M.B. ARBORICULTURE

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Arboricultural Impact Assessment & Tree Protection Plan

Client: Frank Maier
Client email: maierfrank@outlook.com
Property location: 1022 Summit Ave
Site visit conducted at: August 6, 2021
Site conditions: Sunny
Date of completed report: August 24, 2021

Completed by:
Michael Bridgman
ISA Certified Arborist #UI-1221AM
ISA Tree Risk Assessor
Insurance policy numbers: SR034748 (CCGL), PSG00589802 (E&O)

CERTIFIED ARBORIST ISA | MUNICIPAL SPECIALIST ISA | ISA TREE RISK ASSESSMENT QUALIFIED | City & Guilds NPTC Qualified | Arboricultural ASSOCIATION Technician Member

CONTENTS

1.0 Summary

To provide optimal tree protection during the planned construction work, the proposal will limit the extent of the foundation within the PRZ of the Douglas Fir (T30) protected under the City of Victoria Tree Protection Bylaw (No. 21-035) by utilizing concreate pads that will allow for the retention of roots greater than 5cm in diameter. The placement of the pilings will be decided upon after trial pits are dug to ensure the placement will have the least impact on the tree's root system.

The Project Arborist shall be onsite to supervise any excavation or fill placement required within the PRZ.

All retained trees will require tree protection measures including tree protection fencing (TPF), ground protection and supervision of activities in the PRZ by the on-site Project Arborist.

All other significant tree cover within the area will remain intact and unaffected.

No construction works or heavy plant machinery will access the site until the tree protection measures outlined within the report are completed and agreed by the Project Arborist.

2.0 Scope of work

MB Arboriculture was instructed by Frank Maier (Client) to undertake a tree impact assessment at 1022 Summit Avenue in preparation for the proposed development and subsequent construction work where trees protected under the City of Victoria Tree Protection Bylaw (No. 21-035) may be impacted. This report provides a general assessment of these trees located on the parcel of land in question.

The scope of work:

- Identify trees protected under the City of Victoria Tree Protection Bylaw (No. 21-035) that may be impacted by activities occurring as part of the proposed project
- Assess the health and structural condition of these "protected trees"
- Provide recommendations for the protection of trees through all phases of construction to minimize impacts to health and structural condition
- Identify conflicts or conditions that require removal and replacement of

"protected trees".

3.0 Tree survey methodology

The tree survey includes any trees protected within the scope of the tree bylaw both on-property and off-property that could potentially be impacted by the proposed development. The initial visual inspection of these protected trees on the property was undertaken on the August 11, 2021 as well as any boulevard, municipal owned trees included due to the proximity of the canopies and rooting areas to the site. Trees were surveyed individually and inspected from ground level only; no climbing inspections or specialist decay detection were used. Should a more detailed inspection be deemed appropriate, this will be covered under the Recommendations.

The trees were inspected to determine their health, condition and capability to withstand the proposed construction.

For the completion of the survey, I assigned a tree reference number, and tag to trees protected within the property. Tags were not placed on any trees on municipal land or neighbouring properties and, as access was not granted, only estimated measurements were taken. Details of genus and size (DBH in cm) were noted (see Appendix I Tree Inventory). Protected Root Zone (PRZ) is in meters. Canopy spread was recorded in meters. Tree condition (both physiological and structural) was assessed and an indication of their tolerance to construction activity given[1].

4.0 Tree resource and site description

The terrain of the site is relatively flat in a well-developed area. The overall tree cover for the lot is sparse with just a single Douglas Fir located in the north-east corner close to the garage. A well-established Cypress hedge located in the neighbour's yard to the east runs the extent of the fence line and has been pruned back hard on one side. This is not protected under the City of Victoria Tree Protection bylaw. A small ornamental Crab Apple owned by the municipality is located at the frontage of the property. Upon my visit there was no sign of any recent soil disturbances in and around the trees.

[1] Trees and Development - A technical guide to preservation of trees during land development. By Matheny N and Clark JR.

