MUNICIPAL PLANNING COMMISSION AGENDA
SUMMER VILLAGE OF BIRCHCLIFF
SUMMER VILLAGES ADMINISTRATION OFFICE
APRIL 15, 2021 @ 8:30 A.M.

A. CALL TO ORDER

B. ADOPTION OF AGENDA

C. DEVELOPMENT ITEMS

1) 83 Birchcliff Road

D. ADJOURNMENT

Summer Village of Birchcliff – Municipal Planning Commission

April 15, 2021

Agenda Item

83 Birchcliff Road (Lot 4&5, Block 3, Plan 4486AX)

Development Permit Application

Background:

Sorento Custom Homes submitted an application on behalf of the registered owners for a new dwelling located on the property of 83 Birchcliff Road (Lot 4&5, Block 3, Plan 4486AX) in the Summer Village of Birchcliff. This property is located in the R1 District (Lakeshore Residential). The proposed development meets the yard setback requirements, and the parcel coverage is 35.37% and under the maximum 50%. The demolition of the existing dwelling is complete. This application does not include any work on the escarpment.

Discussion:

This application is before MPC for the following reason:

- A dwelling shall not exceed 10m (32.8ft.) in building height measured from grade, the proposed building height is 10.43m (34 ft.-2 5/8”) therefore, a variance of 0.43m is required.

Recommendation:

When reviewing statutory documents, there is a hierarchy to language used. In the case of a Land Use Bylaw,
a. “shall” and “must” means mandatory compliance;
b. “should” means compliance in principle, but is subject to the discretion of the Development Authority where compliance is impracticable or undesirable because of relevant planning principles or circumstances unique to a specific application; and
c. “may” means discretionary compliance or a choice in applying regulation. The regulation can be applied, enforced or implemented if the Development Authority chooses to do so, depending on site specific circumstances.

A variance shall be considered only where warranted by the merits of the proposed development and in response to irregular parcel lines, parcel shapes or site characteristics which create difficulties in siting structures within the required setback or in meeting the usual bylaw requirements;
(i) Except as otherwise provided in this bylaw, there shall be no variance from the following:
i. Parcel coverage; and

ii. Building height;

The Land Use Bylaw is very clear that there "shall be no variance" for building height.

After reviewing all relevant planning documents, it is the recommendation of administration to deny the application for the dwelling.

Conditions:

If approved, Administration would recommend the following conditions:

- Completions Deposit of $5,000.00
- Vegetation to be planted according to the landscaping plan.
- Electrical power from the property line to any buildings situated on this parcel to be constructed underground.
- A final as build real property report from an Alberta Land Surveyor at completion of landscaping that includes parcel coverage.
- All parcels shall be graded to ensure that storm water is directed to a drainage ditch without crossing adjacent land, except as permitted by the Development Authority. All maintenance and upkeep shall be the responsibility of the property owner. A lot grade certificate may be required at completion to ensure that proper drainage on the property exists.
- No work on the escarpment is approved with this development permit.

Authorities:

The MPC may:

- Grant a variance to reduce the requirements of any use of the LUB and that use will be deemed to comply with LUB.
- Approve application even though the proposed development does not comply or is a non-conforming building if:
    - It would not unduly interfere with the amenities of the neighborhood, or
    - Materially interfere with or affect the use, enjoyment, or value of neighboring parcels of land, And
    - It conforms with the use prescribed for that land or building in the bylaw.
- Consider a Variance only where warranted by the merits or the proposed development and in response to irregular lot lines, parcel shapes or site characteristics which create difficulties in siting structures within the required setback or in meeting the usual bylaw requirements, except there shall be no variance for Parcel Coverage or Building Height.

Decision:

In order to retain transparency of the Commission, Administration recommends one of the following:

1. Approve the application with or without conditions *(Section 642 of the MGA),* or
2. Deny the application stating reasons why *(Section 642(4) of the MGA).*

Sorento
CUSTOM HOMES

Summer Village of Sylvan Lake
Bay 8, 14 Thevenaz Industrial Trail
Sylvan Lake, Alberta, T4S 2J5

March 3, 2021

Re: [redacted]
83 Birchcliff Road
Lots 4 and 5, Block 3, Plan 4486 AX
Development Permit Application

To: **Development Permit**

We are applying/acting for the owner of the address above and want to explain what the new owner of this property is wanting to do on this lot. They have an existing house and garage on the lot that they have applied to remove and will be moving it off shortly. Once the house is gone, we will be removing the basement and concrete slabs.

This application is to describe what size of house and location of where it will go as well as how it will impact the rest of the lot and neighbours. The new house will be moved closer to the road from where the old one was. The lake side of the old house is now where the new deck will be, so we are moving the house back from the lake about 12'. This will help the neighbour's views of the lake. The owners want to have a larger back yard is the reason for this.

The grades on the site have been surveyed, please see those. The site grades will not change at all from where they are now. Only the grades around the new house may change slightly to accommodate the new larger footprint. Now work to the bank is proposed in this application as Lakeview will be handling that on behalf of the owners. The old cabin was a walkout and this new house is a walkout so the grades behind the house towards the lake will not be altered by the house development.

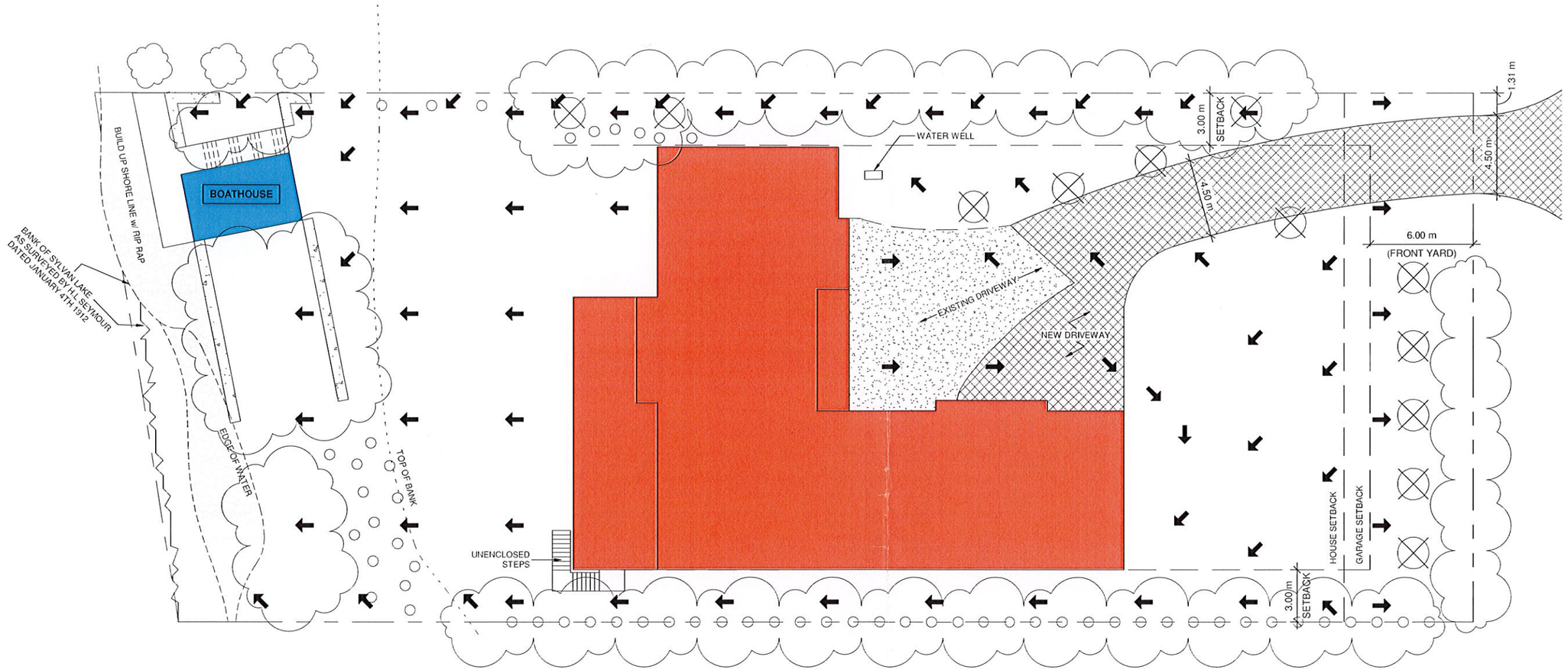
Some trees and shrubs will be removed as noted on the plans. The only shrubs being removed are some caragana's as indicated on the plans. Most of the old trees and shrubs will remain as is. Because of the size of the house some of these will need to be removed. The existing driveway will remain as is where it can but because the old driveway went into the neighbour's lot the new owners want to align the driveway to be on their property. They will realign this and take out the old pavement where necessary and plant grass and shrubs in this area. The new approach will be moved as per plan.

The height of the building exceeds the maximum allowance by 0.43 meters or about 17". We flattened the roof trusses as much as possible.

A slope stability report is attached. If you have any questions, please let us know.

Regards,

Bill Robinson
Sorento Custom Homes Ltd.



LEGEND

- NEW DWELLING
- NEW BOATHOUSE

RECEIVED
MAR 18 2021

1 SITE PLAN - DRAINAGE
3/64" = 1'-0"

Sorento
CUSTOM HOMES

#106, 179 CLEARVIEW DR.
RED DEER COUNTY
T4E 0A1
(403) 352.5222

DATE:	REVISION:

83 BIRCHCLIFF

LOT:
BLOCK:
PLAN:

MAIN:	
UPPER:	
BASEMENT:	
TOTAL:	
GARAGE:	
VERANDA:	
REAR DECK:	

CLIENT:

DATE: 2021-03-18 9:24:25 AM

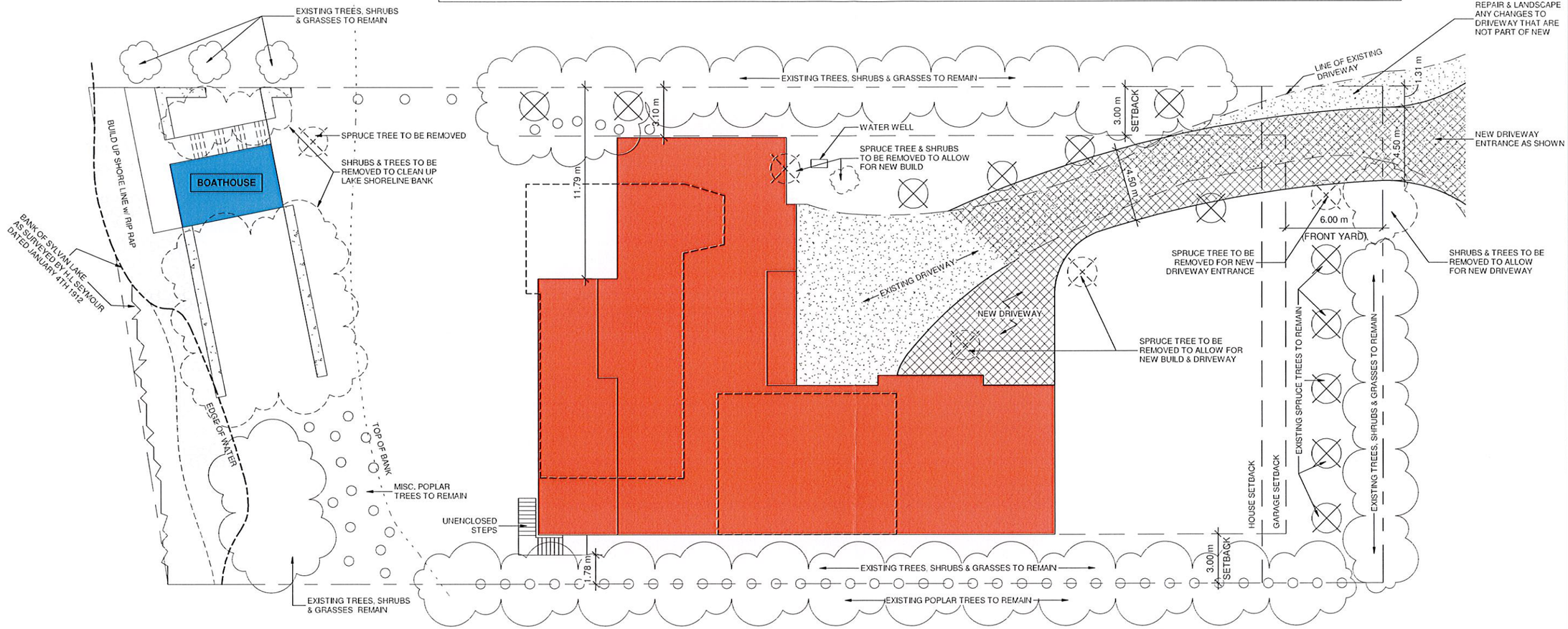
DESIGNER: YVONNE

SCALE: 3/64" = 1'-0"

PAGE: 4 OF:

ADDITIONAL LANDSCAPING NOTES:

- 4 SPRUCE TREES TO BE REMOVED FOR NEW HOUSE & DRIVEWAY RECONFIGURATION
- ALL POPLAR TREES TO REMAIN UNLESS IN NEW RETAINING WALL AREA
- ALL SHRUBS, MISC. TREES & GRASSES TO REMAIN EXCEPT FOR IN AREAS OF DRIVEWAY RECONFIGURATION & RETAINING WALL AREAS
- CUSTOMER WILL REPLACE 10 TREES AND 30 SHRUBS AFTER NEW HOUSE & RETAINING WALL IS COMPLETE



LEGEND

- EXISTING DWELLING
- NEW DWELLING
- NEW BOATHOUSE

LANDSCAPE LEGEND

- EXISTING SPRUCE TREES
- EXISTING SPRUCE TREES TO BE REMOVED
- EXISTING TREES, SHRUBS & GRASSES TO REMAIN
- EXISTING TREES, SHRUBS & GRASSES TO BE REMOVED
- MISC. POPLAR TREES TO REMAIN

SITE COVERAGE:

5,335 sq.ft.	(HOUSE)
2.932.65 sq.ft.	(DRIVEWAY)
750 sq.ft.	(BOAT HOUSE - incl. stairs, dock & retaining walls)
9,019.65 sq.ft.	(TOTAL COVERAGE)
25,495.25 sq.ft.	(TOTAL LOT)
35.37%	(SITE COVERAGE)

R1 ZONING - LAKESHORE RESIDENTIAL DISTRICT
(Maximum Parcel Coverage: Fifty (50) percent, other fifty (50) percent shall remain as is or contain native grasses, trees, shrubs, or ornamental plantings, satisfactory to the Development Authority)

RECEIVED
MAR 18 2021

1 SITE PLAN - LANDSCAPE
3/64" = 1'-0"

Sorento CUSTOM HOMES

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RED DEER COUNTY
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83 BIRCHCLIFF

