

**MUNICIPAL PLANNING COMMISSION AGENDA
SUMMER VILLAGE OF NORGLNWOLD
SUMMER VILLAGES ADMINISTRATION OFFICE
JULY 24, 2023 @ 9:00 A.M.**

A. CALL TO ORDER

B. ADOPTION OF AGENDA

C. DEVELOPMENT ITEMS

1. 111 Grand Avenue

D. ADJOURNMENT

Summer Village of Norglenwold – Municipal Planning Commission

July 24, 2023

Agenda Item

111 Grand Avenue (Lot 4-6, Block B, Plan 5108EO)

Development Permit Application

Background:

An application was submitted on behalf of the registered homeowner of 111 Grand Avenue (Lot 4-6, Block B, Plan 5108EO), in the village of Norglenwold for lakeside retaining walls and stairs on the escarpment. This property is located in the R1 District (Shoreline Residential District). There is currently a new dwelling development permit for this property, and it is in the process of being constructed.

Along with this report, the applicant has included a site plan showing the proposed placement of the retaining walls, the new stairs, new vegetation and an area to remain natural. There is currently rip rap along the shore of the property and two retaining walls on the escarpment which are made with creosote railway ties and are to be replaced with 5ft. and 3ft. Redi Rock concrete block walls. A cross section was included in the application which provides the measurements of the two 5ft. walls, and one 3ft. wall 15ft. apart. The site plan and cross section include a minimum 3ft. no mow zone in between the rip rap and bottom retaining wall as well as grass and plantings in between. Cross section B includes the measurements of one 5ft. retaining wall with existing natural area above and a 3.28ft. no mow zone below. The drawings include a new set of stairs which are also currently constructed out of old railway ties, these new stairs are proposed to span from the top to the bottom of the retaining walls with a precast stair as shown in a photo provided. In order to complete the work, 6 trees and a few bushes will be removed with the intent to leave as much escarpment undisturbed as possible. 12 new plantings are to replace those removed. The vegetation proposed will be in addition to the already approved landscaping plan for the dwelling.

A geotechnical report was provided with the application and reflects that the current slope conditions are stable with the new residence and the three new retaining walls are deemed stable with a Factor Safety of 3.028 (for normal groundwater level) exceeding the minimum required of 1.5, and 2.911 (for high ground water levels) also exceeding the minimum.

Discussion:

This application is before MPC for the following reason:

- Land Use Bylaw, Section 8 (8.11) The following standard of landscaping shall be required for all areas of a parcel not covered by buildings, non-permeable driveways, storage and display areas:

....

b. The retention in their natural state of:

....

v. Land located below the top of bank of the lake, or any water body or water course. Therefore, a variance is required and the decision must come from the Municipal Planning Commission.

Application Review:

After reviewing the application and all relevant planning documents and while administration understands the slope is not failing, administration supports the retaining walls being replaced in order to improve the lake water quality and reduce harmful existing materials going into the lake.

The Municipal Development Plan 6.3.6 states that: *“Development shall not be allowed adjacent to or near the shores of the Lake, unless the proponent can demonstrate to the satisfaction of the Summer Village the development will not: reduce lake water quality; degrade fish or wildlife habitat; adversely impact the area’s visual or natural quality through inappropriate or excessive removal of vegetation and lead to soil erosion or instability or damage to the bank or shore.”* The Sylvan Lake Management Plan 2(a) also states that no development will be considered for approval *unless “the integrity of the natural environment and ecosystems is protected, sustained and if possible, enhanced.”* The Municipal Government Act states under 6.2.1 (1) *“The conservation of the environment goal is to protect the water quality, aquatic life, habitat and ecosystems of Sylvan Lake.”*

The proposed retaining walls will be replaced to remove the existing creosote ties that are causing a health and safety concern to the lake. Alberta Environment and Parks agrees that removing railway ties will be beneficial to the lake.

While the proposed retaining wall closest to the new dwelling is not an existing wall to be replaced, the wall will remain under 1m in height, will not be located on the escarpment and is permitted. The proposed vegetation being planted in this area along with the height of the wall will help keep the natural look of the property.

Conditions:

If approved, Administration would recommend the following conditions:

- All recommendations in the geotechnical report to be followed and construction inspections to be completed by the engineer.
- Engineered drawings to be provided for the construction of the walls and complete.

- Planting of shrubs and trees to be done according to the landscaping plan. The no mow zone shall be a buffer strip of vegetation that includes native plantings that let aquatic vegetation grow to maintain a stable natural state, a no mow zone allows native plants to seed and reestablish.
- A security in the form of an irrevocable letter of credit required up to the value of 125% of the estimated cost of the proposed landscaping to ensure that the landscaping is carried out with reasonable diligence, to the satisfaction of the development authority.

Authorities:

The Municipal Planning Commission may approve an application for Development Permit even though the proposed development does not comply with the regulations of this bylaw or if the development is to be a rebuilding, an enlargement, an addition, or a structural alteration of a non-conforming building if, in the opinion of the Municipal Planning Commission;

- a. The proposed development would not:
 - i. Unduly interfere with the amenities of the neighbourhood; or
 - ii. Materially interfere with or affect the use, enjoyment or value of neighbouring parcels of land; and
- b. The proposed development conforms to the use prescribed for that land or building in this bylaw.

