



Addendum No. 1
City of Coquitlam
Tender No. 81364
Culvert CIPP Installation – Mundy Creek at Cape Horn Ave
(Consists of 47 Pages)
Issue Date: March 16, 2026

Tenderers shall note the following changes:

Revisions

1. Refer to: FORM OF TENDER

Remove: Appendix 1

Replace with: *Revised* – Appendix 1 – *Revision No. 1*

2. Refer to: AGREEMENT, Schedule 2, List of Drawings

ADD: Appendix F – Environmental Permit – Terms and Conditions

3. Refer to: AGREEMENT, Schedule 2, List of Drawings

ADD: Appendix G – Arborist Report and Tree Removals Plan

Contractor Questions/Clarifications

Q1) Has the Environmental Permit been approved for this work?

A1) Yes. Please refer to Appendix F – Environmental Permit – Terms and Conditions for details.

Q2) There seems to be a discrepancy in the pay items for milling and paving. Can you please clarify?

A2) Full-depth temporary pavement rehabilitation is included in pay item 12.02 – Supply and Install 3-600mm dia. C909 PVC Overflow Storm Pipes c/w clear crush bedding and wrapped in geotextile.

The Contractor is required to complete a surface mill (50mm) and overlay once all other work on the street is complete. Pay item 7.01 has been updated. Please refer to *Revised* – Appendix 1 – *Revision No. 1*.

Q3) How is the contractor to be paid for clearing and grubbing?

A3) Pay item 4.01 – Clearing and Grubbing has been added to the Schedule of Quantities and Prices, refer to *Revised* – Appendix 1 – *Revision No. 1*.

Q4) Is the Contractor required to install tree protection?

A4) No, tree protection is not required for this project.

Q5) Is the Contractor required to provide any replacement planting?

A5) The Contractor is required provide topsoil and hydroseed to all disturbed areas, but no other re-vegetation is required.

Q6) Can you please provide the flow rates/volumes for the existing 1200mm and 600mm storm pipes for bypass purposes?

A6) The City of Coquitlam does not have any flow data available.

Q7) How many metres is the upstream manhole on the 600mm pipe away from the 1200mm culvert?

A7) The City doesn't have any reliable records or asbuilt drawings for the 600mm storm main.

Q8) The 600mm storm pipe is not shown on the City of Coquitlam's GIS map. Can this pipe be plugged?

A8) No, the 600mm storm pipe must be maintained in its existing condition.

Q9) The Contract Documents state that one lane in each direction must be open to traffic at all times. Would the City allow single lane alternating traffic on Cape Horn Avenue?

A9) Single lane alternating traffic (SLAT) may be approved for this work if the Contractor can demonstrate how they will manage the traffic effectively. If the Contractor is not able to manage traffic with a SLAT setup then a single lane open in each direction will be required.

Q10) The location of the proposed 2400mm manhole is directly below power lines and will need to be craned in placed due to its weight. Can the location be moved to the north to avoid a conflict with the power lines?

A10) Yes, the 2400mm manhole can be shifted to the north to avoid being placed under the power lines. Please note that a section of the existing abandoned 400mm ductile iron watermain will have to be cut and removed, with both ends capped to complete this work.

Payment for cutting and capping of the abandoned watermain will be considered incidental to other work.

Q11) Would the City of Coquitlam accept a Thermoform PVC lining solution as an alternative to CIPP?

A11) No, Thermoform PVC lining will not be accepted as an alternative to CIPP lining for this project.

Q12) Can you please specify the location and access point to facilitate a site visit? Additionally, are there any specific permissions or coordination needed from the City to visit the site?

A12) The site is easily accessible at the inlet to the culvert, on the north side of Cape Horn Avenue. No special permissions or coordination is required to visit the site.

Q13) Can the City provide more details for the tree removals required for this project?

A13) Yes, please refer to Appendix G – Arborist Report and Tree Removals Plan for details. All tree removals are to be done under the supervision of a certified arborist, which will be provided by the City of Coquitlam.

Q14) Can the tender closing date be extended?

A14) No, tender closing date remains the same, March 19, 2026.

End of Addendum No. 1

Tenderers shall take into account the content of this Addendum in the preparation and submission of the Tender which will form part of the contract and shall be acknowledged on the Tender Form, Item 1.

Upon submitting a Tender, Tenderers will be deemed to have received notice of all Addenda that are posted on the City's website and deemed to have considered the information for inclusion in the Tender submitted.

Issued by:

Mark Pain
Manager Procurement
Email: bid@coquitlam.ca

Revised - APPENDIX 1 - Revision No. 1
FORM OF TENDER

Contract 81364
Culvert CIPP Installation - Mundy Creek at Cape Horn Ave

SCHEDULE OF QUANTITIES AND PRICES

(see paragraph 5.3.1 of the Instruction to Tenderers)

(All Tender and Contract Prices shall NOT include GST. GST will apply upon payment)

(Should there be any discrepancy in the information provided, the City's original file copy shall prevail)

| ITEM NO. | MMCD Ref./ (Supp. Specs) | DESCRIPTION | UNIT | QTY | UNIT PRICE | EXTENDED AMOUNT |
|-----------|-----------------------------|--|------------------------|-----|------------|-----------------|
| 1 | 01 55 00S | TRAFFIC CONTROL, VEHICLE ACCESS, AND PARKING | | | | |
| 1.01 | (1.5.1) | Traffic Control/Management | Incidental to Contract | | | |
| 2 | 01 57 01S | ENVIRONMENTAL PROTECTION | | | | |
| 2.01 | (1.6.1) | Environmental Protection (Erosion and Sediment Control), including bypass to complete the works, and all related works | Incidental to Contract | | | |
| 3 | 03 30 20S | CONCRETE WALK, CURBS AND GUTTERS | | | | |
| 3.01 | (1.4.3) | Concrete Curb and Gutter - MMCD C5 | l.m | 20 | | |
| 3.02 | (1.4.5) | Concrete Sidewalk, Driveways, Walkway connectors & Wheelchair Letdown - 100mm thick – broom finished c/w 100mm granular base and as shown and described in the Contract Documents | sq.m | 30 | | |
| 4 | 31 11 01S | CLEARING AND GRUBBING | | | | |
| 4.01 | (1.4.1) | Clearing and Grubbing, including tree removal as per Appendix G - Draft Arborist Report and Tree Removal Plan | l.s. | 1 | | |
| 5 | 31 37 10S | RIPRAP | | | | |
| 5.01 | (1.4.1) | Supply and Install Class 10 Rip Rap c/w excavation, filter fabric underlay, environmental protection, and geosynthetics installation | tonne | 20 | | |
| 6 | 32 01 16.7S | COLD MILLING | | | | |
| 6.01 | (1.5.1) | Surface Milling (50mm) | sq.m | 105 | | |
| 7 | 32 12 16S | HOT-MIX ASPHALT CONCRETE PAVING | | | | |
| 7.01 | (1.5.1) | Machine Laid MMCD Upper Course #1 - 50mm thick and keyed-in to existing asphalt | tonne | 12 | | |
| 7.02 | (1.5.1) | Machine Laid MMCD Upper Course #1 - 50mm thick - Asphalt Sidewalk | tonne | 2 | | |
| 8 | 32 17 23S | PAINTED PAVEMENT MARKINGS | | | | |
| 8.01 | (1.5.3) | Thermoplastic Pavement Marking Replacement | l.s. | 1 | | |
| 9 | 32 31 13S | CHAIN LINK FENCES AND GATES | | | | |
| 9.01 | (1.5.4) | Remove and reinstate W-beam barrier | l.s. | 1 | | |
| 10 | 32 92 19S | HYDRAULIC SEEDING | | | | |
| 10.01 | (1.8.2) | Hydraulic Seeding | sq.m | 430 | | |
| 11 | 33 05 24S | CURED IN PLACE PIPE LINERS | | | | |
| 11.01 | (1.9.1) | Supply and installation of structural liner to the 1200mm Concrete Storm Pipe c/w acceptable product description, structural design calculation, and all submissions (per MMCD Specification Section 33 05 24), all related works and as shown in Contract Documents | l.m | 86 | | |
| 11.02 | (1.9.12) | Cut protruding rebar from inside existing culvert, including all WCB regulations for confined space entry | l.s. | 1 | | |

