MUNICIPAL PLANNING COMMISSION AGENDA
SUMMER VILLAGE OF JARVIS BAY
SUMMER VILLAGES ADMINISTRATION OFFICE
JUNE 27, 2022 @ 9:00 A.M.

A. CALL TO ORDER

B. ADOPTION OF AGENDA

C. DEVELOPMENT ITEMS

1) 234 Jarvis Bay Drive

D. ADJOURNMENT

Summer Village of Jarvis Bay – Municipal Planning Commission

June 27, 2022

Agenda Item

234 Jarvis Bay Drive (Lot 10A, Block 2, Plan 6735NY)

Development Permit Application

Background:

An application was submitted on behalf of the registered owner for a dwelling at the property of 234 Jarvis Bay Drive (Lot 10A, Block 2, Plan 6735NY) in the Summer Village of Jarvis Bay. This property is located in the R District (Residential). A development permit for the dwelling has already been issued. The original drawings submitted did not show any excavation or work done to the escarpment, and therefore it was considered a permitted use. As the project started taking place, trees were removed according to the landscaping plan. It is the understanding of administration that at this time it was discovered that the original grade measurements were inaccurate. In order to accommodate the walk out basement, the excavation required the removal of the top of the escarpment, which requires Municipal Planning Commission approval. Administration met on site with the owner and developer and requested that they make an application with amended and accurate drawings to the MPC.

Included in this application are new grading plans showing the proposed elevations of the lot along with retaining wall plans and landscaping. The landscaping plan includes retaining walls along the side yards towards the lake end of the property to ensure adjacent lots are protected, and there will be extensive replanting of vegetation on the property. The land below the escarpment will remain in a natural state with existing vegetation. A geotechnical report was provided stating that the proposed development would be safe as designed. The proposed development is within the parcel coverage, height, and setback regulations of the Land Use Bylaw.

Discussion:

This application is before MPC for the following reason:

- Land located below the top of escarpment should be in a natural state, so a variance is required.

Conditions:

If approved, Administration would recommend the following conditions:

- 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 will be required at completion to ensure that proper drainage on the property exists.

- The height of the dwelling shall not exceed 10m (32.81ft.) in building height measured from grade.
- Final as build real property report from an Alberta Land Surveyor at completion of landscaping that includes parcel coverage.
- Replanting of trees/shrubs and existing trees to remain according to landscaping plan.
- Future shop is not included in this approval.
- Development is to comply with the geotechnical report recommendations to ensure that the bank is protected and the development is safe.

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).

May 6, 2022

Kara Kashuba
Development Officer
Summer Village of Jarvis Bay
2 Erickson Drive
Sylvan Lake, Alberta T4S 1P5

Dear Kara,

Please accept this request to amend the development permit for 234 Jarvis Bay Drive to regrade the site to accommodate the 1-1/2 story home with walk-out basement planned for this site.

Site grading has already taken place. After the site was cleared of trees and site grades were reviewed with our foundation contractor, it was apparent that more significant regrading of the site would be required from out initial analysis. We believed that after consulting with the Summer Village office that we had approval to proceed with regrading the southwest portion of the lot. It was our misunderstanding that led us to proceed.

Please review the attached geotechnical report and revised landscape plan. The geotechnical report verifies that the slope stability and groundwater conditions accommodate this home. The revised landscape plan indicates the inclusion of stone retaining walls along the side yards towards the lake end of the property. I have also included a few photos of stone retaining walls, most of which are Bowood projects at Sylvan Lake, to provide some greater clarity on the type, quality, and visually appealing retaining walls planned for the site. The escarpment will remain in its natural state with native vegetation. The landscaping on the site, especially near the escarpment, will be completed to ensure erosion control.

Please feel free to get in touch if you have any questions.

Best regards,

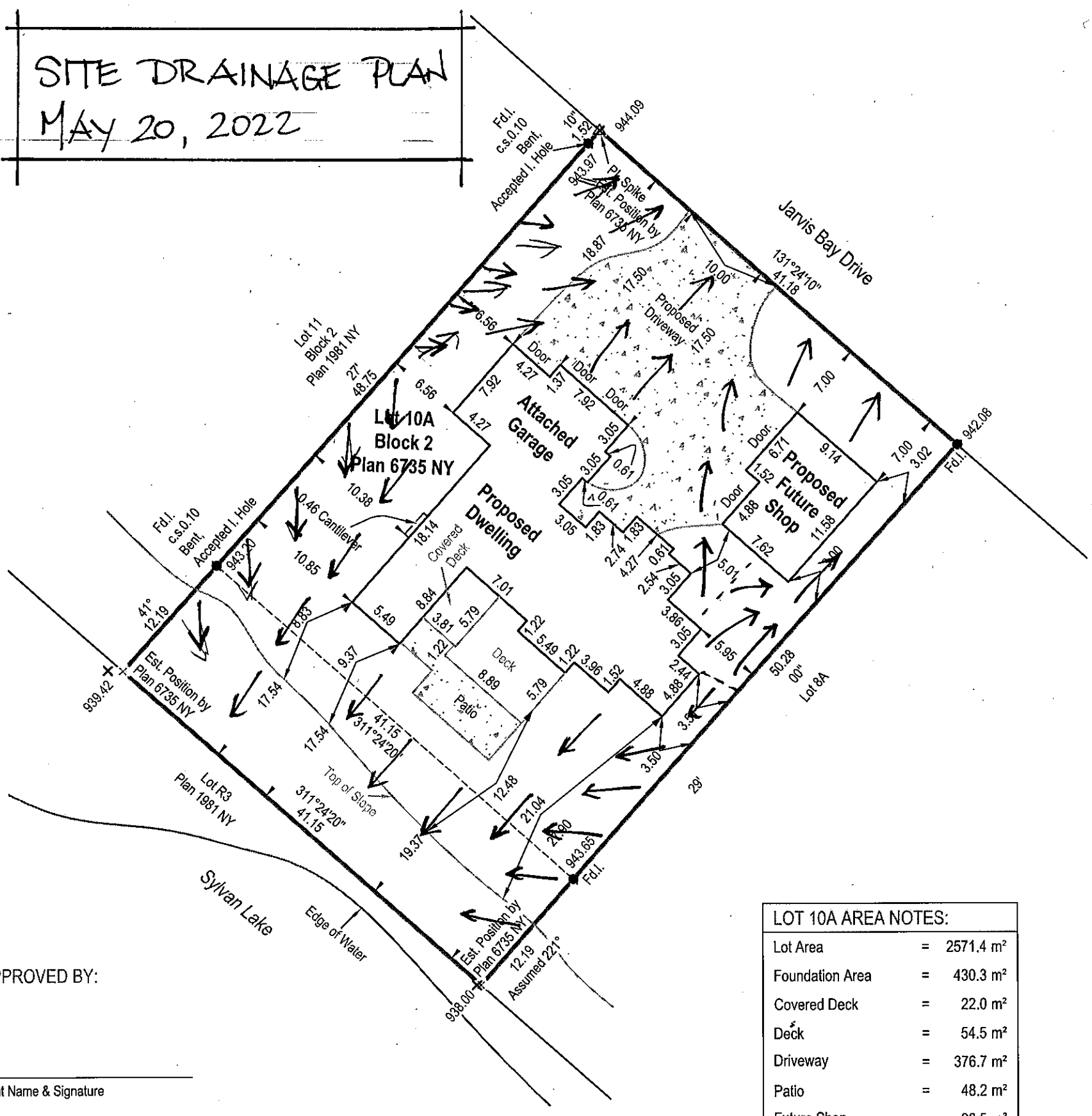
Susan Knopp
BOWOOD HOMES

PLOT PLAN SHOWING PROPOSED LOCATION OF BUILDING(S)

Civic Address: 234 Jarvis Bay Drive
Summer Village of Jarvis Bay, Alberta

Legal Description: Lot 10A, Block 2, Plan 6735 NY

SITE DRAINAGE PLAN
MAY 20, 2022



LOT 10A AREA NOTES:		
Lot Area	=	2571.4 m²
Foundation Area	=	430.3 m²
Covered Deck	=	22.0 m²
Deck	=	54.5 m²
Driveway	=	376.7 m²
Patio	=	48.2 m²
Future Shop	=	98.5 m²
Lot Coverage	=	40.1 %

APPROVED BY:

Print Name & Signature

NOTES:
-Distances are in metres and decimals thereof. Measurements are shown to the outside face of the proposed building foundation wall at ground level.
-The above ground and buried facilities have not been located and are not shown on this plan. It is the responsibility of the owner(s) and contractor to have the facilities located prior to construction.
-Lot boundaries have been calculated from located survey evidence.
-Elevations have been derived from Precise Point Positioning.
-Existing Grades shown thus 810.00

0 5 10 20 30 metres
Scale 1:500

LAND USE DISTRICT
R -Residential District

REVISION SUMMARY
2 Amend Dwelling Location and Shop (05/12/22) PC/JW
1 Add Elevations (02/07/22) PC/JW
0 Original Issue (01/20/22) PC/JW

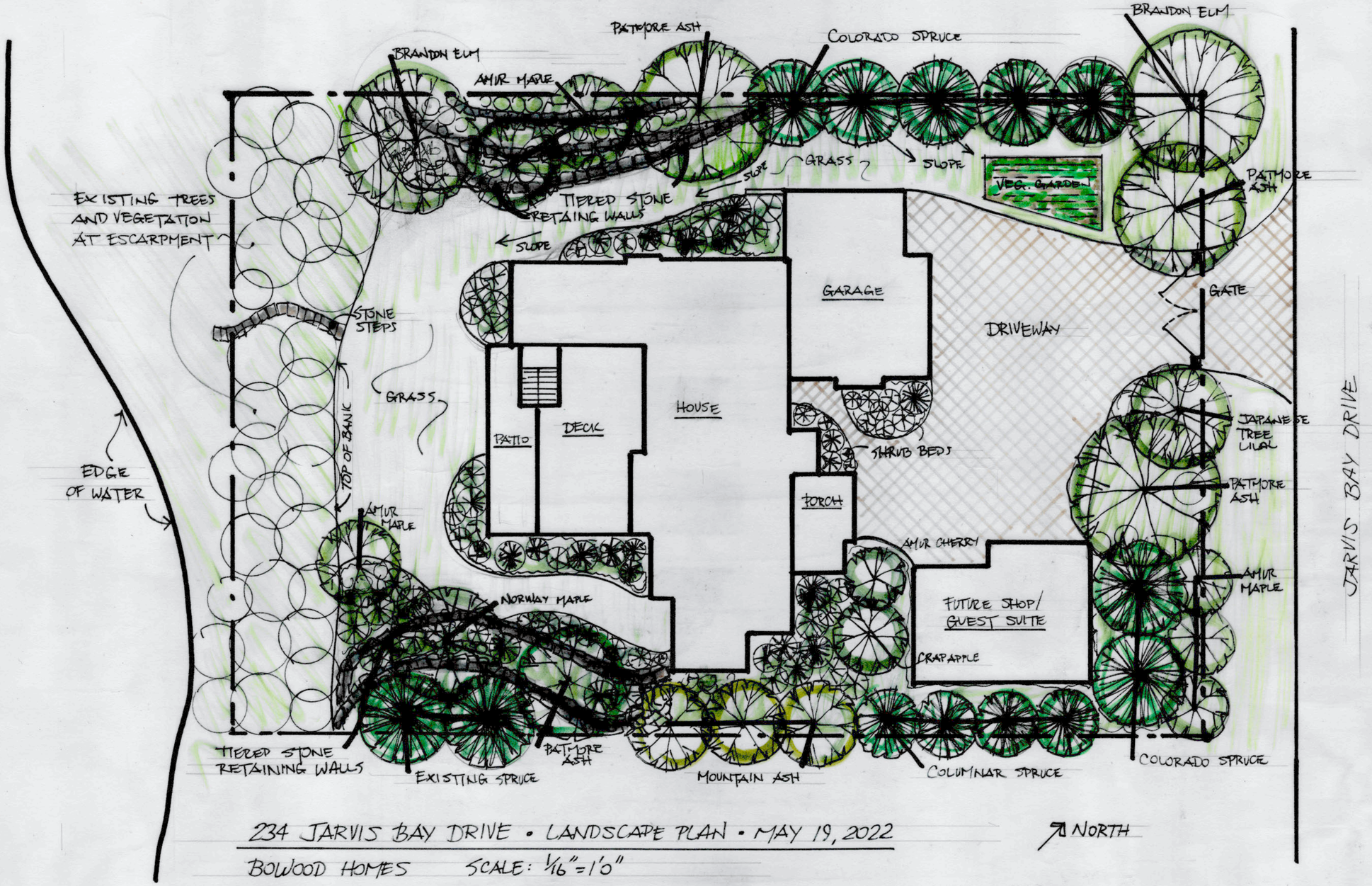
CLIENT
Bowood Homes

REV. 2 | PAGE 1 of 1

COMPASS Geomatics Ltd.
11-4608 62nd Street
Red Deer, Alberta T4N 6T3
Office (403) 356-0111 Fax (403) 356-0114
www.compassgeomatics.ca

ALBERTA LAND SURVEYORS' ASSOCIATION
PERMIT NUMBER
P266
Compass Geomatics Ltd.