In approving an application for development pursuant to Sections 4.7.2.a and 4.7.2.b, the Municipal Planning Commission shall adhere to the following:

- a. 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. Except as otherwise provided in this bylaw, there shall be no variance from the following:
 - i. Site coverage; and
 - ii. Building height.
- b. Where a variance is granted, the nature of the approved variance shall be specifically described in the Development Permit approval.
- c. Where the issuance of a Development Permit involves the exercise of any specified discretion of the Municipal Planning Commission to relax a regulation of a district or any other regulation of this bylaw, the Municipal Planning Commission shall not permit any additional variance from that regulation.

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*).

111 Grand Ave. Letter of Intent

The owners of 111 Grand Ave wish to replace the existing railway tie retaining walls with precast concrete blocks. The main purpose of this is to remove the environmental hazard from the lakeshore that is posed by the chemicals used in the preservation of these timbers. It is recommended by Alberta Environment to replace any structures that are built from such materials. A secondary intent is to improve the stability of the escarpment, helping to reduce current erosion and the introduction of sediment into the lake.

Photos and sketches of the property in its current state and proposed conditions are included in the application package to clearly indicate the locations of the proposed walls and their elevations. Vegetation is proposed in the areas between the walls to help maintain a natural state on the escarpment area and a 1m minimum no mow zone will be maintained between the structures and the lake.

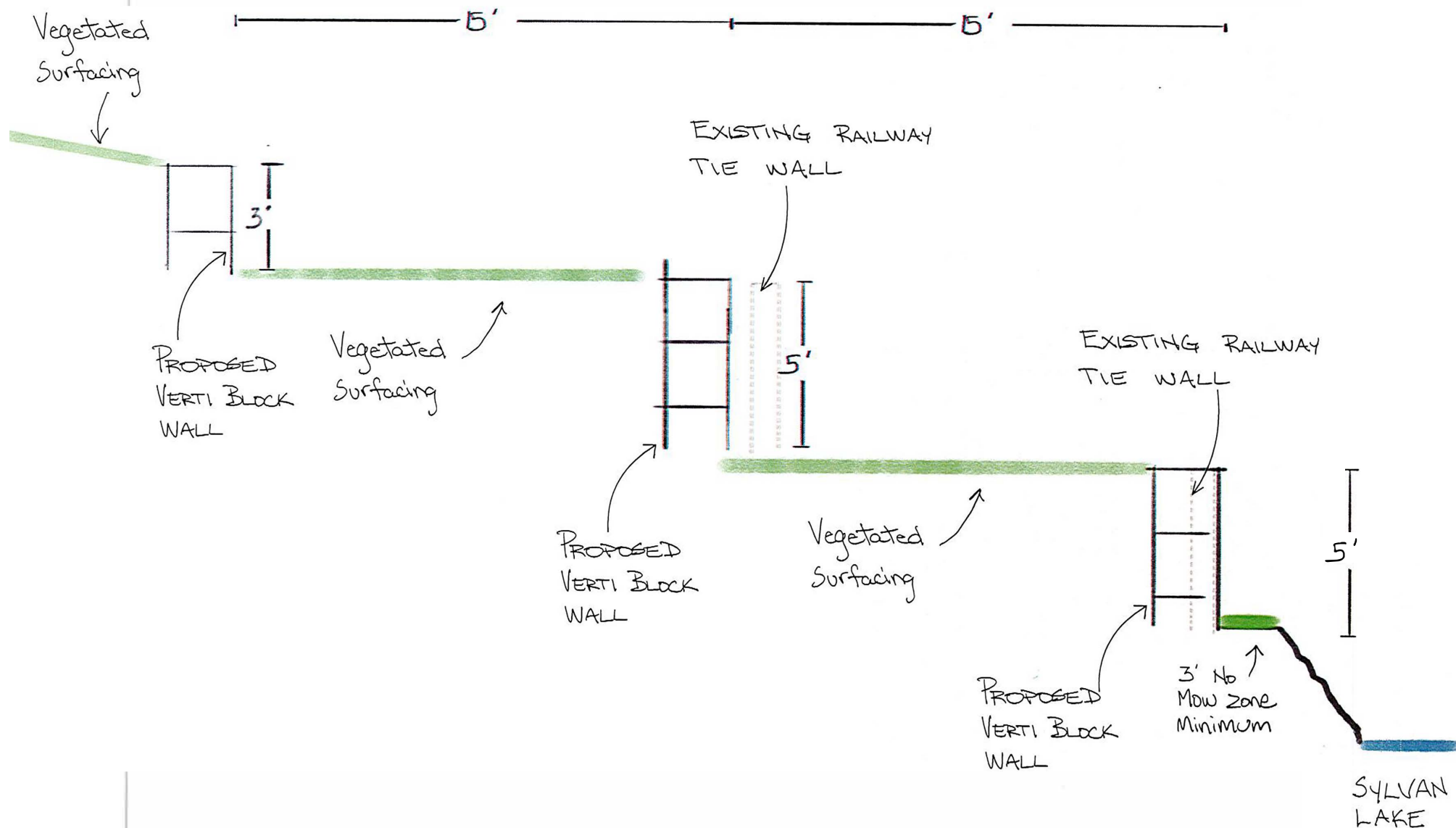
Verti Block concrete blocks are proposed to be used to construct the walls. This product has been approved for many other walls in the neighborhood and will be keeping a consistent appearance with these other properties. These proposed walls have been reviewed by Phil Kwong of Smith Dow and Associates, and a report has been prepared supporting the concept. If approved, Smith Dow and Associates will provide engineered drawings for the construction of the walls and complete construction inspections.