| ITEM NO. | MMCD Ref./ (Supp. Specs) | DESCRIPTION | UNIT | QTY | UNIT PRICE | EXTENDED AMOUNT |
|-----------|-----------------------------|---|------|-----|------------|-----------------|
| 12 | 33 40 015 | STORM SEWERS | | | | |
| 12.01 | (1.6.2) | Supply and Install 710mm dia. HDPE DR17 Overflow Storm Pipe | l.m | 61 | | |
| 12.02 | (1.6.2) | Supply and Install 3-600mm dia. C909 PVC Overflow Storm Pipes c/w clear crush bedding and wrapped in geotextile | l.m | 22 | | |
| 12.03 | (1.6.2) | Supply and Install 150mm dia. Perforated PVC Pipe, c/w clear crush and filter fabric as per Detail D in the Contract Drawings | l.s. | 1 | | |
| 12.04 | (1.6.10) | Remove and reinstall front section of existing debris screen, and all related works and as shown in contract drawings | l.s | 1 | | |
| 13 | 33 42 135 | PIPE CULVERTS | | | | |
| 13.01 | (1.5.3) | Supply and Install dam-sac headwall, geosynthetics and backfill material (including excavation and disposal of spoil) | l.s. | 1 | | |
| 14 | 33 44 015 | MANHOLES AND CATCHBASINS | | | | |
| 14.01 | (1.5.1.1) | Supply and Install 2400mm Pre-benched Storm Manhole (c/w Base, Benching, Lid, Slab, Cover, Frame) | each | 1 | | |
| 14.02 | (1.5.7) | Locate Manhole and Install Location Marker | L.S. | 1 | | |

Total Tendered Price (exclude GST) \$ _____

(Transfer the amount to Form of Tender Summary Page 1)

Name of **Contractor:** _____

***Appendix F -
Environmental Permit -
Terms and Conditions***



March 3, 2026

Job Number: 136072
vFCBC Tracking Number: 100496672

City of Coquitlam
3000 Guildford WAY
Coquitlam, BC V3B 7N2

Sent via email: kbaron@coquitlam.ca

Dear City of Coquitlam,

Notice of Authorized Changes - Changes In and About a Stream (File 100496672)

Thank you for your Authorized Change Application for changes in and about a stream regarding the culvert stream crossing for the project on Mundy Creek, specifically:

- Repair existing 89 meter long by 1200 millimeter diameter concrete culvert with a cured-in-place pipe lining
- Installation of a 600 millimeter HDPE overflow pipe above the existing culvert.
- Placement of class 10 riprap at the outlet to protect the structure and stream channel from erosion.

The location of the works is at the following coordinate, as provided by the applicant:

- 49.2389930, -122.8237180

This letter acknowledges that the proposed activities meet the requirements as identified for Authorized Changes under the *Water Sustainability Regulation*, specifically Section 39(1)(a)(w).

All works shall be completed in accordance with the description of works and supporting documents provided in the Application.

This Authorized Change does not authorize entry onto private or Crown owned land. Permission of the affected landowner must be obtained and should be in writing for your protection.

All work shall be carried out in accordance with the Provincial "Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia"

<https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/wsa-cias-requirements-bmps.pdf>

and

"A Users' Guide for Changes In and About a Stream in British Columbia"

https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/wsa-cias-users_guide.pdf.

As the Habitat Officer under the *Water Sustainability Act*, I am requiring that the proposed changes in and about a stream be made in accordance with the following terms and conditions to protect fish, fish habitat, and/or water quality as per Section 42(2) of the *Water Sustainability Regulation*.

TERMS AND CONDITIONS:

a) THE TIMING WINDOW DURING WHICH THE CHANGE MAY BE MADE

1. As a Habitat Officer I authorize your instream works; permitting works from August 1, 2026 to September 15, 2026, with the conditions listed in the sections below.
2. Minimize the amount of time the work site is in a disturbed state by completing work as quickly as possible, while considering worker safety and minimizing environmental risk.

b) THE MINIMUM INSTREAM FLOW OR THE MINIMUM FLOW OF WATER THAT MUST REMAIN IN THE STREAM WHILE THE CHANGE IS BEING MADE

1. The natural rate of water flow must be maintained upstream and downstream of the worksite during all phases of instream activity.
2. Any pumps, pipes or conduits, or constructed ditches used to divert water around or through the worksite must be sized to divert the 1 in 10 year maximum daily flow for the period of construction.

c) THE REMOVAL OF MATERIAL FROM THE STREAM OR STREAM CHANNEL IN CONNECTION WITH THE CHANGE

1. The removal of material must not lead to stream channel instability or increase the risk of sedimentation into the watercourse.
2. Only remove materials from the channel as required to complete the culvert installation. Retain existing native instream and riparian vegetation, substrates and features surrounding the change.
3. All excavated material removed from the works area must be placed in a location and manner that prevents sediment or debris from entering the watercourse.

d) THE ADDITION OF SUBSTANCE, SEDIMENT, DEBRIS OR MATERIAL TO THE STREAM OR STREAM CHANNEL IN CONNECTION WITH THE CHANGE

1. Instream activities must be conducted in the dry, isolated from water flowing in the stream channel.
2. All equipment must be located and operated from the top of bank.

