Riparian Areas Protection Regulation: Assessment Report

Please refer to submission instructions and assessment report guidelines when completing this report.

Date: May 29th 2025

I. Primary QEP Information

First Name	Robert	Middle Name	William
Last Name	Crandall		
Designation	Environmental QEP AScT	Company	Swordfern Environmental
Registration #	27767	Email	[redacted]
Address	[redacted]		
City	[redacted]	Postal/Zip	[redacted]
Prov/state	[redacted]	Country	Canada
		Phone #	[redacted]

II. Secondary QEP Information (use **Form 2** for other QEPs)

First Name		Middle Name	
Last Name			
Designation		Company	
Registration #		Email	
Address			
City		Postal/Zip	
Prov/state		Country	
		Phone #	

III. Developer Information

First Name	Maria	Middle Name	
Last Name	Kyle		
Company	NA		
Phone #	[redacted]	Email	[redacted]
Address	[redacted]		
City	[redacted]	Postal/Zip	[redacted]
Prov/state	B.C.	Country	Canada

IV. Development Information

Development Type	Single Family Residential		
Area of Development (ha)	0.03	Riparian Length (m)	72.68
Lot Area (ha)	0.11	Nature of Development	New Residential
Proposed Start Date	June 10th 25	Proposed End Date	Dec. 31st 26

V. Location of Proposed Development

Street Address (or nearest town)	276 Tal Road						
Local Government	Town of Lake Cowichan			City	Lake Cowichan		
Stream Name	Unnamed (Watsons Creek)						
Legal Description (PID)	028-497-023			Region	Vancouver Island		
Stream/River Type	Stream			DFO Area	South Coast		
Watershed Code	920-257700						
Latitude	48	48	59	Longitude	124	04	01

Completion of Database Information includes the Form 2 for the Additional QEPs, if needed.
Insert that form immediately after this page.

Table of Contents for Assessment Report

Page Number

Section 1. Description of Fisheries Resources Values and a Description of the Development proposal

(Provide as a minimum: Species present, type of fish habitat present, description of current riparian vegetation condition, connectivity to downstream habitats, nature of development, specific activities proposed, timelines)

This stream flows to Lake Cowichan via culverts and ditches at slopes greater than 25%. A note of Lake Cowichan Bio is therefore worthy:

Watershed Code: 9202577 **COWICHAN LAKE**

BIOPHYSICAL DESCRIPTION

A large, deep oligotrophic lake. Framed by steep mountains in a zone of high precipitation, the lake is not very productive (Carl, 1952). Its flushing rate is high and its shore zone is, for the most part, very narrow. Much of the shore zone is composed of rather exposed gravel which is not conducive to benthic community development and fish production. Cowichan Lake levels normally range from about 161.4 m to 162.4 m in the summer months (full storage level is 162.37 m) 163.9 m is the maximum average winter level and the highest recorded level was 165.388 on January 21, 1968. The 200 year flood level is set at 167.37. The high water mark has been set by the Ministry of Environment at 163.9 m. which is the 5 year return period for maximum high water. The base of the weir is 161.4 m.

Elevation (m) Area (m^2) Volume (m^3) Mean Depth. Max. Depth. Perimeter

Fish Utilization and Limiting Factors

Cowichan Lake is utilized by rainbow and cutthroat trout, Dolly Varden char and kokanee, coho and chinook salmon. A few chum salmon also rear a short time in the lake and an occasional shore spawning chum is reported. Very occasional coho shore spawning is also reported. Sturgeon are also reported very occasionally as are Eastern Brook trout. Three – spine sticklebacks are very numerous in Class 1 and 2 shore zone habitat.

Cowichan Lake coho deserve some discussion. A percentage of the coho born in lake tributaries is morphologically designed for life in the lake (Swain and Holtby, 1989). These fish migrate to the lake in the first few weeks after emergence. Many Cowichan Lake tributaries dry for a large percentage of their accessible distance yet have consistent coho returns. Robertson Side channel is a good example. It has had some of the highest returns of any tributary in the Cowichan system yet dries almost completely in its accessible length.

Production is limited by low nutrients and the lack of quality shore zone fish habitat. Only 14.32% of the lake's shore zone is Class 1 habitat and most coho juveniles in deep coastal lakes like Cowichan remain relatively close to shore except for the warmer parts of summer. Mason 1974 found that Great Central Lake coho remained within 10 m of the shore. Cowichan Lake coho can be found

up to 50 m or more from shore in the summer months. Nonetheless, the lake's shore zone is largely narrow, fairly exposed and lacking in cover/complexity. It is speculated that, with the large reduction in log storage, an important element of cover is lacking log booms and associated elements like boom sticks protecting storage areas and the associated debris that accumulated in the shore zone as sunken and floating/semi-floating wood. It is apparent that coho production is highest in years when juveniles can remain in the shore zone for all or most of the summer. In very warm summers, the fish leave the shore zone sometime in July and do not return until about the second week in October. It is speculated that the fish move into deeper water near the thermocline where food is much less common and survival is probably lessened.

Paul Watson was the developer for the original phases of this subdivision, and a park was created due to the land not being developable. The land in the area of this property has a small park where a 600 sq. m wetland is fed by seep springs and flows west as a stream from the back of #267 Tal Road under a park trail bridge and along the back of #272 Tal Road until it reaches the back of subject property where it (the stream) turns and flows north along the west side of subject property (within a Town Park) where it enters a corrugated plastic pipe 24" diameter to cross drain under Tal Road and continue northward eventually entering the Town storm drain conveyance system at Point Ideal Road. The wetland and stream are located on high ground as is the subject property, so the flow downhill is greater than 25% grade and involves multiple culverts that are not baffled for fish passage. Due to this fact the wetland and stream are non fish bearing however I give them fish bearing status and riparian watercourse measures.
The wetland is located on Lot 17, Cowichan Lake District (PID 002-166-984) at the back of #267 Tal Road and the stream from wetland is on Lot 17, Cowichan Lake District (PID 002-166-984) adjacent to subject property as it passes along subject property boundary both south and west. The wetland is greater than 100m from subject property and therefore is not assessed.
The species vegetation in the overstory consist of Douglas Fir, Big Leaf Maple, Western Red Cedar, and Hemlock, while the understory has Sword Fern, Oregon Grape, Salmon Berry, Red Huckle berry, Bracken Fern, Indian Plum, Swamp Rose, while ground cover species were BC trailing Blackberry, Trailing Current, Maiden Hair Fern, Deer Fern and sedges of Sea Onion, Trillium and Mares tail/Horse tail. Terrestrial species occur above stream boundary while aquatic species are below stream boundary.

The proposed development is for construction of one single family wood frame house. Designs are included in this RAPR and loaded up into RARNS.

2. Results of Detailed Riparian Assessment

Refer to Section 3 of Technical Manual

Date: May 29th 2025

Description of Water bodies involved (number, type): 1 stream (Unnamed) "Watsons Glen"

Stream	X
Wetland	
Lake	
Ditch	
Number of reaches	1
Reach #	1

Channel width and slope and Channel Type (use only if water body is a stream or a ditch, and only provide widths if a ditch)

	Channel Width(m)		Gradient (%)
starting point	3.0		3.0
upstream	3.1		
	3.0		
	2.8		
	3.0		
downstream	4.5d		
	4.0		
	3.4		
	2.0		
	1.9		
	1.7d		2.75
Total: minus high /low	26.2		5.75
mean	2.91		2.87
	R/P	C/P	S/P
Channel Type	X		

I, (Robert Crandall), hereby certify that:

a) I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act.*

b) I am qualified to carry out this part of the assessment of the development proposal made by the developer (*Maria Kyle*);

c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and

d) In carrying out my assessment of the development proposal, I have followed the technical manual to the Riparian Areas Protection Regulation.