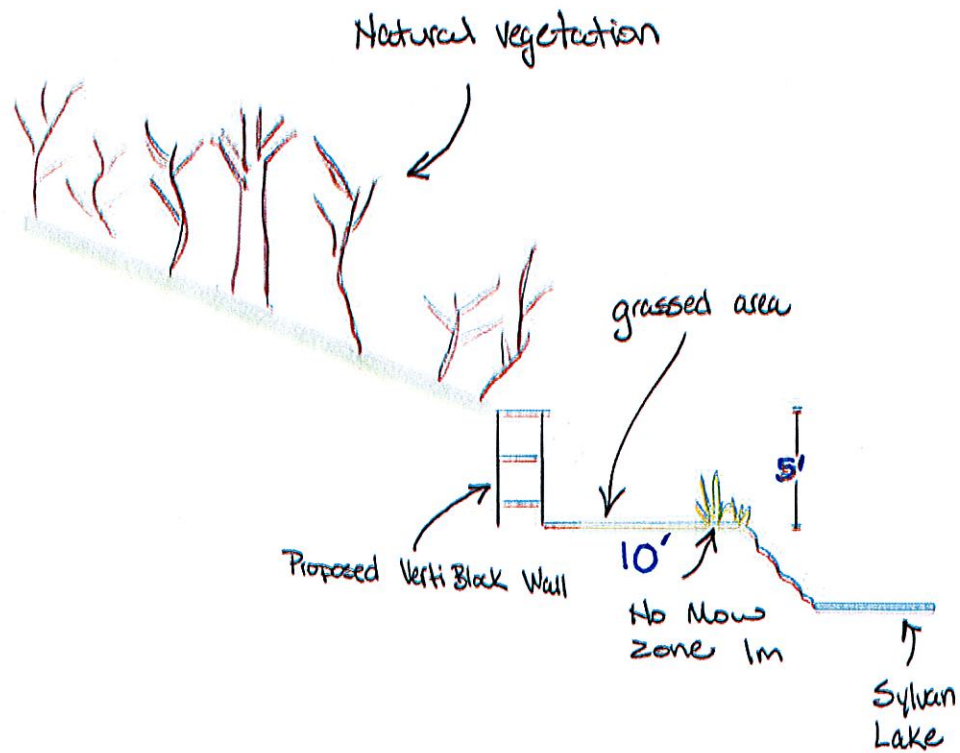
In addition to replacing the existing walls, an additional wall is desired to accommodate the grade of the yard and transition elevation differences to the neighboring lot. This upper wall will not be on the escarpment and will be constructed using the same material as the lower walls.

Throughout construction care will be taken to leave as much of the escarpment as possible undisturbed, however, it is expected that 6 mature trees will be lost along with some other bushes in the work area. A minimum of 12 plantings will be planted to compensate for the loss. All vegetation proposed will be in addition to the already approved landscaping plan.

[illegible]