5.0 Foreseeable impacts due to construction activity

The proposed project is to replace the existing foundation along with the underground utilities, as well as construction of an addition at the rear of the property. A total of two [2] trees were surveyed. One [1] located on the property and one [1] located/owned by the municipality.

The current plan is to retain all the trees both on and off property and incorporate them into the design. Protection measures will need to be implemented before any further demolition or construction activities take place to unsure the impacts from said work is minimized. These protection measures are covered in Section 5.0.

Given the addition at the rear of the property the Douglas Fir (T30) located in the north-east corner of the property will need tree protection fencing as detailed in the site map. Where footings/foundation are to be within the PRZ of the tree in question concreate pad footings are being used to reduce the damage to roots and disturbance of the soil. The smallest practical diameter will be used and selected to protect the PRZ from any potentially toxic effects of uncured concreate. All support locations shall be hand dug to a depth of 60cm to identify any roots present over 5cm in diameter. The priority will be to remove the soil without damaging the bark and wood of significant woody roots. Trial pits should be excavated to ensure all pilings are located to avoid severing any roots in excess of 5cm; retention of individual roots and clumps greater than 5cm is the goal. This will ensure little to no detrimental impact on the health of T30. Any excavation within the PRZ of T30 shall be done under direct Arborist supervision and direction. Sufficient flexibility should be allowed in the design to allow support locations to be moved to avoid any roots over 5cm in diameter. Alternatively, structures can be cantilevered to avoid roots.

Prior to backfilling, retained roots should be surrounded with top soil or uncompacted sharp sand or other loose inert granular fill before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects.

Tree protection measures such as TPF, ground protection and limitations on construction activity shall be implemented to ensure that the tree is protected during the construction phase. TPF will be utilized as well as ground protection (such as current hard surfacing) to reduce the incidence of compaction and likelihood of soil contamination.

All of the proposed locations of the new services (water, sewer, storm sewer, gas, electric) are to be routed from the front of the home. The placement is outside the PRZ of the Crab Apple (M31)(see Appendix II). TPF will be required to protect tree M31 from any construction machinery and foot traffic.

When raising the home to improve/upgrade the foundation, the placement of the support pads and movement of machinery and beams shall be outside the PRZ of the trees outlined in this report and as far away as feasible to ensure there is no compaction to the soil surrounding the trees. There should be no vehicular or repeated pedestrian access to the PRZ of the trees contained in this report unless existing ground protection (current driveway/hard standing) is retained or new protective measures such as 20 cm of coarse wood chips and a double layer of ¾ inch plywood are installed and agreed upon.

Any excavation within the PRZ of the trees will be undertaken with hand tools and/or with a small excavator with a non toothed grading bucket under the direct on-site supervision by the Project Arborist.

The construction is not expected to have an overall negative impact on the health or vitality of any tree marked for retention.

6.0 Tree protection & mitigation plan

The PRZ of all protected trees identified in this report to be retained will be 18 times the diameter of the tree.[2]

Tree protection fencing (TPF) will be required as outlined in the Tree Management Plan (Appendix II) and Appendix IV. All fencing required should be erected, agreed and verified prior to the commencement of any construction work including erection of any temporary structures. Once established the fences should not be removed or altered without prior consultation with the Project Arborist and approval of the municipality. Fencing should be clearly visible and suitable for the location. Securely affixed orange snow fence or plywood and clearly marked as **WARNING - TREE PROTECTION AREA** should be affixed to the fence (see notes on TPF specification by the City of

[2] Best Management Practices (BMP) - Managing Trees During Construction, Second Edition By Kelby Fite and E. Thomas Smiley

Victoria in Appendix IV). Special attention should be paid to ensure that the fencing remains rigid and intact.

Once areas around trees have been protected by fencing, any works on the remaining site area may commence providing activities do not impact the protected areas. Site access will be via the existing driveway.

If temporary access is required outside of the TPF but within the PRZ for whatever reason soil shielding in the form of ground protection shall be used. A range of methods can be utilised including retaining existing hard surfaces that already protect the soil, installing new martials or a combination of both such as in the form of 20 cm of coarse wood chips and a double layer of ¾ inch plywood. Additional measures such as the temporary use of load bearing geotextile fabric may be employed with the approval of the Project Arborist. Whatever the choice of method the end result must be the underlying soil (rooting area) remains undisturbed and retains the capacity to support existing and new roots.

