Note: Tree removal and retention recommendations based on understanding that underground parking will occupy entire lot area. Plans for 560 Sydney Ave have not been reviewed by the arborist.

Removal of trees on 560 Sydney Ave based on assumption that entire property will be excavated for underground parking.

Reassess 633 retention potential with site plan

Only the eastern portion of the hedge would require removal. Detailed review required with building plans.

SITE PLAN

SYDNEY AVE.

SYDNEY AVENUE

CLAYTON

FUTURE CLAYTON STREET

LANE

MAIN ENTRY

PARKING ENTRY

Coquitlam

594-602 SYDNEY AVENUE
COQUITALM, BC

Lot 5
Plan NWP20627
BUILDING
597

Lot 15
Plan NWP16314
BUILDING
601

Lot 14
Plan NWP16314
603
BUILDING

605

Lot 18
Plan NWP16314
604

Lot 74
Plan NWP25510
577

Lot 75
Plan NWP25510
587

Lot 76
Plan NWP25510
597

Lot G
Plan NWP24236
599

Lot 25
Plan NWP16314
601

Lot 24
Plan NWP16314
603

Lot 23
Plan NWP163
605

LEGEND

- TREE PROTECTION ZONE
- NO-BUILD ZONE
- TREE PROTECTION FENCE
- UN-SURVEYED TREE
- TREE TO BE REMOVED

TREE RETENTION VALUE
- High
- Medium
- Low
- Nil

NOTES

1. 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.
2. 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.
3. 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. ½ the trees diameter was added to the graphical tree protection circles to accommodate the survey point being in the center of the tree)
4. Any construction activities or grade changes within the Root Protection Zone must be approved by the project arborist.
5. 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).
6. 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.

REFERENCE DRAWINGS

1. Base Survey by:

DIAMOND HEAD
3559 COMMERCIAL STREET
VANCOUVER BC | V5N 4E8
T 604.733.4886 | F 604.733.4879

Drawing title: Premlinary Tree Retention and Removal Plan
Project address: 560, 594, 596, 600, 602 Sydney Avenue, Coquitlam.
Client: The City of Coquitlam

Drawing No: 1
Date: 2021/04/05
Drawn by: MH
Page Size: TABLOID 11"x17"

Preliminary - Arboricultural Inventory and Report

For:
The City of Coquitlam

Site Location:
560, 594, 596, 600, and 602 Sydney Avenue
Coquitlam, BC

To be submitted with Tree Retention and Removal Plan dated April 5, 2021

Submitted to:
Jacob Edenloff,
City of Coquitlam | 3000 Guilford Way | Coquitlam, BC | V3B 7N2:

Date: 2021.04.05

Submitted by:

DIAMOND HEAD
3559 Commercial Street
Vancouver, BC 604.733.4886

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:

Michael Harrhy, B.Sc., MSFM
Registered Professional Forester
ISA Certified Arborist (PN-8025A)
ISA Tree Risk Assessment Qualified (TRAQ)
BC Wildlife and Danger Tree Assessor (P2528)
Biologist in Training

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: mikeharrhy@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 560, 594, 596, 600, and 602 Sydney Avenue Coquitlam, BC. 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 bylaws, 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 an assembly of smaller lots on Sydney Avenue. 560 Sydney Avenue is the largest lot and is currently occupied by an multistory apartment/ institutional building. 594, 596, and 600 Sydney Avenue are vacant lots that presumably once had residential dwellings on them. 602 Sydney Avenue has a small residence. Access to the lots is from Sydney Avenue; an unfinished laneway access the south side of the site, and a cul-de-sac abuts the northwest corner of 560 Sydney Avenue.

Tree condition and value on the site is remarkably good for an urban area. Trees are a mix of native conifers and common ornamental varieties. Soils on the site are probably good for tree growth, as most trees are large, healthy and vigorous. Because of past development on the sites, most trees are concentrated along the edges of the properties. Several open-grown trees have very good retention potential, and a row of tulip trees (*Liriodendron tulipifera*) on the western margin of the site (some shared, some just offsite) are in exceptionally good condition. Successful tree retention could be challenged by the site's grades, which are steepened and broken, especially along the margins of 560 Sydney Avenue.