3. Equipment used in close proximity to the wetted perimeter must be free of deleterious material (e.g. hydrocarbons) and in good mechanical condition (e.g. no fuel or hydraulic leaks). If hydraulic machinery enters a stream, it must use environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and are readily or inherently biodegradable.
4. Fuelling and servicing of vehicles and heavy equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. All small equipment shall be equipped with drip trays. Keep a large and fully stocked mobile spill kit on site and train onsite staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Provincial Emergency Program 24-hour phone line at **1-800-663-3456**.
5. Design, install and maintain stream crossing structures to ensure that the streambed characteristics are retained or replicated and crossings do not restrict the cross-sectional area below the high water mark, change the stream gradient, or reduce or restrict fish passage.
6. All rock used in the works shall be clean and free of sediment producing material, durable, non-acid generating and suitably graded.
7. Ensure that all works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing construction materials will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into or about any watercourse. Concrete materials cast in place must remain inside sealed formed structures.
8. Erosion and sediment control structures are to be available onsite and utilized as necessary.

9. Construct any ditches, water bars, or water diversions within the work area so they do not directly discharge sediment-laden surface flows into the stream. Divert such flows to a vegetated area where flows can slowly infiltrate.

e) THE SALVAGE OR PROTECTION OF FISH OR WILDLIFE WHILE THE CHANGE IS BEING MADE OR AFTER THE CHANGE HAS BEEN MADE

1. A QEP is required to determine requirement for, plan, and implement fish and wildlife salvages prior to and during any instream and riparian works. Required permits must be obtained from the Ministry of Forests <https://portal.nrs.gov.bc.ca/web/client/home>.
2. Measures must be taken to ensure that equipment (e.g. water pumps) does not harm aquatic life (e.g. pump intakes should be appropriately screened).
3. As this work will be conducted in an area that overlaps with critical habitat for Western Painted turtle, an appropriately qualified professional must be retained to apply species specific Best Management Practices to avoid impacts to habitat and to ensure works will not interfere with critical breeding windows. If you cannot demonstrate avoidance of impacts to the species or their critical habitat, you must notify our office immediately as further offsetting and/or review may be required.
4. Do not disturb wildlife and/or their residences (e.g. beaver lodges) within the project area without proper authorization.

f) THE PROTECTION OF NATURAL MATERIALS AND VEGETATION THAT CONTRIBUTE TO THE AQUATIC ECOSYSTEM OR STREAM CHANNEL STABILITY

1. Minimize disturbance to natural materials (e.g. embedded logs) and vegetation that contribute to habitat or stream channel stability.
2. Minimize disturbance to existing vegetation on and adjacent to the stream banks.
3. Minimize clearing width at the crossing site, and retain streamside vegetation within the stream crossing right-of-way wherever possible.
4. Minimize or avoid disturbing soil and vegetation above and below the area required for actual construction of the stream crossing.

g) THE RESTORATION OF THE WORKSITE AFTER THE CHANGE HAS BEEN MADE

1. Grade disturbed areas to a stable slope after work is completed.
2. Revegetate any disturbed areas using non-invasive species appropriate for local conditions. Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.
3. Remove sediment and erosion control measures when deemed appropriate by the Qualified Professional following completion of the works.
4. Complete post-construction multi-year monitoring to ensure planted revegetation meets full survival.

h) THE REQUIREMENT TO OBTAIN AN APPROVAL FROM THE FEDERAL DEPARTMENT OF FISHERIES AND OCEANS IN CONNECTION WITH THE CHANGES

1. Proponents are responsible for complying with the federal *Fisheries Act*. No harmful alteration, disruption or destruction of fish habitat is authorized by this document, where harm is the death of fish or any permanent alteration to, or destruction of, fish habitat.
2. Fisheries and Oceans Canada (FOC) may authorize a net loss of fish habitat, where a mitigation/compensation package can be negotiated between FOC and the proponent.
3. Proponents are responsible for determining whether Fisheries and Oceans Canada (FOC) must be consulted and whether an authorization from FOC is required prior to making the change.

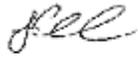
i) OTHER

1. The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works under this Notification. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. Reports are to be completed as outlined in Section 5.1 in the Best Management Practices and kept accessible by the Qualified Professional for no less than two years.

This document does not supersede the requirements of the *Water Sustainability Act* and Regulations, *Federal Fisheries Act* or any other related legislation. The proponent is obligated to comply with all applicable federal, provincial or municipal enactments. Further information on the *Water Sustainability Act*, Section 11 Change Approval and Authorization for "Changes In and About a Stream" can be found at: <http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water> and https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/south_coast_cias_guidance.pdf.

Retain a copy of this document on site during construction of the works.

Sincerely,



Joana Carroll
Senior Authorizations Technologist/Habitat Officer

Cc: mzhang@islengineering.com

***Appendix G -
Arborist Report and Tree
Removals Plan***

Arboricultural Inventory and Report

For:
ISL Engineering

Site Location:
Cape Horn Avenue
Culvert Rehab Project
Coquitlam, BC

To be submitted with Tree Management Plan
dated March 3, 2026

Submitted to:
Attn: Viraj Mann
ISL Engineering and Land Services Ltd.
201-3999 Henning Drive
Burnaby, BC V5C 6P9
Email: 604.629.2696

Date: March 3, 2026

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.

Senior Arborist:



Cody Laschowski
ISA Certified Arborist (PN-7870A)
ISA Tree Risk Assessment Qualified (TRAQ)
Certificate in Production Horticulture

Staff Arborist:



Mitch Davis
ISA Certified Arborist (PN-9077A)
ISA Tree Risk Assessment Qualified (TRAQ)
BC Parks Wildlife and Danger Tree Assessor

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: cody@diamondheadconsulting.com or mitch@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 the City of Coquitlam Cape Horn Avenue Culvert Rehab Project. This report has an inventory of trees and summarizes management recommendations with respect to future construction activities. The approximate location and general health of off-site trees are included, as a limited assessment, because there is a legal obligation to protect them. 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 said, 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. The time frame for assessment of the likelihood of failure is 2 years.
- 3) The scope of work is primarily decided by site boundaries. Only trees specified in the scope of work were inventoried.
- 4) Beyond six months or if there are significant changes to the site or to the trees, 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. Added site visits and report revisions may be needed after this point to ensure report accuracy for the municipality's development permit application process. Site visits and reporting needed 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:

- Obtaining a tree removal permit from the relevant authority prior to any tree cutting.
- Reviewing this report to understand and implement all tree **risk**, removal and protection requirements related to the project.
- Understanding that we have shown trees along the outskirts of the property boundary but not shrubs or other material that could be impacted by your contractors working at your property. The trees we have located are approximate locations and a legal survey is required to determine proper ownership of a tree. It is your responsibility to ensure that all plant material that may have roots passing property lines are protected.
- 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.
- Ensuring they (the client) carry out the risk mitigation recommendations in a reasonable time frame as noted in the Risk Rating Matrices.

