



Talbot Mackenzie & Associates

Consulting Arborists



931 Redfern Street, Victoria

Construction Impact Assessment &

Tree Preservation Plan

PREPARED FOR: Bob Croft and Jim Keefe
931 Redfern Street
Victoria, BC
V8S 4E7

PREPARED BY: Talbot, Mackenzie & Associates

Noah Borges – Consulting Arborist
ISA Certified # PN-8409A

Graham Mackenzie
ISA Certified # PN-0428
TRAQ – Qualified

DATE OF ISSUANCE: June 7, 2018

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Jobsite Property: 931 Redfern St, Victoria

Date of Site Visit: March 30, 2018

Site Conditions: Residential lot. No construction activity present.

Summary: Garry Oak #200 may be significantly impacted by construction of the proposed building. We recommend an arborist supervise any excavation within the critical root zone of the tree and based on the size and number of roots encountered, determine whether the tree remains viable for long-term retention. At least four Oak limbs, up to 25cm in diameter, will also have to be removed for building clearance. Hedge Maple NT1, a municipal tree, will require minor clearance pruning and small roots may be encountered during excavation for construction of the stairway.

Scope of Assignment:

- To inventory the existing bylaw protected trees and any trees on neighbouring properties that could potentially be impacted by construction or that are within three metres of the property line
- Review the proposal to subdivide the property into two lots and construct a new house and driveway
- Comment on how construction activity may impact existing trees
- Prepare a tree retention and construction damage mitigation plan for those trees deemed suitable to retain given the proposed impacts

Methodology: We visually examined the trees on the property and prepared an inventory in the attached Tree Resource Spreadsheet. Each by-law protected tree was identified using a numeric metal tag attached to its lower trunk. Municipal trees and neighbours' trees were not tagged. Information such as tree species, DBH (1.4m), crown spread, critical root zone (CRZ), health, structure, and relative tolerance to construction impacts were included in the inventory. The by-law protected trees with their identification numbers were labelled on the attached Site Plan. The conclusions reached were based on the information provided within the attached plans from Cite 360 Studio (dated May 14, 2018).

Limitations: No exploratory excavations have been requested and thus the conclusions reached are based solely on critical root zone calculations and our best judgement using our experience and expertise. The location, size and density of roots are often difficult to predict without exploratory excavations and therefore the impacts to the trees may be more or less severe than we anticipate.

Summary of Tree Resource: 17 trees were inventoried. There are eight by-law protected trees on the subject property: two Douglas firs, five Garry Oaks, and one Arbutus.

Trees to be Removed: No trees will require removal due to construction related impacts.

Potential Impacts on Trees to be Retained and Mitigation Measures

• **House A Construction**

- **Garry Oak #200:** Excavation for construction of the new house may have a significant impact on the health of this tree. If working room be limited to 1m outside the building footprint, excavation will occur approximately 3m from the base of the tree. We anticipate large roots will be encountered at this distance and recommend the retention status of the tree be determined at the time of excavation.

Four large limbs (approximately 25cm, 20cm, 20cm, and 15cm in diameter), in addition to smaller lateral branches will have to be pruned for building clearance (*Image 1*). We recommend pruning the large limbs back to small lateral branches where available to avoid creating pruning wounds near the trunk of the tree, which will minimize the chance of introducing infection into the main stem.

- **Hedge Maple NT1:** This tree's crown extends 4.5m eastward. The tree will likely require minor pruning for clearance from the stairway. Excavation for the stairway will occur at the edge of the tree's critical root zone. Any roots severed should be pruned back to sound tissue by the project arborist.

• **House B Renovations**

- We do not anticipate the proposed renovations to the existing house will impact any trees, as they are to occur within the existing house footprint.

- **Service Connections:** It is our understanding that underground services to the new building will be aligned underneath the new driveway. If any excavation for service installation occurs within the critical root zone of Hedge Maple NT1, an arborist should be on site to supervise.

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

- Excavation for construction of the new house within the critical root zone of Garry Oak #200

- **Barrier fencing:** The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should

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

- **Minimizing Soil Compaction:** In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:
 - Installing a layer of hog fuel or coarse wood chips at least 20 cm in depth and maintaining it in good condition until construction is complete.
 - Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15 cm over top.
 - Placing two layers of 19mm plywood.
 - Placing steel plates.
- **Mulching:** Mulching is an important proactive step to maintaining the health of the trees to be retained and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. As much of the area within two times the dripline of the tree should be mulched, both inside and outside of the critical root zone. No mulch should be touching the trunk of the tree. See “methods to avoid soil compaction” if the area is to have heavy traffic.
- **Blasting:** If required, care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibration, and overall impact on the surrounding environment. Only explosives of low phytotoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.
- **Arborist Role:** It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:
 - Locating the barrier fencing
 - Reviewing the report with the project foreman or site supervisor
 - Locating work zones, where required
 - Supervising any excavation within the critical root zones of trees to be retained
 - Reviewing and advising of any pruning requirements for machine clearances
- **Review and site meeting:** Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained

herein. It is also important that the arborist meet with the site foreman or supervisor before any site clearing, tree removal, demolition, or other construction activity occurs and to confirm the locations of the tree protection barrier fencing.

Images



Image 1. Four limbs, approximately 15-25cm in diameter, in addition to smaller branches will have to be pruned for building clearance.

Please do not hesitate to call us at (250) 479-8733 should you have any further questions. Thank you.

Yours truly,

Talbot Mackenzie & Associates
ISA Certified Consulting Arborists

Encl. 2-page tree resource spreadsheet, 2-page tree resource spreadsheet methodology and definitions, 1-page site plan, 6-page building plans, 13-page floor plans, 1-page barrier fencing specifications

Disclosure Statement

Arborists are professionals who examine trees and use their training, knowledge and experience to recommend techniques and procedures that will improve their health and structure or to mitigate associated risks.

Trees are living organisms, whose health and structure change, and are influenced by age, continued growth, climate, weather conditions, and insect and disease pathogens. Indicators of structural weakness and disease are often hidden within the tree structure or beneath the ground. It is not possible for an Arborist to identify every flaw or condition that could result in failure or can he/she guarantee that the tree will remain healthy and free of risk.

Remedial care and mitigation measures recommended are based on the visible and detectable indicators present at the time of the examination and cannot be guaranteed to alleviate all symptoms or to mitigate all risk posed.