COMPASS DWG: 01345-21-PP-R2 SURVEYED BY: CN



234 JARVIS BAY DRIVE • LANDSCAPE PLAN • MAY 19, 2022

BOWOOD HOMES SCALE: 1/16"=1'0"

NORTH

PLOT PLAN SHOWING PROPOSED LOCATION OF BUILDING(S)

Civic Address: 234 Jarvis Bay Drive
Summer Village of Jarvis Bay, Alberta
Legal Description: Lot 10A, Block 2, Plan 6735 NY

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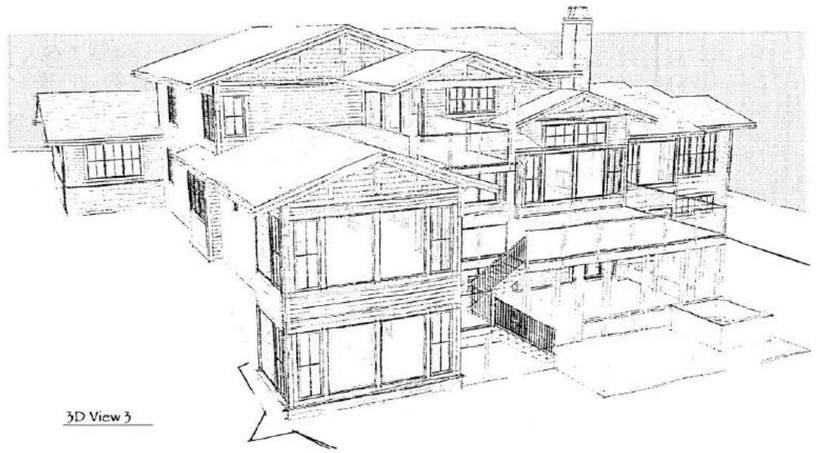
ALBERTA LAND SURVEYORS' ASSOCIATION PERMIT NUMBER P266 Compass Geomatics Ltd.

COMPASS DWG: 01345-21-PP-R2 SURVEYED BY: CN

3D View 4



3D View 3

[redacted]

A0 - TITLE SHEET
A1 - ELEVATION PLANS
A2 - ELEVATION PLANS
A3 - FOUNDATION / LOWER FLOOR PLAN
A4 - MAIN FLOOR PLAN
A5 - UPPER FLOOR PLAN
A6 - BUILDING SECTIONS / ROOF PLAN
A7 - BUILDING SECTIONS

3D View 2

3D View 1

RESIDENCE

[redacted]

PROJECT TITLE

DESIGNED TO THE
2019 ALBERTA
BUILDING CODE

SET PERMIT

[redacted]

BOWOOD

Custom Home Construction
& Renovations

TODD ZIMMERMAN
Cell 403-586-1588

SUSAN KNOPF
Design 403-346-1908

PROJECT TITLE: [redacted]

DATE: 01/23/22

REVISIONS:

SCALE:

DESIGNED BY: SUSAN KNOPF DATE: Designer

DRAWN BY: LYLE FAICHUK DATE: Author

CHECKED BY: DATE

LEGAL DESC: _

ADDRESS: Enter address here

DRAWING TITLE: TITLE SHEET

PAGE NO: A0 REV:

#7 - 4608 - 62 Street, Red Deer, Alberta T4N 6T3
PH: (403) 346-1908 Fax (403) 347-4882

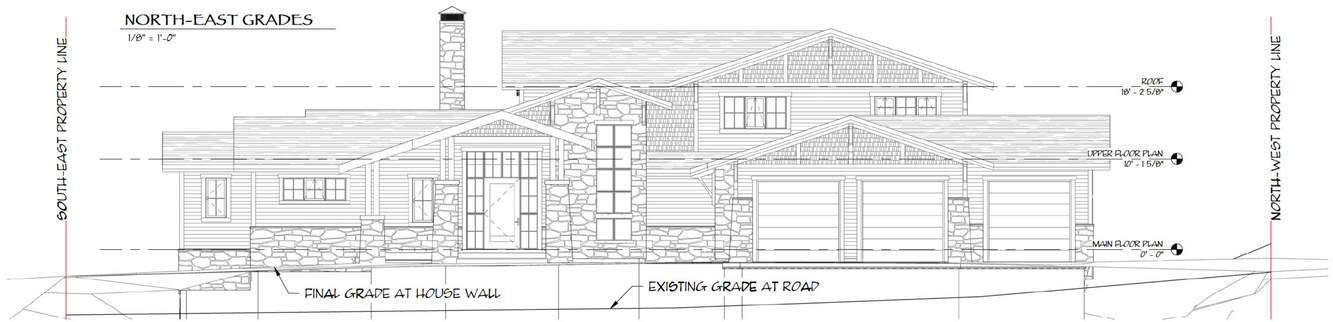
[redacted]

SOUTH-WEST GRADES

1/8" = 1'-0"

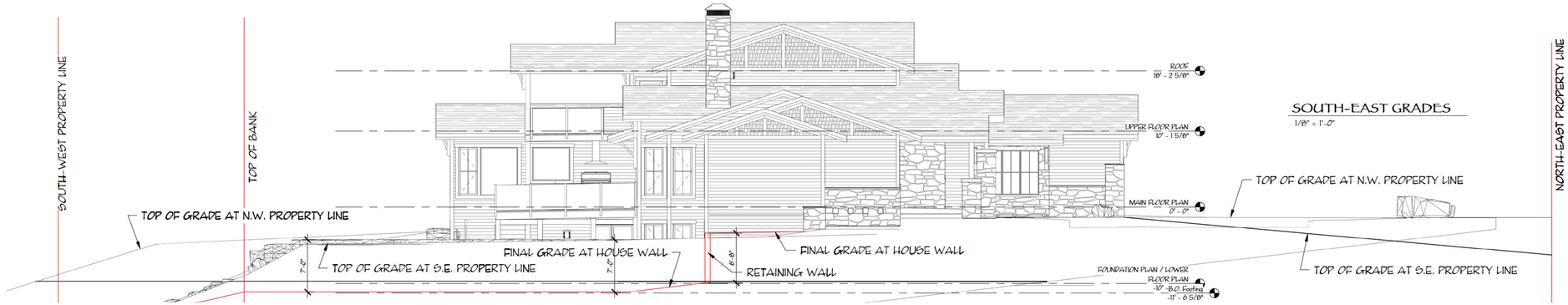
NORTH-EAST GRADES

1/8" = 1'-0"



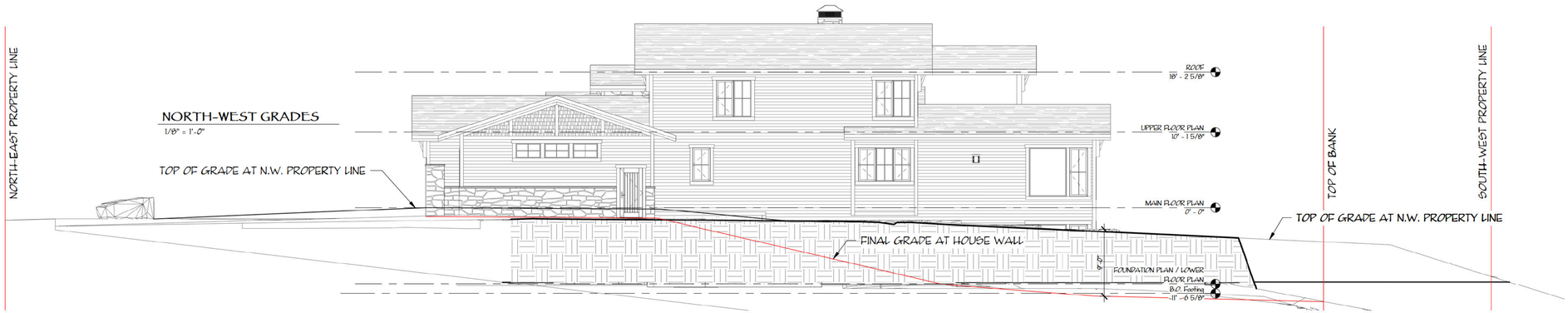
SOUTH-EAST GRADES

1/8" = 1'-0"



NORTH-WEST GRADES

1/8" = 1'-0"