Any storage of materials on site should be clear of all retained trees and positioned to ensure no contamination/run-off into soils in proximity to trees.

The removal of existing structures and/or hard surfaces from within PRZs should be undertaken separately to construction i.e manually and with sensitivity. Any excavation within or adjacent to the PRZ, at any depth, for any reason shall be directly supervised by the Project Arborist. This includes excavation for all underground services, driveways and sidewalks, and structural foundations and the removal of any stumps in the PRZ by an excavator or similar machine. Working radially inward toward the tree, the excavator will remove the soil incrementally with a non- toothed grading bucket allowing any exposed roots to be pruned to an acceptable standard by the Project Arborist. Any roots encountered may need to be cut, and if so, should be done so as cleanly as possible and back to sound tissue under direct onsite supervision by the Project Arborist. Any roots found with a diameter less than 5cm shall be cleanly cut by the Project Arborist; roots 5cm in diameter or above shall be excavated around without damaging them. The Project Arborist shall then decide if its feasible or necessary to retain the root. Roots that have been pruned are to be covered with a layer of burlap and kept damp for the duration of the project.

Where applicable, a Hydro-vac or Airspade® may be employed to expose critical roots and in areas where there is likelihood that larger structural roots may be present.

Tree protection measures will not be amended in any way without approval from the Project Arborist. Any additional tree protection measures will be documented in a memo to the Parks Department at the City of Victoria and the developer.

7.0 Role of the Project Arborist

Pre-Construction

- Prior to construction, all trees identified to be retained will be protected with TPF. The fencing shall be inspected by the Project Arborist (after installation), and photographed and maintained for the whole duration of construction. It shall not be removed until authorized by the Project Arborist and Municipality.
- A site meeting to include the Project Arborist, developer, project supervisor and any other related parties to review/amend the tree protection plan will be held at the beginning of the project. This meeting is where the details of the tree protection should be agreed and finalised.
- If appropriate, preparation of any revised plans and specifications for the agreement of the Municipality.

During Construction

- If excavation is required within the PRZ, this must be supervised/directed and documented by the Project Arborist.
- The developer must keep a copy of the tree protection plan on site to be reviewed and/or initialed by everyone working inside or around the PRZ of trees.
- The Project Arborist is responsible for ensuring that all aspects of this tree protection plan, including violations, are documented in memorandums to the municipality and the developer.

Post-Construction

- Following construction, the PRZ and trees shall be inspected by the Project Arborist and documented according.

- Removal of TPF and ground protection (if needed). The TPF should only be authorised for removal once there is no risk of damage to the PRZ from any construction activity.

8.0 Tree replacement plan

As per Schedule "E" of the bylaw (No. 21-035), two planting areas were identified; one at the front of the property and one to the rear (see Appendix VII). Planting area 1 at the rear of the property is constrained by the existing large Fir (T30) as well as the proximity to the house and garage. Given these factors it is proposed that a medium tree (*Cercidiphyllum japonicum*) be planted in this location. In planting area 2, it is proposed that 1 small tree be planted (*Magnolia grandiflora*), given the proximity of existing tree M31 and location of site services.

9.0 Recommendations

All trees protected under the City of Victoria Tree Protection bylaw will be retained.

All retained trees should be suitably protected with appropriate TPF and ground protection (with set back as necessary to allow for the works within the PRZ) for the duration of the construction project and shall only be removed upon completion of all the construction works.

Any excavation within the PRZ of any retained trees will be undertaken under the direct supervision and guidance of the Project Arborist. Works will be stopped if the activities are considered to have the potential to damage the trees outlined in this report. All work within the PRZ shall be carried out by a preferred method (Hydro-vac or Airspade®) or other agreed upon method.

No prior pruning of retained trees is required based on the visual assessment undertaken that was only intended to address significant hazards identified during the assessment.