Tree ID	Common Name	Latin Name	DBH (cm) ~ approximate	Crown Spread (m)	CRZ (m)	Relative Tolerance	Health	Structure	Remarks and Recommendations	Retention Status
NT1	Hedge maple	<i>Acer campestre</i>	45	8	5.5	Moderate	Good	Good	Municipal tree, small deadwood	Retain
A 200	Garry oak	<i>Quercus garryana</i>	79	12	8.0	Good	Good	Fair	Asymmetric form, previously topped	TBD
A 199	Garry oak	<i>Quercus garryana</i>	52	8	5.0	Good	Good	Fair	Asymmetric form, deflected top	Retain
A 198	Douglas fir	<i>Pseudotsuga menziesii</i>	58	8	6.0	Poor	Fair	Fair	Deflected top	Retain
A 197	Douglas fir	<i>Pseudotsuga menziesii</i>	57	8	6.0	Poor	Fair	Fair	Deflected top	Retain
933 NT2	Douglas fir	<i>Pseudotsuga menziesii</i>	60	8	10.0	Poor	Good	Fair	Neighbour's tree	Retain
933 NT3	Douglas fir	<i>Pseudotsuga menziesii</i>	60	7	10.0	Poor	Fair	Fair	Neighbour's tree, large deadwood, deflected top	Retain
934A NT4	Douglas fir	<i>Pseudotsuga menziesii</i>	59	7	10.0	Poor	Fair	Fair/poor	Neighbour's tree, high crown, deflected top	Retain
934A NT5	Douglas fir	<i>Pseudotsuga menziesii</i>	70	9	12.0	Poor	Good	Fair	Neighbour's tree, ivy on trunk	Retain
A 196	Garry oak	<i>Quercus garryana</i>	61	13	6.0	Good	Good	Fair	Asymmetric form, leans over existing house	Retain
B 195	Garry oak	<i>Quercus garryana</i>	33	3	3.5	Good	Poor	Poor	Very little live foliage, large pruning wounds with decay	Retain
B 194	Garry oak	<i>Quercus garryana</i>	54	9	5.5	Good	Fair	Fair	High crown	Retain
B 900	Arbutus	<i>Arbutus menziesii</i>	23	7	4.0	Poor	Good	Good	Leans over rock	Retain
932 NT6	Trembling aspen	<i>Populus tremuloides</i>	39, 43	7	6.0	Moderate	Fair	Poor	Neighbour's tree, co-dominant at base, included bark	Retain
932 NT7	Trembling aspen	<i>Populus tremuloides</i>	43	8	5.0	Moderate	Fair	Fair	Neighbour's tree	Retain
932 NT8	Trembling aspen	<i>Populus tremuloides</i>	42, 31	8	6.0	Moderate	Fair	Poor	Neighbour's tree. Codominant union at base, included bark	Retain

Prepared by:

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ISA Certified and Consulting Arborists

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Tree ID	Common Name	Latin Name	DBH (cm) ~ approximate	Crown Spread (m)	CRZ (m)	Relative Tolerance	Health	Structure	Remarks and Recommendations	Retention Status
927 NT9	Weeping willow	<i>Salix babylonica</i>	~100	10	10.0	Good	Good	Fair	Neighbour's tree. Previous branch failure, large pruning wounds	Retain



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Tree Resource Spreadsheet Methodology and Definitions

Tag: Tree identification number on a metal tag attached to tree with nail or wire, generally at eye level. Trees on municipal or neighboring properties are not tagged.

NT: No tag due to inaccessibility or ownership by municipality or neighbour.

DBH: Diameter at breast height – diameter of trunk, measured in centimetres at 1.4m above ground level. For trees on a slope, it is taken at the average point between the high and low side of the slope.

* Measured over ivy

~ Approximate due to inaccessibility or on neighbouring property

Crown Spread: Indicates the diameter of the crown spread measured in metres to the dripline of the longest limbs.

Relative Tolerance Rating: Relative tolerance of the tree species to construction related impacts such as root pruning, crown pruning, soil compaction, hydrology changes, grade changes, and other soil disturbance. This rating does not take into account individual tree characteristics, such as health and vigour. Three ratings are assigned based on our knowledge and experience with the tree species: Poor, Moderate or Good.

Critical Root Zone: A calculated radial measurement in metres from the trunk of the tree. It is the optimal size of tree protection zone and is calculated by multiplying the DBH of the tree by 10, 12 or 15 depending on the tree's Relative Tolerance Rating. This methodology is based on the methodology used by Nelda Matheny and James R. Clark in their book "Trees and Development: A Technical Guide to Preservation of Trees During Land Development."

- 15 x DBH = Poor Tolerance of Construction
- 12 x DBH = Moderate
- 10 x DBH = Good

To calculate the critical root zone, the DBH of multiple stems is considered the sum of 100% of the diameter of the largest stem and 60% of the diameter of the next two largest stems. It should be noted that these measures are solely mathematical calculations that do not consider factors such as soil volume restrictions, age, crown spread, health, or structure (such as a lean).

Health Condition:

- Poor - significant signs of visible stress and/or decline that threaten the long-term survival of the specimen
- Fair - signs of stress
- Good - no visible signs of significant stress and/or only minor aesthetic issues

Structural Condition:

- Poor - Structural defects that have been in place for a long period of time to the point that mitigation measures are limited
- Fair - Structural concerns that are possible to mitigate through pruning
- Good - No visible or only minor structural flaws that require no to very little pruning

Retention Status:

- X - Not possible to retain given proposed construction plans
- Retain - It is possible to retain this tree in the long-term given the proposed plans and information available. This is assuming our **recommended mitigation measures are followed**
- Retain * - See report for more information regarding potential impacts
- TBD (To Be Determined) - The impacts on the tree could be significant. However, in the absence of exploratory excavations and in an effort to retain as many trees as possible, we recommend that the final determination be made by the supervising project arborist at the time of excavation. The tree might be possible to retain depending on the location of roots and the resulting impacts, but concerned parties should be aware that the tree may require removal.
- NS - Not suitable to retain due to health or structural concerns