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

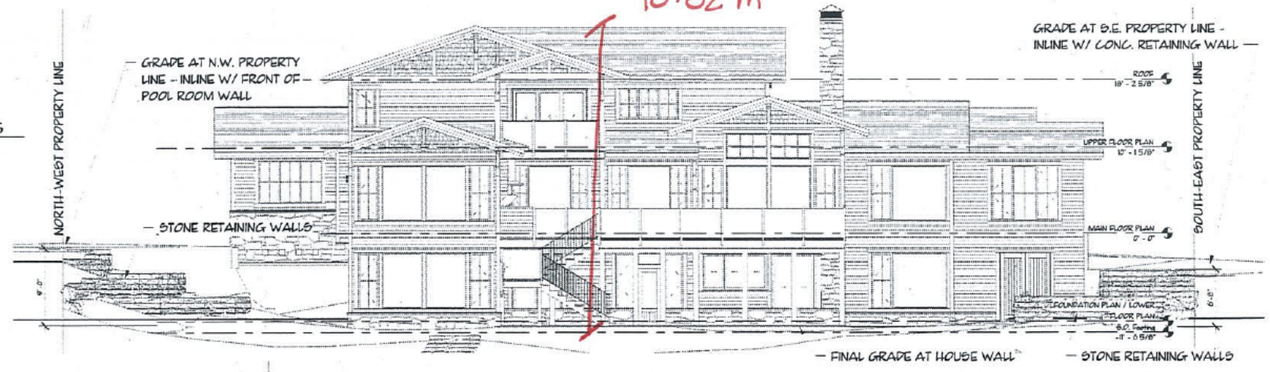
BOWOOD

A9

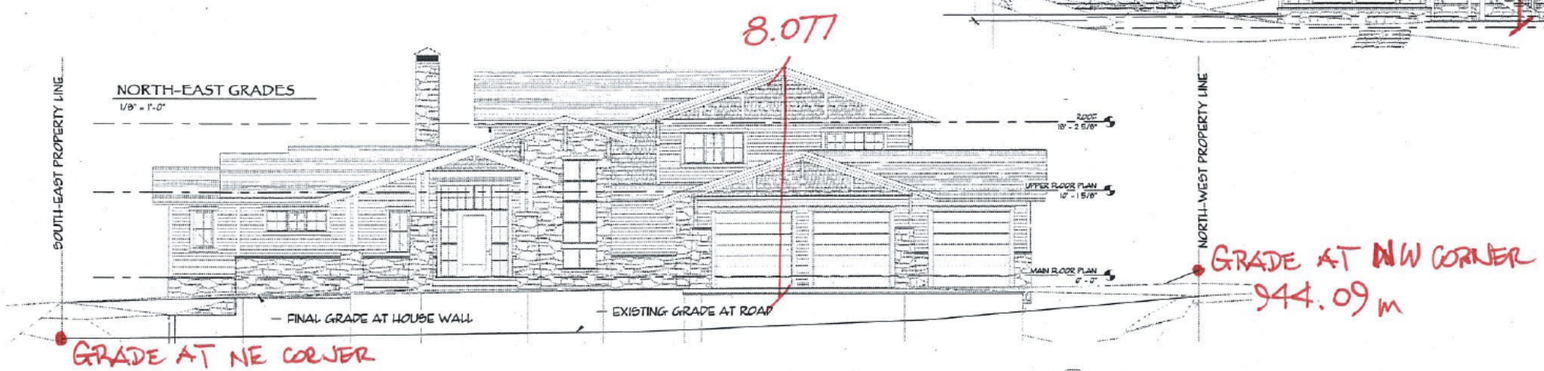
[redacted]

- HOUSE AVERAGE HEIGHT
10.82 m + 8.077 = 18.90 ÷ 2 = 9.45 m

SOUTH-WEST GRADES
1/8" = 1'-0"

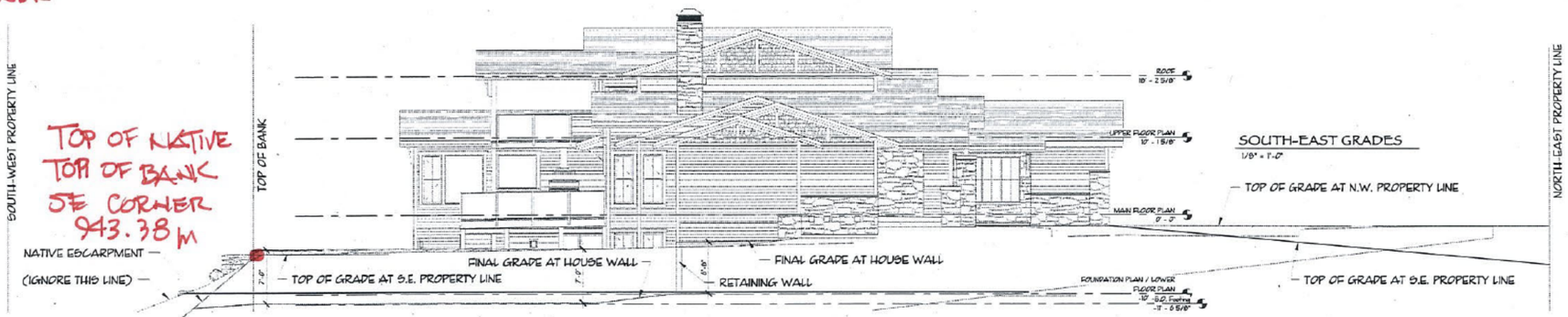


- ROADSIDE AND NATIVE TOP OF BANK CORNERS = 943.06
- AVERAGE HEIGHT OF HOUSE ABOVE AVERAGE GRADE =
943.06m + 9.45m = 952.51 m

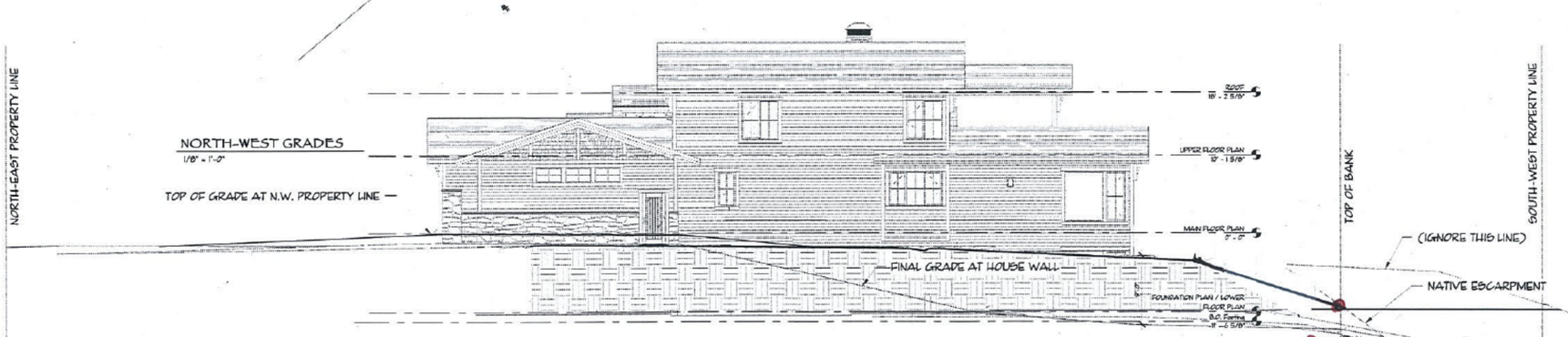


GRADE AT NE CORNER
942.08 m

GRADE AT NW CORNER
944.09 m



TOP OF NATIVE TOP OF BANK SE CORNER
943.38 m



GRADE AT NATIVE TOP OF BANK - SW CORNER
942.69 m

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

BOWOOD

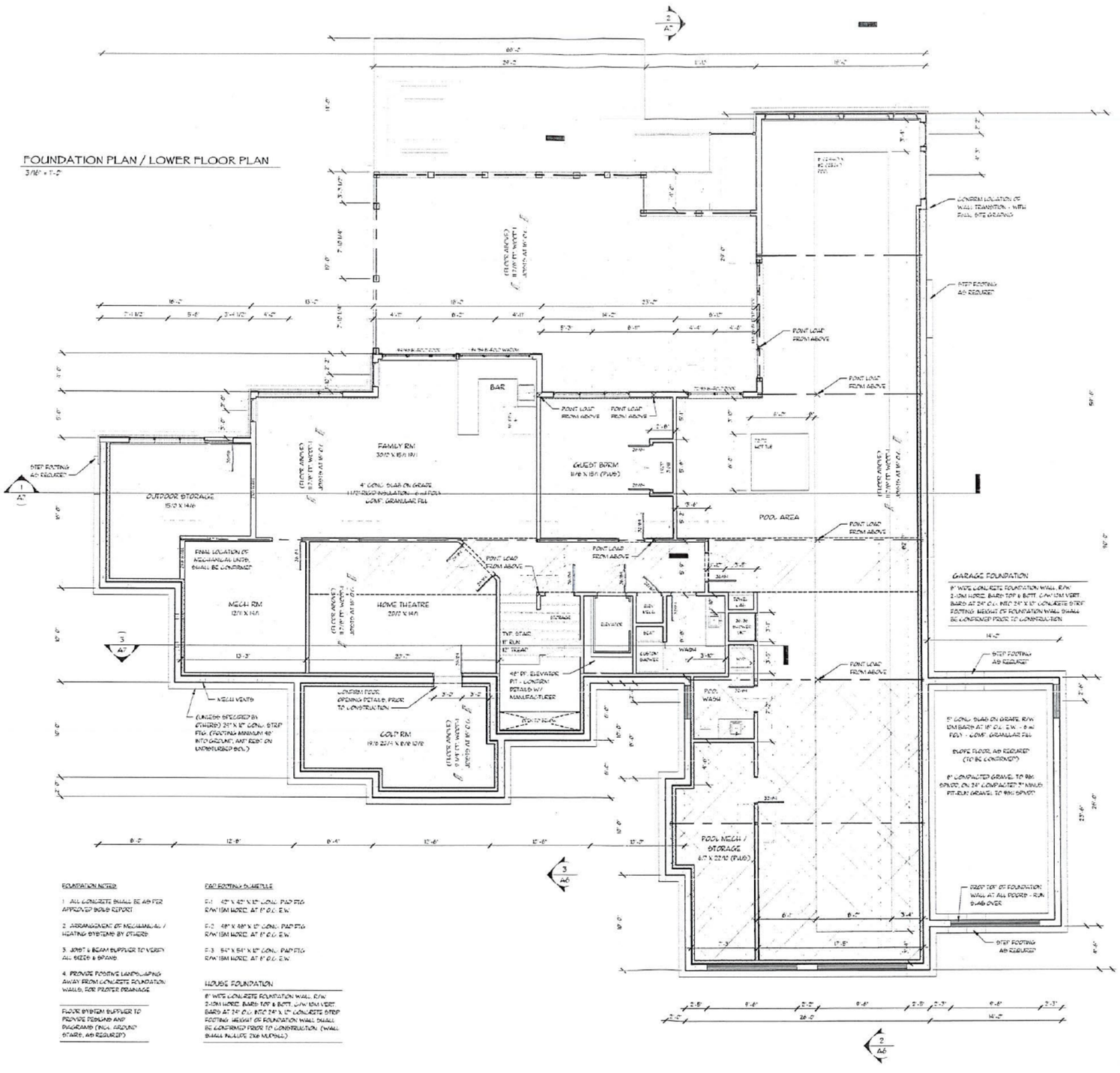
[redacted]

May 27-22

A9

FOUNDATION PLAN / LOWER FLOOR PLAN

3/16" = 1'-0"



FOUNDATION NOTES:

1. ALL CONCRETE SHALL BE AS PER APPROVED SOILS REPORT
2. ARRANGEMENT OF MECHANICAL / HEATING SYSTEMS BY OTHERS
3. JOIST & BEAM SUPPLIER TO VERIFY ALL SIZES & SPANS
4. PROVIDE FOOTING LANDSCAPING AWAY FROM CONCRETE FOUNDATION WALLS, FOR PROPER DRAINAGE

FLOOR SYSTEM SUPPLIER TO PROVIDE PERIMETER AND PIN/RAMP (INCL. GROUND STAKES, AS REQUIRED)

PAD FOOTING SCHEDULE

F-1 - 42" X 42" X 12" CONC. PAD FTG. R/W 15M HORIZ. AT 6" O.C. E.W.

F-2 - 48" X 48" X 12" CONC. PAD FTG. R/W 15M HORIZ. AT 6" O.C. E.W.

F-3 - 54" X 54" X 12" CONC. PAD FTG. R/W 15M HORIZ. AT 6" O.C. E.W.

