kflemming@abbotsford.ca in regard to this report and any other servicing matters relating to this application.

REQUIREMENTS

Additional dedications, SRWs, works, features or limits of construction may be needed as identified through the design and construction phases.

Drainage Collection and Disposal

On Maclure Road and Sumas Way, along the full frontage of the Lands from the east property line to the west property line and westward to Sumas Way, design and construct a storm drainage system to accommodate flow from its catchment area per analysis results. Consult regulatory agencies for discharging flow to watercourses.

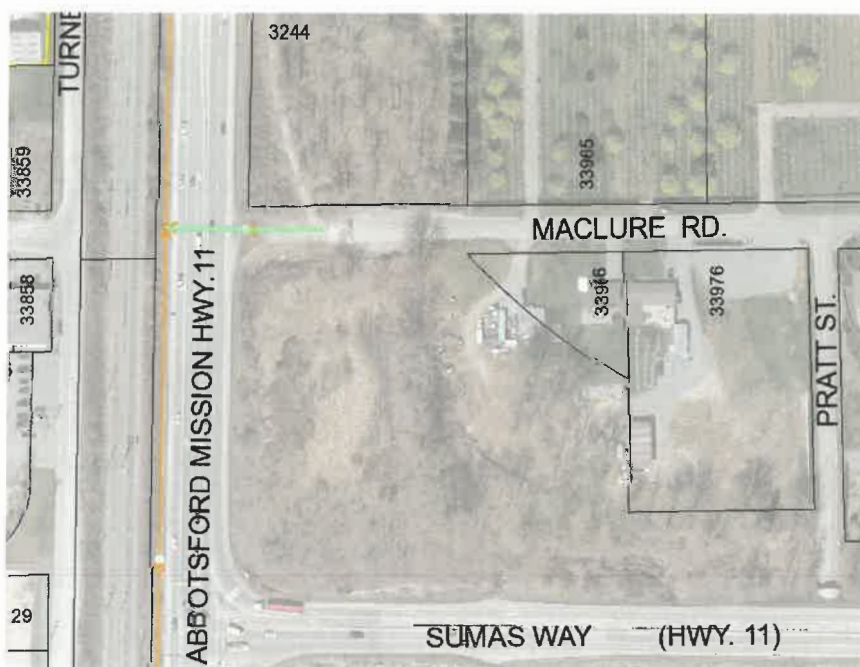
Provide detention for runoff from any new roads. Pre-treat runoff from paved surfaces prior to discharging to the proposed detention facilities and City's drainage system.

Prior to any further development on the Lands, provide an updated storm water management plan showing how drainage on the Lands will be accommodated including detention. All storm water works and services including new installations and upgrades to existing offsite systems required by the updated storm water management plan shall be designed and constructed in accordance with said updated storm water management plan.

Portions of the above noted works may be eligible for Latecomer Charges. (900-9-01)

Sewage Collection and Disposal

On Maclure Road, the applicant shall extend the existing sanitary stub at Abbotsford Mission Hwy 11 and Maclure Road up to the east property line of the subject properties and connect to it to service the proposed development. The stub and the sewer main (Asset IDs: 161311, 161312 shown in the sketch below) crossing under Hwy 11 shall be CCTV inspected and inspection records shall be submitted to Engineering for review and acceptance before connecting the proposed development.



Due to significant increase in the proposed density, the applicant shall pay \$31,500 cash-in-lieu towards the future Highway 11 and Industrial Avenue trunk sewer upgrade.

The applicant shall submit a servicing plan not just for the subject development but also for the entire stretch of properties on Maclure Road between the subject development and Hwy 11.

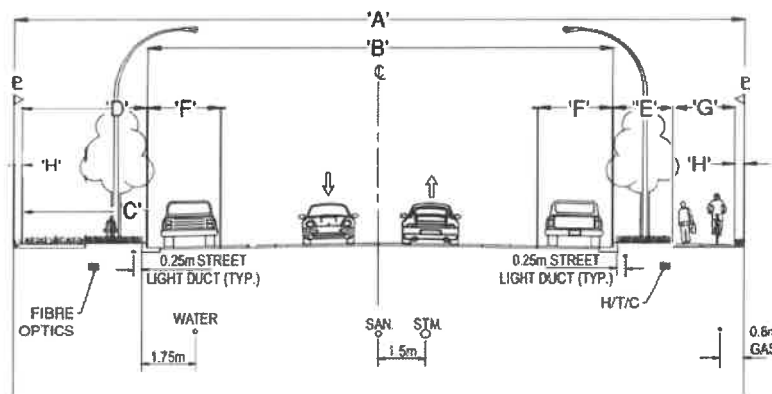
Portions of the above noted works may be eligible for Latecomer Charges. (900-9-01)

Urban Roadways - Construction

On Maclure Road, along the full frontage of the Lands from the east property line to the west property line, construct a full Urban Modified Multi-Family local standard road with Urban Highway design features as per the Modified Multi-Family Standard Drawing below, including;

- barrier curb and gutter on the both sides;
- 11.4 m wide asphalt roadway;
- 3.0 m wide Multi use path (MUP) on the south side;
- LED street lighting;
- Traffic signage;
- Traffic lane markings;
- soil(s) to support street trees on both sides;
- boulevard improvements on the both sides; and
- associated drainage.
- Provide a 3m wide Multi Use Path crossing with elephant feet and green conflict paint at the intersection with Park Lane connecting the Parks trail exit from the north side to the MUP on the south side at Maclure Rd.

Modified cross-sections for PRJ22-107



ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	BLVD (NORTH SIDE)	BLVD (SOUTH SIDE)	PARKING LANE	MUP	BOW TO PL
	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'
MACLURE RD: MODIFIED MULTI-FAMILY LOCAL	18.7	11.4	2.2	2.2	1.8	2.2	3.0	0.15

Construction is required for a new intersection of Maclure Road and Elmwood Drive to provide access to proposed development. Provide sidewalk connection east of the new intersection to existing sidewalk fronting 34230 Elmwood Drive (or nearest bus stop). Maclure Rd to have stop control.

From the new intersection of Maclure Road extension and Elmwood Drive to Maclure Road, construct a full Urban Modified Multi-Family Standard road with Urban Highway design features as per the Modified Multi-Family Standard Drawing above, including;

- barrier curb and gutter on the both sides;
- 11.4 m wide asphalt roadway;
- 3.0 m wide Multi use path (MUP) on the south and east side;
- LED street lighting;
- Traffic signage;
- Traffic lane markings;
- soil(s) to support street trees on both sides;
- boulevard improvements on the both sides; and
- associated drainage.

A geotechnical report shall be submitted with any roadway design, confirming the structural adequacy of any existing roadway and/or new roadway being constructed by the Developer.

The above noted works may be eligible for Latecomer Charges. (900-9-01)

Access

Pratt St tunnel is for cyclist and pedestrian traffic only. Emergency access to proposed development is needed.

Review the loading and turning movements of delivery (HSU), moving, garbage and fire trucks. Please ensure all trucks and emergency vehicles have enough clearance to access the site for fire hydrant, loading, or emptying garbage bins.

- Trucks cannot block City's sidewalk and/or roadway during loading.
- Truck cannot cross centreline onto oncoming traffic to make a turn.
- A minimum of 0.5 m offset should be allowed between the vehicular envelope and edge of pavement, and maintain a minimum of 0.3 m offset to centerline of street.
- Slope of access routes cannot exceed 6% grade.

Develop and submit a waste collection plan including the following:

- Illustrate the locations of garbage/recycling room(s) and collection/loading area(s).
- Ensure doorways have adequate width for wheeling the bin to the loading area(s).
- Review the swept path of garbage trucks ingress and egress to the site including within the building if garbage room is within parkade.
- Trucks are not permitted to block City's sidewalk and/or roadway during loading.
- Trucks reversing from or onto City roadways is not permitted.
- Provide an area free of conflicting traffic within the driveway for a distance of 6 m minimum.

Driveway departure sight distance must be demonstrated at design speed for intersecting roadway.

Driveway width to be a maximum of 9.0 meters.

Trail construction

Construct a realigned portion of Discovery Trail shown below in red to the Multi Use Trail Standard CS-TR- 1. Construct the secondary trail in the trees built to a Nature Trail Standard CS-TR-4, per the Development Bylaw. Trails are to be in the general alignment shown on the image below but field fit with Parks Planning and Parks Operations staff prior to construction. Decommission old trail.



Power/Telecommunications

Service Connection:

Provide underground power and telecommunications services from the distribution system to the property line.

Required Covenants, Easements and Rights-of-way

- Infiltration and/or Detention rights-of-way (PL-201)
- On-site water meters rights-of-way (PL-202)

Rezoning Development Agreement Preparation Fee

Pay \$500 Development Agreement preparation fee.