Disclosure statement

An arborist uses their professional education and experience to assess trees and provide recommendations on the management of trees that will promote or improve their physical and structural health and reduce risks to human life and the built environment.
This report, its appendices and any subsequent revisions thereof, will form part of any formal planning application in respect of the development of this site, and as such will be open to public scrutiny and comment.

Limitations
The use of this report is intended solely for the addressed client and may not be used or reproduced without the consent of the author.
The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified and experienced arborist to assess any changes to the trees and groups on site and to inform a review of the conclusions and recommendations made.
Trees are living organisms and as such their structural and physical health is influenced by age, growth, pest and diseases and climate and weather conditions. Defects that may affect a trees structure or health may be concealed within the tree or beneath the ground. It is not possible for an arborist to identify all flaws or conditions that may result in failure nor can an arborist guarantee that a tree will remain healthy and free of risk in the future.
Trees are dynamic living organisms, whose health and condition can be subject to rapid change, depending on a number of external and internal factors. The conclusions and recommendations contained in this report relate to the trees at the time of inspection. .
The information in this report is limited to only the items that were examined and reported on and reflect only the visual conditions present at the time of the assessment. Any significant alteration to the site that may affect the trees that are present will necessitate a re-assessment of the site and trees.
Unless stated, the inspection was limited to a visual examination of the accessible components without dissection or probing.
Site plans or other diagrams in this report are intended as visual aids only and are not to scale.