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1.0 Introduction

1.1 Site Overview

The subject site is comprised of city owned park areas north and south of Cape Horn Avenue, near the intersection with United Boulevard. A stream enters an existing culvert near the northern edge of Cape Horn Avenue which runs underground and outflows approximately 80m to the southeast.

Throughout the site is a relatively sparsely populated pioneer deciduous stand dominated by Black Cottonwood (*Populus bal. tri*). With scattered inclusions of understory Red Alder (*Alnus rubra*) and Western Red Cedar (*Thuja plicata*).

1.2 Proposed Land Use Changes

The proposed development consists of excavating and rehabilitating the existing culvert that runs beneath Cape Horn Avenue. In preparing this report, we reviewed the following information:

- Site Plan. ISL Engineering. February 26, 2026.

1.3 Report Objective

This report has been prepared to ensure the proposed development is compliant with the City of Coquitlam Tree Management Bylaw No. 4091, 2010. Refer to Bylaw 4091 for the complete definition of protected trees, summarized below as:

- Living, erect, woody plants with a diameter equal to or greater than 20 cm (measured 1.4 m from the base of the tree stem) for a single stem or multiple trunks measured together;
- Living, erect, woody plant on a steep slope (>36%) that measures 5 or more metres in height;
- Replacement trees (or a tree planted or retained with a previous development related permit).
- Trees within a SPEA or on steep slopes.

Bylaw 4068 requires that arborist reports for development assess the health of **existing trees and undergrowth** within a Watercourse Protection DPA. **Coquitlam's Arborist Report Guidelines for Development Applications request an inventory of on-site trees greater than 10 cm DBH and a count of any trees under that size.**

Trees on adjacent properties with a tree protection zone that extends into the subject site have also been captured in the arborist report.

2.0 Process and Methods

Mitch Davis of Diamond Head Consulting (DHC) visited the site on February 2, 2026. The following methods and standards are used throughout this report.

2.1 Tree Inventory

Selected trees on site and shared with adjacent properties were marked with numbered tags and assessed for attributes including species, height measured to the nearest meter, and diameter at breast height (DBH) measured to the nearest centimetre at 1.4 m above grade. Off-site trees were assessed visually and their locations noted but not tagged. The general health and structural integrity of each tree were visually assessed and assigned to one of six categories: *excellent*, *good*, *fair*, *poor*, *very poor*, and *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 decided 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. 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 trees that had *high* or *extreme* risk ratings in their current condition and in context of their surrounding land use were noted. 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

Tree protection zones were calculated for each tree according to a minimum standard of 10 x DBH or dripline plus 1 m, whichever is larger, but may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions.

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

See Appendix 1 for the complete tree inventory.

There are 40 city owned park trees were identified within the scope of the proposed Cape Horn Avenue Culvert Rehabilitation Project. Of these, 24 are recommended for removal and 16 are recommended for retention.

3.2 Tree Risk Assessment

Table 2: Summary of trees that pose a high or extreme risk at the time of assessment. To meet these criteria there was a probable or imminent likelihood of failure and will impact a target with significant or severe consequences. Trees that meet these criteria are shown in the table below. Residual risk will be discussed for any tree within the table that is not a complete removal.

| Tree | | Target | Likelihood | | | Consequences | Risk Rating | Action | Residual Risk |
|--------|----------------------------|-----------------|------------|--------|------------------|--------------|-------------|--------|---------------|
| Number | Part to Fail | Type | Failure | Impact | Failure & Impact | | | | |
| 3596 | Whole tree at decayed base | Future worksite | Probable | High | Likely | Severe | High | Remove | Nil |

4.0 Tree Replacement

The City of Coquitlam expects tree replacement based on lot size, the number of trees retained on the lot, and the class of replacement tree proposed. The project proponent and landscape architect may use the following table and the [City's list of suitable replacement trees](#) to plan tree replacements for each lot. Diamond Head Consulting has not prepared a replacement plan for this project but can upon request.

Table 1: A list of tree replacement requirements per City of Coquitlam standard. Please refer to the City's website for the most current requirements.

| Lot Size (m ²) | Number of trees greater than 20cm stem diameter remaining on the lot after tree removal | Maximum number of required replacement trees |
|--|---|---|
| Less than 250 m ² | 0 | 1 Class A or 1 Class B or 1 Class C |
| | 1 or more | None |
| 250m ² - 500 m ² | 0 | 2 Class A or 3 Class B or 4 Class C |
| | 1 or more | None |
| 501m ² - 750 m ² | 0 | 4 Class A or 6 Class B or 8 Class C |
| | 1 | 2 Class A or 3 Class B or 4 Class C |
| | 2 or more | None |
| 751m ² - 1000 m ² | 0 | 6 Class A or 9 Class B or 12 Class C |
| | 1 | 4 Class A or 6 Class B or 8 Class C |
| | 2 | 2 Class A or 3 Class B or 4 Class C |
| | 3 or more | None |
| 1001m ² - 1250 m ² | 0 | 8 Class A or 12 Class B or 16 Class C |
| | 1 | 6 Class A or 9 Class B or 12 Class C |
| | 2 | 4 Class A or 6 Class B or 8 Class C |
| | 3 | 2 Class A or 3 Class B or 4 Class C |
| | 4 or more | None |
| Over 1250 m ² | 1 tree every 250m ² | None |
| | Less than 1 tree every 250m ² | 1 Class A every 125m ² or 1 Class B every 85m ² or 1 Class C every 65m ² |

5.0 Discussion and Summary

The following trees directly in conflict with the proposed excavation and/or the proposed construction access or have significant portions of their tree protection zones that will be impacted by the proposed work:

- 259, 2391, 2392, 2393, 2395, 2396, 2397, 2398, 2399, 2400, 3567, 3573, 3574, 3576, 3581, 3584, 3596, 3597, 8499, 8688, 8689, and 8690, 3593 and 3594

We recommend these trees be removed.

One tree, 3596, has been identified as a high risk to the future worksite. We recommend it be removed prior to beginning on site work.

Recommendation of stumps from trees # 3593 and 3594 be left and cut at grade. Removal for stumps may impact other trees around them within the tree retention are. Removal of these trees to be done under arborist supervision.