Works & Services Security & Warranty Deposit

Provide as Security Deposit, the estimated construction cost plus 50% for engineering (min \$25,000) and 5% for as-constructed drawings (minimum \$15,000) in cash or letter of credit.

Administration & Inspection Fee

Pay 5% of the first \$300,000 + 3% of the remainder of the estimated construction cost for administration and inspections.

City Services Fees

Tie-in inspection fee (\$50 per inspection) for water, sanitary, and storm sewer services.

Water meters supplied, delivered, and installed by the City's Water Operations Department (per Fees and Charges Bylaw, 2006, Amendment Bylaw No. 32)

Regular Service Meter:

- Up to and including 18mm (3/4") meter	\$470.00
- 25 mm (1") meter	\$635.00
- 38 mm (1 1/2") meter	\$1,055.00
- 50 mm (2") meter	\$1,370.00

Water and sewer main connections and wet taps are supervised and/or performed by City crews at the developer's expense and payable upon invoice.

Street and traffic signs are supplied and installed by the City at the developer's expense and payable upon invoice.

Latecomer Charges - receivable *Policy 900-9-01*

The Developer is required to submit an acceptable Latecomer Report prior to Latecomer Charges being enacted.

FUTURE CONSIDERATIONS

Upon further development an additional works and services review will apply related to that application. Listed below are some items to consider.

Bylaws

- the applicant is to be familiar with the Development Bylaw to ensure an understanding of possible future Works and services that may impact the development
- the applicant is to review the Works and Services identified in the Development Agreement and how they may impact the building.

Stormwater Management

- Provide onsite detention for 1 in 100-year rainfall events with a maximum allowable release rate of 5L/s/ha to reduce peak flow to downstream lowland area where experienced flooding during raining seasons. The detention facilities are to be a privately owned and maintained.
- Provide detention for runoff from any new roads. Pre-treat runoff from paved surfaces prior to discharging to the proposed detention facilities and City's drainage system.

Traffic Management

- the increase in vehicle traffic will be reviewed for its impact on the access and nearest intersections. Access may be restricted.
- road dedications, statutory rights-of-way and easements to accommodate the works and lot grading may require adjustments to the placement or size of the building.

Service Connections

- water, sanitary and storm connections may have specific tie in locations. Review and confirm locations prior to design.
- calculations related to the required domestic and fire water demand will be reviewed. There may be a service, meter or flow restrictions.
- Fire Department review may result in geometric changes to onsite roadways, additional fire hydrants, emergency access and building placement.
- Provide underground power and telecommunications services from the distribution system to the proposed building(s).

Development Cost Charges.

- Development Cost Charges are applicable at Building Permit.

Lot Grading

- A Lot Grading Plan is required. Final lot grading shall conform to City's Development Bylaw Schedule "I" Lot Grading Standards. Any retaining walls that the Developer or Consulting Engineer consider are necessary to effectively grade the Lands to prevent negative impacts on finished neighbouring Lands, either existing or proposed, shall be constructed by the Developer. The standard "Lot Grading Covenant shall be registered against title to all proposed lots.



DEVELOPMENT ENGINEERING DIVISION

- Lot grading shall also provide for the collection of surface runoff and other drainage that will discharge to the City Drainage system. Lot grading may be designed to allow for surface sheet flows or collected in swales and directed to lawn basins as necessary to the satisfaction of the General Manager, Engineering & Regional Utilities. Any collection of surface flows to a concentrated point discharge location shall include provision for easements or rights-of-way across impacted Lands as necessary. All lot grading shall be designed to take care of surface flows emanating from onsite grading.

Building Permit Submissions

- In order to avoid delays in receipt of building permits, the builder shall be responsible for ensuring that building permit applications on the Lands conform to the intent of the accepted Lot Grading Plan(s) prior to submission to the City.
- The developer or their designate shall review and approve building permit applications prior to submission to the City. When submitted, the building permit plans shall provide lot grading information that shall, at time of final inspection for building occupancy or approval, comply with the accepted Lot Grading Plan or the intent of the lot grading design accepted by the General Manager, Engineering & Regional Utilities prior to construction.

Arboricultural Inventory and Report

For:
Infinity Group

Site Location:
34084, 34098, 34118, 34138,
34144 and 34164 Maclure Road
Abbotsford, BC

To be submitted with Management Plan dated
November 15, 2021

Submitted to:
Infinity Group
205-6360 202nd Street
Langley BC
V2Y 1H2

Date: August 25, 2021
Revised: November 15, 2021

Submitted by:



The following Diamond Head Consulting staff conducted the on-site tree inventory and prepared or reviewed the report.

All general and professional liability insurance and staff accreditations are provided below for reference.

Supervisor:



Max Rathburn | Principal | Arboriculture Manager | Senior Arborist
ISA Certified Arborist (PN-0599A)
ISA Tree Risk Assessment Qualified (TRAQ)
BC Parks Wildlife and Danger Tree Assessor

Project Staff:



Mitch Davis, TFT
ISA Certified Arborist (PN-9077A)
ISA Tree Risk Assessment Qualified (TRAQ)

Please contact us if there are any questions or concerns about the contents of this report.

Contact Information:

Phone: 604-733-4886
Fax: 604-733-4879
Email: max@diamondheadconsulting.com
Website: www.diamondheadconsulting.com

Insurance Information:

WCB: # 657906 AQ (003)
General Liability: Northbridge General Insurance Corporation - Policy #CBC1935506, \$10,000,000
Errors and Omissions: Lloyds Underwriters – Policy #1010615D, \$1,000,000

Scope of Assignment:

Diamond Head Consulting Ltd. (DHC) was retained to complete an arboricultural assessment to supplement the proposed development application for 34084, 34098, 34118, 34138, 34144 and 34164 Maclure Road, Abbotsford. This report contains an inventory of protected on and off-site trees and summarizes management recommendations with respect to future development plans and construction activities. Off-site trees are included because pursuant to municipal by-laws, site owners must include the management of off-site trees that are within the scope of the development. This report is produced with the following primary limitations, detailed limitations specified in Appendix 7:

- 1) Our investigation is based solely on visual inspection of the trees during our last site visit. This inspection is conducted from ground level. We do not conduct aerial inspections, soil tests or below grade root examinations to assess the condition of tree root systems unless specifically contracted to do so.
- 2) Unless otherwise stated, tree risk assessments in this report are limited to trees with a *high* or *extreme* risk rating in their current condition, and in context of their surrounding land use at the time of assessment.
- 3) The scope of work is primarily determined by site boundaries and local tree-related bylaws. Only trees specified in the scope of work were assessed.
- 4) Beyond six months from the date of this report, the client must contact DHC to confirm its validity because site base plans and tree conditions may change beyond the original report's scope. Additional site visits and report revisions may be required after this point to ensure report accuracy for the municipality's development permit application process. Site visits and reporting required after the first submission are not included within the original proposal fee and will be charged to the client at an additional cost.

The client is responsible for:

- Reviewing this report to understand and implement all tree **risk**, removal and protection requirements related to the project.
- Understanding that we did not assess trees off the subject property and therefore cannot be held liable for actions you or your contractors may undertake in developing this property which may affect the trees on neighboring properties.
- Obtaining a tree removal permit from the relevant municipal authority prior to any tree cutting.
- Obtaining relevant permission from adjacent property owners before removing off-site trees and vegetation.
- Obtaining a timber mark if logs are being transported offsite.
- Ensuring the project is compliant with the tree permit conditions.
- Constructing and maintaining tree protection fencing.
- Ensuring an arborist is present onsite to supervise any works in or near tree protection zones.

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1.0 Introduction

1.1 Site Overview

The subject site is comprised of four adjacent residential lots making up an area of approximately 7.12 acres. Each lot is occupied by a dwelling which is accessed by a gravel driveway from the north via Maclure Road. In addition to the dwellings, several outbuildings (garages, sheds etc.) are scattered throughout the site.

Vegetation in the area can be organized into three distinct areas. The first being rows of large mature conifer and deciduous trees (Western Red Cedar, Douglas Fir, Norway Spruce, and Lombardy Poplar) along the northern border running parallel and perpendicular to Maclure Road; the second composed of various ornamental coniferous and deciduous species concentrated around the dwellings; and the last composed of a stand of mixed age Alder, Cottonwood, and Bigleaf Maple trees along the southern border.

1.2 Proposed Land Use Changes

The proposed development consists of demolishing current on site structures and the construction of 142 residential units. In preparing this report, we reviewed the following information:

- One site survey created by Onderwater Land Surveyors Ltd. dated April 20, 2021.
- One site plan created by Focus Architecture Incorporated dated August 13, 2021.

1.3 Report Objective

This report has been prepared to ensure the proposed development is compliant with the Abbotsford Tree Protection Bylaw, 2010, No. 1831-2009. Refer to Bylaw No. 1831-2009 for the complete definition of protected trees, summarized below as:

- Trees that have reached a height of at least 4 m above grade and have a DBH of at least 20 cm (dbh, measured at 1.4 m above grade) for a single stem or summed cumulatively for multiple stems;
- Trees of any size growing in a tree retention area.