111 GRAND AVE NORGLENWOLD
CROSS SECTION A - RETAINING WALLS

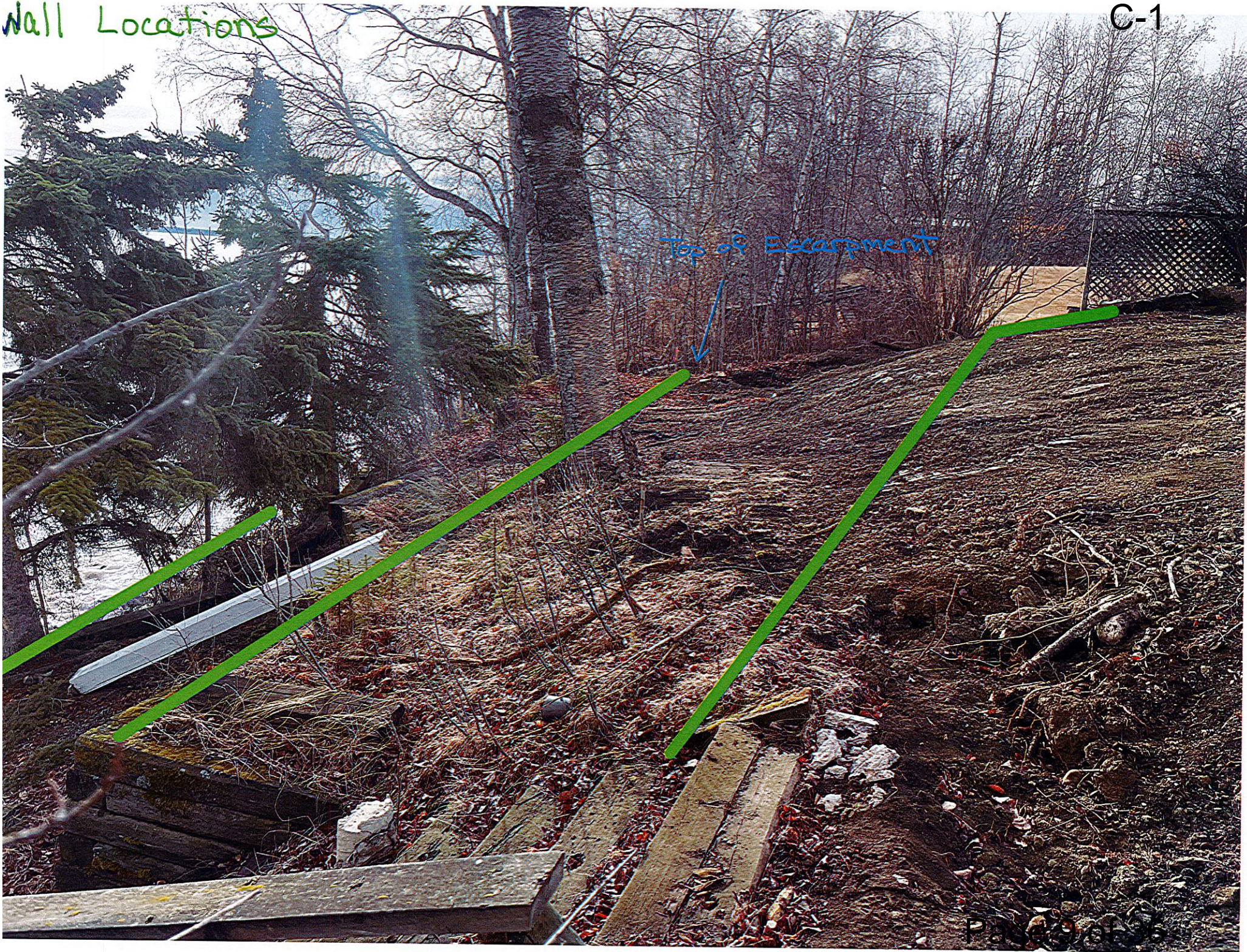






Wall Locations

C-1



Remove Existing
Railway Tie Walls

No MOW
Zone



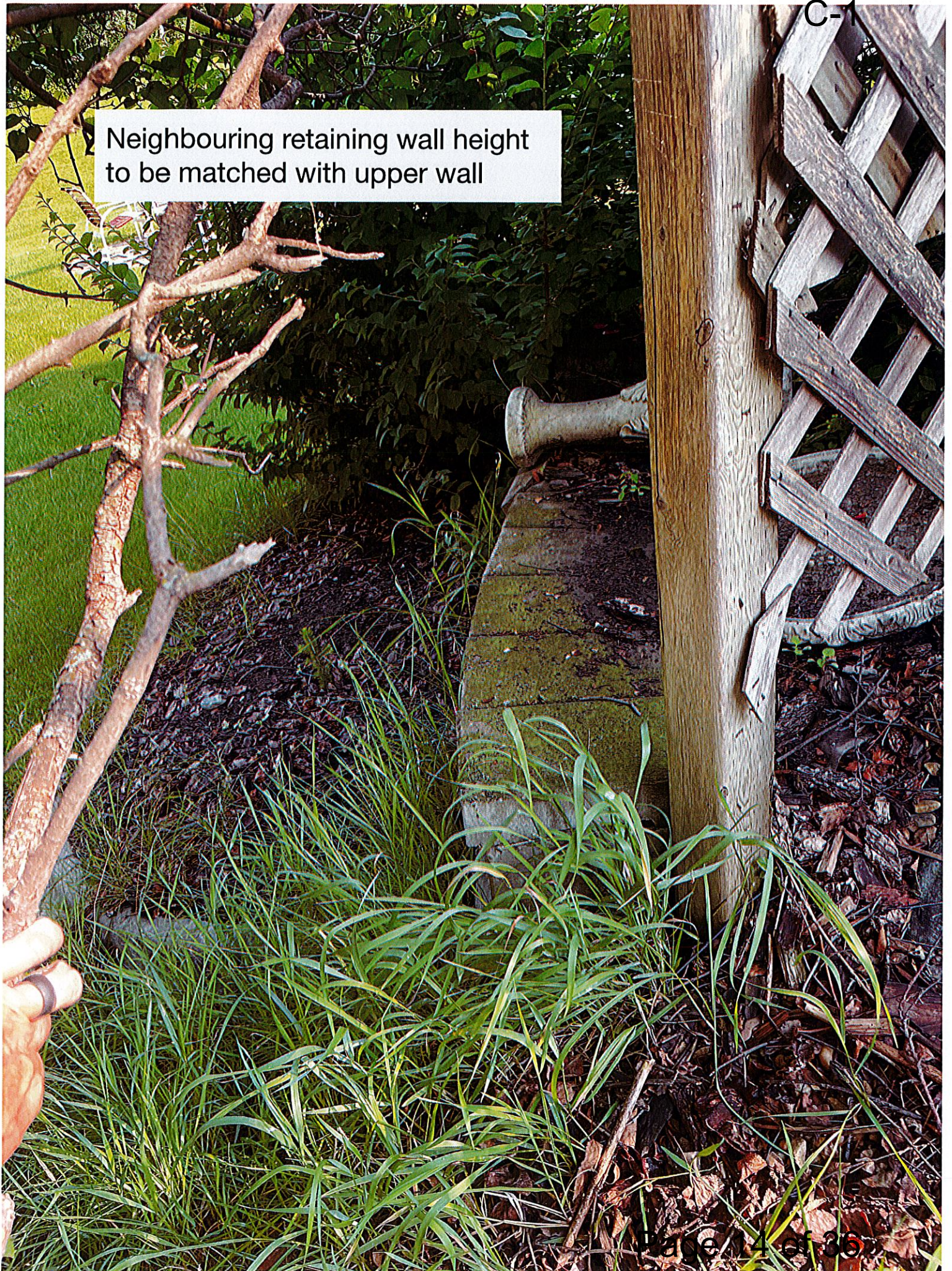


Remove and Replace
Existing Stairs

Neighboring retaining wall location



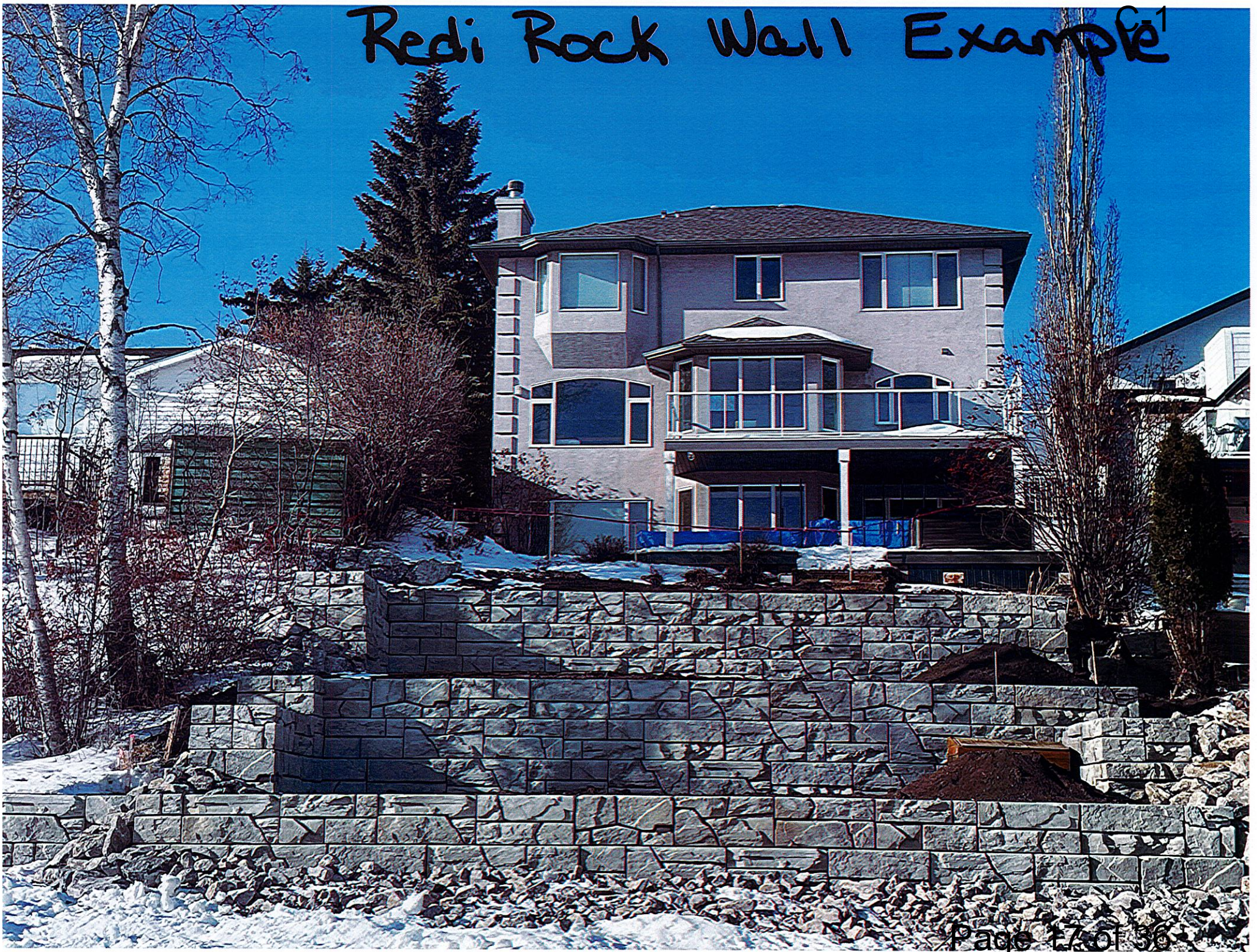
Neighbouring retaining wall height
to be matched with upper wall



upper retaining wall to be installed to reduce slope for maintenance and to mitigate erosion

Precast stairs to be used

Redi Rock Wall Example¹







Chemically Treated Wood Waste

ACCEPTABLE INDUSTRY PRACTICES

February 2012

Chemically treated wood including telephone/power poles or railway ties are not classified as hazardous waste and can be disposed of in Class I or Class II landfills provided that prior landfill operator permission is obtained.

Chemically treated wood waste is not an inert waste and should never be burned in open fires or disposed of in Class III landfills.

Overview

This document describes Alberta Environment and Sustainable Resource Developments recommended management when dealing with chemically treated wood waste resulting from wood previously treated with creosote, pentachlorophenol (PCP), chromated copper arsenate (CCA), copper naphthenate (CN), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or other chemical preservatives. The first three are oilborne wood preservatives and the other three are waterborne formulations.

Legal Framework and Waste Classification

The *Alberta User Guide for Waste Managers* states that wood treated with wood preservatives or wood protection products registered under the Canadian *Pest Control Products Act* is not a hazardous waste. Creosote, PCP, CCA, CN, ACA, and ACZA are products registered under this Act. Therefore, chemically treated wood including telephone/power poles or railway ties are not classified as hazardous waste and can be disposed of in Class I or Class II landfills provided that prior landfill operator permission is obtained.