HOUSE FOUNDATION

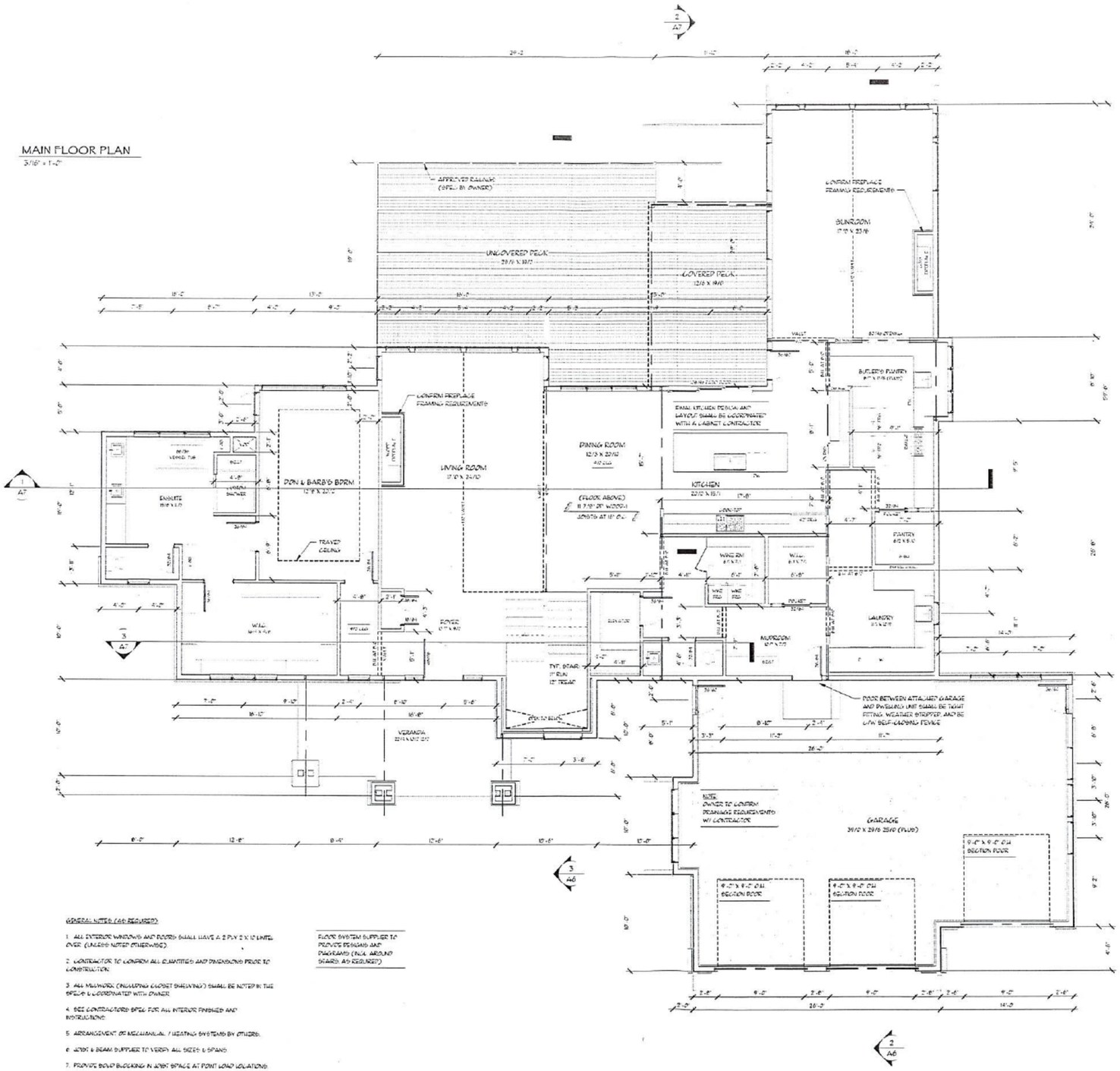
8" WIDE CONCRETE FOUNDATION WALL R/W 2-10M HORIZ. BARS TOP & BOTT. C/W 10M VERT. BARS AT 24" O.C. INTO 24" X 10" CONCRETE STRIP FOOTING. HEIGHT OF FOUNDATION WALL SHALL BE CONFIRMED PRIOR TO CONSTRUCTION. (WALL SHALL INCLUDE 2X8 MUDSILL)

BOWOOD

A3 [redacted]

MAIN FLOOR PLAN

3/16" = 1'-0"



GENERAL NOTES (AS REQUIRED)

1. ALL EXTERIOR WINDOWS AND DOORS SHALL HAVE A 2 PLY 2"X 10" LINTEL OVER (UNLESS NOTED OTHERWISE)
2. CONTRACTOR TO CONFIRM ALL QUANTITIES AND DIMENSIONS PRIOR TO CONSTRUCTION.
3. ALL MILLWORK (INCLUDING CLOSET SHELVING) SHALL BE NOTED IN THE SPECS & COORDINATED WITH OWNER
4. SEE CONTRACTORS SPEC FOR ALL INTERIOR FINISHES AND INSTRUCTIONS
5. ARRANGEMENT OF MECHANICAL / HEATING SYSTEMS BY OTHERS.
6. JOIST & BEAM SUPPLIER TO VERIFY ALL SIZES & SPANS
7. PROVIDE BOXD BLOCKING IN JOIST SPACE AT POINT LOAD LOCATIONS.

FLOOR SYSTEM SUPPLIER TO PROVIDE FRAMING AND DIAGRAMS (INCL. AROUND STAIRS) AS REQUIRED

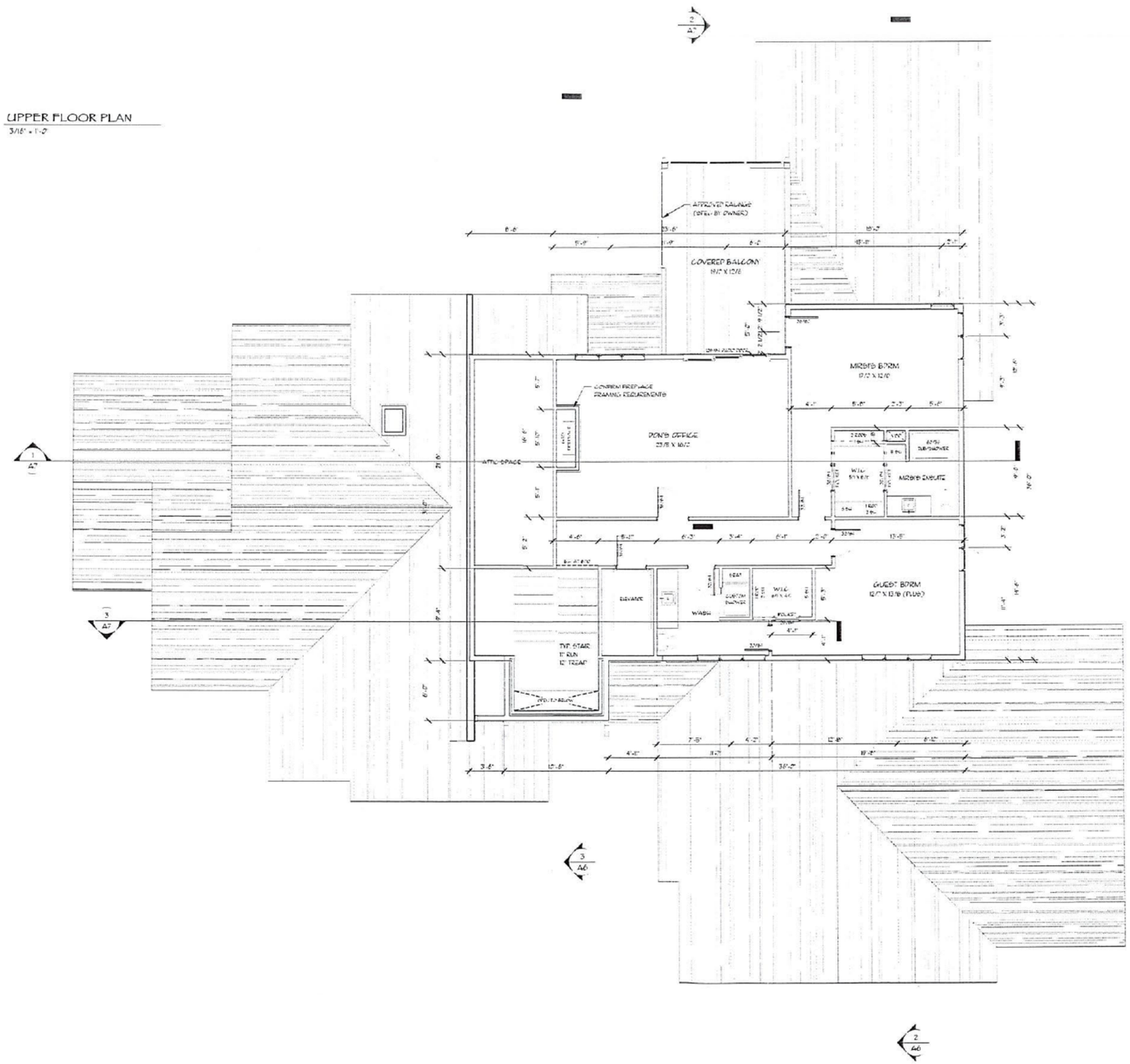
HOUSE (TOTAL) - 3238 SF
GARAGE - 1164 SF

BOWOOD

A4

[redacted]

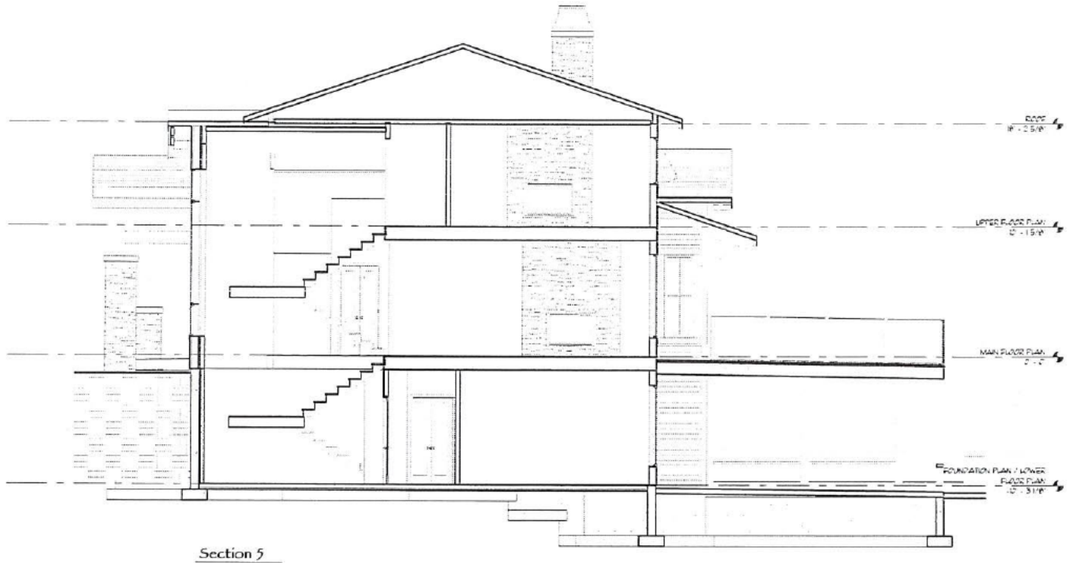
UPPER FLOOR PLAN
3/16" = 1'-0"



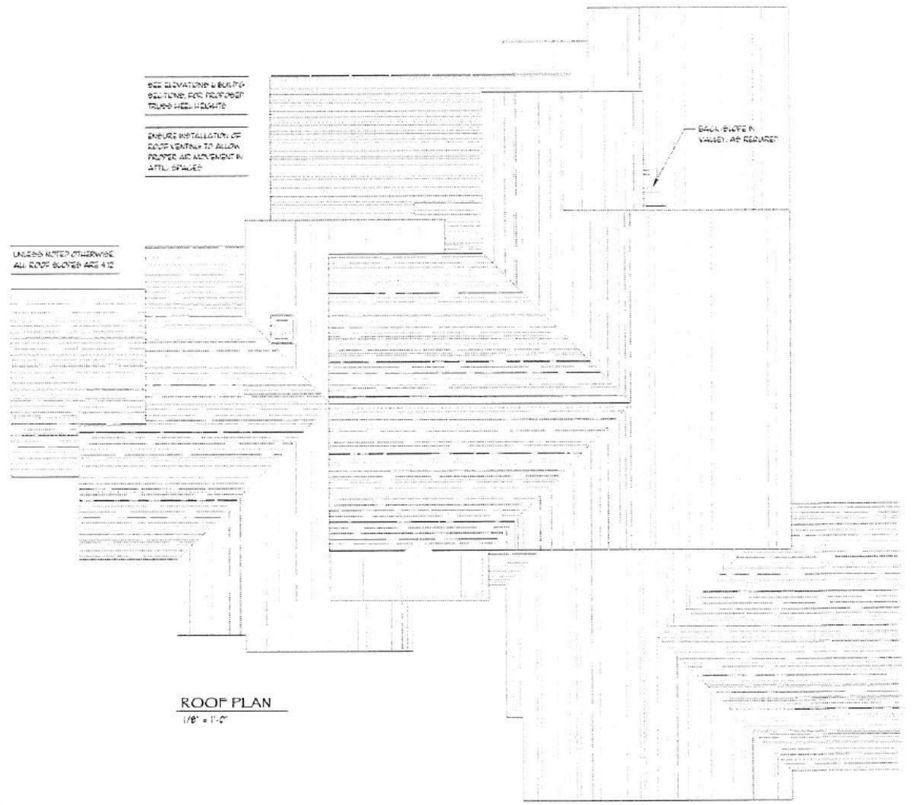
HOUSE (TOTAL) - 1336 S.F.