LOT:
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TOTAL:	
GARAGE:	
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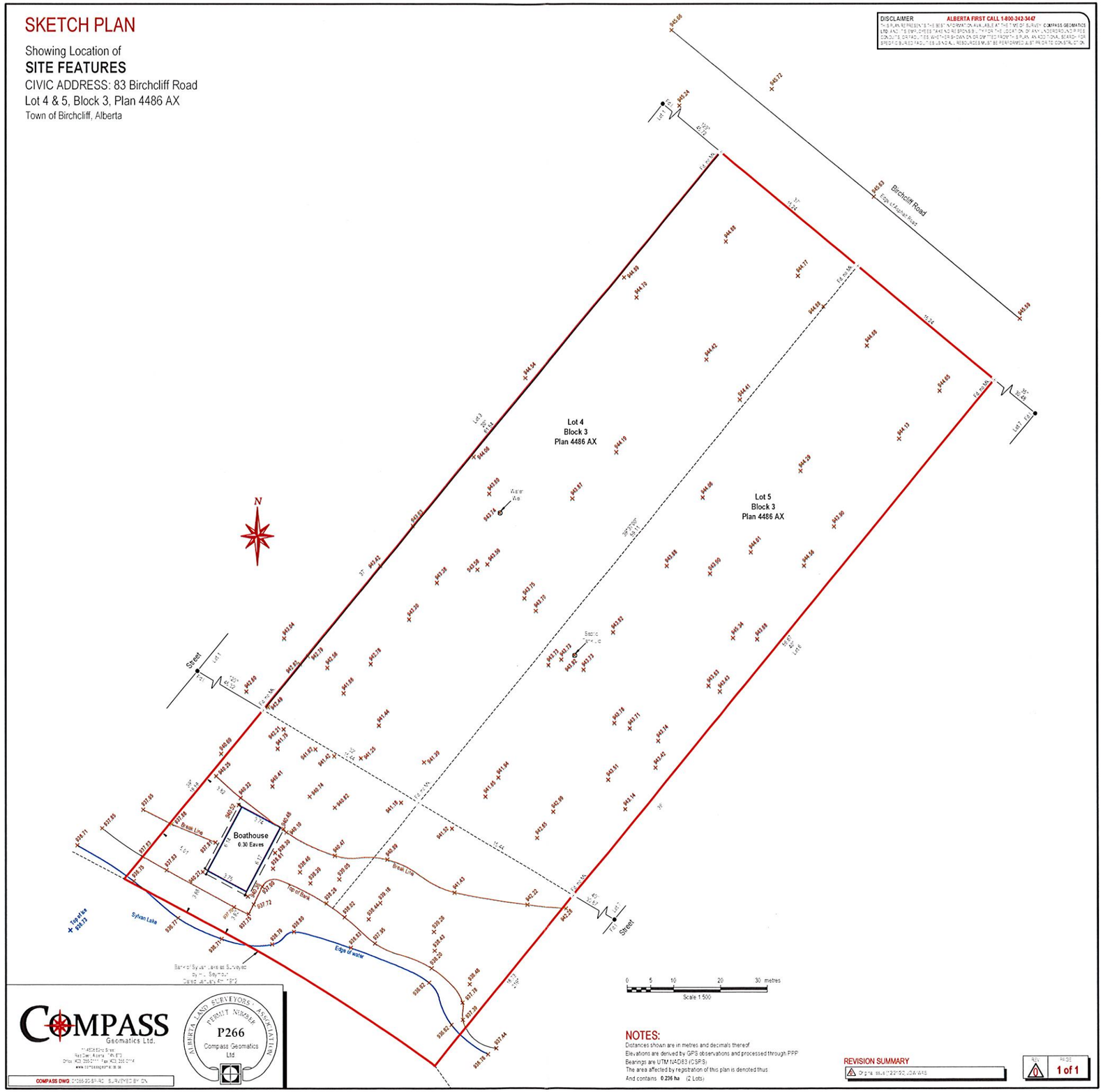
SCALE: 3/64" = 1'-0"
PAGE: 2 OF:

SKETCH PLAN

Showing Location of
SITE FEATURES
CIVIC ADDRESS: 83 Birchcliff Road
Lot 4 & 5, Block 3, Plan 4486 AX
Town of Birchcliff, Alberta



COMPASS Geomatics Ltd.
#1, 4604 63rd Street
Red Deer, Alberta T4N 6E3
Office: 403.356.2111 Fax: 403.356.0114
www.compassgeomatics.ab.ca

ALBERTA LAND SURVEYORS' ASSOCIATION
PERMIT NUMBER
P266
Compass Geomatics Ltd

COMPASS DWG 21-055-20 SR-RC SURVEYED BY: DN

NOTES:
Distances shown are in metres and decimals thereof
Elevations are derived by GPS observations and processed through PPP
Bearings are UTM NAD83 (CSRS)
The area affected by registration of this plan is denoted thus
And contains 0.236 ha (2 Lots)

REVISION SUMMARY
Original issued 22/02/JDA/AS

REV 1 | PAGE 1 of 1

BJORNSON RESIDENCE

83 Birchcliff Road
SYLVAN LAKE, AB

GENERAL NOTES

THE GENERAL CONTACTOR & SUB-CONTRACTOR(S) ARE RESPONSIBLE FOR THE FOLLOWING:

1. REVIEW THE ENTIRE DRAWING SET & ANY OTHER DOCUMENTS WHICH MAKE UP THE CONTRACT WITH THE OWNER.

2. THE GENERAL CONTRACTOR IS TO ENSURE ALL CONSTRUCTION IS COMPLETED AS PER THE CURRENT ALBERTA BUILDING CODE, LOCAL BYLAWS AND THE LANDLORDS REGULATIONS.

3. THE MATERIALS AND STANDARD CONSTRUCTION PROCEDURES SPECIFIED ON THIS DRAWING ARE AS RECOMMENDED ONLY. THE ACTUAL MATERIALS/STANDARDS SUED ON THE STRUCTURE SHALL BE AS PER THE CONTRACT DOCUMENTS BETWEEN THE OWNER AND SORENTO CUSTOM HOMES.

4. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS REQUIRED TO PROCEED.

5. THE SERVICES OF THE SOILS ENGINEER IS REQUIRED TO CONFIRM SOIL STABILITY, FOUNDATION DIMENSIONS & REINFORCEMENT.

6. ALL UTILITES ARE TO BE LOCATED BEFORE EXCAVATION BEGINS, CONFIRM ALLOWABLE CLEARANCES BETWEEN UTILITY LINES & NEW CONSTRUCTION WITH EACH UTILITY PROVIDER.

7. THE GENERAL CONTRACTOR IS RESPONSIBLE TO ENSURE BUILDING LOCATION CONFORMS TO LOCAL SET-BACKS & BUILDING ENVELOPE RESTRICTIONS.

8. SITE CONFIRM BEFOIRE PROCEEDING WITH NEW CONSTRUCTION REPORT ERRORS, OMISSIONS OR DISCREPANCIES ON THIS SET OF DRAWINGS TO THE GENERAL CONTRACTOR FOR CORDINATION PRIOR TO CONTRUCTION.

9. PROFESSIONAL LIABILITY OF THE DESIGNER IS LIMITED TO THE REVISION OF DRAWINGS & REPRODUCTION OF SAME DUE TO SUCH FOUND ERRORS, OMISSIONS, OR DUSCREPANCIES.

10. OBTAIN INSTALLATION INSTRUCTIONS & DIMENSIONS FOR ALL PRE-MANUFACTURERED ITEMS; ADJUST WALL LOCATIONS TO SUIT.

11. COORDINATE WITH WINDOW MANUFACTURER TO ENSURE BEDROOM WINDOWS MEET EGRESS REQUIREMENTS.

12. PLUMBING SYSTEM IS TO BE DESIGNED & INSTALLED BY THE APPROPRIATE TRADE CONSULTANTS.

13. H.V.A.C. SYSTEM IS TO BE DESIGNED & INSTALLED BY THE APPROPRIATE TRADE CONSULTANTS.

14. ELECTRICAL & LIGHTING SYSTEM IS TO BE DESIGNED & INSTALLED BY THE APPROPRIATE TRADE CONSULTANTS.

15. ALL PENETRATIONS IN ROOF, WALLS, & H.V.A.C. SHAFTS ARE TO BE SEALED WITH U.L. APPROVED MATERIALS & BUILDING CODE APPROVED METHODS.

DRAWING LIST

AREAS:

LOWER FLOOR:	2167 sq.ft.
LOWER FLOOR STORAGE:	201 sq.ft.
MAIN FLOOR SUITE:	665 sq.ft.
MAIN FLOOR:	2041 sq.ft.
UPPER FLOOR SUITE:	593 sq.ft.
UPPER FLOOR:	1667 sq.ft.
GARAGE (INCL. STAIR):	1759 sq.ft.
FRONT VERANDA:	85 sq.ft.
REAR DECK (MAIN):	763 sq.ft.
UPPER DECK:	246 sq.ft.
MAIN FLOOR TOTAL:	2706 sq.ft.
UPPER FLOOR TOTAL:	2260 sq.ft.
LOWER FLOOR TOTAL:	2368 sq.ft.
TOTAL DEVELOPED AREA:	7334 sq.ft.

Sorento
CUSTOM HOMES

#106, 179 CLEARVIEW DR.
RED DEER COUNTY
T4E 0A1
(403) 352.5222

DATE:	REVISION:

PRICING DRAWINGS
NOT FOR CONSTRUCTION

83 BIRCHCLIFF ROAD
SYLVAN LAKE, AB

LOT:	4 & 5
BLOCK:	3
PLAN:	4486AX
MAIN:	
UPPER:	
BASEMENT:	
TOTAL:	
GARAGE:	
VERANDA:	
REAR DECK:	

PRELIMINARY DRAWINGS

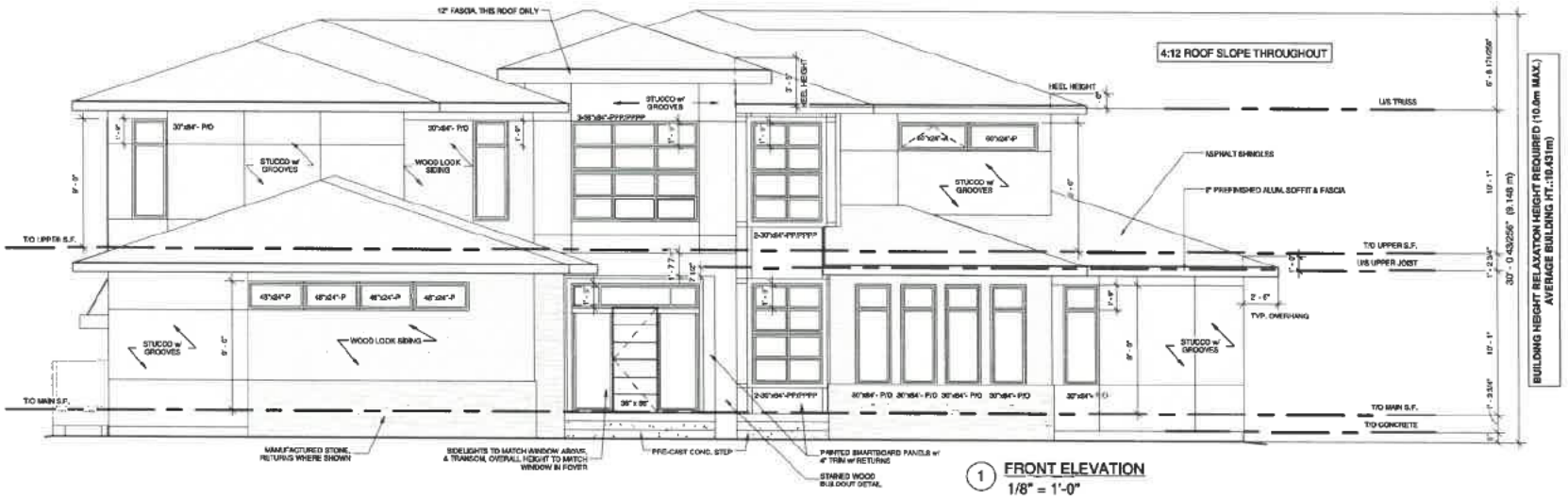
CLIENT: [redacted] RESIDENCE

DATE: 2021-02-24 2:16:55 PM

DESIGNER: YVONNE

SCALE:

PAGE: 0 OF: 11



1 FRONT ELEVATION
1/8" = 1'-0"

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CLIENT:
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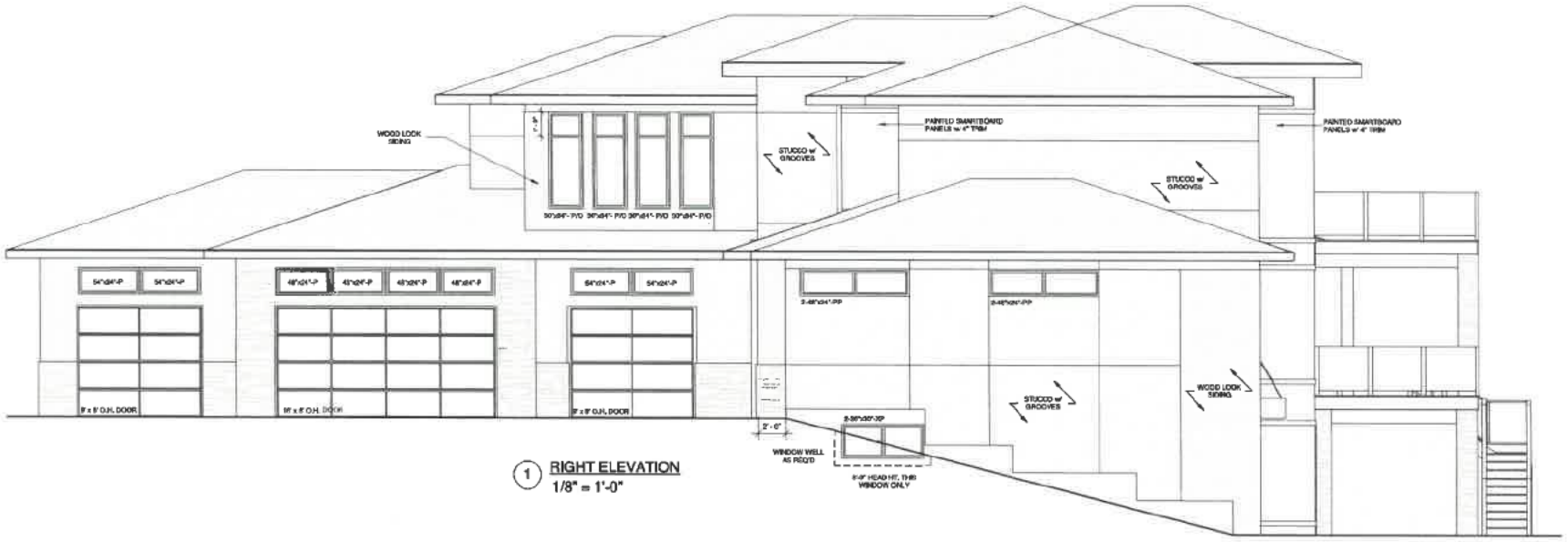