Additionally, any neighbouring trees with a tree protection zone that extends into the subject site have been captured in the arborist report.

This report outlines the existing condition of protected trees on and adjacent to the property, summarizes the proposed tree retention and removal, and suggests guidelines for protecting retained trees during the construction process.



Figure 1. 34084, 34098, 34118, 34138, 34144 and 34164 Maclure Road, Abbotsford.

2.0 Process and Methods

Mitch Davis of DHC visited the site on August 10 and 11, 2021. The following methods and standards are used throughout this report.

2.1 Tree Inventory

Trees on site and trees shared with adjacent properties were marked with a numbered tag and assessed for attributes including: species; height measured to the nearest meter; and, diameter at breast height (DBH) measured to the nearest centimeter at 1.4 m above grade. Off-site trees were inventoried, but not tagged. The general health and structural integrity of each tree was assessed visually and assigned to one of five categories: *excellent*; *good*; *moderate*; *poor*; or *dying/dead*. Descriptions of the health and structure rating criteria are given in Appendix 3.

Tree retention value, categorized as *high*, *medium*, *low*, or *nil*, was assigned to each tree or group of trees based on their health and structure rating, and potential longevity in a developed environment. Descriptions of the retention value ratings are given in Appendix 4. Recommendations for tree retention or removal were determined by taking in to account a tree's retention value rating, its location in relation to proposed building envelopes and development infrastructure.

2.2 Tree Risk Assessment

Tree risk assessments were completed following methods of the ISA Tree Risk Assessment Manual¹ published in 2013 by the International Society of Arboriculture, which is the current industry standard for assessing tree risk. This methodology assigns risk based on the likelihood of failure, the likelihood of impact and the severity of consequence if a failure occurs. Only on-site hazard trees that had *high* or *extreme* risk ratings in their current condition and in context of their surrounding land use were identified and reported in section 3.2. Appendix 5 gives the likelihood and risk rating matrices used to categorize tree risk. DHC recommends that on-site trees be re-assessed for risk after the site conditions change (e.g. after damaging weather events, site disturbance from construction, creation of new targets during construction or in the final developed landscape).

2.3 Tree Protection and Replacement

Tree protection zones were calculated for each tree according to the City of Abbotsford's minimum requirements for fencing to dripline but may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions.

The number of replacement trees has been calculated based on the number of protected trees removed and their size according to the specifications in Bylaw No. 1831-2009.

¹ Dunster, J.A., Smiley, E.T., Matheny, N. and Lilly, S. (2013). Tree Risk Assessment Manual. *International Society of Arboriculture*. Champaign, Illinois.

3.0 Findings: Tree Inventory and Risk Assessment

3.1 Tree Inventory

The complete tree inventory is given in Appendix 1.

Trees On-site

There were 106 protected trees on the site. In total, 102 protected trees are recommended for removal and 4 are recommended for retention on the site as part of this development proposal (see Appendix 1 for individual tree inventory information).

Of the on-site trees, 3 have good or excellent health and structure; they have high retention value and potential longevity in an urban landscape. A further 72 trees have moderate health and structure and have medium retention value, but may require remedial work to promote their health and structural integrity if retained. 31 trees have poor health and structure or are dying/dead and have low retention value.

Trees on Adjacent Properties

There were 25 privately owned off-site trees with tree protection zones extending into the subject site. All 25 privately owned off-site trees are recommended for retention.

There were 4 trees identified as having shared ownership between the subject site neighboring private properties. Of the shared trees, 1 is recommended for removal and three are recommended for retention.

There were 33 City trees with tree protection zones extending into the subject site. In total, 29 City owned trees are recommended for removal and 4 are recommended for retention.

3.2 Tree Risk Assessment

There were no trees on this site that posed a *high* or *extreme* risk at the time of assessment.

4.0 Tree Replacement

The City of Abbotsford requires tree replacements for trees that are removed. Table 1 summarizes the anticipated tree replacement requirements based on the number and size of trees planned for removal.

Table 1. Tree replacement summary (excludes dead or hazard trees).

	20-30 cm trees to be removed @ 2:1	>30 cm trees to be removed @3: 1	Required tree replacements*
On-site	17 x 2 = 34	85 x 3 = 255	289
Private off-site	0 x 2 = 0	1 x 3 = 3	3
City	6 x 2 = 12	22 x 3 = 66	78
Total replacements			370 (trees) 6 cm caliper deciduous or 3 m tall coniferous, required as compensation for trees removed.

5.0 Discussion and Summary

5.1 Trees On-site

Due to the full site coverage of the proposed development, the opportunities for on site tree retention are extremely limited. As such, the only on-site trees recommended for retention are those within the setback along the southern edge.

5.2 Trees on Adjacent Properties

Except for trees City29, City30, City31, and City-32, all other city owned trees along Maclure Road have been recommended for removal. Note these trees growing along the Maclure Road frontage have crowns and root zones that will be damaged by the proposed construction. In addition many of the small trees within this group are small and reliant on the large trees for wind force support and will need to be remove if the large dominant trees are removed. This Permission must be granted by the city prior to removing any city owned tree recommended for removal

All the off-site trees along the southern setback have been recommended for retention. Furthermore, arborist supervision is required for any work with the 1.5m of the TPZs of trees OS08 to OS17.

Appendix 1 Complete Tree Inventory Table

The complete tree inventory below contains information on tree attributes and recommendations for removal or retention. Tree ownership in this inventory table is not definitive, its determination here is based on information available from the legal site survey, GPS locations, and field assessment during site visits. Tree protection Zones are measured from the outer edge of a tree's stem and are generally used to delineate the Tree Protection Zone. If using these measurements for mapping the tree protection zone, ½ the tree's diameter must be added to the distance to accommodate a survey point at the tree's center. Where Tree Protection Zones are proposed to vary from the minimum municipal TPZ, comments will be included in the Retention/TPZ comments and shown on the Tree Retention and Removal Plan.

*TPZ is the tree protection zone size required by the relevant municipal bylaw or, if not defined, the project arborist.

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8200	On Site	Western Red Cedar	Thuja plicata	30	12	Poor	Growing as part of row. Multiple stems union at base. Fused to 1.5m. Assumed offsite at time of assessment. Not tagged.	Low	Remove	In conflict with proposed development.	1.8
Surveyed	8200-1	On Site	Western Red Cedar	Thuja plicata	100	20	Moderate	Growing as part of row. Multiple stems union at base. Fused to 1.5m. Assumed offsite at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	6
Surveyed	8200-2	On Site	Western Red Cedar	Thuja plicata	70	20	Moderate	Growing as part of row. Multiple stems union at base. Fused to 1.5m. Assumed offsite at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	4.2
Surveyed	8200-3	On Site	Western Red Cedar	Thuja plicata	60	20	Moderate	Growing as part of row. Multiple stems union at base. Fused to 1.5m. Assumed offsite at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	3.6
Surveyed	8200-4	On Site	Western Red Cedar	Thuja plicata	100	20	Moderate	Growing as part of row. Multiple stems union at base. Fused to 1.5m. Assumed offsite at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	6

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8200-5	On Site	Western Red Cedar	Thuja plicata	70	20	Moderate	Growing as part of row. Multiple stems union at base. Fused to 1.5m. Assumed offsite at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	4.2
Surveyed	8200-6	On Site	Fig	Ficus sp.	30	4	Moderate	Off site fig. Unable to see stem. DBH estimated. Crown reaches 1m onto site. Assumed offsite at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	1.8
Surveyed	8201	On Site	Norway Maple	Acer platanoides	86	20	Good	Well spaced. Maintained crown. Good structure. U shaped codom union at 2m. Good vigour.	High	Remove	In conflict with proposed development.	5.16
Surveyed	8202	On Site	Magnolia	Magnolia spp.	58	18	Moderate	Codom union at 1m. DBH 2x27cm. Some deadwood throughout crown.	Medium	Remove	In conflict with proposed development.	3.48
Surveyed	8203	On Site	Mulberry	Morus sp.	82	13	Poor	Codom union at dose. DBH 42 and 40cm. Large wounds as base of both stems, extensive decay,.	Low	Remove	In conflict with proposed development.	4.92
Surveyed	8204	On Site	Tree Of Heaven	Ailanthus altissima	170	24	Moderate	Multiple stems union at base. Unable to access around stem. DBH estimated 70, 60 and 40cm. Appears on-site/shared.	Medium	Remove	In conflict with proposed development.	10.2
Surveyed	8205	On Site	Tree Of Heaven	Ailanthus altissima	49	24	Moderate	Multiple stems union at 2m. Appears on-site/shared.	Medium	Remove	In conflict with proposed development.	2.94
Surveyed	8206	On Site	Tree Of Heaven	Ailanthus altissima	65	30	Moderate	Single stem. Appears on-site/shared.	Medium	Remove	In conflict with proposed development.	3.9