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. 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 fencing is proposed to vary from the minimum municipal TPZ, comments will be included in the Retention/TPZ comments and shown on the Tree Management Plan.

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

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--------------------------------------|----------|------------|---------------------|-----------------------------|--|------------------------|---------------|---|----------|
| Yes | 259 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 81 | 25 | 5 | Fair | Codominant stem. Union at 1m. . Growing near edge of access and existing outflow. Very likely root conflict with access and excavation | Medium | Remove | In conflict with the proposed excavation and construction access. | 4.9 |
| Yes | 2391 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 39 | 21 | 3 | Fair | Single stem. Bottom 1/3 overgrown with ivy. | Medium | Remove | In conflict with the proposed excavation. | 2.3 |
| Yes | 2392 | City | Japanese Cherry | Prunus serrulata | 8 | 7 | 2 | Fair | Single stem. | Medium | Remove | In conflict with the proposed construction access. | 1.2 |

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--------------------------------------|----------|------------|---------------------|-----------------------------|---|------------------------|---------------|---|----------|
| Yes | 2393 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 34 | 21 | 3 | Fair | Single stem. Bottom 1/3 overgrown with ivy. | Medium | Remove | In conflict with the proposed excavation. | 2.0 |
| Yes | 2394 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 35 | 20 | 3 | Fair | Single stem. Bottom 1/3 overgrown with ivy. | Medium | Retain | Outside of the proposed scope of work. | 2.1 |
| Yes | 2395 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 83 | 25 | 5 | Fair | Single stem. Bottom 1/3 overgrown with ivy. Growing at edge of access area. | Medium | Remove | In conflict with the proposed construction access and excavation. | 5.0 |
| Yes | 2396 | City | Willow spp. | Salix spp. | 16 | 5 | 3 | Very Poor | Dying. | Nil | Remove | In conflict with the proposed excavation. | 1.2 |
| Yes | 2397 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 26 | 15 | 2 | Fair | Single stem. Bottom 1/3 overgrown with ivy. | Medium | Remove | In conflict with the proposed excavation. | 1.6 |
| Yes | 2398 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 47 | 20 | 3 | Fair | Single stem. Bottom 1/3 overgrown with ivy. | Medium | Remove | In conflict with the proposed construction access. | 2.8 |
| Yes | 2399 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 40 | 15 | 3 | Fair | Two stems. Bottom 1/3 overgrown with ivy. | Medium | Remove | In conflict with the proposed construction access. | 2.4 |

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--|----------|------------|---------------------|-----------------------------|---|------------------------|---------------|---|----------|
| Yes | 2400 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 33 | 23 | 2 | Fair | Codominant stem. Union at 1m. Growing near edge of access and existing outflow. | Medium | Remove | In conflict with the proposed construction access. | 2.0 |
| Yes | 3567 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 73 | 20 | 4 | Fair | Single stem. Bottom 1/3 overgrown with ivy | Medium | Remove | In conflict with the proposed development. | 4.4 |
| Yes | 3570 | City | Red alder | <i>Alnus rubra</i> | 10 | 7 | 2 | Fair | Single stem. Outside of access | Medium | Retain | Protect as per TMP. | 1.2 |
| Yes | 3571 | City | Red alder | <i>Alnus rubra</i> | 10 | 7 | 2 | Fair | Single stem. Outside of access. | Medium | Retain | Protect as per TMP. | 1.2 |
| Yes | 3573 | City | Red alder | <i>Alnus rubra</i> | 10 | 7 | 2 | Fair | Single stem. | Medium | Remove | In direct conflict with the proposed construction access. | 1.2 |
| Yes | 3574 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 20 | 15 | 2 | Fair | Small secondary stem nearby. | Medium | Remove | In conflict with the proposed excavation. | 1.2 |
| Yes | 3575 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 50 | 20 | 2 | Fair | Cluster of three stems. | Medium | Retain | Protect as per TMP. | 3.0 |

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--|----------|------------|---------------------|-----------------------------|---|------------------------|---------------|---|----------|
| No | 3576 | City | Big Leaf maple | <i>Acer macrophyllum</i> | 18 | 13 | 3 | Fair | Single stem. Asymmetrical crown. . Appears to not be surveyed. | Medium | Remove | In conflict with the proposed construction access. | 1.2 |
| No | 3581 | City | Japanese Cherry | <i>Prunus serrulata</i> | 25 | 8 | 4 | Fair | Multiple stems. Asymmetrical crown. . Appears to not be surveyed. | Medium | Remove | In conflict with the proposed construction access. | 1.5 |
| Yes | 3584 | City | Black Poplar | <i>Populus nigra</i> | 91 | 25 | 3 | Poor | Heavily pruned for line clearance. | Low | Remove | In conflict with the proposed construction access and excavation. | 5.5 |
| Yes | 3585 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 43 | 18 | 2 | Fair | Single stem. Likely outside of impact area | Medium | Retain | Outside of the proposed scope of work. | 2.6 |
| Yes | 3587 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 45 | 20 | 2 | Fair | Edge tree of Cottonwood group. Single stem. Asymmetrical crown | Medium | Retain | Protect as per TMP. | 2.7 |
| Yes | 3588 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 57 | 20 | 2 | Fair | Edge tree of Cottonwood group. Single stem. Asymmetrical crown | Medium | Retain | Protect as per TMP. | 3.4 |

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--------------------------------------|----------|------------|---------------------|-----------------------------|--|------------------------|---------------|--|----------|
| Yes | 3590 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 23 | 18 | 2 | Fair | Edge tree of Cottonwood group. Single stem. Asymmetrical crown | Medium | Retain | Protect as per TMP. | 1.4 |
| Yes | 3592 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 53 | 20 | 2 | Fair | Edge tree of Cottonwood group. Secondary stem. Asymmetrical crown. | Medium | Retain | Protect as per TMP. | 3.2 |
| Yes | 3593 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 47 | 20 | 2 | Fair | Edge tree of Cottonwood group. Single stem. Asymmetrical crown | Medium | Remove | In conflict with proposed area of disturbances and machinery impact. | 2.8 |
| Yes | 3594 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 60 | 20 | 2 | Fair | Edge tree of Cottonwood group. Three stems. Asymmetrical crown. | Medium | Remove | In conflict with proposed area of disturbances and machinery impact. | 3.6 |
| Yes | 3596 | City | Black Cottonwood | Populus balsamifera ssp. trichocarpa | 38 | 18 | 2 | High Risk | Dead snag. Within access area | Nil | Remove | Remove prior to beginning on site work. | 2.3 |