1 RIGHT ELEVATION
1/8" = 1'-0"

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SYLVAN LAKE, AB

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PRELIMINARY DRAWINGS

CLIENT: [redacted]ESIDENCE

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DESIGNER: YVONNE

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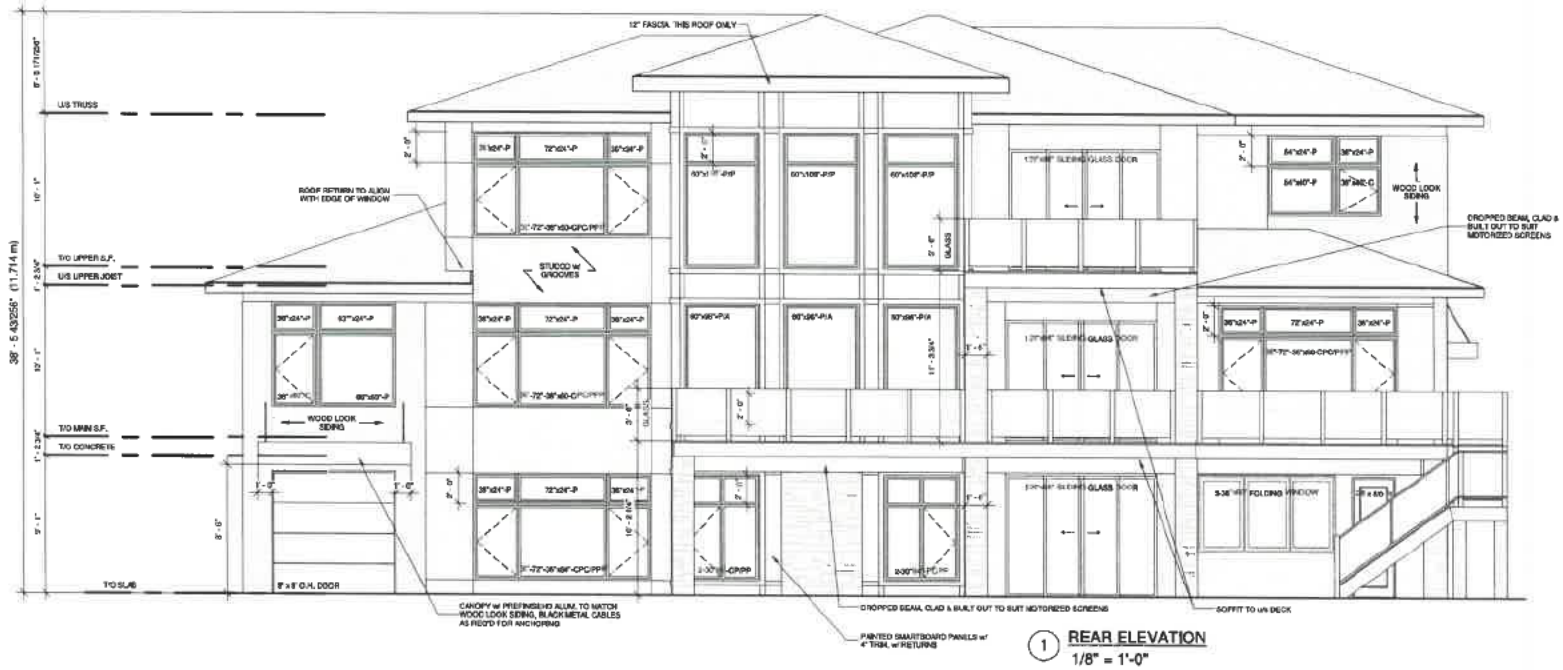

1 REAR ELEVATION
1/8" = 1'-0"

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83 BIRCHCLIFF ROAD
SYLVAN LAKE, AB

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PRELIMINARY DRAWINGS

CLIENT: [redacted] RESIDENCE

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DESIGNER: YVONNE

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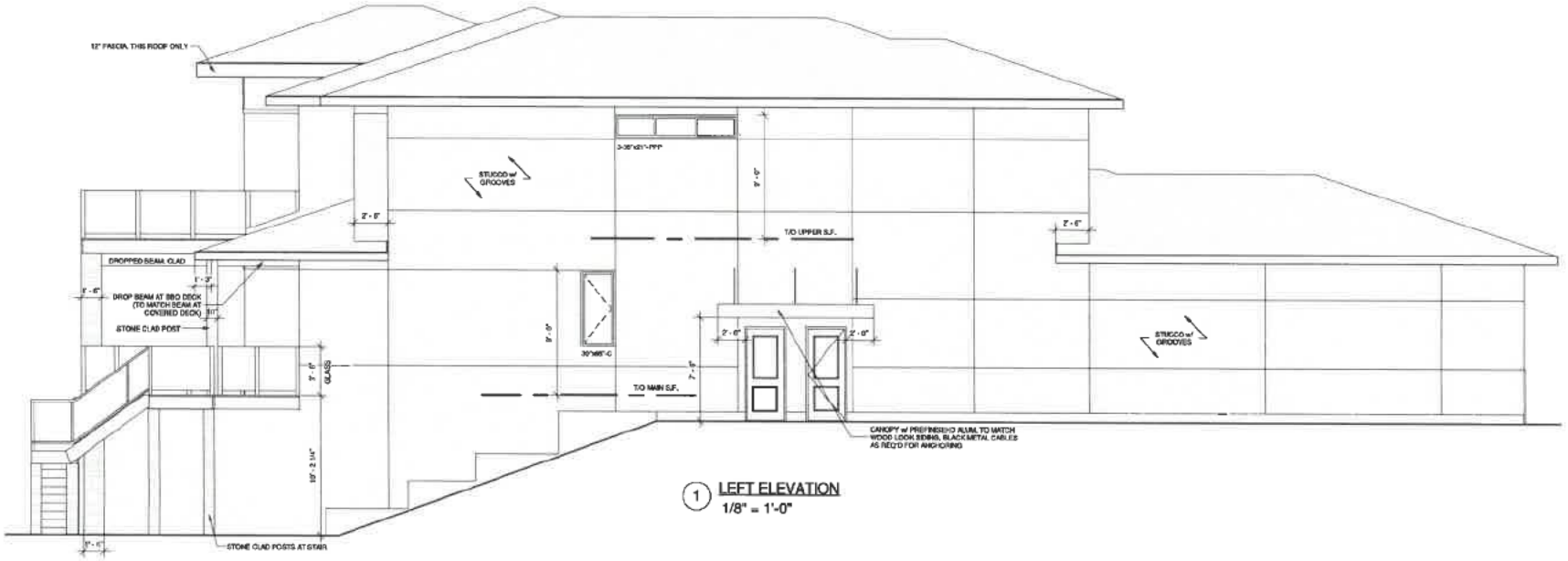

1 LEFT ELEVATION
1/8" = 1'-0"

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SYLVAN LAKE, AB

LOT:	4 & 5
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PLAN:	4486AX

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GARAGE:	
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PRELIMINARY DRAWINGS

CLIENT: [redacted] RESIDENCE

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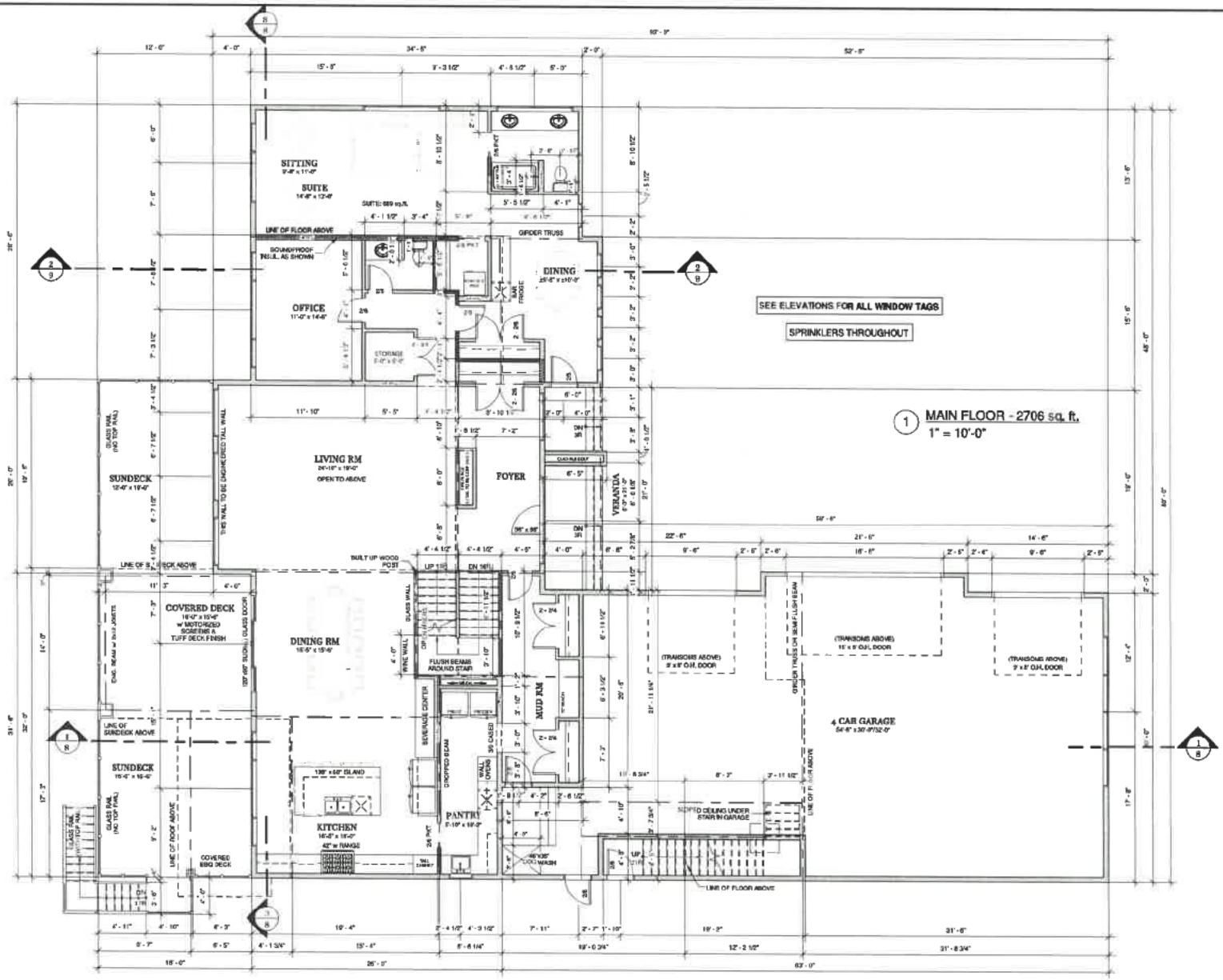

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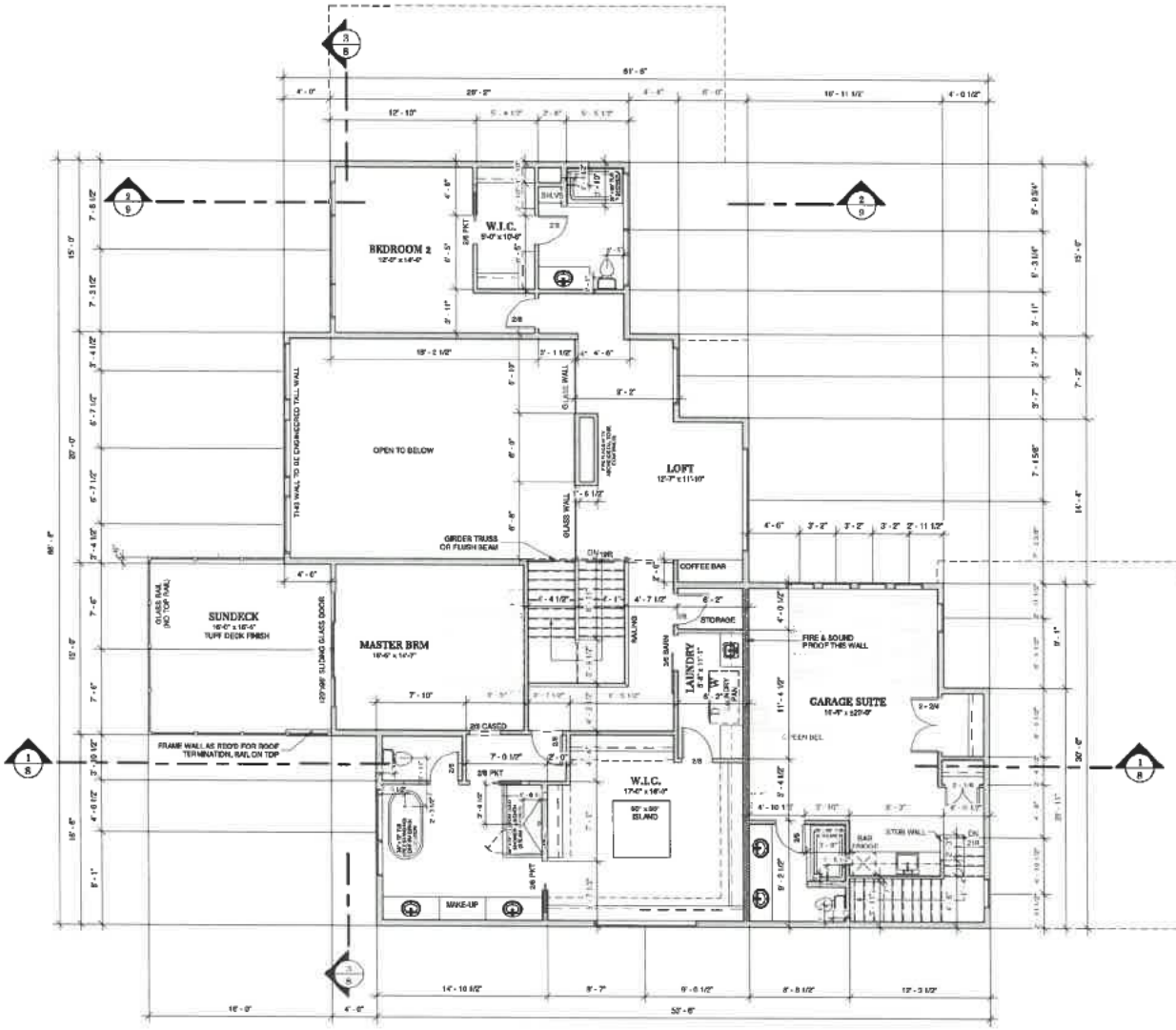