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8206-1	On Site	Tree Of Heaven	Ailanthus altissima	47	25	Moderate	Single stem. Assumed off site at time of assessment. Not tagged.	Medium	Remove	In conflict with proposed development.	2.82
Surveyed	8207	On Site	Cherry Laurel	Prunus laurocerasus	66	17	Moderate	Multiple stems union at base. DBH 4x24cm and 18cm. North of covered car port. Good vigour.	Medium	Remove	In conflict with proposed development.	3.96
Surveyed	8208	On Site	English Holly	Ilex aquifolium	60	16	Moderate	Multiple stems union at base. DBH 3x20cm. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.6
Surveyed	8209	On Site	Bitter Cherry	Prunus emarginata	32	25	Moderate	Growing on bank between properties. Single stem.	Medium	Remove	In conflict with proposed development.	1.92
Surveyed	8210	On Site	Western Hemlock	Tsuga heterophylla	61	13	Poor	Growing on bank between on site properties. Stone wall abutting west side of stem. Single straight stem. Appears to be topped at 13m.	Low	Remove	In conflict with proposed development.	3.66
Surveyed	8211	On Site	Sawara Cypress	Chamaecyparis pisifera	68	6	Poor	Stairs abutting west side of stem. Multiple stems union at base. Topped at 6m.	Low	Remove	In conflict with proposed development.	4.08
Surveyed	8212	Shared	Big-Leaf Maple	Acer macrophyllum	89	22	Moderate	Dead broken stem at 5m. Codom union at 5m. Moderate vigour.	Moderate	Remove	In conflict with proposed development. Permission from owner required to remove.	5.34

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8214	On Site	Paper Birch	Betula papyrifera	58	25	Moderate	Gravel piled up 1m on east side of stem. Some deadwood throughout crown. Good vigour.	Medium	Remove	In conflict with proposed development.	3.48
Surveyed	8215	On Site	Paper Birch	Betula papyrifera	100	15	Dying	Objects piled around stem. Unable to access around all of stem. Multiple stems union at base. DBH estimated.	Nil	Remove	Due to preexisting conditions.	6
Surveyed	8216	Shared	Black Cottonwood	Populus balsamifera ssp. trichocarpa	189	30	Moderate	Multiple stems union at base. DBH 3x63cm. Moderate vigour. Within riparian setback.	Medium	Retain	Protect as per TMP.	11.34
Surveyed	8217	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	85	30	Moderate	Objects piled around stem. Single stem. Unable to access. DBH estimated. Moderate vigour. Within riparian setback.	Medium	Retain	Protect as per TMP.	5.1
Surveyed	8218	On Site	Douglas-Fir	Pseudotsuga menziesii	101	30	Moderate	Growing at toe of small slope. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	6.06
Surveyed	8219	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	42	25	Moderate	Part of small decid stand. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.52
Surveyed	8220	On Site	Red Alder	Alnus rubra	22	20	Moderate	Part of small decid stand. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.32
Surveyed	8221	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	43	25	Moderate	Part of small decid stand. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.58
Surveyed	8222	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	32	18	Moderate	Part of small decid stand. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.92

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8223	On Site	Red Alder	Alnus rubra	30	18	Moderate	Part of small decid stand. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.8
Surveyed	8224	On Site	Red Alder	Alnus rubra	53	25	Moderate	Part of small decid stand. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.18
Surveyed	8225	On Site	Red Alder	Alnus rubra	40	20	Moderate	Part of small decid stand. Single stem. Moderate vigour. Wasp nest in front of tree. DBH estimated.	Medium	Remove	In conflict with proposed development.	2.4
Surveyed	8226	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	70	25	Moderate	Part of small decid stand. Single stem. Moderate vigour. Wasp nest in front of tree. DBH estimated.	Medium	Remove	In conflict with proposed development.	4.2
Surveyed	8227	On Site	Big-Leaf Maple	Acer macrophyllum	90	14	Poor	Topped at 5m. Extensive decay columns. kretschmaria deusta at site of failed codom at 1m.	Low	Remove	In conflict with proposed development.	5.4
Surveyed	8228	On Site	Walnut spp.	Juglans spp.	82	20	Moderate	Open grown. Topped at 8m. Decay cavities at old pruning sites. Moderate vigour.	Medium	Remove	In conflict with proposed development.	4.92
Surveyed	8229	On Site	Scouler's Willow	Salix scouleriana	60	13	Moderate	Multiple acute stems union at base. DBH 23, 19, and 18cm. Open grown, good vigour.	Medium	Remove	In conflict with proposed development.	3.6
Surveyed	8230	On Site	Big-Leaf Maple	Acer macrophyllum	110	22	Poor	kretschmaria deusta visible at wound on base. Historically topped at 10m. Moderate vigour.	Low	Remove	In conflict with proposed development.	6.6
Surveyed	8231	On Site	Cherry spp.	Prunus spp.	35	8	Moderate	Topped at 2m. Typical fruit tree form. Moderate vigour. Stem 2m east of dwelling.	Medium	Remove	In conflict with	2.1

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											proposed development.	
Surveyed	8232	On Site	Apple spp.	Malus spp.	85	10	Moderate	Topped at 4m. Typical fruit tree form. Decayed codom stems. Moderate vigour.	Medium	Remove	In conflict with proposed development.	5.1
Surveyed	8233	On Site	Apple spp.	Malus spp.	60	12	Moderate	Topped at 10m. Typical fruit tree form. Decayed codom stems. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.6
Surveyed	8234	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	113	25	Poor	Topped at 13m. Multiple poorly attached leaders at top. Moderate vigour.	Low	Remove	In conflict with proposed development.	6.78
Surveyed	8235	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	62	30	Moderate	Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.72
Surveyed	8236	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	136	30	Moderate	Codom union at base. DBH 2x68. Moderate vigour.	Medium	Remove	In conflict with proposed development.	8.16
Surveyed	8237	Shared	Black Cottonwood	Populus balsamifera ssp. trichocarpa	36	18	Poor	Significant S shaped stem. Poor vigour. Within riparian setback.	Low	Retain	Protect as per TMP.	2.16
Surveyed	8240	On Site	Big-Leaf Maple	Acer macrophyllum	78	25	Moderate	Growing at edge of property. Codom union at 1m fused to 2m. Good vigour.	Medium	Retain	Protect as per TMP.	4.68
Surveyed	8241	Shared	Big-Leaf Maple	Acer macrophyllum	144	30	Moderate	Growing at edge of property. Codom union at base fused to 2m. Some deadwood throughout crown. Good vigour.	Medium	Retain	Protect as per TMP.	8.64

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8242	On Site	Big-Leaf Maple	Acer macrophyllum	57	24	Moderate	Growing between gravel driveways. Kretch at base. Some deadwood throughout crown. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.42
Surveyed	8243	On Site	Sawara Cypress	Chamaecyparis pisifera	76	11	Poor	Growing between paved walkways. Multiple stems union at base. DBH 38, 20, and 18cm. Crown raised to 7m. Slight sweep north. Corrected.	Low	Remove	In conflict with proposed development.	4.56
Surveyed	8244	On Site	Douglas-Fir	Pseudotsuga menziesii	64	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.84
Surveyed	8245	On Site	Douglas-Fir	Pseudotsuga menziesii	67	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	4.02
Surveyed	8246	On Site	Douglas-Fir	Pseudotsuga menziesii	66	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.96
Surveyed	8247	On Site	Douglas-Fir	Pseudotsuga menziesii	45	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.7
Surveyed	8248	On Site	Douglas-Fir	Pseudotsuga menziesii	69	30	Moderate	Part of L shaped row of fir growing along Maclure rd. U shaped codom union at 3m. Moderate vigour.	Medium	Remove	In conflict with proposed development.	4.14
Surveyed	8249	On Site	Douglas-Fir	Pseudotsuga menziesii	66	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	3.96