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--|----------|------------|---------------------|-----------------------------|--|------------------------|---------------|--|----------|
| Yes | 3597 | City | Black Cottonwood | <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> | 36 | 21 | 3 | Fair | Single stem. Bottom 1/3 overgrown with ivy. Within excavation | Medium | Remove | In conflict with the proposed construction access. | 2.2 |
| Yes | 8493 | City | Big Leaf maple | <i>Acer macrophyllum</i> | 65 | 15 | 4 | Poor | Pruned for line clearance. Multiple stems. Primary stem swept over stream. Corrected. Overgrown with ivy | Low | Retain | Protect as per TMP. | 3.9 |
| Yes | 8494 | City | Western redcedar | <i>Thuja plicata</i> | 16 | 9 | 2 | Fair | Single stem. Growing near edge of creek | Medium | Retain | Protect as per TMP. | 1.2 |
| Yes | 8495 | City | Western redcedar | <i>Thuja plicata</i> | 22 | 9 | 12 | Fair | Single stem. Growing near edge of creek. . Overgrown with ivy | Medium | Retain | Protect as per TMP. | 1.3 |
| Yes | 8496 | City | Red alder | <i>Alnus rubra</i> | 15 | 13 | 2 | Fair | Single stem. Growing near edge of creek. Asymmetrical crown | Medium | Retain | Protect as per TMP. | 1.2 |
| Yes | 8497 | City | Western redcedar | <i>Thuja plicata</i> | 6 | 4 | 1 | Fair | Single stem. Suppressed form | Medium | Retain | Protect as per TMP. | 1.2 |
| Yes | 8498 | City | Willow spp. | <i>Salix</i> spp. | 25 | 7 | 2 | Poor | Stem heavily overgrown with ivy | Low | Retain | Protect as per TMP. | 1.5 |

| Surveyed? | Tag # | Location | Species Common Name | Botanical Name | DBH (cm) | Height (m) | Dripline Radius (m) | Health and Structure Rating | Comments | Retention Value Rating | Retain/Remove | Retention/TPZ Comments | *TPZ (m) |
|-----------|-------|----------|---------------------|--------------------------|----------|------------|---------------------|-----------------------------|--|------------------------|---------------|---|----------|
| Yes | 8499 | City | Red alder | <i>Alnus rubra</i> | 30 | 5 | 2 | Fair | Cluster of stems growing in slope | Low | Remove | In conflict with the proposed headwall. | 1.8 |
| Yes | 8500 | City | Big Leaf maple | <i>Acer macrophyllum</i> | 50 | 5 | 2 | Poor | Cluster of stems growing in slope. . Historically topped | Low | Retain | Protect as per TMP. | 3.0 |
| Yes | 8688 | City | Western redcedar | <i>Thuja plicata</i> | 32 | 15 | 2 | Fair | Single stem. | Medium | Remove | In conflict with the proposed excavation. | 1.9 |
| Yes | 8689 | City | Big Leaf maple | <i>Acer macrophyllum</i> | 37 | 17 | 3 | Fair | Single stem. Asymmetrical crown. | Medium | Remove | In conflict with the proposed excavation. | 2.2 |
| Yes | 8690 | City | Common hazel | <i>Corylus avellana</i> | 30 | 5 | 3 | Fair | Multiple stems. Growing outside of access. | Medium | Remove | In conflict with the proposed excavation and construction access. | 1.8 |

Appendix 2 Site Photographs



Photo 1. Trees 8493-8498, showing locations near inflow north of Cape Horn Avenue.

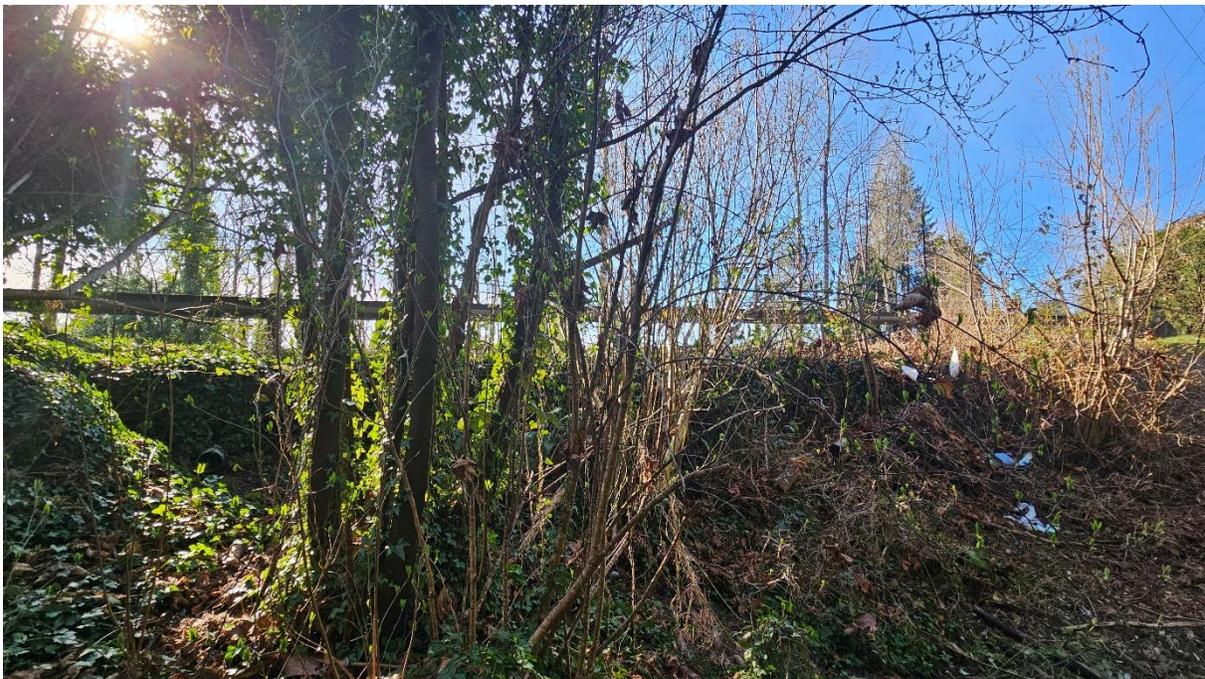


Photo 2. Tree 8499



Photo 3. Trees 3567-3596, showing locations along the construction alignment as seen from 3567.



Photo 4. Tree 259, showing location near the existing outflow.