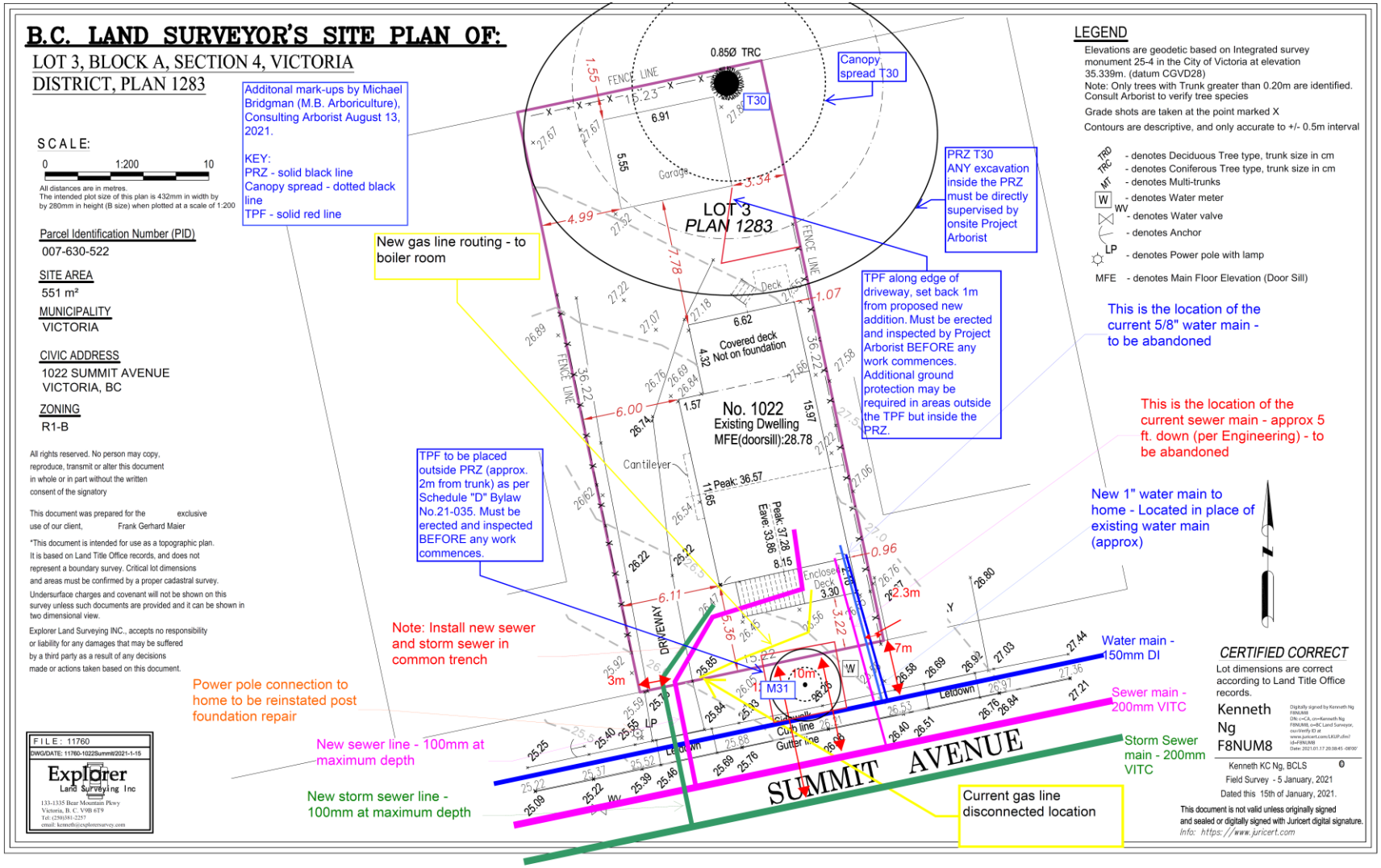
APPENDIX I Tree Inventory

Tree Ref #	Species	Bylaw status	DBH (cm)	PRZ (m)	Canopy spread (m from trunk)	Structural condition	Health condition	Retention suitability	Tolerance to construction activity	Remove/ Retain	Comments
30	Douglas Fir *(Pseudotsuga menziesii)*	Bylaw	70	13	6	Good	Good	Suitable	Moderate	RETAIN	Minor deadwood/some broken lower branches/long laterals
M31	Crab apple (Malus spp.)	Municipal	9	2	1	Poor	Good	Suitable	Moderate	RETAIN	Municipal owned boulevard tree/fairly newly planted/ has had some poor pruning undertaken previously

Tree Inventory Key

Tree numbers (#) – tree numbers relate to the location of the tree on the site plan and assigned tag (Appendix II)
Tree species – common names (*latin names*)
DBH – diameter at breast height (measured 1.4m from grade)
PRZ – protected root zone is a radius in meters from the tree truck calculated as (DBH in cm x 18)/100) Ref: Best Management Practices **(BMP)** - Managing Trees During Construction, Second Edition By Kelby Fite and E. Thomas Smiley

APPENDIX II Tree Survey & Tree Management Plan



APPENDIX III Photographs

All photographs were taken on August 11, 2021 (unless specified).

Picture 1 – Looking at the frontage of the property.

Picture 2 – Looking at overall form of Fir #30.

Picture 3 – Looking at Crab Apple M31 overall form.

Picture 4 – Looking at the base of the Fir #30.

APPENDIX IV Tree Protection Fencing

SCHEDULE "D"

TREE PROTECTION BARRIER REQUIREMENTS

1 The requirements for tree protection barriers are as follows:

(a) The barrier must be placed around the outside of the protected root zone of the tree, or as approved by the Director; and

(b) The barrier must meet the following specifications:

(i) it must have a minimum height of 1.2 m,

(ii) 38 mm x 89 mm timbers must be used for vertical posts, top and bottom rails (in rocky areas, metal posts (T-bar or rebar) drilled into rock will be accepted), and cross-bracing (in an "X"),