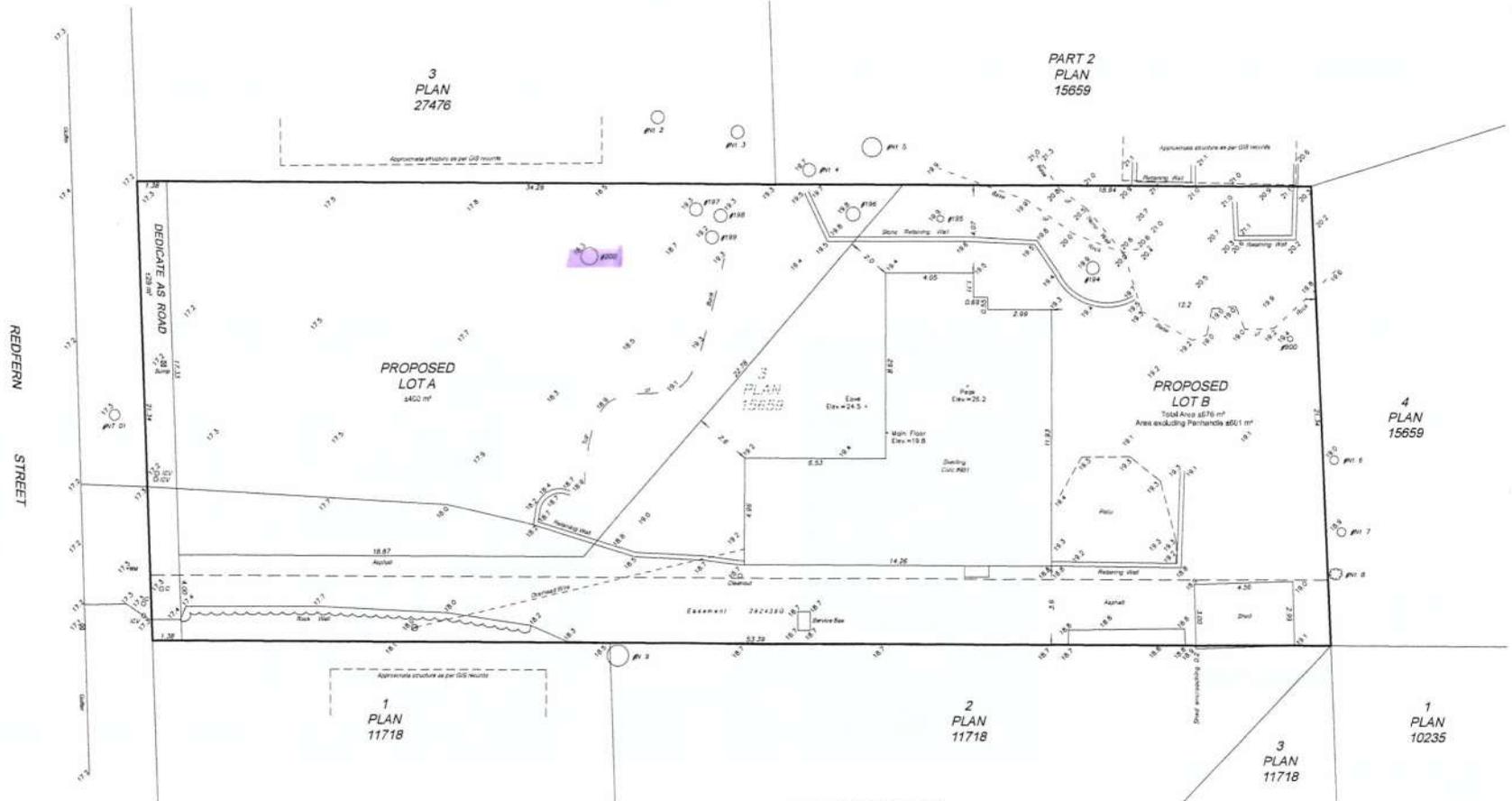
**PROPOSED SUBDIVISION PLAN OF LOT 3, SECTION 68,
VICTORIA DISTRICT, PLAN 15659.**



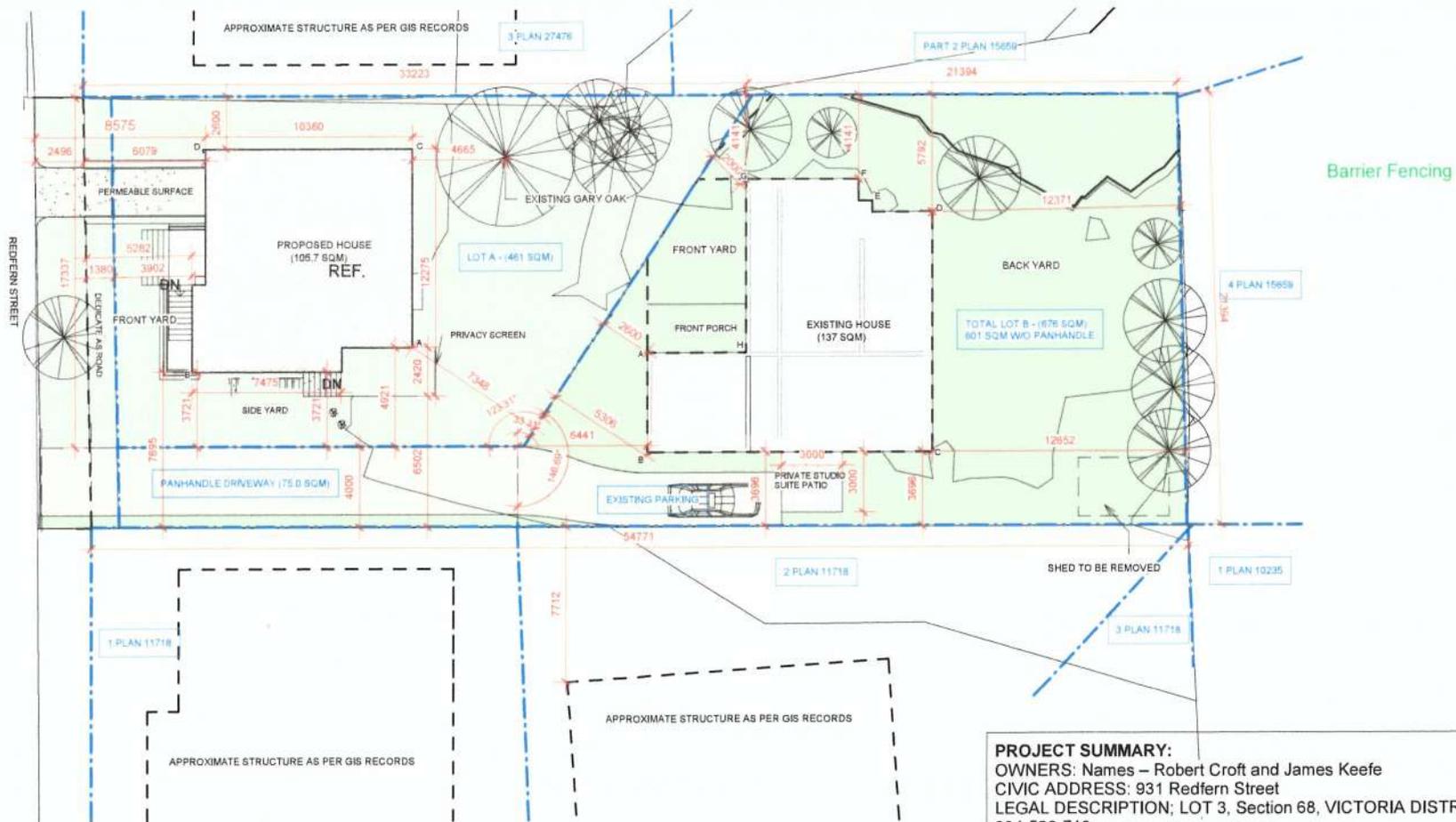
NOTE:
 Lot dimensions shown are based upon Plan 15659 and are subject to any subsequent survey.
 Lot dimensions, offsets, and areas shown may vary upon completion of a comprehensive legal survey. Geodetic elevations shown are based upon observations to geodetic control monuments 10.51 (Elevation: 19.451m) and 10.52 (Elevation: 17.80m).
 This plan is for building design & permit purposes only and is for the exclusive use of our client. This plan shall not be used to define property lines or property corners. Unregistered interests have not been included or considered.

- LEGEND**
- Denotes catch basin
 - w— Denotes water main
 - /PH 2 Denotes approximate fire location and number
 - Denotes ground elevation
 - Denotes utility pole
 - /ICV Denotes irrigation control valve
 - /C Denotes connection

Field survey dated April 6, 2018.
 The parcel is subject to Easement 2824383.
 Total site area ±1162 m².