BOWOOD

A5 [redacted]



Section 5
3/16" = 1'-0"



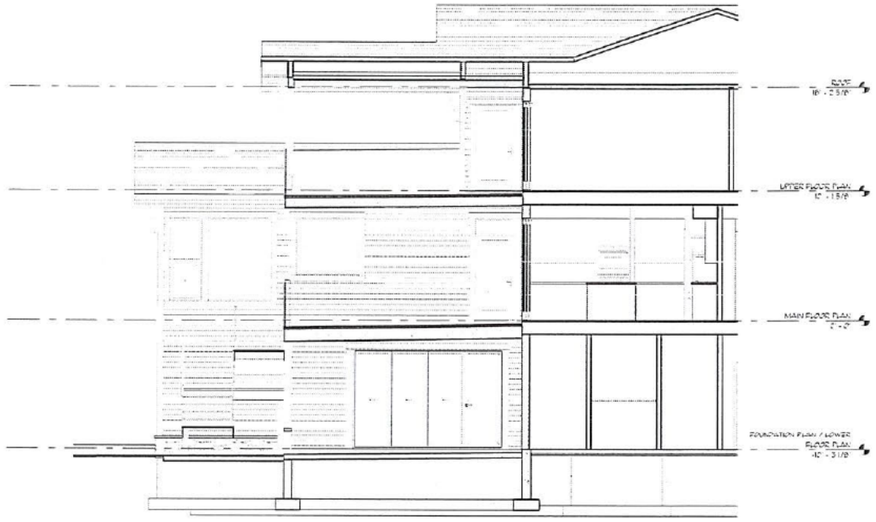
ROOF PLAN
1/8" = 1'-0"

Section 4
3/16" = 1'-0"

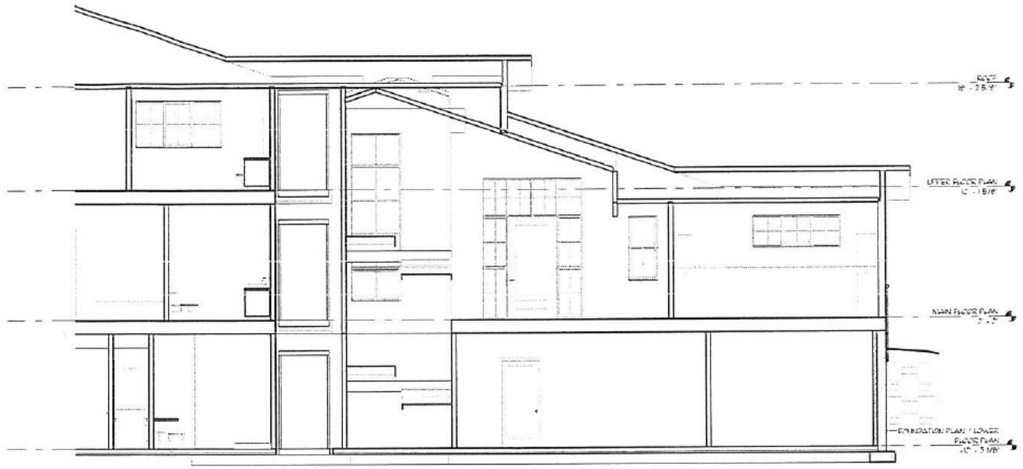
BOWOOD

A6

[redacted]



Section 7
3/16" = 1'-0"



Section 8
3/16" = 1'-0"

Section 6
3/16" = 1'-0"

BOWOOD

A7

[redacted]

Smith Dow & Associates Ltd.

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

Proposed Residence

234 Jarvis Bay Drive

Summer Village of Jarvis Bay, Alberta

FILE #: 234 Jarvis Bay Drive

April 5, 2022

4632 - 62 Street, Red Deer, Alberta T4N 6T3

Phone : (403) 343 - 6888 Fax: (403) 341 - 4710

Smith Dow & Associates Ltd.

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

April 5, 2022

Bowood Homes
Red Deer, Alberta

File #: 234 Jarvis Bay Drive

Attn: Todd

Re: Geotechnical Investigation
234 Jarvis Bay Drive
Summer Village of Jarvis Bay, Alberta

At your request, we conducted a geotechnical investigation at the suggested residential home on March 11, 2022.

The existing site sloped from the North to the South. It is out understanding that the proposed development will consist of a two-story structure with a walkout basement and an indoor swimming pool. The swimming pool is a metal seacan type of material support by the basement slab. In the swimming pool area, the basement slab could be about 5 meters below the existing site grade. Whereas, in the remaining basement slab on the east, the excavation depth could be about 3.3 meters deep.

The subject slope to the South was covered with mix vegetation and minor construction debris. The South facing downward slant contained various gradients of slope.

The observed localized erosional features near the slope base at the lake water level were considered part of very slow erosion process. It must be properly protected to prevent any further erosion of the slope. No visible evidence of current or previous slope failure was observed within most part of the slopes.

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.

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

Field Investigation

Six (6) test holes were opened at this site within the vicinity of the suggested building footprint. The test holes were opened by using a drilling rig with continuous flight augers. The approximate locations of the test holes are shown on the attached site plan (Dwg. #1).

The holes were advanced incrementally by augering 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.

Where allowable, 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 through 7 inclusive, Appendix A. Results of field and laboratory tests are shown on the borehole logs.

The soil profile in the test hole areas consisted of native clayey silt till and sandstone / siltstone deposits. Description of the following soil types encountered should be read in conjunction with review of the borehole logs.

Clayey Silt Till

At the time of site drilling, the building site had been stripped to expose the native clayey silt till. The site was undulating. The native clayey silt till extended from the existing site grade to depths of about 2 to 4 meters below. Localized sandy silt and damp interlayers were noted at borehole #1 area.

The brown clayey silt and sandy silt were generally firm to stiff in consistency. Stones, pebbles, rust specks. Coal fragments and bedrock fragments individualized this glacial till deposit.

The on-site clayey soil could have some potential to swell. It is imperative penetration of surface and subsurface water (such as pipe leakage) into the native clayey silt subgrade soil should be prohibited. All subsurface plumbing work must be completed to the highest standard to prevent leaking. As well, all soil backfill against the foundation wall should be moderately compacted to 95% Standard Proctor Maximum Dry Density to prevent surface water seeping into the ground. Soil compaction must proceed with caution to prevent damaging the walls. Finished site grade should be properly sloped to direct all surface runoff away from buildings.

Sandstone / Siltstone

The sandstone / siltstone encountered at varied elevations in each of the boreholes. In general, it was found at depths of about 2 to 3.5 meters below the existing site grade and extended to the bottom of each drilled hole. The sandstone / siltstone bedrock was weathered in the upper region. As drilled depth increased, it transformed to very dense to hard in consistency. Augering was experiencing difficulty as drilled depths increased. The bedrock will create difficulties in basement excavation.

Sporadic clayey silt till or gravelly sand were found at differed elevations at borehole #1, #3 and #4 locations. The interbedded clayey silt and silt till detected within the bedrock deposit and at a depth of about 8.5 meters was wet. One should be noted that the interbedded wet interlayer within the sandstone bedrock could be found at different elevations across the site. Adequate subsurface drainage should be provided to prevent any water seeping into the building area.

B) Groundwater

Signs of underground water was detected at a depth of about 8.4 meter below the existing ground elevation at borehole #1 location on March 11, 2022. No groundwater was found within the drilled holes #3, #4 and #6 at the time of site drilling.

Four (4) slotted PVC standpipes were installed in boreholes #1, #3, #4 and #6 locations for monitoring the groundwater level. On March 25, the approximate water table measurement was recorded and summarized in the table below based on the reference elevation. No topographic survey and borehole elevations were provided at time of preparation of this report.

Location	March 16, 2022	April 1, 2022
	Groundwater Level Referenced to Existing Grade (mbg)	Groundwater Level Referenced to Existing Grade (mbg)
Hole 1	7.80m	7.80m
Hole 3	Dry to 6.15m	Dry to 6.15m
Hole 4	Dry to 5.85m	Dry to 5.85m
Hole 6	7.90m	7.70m

mbg = Meters Below Grade

It should be noted that the water conditions were observed in a relative short term and may not represent stabilized groundwater readings. Hence the actual groundwater condition at the time of construction could vary from those recorded during this investigation. 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

At the time of site drilling, the entire slope was covered with some snow. Our limited field observation revealed the south 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 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 of the upper plateau were analyzed.

The following conservatively assumed soil parameters were used:

Soil Type	Unit Weight (kN/m3)	Cohesive Strength (kPa)	Angle of Internal Friction (degree)
Native Clayey Silt Till	18	10	26
Sandstone / Siltstone Bedrock	22	0	50

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 about 12 meters from the slope crest, the stability of the slope is 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 1.776. This means the existing slope conditions under normal groundwater level is deemed stable. This F.S. = 1.776 exceed the minimum required FS of 1.5.

b) The second stage of slope stability analysis was conducted with the proposed slope cut for the walkout basement / pool area. The second stage of the slope stability assessment also confirmed a long-term factor of safety (FS) of 2.989 can be achieved. This F.S. = 2.989 exceeds the minimum required FS = 1.5.

c) The final stage of slope stability analysis was conducted with the proposed slope cut for the walkout basement / pool area with the addition of a simulated high water table. The final stage of the slope stability assessment revealed a long-term factor of safety (FS) of 2.314 can be achieved under simulated high water table. This F.S. = 2.314 exceeds the minimum required FS = 1.5.

Although no specific site survey containing elevations and a slope cross-sectional drawing was provided at the time of site drilling, our personnel went to site to create a general slope / lot profile plan to reflect the approximate current site conditions. The new building was assumed to maintain a minimum setback of about 12 meters from the slope crest at time of preparing this report. Confirmation of the exact building setback distance from the slope crest 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) All footings must be directly supported by the firm to stiff native silty clay till or sandstone bedrock deposits approved by our personnel.