1.2 Proposed Land Use Changes

The proposed development consists of densifying the site, building two multifamily structures separated by a newly extended Clayton Street.

Detailed plans for the development at 560 Sydney Avenue have not been reviewed by the arborist. For the purposes of this assessment, we have assumed that the entire site will be excavated to accommodate underground parking.

In preparing this report we have used the following surveys and plans:

- 20-1016-SURVEY BASE with Prop. Property Lines
- Concept plan – 594-602 Sydney Avenue - IBI Living

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.

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.

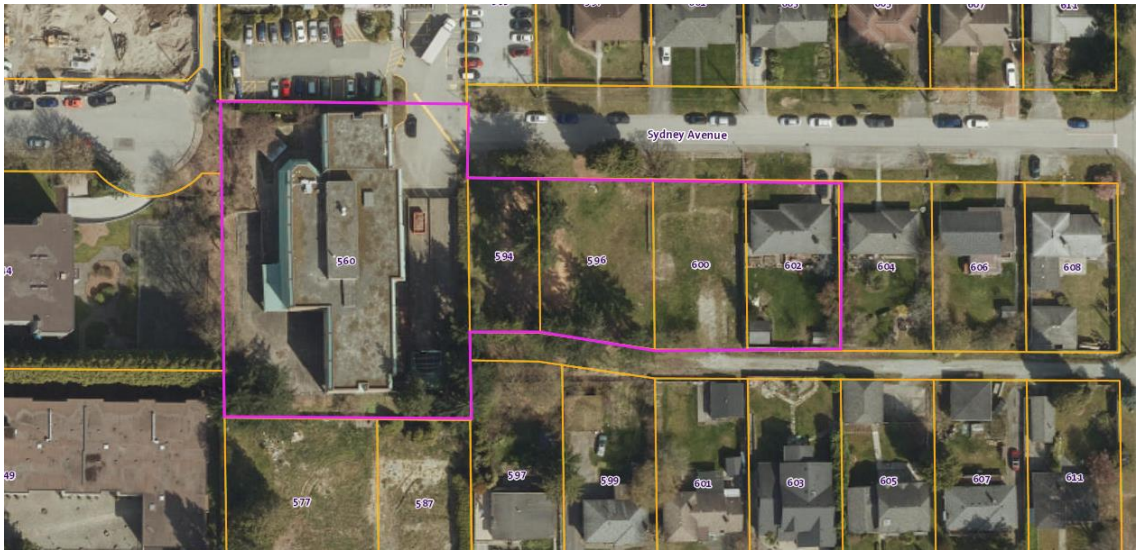

Figure 1. The assessment area in context of the surrounding landscape and infrastructure.

2.0 Process and Methods

Michael Harrhy of DHC visited the site on March 26th, 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 Manual[1] 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

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

Table 1: Summary of the tree inventory from Sydney Avenue containing the number of trees categorized by retention value and the recommended number to be retained or removed. The complete tree inventory is given in Appendix 1.

Tree Species	Retention Value				Recommendation		
	High	Medium	Low	Nil	Remove	Retain	Total
On-site and shared trees							
Black Locust	1				17		17
Callery Pear	1				1		1
Douglas-Fir	11	4	2		1		1
Eastern White Cedar			3		2		2
Horsechestnut	1				2		2
Japanese Cherry			1		4		4
Japanese Maple	1				1		1
Lawson Cypress		2			1		1
Monkey Puzzle	1				1		1
Sawara Cypress		1	1		1		1
Tulip Tree	2				1		1
Western Hemlock			1		3		3
Western Red Cedar		1	3		2		2
On-site totals	**18**	**8**	**11**		**37**		**37**
Off-site trees							
Black Cottonwood		1			1		1
Black Locust		1				2	2
Norway Maple	2				1		1
Tulip Tree	2				1		1
Western Red Cedar	1					2	2
Off-site totals	**5**	**2**			**3**	**4**	**7**
City trees							
Douglas-Fir	1				1		**1**
Western Red Cedar	2	2			4		**4**
City (streets) totals					**5**		**5**
				GRAND TOTAL	**45**	**4**	**49**

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 Coquitlam may require that replacement trees be planted for trees that are removed per the Bylaw. The City will decide the quantity of replacement trees required and the project arborist or landscape architect can then prepare a tree replacement plan showing the location and species.