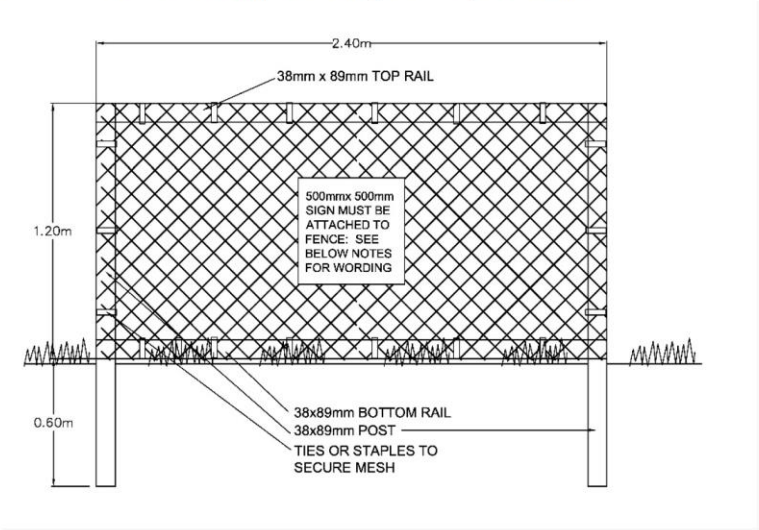
(iii) spacing between vertical posts must be a maximum of 3.0 metres on center,

(iv) the structure must be sturdy with vertical posts driven firmly into the ground,

(v) there must be continuous plastic mesh high visibility screening (e.g. orange snow fencing), and

(vi) it must have visible all weather 500 mm x 500 mm signage on it with the wording "Warning – Tree Protection Area".

2 Below is an example showing an acceptable barrier:



Ref: City of Victoria Bylaw No. 21-035

APPENDIX V Tree Impact Summary Table

Table A. Tree Impact Summary Table as specified by City of Victoria Bylaw No. 21-035 Schedule "C"

	A	B	C	D	
Tree Status	**Total # of protected trees**	**# of trees to be REMOVED**	**# of NEW or REPLACEMENT trees to be planted**	**# of EXISTING non protected trees counted as replacements**	**Net change (A-B+C+D)**
Onsite trees	1	0	2	0	3
Offsite trees	0	0	0	0	0
Municipal trees	1	0	n/a	n/a	1
Total	**2**	**0**	**2**	**0**	**4**

No trees are to be removed. Two trees are proposed to be planted to increase canopy coverage on the lot.

APPENDIX VI Replacement Tree Summary Table

Table B. Tree Replacement Summary Table as specified by City of Victoria Bylaw No. 21-035 Schedule "C"

	Count	Multiplier	Total
ONSITE Minimum replacement tree requirement			
A. Protected trees removed	0	x1	A. 0
B. Replacement trees proposed (Schedule E Part 1)	1	x1	B. 1
C. Replacement trees proposed (Schedule E Part 2)	1	x0.5	C. 0.5
D. Replacement trees proposed (Schedule E Part 3)	0	x1	D. 0
E. Total replacement trees proposed (B+C+D)			E. 1.5
F. Onsite replacement tree deficit (A-E)			F. 0
ONSITE Minimum trees per lot requirement (onsite trees)			
G. Tree minimum on lot			G. 3
H. Protected trees retained (other than specimen trees)	1	x1	H. 1
I. Specimen trees retained	0	x3	I.0
J. Trees per lot deficit (G-(B+C+H+I)			J.0.5
OFFSITE Minimum replacement tree requirement (offsite trees)			
K. Protected trees removed	0	x1	K.0
L. Replacement trees proposed per Schedule E part 1 or 3	0	x1	L.0
M. Replacement trees proposed from Schedule E part 2	0	x0.5	M.0
N. Total replacement trees proposed (L+M)			N.0
O. Offsite replacement tree deficit (K-N)			O.0
Cash-in-lieu requirement			
P. Onsite trees proposed for cash in-lieu (F or J, whichever is larger)			P.0.5
Q. Offsite trees proposed for cash in-lieu (Enter O.)			Q.0
R. Cash-in-lieu proposed ((P+Q)x$2000)			R.$1000