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8250	On Site	Douglas-Fir	<i>Pseudotsuga menziesii</i>	115	33	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	6.9
Surveyed	8251	On Site	Deodar Cedar	<i>Cedrus deodara</i>	34	24	Moderate	Growing between gravel driveways. Well spaced. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.04
Surveyed	8252	On Site	Deodar Cedar	<i>Cedrus deodara</i>	77	30	Moderate	Growing between gravel driveways. Well spaced. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	4.62
Surveyed	8253	On Site	Colorado Blue Spruce	<i>Picea pungens</i>	36	18	Moderate	Part of row. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.16
Surveyed	8254	On Site	Colorado Blue Spruce	<i>Picea pungens</i>	30	15	Poor	Part of row. Single straight stem. Poor vigour.	Low	Remove	In conflict with proposed development.	1.8
Surveyed	8255	On Site	Colorado Blue Spruce	<i>Picea pungens</i>	27	10	Poor	Part of row. Single stem. Poor vigour.	Low	Remove	In conflict with proposed development.	1.62
Surveyed	8256	On Site	Colorado Blue Spruce	<i>Picea pungens</i>	40	8	Dying	Part of row. Single stem. Topped at 8m. Very poor vigour.	Low	Remove	In conflict with proposed development.	2.4
Surveyed	8257	On Site	Colorado Blue Spruce	<i>Picea pungens</i>	47	13	Poor	Codom union at 1m. DBH 32 and 15cm. Poor structure. Moderate vigour.	Low	Remove	In conflict with proposed development.	2.82
Surveyed	8258	On Site	Pacific Dogwood	<i>Cornus nuttallii</i>	44	14	Moderate	Well spaced. Wound 1m up north side of trunk. Good reaction growth. Some	Medium	Remove	In conflict with	2.64

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
								deadwood throughout crown. Moderate structure. Moderate vigour.			proposed development.	
Surveyed	8259	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	65	25	Moderate	Growing east of gravel driveway. Single stem. Moderate vigour. Unable to access stem. DBH estimated. Not tagged.	Medium	Remove	In conflict with proposed development.	3.9
Surveyed	8260	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	60	25	Moderate	Part of row growing on slope east of driveway. Single stem. Moderate vigour. Overgrown with blackberry. Unable to access stem. DBH estimated. Not tagged.	Medium	Remove	In conflict with proposed development.	3.6
Surveyed	8261	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	42	25	Moderate	Part of row growing on slope east of driveway. Single stem. Moderate vigour. Overgrown with blackberry. Unable to access stem. DBH estimated. Not tagged.	Medium	Remove	In conflict with proposed development.	2.52
Surveyed	8262	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	50	25	Moderate	Part of row growing on slope east of driveway. Single stem. Moderate vigour. Overgrown with blackberry. Unable to access stem. DBH estimated. Not tagged.	Medium	Remove	In conflict with proposed development.	3
Surveyed	8263	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	90	18	Moderate	Multiple stems union at base. Moderate vigour.	Medium	Remove	In conflict with proposed development.	5.4
Surveyed	8264	On Site	Big-Leaf Maple	Acer macrophyllum	200	30	Poor	Part of group. Many stems union at base. Decay at unions. Moderate vigour.	Low	Remove	In conflict with proposed development.	12

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8265	On Site	Big-Leaf Maple	Acer macrophyllum	65	20	Poor	Part of group. Multiple stems union at 1m. DBH 2x26 and 13cm. Decay columns up stems. Moderate deadwood throughout crown. Moderate vigour.	Low	Remove	In conflict with proposed development.	3.9
Surveyed	8266	On Site	Big-Leaf Maple	Acer macrophyllum	70	30	Moderate	Part of group. Single stem. Moderate vigour.	Low	Remove	In conflict with proposed development.	4.2
Surveyed	8267	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	35	20	Moderate	Open grown. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.1
Surveyed	8268	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	28	20	Moderate	Open grown. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.68
Surveyed	8269	On Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	30	20	Moderate	Open grown. Single stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.8
Surveyed	8270	On Site	Apple spp.	Malus spp.	24	7	Moderate	Growing in planted area. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.44
Surveyed	8271	On Site	Apple spp.	Malus spp.	26	7	Moderate	Open grown. Moderate vigour.	Medium	Remove	In conflict with proposed development.	1.56
Surveyed	8272	On Site	Norway Spruce	Picea abies	34	22	Poor	Part of group growing on slope. Single stem. Asymmetrical crown. Poor vigour.	Low	Remove	In conflict with proposed development.	2.04

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8273	On Site	Colorado Blue Spruce	Picea pungens	42	20	Moderate	Growing on slope. Single straight stem. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.52
Surveyed	8274	On Site	Magnolia	Magnolia spp.	34	5	Moderate	Open grown. Overgrown with grape vine. Moderate vigour.	Medium	Remove	In conflict with proposed development.	2.04
Surveyed	8275	On Site	Sawara Cypress	Chamaecyparis pisifera	50	12	Moderate	Growing 2m from pool deck. Unable to access pool area. DBH estimated. Not tagged. Good vigour.	Medium	Remove	In conflict with proposed development.	3
Surveyed	8276	On Site	Sawara Cypress	Chamaecyparis pisifera	60	18	Moderate	Growing 2m from pool deck. Unable to access pool area. DBH estimated. Not tagged. Good vigour.	Medium	Remove	In conflict with proposed development.	3.6
Surveyed	8277	On Site	Western Red Cedar	Thuja plicata	45	16	Poor	Growing on top of raised planted area. Brick retaining wall 0.5m from stem. Topped at 7m. Unable to access pool area. DBH estimated. Not tagged. Good vigour.	Medium	Remove	In conflict with proposed development.	2.7
Surveyed	8278	On Site	Western Red Cedar	Thuja plicata	55	16	Poor	Growing on top of raised planted area. Brick retaining wall 0.5m from stem. Topped at 7m. Unable to access pool area. DBH estimated. Not tagged. Good vigour.	Medium	Remove	In conflict with proposed development.	3.3
Surveyed	8279	On Site	Black Poplar	Populus nigra	64	25	Moderate	Part of row growing along edge of site. Single stem. Good vigour.	Medium	Remove	In conflict with proposed development.	3.84
Surveyed	8280	On Site	Black Poplar	Populus nigra	81	25	Moderate	Part of row growing along edge of site. Multiple stem unions through crown. Good vigour.	Medium	Remove	In conflict with	4.86

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											proposed development.	
Surveyed	8281	On Site	Black Poplar	Populus nigra	71	25	Moderate	Part of row growing along edge of site. Multiple stem unions through crown. Good vigour.	Medium	Remove	In conflict with proposed development.	4.26
Surveyed	8282	On Site	Black Poplar	Populus nigra	64	25	Moderate	Part of row growing along edge of site. Multiple stem unions through crown. Good vigour.	Medium	Remove	In conflict with proposed development.	3.84
Surveyed	8283	On Site	Black Poplar	Populus nigra	70	25	Moderate	Part of row growing along edge of site. Multiple stem unions through crown. Good vigour.	Medium	Remove	In conflict with proposed development.	4.2
Surveyed	8284	On Site	Black Poplar	Populus nigra	74	25	Poor	Part of row growing along edge of site. Multiple stem unions through crown. Large wound on west side of stem from base to 2m. Decay column present. Moderate vigour.	Low	Remove	In conflict with proposed development.	4.44
Surveyed	8285	On Site	Douglas-Fir	Pseudotsuga menziesii	50	27	Moderate	Growing on slope. Single straight stem. Full crown. Driveway 3m west of stem. Good vigour.	Medium	Remove	In conflict with proposed development.	3
Surveyed	8286	On Site	Birch spp.	Betula spp.	46	12	Poor	Multiple stems union at decayed base. DBH 20, 14, 12cm. Moderate vigour.	Low	Remove	In conflict with proposed development.	2.76
Unsurveyed	8287	On Site	Birch spp.	Betula spp.	43	12	Poor	Heavily decayed stem. Many weakly attached leaders at 3m. Moderate vigour.	Low	Remove	In conflict with proposed development.	2.58

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	8288	On Site	Big-Leaf Maple	Acer macrophyllum	84	28	Poor	Multiple large wounds up stem. Moderate reaction growth. Failed branches in crown.	Low	Remove	In conflict with proposed development.	5.04
Surveyed	8289	On Site	Paper Birch	Betula papyrifera	50	18	Poor	Open grown. Significant dieback from crown. Poor vigour. Unable to access animal enclosure. DBH estimated. Not tagged.	Low	Remove	In conflict with proposed development.	3
Surveyed	8290	On Site	Red Alder	Alnus rubra	62	22	Moderate	Growing on slope. Well spaced. Multiple acute unions at 2m. Good vigour.	Medium	Remove	In conflict with proposed development.	3.72
Surveyed	8291	On Site	Red Alder	Alnus rubra	30	22	Moderate	Growing on slope. Well spaced. Acute codom union at 1.5m. Good vigour.	Medium	Remove	In conflict with proposed development.	1.8
Unsurveyed	8292	On Site	Silver Birch	Betula pendula	22	5	Moderate	Topped at 5m. Well maintained crown. Single stem. Good vigour.	Medium	Remove	In conflict with proposed development.	1.32
Surveyed	8293	On Site	Silver Maple	Acer saccharinum	24	8	Poor	Topped at 4m. Poor branching. Moderate vigour.	Low	Remove	In conflict with proposed development.	1.44
Surveyed	8294	On Site	Silver Maple	Acer saccharinum	38	11	Poor	Topped at 4m. Codom union at 1.5m. Poor branching. Moderate vigour.	Low	Remove	In conflict with proposed development.	2.28
Surveyed	8295	On Site	Western Red Cedar	Thuja plicata	46	25	Good	Growing as pair. Full crown. Single straight stem. Good vigour.	High	Remove	In conflict with proposed development.	2.76
Surveyed	8296	On Site	Western Red Cedar	Thuja plicata	86	25	Moderate	Growing as pair. Full crown. Acute codom union at 1m. Moderate vigour.	Medium	Remove	In conflict with	5.16