1 UPPER FLOOR - 2260 sq. ft.
1" = 10'-0"

Sorento
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PRELIMINARY DRAWINGS

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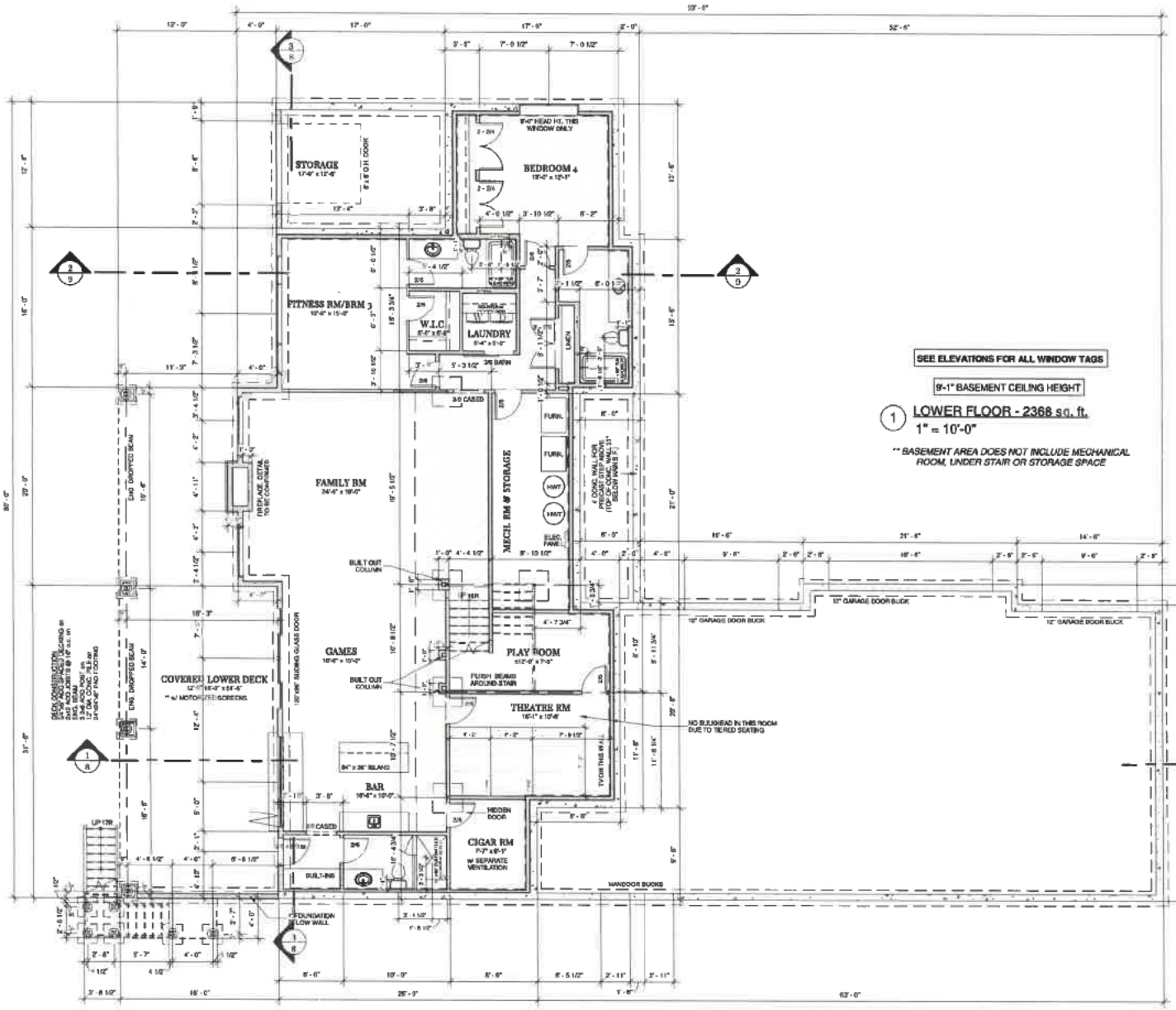

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PRELIMINARY DRAWINGS

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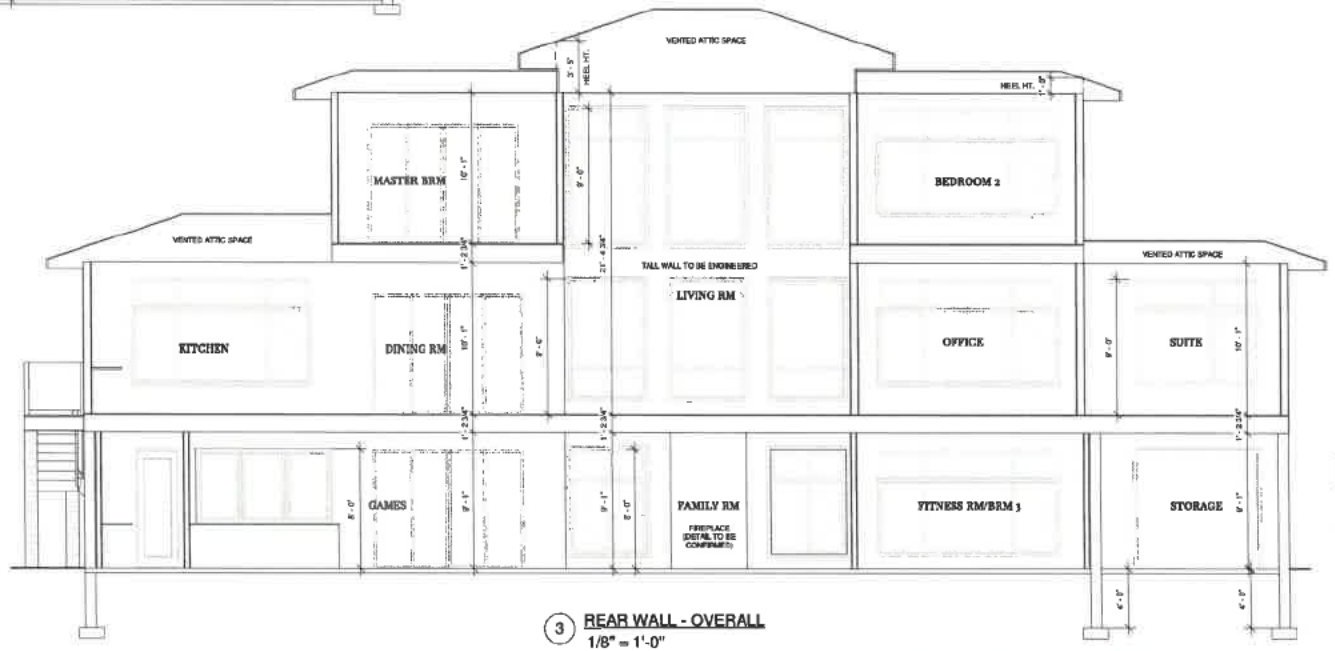
DESIGNER: YVONNE

SCALE: 1" = 10'-0"

PAGE: 7 OF: 11

1 OVERALL 1
1/8" = 1'-0"



3 REAR WALL - OVERALL
1/8" = 1'-0"

Sorento
CUSTOM HOMES

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SYLVAN LAKE, AB

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PRELIMINARY DRAWINGS

CLIENT: [redacted] RESIDENCE

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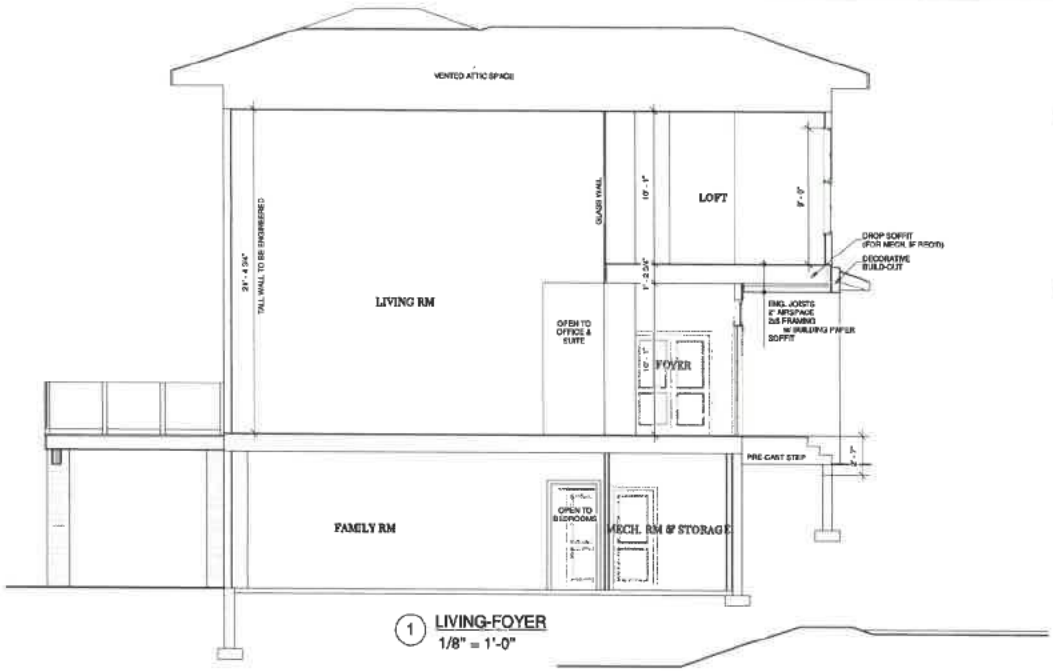
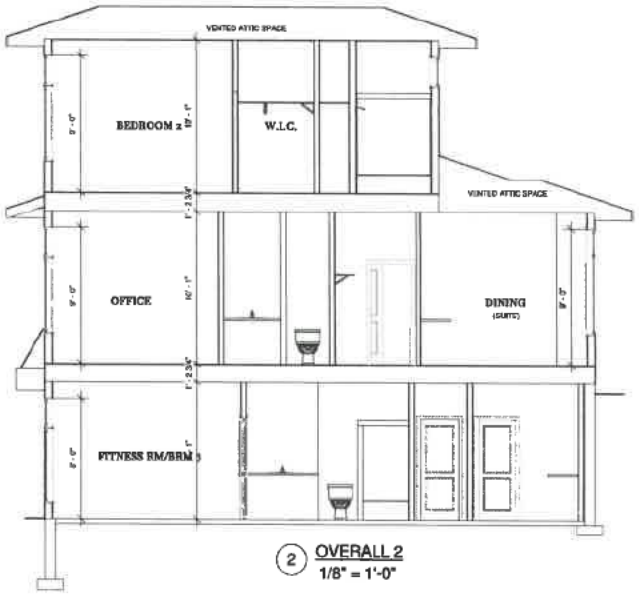


1 LIVING-FOYER
1/8" = 1'-0"



2 OVERALL 2
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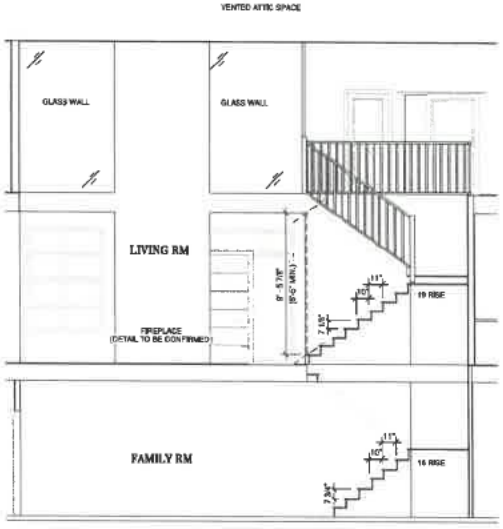

3 STAIR & ENTRY WALL
1/8" = 1'-0"

Sorento CUSTOM HOMES

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PRELIMINARY DRAWINGS

CLIENT: [redacted] RESIDENCE

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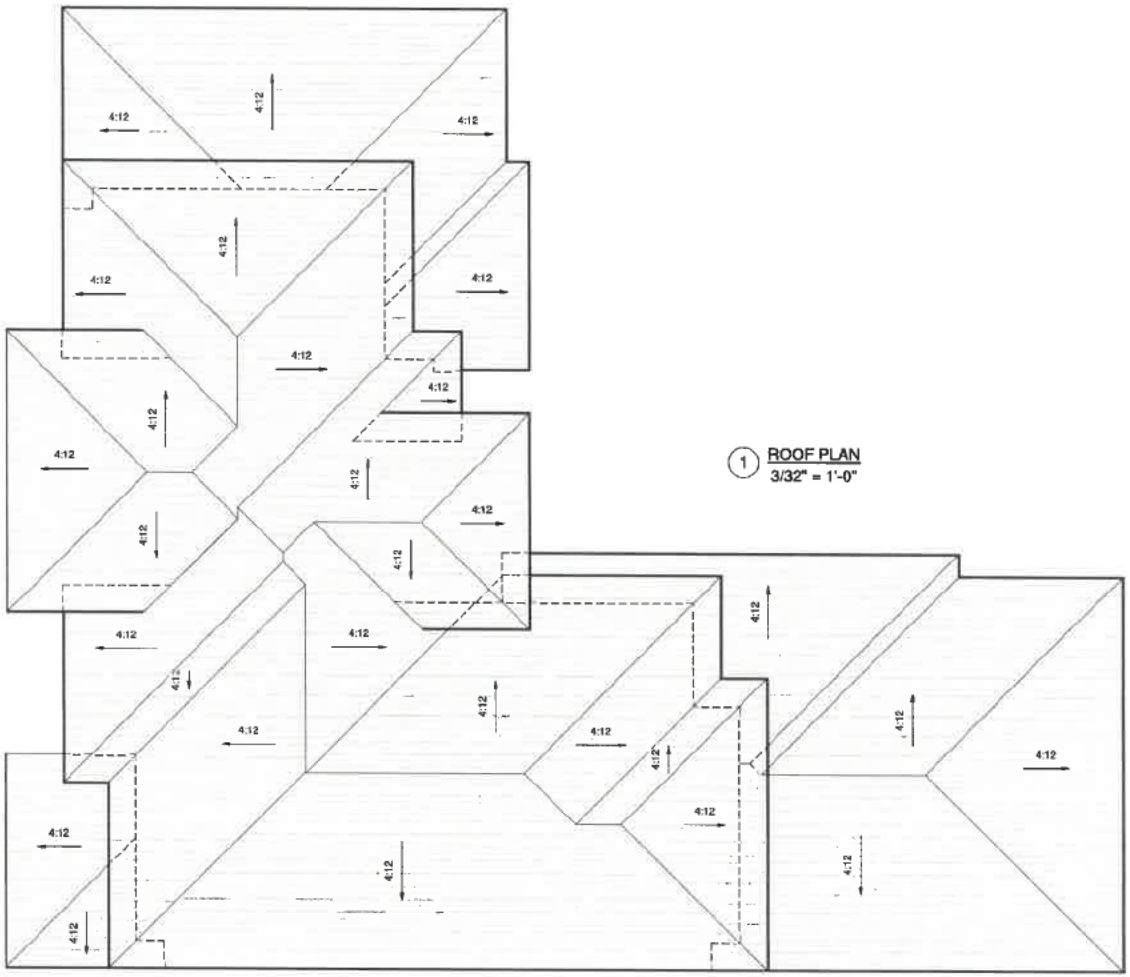
OF:	11