5.0 Discussion and Summary

5.1 Trees On-site

Tree retention on the site is limited by the large footprint of the proposed development. Underground parking and new roads will limit the number of trees that can be retained.

The best tree retention opportunities are along the western edge of the site, where good-to-excellent trees could be retained in a group along with offsite trees.

5.2 Trees on Adjacent Properties

- Offsite trees that have root zones overlapping with project area are generally good candidates for retention.
- Tree Os2, OS3, and Os4 can all be retained south of the new lane. Note that they will probably be removed by the project to the south.
- One tree, 633, could possibly be retained, depending on the extent of the proposed work.
- A notable cedar hedge (OS Hedge) located at 549 Dansey Avenue creates a visual break between the neighbouring apartment buildings and the proposed project.
    - The proposed development will require removal of the end tree or trees.
- Permission from neighbouring property owners will be required to remove offsite trees.

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 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)	Dripline Radius (m)	Health and Structure Rating	Comments	Retention Value Rating	Retain/ Remove	Retention/TPZ Comments	*TPZ (m)
NA	239	On Site	Douglas-Fir	Pseudotsuga menziesii	48	25	5	Good	Open grown with good form. Challenging root zone. South side approx 1m lower than north side, with steep break in slope. North side of root zone extends into covered parking area. Roots are heaving asphalt. Retention through demolition is possible but would be challenging. Extra consideration to grades and construction required if planning to retain.	Medium	Remove	In conflict with future building at 560.	4.8

Unsurveyed	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)
NA	240	On Site	Douglas-Fir	Pseudotsuga menziesii	62	25	5	Good	Healthy open grown tree. Structure 2m west will have limited root zone on hat side. Care required during demo if retaining.	High	Remove	In future road ROW.	6.2
NA	241	On Site	Douglas-Fir	Pseudotsuga menziesii	55	25	5	Good	Healthy open grown tree. Structure to north at edge of root zone. Care required during demo if retaining.	High	Remove	In future road ROW.	5.5
NA	242	On Site	Western Hemlock	Tsuga heterophylla	22	7	2	Moderate	Suppressed tree with crooked stem. Marginal value. Could only be retained with 241.	Low	Remove	In future road ROW.	2.2
NA	256	On Site	Douglas-Fir	Pseudotsuga menziesii	78	30	7	Moderate	Large open grown tree. Subordinate top from 10m has inclusion. Consider pruning out subordinate. Difficult root zone with steep slopes, significant old fill for parking lot on northwest side. Cinder lock wall to south. Overall a good tree.	Medium	Remove	In conflict with future building at 560.	7.8

Unsurveyed	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)
NA	257	On Site	Douglas-Fir	Pseudotsuga menziesii	62	30	7	Good	Large natural edge tree in corner of lot. Asymmetrical crown southwest. Sloped root zone southwest aspect. Storm CB in east of root zone. Would look best if retained with other trees, but is suitable on its own.	High	Remove	In conflict with future building at 560.	6.2
NA	258	On Site	Douglas-Fir	Pseudotsuga menziesii	36	20	4	Moderate	Codominant tree is he smallest in group of three. Suitable with others, but marginal alone. Root zone slopes to southwest.	Medium	Remove	In conflict with future building at 560.	3.6
NA	632	Off Site	Black Locust	Robinia pseudoacacia	29	20	6	Moderate	Good form, slightly asymmetrical crown to western opening. Root zone may be somewhat restricted by concrete wall on property line. Best if retained with other trees.	Medium	Remove	Removal recommendation assumes other trees in row will also be removed. Not expected to be stable if isololated.	2.9
NA	633	Off Site	Tulip Tree	Liriodendron tulipifera	48	30	6	Good	Healthy tree in row along property line. Root zone has minor slope.	High	Retain	Some encroachment expected on high side of root zone. Review with final plan.	4.8