Management of Treated Wood Waste

The potential health and environmental impacts associated with the improper management of chemically treated wood waste demands the adoption of recycling, treatment and disposal practices that include:

- Recycling or additional use under controlled conditions,
- High temperature incineration with stabilization of the resulting ash residue when necessary, or
- Landfill disposal at Class I or II landfills.

Chemically treated wood waste is not an inert waste and should never be burned in open fires or disposed of in Class III landfills.

Additional information on the management practices for treated wood is available from the Canadian Council of Ministers of the Environment's (CCME) publication entitled *Provisional Code of Practice for the Management of Post-Use Treated Wood*. Copies are available by contacting the CCME at 1-800-805-3025 or on-line at www.ccme.ca/publications.

Post-Use of Chemically Treated Wood

Creosote is a complex mixture of about 200 organic chemicals that is used primarily by the industry to preserve wood products such as railway ties and power poles. Under warm weather conditions, creosote tends to create odors and exude from the treated wood. Therefore, the use of creosote-treated wood should never occur indoors and should be avoided in outdoor areas frequented by people, specifically children, or animals.

Concerns raised by the use of PCP treated wood stemmed from the potential for the formation of small amounts of dioxins and dibenzofurans when burned in uncontrolled conditions. The immediate environmental and health impacts of PCP are less evident than those associated with creosote treated wood but are generally more serious. PCP is not very soluble in water and leaches from treated wood at very low rates. Consequently, its reuse, mainly in landscaping, is generally acceptable provided that the exposure to potential receptors is minimized. Additional problems arise with the uncontrolled burning of CCA treated wood because the ash residue contains relatively high levels of copper, chromium, and arsenic.

Summary:

- Post-used treated wood is not a hazardous waste in Alberta;
- Treated wood should be recycled or re-used, disposal is the last option;
- Treated wood waste can be disposed of at Class I or Class II landfills; and
- Burning of chemically treated wood is only acceptable in high temperature incinerators. The resulting ash may require stabilization depending on the wood preservatives.



SmithDow

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

**Proposed Retaining Structures
111 Grand Avenue
Summer Village of
Norglenwold, Alberta**

File No: 111 Grand Avenue

June 9, 2023


SmithDow

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

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**SmithDow**

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

June 9, 2023

GWS Contracting
Sylvan Lake, Alberta

File No: 111 Grand Avenue

Attn: Geoff Stan

**Re: Proposed Retaining Structures
And Slope Stability Study
111 Grand Avenue
Summer Village of Norglenwold, Alberta**

At your request, we attended a site meeting at the above referenced location on May 18, 2023. Present at this meeting was yourself, Brian with Lakeview Contracting and Philip with Smith Dow and Associates.

Slope stability modelling was conducted on the proposed retaining structure design by Lakeview Contracting provided by Brian Engel on May 17, 2023.

The intention of the meeting and report was to verify the stability of the slope with the construction of new retaining structures near the lake. Environmental studies are beyond the scope of this report.

Summary

A) Stability of Slope

Field observation revealed the northeast facing slope appeared to have no apparent signs of slope movement within the subject property at the time of site meeting. Though groundwater or seepage was not directly noticed on the slope surface neighboring the building site, the potential of seepage or springs cannot be wholly discounted under all circumstances.

Slope stability analyses was carried out using the slope computer program to evaluate the stability of the existing slope profile with the construction of retaining structures. 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 Cross Section A – Retaining Walls per Lakeview Contracting's drawing were analyzed.

The following conservatively assumed soil parameters were used:

| Soil Type | Unit Weight (kN/m ³) | Cohesive Strength (kPa) | Angle of Internal Friction (degree) |
|------------------------|-------------------------------------|----------------------------|--|
| Native Silty Clay Till | 20 | 10 | 32 |
| Shale / Sandstone | 22 | 0 | 50 |

The following design parameters were also considered.

Loading Conditions: 2.0 kPa - Pedestrian / snow load
4.8 kPa - Building slab surcharge load
90 kPa - Building footing surcharge load.

Slope above walls: Horizontal

Slope below walls: Horizontal

Seismic coefficient: n/a

Groundwater: Groundwater was assumed to be drained away from the retaining wall.

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, existing vegetation and new retaining structures near the edge of the lake, the stability of the slope cross-sectional profiles were analyzed under the following conditions.

- a) Under “normal” groundwater and slope conditions while using the new slope cross-sectional profile ‘A’ in combination with Lakeview Contracting’s retaining wall structure.

This first stage of the slope stability analysis confirms a long-term factor of safety (F.S.) of 3.028 for under normal groundwater conditions as mentioned above. This means the existing slope with the new residence and the new three - 5 foot retaining walls are deemed stable. The F.S. of 3.028 of the existing cross-sectional slope profile exceeds the minimum required FS of 1.5.

- b) The second stage of slope stability analysis was to take the conditions and cross-sectional analysis from the first stage and adding a simulated high groundwater level.

The second stage of the slope stability assessment for the simulated high ground water tables revealed a long-term factor of safety (FS) of 2.911 can still be achieved with these parameters for cross-sectional profile A in combination with Lakeview Contracting’s three new retaining wall structures. The F.S. of 2.911 also exceed the minimum required FS = 1.5.

The recommendations for 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 of the three new retaining wall structures.