File: 10-Craft-602
 Date: April 18, 2018
Ward Land Surveying Ltd
 117-891 Haultain Avenue
 Victoria B.C. V8S 4X1
 TEL: 250-475-1515 Fax: 250-475-1519
 www.wardlandsurveying.ca



931 REDFERN STREET SITE PLAN

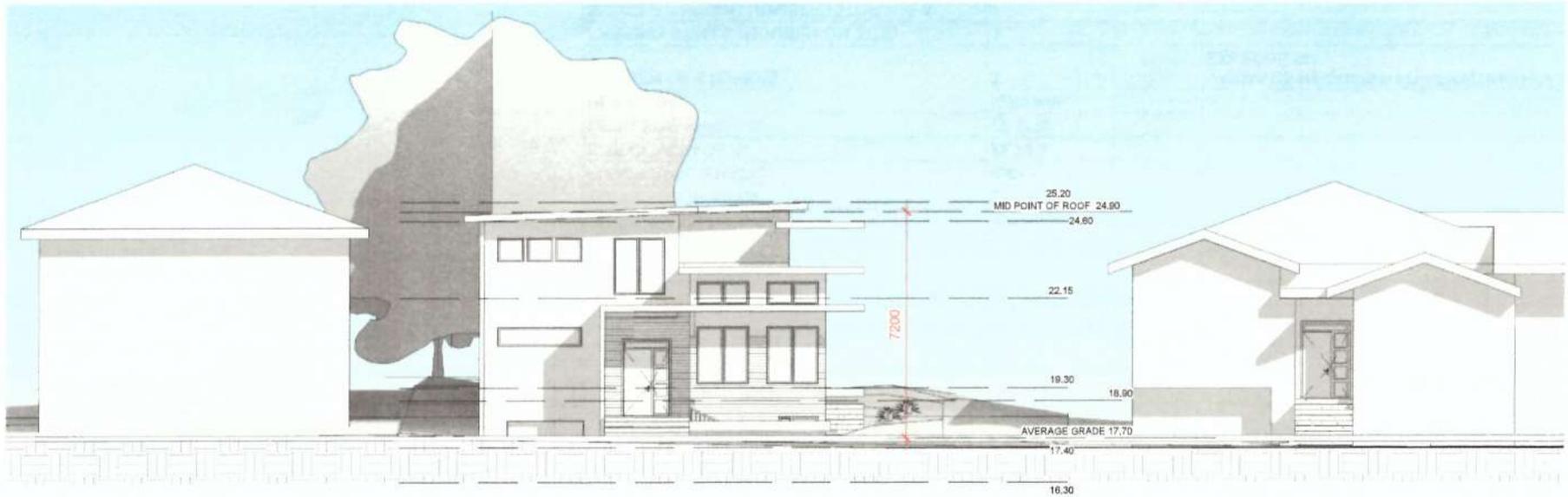
PROJECT SUMMARY:
 OWNERS: Names – Robert Croft and James Keefe
 CIVIC ADDRESS: 931 Redfern Street
 LEGAL DESCRIPTION: LOT 3, Section 68, VICTORIA DISTRICT PLAN 15659
 004-520-718
 PROJECT DESCRIPTION SUBDIVISION TO CREATE ONE ADDITIONAL LOT
 EXISTING ZONE R1-G
 PROPOSED ZONE NO CHANGE
 EXISTING SITE AREA 1166m²
 PROPOSED LOT AREAS
 LOT A 460 m²
 LOT B 676 m² (601M2 W/O PANHANDLE)



PROJECT INFORMATION TABLE FOR LOT A		
NAME	ZONE STANDARD	VARIANCE
ZONING	R1-G	N/A
SITE AREA	461 SQM	
TOTAL FLOOR AREA	196.7 SQM	
FLOOR SPACE RATIO	0.43:1	
SITE COVERAGE %	22.92 %	
OPEN SITE SPACE %	77.08%	
HEIGHT (m)	7200 mm	
NUMBER OF STOREYS	1.5	
PARKING STALLS (NUMBER ON SITE)	1	
BICYCLE PARKING NUMBER (STORAGE & RACK)	-	
FRONT YARD SETBACK	3902 mm	VARIANCE REQUIRED SETBACK IS LESS THAN 7.5M
REAR YARD SETBACK	7348 mm	VARIANCE REQUIRED SETBACK IS LESS THAN 9.1M
SIDE YARD SETBACK (SOUTH)	3721 mm	
SIDE YARD SETBACK (NORTH)	2600 mm	

PROJECT INFORMATION TABLE FOR LOT B		
NAME	ZONE STANDARD	VARIANCE
ZONING	R1-G	N/A
SITE AREA	601 SQM	
TOTAL FLOOR AREA	252 SQM	
FLOOR SPACE RATIO	0.42:1	
SITE COVERAGE %	22.79%	
OPEN SITE SPACE %	77.21%	
HEIGHT (m)	6250 mm	
NUMBER OF STOREYS	2	VARIANCE REQUIRED FOR EXISTING HOUSE EXCEEDS 5M
PARKING STALLS (NUMBER ON SITE)	1	
BICYCLE PARKING NUMBER (STORAGE & RACK)	-	
FRONT YARD SETBACK	2000 mm	VARIANCE
REAR YARD SETBACK	12652 mm	VARIANCE
SIDE YARD SETBACK (SOUTH)	3696 mm	
SIDE YARD SETBACK (NORTH)	4141 mm	