1 ROOF PLAN
3/32" = 1'-0"

Sorento
CUSTOM HOMES

#106, 179 CLEARVIEW DR.
RED DEER COUNTY
T4E 0A1
(403) 352.5222

DATE:	REVISION:

PRICING DRAWINGS
NOT FOR CONSTRUCTION

83 BIRCHCLIFF ROAD
SYLVAN LAKE, AB

LOT:	4 & 5
BLOCK:	3
PLAN:	4486AX
MAIN:	
UPPER:	
BASEMENT:	
TOTAL:	
GARAGE:	
VERANDA:	
REAR DECK:	

PRELIMINARY DRAWINGS

CLIENT: [redacted] RESIDENCE

DATE: 2021-02-24 2:17:13 PM

DESIGNER: YVONNE

SCALE: 3/32" = 1'-0"

PAGE: 10 OF: 11

CONSTRUCTION KEYNOTES:

1. ROOFS

1.1 INSULATED TRUSS ROOF :
- ASPHALT SHINGLES.
- ASPHALT ROOFING FELT UNDERLAY.
- PEAL & STICK MOISTURE / ICE BARRIER UNDER PRE-FINISHED METAL FLASHING AT VALLEYS & EAVES.
- 1/2" O.S.B. OR BETTER SHEATHING C/W H-CLIPS.
- ENGINEERED TRUSS SYSTEM AT 24" O.C.
- MIN. R-40 BLOWN-IN CELLULOSE &/ OR FIBERGLASS BATT INSULATION. (REFER TO ENERGY REPORT 9.36)
- INSULATION BAFFLE AT EVERY TRUSS SPACE.
- 6 MIL. POLY VAPOR BARRIER.
- 1/2" GYPSUM CEILING BOARD.
- PROVIDE ROOF VENTS TO PROVIDE 1 sq.ft VENTING PER 300 sq.ft INSULATED CEILING AREA (AS PER A.B.C. 9.19.1)
- REFER TO SUPPLIER'S ENGINEERED DRAWINGS FOR POINT LOAD QUANTITY & LOCATION; ENSURE POINT LOADS FROM ROOF STRUCTURE ARE ADEQUATELY-SUPPORTED WITHIN ROOF SYSTEM OR SUPPORTED BY JOIST SPACE BLOCKING & BUILT-UP STUD POSTS IN MAIN FLOOR WALLS WHERE REQUIRED

1.2 NON-INSULATED TRUSS ROOF :
- ASPHALT SHINGLES.
- ASPHALT ROOFING FELT UNDERLAY.
- PEAL & STICK MOISTURE / ICE BARRIER UNDER PRE-FINISHED METAL FLASHING AT VALLEYS & EAVES.
- 1/2" O.S.B. OR BETTER SHEATHING C/W H-CLIPS.
- ENGINEERED WOOD TRUSSES AT 24" O.C. C/W 12" HEEL (UNLESS NOTED OTHERWISE)
- 1x4 WOOD STRAPPING AT 24" O.C.
- PRE-FINISHED VENTED METAL SOFFIT.
- PRE-FINISHED VENTED METAL SOFFIT
- REFER TO SUPPLIER'S ENGINEERED DRAWINGS FOR POINT LOAD QUANTITY & LOCATION; ENSURE POINT LOADS FROM ROOF STRUCTURE ARE ADEQUATELY-SUPPORTED WITHIN ROOF SYSTEM OR SUPPORTED BY JOIST SPACE BLOCKING & BUILT-UP STUD POSTS IN MAIN FLOOR WALLS WHERE REQUIRED

1.3 EAVE & FASCIA
- REFER TO ELEVATIONS FOR OVERHANG SIZE
- 2x6 (OR AS SPECIFIED) PWF HEADER c/w PRE-FINISHED METAL FASCIA, VENTED SOFFIT, EAVESTROUGH, DOWNSPOUTS & FLASHING AT EDGE OF ROOF SHEATHING
- NON-VENTED SOFFIT ON SIDE OF BUILDING WHEN WITHIN 4' OF PROPERTY LINE, AS PER A.B.C. 9.10.15.5)

2. WALLS

2.1 EXTERIOR WALL (UNLESS NOTED OTHERWISE)
- PRE-FINISHED VINYL SIDING AND CORNERS (OR AS PER ELEVATION) AS PER A.B.C. 9.27
- AIR BARRIER/BUILDING WRAP
- 3/8" OSB OR BETTER SHEATHING
- 2x6 SPF #1&2 STUDS @ 16" o/c
- MIN. R-20 BATT INSULATION (REFER TO ENERGY REPORT 9.36)
- 6mm POLY VAPOUR BARRIER
- 1/2" GYPSUM BOARD, TAPED & SANDED w/ PAINT FINISH

2.2 INTERIOR WALL CONSTRUCTION:
- 1/2" GYPSUM WALL BOARD ON BOTH SIDES OF 2x4 #2 S-P-F STUDS AT 16" O.C. (UNLESS NOTED OTHERWISE)

2.3 INTERIOR WALL CONSTRUCTION: (THICK)
- 1/2" GYPSUM WALL BOARD ON BOTH SIDES OF 2x6 #2 S-P-F STUDS AT 16" O.C.

2.4 HALF-WALL CONSTRUCTION: (42" HEIGHT UNLESS NOTED OTHERWISE)
- 1/2" GYPSUM WALL BOARD ON BOTH SIDES OF 2x4 #2 S-P-F STUDS AT 16" O.C.
- WOOD LEDGE CAP AT TOP OF WALL

2.5 EXTERIOR WALL: (45 MIN FIRE RATING AS PER A.B.C. 9.10.15.5)
- PRE-FINISHED VINYL SIDING AND CORNERS (OR AS PER ELEVATION) AS PER A.B.C. 9.27
- AIR BARRIER/BUILDING WRAP
- 1/2" GYPSUM BOARD
- 3/8" OSB SHEATHING
- 2x6 SPF #1&2 STUDS @ 16" o/c (LINE UP STUDS w/ ROOF TRUSSES ON SPANS EXCEEDING 30')
- MINIMUM R20 BATT INSULATION
- 6mm POLY VAPOUR BARRIER
- 1/2" TYPE 'X' GYPSUM BOARD, TAPED & SANDED w/ PAINT FINISH

2. WALLS (cont.)

2.6 EXTERIOR WALL (TALL WALL): (OVER 10 FT. HEIGHT)
- PRE-FINISHED VINYL SIDING AND CORNERS (OR AS PER ELEVATION) AS PER A.B.C. 9.27
- AIR BARRIER/BUILDING WRAP
- 3/8" O.S.B OR BETTER SHEATHING.
- 2x6 #2 S-P-F STUDS AT 8" O.C. C/W 1/3 SPAN BLOCKING. ALL STUDS WITHIN ASSEMBLY SECURED TO BASE AND CAP PLATES W/ 4" C.S END NAILED INTO STUD ASSEMBLY.
- MIN. R-20 BATT INSULATION (REFER TO ENERGY REPORT 9.36)
- 6mm POLY VAPOUR BARRIER.
- 1/2" GYPSUM BOARD, TAPED & SANDED w/ PAINT FINISH

2.7 INTERIOR BEARING WALL c/w STRIP FOOTING :
- 18" x 8" CAST-IN-PLACE CONCRETE STRIP FOOTING.
- REINFORCE WITH 3-10M BARS (CONTINUOUS).
- 2 PLY 2x4 PRESERVED WOOD CURB.
- BEARING WALL TO BE 2x6 #2 S-P-F STUDS AT 16" O.C. C/W SOLID BLOCKING AT MID-HEIGHT.
- TOP PLATE = 2 PLY 2x4 #2 S-P-F WOOD.
- BOTTOM PLATE = 2x4 PRESERVED WOOD.
- 1/2" GYPSUM WALL BOARD (IF REQUIRED)

3. FLOORS

3.1 FLOOR CONSTRUCTION: (UNLESS NOTED OTHERWISE)
- 3/4" T&G OSB DECKING, GLUED & SCREWED
- ENGINEERED WOOD "I" JOIST. (SPACING BY SUPPLIER)
- 1/2" GYPSUM CEILING BOARD, TAPED & SANDED w/ TEXTURED FINISH

3.2 EXTERIOR DECK:
- 3/4" S-P-F PLYWOOD T&G DECKING. (SANDED ONE SIDE)
- 2x6 PTW DECK BOARDS AT 16" O.C. C/W SOLID BLOCKING AT 46" O.C. (SLOPE JOISTS 1.5%)
- 1x4 S-P-F- WOOD STRAPPING AT 24" O.C.

3.3 BASEMENT SLAB :
- 3 1/2" CONC. SLAB; REINFORCE WITH 10M BARS AT 24" O.C. E/W.
- 6mm POLY VAPOR BARRIER.
- 8" COMPACTED GRAVEL FILL.
- SUB-BASE TO BE UNDISTURBED OR COMPACTED GRANULAR FILL.
- SLOPE SLAB TO FLOOR DRAINS.

3.4 GARAGE SLAB :
- 4" CONC. SLAB; REINFORCE WITH 10M BARS AT 24" O.C. E/W.
- 6mm POLY VAPOR BARRIER.
- 8" COMPACTED GRAVEL FILL.
- SUB-BASE TO BE UNDISTURBED OR COMPACTED GRANULAR FILL.
- SLOPE SLAB TO FLOOR DRAINS.

3.5 CANTILEVER :
- 6 MIL. POLY VAPOR BARRIER BETWEEN SUBFLOOR SHEATHING & TOP OF JOISTS.
- 2x6 WOOD FURRING UNDER JOISTS.
- SPRAY FOAM
- 3/8" O.S.B. SHEATHING OR 5/8" GYPSUM BOARD.
- PRE-FINISHED METAL SOFFIT (IF REQUIRED)

3.6 FLOOR CONSTRUCTION : (OVER GARAGE)
- 3/4" T&G O.S.B. DECKING; GLUED & SCREWED.
- ENGINEERED WOOD "I" JOIST AT 16" O.C. (MIN.) (ENGINEERED BY SUPPLIER)
- 1/2" GYPSUM CEILING BOARD. (WHERE REQUIRED)
- *CONTINUE INSULATION & VAPOUR BARRIER THRU JOIST SPACE AT INSIDE PERIMETER OF EXTERIOR FACING RIM BOARD.

3.7 FLOOR CONSTRUCTION : (FOYER)
- 3/4" T&G O.S.B. DECKING; GLUED & SCREWED.
- 9 1/2" ENGINEERED WOOD "I" JOIST AT 16" O.C. (MIN.) (ENGINEERED BY SUPPLIER)
- 1/2" GYPSUM CEILING BOARD. (WHERE REQUIRED)
- *CONTINUE INSULATION & VAPOUR BARRIER THRU JOIST SPACE AT INSIDE PERIMETER OF EXTERIOR FACING RIM BOARD.

4. BEAMS / LINTELS

4.1 TYPICAL LINTEL: (UNLESS NOTED OTHERWISE)
- 2-2x10 #2 S.P.F. OR BETTER FOR OPENINGS LESS THAN 73"
- 3-2x10 #2 S.P.F. OR BETTER FOR OPENINGS 73"-84"
- FILL VOIDS WITH RIGID INSULATION

4.2 WIDE SPAN LINTEL :
- L.V.L. LINTEL ENGINEERED BY TRUSS SUPPLIER FOR OPENINGS GREATER THAN 84", WHERE POINT LOADS BEAR ON A LINTEL AND OVER OPENINGS IN CONCRETE FOUNDATION WALL. (FILL VOIDS WITH RIGID INSULATION)

4.3 DROPPED BEAM
- L.V.L. OR STEEL BEAM INSTALLED UNDER BOTTOM OF JOISTS &/OR TRUSSES (SIZE ENGINEERED BY SUPPLIER)

4. BEAMS / LINTELS (cont.)

4.4 FLUSH BEAM
- L.V.L. BEAM INSTALLED ON SAME PLANE AS JOISTS (SIZE ENGINEERED BY SUPPLIER)

4.5 SEMI-FLUSH BEAM
- L.V.L. BEAM INSTALLED ON DIFFERENT PLANE AS JOISTS (SIZE ENGINEERED BY SUPPLIER)

4.6 DECK LEDGER:
- PRESERVED WOOD DECK LEDGER C/W BUILDING PAPER BEHIND & PRE-FINISHED METAL FLASHING OVER
- PROVIDE SOLID BLOCKING AT EACH JOIST SPACE INSIDE RIM JOIST SUPPORTING THE DECK LEDGER
- LAG BOLT DECK LEDGER TO RIM JOIST OR STUDS ON HOUSE

4.7 WOOD BEAM:
3-PLY 2x8 PRESERVED WOOD BEAM; GLUED & NAIL LAMINATED AS SPECIFIED BY THE ALBERTA BUILDING CODE.

5. FOUNDATIONS

5.1 HOUSE FOUNDATION WALL :
- PARGING ON EXPOSED CONCRETE.
- WATERPROOF FOUNDATION WRAP MEMBRANE SYSTEM.
- 8" x 108" CAST-IN-PLACE 20 MPa CONCRETE WALL PLUS 2x6 P.W.F GRADE LADDER = TOTAL WALL HEIGHT OF 9'-3 1/2".
- REINFORCEMENT: 2-10M BARS AT TOP & BOTTOM.
  - VERTICAL 10M BARS AT 12" O.C.
  - HORIZONTAL 10M BARS AT 12" O.C.
- 2x4 #2 S-P-F STRAPPING AT 24" O.C. (P.W.F. BOTTOM PLATE).
- R-12 FIBERGLASS BATT INSULATION.
- 6 MIL. POLY VAPOR BARRIER.
- 1/2" GYPSUM WALL BOARD.

5.2 GARAGE FROST WALL :
- PARGING ON EXPOSED CONCRETE.
- WATERPROOF FOUNDATION WRAP MEMBRANE SYSTEM.
- 8" x 108" CAST-IN-PLACE 20 MPa CONCRETE WALL PLUS 2x6 P.W.F GRADE LADDER = TOTAL WALL HEIGHT OF 4'-0".
- REINFORCEMENT: 2-10M BARS AT TOP & BOTTOM.
  - VERTICAL 10M BARS AT 12" O.C.
  - HORIZONTAL 10M BARS AT 12" O.C.