APPENDIX VII Replacement Tree Plan

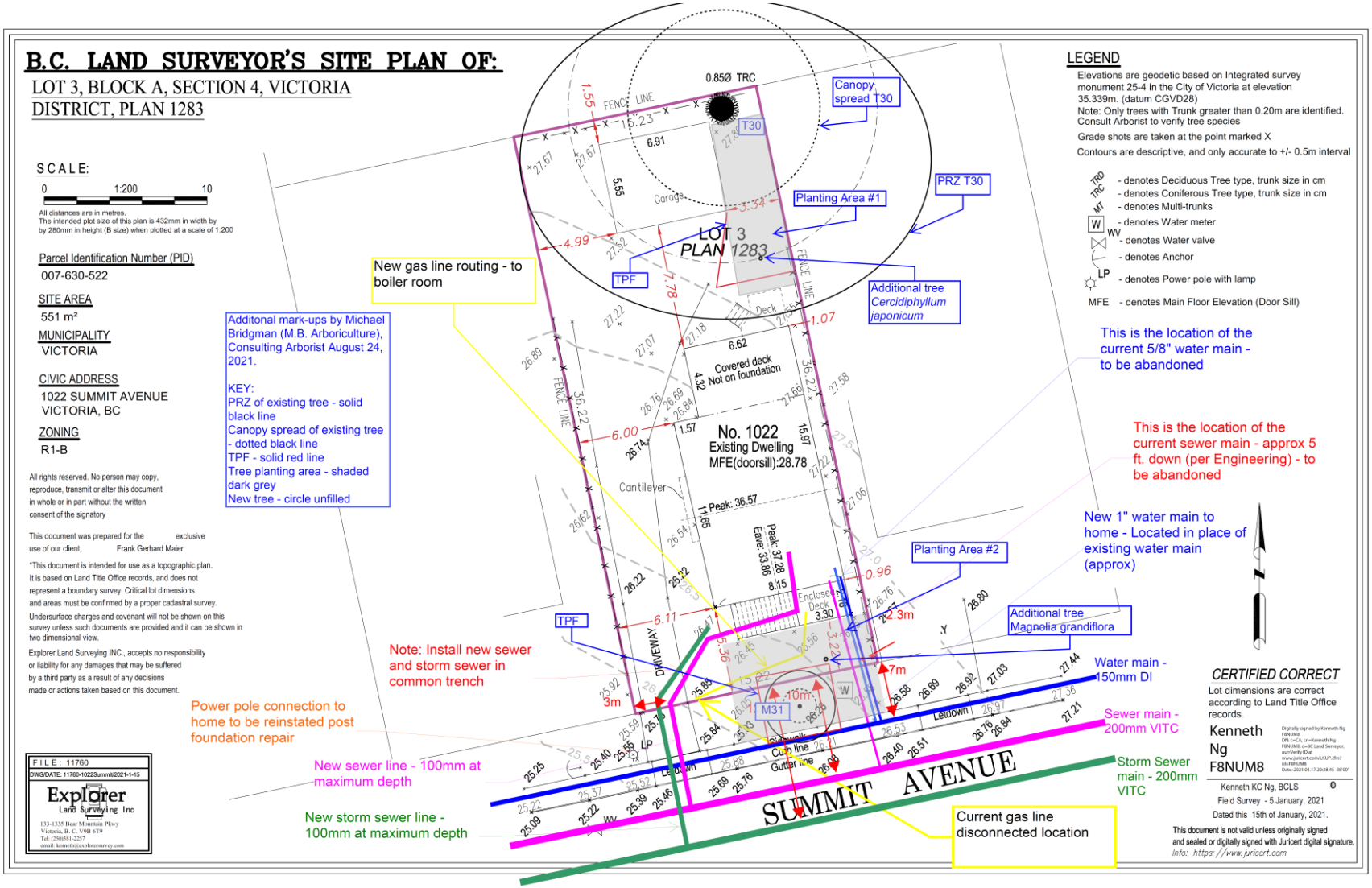


Table C. Estimated soil volume per planting area

				Replacement Trees Proposed			Soil Volume Required (m3)			
Planting Area ID	**Area (m2)**	**Soil volume multiplier**	**A. Estimated soil volume**	**B. #Small**	**C. #Medium**	**D. #Large**	**E. Small**	**F. Medium**	**G. Large**	**Total**
ONSITE										
Planting Area 1	35	1	35			1			35	35
Planting Area 2	55	1	55	1			8			8
OFFSITE (Excluding City property)										
Planting Area OSA	N/A									