Photo 5. Tree 3596

Appendix 3 Guide of Plant Appraisal, 10th Edition Categories

The rating categories used by Diamond Head Consulting are taken from the Guide for Plant Appraisal, the 10th edition, and summarize each tree based on both positive and negative attributes using six stratified categories. An additional High Risk category accounts for trees rated as high risk per TRAQ criteria. These ratings indicate health, structural and form 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: High tree vigour and nearly perfect health, nearly ideal tree form, free of defects, and form is nearly ideal of the species. Generally symmetric. Consistent with the intended use. Species of *Populus*, *Alnus* and *Betula* are excluded from this category.

Good: Vigour is normal of species, no significant damage. Structure is Well developed and defects are minor and can be corrected. Form may have minor asymmetries/ deviations from the species norm. Mostly consistent with the intended use but function and aesthetics are not compromised.

Fair: Tree vigour is reduced. Damage due to pathogens may be significant but not likely to be fatal. Twig dieback, defoliation, discoloration may compromise up to 50% of the crown. Structure may have a single significant defect or multiple moderate defects that are not practical to correct or would require multiple treatments. Form would have major asymmetries/ deviations from the species norm. Function and/or aesthetics are compromised.

Poor: Tree is unhealthy and declining in appearance. Poor vigor. Canopy foliage is low density and of poor color. Potentially fatal pest infestation. The structure would have a serious defect or multiple significant defects. Recent change in tree orientation. There are observable problems that cannot be corrected. Failure may occur at any time. The form would be largely asymmetric/ abnormal that detracts from intended use and or aesthetics to a significant degree.

Very Poor: Poor vigour and appears to be dying/ at the last stages of life. Little live foliage. The structure would have single or multiple defects with failure probable or imminent. The form would be visually unappealing. It would provide little or no function in the landscape.

Dead: The tree is dead. Or have less than 5% live crown from its original percent.

High Risk: The tree shows severe health decline and/or with major structural weaknesses or decay. Dead or compromised tree parts increase the likelihood of failure, posing a high risk to nearby targets within the timeframe of this report. The tree is not suitable for retention due to deteriorating tree conditions and exceeding thresholds as a risk high or extreme risk as outlined in Appendix 5. See Section 3.2 for individual detailed risk assessments.

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 |

Guidelines for Mitigation Actions

extreme-risk trees
mitigate as soon as possible

high-risk trees
mitigate as soon as work schedule allows

moderate-risk trees
retain and monitor and/or mitigate, as necessary

low-risk trees
retain and monitor or mitigate if desired

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

A Tree protection zone (TPZ) is determined using either dripline or a DBH multiplier to define a radius measured in all directions from the outside of a tree's trunk. It is typically determined 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. For retained trees, the TPZ and fencing indicated in this report are proposed as suitable in relation to the level of disturbance proposed on the site plan provided to the project arborist. Arborist consultation is required if any additional work beyond the scope of the plans provided is proposed near the tree. Work done in addition to the proposed impacts discussed in this report may cause the tree to decline and die.

Tree Protection Fencing: Tree protection zones (TPZs) will be protected by Tree Protection Fencing except where site features constrict roots (e.g., retaining walls or roads), where continual access is required (e.g., sidewalks), or when an acceptable encroachment into the TPZ is proposed, in which case the fencing will be modified. Tree Protection Fencing is shown on the Tree Protection Plan and, where it varies from the TPZ, the rationale is described in the inventory table in Section 3.1.

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.

Prior to any construction activity, Tree Protection Fencing must be constructed as shown on the Tree Protection Plan. 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 Fencing must be constructed prior to tree removal, excavation or construction and remain intact for the entire duration of construction.

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 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:

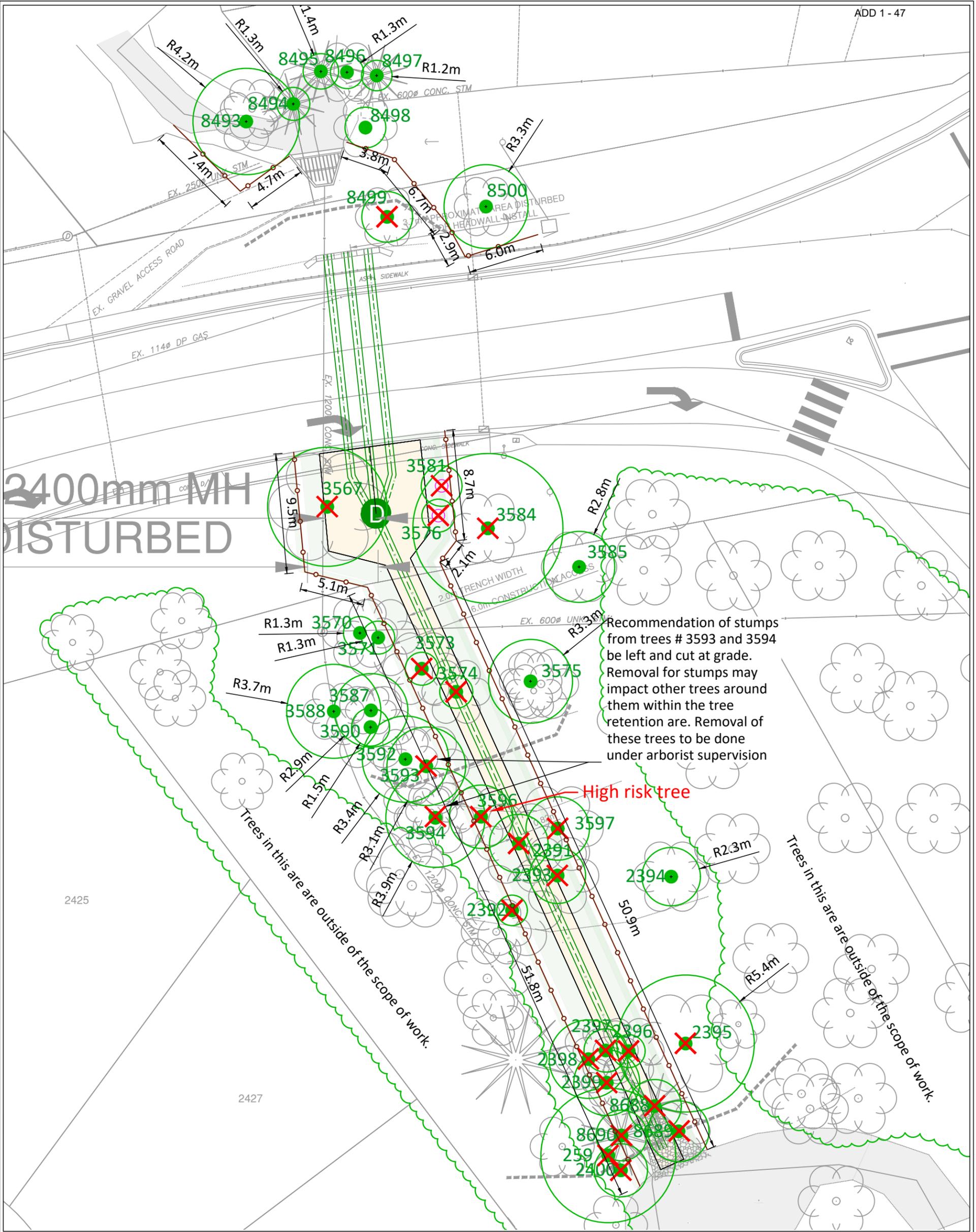
- Health and condition of protected trees, including damage to branches, trunks and roots that may have resulted from construction activities, as will the health of. Recommendations for remediation will follow.
- Integrity of the TPZ and fencing.
- Changes to TPZ conditions including overall maintenance, 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