Site Potential Vegetation Type (SPVT)

	Yes	No	
SPVT Polygons		X	Tick yes only if multiple polygons, if No then fill in one set of SPVT data boxes

I, (*Robert Crandall*) , hereby certify that:

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Polygon No:				Method employed if other than TR
	LC	SH	TR	
SPVT Type				
Polygon No:				Method employed if other than TR
	LC	SH	TR	
SPVT Type				

Polygon No:				Method employed if other than TR
SPVT Type				

Zone of Sensitivity (ZOS) and resultant SPEA

Segment No:	1	If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons						
LWD, Bank and Channel Stability ZOS (m)	10							
Litter fall and insect drop ZOS (m)	10							
Shade ZOS (m) max	30	South bank	Yes		No	X		
Ditch	Justification description for classifying as a ditch (manmade, no significant headwaters or springs, seasonal flow)							
Ditch Fish Bearing	Yes		No		If non-fish bearing insert no fish bearing status report			
SPEA maximum		(For ditch use table3-7)						

Segment No:		If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons						
LWD, Bank and Channel Stability ZOS (m)								
Litter fall and insect drop ZOS (m)								
Shade ZOS (m) max		South bank	Yes		No			
SPEA maximum		(For ditch use table3-7)						

Segment No:		If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons						
LWD, Bank and Channel Stability ZOS (m)								
Litter fall and insect drop ZOS (m)								
Shade ZOS (m) max		South bank	Yes		No			
SPEA maximum		(For ditch use table3-7)						

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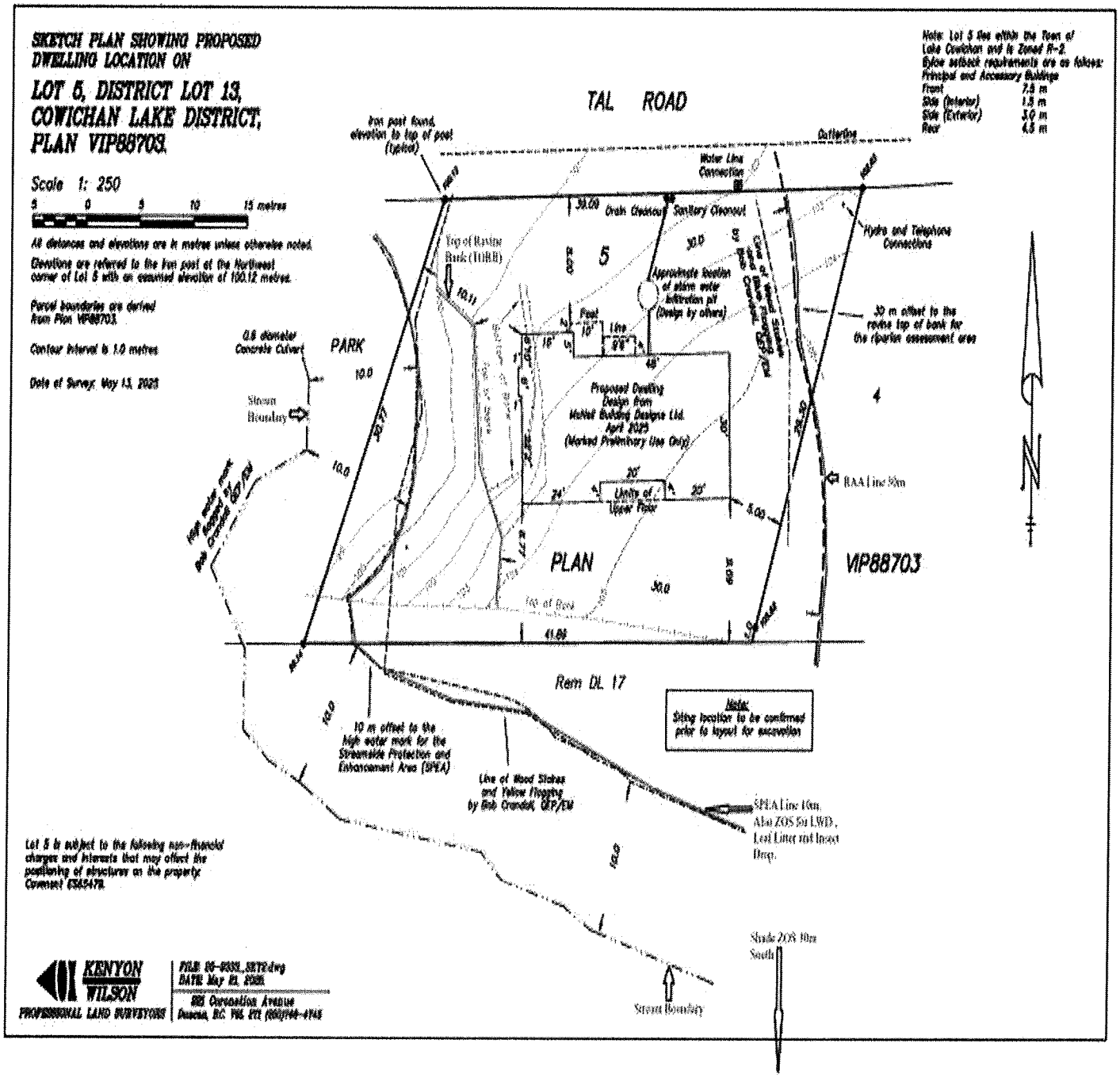
d) In carrying out my assessment of the development proposal, I have followed the technical manual to the Riparian Areas Protection Regulation.

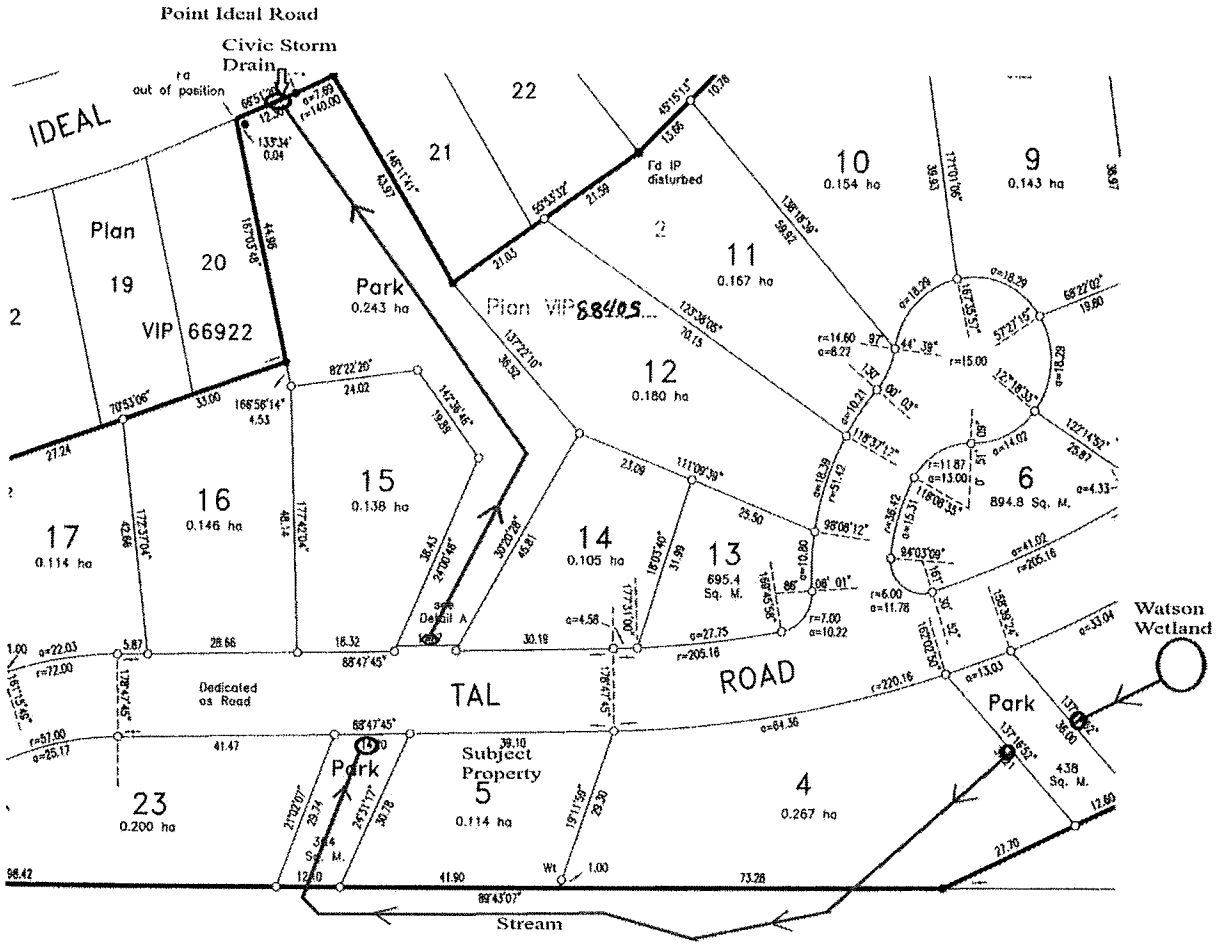
Comments

Development on one side only therefore one side assessed only.