2) Footing founded on the firm to stiff native silty clay till soil or sandstone bedrock deposits 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 Clayey Silt Till	240	120	95
Sandstone Bedrock	600	300	200

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.

3) 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.

4) For protection against frost action, exterior footing in continuously heated structures should be provided with a minimum depth of ground cover of 1.5 meters. 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.

5) Site classification for seismic site response is D for this specific site.

6) 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 (Basement)

1) A reinforced grade-supported slab should be received by a properly prepared subgrade soil and radon rock.

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

   - all organic material and fill soil encountered must be sub-excavated to expose the underlying native clay till deposit.

   - any soft and spongy areas encountered should be removed and replaced with low plastic clay compacted to at least 98 %Standard Proctor Maximum Dry Density.

3) In raising the building site to design grade or higher elevation, low plastic clay material should be used. All acceptable engineered fill material must be compacted to at least 98 percent Standard Proctor Maximum Dry Density.

4) A minimum of 200 mm of radon rock should be placed beneath the entire slab and above the prepared subgrade soil. All gravel must be uniformly compacted to at least 98% Standard Proctor Maximum Dry Density.

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

6) Compaction tests should be performed during backfill operation to verify the percentage of compaction achieved and if any additional compaction is warranted.

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

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

C) Concrete Slab (Swimming Pool)

It is our understanding a metal shipping container pool will be installed beneath the basement. At the time of preparing this report, no information is available for the foundation of the swimming pool from the manufacturer. The insulated pool could be installed within a concrete structure with a reinforced concrete slab. We advised the following comments regarding the reinforced concrete slab for the swimming pool should be taken into consideration

1) Remove all organic material in the proposed swimming pool area to expose the stiff native clayey silt till or sandstone deposit. The exposed native soil should be examined and verified by our personnel.

2) Upon approval of the exposed native subgrade soil by our personnel, a minimum of 200mm thick compacted radon rock mat can be used to support the reinforced pool slab.

   The guidelines from the swimming pool manufacturer should be followed and the Alberta Building Codes should also be adhered to. As well, any moisture migration from the soil and surrounding areas should be prohibited from entering the swimming pool enclosed concrete structure.

3) The reinforced slab should be designed based on the following factored ultimate limited state end bearing pressure (ULS).

Soil Type	ULS (kPa)		SLS (kPa)
	Ultimate Resistance	Factored Resistance	
Native Clayey Silt Till	240	120	95
Sandstone Bedrock	600	300	200

   The factored ULS was calculated by reducing the ultimate resistance values above by a geotechnical resistance factor.

4) Site classification for seismic site response for this subject site is D.

5) The on-site clayey silt till has very medium swelling potential. When the clayey soil is exposed to moisture, foundation movement could occur. Proper measures must be provided to prevent water contact with soil beneath the foundation soil and backfill soil against or around the foundation or retaining walls.

6) All underground piping must be constructed to the highest standards to prevent leaking and damage. Leaking water could cause foundation heaving and cracking. Perimeter drainage tile should be properly installed to intercept any surface water running along the building perimeters into the building.

7) All underground piping must be constructed to the highest standards to prevent leaking and damage. Leaking water could cause foundation heaving and cracking. Perimeter drainage tile should be properly installed to intercept any surface water running along the building perimeters into the building.

8) The finished site grade should also be covered with a protective apron (asphalt, concrete, brick or flat stone) to minimize moisture changes in the backfilling soil. Any added soil moisture could cause movement and additional soil pressures on walls. Drying of soil due to evaporation accelerated by hot weather and wind will also prompt potential foundation movement especially when prolonged soil desiccation transpires. This is of critical importance in underground heating pipe or heating duct areas. Proper measures must be provided to prevent drying of foundation soil.

9) The swimming pool base should maintain at least 300mm above the static groundwater level, and about1 meter above Sylvan Lake's highest water level and also above the 1 in 100 year flood plain.

10) An adequate subsurface drainage system must be installed to prevent water seeping into the basement slab and swimming pool slab area.

D) Retaining Wall

Due to a small existing hill towards the south of the new proposed residence area, a retaining structure is likely needed for the south portion of the residence to resist any lateral pressure from the south hill. As well, the building structure has to be designed to resist any soil lateral pressure.

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 compactive 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 backfill material should be moderately compacted to 95% Standard Proctor Maximum Dry Density. Compaction tests should be conducted to confirm the percentage of compaction achieved.

2) Applicable surcharge loading should be applied if applicable.

3) 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.

E) Ground Water- Drainage

a) Around House Perimeters

A permanent subdrainage system (weeping tile drain) is recommended for the residential structure. 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 300 millimeter lifts. This is especially important in the frost wall in the walkout basement 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 be properly compacted in 300 millimeter 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 backfill soil of about 300-millimeter lifts 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 crackings. 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.

F) 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) Some erosion was noted near the toe of the slope, proper measures must be provided to prevent any erosion and destabilization of the slope.

4) 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.

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

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

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

8) 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.

E) Foundation Concrete

The four (4) sulphate test results from soil samples retrieved at borehole the locations indicated a water-soluble concentration between 0.051% to 0.062%. 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. However, in view of the subsoil conditions, groundwater conditions, and potential imported material for site backfilling, it is advisable that sulphate resistance cement (Type HS) should be used for all concrete in contact with the subsurface soil.

Concrete elements exposed to de-icing salts or other substances containing chlorides should be designed in accordance with an exposed concrete classification pertaining to concrete exposed to chloride attack. As well, subsurface concrete could be subject in seasonal saturated conditions. Air-entrainment should be provided in all concrete exposed to freeze-thaw cycles to enhance its durability. In accordance with clause 4.1.1.1 of CSA A23.1-19, where more than one exposure condition applies to concrete elements, the concrete shall be designed to meet the highest specified 28-day compressive strength, the lowest water to cementing materials ratio, the highest range in air content, and the most stringent cement type requirement.

It should be recognized that there may be structural and other considerations which may necessitate additional requirements for concrete mix design.

F) 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 that is experienced in foundation and earthwork construction.

An adequate level of inspection is considered to be:

• For footing foundation:	- confirm soil bearing capacity by our personnel as recommended in the geotechnical report.
• For slabs and flatworks:	- confirm all subgrade soil is acceptable prior to construction of the slab and exterior flatworks.
• For earthworks:	- full-time monitoring and soil compaction testing.
• For concrete construction:	- testing of plastic / hardened concrete, mortar or grout.

Closure

The report reflects the base judgement of Smith Dow & Associates Ltd. considering the information available at the time of preparation which was based on the amount and locations of the test holes drilled and subsequent soil samples that were retrieved. Although caution was taken in gathering the information therein, the results obtained are only advisory for the use of our client. Should conditions encountered during construction appear to be different from those shown by the test holes, this office should be notified immediately in order that we may reassess our recommendations based on the new findings.

Foundation inspections and verification of soil compaction must be performed as recommended in this report. A contingency amount should be included in the construction budget to allow for the possibility of variation 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 Todd of Bowood Homes and their agents for specified application to the proposed development at #234 Jarvis Bay Drive, Summer Village of Jarvis Bay, Alberta. It has been prepared in accordance with generally accepted soil and foundation engineering practices. This report is for advisory purposes only. No other warranty, expressed or implied, is made.

Any use which a third party makes of this report, or any reliance on or decisions to be made on it, are the responsibility of such third parties. Smith Dow & Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made of actions taken based on this report.

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

Philip Kwong

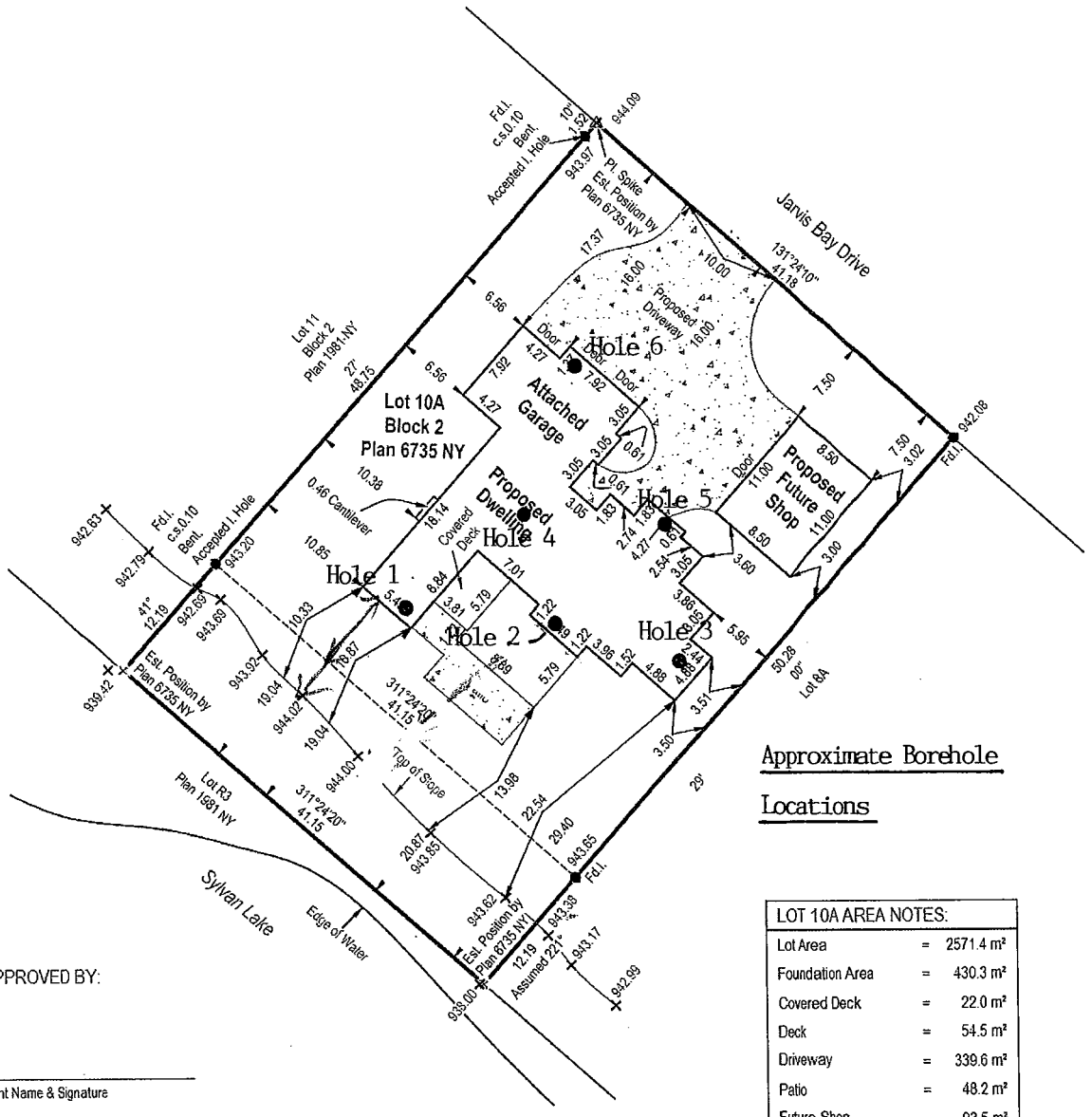
Philip Kwong (P. Eng.)