- 1) Unless expressly set out in this report or these Assumptions and Limiting Conditions, Diamond Head Consulting Ltd. (“Diamond Head”) makes no guarantee, representation or warranty (express or implied) regarding this report, its findings, conclusions or recommendations contained herein, or the work referred to herein.
- 2) The work undertaken in connection with this report and preparation of this report have been conducted by Diamond Head for the “Client” as stated in the report above. It is intended for the sole and exclusive use by the Client for the purpose(s) set out in this report. Any use of, reliance on or decisions made based on this report by any person other than the Client, or by the Client for any purpose other than the purpose(s) set out in this report, is the sole responsibility of, and at the sole risk of, such other person or the Client, as the case may be. Diamond Head accepts no liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm (including without limitation financial or consequential effects on transactions or property values, and economic loss) that may be suffered or incurred by any person as a result of the use of or reliance on this report or the work referred to herein. The copying, distribution or publication of this report (except for the internal use of the Client) without the express written permission of Diamond Head (which consent may be withheld in Diamond Head’s sole discretion) is prohibited. Diamond Head retains ownership of this report and all documents related thereto both generally and as instruments of professional service.
- 3) The findings, conclusions and recommendations made in this report reflect Diamond Head’s best professional judgment given the information available at the time of preparation. This report has been prepared in a manner consistent with the level of care and skill normally exercised by arborists currently practicing under similar conditions in a similar geographic area and for specific application to the trees subject to this report on the date of this report. Except as expressly stated in this report, the findings, conclusions and recommendations it sets out are valid for the day on which the assessment leading to such findings, conclusions and recommendations was conducted. If generally accepted assessment techniques or prevailing professional standards and best practices change at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if generally accepted assessment techniques and prevailing professional standards and best practices change.
- 4) Conditions affecting the trees subject to this report (the “Conditions”, include without limitation, structural defects, scars, decay, fungal fruiting bodies, evidence of insect attack, discolored foliage, condition of root structures, the degree and direction of lean, the general condition of the tree(s) and the surrounding site, and the proximity of property and people) other than those expressly addressed in this report may exist. Unless otherwise stated information contained in this report covers only those Conditions and trees at the time of inspection. The inspection is limited to visual examination of such Conditions and trees without dissection, excavation, probing or coring. While every effort has been made to ensure that any trees recommended for retention are both healthy and safe, no guarantees, representations or warranties are made (express or implied) that those trees will not be subject to structural failure or decline. The Client acknowledges that it is both professionally and practically impossible to predict with absolute certainty the behavior of any single

tree, or groups of trees, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure and this risk can only be eliminated if the risk is removed. If Conditions change or if additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification of Conditions change or additional information becomes available.

- 5) Nothing in this report is intended to constitute or provide a legal opinion and Diamond Head expressly disclaims any responsibility for matters legal in nature (including, without limitation, matters relating to title and ownership of real or personal property and matters relating to cultural and heritage values). Diamond Head makes no guarantee, representation or warranty (express or implied) as to the requirements of or compliance with applicable laws, rules, regulations, or policies established by federal, provincial, local government or First Nations bodies (collectively, "Government Bodies") or as to the availability of licenses, permits or authorizations of any Government Body. Revisions to any regulatory standards (including bylaws, policies, guidelines and any similar directions of a Government Bodies in effect from time to time) referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if any such regulatory standard is revised.
- 6) Diamond Head shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
- 7) In preparing this report, Diamond Head has relied in good faith on information provided by certain persons, Government Bodies, government registries and agents and representatives of each of the foregoing, and Diamond Head assumes that such information is true, correct and accurate in all material respects. Diamond Head accepts no responsibility for any deficiency, misinterpretations or fraudulent acts of or information provided by such persons, bodies, registries, agents and representatives.
- 8) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
- 9) Loss or alteration of any part of this report invalidates the entire report.



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|---------------|----------------------------------|--|---|
| LEGEND | CRITICAL ROOT ZONE | SURVEYED TREE TO BE RETAINED | SURVEYED TREE TO BE REMOVED |
| | TREE PROTECTION ZONE AND FENCING | UN-SURVEYED TREE TO BE RETAINED (MUST BE SURVEYED) | UN-SURVEYED TREE TO BE REMOVED (MUST BE SURVEYED) |

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| REFERENCE DRAWINGS |
| 1. Base Site Plan provided by ISL Engineering dated February 26, 2026 |

- NOTES**
- The location of un-surveyed trees on this plan is approximate. Their location and ownership cannot be confirmed without being surveyed by a Registered BC Land Surveyor.
 - All tree protection fencing must be built to the relevant municipal bylaw specifications. The dimensions shown are from the outer edge of the stem of the tree.
 - The tree protection zone shown is a graphical representation of the critical root zone, measured from the outer edge of the stem of the tree. ($\frac{1}{2}$ the trees diameter was added to the graphical tree protection circles to accommodate the survey point being in the center of the tree)
 - No work is permitted within the Tree Protection Zone with the exception of swales. Swale construction is only permitted under the direct supervision of an arborist.
 - The 1.5m area No Build Zone does not allow for any building foundation wall encroachment. Excavation is permitted within this area under the direct supervision of an arborist.
 - Drainage works such as lawn basins, associated piping or services are permitted within the No Build Zone under the direct supervision of an arborist.
 - This plan is based on a topographic and tree location survey provided by the owners' Registered British Columbia Land Surveyor (BCLS) and layout drawings provide by the owners' Engineer (P Eng).
 - This plan is provided for context only, and is not certified as to the accuracy of the location of features or dimensions that are shown on this plan. Please refer to the original survey plan and engineering plans.



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Drawing title: Tree Management Plan
Project address: Cape Horn Avenue Culvert Rehab, Coquitlam
Client: ISL Engineering

Drawing No: 001
Date: 2026/03/03
Drawn by: MD
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