Section 3. Site Plan (next page)

Site Plan


SKETCH PLAN SHOWING PROPOSED DWELLING LOCATION ON
LOT 5, DISTRICT LOT 13, COWICHAN LAKE DISTRICT, PLAN VIP88703.
Scale 1: 250
5 0 5 10 15 metres
All distances and elevations are in metres unless otherwise noted.
Elevations are referred to the iron post at the Northwest corner of Lot 5 with an assumed elevation of 100.12 metres.
Parcel boundaries are derived from Plan VIP88703.
Contour interval is 1.0 metres
Date of Survey: May 13, 2025
TAL ROAD
Iron post found, elevation to top of post (typical)
Gutterline
Water Line Connection
Drain Cleanout
Sanitary Cleanout
Hydro and Telephone Connections
Top of Ravine Bank (TIBB)
Approximate location of storm water infiltration pit (Design by others)
30 m offset to the ravine top of bank for the riparian assessment area
0.6 diameter Concrete Culvert
PARK
Stream Boundary
Proposed Dwelling Design from Mallet Building Designs Ltd. April 2025 (Marked Preliminary Use Only)
Limits of Upper Floor
BAA Line 30m
PLAN
VIP88703
Rem DL 17
Note: Siting location to be confirmed prior to layout for excavation
10 m offset to the high water mark for the Streamside Protection and Enhancement Area (SPEA)
Line of Wood Stakes and Yellow Flagging by Rob Crandell, QEP/EM
SPEA Line 10m. Also ZOS for LWD, Leaf Litter and Insect Drop.
Shade ZOS 10m South
Stream Boundary
Lot 5 is subject to the following non-financial charges and interests that may affect the positioning of structures on the property: Covenant ES65478.
KENYON WILSON
PROFESSIONAL LAND SURVEYORS
Note: Lot 5 lies within the Town of Lake Cowichan and is Zoned R-2. Bylaw setback requirements are as follows:
Principal and Accessory Buildings
Front 7.5 m
Side (Interior) 1.5 m
Side (Exterior) 3.0 m
Rear 4.5 m



Stream mapping

Civic Map

Section 4. Measures to Protect and Maintain the SPEA

This section is required for detailed assessments. Attach text or document files, as need, for each element discussed in Part 4 of the RAPR. It is suggested that documents be converted to PDF *before* inserting into the assessment report. Use your "return" button on your keyboard after each line. You must address and sign off each measure. If a specific measure is not being recommended a justification must be provided.

1. Danger Trees	There are no hazardous trees on the property. The lot has been cleared and grubbed for decades.
I, Robert Crandall) , hereby certify that: e) I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*; f) I am qualified to carry out this part of the assessment of the development proposal made by the developer (Maria Kyle) ; g) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and in carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.	
2. Windthrow	Windthrow is not an issue here as trees on adjacent lands are windfirm.
I, (Robert Crandall) , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer (Maria Kyle); c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and in carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.	
3. Slope Stability	Slope stability is not a concern here, the proposed house location is far enough away from slope (ravine) that it is not an issue.
I, (Robert Crandall), hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer (Maria Kyle) ; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and in carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.	
4. Protection of Trees	The SPEA line will have a silt sediment fence along the SPEA which will serve as a barrier to encroachment. An orange plastic snow fence will be on hand to install if required. The SPEA line will be permanently denoted with a row of boulders, live fence or split rail fence.
I, (Robert Crandall) , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer (Maria Kyle) ; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and in carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.	
5. Encroachment	Encroachment into the SPEA will not be allowed and along the SPEA line a sediment silt fence will be erected according to specifications for installation procedure/s. An

	additional orange plastic stretch snow fence may also be requested to stop encroachment during construction. A decision will be made for permanent demarcation of the SPEA line which include options such as live fence of trees /shrubs, row of boulders or a split rail fence. Many clients choose from and implement from a variety of demarcation.

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6. Sediment and Erosion Control	Best management practices for erosion sediment control will be implemented. Silt sediment fence will be erected along SPEA lines. A vegetated strip will be left in place along the TAL Road to trap any mobile sediments during precipitation events.

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c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and in carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.

7. Stormwater Management	Storm water from the rooftops will follow gutters/eves-troughs and downspouts to an infiltration pit chamber and perimeter drains will be connected to the storm water conveyance system of the Town at the street where a connection is available.

I, (Robert Crandall) , hereby certify that:

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8. Floodplain Concerns (highly mobile channel)	This property is on high ground and Town Building Inspector will not allow construction until main floor joists are installed above 200 year flood elevation.

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c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.

Section 5. Environmental Monitoring

Attach text or document files explaining the monitoring regimen Use your "return" button on your keyboard after each line. It is suggested that all document be converted to PDF *before* inserting into the PDF version of the assessment report.
Include actions required, monitoring schedule, communications plan, and requirement for a post development report.

Pre-construction

A pre-construction meeting will be held with the landowner and his contractor to finalize construction plans and ensure that no impacts will occur. Best Management Practices will be utilized to ensure sediment and erosion control ie; Silt fencing and straw bales where required.

Construction

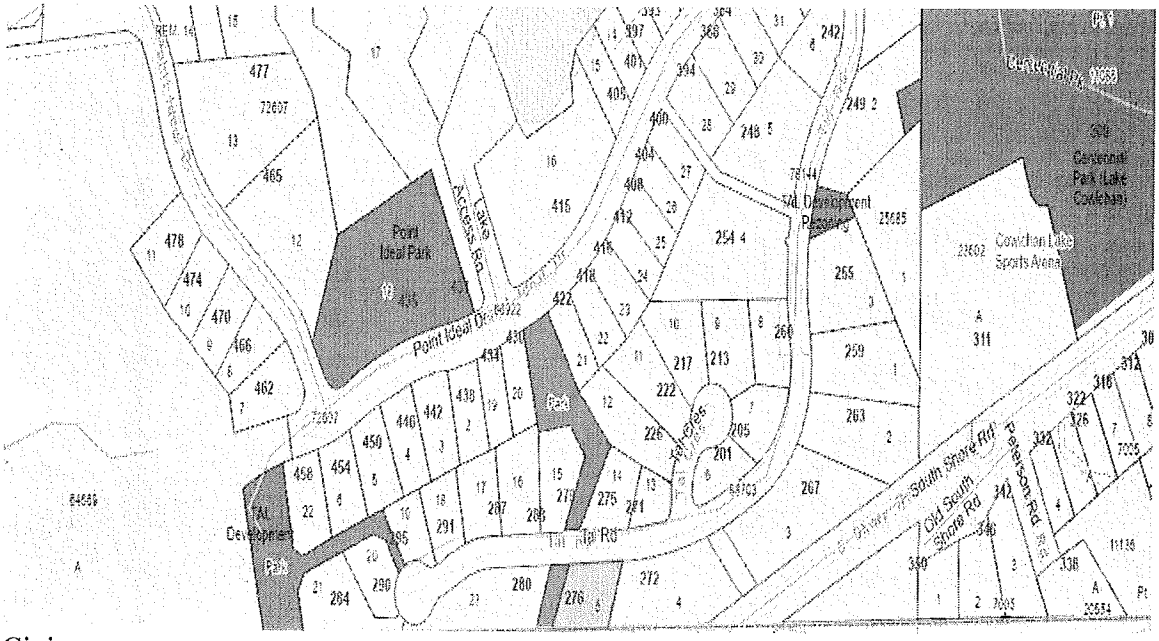
The site will be monitored during construction and always following precipitation events (50mm per day or greater). During the installation of the storm water infiltration pit the QEP will be onsite environmental monitoring and best management practices (BMP s) for erosion and sediment control will be utilized. Spill kits will be on site. Any disturbed soils will have native grass seed mix cast or native plants added.