Unsurveyed	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)
NA	634	Shared	Black Locust	Robinia pseudoacacia	44	25	6	Good	Good form, slightly asymmetrical crown to western opening. Root zone may be somewhat restricted by concrete wall on property line.	High	Remove	In conflict with future building at 560.	4.4
NA	635	Shared	Tulip Tree	Liriodendron tulipifera	65	30	6	Excellent	A very nice, open grown tree. Large, symmetrical crown with single straight stem. Root zone slopes to west, and may be partially limited by low wall along property Line. This tree is worth consideration.	High	Remove	In conflict with future building at 560.	6.5
NA	950	On Site	Sawara Cypress	Chamaecyparis pisifera	74	15	4	Poor	32, 42cm stems. Stressed crown indicates tree will be sensitive to construction. Okay if given lots of room.	Medium	Remove	In conflict with proposed sidewalk and road widening.	7.4
NA	951	On Site	Douglas-Fir	Pseudotsuga menziesii	60	30	5	Good	Solid edge tree in short row.	High	Remove	In conflict with proposed building envelope	6
NA	952	On Site	Douglas-Fir	Pseudotsuga menziesii	43	30	4	Moderate	NA. Intermediate in row. Can only be retained if whole row is kept.	Medium	Remove	In conflict with proposed building envelope	4.3

Unsurveyed	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)
NA	953	On Site	Douglas-Fir	Pseudotsuga menziesii	25	30	4	Poor	Suppressed. Subordinate stem bowed out and under tension. Removal recommended to give better trees more room.	Low	Remove	In conflict with proposed building envelope	2.5
NA	954	On Site	Douglas-Fir	Pseudotsuga menziesii	41	30	4	Good	Good codominant in short row.	High	Remove	In conflict with proposed building envelope	4.1
NA	955	On Site	Douglas-Fir	Pseudotsuga menziesii	58	30	4	Good	Solid edge tree in short row.	High	Remove	In conflict with proposed building envelope	5.8
NA	956	City	Western Red Cedar	Thuja plicata	30	10	3	Moderate	Part of row of stressed cedars. Decent form. Would benefit from removal of two smaller trees in middle of row.	Medium	Remove	In conflict with Clayton Street Road dedication	3
NA	957	On Site	Western Red Cedar	Thuja plicata	20	10	3	Poor	Part of row of stressed cedars. Low risk, but low vigour. Unattractive.	Low	Remove	In conflict with Clayton Street Road dedication	2
NA	958	On Site	Western Red Cedar	Thuja plicata	20	10	3	Poor	Part of row of stressed cedars. Low risk, but low vigour. Unattractive.	Low	Remove	In conflict with Clayton Street Road dedication	2
NA	959	On Site	Western Red Cedar	Thuja plicata	32	10	3	Moderate	Part of row of stressed cedars. Decent form. Would benefit from removal of two smaller trees in middle of row.	Medium	Remove	In conflict with proposed lane and loading area	3.2

Unsurveyed	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)
NA	960	City	Douglas-Fir	Pseudotsuga menziesii	44	25	6	Good	Codominant tree at end of row. Ditch along root zone, parallel to lane. A portion of the root zone may be in the road prism, but difficult to assess. Consider root zone exploration if retention beside future lane upgrade is an option. Lane is approximately 1m lower than rest of site. Minor asymmetrical crown to west.	High	Remove	In conflict with proposed lane and loading area	4.4
NA	961	On Site	Douglas-Fir	Pseudotsuga menziesii	56	25	6	Good	Large dominant fir in row along lane. Ditch along root zone, parallel to lane. A portion of the root zone may be in the road prism, but difficult to assess. Consider root zone exploration if retention beside future lane. Upgrade is an option. Lane is approximately 1m lower than rest of site.	High	Remove	In conflict with building and lane.	5.6