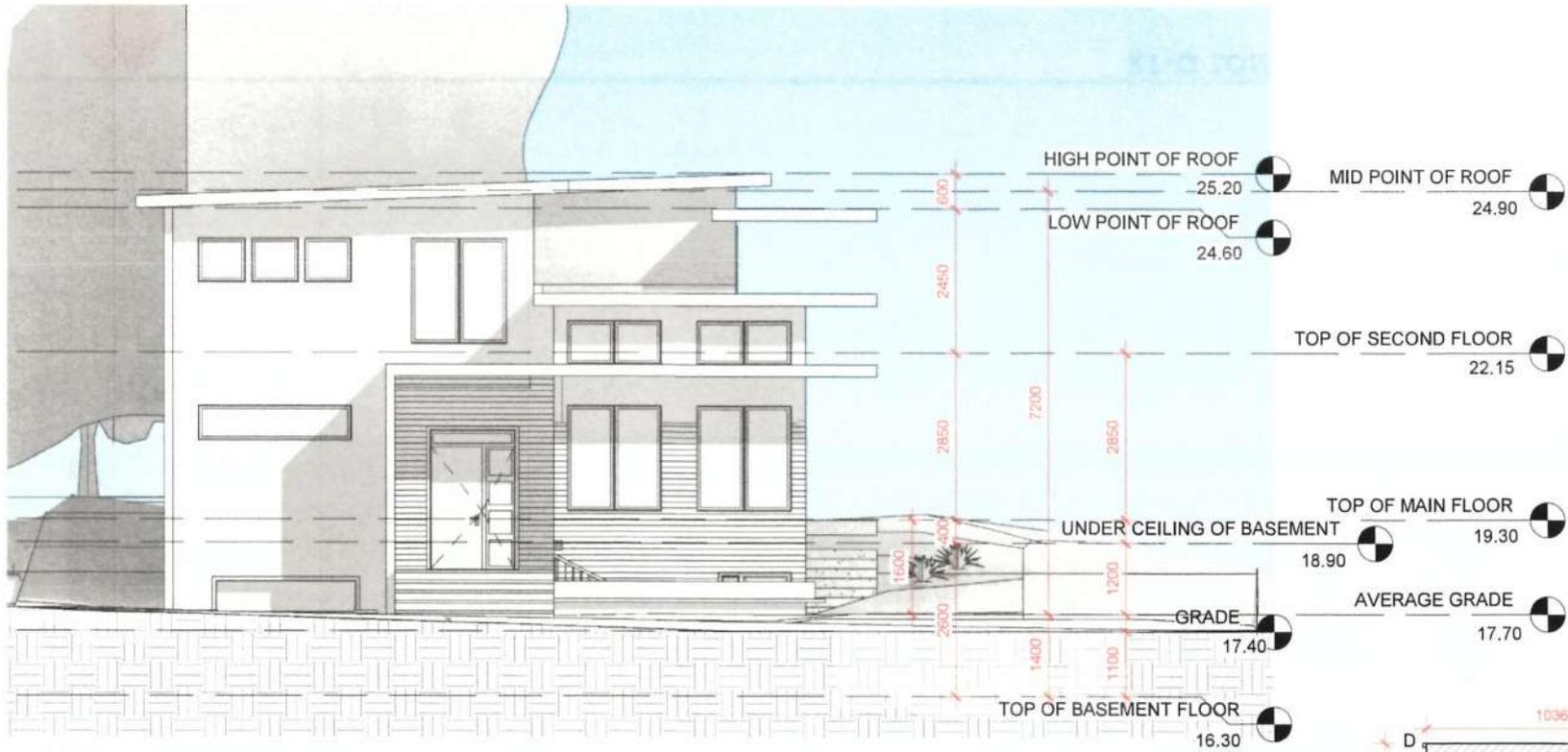




R1-G ZONING HEIGHT CONFIRMATION



R1-G ZONE SUB-DIVISION APPLICATION FOR
 931 REDFERN STREET
 N003 05/14/18



GRADE POINTS

GRADE POINT A : 18.1
 GRADE POINT B : 17.5
 GRADE POINT C : 18.1
 GRADE POINT D : 17.35

GRADE POINTS

POINTS A & B ((18.1 + 17.5) / 2)
 POINTS B & D ((17.5 + 17.35) / 2)
 POINTS D & C ((17.35 + 18.1) / 2)
 POINTS C & A ((18.1 + 18.1) / 2)

AVERAGE OF POINTS

DIST. BETWEEN GRADE POINTS

TOTALS

GRADE CALCULATION

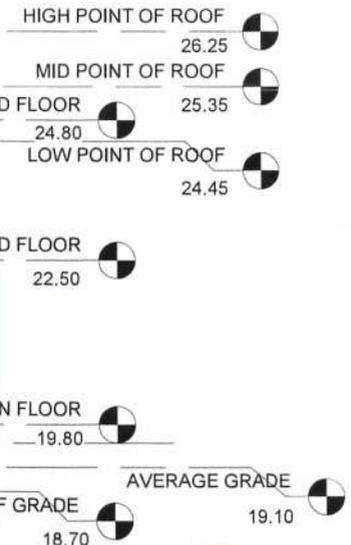
$745.72 / 42.11\text{M (PERIMETER OF THE BUILDING)} = 17.70$