5.3 STRIP FOOTING : (UNLESS NOTED OTHERWISE)
- 20" x 8" CAST-IN-PLACE CONCRETE STRIP FOOTING.
- REINFORCE WITH 3-10M BARS (CONTINUOUS).
- CAST-IN VERTICAL 24" LONG 15M J-HOOK DOWELS AT 24" O.C.
- BEARING ON UNDISTURBED SOIL OR COMPACTED GRANULAR FILL.
- 4" WEEPING TILE TIED INTO MUNICIPAL WASTE WATER SYSTEM.
- COVER WITH AND 8" OF WASHED ROCK AND FILTER CLOTH.

5.4 PAD FOOTING C/W STEEL COLUMN :
- ADJUSTABLE STEEL COLUMN; ENGINEERED BY SUPPLIER.
- CAST-IN-PLACE CONCRETE PAD FOOTING; REINFORCE WITH 10M BARS E/W; (3" BOTTOM COVER).
- BEARING ON UNDISTURBED SOIL OR COMPACTED GRANULAR FILL.
- BUILDING CONTRACTOR TO CONFIRM LOAD QUANTITIES WITH THE FLOOR SYSTEM SUPPLIER THEN NOTATE THE COLUMN MODEL NAME, COLUMN LOAD & PAD FOOTING DIMENSIONS IN THE LOCATIONS PROVIDED ON THE FOUNDATION PLAN.
- PAD FOOTING DIMENSIONS AND REINFORCEMENT TO BE AS SPECIFIED BY THE COLUMN MANUFACTURER'S ENGINEERED TABLES.

5.5 PAD FOOTING C/W CONCRETE PIER :
- 12" DIA. x48" CONCRETE PIER; R/W 4-15M VERTICAL BAR.
- PROVIDE 2x4 P-W-F WOOD NAILER CAST INTO TOP OF PIER.
- 30"x30"x16" CONCRETE PAD FOOTING R/W 5-10M BARS E/W.
- DOWEL PAD INTO PIER WITH 15M DOWELS TIED TO PIER VERTS.
- BEARING ON UNDISTURBED SOIL OR COMPACTED GRANULAR FILL.

5.6 INTERIOR BEARING WALL c/w STRIP FOOTING :
- 18" x 8" CAST-IN-PLACE CONCRETE STRIP FOOTING.
- REINFORCE WITH 3-10M BARS (CONTINUOUS).
- 2 PLY 2x4 PRESERVED WOOD CURB.
- BEARING WALL TO BE 2x4 #2 S-P-F STUDS AT 16" O.C. C/W SOLID BLOCKING AT MID-HEIGHT.
- TOP PLATE = 2 PLY 2x4 #2 S-P-F WOOD.
- BOTTOM PLATE = 2x4 PRESERVED WOOD.
- 1/2" GYPSUM WALL BOARD (IF REQUIRED)

5. FOUNDATIONS (cont.)

5.7 HOUSE FOUNDATION WALL : (STEPPED WALL)
- PARGING ON EXPOSED CONCRETE.
- WATERPROOF FOUNDATION WRAP MEMBRANE. (WHERE REQUIRED)
- 8" x 108" CAST-IN-PLACE 20 MPa CONCRETE WALL C/W 2x4 GRADE WOOD LADDER AT TOP OF CONCRETE WALL.
  - REINFORCEMENT= 2-10M BARS AT TOP & BOTTOM.
  - VERTICAL 10M BARS AT 12" O.C.
  - HORIZONTAL 10M BARS AT 12" O.C.
- R-10 2" RIGID INSULATION BELOW GRADE (WHERE REQUIRED).
- 2x4 #2 S-P-F STRAPPING AT 24" O.C. C/W P.W.F. BOTTOM PLATE.
- R-12 FIBERGLASS BATT INSULATION.
- 6 MIL. POLY VAPOR BARRIER.
- 1/2" GYPSUM WALL BOARD. (WHERE REQUIRED)
- 2x6 WALL OVER (TYP. EXTERIOR) C/W P.W.F. BOTTOM PLATE.

5.8 HOUSE FOUNDATION WALL : (FROST WALL)
- 8" x 48" (MIN. BELOW GRADE) CAST-IN-PLACE 20 MPa
- CONCRETE WALL C/W 2x6 P.W.F. GRADE LADDER SET IN FORM TO PROVIDE TOTAL WALL HEIGHT OF 5'-3 1/2".
- REINFORCEMENT= 2-10M BARS AT TOP & BOTTOM.
- FORM IN LEDGE AT TOP OF WALL FOR BASEMENT SLAB.
- R-10 2" RIGID INSULATION BELOW GRADE.
- 2x6 WALL OVER (TYP. EXTERIOR) C/W P.W.F. BOTTOM PLATE

6. MISCELLANEOUS

6.1 HAND / GUARD RAIL :
- HEIGHT, MATERIAL & INSTALLATION TO BE AS PER THE MANUFACTURERS SPECIFICATIONS & THE ALBERTA BUILDING CODE.

6.2 SUMP PIT: (IF APPLICABLE)
- 20"x20"x36" DEEP (MINIMUM)
- DISCHARGE TO MUNICIPAL SEWER SYSTEM OR ON SITE
- PLUMBING CONTRACTOR TO DETERMINE LOCATION ON SITE

6.3 CUSTOM TILED SHOWER:
- 1/2" CONCRETE WALL BOARD
- SCHLUTER-KERDI WATERPROOFING SYSTEM
- TILE FINISH WALLS & FLOOR

6.4 STRUCTURAL & DECORATIVE COLUMN:
- STRUCTURAL COLUMN AS NOTED ON DRAWINGS
- PRESERVED WOOD STRUCTURAL POST; GLUED & NAIL LAMINATED AS SPECIFIED BY THE ALBERTA BUILDING CODE
- SHAPE DECORATIVE COLUMN WITH PRESERVED WOOD MATERIALS.
- REFER TO ELEVATIONS FOR SHAPE & FINISH MATERIALS

6.5 FRONT STEP CONSTRUCTION:
- PRECAST OR CAST-IN-PLACE (BEST SUITED FOR SITE), STANDARD FINISH CONCRETE STEPS & LANDING
- BOLT ANGLE IRON LEDGERS TO HOUSE FOUNDATION WALL
- PROVIDE MOISTURE PROTECTION BETWEEN CONCRETE STEP & WOOD STRUCTURE OF HOME
- SUB-BASE TO BE FIRMLY COMPACTED GRANULAR FILL

6.6 WINDOW WELL:
- GALVANIZED METAL WINDOW WELL; SIZE TO MEET EGRESS
- PERFORATED DRAIN TO WEEPING TILE C/W FILTER CLOTH
- GROUND COVER TO BE 12" CRUSHED ROCK

MISCELLANEOUS CONSTRUCTION NOTES

- WINDOW MANUFACTURER TO CONFIRM WINDOW SIZES MEET MIN. DIMENSIONS FOR EGRESS REQUIREMENTS AS ESTABLISHED BY LOCAL CODE AUTHORITY
- REFER TO ELEVATIONS FOR WINDOW SHAPE AND STYLE.
- WINDOW MANUFACTURER TO PROVIDE R.O. SIZES FOR WINDOWS & DOORS.
- ALL WINDOW & DOOR OPENINGS OCCURRING IN LOAD BEARING WALLS ARE TO C/W 2-2x10 #2 S.P.F. LINTELS, UNLESS NOTED OTHERWISE.

- ALL DIMENSIONS ARE MEASURED IN FEET & INCHES UNLESS NOTED OTHERWISE.
- **DO NOT SCALE DRAWINGS, USE GIVEN DIMENSIONS.**

- DIMENSIONS ARE TYPICALLY TO OUTSIDE EDGE OF EXTERIOR FRAMING/CONCRETE, EDGE OF INTERIOR WALLS & CENTER OF WINDOWS UNLESS NOTED OTHERWISE.
- ALL ANGLED WALLS ARE 45° UNLESS NOTED OTHERWISE.

- ROOM SIZES UNDER ROOM NAMES ARE APPROXIMATE.

- CONFIRM DIMENSION OF TUBS/SHOWERS, FURNACES & APPLIANCES, REVISE FRAMING DIMENSIONS AS REQUIRED TO SUIT.

- PROVIDE 1/2" CONCRETE WALL BOARD ON ALL TUB & SHOWER WALLS TO BE SURFACED WITH TILE.

- REFER TO ROOF & FLOOR SYSTEM SUPPLIERS ENGINEERED DRAWINGS FOR ACTUAL POINT LOAD QUANTITY AND LOCATION.
-PROVIDE ALL WINDOW AND DOOR OPENINGS WITH BUILT-UP STUD POSTS AS REQUIRED.

Sorento
CUSTOM HOMES
#106, 179 CLEARVIEW DR.
RED DEER COUNTY
T4E 0A1
(403) 352.5222

DATE:	REVISION:

PRICING DRAWINGS
NOT FOR CONSTRUCTION

83 BIRCHCLIFF ROAD
SYLVAN LAKE, AB

LOT:	4 & 5
BLOCK:	3
PLAN:	4486AX
MAIN:	
UPPER:	
BASEMENT:	
TOTAL:	
GARAGE:	
VERANDA:	
REAR DECK:	

PRELIMINARY DRAWINGS

CLIENT: [redacted] RESIDENCE

DATE: 2021-02-24 2:17:13 PM
DESIGNER: YVONNE
SCALE:
PAGE: 11 OF: 11

Smith Dow & Associates Ltd.

- Foundation and Geotechnical Engineering
- Soil Investigation and Site Assessment
- Slope Stability Reports
- Environmental Audits
- Material Testing: Soil, Asphalt, and Concrete

New Residence
83 Birchcliff Road
Summer Village of Birchcliff, Alberta

File No: 83 Birchcliff Road

December 23, 2020

4632 - 62 Street, Red Deer, Alberta T4N 6T3 Phone : (403) 343 - 6888 Fax: (403) 341 - 4710

SmithDow & Associates Ltd.

- Foundation and Geotechnical Engineering
- Soil Investigation and Site Assessment
- Slope Stability Reports
- Environmental Audits
- Material Testing: Soil, Asphalt, and Concrete

December 23, 2020

Sorento Custom Homes
#106, 179 Clearview Drive
Red Deer County, AB.
T4E OA1

File: 83 Birchcliff Road

Attn: Bill Robinson

Re: New Residence
83 Birchcliff Road
Summer Village of Birchcliff , Alberta

As requested, we conducted a geotechnical investigation for the proposed residence with attached garage at the above referenced location on December 21, 2020.

The existing site sloped from north to the south. It is our understanding that the proposed new development will consist of a residential structure with basement and attached garage. The subject slope to the south was covered with mixed vegetation. The south to south-west facing downward slant contained a few different gradients in the slope as per our general profile cross-sectional drawing.

The south to southwest facing slope starting from Birchcliff Road, consisted of a relatively flat to gentle gradient up to the edge of the existing house. The slope began to decline at various gradients from the north portion of the existing house then to the walkout area leading to a lower crest then to the toe of the slope.

The existing house will be soon demolished to give space for the new structure.

Fill material was encountered in both borehole locations. The on-site fill material layer varied from 1.5 to 2.1 meters in thickness at the two borehole locales. Any exterior flatwork, patios or structures resting on the existing fill could experience movement. Beneath the fill material the soil was mostly a silty clay till deposit.

Snow cover blanketed the site and slope. Our observation was limited. Any observed localized erosional features associated with the slope appeared to be part of a very slow process and posed no immediate threat to the existing slopes. No visible evidence of current or previous slope failure was observed within most part of the slopes. However, this should be re-verified at a later date when snow and ice have melted.

The purpose of this investigation was to determine the general extent and nature of the subsurface materials encountered along with some basic engineering properties of the subsurface soil. Environmental studies are beyond the scope of this report.

Field Investigation

Two boreholes were required at this site. The test holes were opened near the vicinity of the existing building, as it had not been demolished at this time. Test hole #1 was near the northwest corner of the existing building and west of the old water well and test hole #2 was centered just north of the existing garage which was located northeast of the existing house. The new structure's footprint will be located in a similar place. A drilling rig with continuous flight auger set up was utilized to drill the test holes. The approximate locations of the test holes are shown on drawing #1.

The holes were advanced incrementally by auguring approximately 1.6 meters into the ground and withdrawing soil on the auger vanes. All samples retained were carefully sealed to prevent moisture loss and subsequently taken to our Soil Mechanics Laboratory for further analysis.

The in-situ strength of the soil was determined in the field by conducting a series of standard penetration tests and obtaining the corresponding blow count - N values. Where cohesive materials were encountered, pocket penetrometer tests were performed.

Subsurface Features

A) Subsoil Conditions

The soil profiles, as logged at the borehole locations, are shown on drawing No.'s 2 and 3 inclusive, Appendix A. Results of field and laboratory tests are shown on the borehole logs.

The soil profile at the test hole areas consisted of some topsoil, fill material and a native silty clay till deposit. The geotechnical report should be read in conjunction with information provided in the attached soil logs.

Fill

Fill material thickness ranged from 1.5 to 2.1 meters between the two boreholes locations. The fill material was overlain with topsoil in the test hole #2 locale and an asphalt and gravel structure in the hole #1 locale. The fill was comprised of silt with some varying amounts of clay, with more clay present in the test hole #1 location. It appeared to be tan to olive / dark brown in color, medium in plasticity and soft to loose / compact in consistency.

One should be noted that the thickness and characteristics of the fill material may vary across the site. This is especially significant in the area of the existing house and water service locale in the northwest portion of the future excavation. More accurate fill levels can be determined after demolition and further excavation for the new structure by our personnel.

It should be noted that exterior flatworks, brick / stone-works, etc. resting on the on-site fill soil could experience differential movement. Any soft / loose fill placed near the slope crest will reduce the stability of the slope. All excavated soil during construction should be removed from the property.

Silty Clay Till

The natural silty clay till deposit underlying the fill material was golden brown to olive brown in color, medium to low in plasticity and firm to stiff in consistency. This silty clay till deposit was encountered at both borehole locations.

The native silty clay till was primarily characterized with occasional rootlets, organics, coal traces, silt / sand specks to lenses, pebbles to stones, rusting, bedrock fragments, cream mineral traces. Damp to wet sandy silt lenses were noted at deeper elevations within the native silty clay deposit.

The on-site clayey soil could have potential to swell when in contact with water. It is imperative penetration of surface and subsurface water (such as pipe leakage) into the native clay subgrade soil should be prohibited. All subsurface plumbing work must be completed to the highest standard to prevent leaking. Any leakage could cause undesirable movement of the slab or exterior flatworks and reduce the stability of the slope.

As well, all soil backfill against the foundation walls should be moderately compacted to 95% Standard Proctor Maximum Dry Density to prevent surface water seeping into the ground and building. Soil compaction of backfill soil against the walls must proceed with caution to prevent damaging the walls. Compaction tests should be conducted by our personnel during backfilling to confirm the soil compaction achieved. Finished site grade should be properly sloped to direct all surface runoff away from buildings.