In order to maintain the stability of the slope, it is imperative the following should be adhered to:

- a) Details of the proposed stone retaining walls presented by the builder should be reviewed by our personnel.
- b) Check the recommended soil bearing strength can be achieved at the retaining wall footing grade by our personnel after excavation and prior to construction of the retaining wall structure.
- c) Test gravel compaction to ensure the 98% Standard Proctor Maximum Dry Density can be achieved.
- d) Proper drainage and site grading must be maintained to direct all water accordingly in order to maintain the stability of the slope.
- e) All other recommendations in this geotechnical report.

B) Retaining Wall Bearing Strength

- 1) All topsoil / organic material must be removed from the construction area to expose the underlying native silty clay till deposit. The exposed over-excavated area must be inspected and approved by our personnel.
- 2) All retaining walls should be directly supported by 300 mm thick compacted, 20 mm crushed gravel which in turn is supported by the firm to stiff native silty clay till and / or bedrock material.
- 3) The 300 mm thick gravel layer must be uniformly compacted to a minimum 98% Standard Proctor Maximum Dry Density. Soil compaction tests are required to confirm the gravel layer has achieved 98% S.P.M.D.D.
- 4) Shallow foundations founded on the compacted gravel layer overlying the firm to stiff native silty clay till soil or bedrock may be designed based on the factored resistance or serviceability bearing resistance values given in the following table:

SOIL BEARING RESISTANCES

| Soil Type | ULS (kPa) | | SLS (kPa) |
|-----------------------------------|---------------------|---------------------|-----------|
| | Ultimate Resistance | Factored Resistance | |
| Native Silty Clay Till or Bedrock | 250 | 125 | 90 |

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.

- 5) Any organics, fill soil or deleterious material encountered within the shallow foundation must be completely removed to expose the underlying native silty clay till or bedrock. The exposed soil must be inspected and approved by our personnel in writing prior to gravel placement.
- 6) 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.

Conclusion

This report is based on the findings at the borehole locations from the original slope stability in conjunction with the site meeting on May 17, 2023. 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.

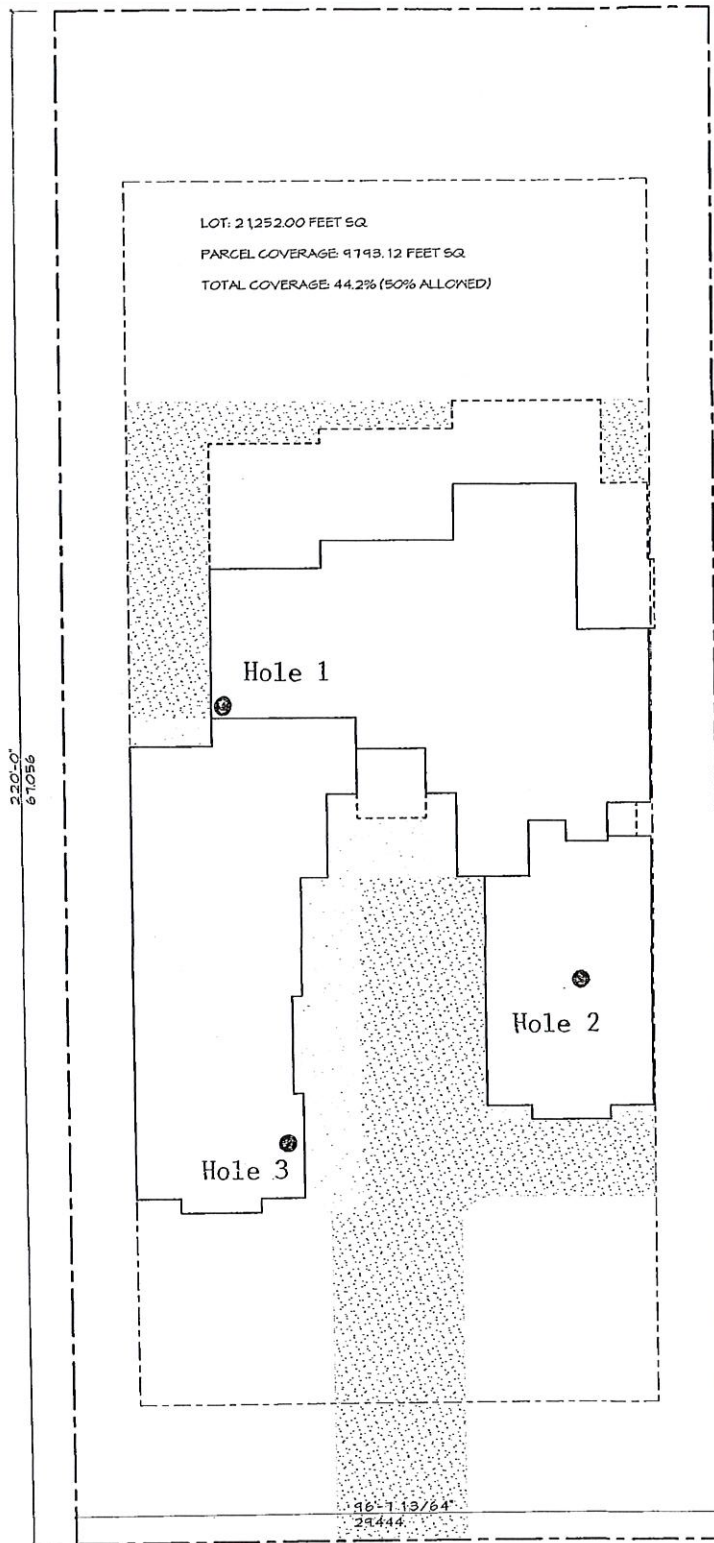
Soil conditions, by their nature, can be highly variable across a construction site. The placement of fill during and prior to construction activities on a site can contribute to variable near surface soil conditions. A contingency should be included in the construction budget to allow for the possibility 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 GWS Contracting and their agents, for specific application to the development at 111 Grand Avenue, Summer Village of Norglenwold, 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.