APPENDIX-A

PLOT PLAN SHOWING PROPOSED LOCATION OF BUILDING(S)

Civic Address: 234 Jarvis Bay Drive
Summer Village of Jarvis Bay, Alberta

Legal Description: Lot 10A, Block 2, Plan 6735 NY



Approximate Borehole Locations

LOT 10A AREA NOTES:		
Lot Area	=	2571.4 m²
Foundation Area	=	430.3 m²
Covered Deck	=	22.0 m²
Deck	=	54.5 m²
Driveway	=	339.6 m²
Patio	=	48.2 m²
Future Shop	=	93.5 m²
Lot Coverage	=	38.4 %

APPROVED BY:

Print Name & Signature

NOTES:
-Distances are in metres and decimals thereof. Measurements are shown to the outside face of the proposed building foundation wall at ground level.
-The above ground and buried facilities have not been located and are not shown on this plan. It is the responsibility of the owner(s) and contractor to have the facilities located prior to construction.
-Lot boundaries have been calculated from located survey evidence.
-Elevations have been derived from Precise Point Positioning.
-Existing Grades shown thus 810.00

0 5 10 20 30 metres
Scale 1:500

LAND USE DISTRICT
R -Residential District

REVISION SUMMARY
Add Elevations (02/07/22) PCJW
Original Issue (01/20/22) PCJW

CLIENT
Bowood Homes

REV. 2 PAGE 1 of 1

COMPASS Geomatics Ltd.
11-4808 62nd Street
Red Deer, Alberta T4N 6T3
Office (403) 356-0111 Fax (403) 356-0114
www.compassgeomatics.ca

ALBERTA LAND SURVEYORS' ASSOCIATION
PERMIT NUMBER
P266
Compass Geomatics Ltd.

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

Project: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

DWN HB	CKD AK	DATE March 11, 2022	FILE #	HOLE 1

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

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

DATUM
GROUND ELEV-

CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Clayey Silt	rust brown, slightly silty with sand				1	
Till	frost				2	
	frozen, olive/tan, coal & rust specks				3	
	slightly silty, white mineral specks				4	1
	stones, low plastic, stiff				5	
Sandy Silt	tan/golden brown, very dense		N=30	X	6	
Till	non-plastic				7	2
	bedrock fragments				8	
	damp, laminations				9	
					10	3
Sandstone	rust stains, very dense		N=50	X	11	
Siltstone	bedrock fragments				12	
	laminations				13	4
	organic traces				14	
	rust deposit, hard				15	
	carbonous deposit		N=70	X	16	5
	difficult auguring				17	
	siltstone layer				18	
					19	
					20	6
	weathered layer		N=19	X	21	
	tan/brown in color				22	7
	siltstone fragments				23	
	non-plastic				24	
	sandy layer				25	
Clayey Silt	compact		N=10	X	26	8
Till	wet / water				27	
	sample primarily washed off auger				28	
	wet				29	
	sand layers				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: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

DWN	HB	CKD	AK	DATE	March 11, 2022	FILE #		HOLE	1b

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

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

DATUM
GROUND ELEV-

CLASSIFICATION	SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Clayey Silt medium dense				31	
Sandstone damp, weathered		N=18	X	32	
				33	
End of Hole				34	11
(Standpipe In)				35	
				36	
				37	12
				38	
				39	
				40	13
				41	
				42	
				43	14
				44	
				45	
				46	15
				47	
				48	
				49	16
				50	
				51	
				52	17
				53	
				54	
				55	
				56	18
				57	
				58	
				59	
				60	19

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

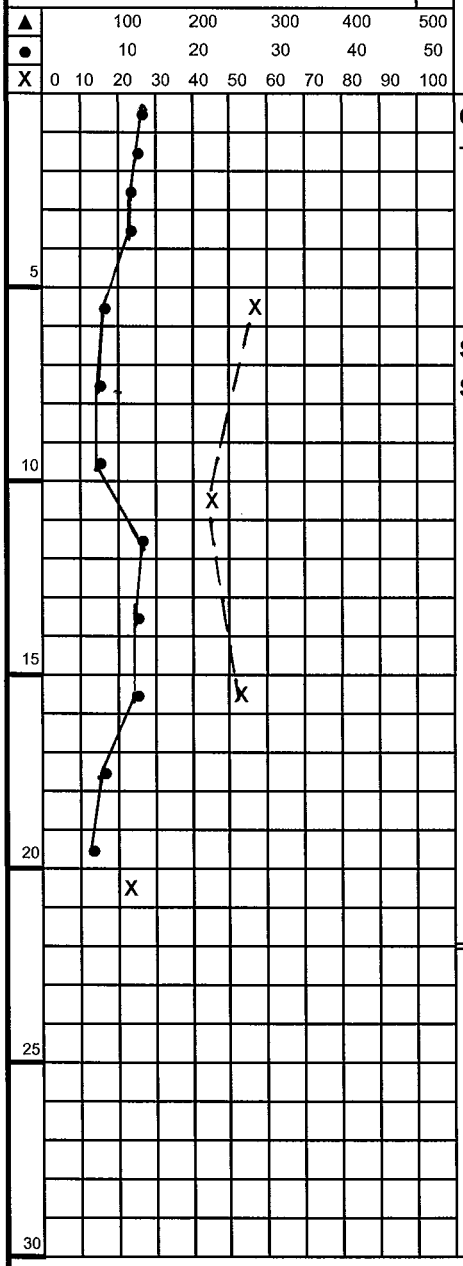
SMITH DOW & ASSOCIATES LTD.
-------Engineering Consultants-------

Project: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

DWN HB	CKD AK	DATE March 11, 2022	FILE #	HOLE 2

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

DATUM
GROUND ELEV-



CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Clayey Silt	golden brown, sandy silt				1	
Till	roots/rootlets, brown				2	
	frozen, coal specks				3	
	low plastic, stiff, olive/tan				4	1
	white mineral specks, coal fragments				5	
	siltstone/ boulder layer		**N=59**	X	6	
Sandstone	very dense to hard				7	2
Siltstone	olive/tan, non-plastic				8	
	light grey, hard to very hard				9	
	difficult augering				10	3
	very dense, golden brown, rusting		**N=46**	X	11	
	olive				12	
	white mineral specks				13	4
	golden brown				14	
	very dense, non-plastic				15	
	coal traces		**N=53**	X	16	5
	rusting				17	
	very dense				18	
					19	6
	light grey, hard				20	
	brown, fine grained, sandy		**N=21**	X	21	
	very dense, sandy				22	7
	End of Hole				23	
					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 # 4

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

Project: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

DWN	HB	CKD	AK	DATE	March 11, 2022	FILE #		HOLE	3

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

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

DATUM
GROUND ELEV-

CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth (feet)	Depth (meters)
Clayey Silt Till	roots, occasional peat/topsoil lumps				1	
	frozen, white mineral traces				2	
	frost, coal specks silt lenses				3	
	clayey, stiff				4	1
	low plastic				5	
	stones of varying sizes		N=15	X	6	
	rust specks, low to medium plastic				7	2
	bedrock and coal fragments				8	
	stiff				9	
	low plastic, rust stains				10	3
Sandstone	golden brown		N=14	X	11	
	weathered, medium dense				12	
	grey traces				13	4
	medium grained gravely sand,				14	
	light grey/tan, thumbnail indent difficult				15	
	laminated, hard		N=46	X	16	5
	golden brown				17	
	dense				18	
	grey siltstone interlayers, hard				19	6
	very dense, thumbnail indent difficult				20	
	hard		N=75	X	21	
	thumbnail indent difficult				22	7
End of Hole					23	
(Standpipe In)					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 # 5

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

Project: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

DWN HB	CKD AK	DATE March 11, 2022	FILE #	HOLE 4

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

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

▲ DATUM
● GROUND ELEV-
X

CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Clayey Silt	low plastic, frozen, roots/rootlets				1	
Till	golden brown to olive				2	
	frozen, coal specks				3	
	rust specks, sand/silt lenses				4	1
					5	
Sandstone	tan, laminated, dense, difficult drilling		N=34	X	6	
Clayey Silt	dark brown				7	2
Till	coal/bedrock specks, silt/sand specks				8	
Sandstone	rusting				9	
Siltstone	grey mottles				10	3
	dense, laminated		N=50	X	11	
	golden brown				12	
	rusting				13	4
	very dense to hard				14	
					15	
	laminated		N=58	X	16	5
					17	
	hard, grey				18	
	difficult augering				19	6
	hard, grey				20	
	sand interbedded, medium grained		N=46	X	21	
	coal traces, laminated				22	7
	End of Hole				23	
	(Standpipe In)				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 # 6

Smith Dow

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

Project: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

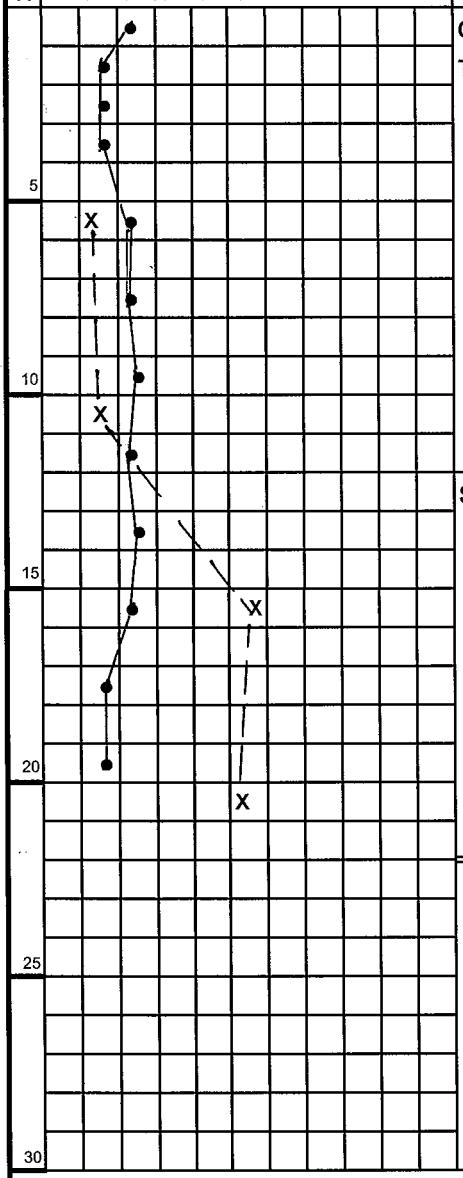
DWN	HB	CKD	AK	DATE	March 11, 2022	FILE #		HOLE	5

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

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

DATUM
GROUND ELEV-

CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth feet	Depth meters
Clayey Silt Till	silty with roots, frost				1	
	white mineral traces				2	
	frozen, pebbles, coal traces				3	
	clayey, low plastic stiff				4	1
	olive/brown				5	
	firm to stiff		N=10	X	6	
	silty, low plastic				7	2
	olive/tan				8	
	pebbles to stones				9	
	coal traces, white mineral deposits				10	3
	stiff, clay, low plastic		N=17	X	11	
Sandstone	weathered, golden brown				12	
	sand interbedded, coal traces				13	4
	dense				14	
	hard, difficult drilling		N=59	X	15	
	white mineral traces				16	5
					17	
	rusting				18	
	laminated				19	6
	very hard, yellow/brown		N=50	X	20	
					21	
	End of Hole				22	7
					23	
					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 # 7