Post Construction

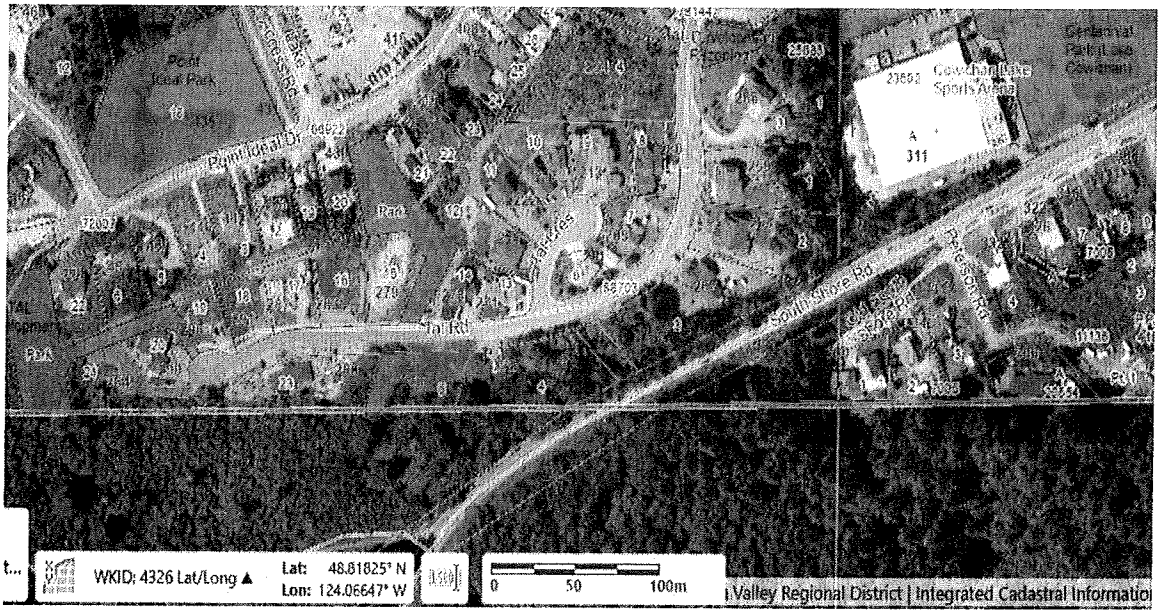
A post construction report that describes SPEA protection, compliance, enhancement and makes recommendations for future action will be prepared. The roof top will drain to infiltration pit in order to reduce run off. Native grass seeding will take place in the final dressing stage upon completion of the work.

Section 6. Photos

Provide a description of what the photo is depicting, and where it is in relation to the site plan.

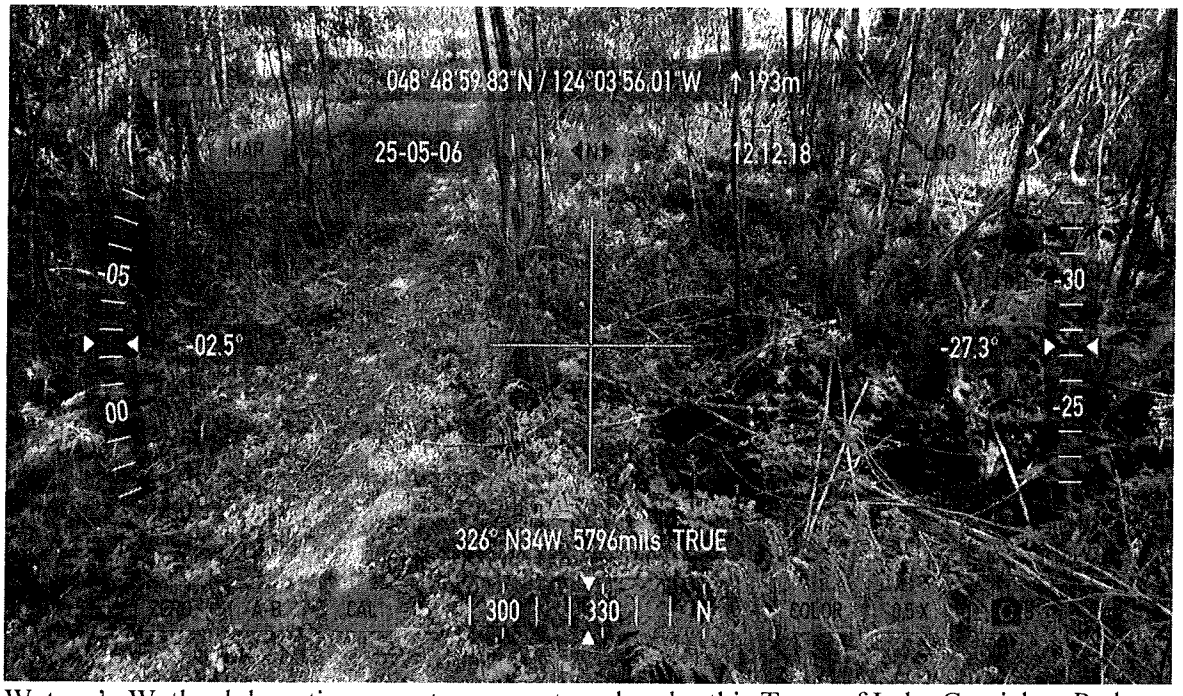


Civic map

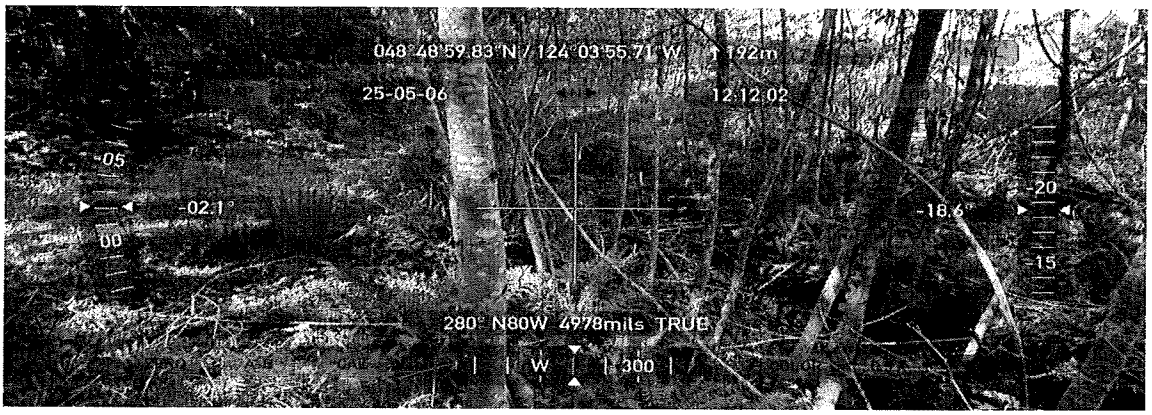


Ortho 2022

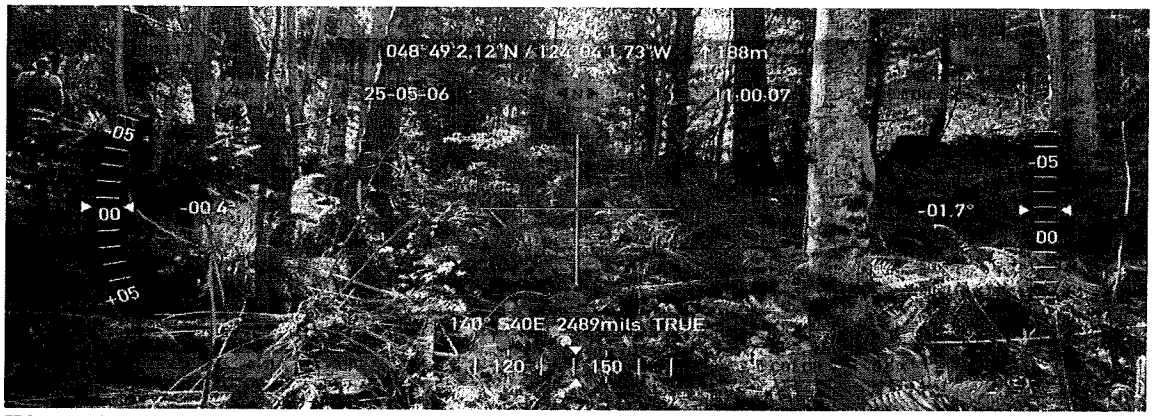
Watson's wetland behind #267 Tal Road.