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											proposed development.	
Surveyed	8297	On Site	Norway Spruce	Picea abies	28	12	Good	Open grown, full crown. Single straight. Good vigour.	High	Retain	Protect as per TMP.	1.68
Unsurveyed	8298	On Site	Big-Leaf Maple	Acer macrophyllum	80	15	Dead	Dead standing snag.	Nil	Remove	Due to preexisting conditions.	4.8
Surveyed	8299	On Site	Willow spp.	Salix spp.	43	10	Poor	Significant deadwood throughout crown. Moderate epicormic growth. Moderate vigour.	Low	Remove	In conflict with proposed development.	2.58
Surveyed	8300	On Site	Western Hemlock	Tsuga heterophylla	26	9	Poor	Part of group growing on slope in backyard. Topped at 4m.	Low	Remove	In conflict with proposed development.	1.56
Surveyed	8301	On Site	Western Hemlock	Tsuga heterophylla	26	9	Poor	Part of group growing on slope in backyard. Topped at 4m.	Low	Remove	In conflict with proposed development.	1.56
Surveyed	8302	On Site	Western Red Cedar	Thuja plicata	26	9	Poor	Part of group growing on slope in backyard. Growing at edge of a wooden retaining wall. Topped at 4m.	Low	Remove	In conflict with proposed development.	1.56
Surveyed	8303	On Site	Western Red Cedar	Thuja plicata	26	9	Poor	Part of group growing on slope in backyard. Growing at edge of a wooden retaining wall. Topped at 4m.	Low	Remove	In conflict with proposed development.	1.56
Surveyed	8304	On Site	Western Red Cedar	Thuja plicata	33	9	Poor	Part of group growing on slope in backyard. Growing at edge of wooden retaining wall. Topped at 4m.	Low	Remove	In conflict with proposed development.	1.98

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	OS01	Off Site	Big-Leaf Maple	Acer macrophyllum	50	22	Poor	Stem damaged at from base to 3m on west side. Moderate vigour.	-	Retain	Outside of scope of work.	3
Surveyed	OS02	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	65	30	Moderate	Single straight stem. Moderate vigour.	-	Retain	Outside of scope of work.	3.9
Unsurveyed	OS03	Off Site	Big-Leaf Maple	Acer macrophyllum	15	14	Moderate	Part of stand south of site. 1m from fence.	-	Retain	Protect as per TMP.	1.2
Surveyed	OS04	Off Site	Big-Leaf Maple	Acer macrophyllum	20	14	Moderate	Part of stand south of site. 1m from fence.	-	Retain	Protect as per TMP.	1.2
Surveyed	OS05	Off Site	Big-Leaf Maple	Acer macrophyllum	35	20	Moderate	Part of stand south of site. 1.5m from fence.	-	Retain	Protect as per TMP.	2.1
Surveyed	OS06	Off Site	Vine Maple	Acer circinatum	12	6	Moderate	Part of stand south of site. 1m from fence. Stem growing north into site.	-	Retain	Protect as per TMP.	1.2
Surveyed	OS07	Off Site	Big-Leaf Maple	Acer macrophyllum	40	20	Dying	Part of stand south of site. 1m from fence.	-	Retain	Protect as per TMP.	2.4
Surveyed	OS08	Off Site	Big-Leaf Maple	Acer macrophyllum	45	20	Moderate	Part of stand south of site. Multiple stems union at base. 1m from fence.	-	Retain	Protect as per TMP.	2.7
Surveyed	OS09	Off Site	Big-Leaf Maple	Acer macrophyllum	90	20	Moderate	Part of stand south of site. Multiple stems union at base. Some deadwood throughout crown. 1m from fence.	-	Retain	Protect as per TMP.	5.4
Surveyed	OS10	Off Site	Big-Leaf Maple	Acer macrophyllum	40	20	Moderate	Part of stand south of site. Multiple stems union at base. 1.5m from fence.	-	Retain	Protect as per TMP.	2.4

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Unsurveyed	OS11	Off Site	Big-Leaf Maple	Acer macrophyllum	37	20	Moderate	Part of stand south of site. Multiple stems union at base. 1.5m from fence.	-	Retain	Protect as per TMP.	2.22
Unsurveyed	OS12	Off Site	Bitter Cherry	Prunus emarginata	17	20	Moderate	Part of stand south of site. Single stem. 1m from fence.	-	Retain	Protect as per TMP.	1.02
Unsurveyed	OS13	Off Site	Big-Leaf Maple	Acer macrophyllum	40	20	Moderate	Part of stand south of site. Single stem. 1.5m from fence.	-	Retain	Protect as per TMP.	2.4
Unsurveyed	OS14	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	25	16	Moderate	Part of stand south of site. Multiple stems union at base. 1.5m from fence.	-	Retain	Protect as per TMP.	1.5
Unsurveyed	OS15	Off Site	Paper Birch	Betula papyrifera	38	18	Moderate	Part of stand south of site. Single stem. 1.5m from fence.	-	Retain	Protect as per TMP.	2.28
Unsurveyed	OS16	Off Site	Red Alder	Alnus rubra	18	14	Moderate	Part of stand south of site. Single stem. 1.5m from fence.	-	Retain	Protect as per TMP.	1.08
Unsurveyed	OS17	Off Site	Paper Birch	Betula papyrifera	30	18	Moderate	Part of stand south of site. Single stem. 1.5m from fence.	-	Retain	Protect as per TMP.	1.8
Unsurveyed	OS18	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	45	18	Moderate	Part of stand south of site. Single stem. 1.5m from fence.	-	Retain	Protect as per TMP.	2.7
Unsurveyed	OS19	Off Site	Paper Birch	Betula papyrifera	35	18	Moderate	Part of stand south of site. Single stem. 1.5m from fence.	-	Retain	Protect as per TMP.	2.1
Unsurveyed	OS20	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	30	18	Poor	Part of stand south of site. Stem extends 5m into site. 1.5m from fence.	-	Retain	Protect as per TMP.	1.8

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Unsurveyed	OS21	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	60	35	Moderate	Single straight stem. Moderate vigour. 2m from hedge at rear of site.	-	Retain	Protect as per TMP.	3.6
Unsurveyed	OS22	Off Site	Big-Leaf Maple	Acer macrophyllum	50	25	Moderate	Asymmetrical crown. Moderate vigour. 2m from hedge at rear of site.	-	Retain	Protect as per TMP.	3
Unsurveyed	OS23	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	37	30	Moderate	Single straight stem. Moderate vigour. 2m from hedge at rear of site.	-	Retain	Protect as per TMP.	2.22
Surveyed	OS 8213	On Site	Big-Leaf Maple	Acer macrophyllum	60	22	Moderate	Stem damaged at 1m on west side. Moderate vigour. Assumed on site at time of assessment.	-	Retain	Protect as per TMP.	3.6
Surveyed	OS 8238	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	63	25	Moderate	Growing at southern edge of property. Ownership uncertain. Single stem. Moderate vigour. Assumed on site at time of assessment. Within riparian setback.	-	Retain	Protect as per TMP.	3.78
Surveyed	OS 8239	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	72	25	Moderate	Growing at southern edge of property. Ownership uncertain. Single stem. Moderate vigour. Assumed on site at time of assessment. Within riparian setback.	-	Retain	Protect as per TMP.	4.32
Surveyed	City01	City	Western Red Cedar	Thuja plicata	88	20	Moderate	Growing as part of row. Multiple stems union at base.	-	Remove	Remove with rest of row. Permission from city required for removal.	5.28
Surveyed	City02	City	Western Red Cedar	Thuja plicata	55	20	Moderate	Growing as part of row. Multiple stems union at base.	-	Remove	Remove with rest of row. Permission from city	3.3

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											required for removal.	
Surveyed	City03	City	Western Red Cedar	Thuja plicata	10	8	Poor	Growing as part of row. Assumed offsite at time of assessment. Not tagged.	-	Remove	Remove with rest of row. Permission from city required for removal.	1.2
Surveyed	City04	City	Western Red Cedar	Thuja plicata	158	25	Moderate	Growing as part of row along Maclure rd. Multiple stems union at 2m. West side of crown pruned for line clearance.	-	Remove	In conflict with proposed development. Permission from city required for removal.	9.48
Surveyed	City05	City	Western Red Cedar	Thuja plicata	140	25	Moderate	Growing as part of row along Maclure rd. Multiple stems union at 1.5m.	-	Remove	In conflict with proposed development. Permission from city required for removal.	8.4
Surveyed	City06	City	English Oak	Quercus robur	14	5	Moderate	Growing as part of row along Maclure rd. Suppressed.	-	Remove	Remove with City05. Permission from city required for removal.	1.2
Surveyed	City07	City	Douglas-Fir	Pseudotsuga menziesii	114	30	Moderate	Growing as part of row along Maclure rd. Secondary stem union at 4m. Acute union.	-	Remove	In conflict with proposed development.	6.84