STREET VIEW



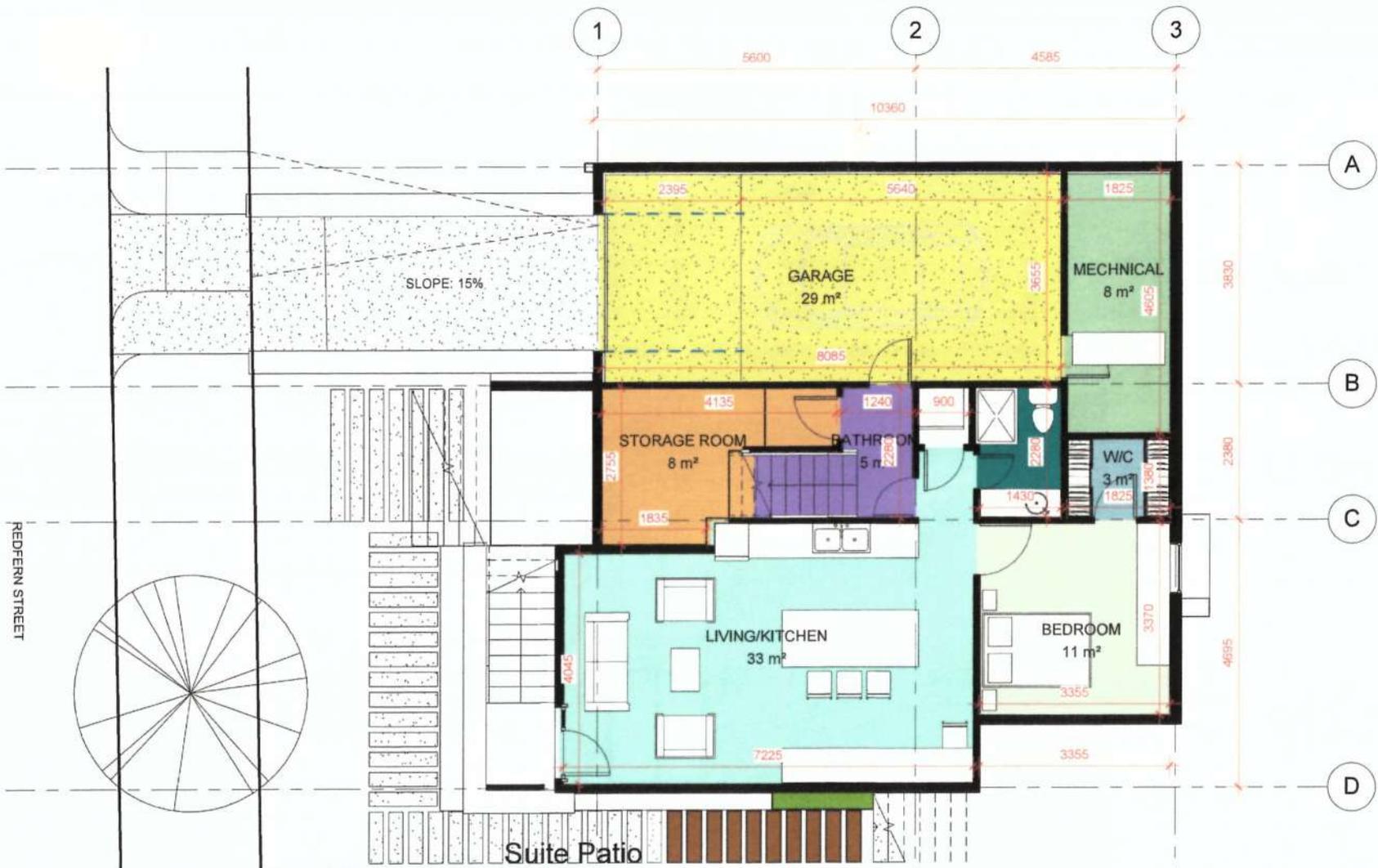


GRADE POINTS	GRADE POINTS	AVERAGE OF POINTS	DIST. BETWEEN GRADE POINTS	TOTALS
GRADE POINT A = 19.2	POINTS A & B	$((19.2 + 18.7) / 2)$	X 4.96	93.99
GRADE POINT B = 18.7	POINTS B & C	$((18.7 + 18.8) / 2)$	X 14.26	267.38
GRADE POINT C = 18.8	POINTS C & D	$((18.8 + 19.3) / 2)$	X 11.93	227.27
GRADE POINT D = 19.3	POINTS D & E	$((19.3 + 19.4) / 2)$	X 2.99	57.86
GRADE POINT E = 19.4	POINTS E & F	$((19.4 + 19.5) / 2)$	X 0.69	13.42
GRADE POINT F = 19.5	POINTS F & G	$((19.5 + 19.4) / 2)$	X 4.05	78.77
GRADE POINT G = 19.4	POINTS G & H	$((19.4 + 19.4) / 2)$	X 8.62	167.23
GRADE POINT H = 19.4	POINTS H & A	$((19.4 + 19.2) / 2)$	X 6.53	126.03
				1,031.95

GRADE CALCULATION

$1031.95 / 54.03M$ (PERIMETER OF THE BUILDING) = 19.10





TOTAL BASEMENT FLOOR AREA (105.7 SQM)
 1 BEDROOM SUITE AREA (51.5 SQM)





MAIN FLOOR PLAN
(119.5 SQM)



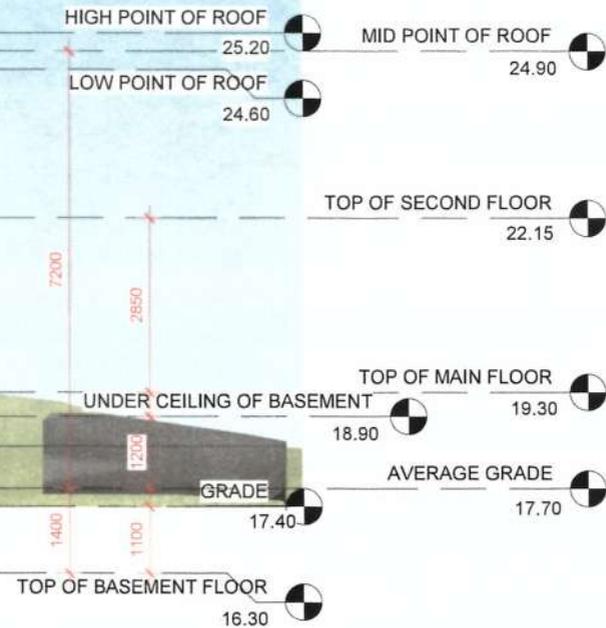


2ND FLOOR AREA (77.2 SQM)