Watson's Wetland departing as a stream westward under this Town of Lake Cowichan Park Path southwest side of #267 Tal Road.



Watson's watercourse travelling west behind #272 Tal Road.



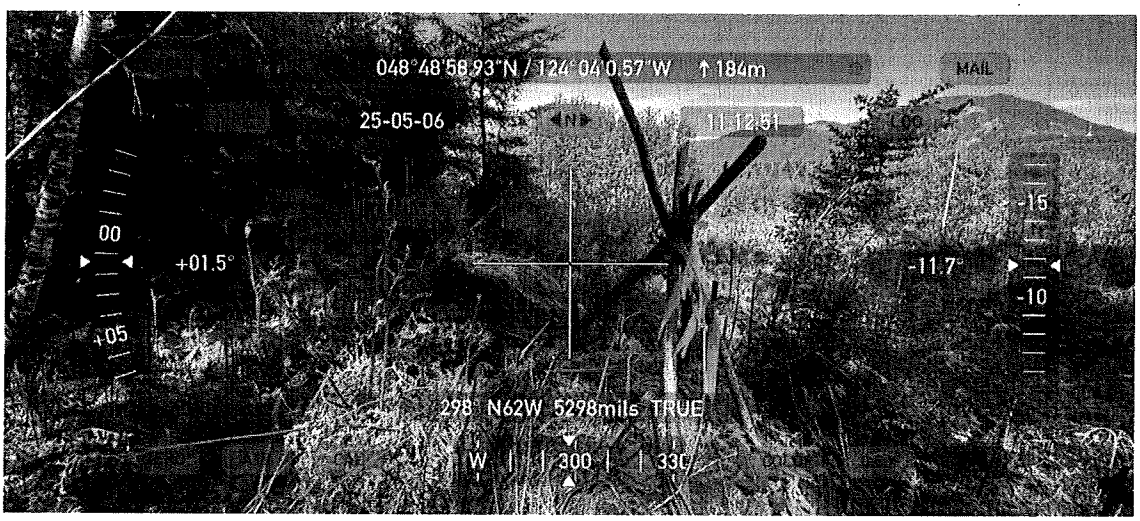
Watson's watercourse approaching the back of subject property.

Looking west along Watson's watercourse behind (south) of subject property.

Measuring SPEA from stream boundary up 10m onto back of subject property.

Measuring SPEA 10m up to southwest corner of subject lot.

Watercourse tuns northbound and enters 24" CMP culvert (Town storm water conveyance system).



Southeast corner of subject property.

RAA line at 30m from top of ravine bank (TORB). Ravine is less than 60m wide.

RAA line at 30m from TORB.

NW lot corner of subject property and TORB.

Subject property 276 Tal Road Lake Cowichan.

Section 7. Professional Opinion

Qualified Environmental Professional opinion on the development proposal's riparian assessment.

Date May 29th 2025

1. I/We Robert Crandall

Please list name(s) of qualified environmental professional(s) and their professional designation that are involved in assessment.)

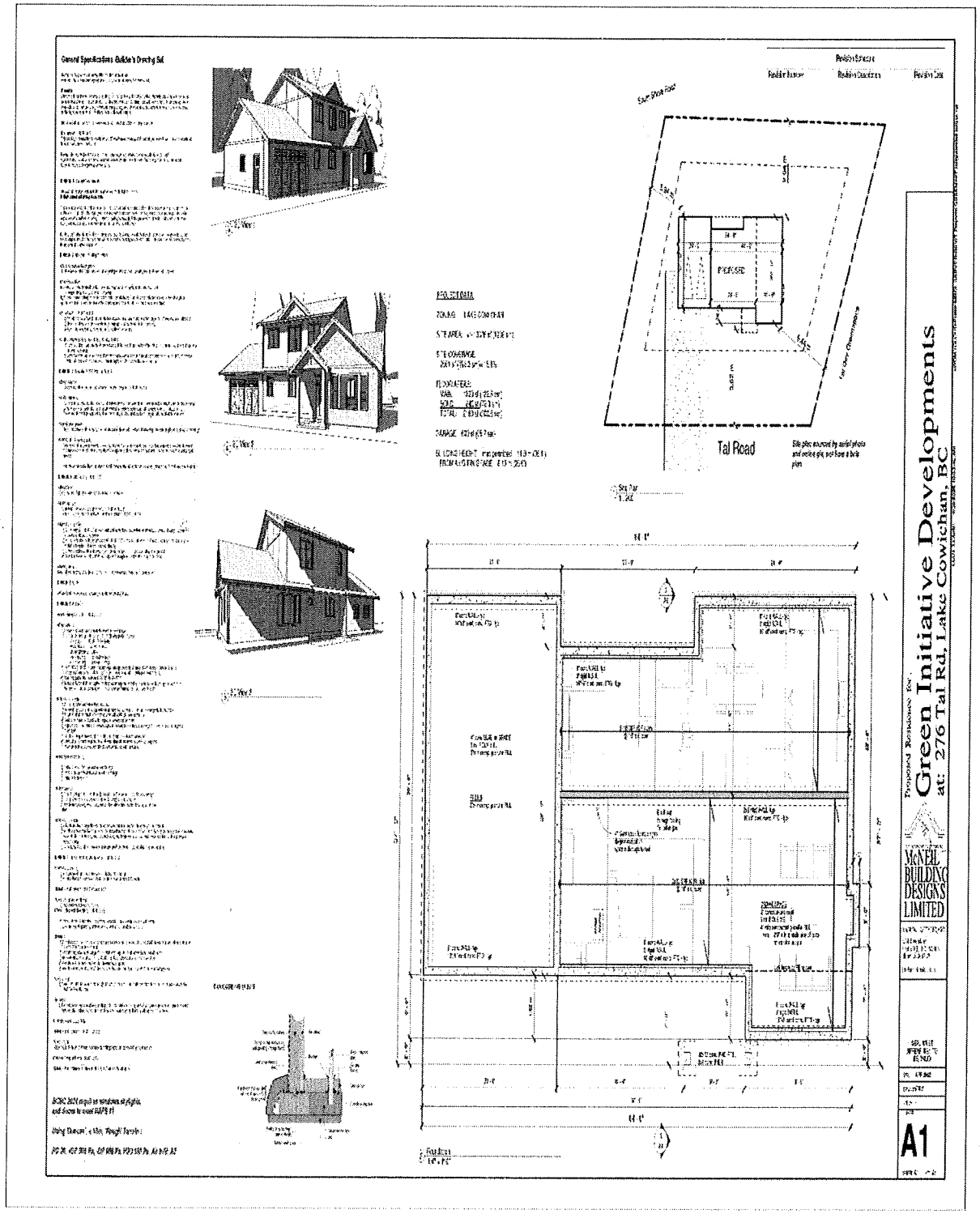
hereby certify that:

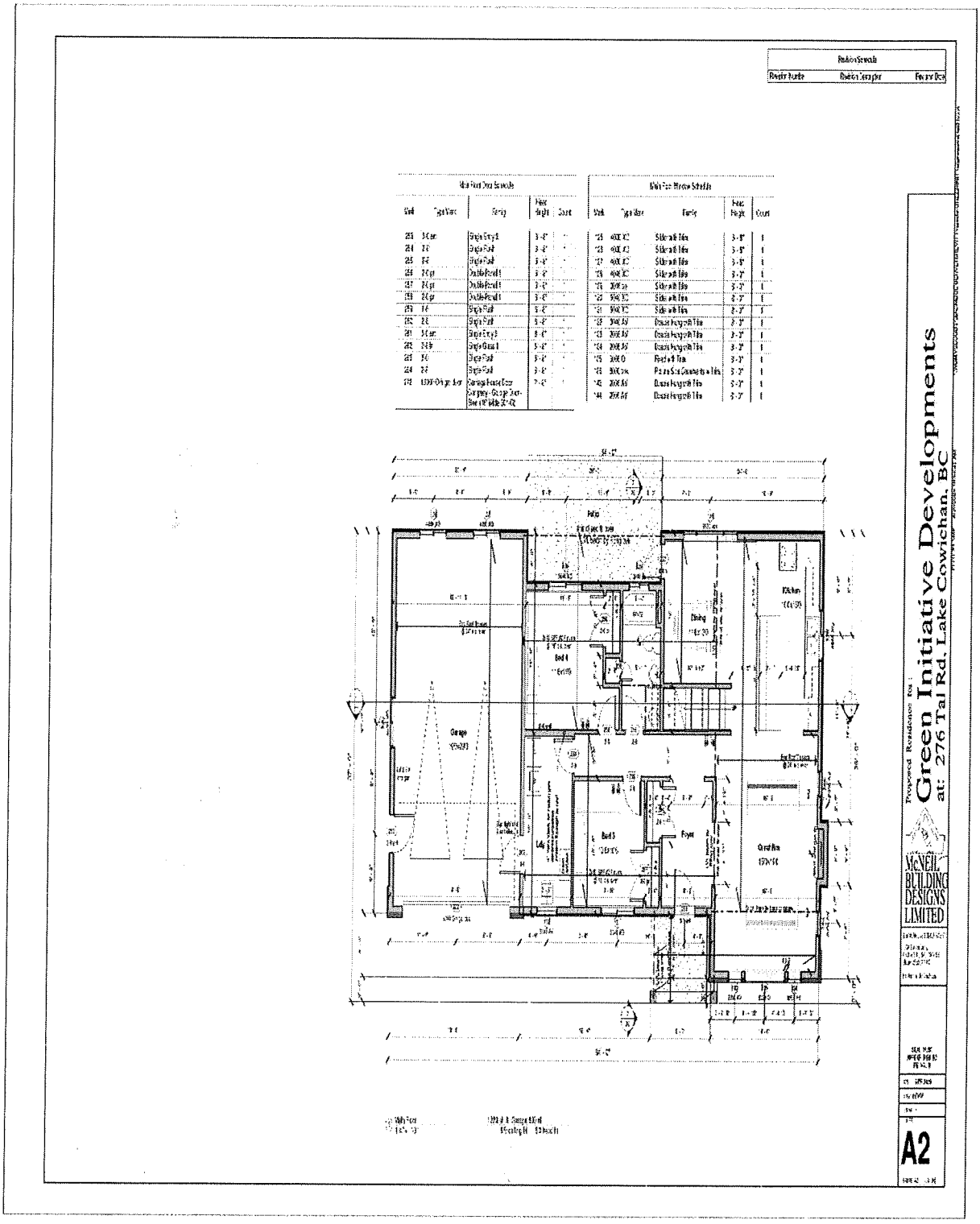
a) I am/We are qualified environmental professional(s), as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*;
b) I am/We are qualified to carry out the assessment of the proposal made by the developer *(Maria Kyle)*, which proposal is described in section 3 of this Assessment Report (the "development proposal"),
c) I have/We have carried out an assessment of the development proposal and my/our assessment is set out in this Assessment Report; and
d) In carrying out my/our assessment of the development proposal, I have/We have followed the specifications of the Riparian Areas Protection Regulation and assessment methodology set out in the minister's manual; AND

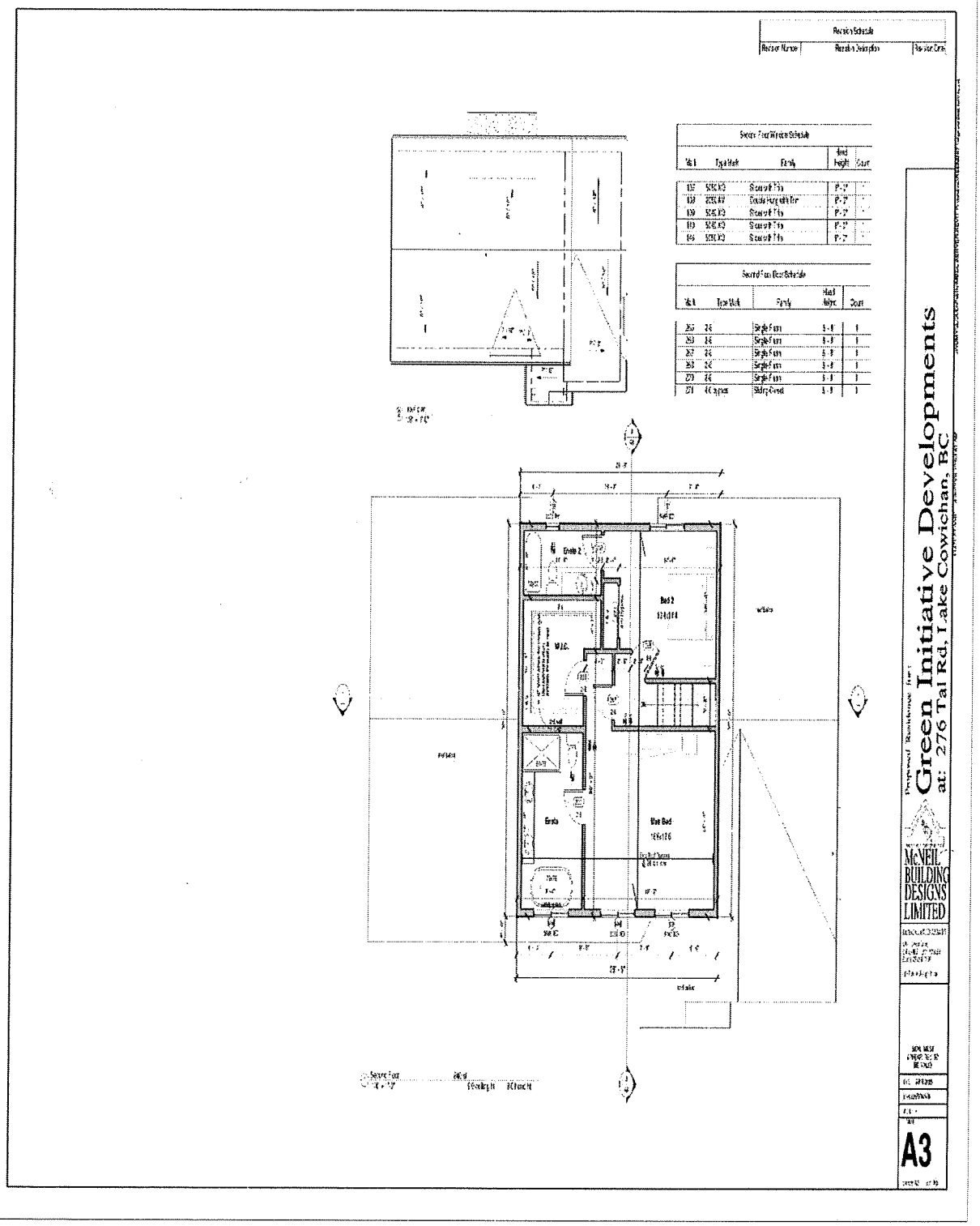
2. As qualified environmental professional(s), I/we hereby provide my/our professional opinion that:

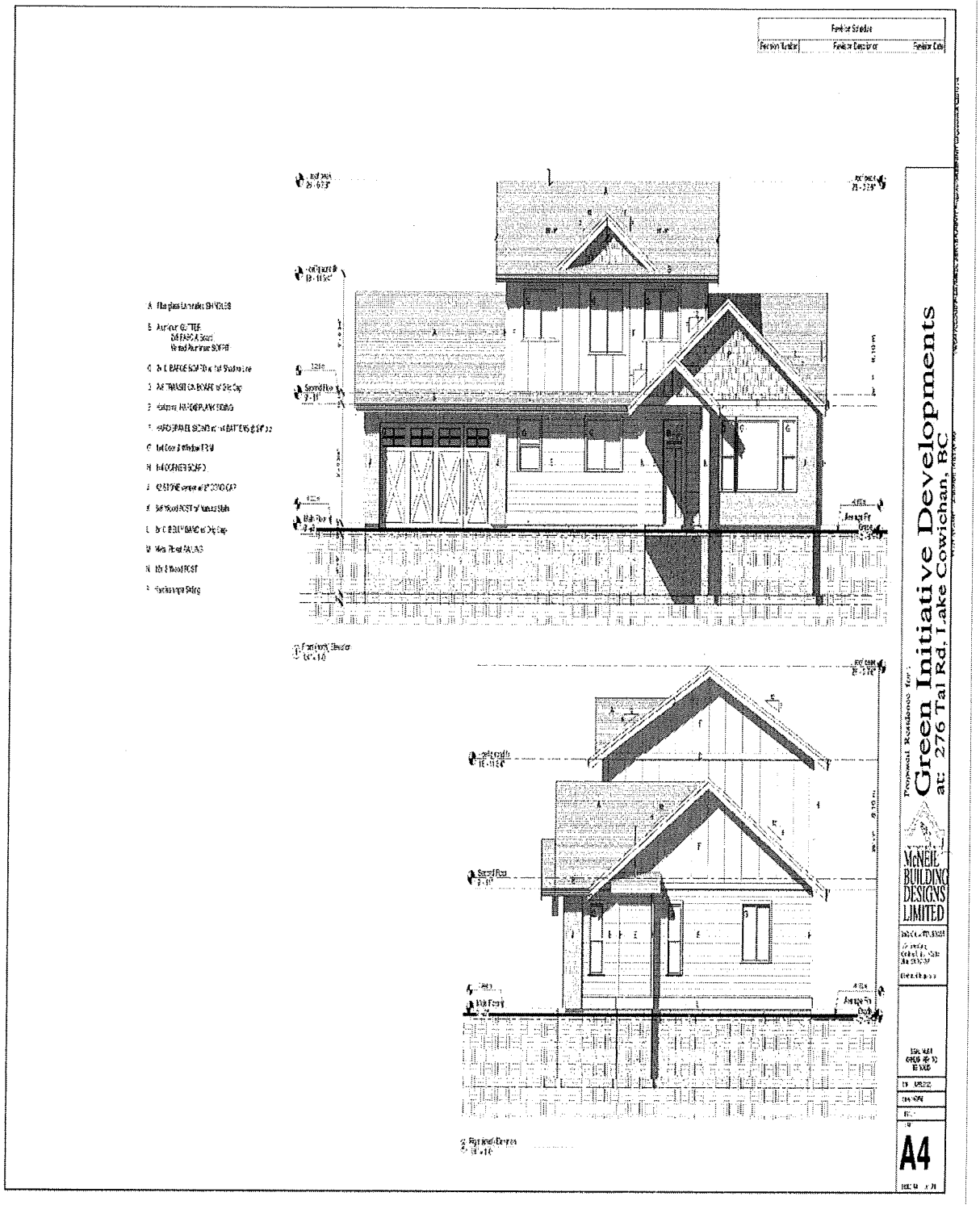
a) [ ] the site of the proposed development is subject to undue hardship, (**if applicable, indicate N/A otherwise**) and
b) [X] the proposed development will meet the **riparian protection standard** if the development proceeds as proposed in the report and complies with the measures, if any, recommended in the report.

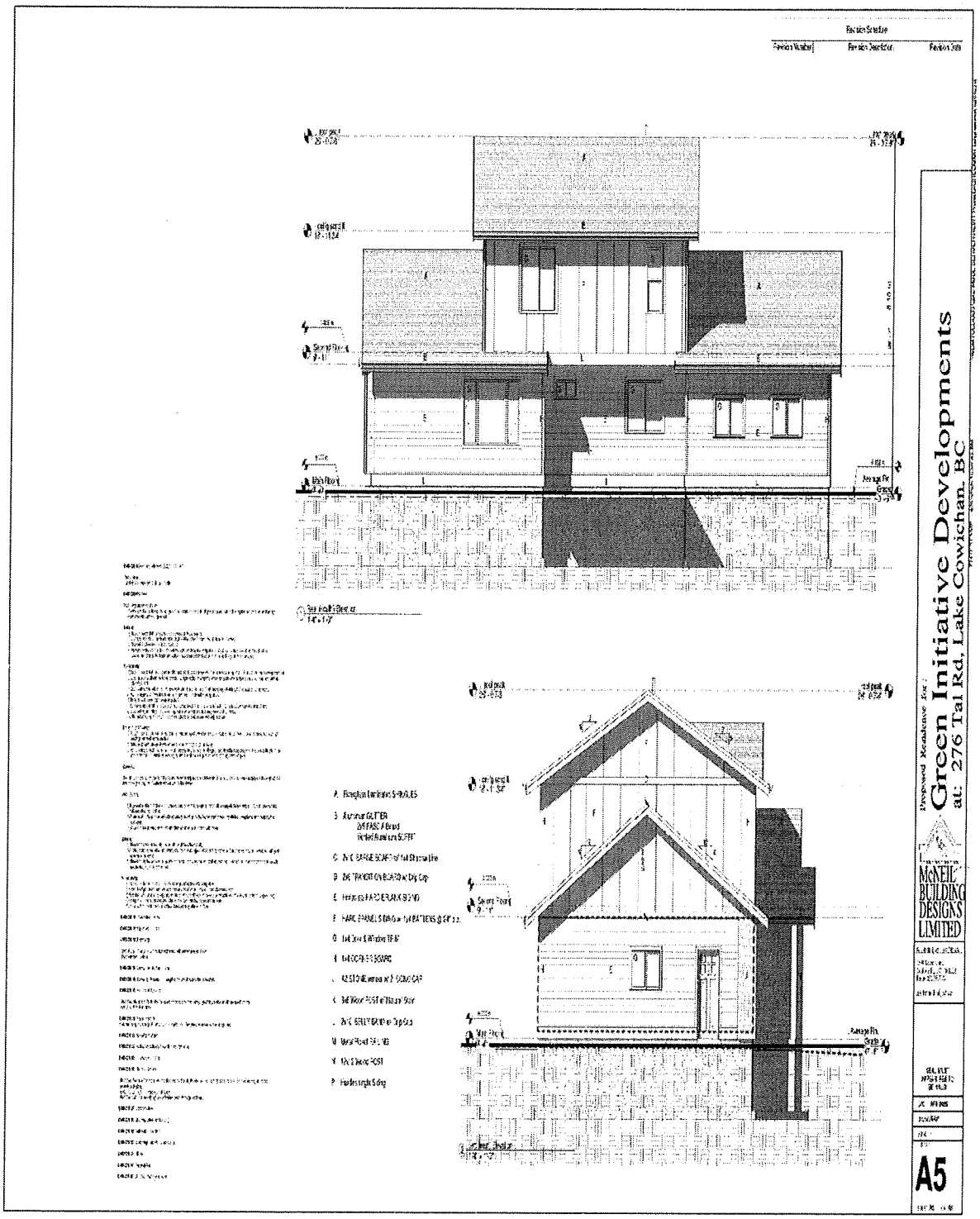
House design on next pages:

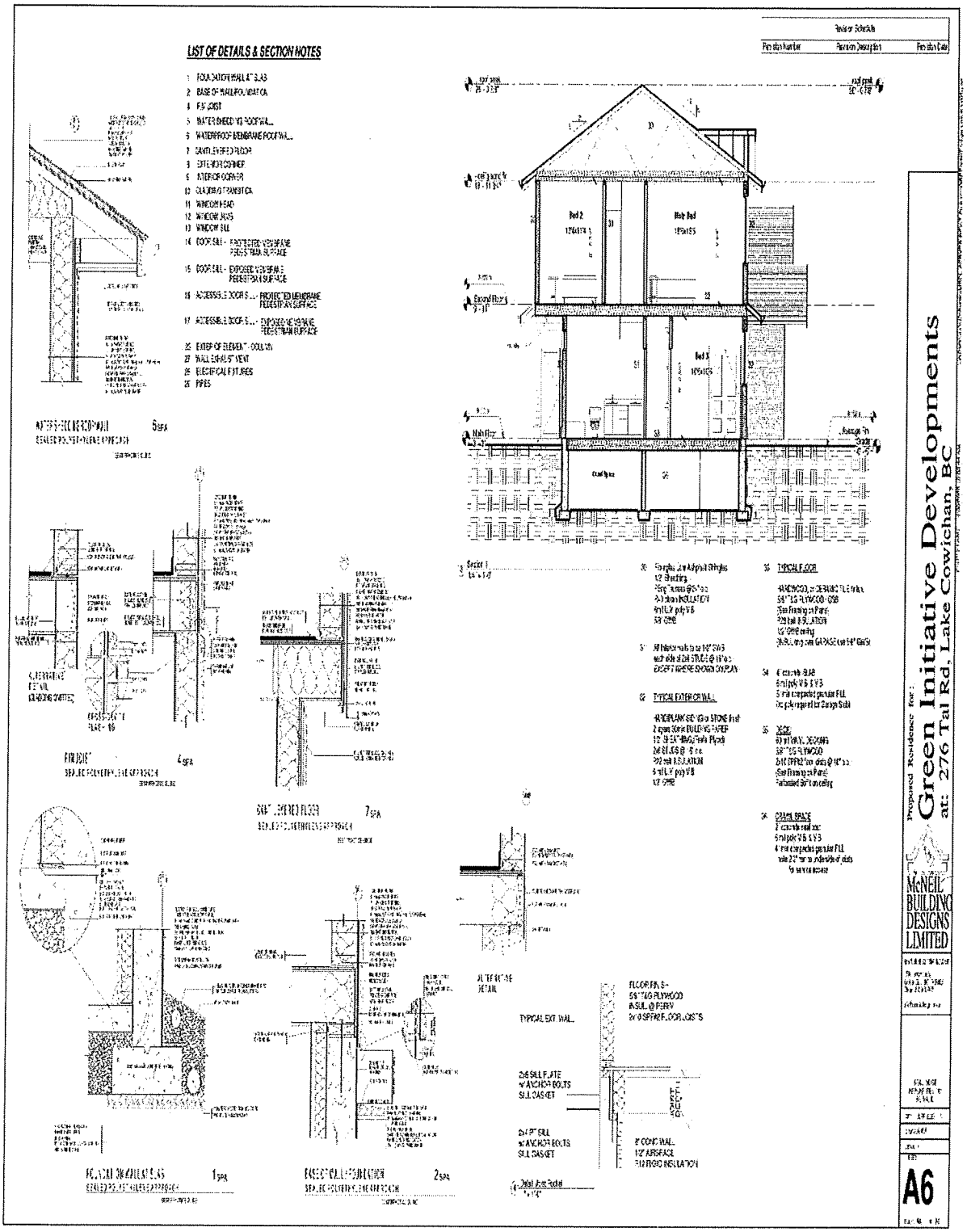

Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McNEIL BUILDING DESIGNS LIMITED
A1
Tal Road

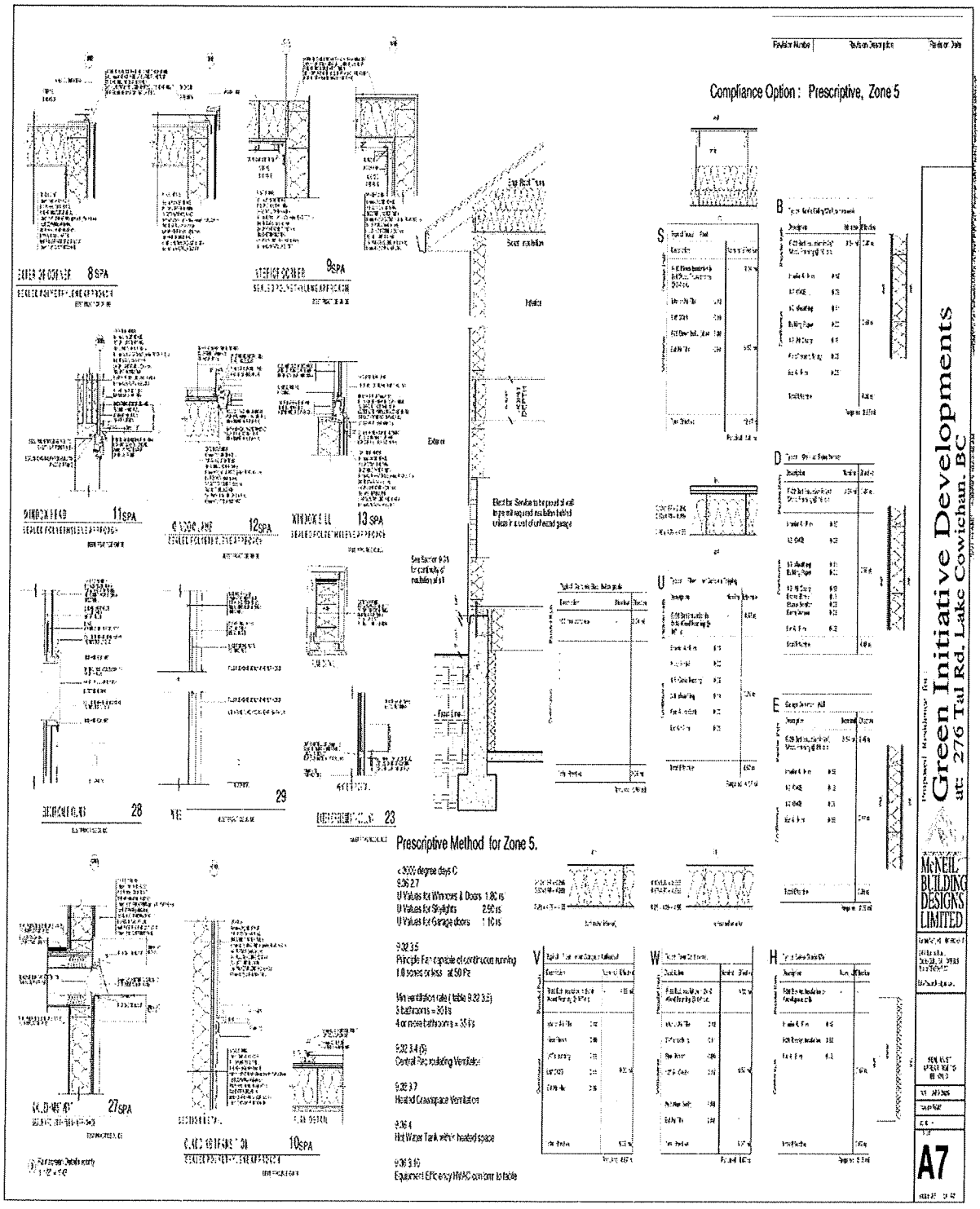

Proposed Residence for :
Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McNEIL BUILDING DESIGNS LIMITED
A2


Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McNEIL BUILDING DESIGNS LIMITED
A3


Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McNEIL BUILDING DESIGNS LIMITED
A4


Revision Schedule
Revision Number
Revision Description
Revision Date
Proposed Residence for:
Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McKEIL BUILDING DESIGNS LIMITED
A5


LIST OF DETAILS & SECTION NOTES
Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McNEIL BUILDING DESIGNS LIMITED
A6


Compliance Option : Prescriptive, Zone 5
Green Initiative Developments
at: 276 Tal Rd, Lake Cowichan, BC
McNEIL BUILDING DESIGNS LIMITED
A7
Prescriptive Method for Zone 5.

Timber West Mosaic Property Adjacent:
Admin Area: F
PID: 002-166-984
BC Assessment Roll Number:76629007365
Legal Description:
LOT 17, COWICHAN LAKE DISTRICT, EXCEPT PARTS IN PLANS 11748 AND 94 RW