Unsurveyed	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)
NA	962	On Site	Douglas-Fir	Pseudotsuga menziesii	32	20	2	Poor	Suppressed under crowns of larger firs adjacent. Weak union between twin stems at 2m. Small crown. Tolerable in current state but not recommended for retention if either of the neighbouring trees removed.	Low	Remove	In conflict with building and lane.	3.2
NA	963	On Site	Douglas-Fir	Pseudotsuga menziesii	75	26	6	Good	Large dominant fir in row along lane. Ditch along root zone, parallel to lane. A portion of the root zone may be in the road prism, but difficult to assess. Consider root zone exploration if retention beside future lane. Upgrade is an option. Lane is approximately 1m lower than rest of site.	High	Remove	In conflict with building and lane.	7.5
NA	964	On Site	Monkey Puzzle	Araucaria araucana	36	7	3	Good	Very good condition and form. Root zone limited to west and south by low walls. Tree could be retained if walls removed and back filled with soil. Sensitive species, requires extra room.	High	Remove	In conflict with underground parking	3.6

Unsurveyed	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)
NA	965	On Site	Douglas-Fir	Pseudotsuga menziesii	46	20	5	Good	Typical established fir. Forms a nice pair with 965. Concrete culvert along root zone, parallel to lane. A portion of the root zone may be in the road prism, but difficult to assess. Consider root zone exploration if retention beside future lane. Upgrade is an option.	High	Remove	In conflict with building and lane.	4.6
NA	966	On Site	Douglas-Fir	Pseudotsuga menziesii	44	20	5	Good	Typical established fir. Forms a nice pair with 965. Concrete culvert along root zone, parallel to lane. A portion of the root zone may be in the road prism, but difficult to assess. Consider root zone exploration if retention beside future lane. Upgrade is an option.	High	Remove	In conflict with building and lane.	4.4
NA	967	On Site	Callery Pear	Pyrus calleryana	20	5	3	Good	Healthy well established fruit tree.	High	Remove	In conflict with underground parking	2
NA	968	Shared	Japanese Cherry	Prunus serrulata	45	4	3	Moderate	Mature. Badly pruned. Crown is mostly sprouts. Root zone even, divided by low wall. Diameter estimated.	Low	Remove	In conflict with underground parking	4.5

Unsurveyed	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)
NA	969	On Site	Japanese Maple	Acer palmatum	15	3	3	Good	Nice small open grown tree. Unrestricted rooting in front lawn. Requires protection to dripline.	High	Remove	In conflict with proposed hardscape	1.5
NA	970	On Site	Horsechestnut	Aesculus hippocastanum	90	8	7	Good	Multi stemmed tree with large symmetrical crown. Attractive form. Has been well pruned, but is showing incipient decay at pruning wounds. Minor inclusion between stems not an issue. Requires protection to dripline because of low crown height.	High	Remove	In conflict with proposed building envelope.	8
NA	971	City	Western Red Cedar	Thuja plicata	52	15	4	Good	Good taper and crown condition. In group of three. Asphalt sidewalk over northern root zone has minor heaving.	High	Remove	In conflict with proposed road widening.	5.2
NA	972	City	Western Red Cedar	Thuja plicata	32	10	3	Good	Subordinate to 973, has asymmetrical crown. Only retain with 972.	Medium	Remove	In conflict with proposed road widening.	3.2
NA	973	City	Western Red Cedar	Thuja plicata	66	15	4	Good	Good taper and crown condition. Largest in group of three. Asphalt sidewalk over northern root zone has minor heaving.	High	Remove	In conflict with proposed road widening.	6.6