WEST ELEVATION

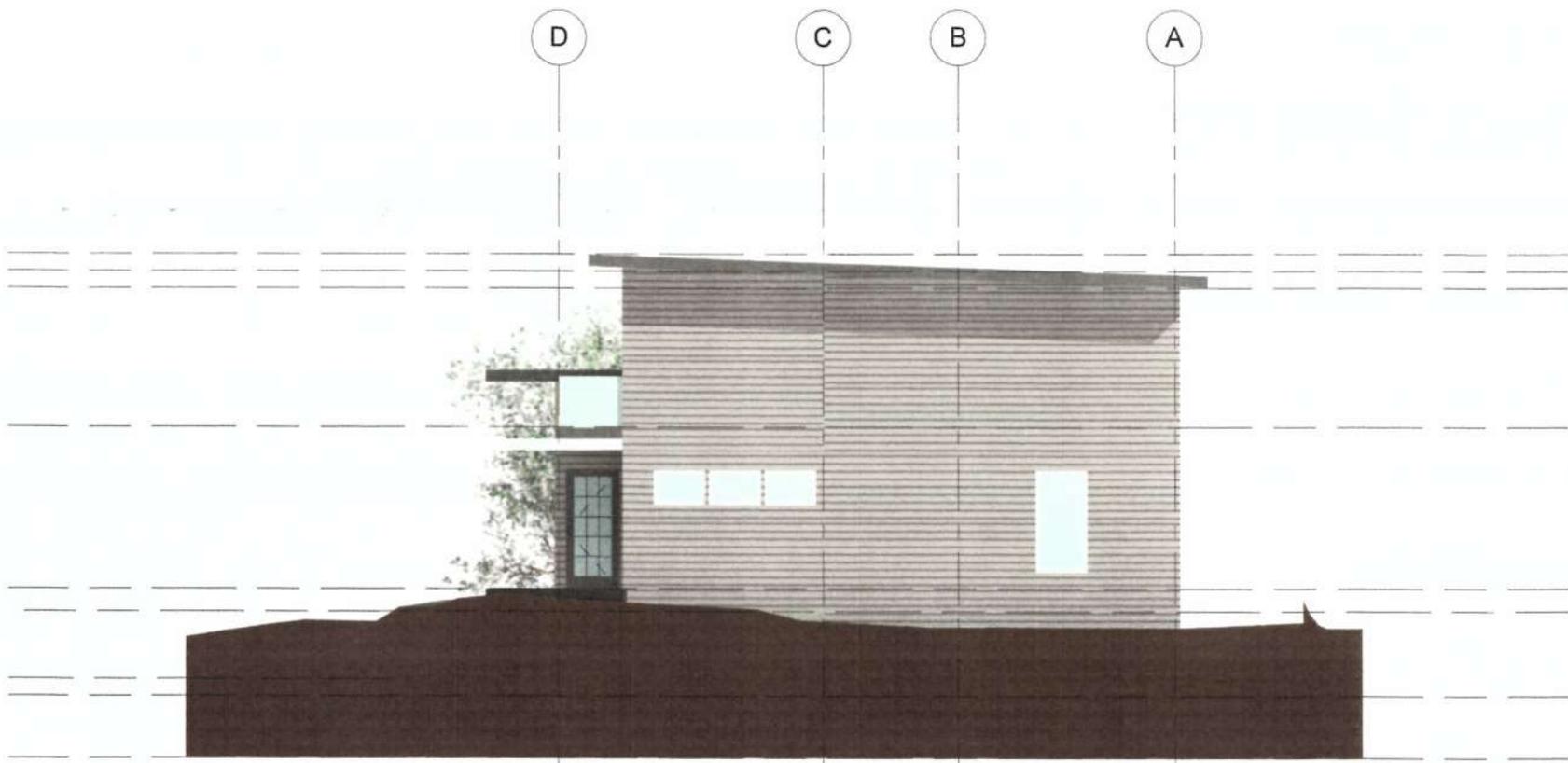




SOUTH ELEVATION

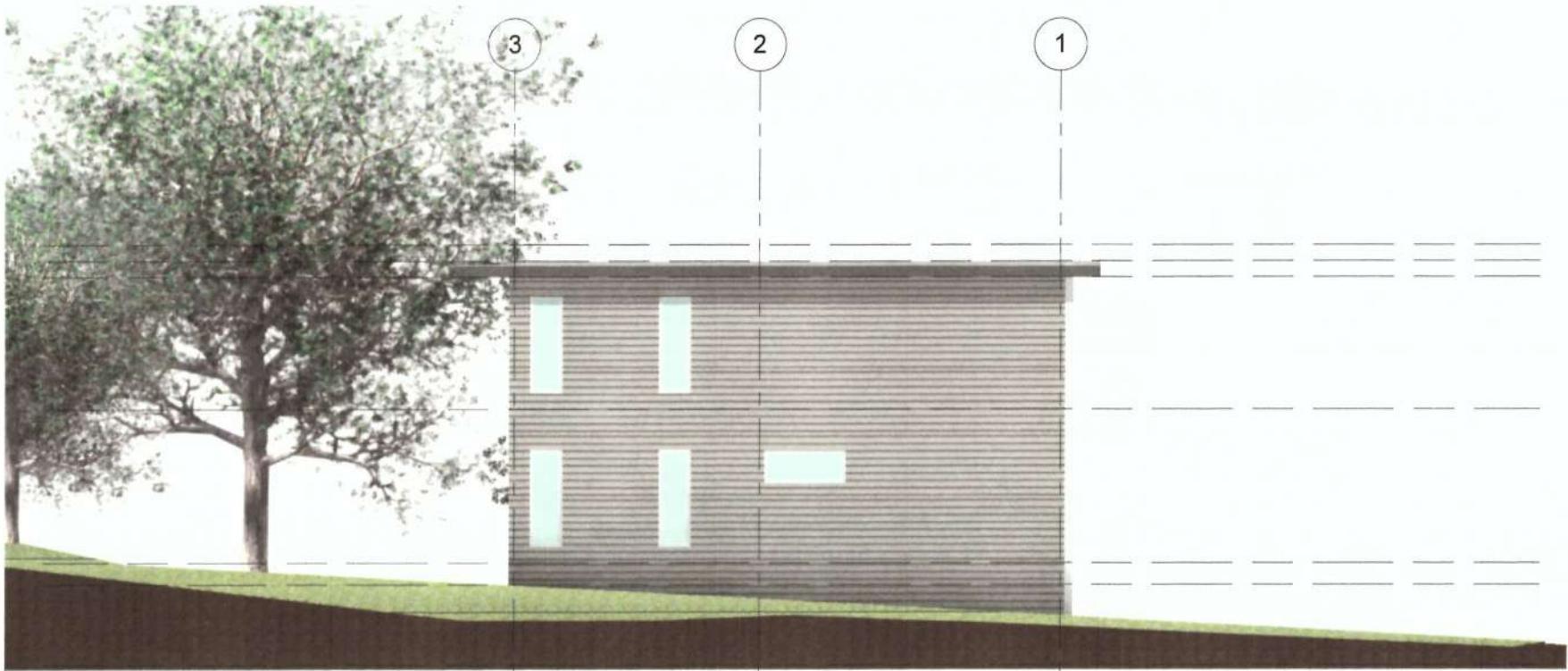


R1-G ZONE SUB-DIVISION APPLICATION FOR
931 REDFERN STREET
A105 05/23/18



EAST ELEVATION





NORTH ELEVATION

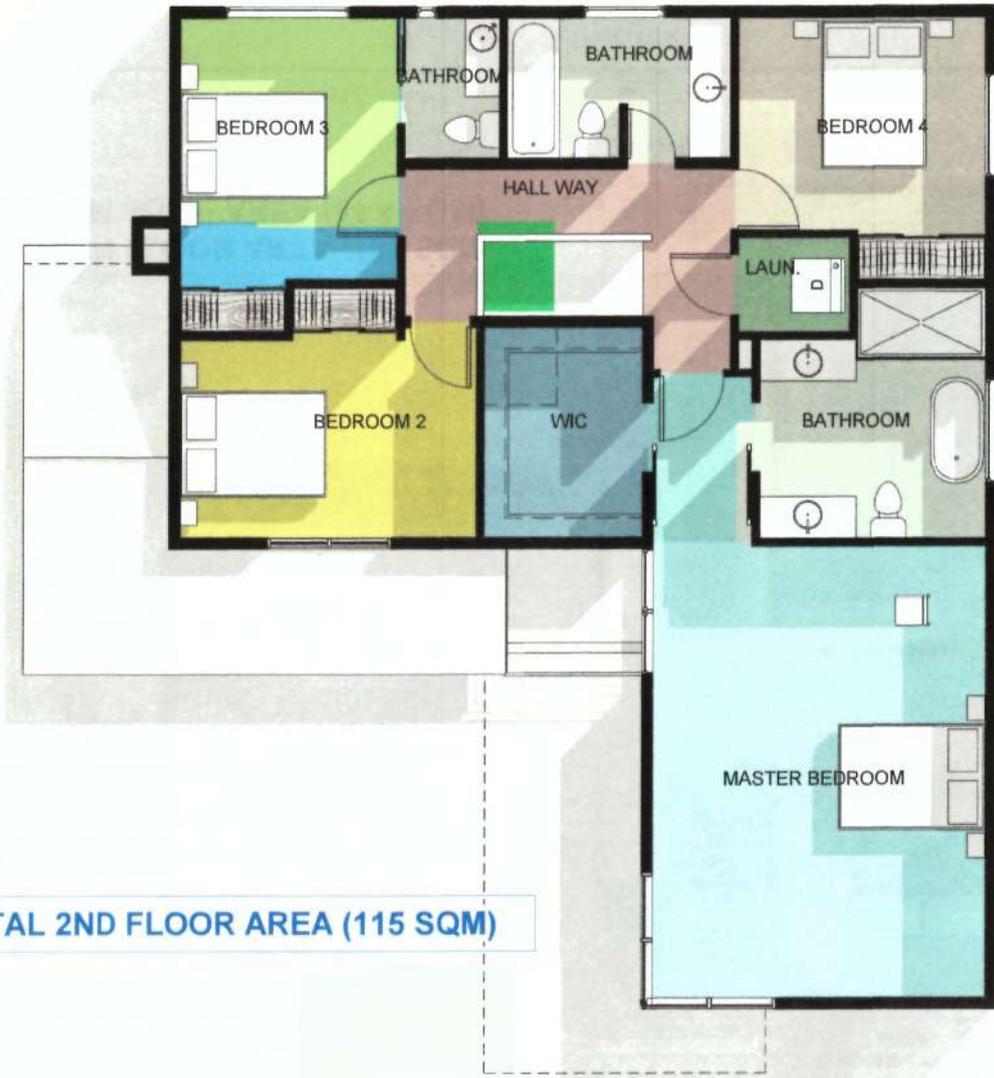




- Room Legend
- BATHROOM
 - KITCHEN & DINING AREA
 - LIVING ROOM
 - PANTRY
 - ST.
 - SUITE
 - TV ROOM
 - WASHRM

TOTAL MAIN FLOOR AREA (137 SQM)
1 BEDROOM SUITE AREA (34.4 SQM)