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B) Groundwater

Underground water was detected in each of the boreholes in the midst of site testing on December 21, 2020. The highest signs of seepage were noted at 7.3 meters below the existing ground surface level in the borehole #1 location.

One slotted PVC standpipe was installed in borehole #1 location for monitoring the groundwater level. On December 23, 2020, the water table measurement was recorded and summarized as follows in the table below.

Hole	Water Table Measurement Below Existing Grade (m)
1	7.1

It should be noted that the water conditions were observed in a relatively short term and may not represent stabilized ground water readings. The groundwater table has the potential for short term upward fluctuations during periods of snow melt or precipitation. These seasonal fluctuations will impact subgrade support conditions and excavations.

C) Stability of Slope

Field observation revealed the south-west facing slope appeared to have no apparent signs of erosion within the subject property. Though groundwater or seepage was not noticed on the slope surface neighboring the building site, the potential of seepage or springs cannot be wholly discounted of under all circumstances.

Slope stability analyses was carried out using the slope computer program (Geostudio) to evaluate the stability of the existing south-west facing slope angle with the construction of a residential structure. The slope stability analyses were to determine the factors of safety (FS) for various slip planes through compelling development features.

The slope factors of safety (FS) based on the new house constructed near the slope crest were analyzed.

The following conservatively assumed soil parameters were used:

Soil Type	Unit Weight (kN/m3)	Cohesive Strength (kPa)	Angle of Internal Friction (degree)
Fill Material	15	0	10
Silty Clay Till	22	10	32

Essentially, a factor of safety (FS) of less than 1 indicates that failure is expected. Given the possibility of soil variation, groundwater fluctuation, erosion and other factors, slopes with FS ranging between 1.0 and 1.3 are considered to be marginally stable. A "long term" stable slope to have a calculated FS of at least 1.5 is required for structures constructed at or near the slope.

On account of the present slope configuration, vegetation and a proposed new residence constructed approximately 7 meters from the slope crest - the stability of the existing south facing slope were analyzed under the following conditions.

a) Under "normal" groundwater and existing slope conditions. This first stage of the slope stability analysis of the existing slope confirms a long-term factor of safety (F.S.) of 2.988 for the cross-section at hole #1. This means the construction of the new building at about 10 meters from the slope crest as shown on the survey plan is deemed stable. The calculated F.S of 2.988 exceed the minimum required FS of 1.5.

b) The second stage of slope stability analysis was under the assumption of simulated high groundwater level at the hole #1 cross-section area. The second stage of the slope stability assessment also confirmed a long-term factor of safety (FS) of 2.793 can be achieved. This estimated F.S. of 2.793 exceeds the minimum required FS = 1.5.

It is advisable proper drainage and site grading must be provided at all times in order to maintain the stability of the slope. Confirmation of the exact building setback distance from the slope crest of about 10 meters has to be confirmed by our personnel during site preparation.

The following sections regarding recommendations for foundation construction, slab construction, soil compaction, the slope developments, site grading, subsurface drainage, and different stages of site inspections as required must also be adhered to for maintaining the stability of the slope during and after construction.

Recommendations

A) Footings

1) An existing septic tank could to be located within the subject property and on the north side of the existing house. This existing underground septic tank must be removed to expose the underlying natural silty clay till deposit. The exposed over-excavated area must be inspected and approved by our personnel.

   Upon our approval, the over-excavated septic tank area must be backfilled with clay compacted to 95% standard proctor maximum dry density (S.P.M.D.D) to help lessen any foundation movement. Compaction tests must be performed one each lift of 200 m.m of unfrozen clay fill soil.

2) All footings must be directly supported by the firm native silty clay till deposit.

3) Footing founded on the firm to stiff native silty clay till soil may be designed based on the factored resistance or serviceability bearing resistance values given in the following table:

BEARING RESTANCE FOR FOOTINGS

Soil Type	ULS (kPa)		SLS (kPa)
	Ultimate Resistance	Factored Resistance	
Native Silty Clay Till	200	100	70

The ultimate resistance values in this table are only based on semi-empirical data, therefore the factored resistance or serviceability bearing resistance should be used for the footing design. The "factored" resistance has been calculated by reducing the ultimate resistance values above by a geotechnical resistance factor of 0.5, in accordance with the building code.

4) Any fill material encountered within the footing zone must be completely removed to expose the underlying native silty clay till deposit. The exposed native silty clay must be inspected and approved by our personnel in writing. Any over-excavation that requires replacement material should be in organic clay compacted to 98% S.P.M.D.D.

5) If construction is carried out during the winter, the foundation excavation must be protected against freezing of the subsoil at the footing grade. Under no circumstances shall concrete be placed on frozen soil.

6) For protection against frost action, exterior footing in continuously heated structures should be provided with a minimum depth of ground cover 1.5m. Insulation should be placed on the exterior of the footing wall. Isolated footing and exterior footing in unheated structures will require 2.5m of ground cover. Styrofoam insulation may be used to prevent frost penetration where adequate depths of ground cover cannot be economically provided.

7) Site classification for seismic site response is E for this specific site.

8) All exposed footing bases must be inspected and approved by our personnel to confirm the soil bearing strength (factored resistance or serviceability bearing resistance) prior to footing construction.

B) Concrete Floor Slab

1) A reinforced grade-supported slab should be received by a prepared subgrade soil and base gravel.

2) Proper preparation of the subgrade soil for the floor slab includes the following:

- removal of all vegetation, organic soil and fill material to expose the firm, native silty clay till subgrade soil. The exposed excavation must be inspected by our representative for approval prior to proof-rolling.

- re-compacting the exposed and approved native subgrade soil to at least 95% Standard Proctor Maximum Dry Density (S.P.M.D.D). Any soft subgrade soil or septic tank areas encountered should be sub-excavated and replaced with low plastic clay. All replacement soil has to be compacted to at least 95% S.P.M.D.D.

3) A minimum of 200 millimeters of approved crushed gravel (minus 20 mm) or radon rock as required must be placed directly beneath the entire slab and above the re-compacted sandy subgrade soil. The gravel must be uniformly compacted to at least 98% S.P.M.D.D.

4) Compaction tests should be conducted on replacement soil and slab base gravel or radon rocks to confirm adequate and uniform compaction has been achieved. Improper and non-uniform soil compaction could cause differential movement, deflection and cracking of the concrete slab.

5) All utility trenches must be backfilled with inorganic suitable soil. The inorganic acceptable soil must be compacted to at least 95% Standard Proctor Maximum Dry Density.

6) The slab base gravel, radon rocks, and subgrade soil must be protected from snow, freezing, excessive drying, rain and ingress of free water, during and after the construction to prevent any foundation movement.

7) It is imperative penetration of surface and subsurface water (such as pipe leakage) into the native subgrade soil must be prohibited. Water leaking below the concrete slab could soften the footing soil and affect the slope stability. It is imperative all subsurface plumbing work has to be completed to the highest standards.

8) Adequate perimeter and interior subsurface drainage must be provided to discharge all sub-slab water away from the building and towards positive outlets.

9) The above recommendations are for a continuously heated building with light floor loading.

C) Retaining Wall

1) All retaining walls must be properly designed by a qualified structural engineer to ensure they can withstand the following anticipated soil lateral pressures and over-burden load.

2) The lateral pressures are dependent on the soil type behind the wall, the wall orientation, exposure to frost action, the slope of the backfill away from the wall, and compaction effort used.

3) For the general case of a permanent vertical wall with horizontal backfill, lateral earth pressures may be computed using the following equation:

$$P = KQ + KrH$$

Where:

P = Lateral earth pressure at depth H below ground level(kPa)
Q = Surcharge loading at the ground surface (kPa.)
K = Coefficient of lateral earth pressure
r = Total unit weight of soil backfill compacted to at least 95% Standard Proctor Maximum Dry Density (KN/m^3)
H = Depth below ground level (meters)

3) Recommended designed values for these parameters will depend on the type of backfill used. Recommended designed values are given below:

Lateral Earth Pressure Parameter		
Type of Backfill	**Total Unit Weight (KN/m^3)**	**Coefficient of Lateral Earth Pressure K**
Inorganic clay	19	0.6
Free draining granular material	21	0.4

The values given above are for backfill compacted to 95 % Standard Proctor Maximum Dry Density. If the density of the backfill is increased, the lateral pressures acting on the wall should be reviewed.

The following should also be considered in the wall design:

1) All retaining wall foundation systems can be supported by properly designed footing system or piles. The selected foundation systems must be inspected and approved by our personnel during installation of the foundation system, to ensure the existing slope is protected and to prevent any slope failure.
2) All backfill material should be moderately compacted to 90 % Standard Proctor Maximum Dry Density. Compaction tests should be conducted to confirm the percentage of compaction achieved.
3) Applicable surcharge loading should be applied if applicable.
4) It is imperative that proper steps be taken to prevent any water that infiltrates the backfill soil from accumulating behind the wall. If water is allowed to permeate the soil behind the wall, large additional pressures will be applied to the wall. Therefore, proper site grading must be provided to shed all surface water from the retaining area.

D) Ground Water- Drainage

a) Around House Perimeters

An adequate permanent subdrainage system (weeping tile drain) is recommended for the residential structure to prevent water seeping into the basement. The weeping tile should be placed around the outside perimeter of the basement walls to allow drainage of local groundwater and water trapped in backfill; and to reduce the hydrostatic pressures against foundation walls and floor slabs.

The weeping drain should be surrounded with granular material to minimize fine grained native soil migration into the drain. The drains shall be of a minimum 150 millimeter diameter, connected to sump pumps and provided with back flushing facilities and clean outs.

Infiltration flows into the weeping tile drains will depend on the surficial soil around the house. The largest flows will occur during periods of heavy precipitation and will be greatest for basements within sand or silt soils that are perched on top of lower permeable clay soils. Except for seepage through loose backfill, flows will not be instantaneous with precipitation. Groundwater infiltration flows can be significantly increased by poor site drainage around houses, improperly directed roof leaders and poorly compacted backfill.

b) Backfill Soil Compaction

In general, compaction of backfill soil in the following areas are advised to minimize seepage from the surface and surrounding areas.

1) All backfill soil along the perimeters of the foundation walls must be uniformly compacted in 0.3 meter lifts. This is especially important in the frost wall area where groundwater can be trapped and soften the footing foundation soil. Each lift should be moderately compacted to 95% S.P.M.D.D. During compaction, caution must be exercised to prevent any damage to the foundation walls.

2) All backfill soil within the utility trenches must also be properly compacted in 0.3 meter lifts to 95% S.P.M.D.D. As well, proper measures must be provided to prevent water from the surrounding areas seeping into the building and the subject property.

3) All surface areas outside the gravel trench drains in the lower plateau area should also be compacted to 95% S.P.M.D.D.

4) Any other excavated areas must also be properly re-compacted to 95% S.P.M.D.D.

c) Compaction Tests

Compaction tests must be conducted at each lift of all backfill soil of about 0.3 meter to ensure proper compaction has been achieved and warrant if additional compaction testing is required.

d) Site Grading

Proper site grading must be provided to direct all surface away from the buildings and the property.

In providing subsurface drainage and soil compaction, one should note these will only minimize on-site fill soil differential movement. Any exterior flatworks, brick works, fences, etc. supported by the on-site fill material could still experience some differential movement, deflection, or cracking. These are due to the thickness, quality, and compactness of the fill material will vary across the site. As well, the potential presence of undetected organic fill material within the on-site fill soil could be a factor.

E) General Slope Recommendations

The following general recommendations apply to residential development at this site.

1) In order to reduce the possibility of surficial sloughing, the slopes must be kept well vegetated at all times. The factor of safety of a slope will increase slightly as vegetation is maintained on the slope surface to protect the subgrade soil from weathering.

2) The native soil could be susceptible to erosion. Surface drainage and roof water must be discharged on the ground surface and kept away from the developed slope and the new building. No water is permitted to discharge below grade as that could cause erosion and potential slope failure.

3) All underground services should be installed to the highest standards to minimize the risk of seepage infiltration into the slope area due to leaking water.

4) No fill or excavated material from the building site (basement etc.) may be placed at the top of the slope.

5) Construction of such items as wooden decks and paved patios would be permitted.

6) Automatic sprinkler system, ornamental fountains, other water retaining structure are prohibited.

7) The finished site grade should be properly sloped to direct all surface water from the house and sloped areas. A minimum grade slope of 3% is advised at this site.

8) Any excavation along the existing slope including the boathouse area must be inspected and approved by our personnel to ensure the stability of the slope is not undermined

4632 - 62 Street, Red Deer, Alberta T4N 6T3 Phone : (403) 343 - 6888 Fax: (403) 341 - 4710

F) Foundation Concrete

Water soluble sulphate concentration tests were completed on two soil samples one from test hole #1 location and one from test hole #2 locale. The water-soluble sulphate concentration was 0.020% in both locales. In accordance with current CSA standards, the degree of sulphate exposure may be considered negligible and the use of sulphate resistant hydraulic cement is not required for concrete in contact with local soil. It is advisable water-soluble sulphate concentration determination should be completed on any imported fill to verify sulphate resistant requirements for concrete element in contact with fill material.

Air-entrainment should be provided for all concrete exposed to freeze-thaw cycles. The concrete should also be designed in accordance with CSA Standard CSA A23.1-19, in conjunction with a maximum water to cement ratio of 0.45. The concrete should possess a minimum 28-day compressive strength of 25 MPa.

G) Construction Monitoring

The engineering design recommendations presented in this report are based on the assumption that an adequate level of inspection will be provided during construction and that all construction will be carried out by a qualified contractor experienced in concrete and earthworks construction.

- for footing foundation and pile foundation -confirm the recommended soil bearing strength can be achieved at the footing elevation.
- for slab and flatworks -confirm all subgrade soil is acceptable prior to construction of the slab and exterior flatworks.
- for earthworks: -full time monitoring of soil compaction and testing.
- for concrete construction - testing of plastic and hardened concrete in accordance with CSA A23.1-19 and A23.3-19.

Closure

This report is based on the findings at the borehole locations. Should conditions encountered during construction appear to be different from those shown by the test holes, this office should be notified immediately so that we may reassess our recommendations on the basis of the new findings. Recommendations presented herein may not be valid if an adequate level of inspection is not provided during construction or if relevant building code requirements are not met.

Soil conditions, by their nature, can be highly variable across a construction site. The placement of fill during and prior to construction activities on a site can contribute to variable near surface soil conditions. A contingency should be included in the construction budget to allow for the possibility of variations in soil conditions, which may result in modification of the design, and / or changes in construction procedures.