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											Permission from city required for removal.	
Surveyed	City08	City	Western Red Cedar	Thuja plicata	130	25	Moderate	Growing as part of row along Maclure rd. Multiple stems union at base. DBH 72 and 58cm.	-	Remove	In conflict with proposed development. Permission from city required for removal.	7.8
Surveyed	City09	City	Western Red Cedar	Thuja plicata	126	25	Moderate	Growing as part of row along Maclure rd. Multiple stems union at base. DBH 66, 60, and 60cm. Stem overgrown with ivy.	-	Remove	In conflict with proposed development. Permission from city required for removal.	7.56
Surveyed	City10	City	Big-Leaf Maple	Acer macrophyllum	130	22	Moderate	Growing as part of row along Maclure rd. Multiple stems union at base. DBH 70 and 60cm. Stem overgrown with ivy.	-	Remove	In conflict with proposed development. Permission from city required for removal.	7.8
Surveyed	City11	City	Big-Leaf Maple	Acer macrophyllum	57	22	Moderate	Growing as part of row along Maclure rd. Stem overgrown with ivy.	-	Remove	In conflict with proposed development. Permission from city required for removal.	3.42

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	City12	City	Apple spp.	Malus spp.	28	7	Poor	Growing as part of row along Maclure rd. Multiple stems union at 1.6m. Large pruning wound at base. Significant decay.	-	Remove	Remove with City13. Permission from city required for removal.	1.68
Surveyed	City13	City	Willow spp.	Salix spp.	77	15	Moderate	Growing as part of row along Maclure rd. Decay cavity 1m up north side of stem. Good structure. Good vigour.	-	Remove	In conflict with proposed development. Permission from city required for removal.	4.62
Unsurveyed	City14	City	Norway Spruce	Picea abies	15	5	Moderate	Growing beneath adjacent willow. Suppressed form.	-	Remove	Remove with City13. Permission from city required for removal.	1.2
Unsurveyed	City15	City	Lilac	Syringa reticulata	30	5	Moderate	Many stems. Coppice growth from larger stems pruned near base. Moderate vigour.	-	Remove	Remove with City13. Permission from city required for removal.	1.8
Unsurveyed	City16	City	Cypress (Unknown Species)	Cypress (Unknown species)	27	6	Poor	Growing in row along Maclure rd. Stump of decayed codom at base. Poor vigour.	-	Remove	Remove with City13. Permission from city required for removal.	1.62
Surveyed	City17	City	Big-Leaf Maple	Acer macrophyllum	84	15	Poor	Growing in row along Maclure rd. Acute codom union at 2m. Extensive decay column up south stem. Topped at 10m.	-	Remove	In conflict with proposed development.	5.04

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											Permission from city required for removal.	
Surveyed	City18	City	Douglas-Fir	Pseudotsuga menziesii	94	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem.moderate vigour.	-	Remove	In conflict with proposed development. Permission from city required for removal.	5.64
Surveyed	City19	City	Douglas-Fir	Pseudotsuga menziesii	46	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	-	Remove	Remove with rest of row. Permission from city required for removal.	2.76
Surveyed	City20	City	Douglas-Fir	Pseudotsuga menziesii	92	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	-	Remove	In conflict with proposed development. Permission from city required for removal.	5.52
Surveyed	City21	City	Douglas-Fir	Pseudotsuga menziesii	63	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	-	Remove	In conflict with proposed development. Permission from city required for removal.	3.78

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
Surveyed	City22	City	Douglas-Fir	Pseudotsuga menziesii	62	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Moderate vigour.	-	Remove	In conflict with proposed development. Permission from city required for removal.	3.72
Surveyed	City23	City	Douglas-Fir	Pseudotsuga menziesii	80	30	Moderate	Part of L shaped row of fir growing along Maclure rd. Single straight stem. Stem overgrown with ivy. Moderate vigour.	-	Remove	In conflict with proposed development. Permission from city required for removal.	4.8
Unsurveyed	City24	City	Common Hazelnut	Corylus avellana	56	6	Dying	Part of group growing on slope. Multiple stems union at base. SBH 7x8cm.	-	Remove	Due to pre- existing conditions. Permission from city required for removal.	3.36
Unsurveyed	City25	City	Common Hazelnut	Corylus avellana	56	6	Dying	Part of group growing on slope. Multiple stems union at base. SBH 7x8cm.	-	Remove	Due to pre- existing conditions. Permission from city required for removal.	3.36
Surveyed	City26	City	Norway Spruce	Picea abies	32	22	Poor	Part of group growing on slope. Single stem. Asymmetrical crown. Poor vigour.	-	Remove	In conflict with proposed development. Permission from city	1.92

Unsurveyed	Tag #	Location	Species Common Name	Botanical Name	DBH (cm)	Height (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
											required for removal.	
Surveyed	City27	City	Norway Spruce	Picea abies	37	22	Poor	Part of group growing on slope. Single stem. Asymmetrical crown. Large wound on north side of base from past codom failure. Poor vigour.	-	Remove	Remove with rest of group. Permission from city required for removal.	2.22
Surveyed	City28	City	Norway Spruce	Picea abies	21	20	Poor	Part of group growing on slope. Single stem. Asymmetrical crown. Poor vigour.	-	Remove	Remove with rest of group. Permission from city required for removal.	1.26
Surveyed	City29	City	Norway Spruce	Picea abies	40	18	Moderate	Row of well spaced spruce growing north of fence. Single straight stem. Moderate vigour.	-	Retain	Protect as per TMP.	2.4
Surveyed	City30	City	Norway Spruce	Picea abies	47	20	Moderate	Row of well spaced spruce growing north of fence. Single straight stem. Moderate vigour.	-	Retain	Protect as per TMP. Arborist supervision required during construction of driveway within TPZ.	2.82
Surveyed	City31	City	Norway Spruce	Picea abies	46	20	Moderate	Row of well spaced spruce growing north of fence. Single straight stem. Moderate vigour.	-	Retain	Protect as per TMP.	2.76
Unsurveyed	City32	City	Silver Maple	Acer saccharinum	92	24	Moderate	Large crown. Good structure. Good vigour. Lower west side of crown pruned for line clearance. Some dieback at top of crown.	-	Retain	Protect as per TMP.	5.52

Appendix 2 Site Photographs



Photo 1. Row of trees parallel Maclure Road City01-City11, Showing locations of trees within row.



Photo 2. Trees OS8213, OS01, and OS02, Showing locations. Pictured from right to left.



Photo 3. Deciduous stand, Example of size and species composition of stand along southern edge of site.



Photo 4. Row of trees parallel Maclure Road City12-City17, Showing locations of trees within row.



Photo 5. Row of trees parallel Maclure Road City18-City23, Showing locations of trees within row.



Photo 6. Row of trees parallel Maclure Road City29-City31, Showing locations of trees within row.



Photo 7. Tree City32, Showing location of tree at end of Maclure road.

Appendix 3 Tree Health and Structure Rating Criteria

The tree health and structure ratings used by Diamond Head Consulting summarize each tree based on both positive and negative attributes using five stratified categories. These ratings indicate health and structural conditions that influence a tree's ability to withstand local site disturbance during the construction process (assuming appropriate tree protection) and benefit a future urban landscape.

Excellent: Tree of possible specimen quality, unique species or size with no discernible defects.

Good: Tree has no significant structural defects or health concerns, considering its growing environment and species.

Moderate: Tree has noted health and/or minor to moderate structural defects. This tree can be retained, but may need mitigation (e.g., pruning or bracing) and monitoring post-development. A moderate tree may be suitable for retention within a stand or group, but not suitable on its own.

Poor: Tree is in serious decline from previous growth habit or stature, has multiple defined health or structural weaknesses. It is unlikely to acclimate to future site use change. This tree is not suitable for retention within striking distance of most targets.

Dying/Dead: Tree is in severe decline, has severe defects or was found to be dead.

Appendix 4 Tree Retention Value Rating Criteria

The tree retention value ratings used by Diamond Head Consulting provide guidance for tree retention planning. Each tree in an inventory is assigned to one of four stratified categories that reflect its value as a future amenity and environmental asset in a developed landscape. Tree retention value ratings take in to account the health and structure rating, species profile*, growing conditions and potential longevity assuming a tree's growing environment is not compromised from its current state.