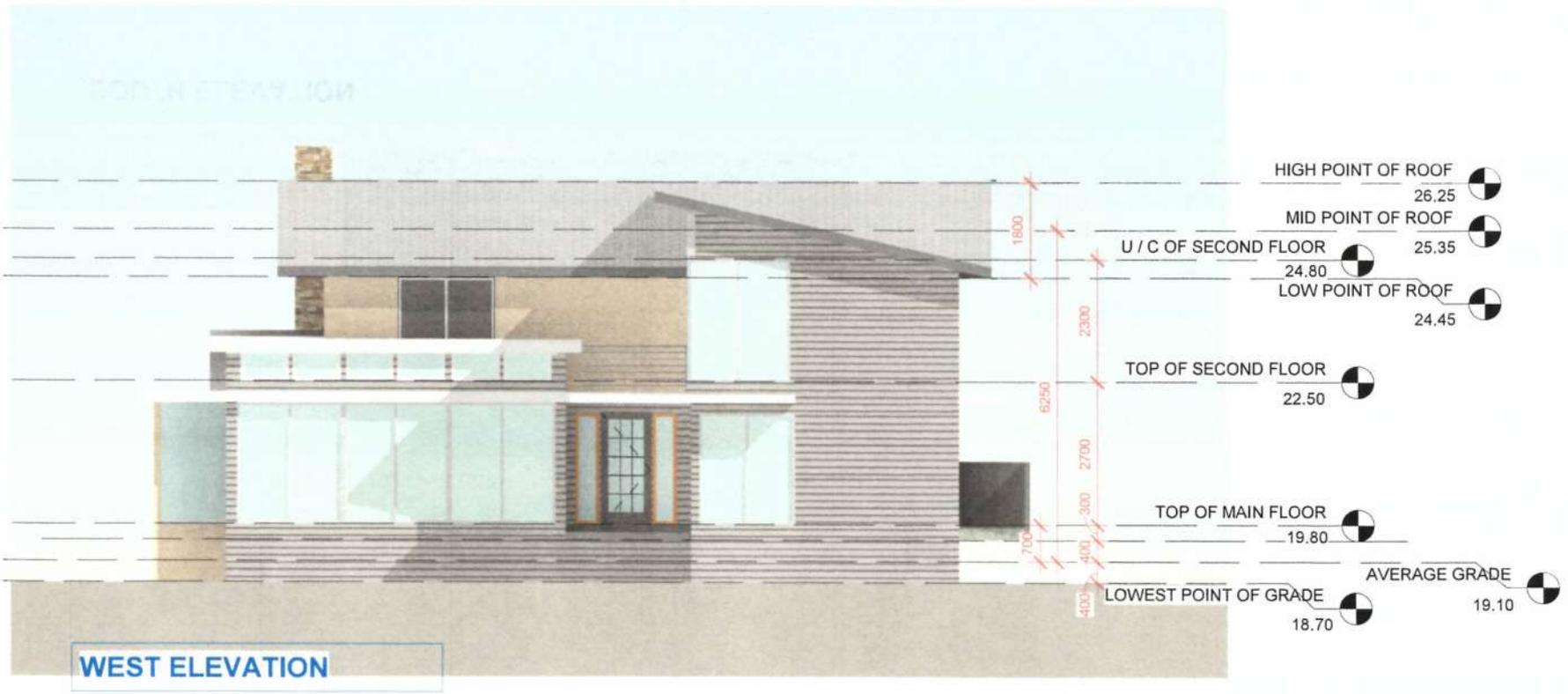


TOTAL 2ND FLOOR AREA (115 SQM)

Room Legend

- BATHROOM
- BEDROOM 2
- BEDROOM 3
- BEDROOM 4
- HALL WAY
- LAUN.
- MASTER BEDROOM
- ST.
- SUITE
- TV ROOM
- WIC







SOUTH ELEVATION



**R1-G ZONE SUB-DIVISION APPLICATION FOR
931 REDFERN STREET
B104 05/23/18**



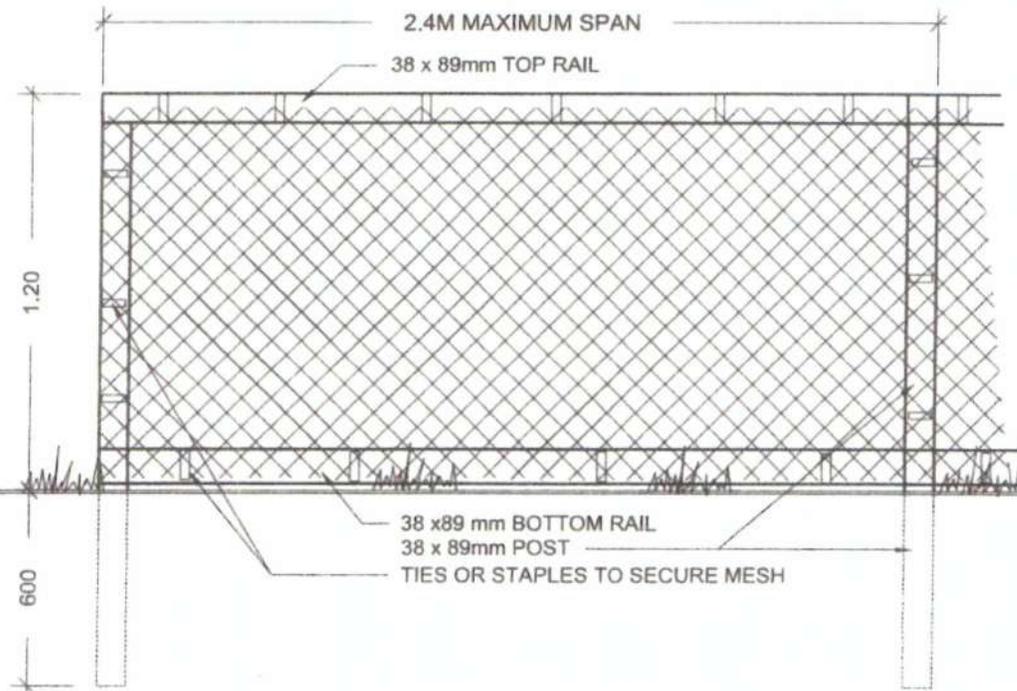
EAST ELEVATION





NORTH ELEVATION





TREE PROTECTION FENCING
 FENCE WILL BE CONTRUCTED USING
 38 X 89 mm (2"X4") WOOD FRAME:
 TOP, BOTTOM AND POSTS. *
 USE ORANGE SNOW-FENCING MESH AND
 SECURE TO THE WOOD FRAME WITH
 "ZIP" TIES OR GALVANZIED STAPLES

* IN ROCKY AREAS, METAL POSTS (T-BAR
 OR REBAR) DRILLED INTO ROCK WILL BE
 ACCEPTED

DETAIL NAME:

TREE PROTECTION FENCING

DATE: Oct 30/07
 DRAWN: DM
 APP'D: RR
 SCALE: N.T.S.

E105
 DRAWING

THE UNIVERSITY OF MICHIGAN



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C C