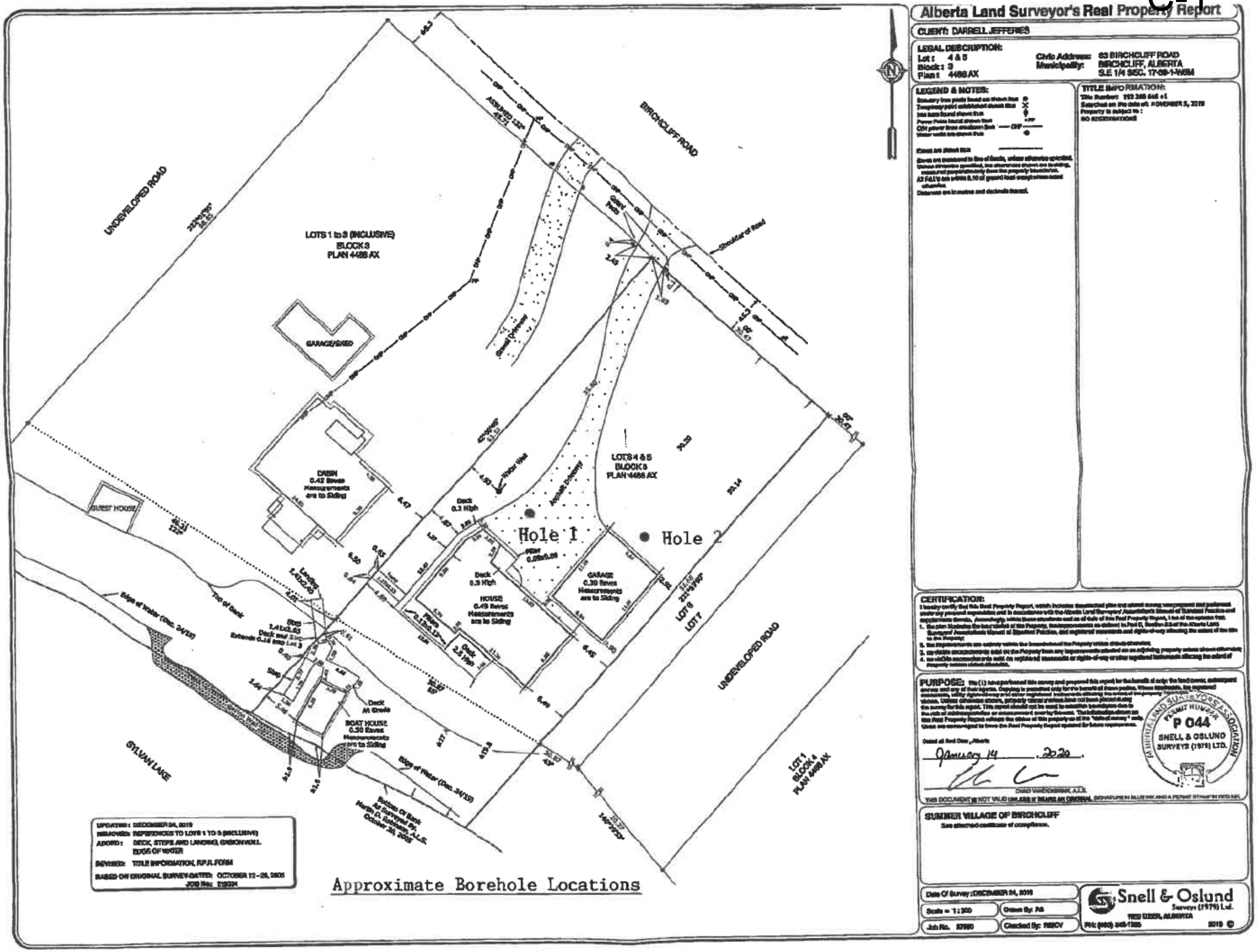
This report has been prepared for the exclusive use of Mr. Bill Robinson of Sorento Custom Homes and his agents, for specific application to the development at 83 Birchcliff Road, Summer Village of Birchcliff, Alberta. Any use that a third party makes of this report, or any reliance or decisions based on this report, are the sole responsibility of those parties. It has been prepared in accordance with generally accepted soil and foundation engineering practices. No other warranty is made, either expressed or implied.

Sincerely,
Smith Dow and Associates Ltd. (Red Deer)

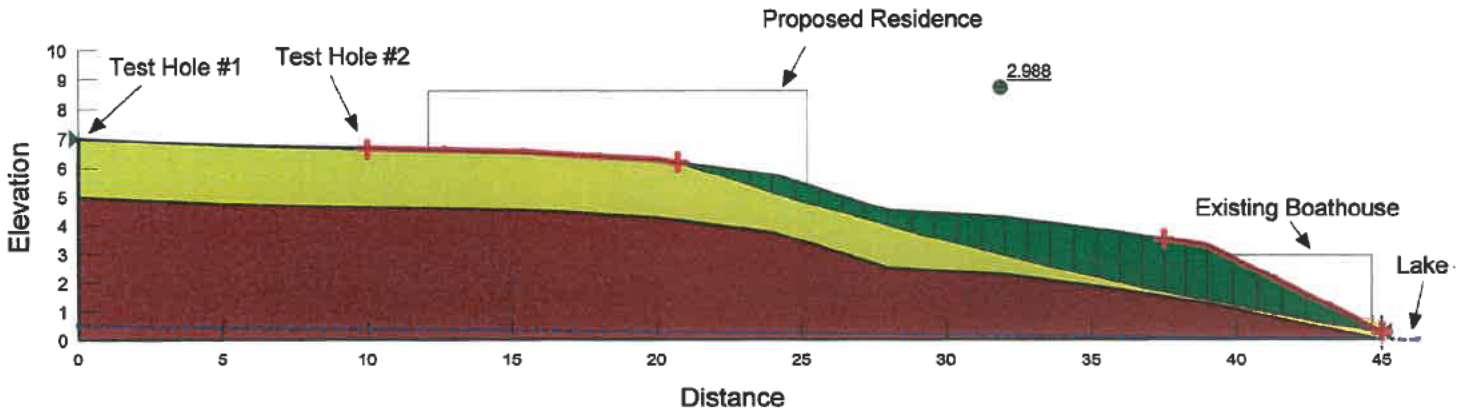
Philip Kwong (P.Eng)

4632 - 62 Street, Red Deer, Alberta T4N 6T3 Phone : (403) 343 - 6888 Fax: (403) 341 - 4710

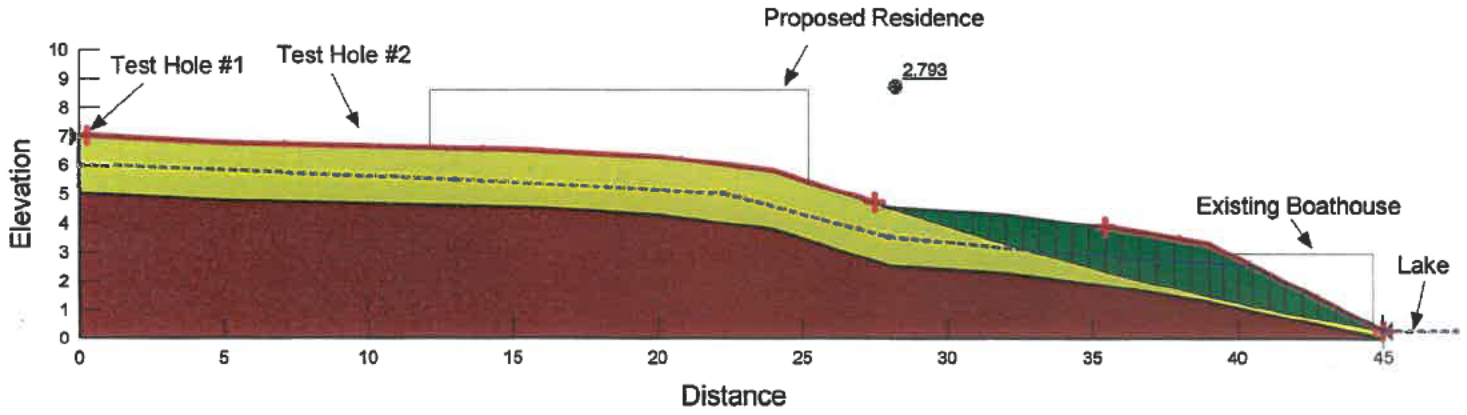
APPENDIX-A


Alberta Land Surveyor's Real Property Report
CLIENT: DARRELL JEFFERIES
LEGAL DESCRIPTION:
Lot: 4 & 5
Block: 3
Plan: 4486 AX
BIRCHCLIFF, ALBERTA
LEGEND & NOTES:
TITLE INFORMATION:
CERTIFICATION:
PURPOSE:
SUMMER VILLAGE OF BIRCHCLIFF
Snell & Oslund
P 044
UNDEVELOPED ROAD
BIRCHCLIFF ROAD
LOTS 1 to 3 (INCLUSIVE)
BLOCK 3
PLAN 4486 AX
GARAGE/SHED
CABIN
GUEST HOUSE
HOUSE
GARAGE
BOAT HOUSE
LOTS 4 & 5
BLOCK 3
PLAN 4486 AX
Hole 1
Hole 2
LOT 6
LOT 7
LOT 1
BLOCK 4
PLAN 4486 AX
SYLVAN LAKE
Approximate Borehole Locations

83 Birchcliff Road
Summer Village of Birchcliff



83 Birchcliff Road
Summer Village of Birchcliff
(Simulated High Water Table)



SMITH DOW & ASSOCIATES LTD.
-------Engineering Consultants-------

Project: 83 Birchcliff Road
Summer Village of Birchcliff, AB.

DWN MK.	CKD PK.	DATE December 21, 2020	FILE #	HOLE 1

STRENGTH----------
MOISTURE----------
PENETRATION----------

▲ 100 200 300 400 500
● 10 20 30 40 5
X 0 10 20 30 40 50 60 70 80 90 100

DATUM
GROUND ELEV-

CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Fill	asphalt (50mm), base gravel (150mm)				1	
	gravelly (~250mm) brown, non-pl.				2	
	light brown, pebbles, sandy		N=4	X	3	1
	firm, rootlets, pebbles to stones				4	
	topsoil interspersed, coal fragments				5	
	organics w/ topsoil traces, stones				6	
	black plastic water line encountered				7	2
Silty Clay Till	slightly silty, coal / bedrock fragments		N=7	X	8	
	tan to brown				9	
	sand lenses, pebbles				10	3
	rusting, low plastic, firm				11	
	silt lenses				12	
	coal fragments, firm to stiff		N=16	X	13	4
	silty stringers, shale fragments				14	
	olive/brown, low plastic				15	
	tan / brown				16	5
	stiff, low plastic, pebbles				17	
	varying bedrock fragments sizes		N=18	X	18	
	coal fragments, very stiff				19	6
	light brown				20	
	moist to damp				21	
	stiff				22	7
	pebbles to stones		N=14	X	23	
	low to non-plastic, damp				24	
	medium to fine grained, sandy				25	
	water, med.dense, sandstone traces				26	8
	low plastic to non-plastic, wet				27	
	weathered sandstone layers		N=34	X	28	
	coal traces, tan/yellow brown				29	
End of Hole (Standpipe In)					30	9

FILL	CLAY	TILL	Q - Unconfirmed Strength, kN/m2	Tube	/
TOPSOIL	PEAT	COAL	d - Dry Unit Weight, kN/m3	Penetrometer	X
SAND	GRAVEL	WATER	S - Sulphate Concentration, %	No Recovery	
SILT	SILTSTONE	LIMITS	N - Penetration Resistance, blows		

TEST HOLE LOG AND LAB DATA

DWG #2

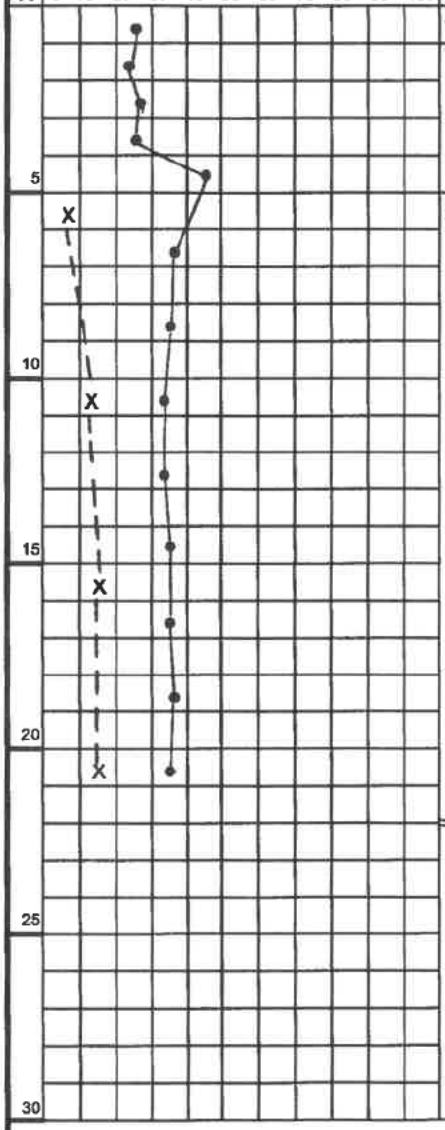
SMITH DOW & ASSOCIATES LTD.
-------Engineering Consultants-------

Project: 83 Birchcliff Road
Summer Village of Birchcliff, AB.

DWN MK.	CKD PK.	DATE December 21, 2020	FILE #	HOLE 2

STRENGTH----------
MOISTURE----------
PENETRATION----------

▲ 100 200 300 400 500
● 10 20 30 40 5
X 0 10 20 30 40 50 60 70 80 90 100



DATUM
GROUND ELEV-

CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Topsoil	80mm, organic silt, dark brown				1	
Fill	tan, sandy silt, non-plastic				2	
	frozen, silty, low to non-plastic				3	
	frost, medium to low plastic				4	1
	olive / brown, organics, rusting				5	
Silty Clay Till	coal, silt / sand specks		N=9	X	6	
	firm to stiff, olive brown				7	2
	white mineral traces				8	
	rusting, fissures				9	
	low to non-plastic				10	3
	very stiff to stiff		N=13	X	11	
	low plastic, olive brown				12	
	stone sized bedrock fragments				13	4
	stiff, white mineral traces				14	
	low plastic, silt lenses, yellow				15	
	stones, bedrock fragments		N=15	X	16	5
	moist, stiff				17	
	stones				18	
	rust traces				19	6
	low plastic, stiff, moist to damp				20	
	pebbles		N=14	X	21	
	silt / coal specks, stiff				22	7
End of Hole					23	
(Backfilled w / auger cuttings)					24	
					25	
					26	8
					27	
					28	
					29	
					30	9

FILL	CLAY	TILL	Q - Unconfirmed Strength, kN/m2
TOPSOIL	PEAT	COAL	d - Dry Unit Weight, kN/m3
SAND	GRAVEL	WATER	S - Sulphate Concentration, %
SILT	SILTSTONE	LIMITS	N - Penetration Resistance, blows

Tube	/
Penetrometer	X
No Recovery	

TEST HOLE LOG AND LAB DATA

DWG #3