SmithDow

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

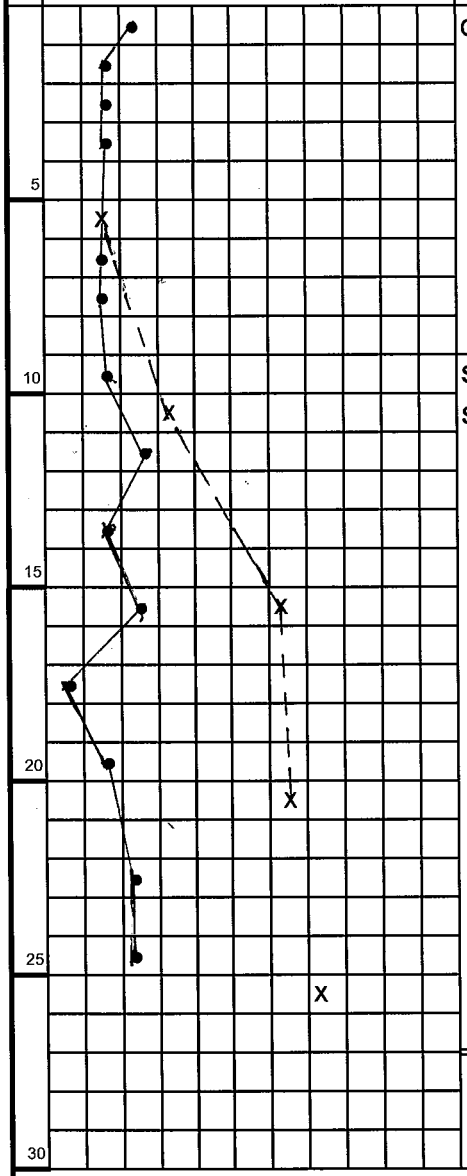
Project: 234 Jarvis Bay Drive
SV of Jarvis Bay, Alberta

DWN	CKD	DATE	FILE #	HOLE 6

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

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

DATUM
GROUND ELEV-



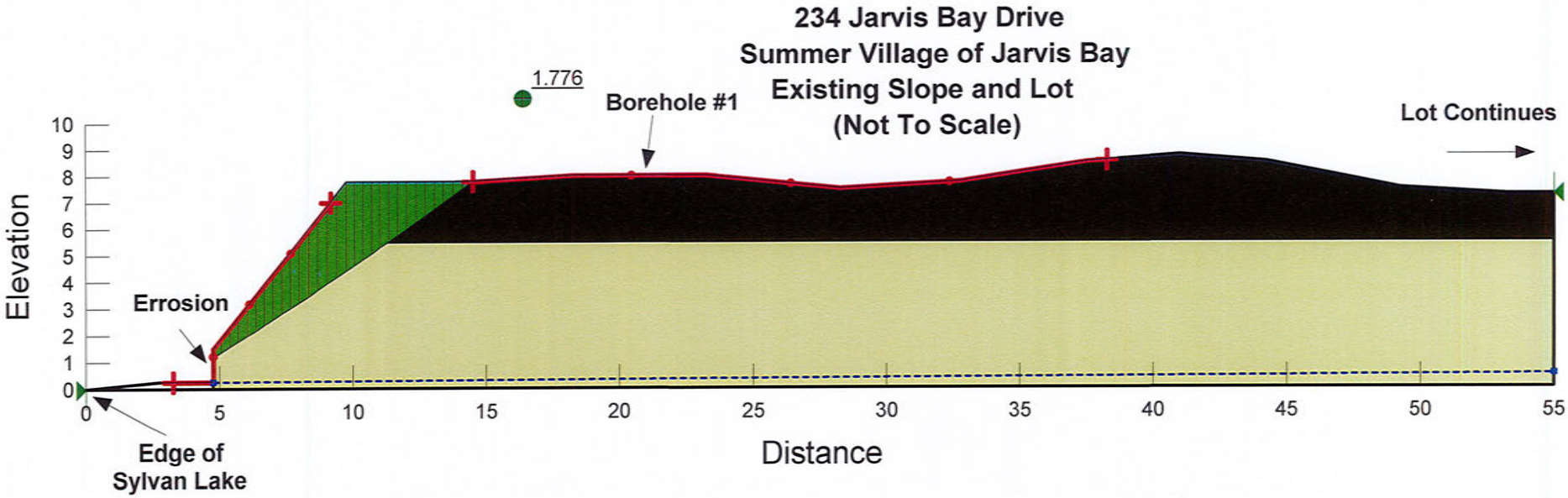
CLASSIFICATION		SYMBOL	TEST DATA	SAMPLE	Depth (feet)	Depth (meters)
Clayey Silt	dark brown, silty clay				1	
	frozen				2	
	frost, silty, light olive/cream				3	
	firm to medium dense				4	1
	low plastic, clayey, olive brown				5	
	stone to pebbles, low plastic		N=16	X	6	
	white mineral deposits				7	2
	coal traces, stiff, clayey				8	
	weathered, tan				9	
Sandstone	golden brown				10	3
Siltstone	white mineral traces		N=30	X	11	
	non-plastic, medium dense				12	
	sand interbedded, medium grained				13	4
	golden brown				14	
	rusting, thumbnail indent difficult				15	
	hard		N=61	X	16	5
	difficult drilling				17	
	light grey				18	
	olive/grey				19	6
	laminated				20	
	light grey to golden brown		N=65	X	21	
	very dense				22	7
	rusting				23	
					24	
					25	
			N=71	X	26	8
					27	
					28	
					29	
	End of Hole				30	9
	(Standpipe In)					

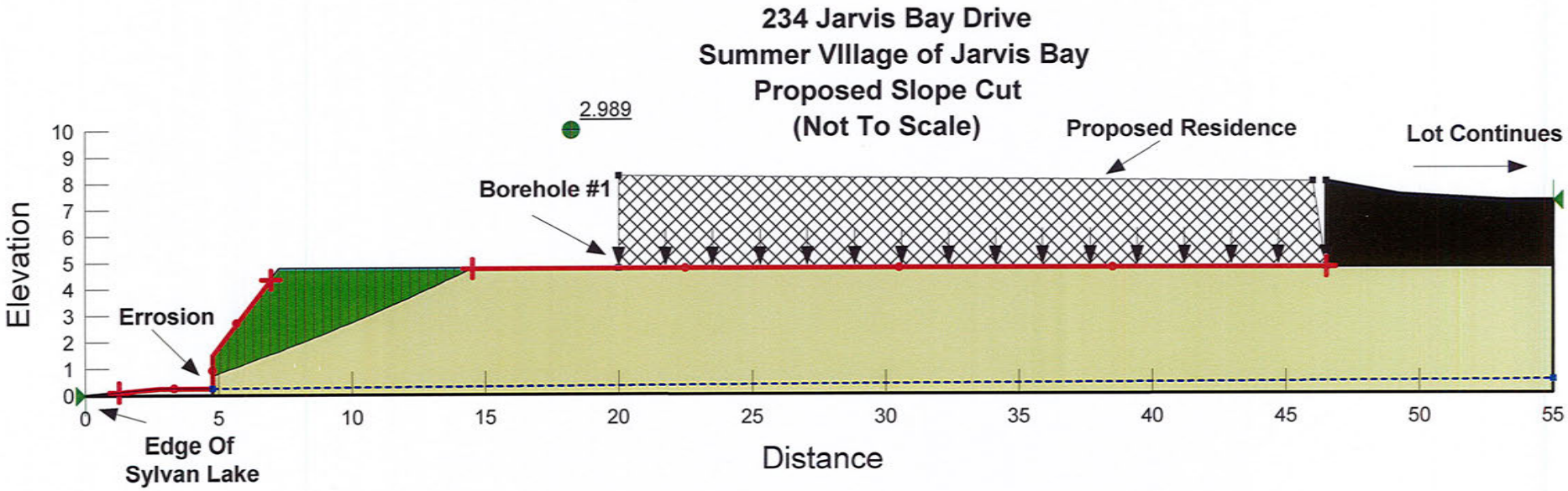
FILL	CLAY	TILL	Q - Unconfirmed Strength, kN/m2
TOPSOIL	PEAT	COAL	d - Dry Unit Weight, kN/m3
SAND	GRAVEL	WATER	S - Sulphate Concentration, %
SILT	SILTSTONE	LIMITS	N - Penetration Resistance, blows

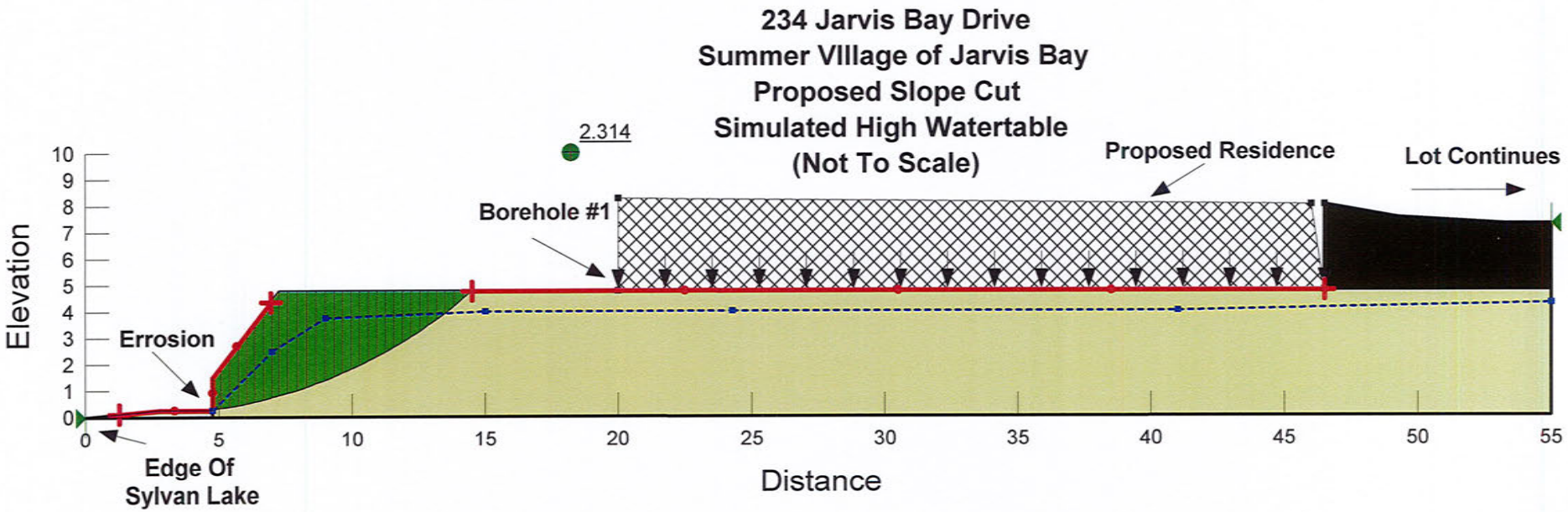
Tube	/
Penetrometer	X
No Recovery	■

TEST HOLE LOG AND LAB DATA

DWG # 8


234 Jarvis Bay Drive
Summer Village of Jarvis Bay
Existing Slope and Lot
(Not To Scale)
1.776
Borehole #1
Lot Continues
Errosion
Edge of
Sylvan Lake
Elevation
Distance
0
1
2
3
4
5
6
7
8
9
10
0
5
10
15
20
25
30
35
40
45
50
55


234 Jarvis Bay Drive
Summer VIllage of Jarvis Bay
Proposed Slope Cut
(Not To Scale)
2.989
Proposed Residence
Lot Continues
Borehole #1
Errosion
Elevation
Distance
Edge Of
Sylvan Lake
0
1
2
3
4
5
6
7
8
9
10
0
5
10
15
20
25
30
35
40
45
50
55


234 Jarvis Bay Drive
Summer VIllage of Jarvis Bay
Proposed Slope Cut
Simulated High Watertable
(Not To Scale)
2.314
Borehole #1
Proposed Residence
Lot Continues
Errosion
Edge Of
Sylvan Lake
Elevation
Distance
0
1
2
3
4
5
6
7
8
9
10
0
5
10
15
20
25
30
35
40
45
50
55