Unsurveyed	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)
NA	974	On Site	Sawara Cypress	Chamaecyparis pisifera	74	13	5	Moderate	Patchy crown. Three stems, two are twisted around each other. Lift pruned. Tolerable overall, but sensitive to construction.	Low	Remove	In conflict with proposed road widening.	7.4
NA	975	On Site	Eastern White Cedar	Thuja occidentalis	20	10	2	Moderate	In small row. Previously topped, multiple tops. Poor long term prospects.	Low	Remove	In conflict with proposed road widening.	2
NA	976	On Site	Eastern White Cedar	Thuja occidentalis	35	10	2	Moderate	In small row. Previously topped, multiple tops. Poor long term prospects.	Low	Remove	In conflict with proposed road widening.	3.5
NA	977	On Site	Eastern White Cedar	Thuja occidentalis	37	10	2	Moderate	In small row. Previously topped, multiple tops. Poor long term prospects.	Low	Remove	In conflict with proposed road widening.	3.7
NA	978	On Site	Lawson Cypress	Chamaecyparis lawsoniana	50	18	2	Moderate	Moderate vigour, good structure. Root zone grade drops to west. Inclusion between three stems.	Medium	Remove	In conflict with Clayton Street Road dedication	5
NA	979	On Site	Douglas-Fir	Pseudotsuga menziesii	55	24	5	Good	Nice vigorous crown.good taper. Open grown. Root zone has split grade, about 75cm higher in east side. West side of root zone is paved. Extra care would be required if asphalt to be removed.	High	Remove	In conflict with Clayton Street Road dedication	5.5

Unsurveyed	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)
NA	980	On Site	Lawson Cypress	Chamaecyparis lawsoniana	28	18	2	Moderate	Moderate vigour, good structure. Root zone grade drops to west.	Medium	Remove	In conflict with Clayton Street Road dedication	2.8
NA	981	Shared	Tulip Tree	Liriodendron tulipifera	37	30	6	Good	NA. Healthy tree in row along property line. Root zone has minor slope.	High	Remove	Removal recommendation assumes excavation to property line for underground parking.	3.7
NA	Hedge 1	On Site	Western Red Cedar	Thuja plicata	10	3	2	Poor	Ugly, patchy, and poorly maintained.	Low	Remove	In conflict with Clayton Street Road dedication	1
NA	Os1	Off Site	Black Cottonwood	Populus balsamifera ssp. trichocarpa	25	15	2	Moderate	Clump of young trees near cul dec sac.	Medium	Remove	In conflict with future building at 560.	2.5
Unsurveyed	Os2	Off Site	Tulip Tree	Liriodendron tulipifera	29	8	4	Good	Young tree with phototropic lean east, over fence into eastern yard. Root zone separated from lane by ditch.	High	Retain	Protect with fencing per plan. Note: these trees will likely be removed by the project to the south, prior to the start of development at Sydney.	2.9
Unsurveyed	Os3	Off Site	Norway Maple	Acer platanoides	45	12	4	Good	Appears vigorous. Good form except for inclusions near base. About 1m south of fence. Limited assessment.	High	Retain	Protect with fencing per plan. Note: these trees will likely be removed by the project to the south, prior to the start of development at Sydney.	4.5

Unsurveyed	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)
Unsurveyed	Os4	Off Site	Norway Maple	Acer platanoides	45	12	4	Good	Appears vigorous. Good form except for inclusions near base. About 1m south of fence. Limited assessment.	High	Retain	Protect with fencing per plan. Note: these trees will likely be removed by the project to the south, prior to the start of development at Sydney.	4.5
Unsurveyed	Oshedge1	Off Site	Western Red Cedar	Thuja plicata	50	15	3	Good	A significant hedgerow of large cedars. Does not appear to be topped. Easter end tree is largest and has deepest crown. Important privacy barrier for adjacent building.	High	Remove	The easternmost trees will require removal if excavation extends to property line. The remaining hedge will be stable, but there will be a large brown patch at edge where trees have been removed. As hedge is unsurveyed, some adjustment in field will likely be required. Permission from neighbouring property owner will be required.	5

Appendix 2 Site Photographs

Photo 1. Tree 970, an open grown Horsechestnut on Sydney Avenue

Photo 2. Average Douglas fir are good on the site. Open grown canopies with good vigor and form

Photo 3. Cedars on Sydney Ave, 971, 972, 973

Photo 4. Offsite trees OS2, 3, 4, Are south of the proposed lane and separated from the site by an old ditch

Photo 5. Tree 256 showing grades in southwestern corner of property, successful retention of trees in this area would require attention to grading.

Photo 6. Trees 981, 634, 635, are growing in a row along the western property line

Photo 7. Tree 635 is a specimen Tulip tree

Photo 8. 635, 633, and 634, as viewed from onsite.

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 and 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 then 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

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

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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

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