High: Tree suitable for retention. Has a good or excellent health and structure rating. Tree is open grown, an anchor tree on the edge of a stand or dominant within a stand or group. Species of *Populus*, *Alnus* and *Betula* are excluded from this category.

Medium: Tree suitable for retention with some caveats or suitable within a group**. Tree has moderate health and structure rating, but is likely to require remedial work to mitigate minor health or structural defects. Includes trees that are recently exposed, but wind firm, and trees grown on sites with poor rooting environments that may be ameliorated.

Low: Tree has marginal suitability for retention. Health and structure rating is moderate or poor; remedial work is unlikely to be viable. Trees within striking distance of a future site developments should be removed.

Nil: Tree is unsuitable for retention. It has a dying/dead or poor health and structure rating. It is likely that the tree will not survive, or it poses an unacceptable hazard in the context of future site developments.

* The species profile is based upon mature age and height/spread of the species, adaptability to land use changes and tree species susceptibility to diseases, pathogen and insect infestation.

** Trees that are 'suitable as a group' have grown in groups or stands that have a single, closed canopy. They have not developed the necessary trunk taper, branch and root structure that would allow them to be retained individually. These trees should only be retained in groups.

Appendix 5 Risk Rating Matrices

Trees with a *probable* or *imminent* likelihood of failure, a *medium* or *high* likelihood of impacting a specified target, and a *significant* or *severe* consequence of failure have been assessed for risk and included in this report (Section 3.2). These two risk rating matrices showing the categories used to assign risk are taken without modification to their content from the International Society of Arboriculture Tree Risk Assessment Qualification Manual.

Matrix 1: Likelihood

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat Likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat Likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat Likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2: Risk Rating

Likelihood of Failure and Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very Likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat Likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Appendix 6 Construction Guidelines

Tree management recommendations in this report are made under the expectation that the following guidelines for risk mitigation and proper tree protection will be adhered to during construction.

Respecting these guidelines will prevent changes to the soil and rooting conditions, contamination due to spills and waste, or physical wounding of the trees. Any plans for construction work and activities that deviate from or contradict these guidelines should be discussed with the project arborist so that mitigation measures can be implemented.

Tree protection Zones

Tree protection zones (TPZs) are specifically intended to protect a tree's roots from negative construction impacts. TPZs are required to retain good health and vigor of the tree during development and in the future landscape. The TPZ boundary is measured as a radius in all directions from the outer surface of the tree's stem. The TPZ radius is determined by the extent of tree protection zones according to local municipal bylaw specifications and may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions.

Tree Protection Zones

Tree protection zones (TPZs) are fenced areas around the recommended TPZ. Within a TPZ, no construction activity, including materials storage, grading or landscaping, may occur without project arborist approval. Within the TPZ, the following are tree preservation guidelines based on industry standards for best practice and local municipal requirements:

- No soil disturbance or stripping.
- Maintain the natural grade.
- No storage, dumping of materials, parking, underground utilities or fires within TPZs or tree driplines.
- Any planned construction and landscaping activities affecting trees should be reviewed and approved by a consulting arborist.
- Install specially designed foundations and paving when these structures are required within TPZs.
- Route utilities around TPZs.
- Excavation within the TPZs should be supervised by a consultant arborist.
- Surface drainage should not be altered in such a way that water is directed in or out of the TPZ.
- Site drainage improvements should be designed to maintain the natural water table levels within the TPZ.

Tree Protection Fences

Prior to any construction activity, tree protection fences must be constructed at the tree protection zone perimeter. The protection barrier or temporary fencing must be at least 1.2 m in height and constructed of 2" by 4" lumber with orange plastic mesh screening. Tree protection fences must be

constructed prior to tree removal, excavation or construction and remain intact throughout the entire duration of construction.

Tree Crown Protection and Pruning

All heavy machinery (excavators, cranes, dump trucks, etc.) working within five meters of a tree's crown should be made aware of their proximity to the tree. If there is to be a sustained period of machinery working within five meters of a tree's crown, a line of colored flags should be suspended at eye-level of the machinery operator for the length of the protected tree area. Any concerns regarding the clearance required for machinery and workers within or immediately outside tree protection zones should be referred to the project arborist so that a zone surrounding the crowns can be established or pruning measures undertaken. Any wounds incurred to protected trees during construction should be reported to the project arborist immediately.

Unsurveyed Trees

Unsurveyed trees identified by DHC in the Tree Retention Plan have been hand plotted for approximate location only using GPS coordinates and field observations. The location and ownership of unsurveyed trees cannot be confirmed without a legal surveyed. The property owner or project developer must ensure that all relevant on- and off-site trees are surveyed by a legally registered surveyor, whether they are identified by DHC or not.

Removal of logs from sites

Private timber marks are required to transport logs from privately-owned land in BC. It is property owner's responsibility to apply for a timber mark prior to removing any merchantable timber from the site. Additional information can be found at: <http://www.for.gov.bc.ca/hth/private-timber-marks.htm>

Regulation of Soil Moisture and Drainage

Excavation and construction activities adjacent to TPZs can influence the availability of moisture to protected trees. This is due to a reduction in the total root mass, changes in local drainage conditions, and changes in exposure including reflected heat from adjacent hard surfaces. To mitigate these concerns the following guidelines should be followed:

- Soil moisture conditions within the tree protection zones should be monitored during hot and dry weather. When soil moisture is inadequate, supplemental irrigation should be provided that penetrates soil to the depth of the root system or a minimum of 30 cm.
- Any planned changes to surface grades within the TPZs, including the placement of mulch, should be designed so that any water will flow away from tree trunks.
- Excavations adjacent to trees can alter local soil hydrology by draining water more rapidly from TPZs more rapidly than it would prior to site changes. It is recommended that when excavating within 6 m of any tree, the site be irrigated more frequently to account for this.

Root Zone Enhancements and Fertilization

Root zone enhancements such as mulch, and fertilizer treatments may be recommended by the project arborist during any phase of the project if they deem it necessary to maintain tree health and future survival.

Paving Within and Adjacent to TPZs

If development plans propose the construction of paved areas and/or retaining walls close to TPZs, measures should be taken to minimize impacts. Construction of these features would raise concerns for proper soil aeration, drainage, irrigation and the available soil volume for adequate root growth. The following design and construction guidelines for paving and retaining walls are recommended to minimize the long-term impacts of construction on protected trees:

- Any excavation activities near or within the TPZ should be monitored by a certified arborist. Structures should be designed, and excavation activities undertaken to remove and disturb as little of the rooting zone as possible. All roots greater than 2 cm in diameter should be hand pruned by a Certified Arborist.
- The natural grade of a TPZ should be maintained. Any retaining walls should be designed at heights that maintain the existing grade within 20 cm of its current level. If the grade is altered, it should be raised not reduced in height.
- Compaction of sub grade materials can cause trees to develop shallow rooting systems. This can contribute to long-term pavement damage as roots grow. Minimizing the compaction of subgrade materials by using structural soils or other engineered solutions and increasing the strength of the pavement reduces reliance on the sub-grade for strength.
- If it is not possible to minimize the compaction of sub-grade materials, subsurface barriers should be considered to help direct roots downward into the soil and prevent them from growing directly under the paved surfaces.

Plantings within TPZs

Any plans to landscape the ground within the TPZ should implement measures to minimize negative impacts on the above or below ground parts of a tree. Existing grass layer in TPZs should not be stripped because this will damage surface tree roots. Grass layer should be covered with mulch at the start of the project, which will gradually kill the grass while moderating soil moisture and temperatures. Topsoil should be mixed with the mulch prior to planting of shrubs, but new topsoil layer should not be greater than 20 cm deep on top of the original grade. Planting should take place within the newly placed topsoil mixture and should not disturb the original rooting zone of the trees. A two-meter radius around the base of each tree should be left unplanted and covered in mulch; a tree's root collar should remain free from any amendments that raise the surface grade.

Monitoring during construction

Ongoing monitoring by a consultant arborist should occur for the duration of a development project. Site visits should be more frequent during activities that are higher risk, including the first stages of construction when excavation occurs adjacent to the trees. Site visits will ensure contractors are

respecting the recommended tree protection measures and will allow the arborist to identify any new concerns that may arise.

During each site visit the following measures will be assessed and reported on by a consulting arborist:

- Health and condition of protected trees, including damage to branches, trunks and roots that may have resulted from construction activities, as will the health of. Recommendations for remediation will follow.
- Integrity of the TPZ and fencing.
- Changes to TPZ conditions including overall maintenance, parking on roots, and storing or dumping of materials within TPZ. If failures to maintain and respect the TPZ are observed, suggestions will be made to ensure tree protection measures are remediated and upheld.
- Review and confirmation of recommended tree maintenance including root pruning, irrigation, mulching and branch pruning.
- Changes to soil moisture levels and drainage patterns; and
- Factors that may be detrimentally impact the trees.

Appendix 7 Report Assumptions and Limiting Conditions

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