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



Philip Kwong (P.Eng.)



Approximate Test Hole Locations

SITE PLAN
 SCALE 1:200

| |
|---------------|
| PROJECT NAME |
| 111 GRAND AVE |

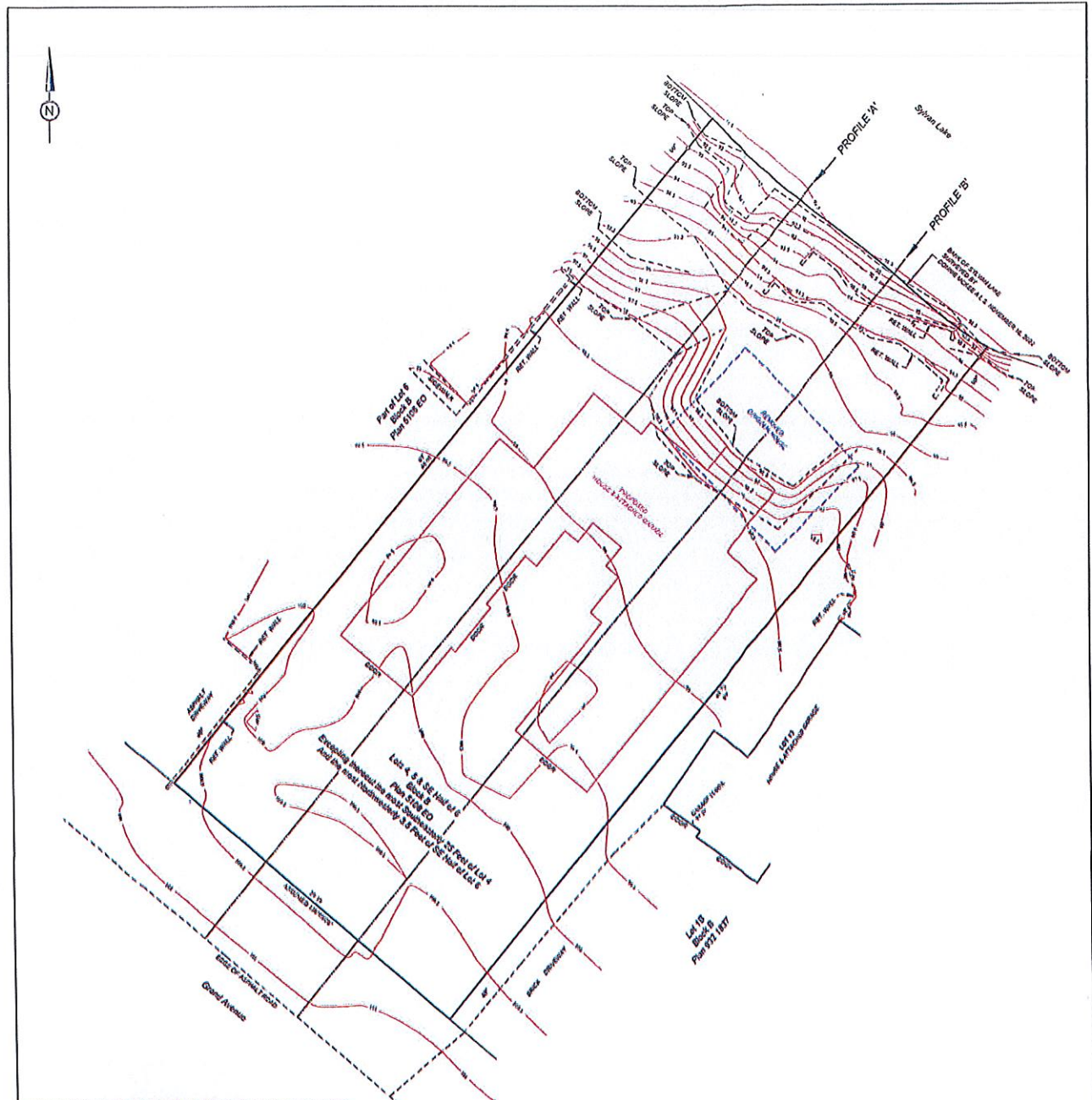
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| DATE |
| 15-11-2022 |



THESE DRAWINGS MAY NOT BE USED OR DUPLICATED WITHOUT THE PERMISSION OF KD RESIDENTIAL DESIGN, INC.

11x17



**SURVEYOR'S SKETCH
DRAINAGE PLAN**

LEGAL DESCRIPTION:

LOTS 4, 5 & SE HALF LOT 6 BLOCK B PLAN 5108 EO
EXCEPTING THEREOUT:

THE MOST SOUTHEASTERLY 25 FEET OF LOT 4 AND THE
NORTHWESTERLY 3.5 FEET OF SOUTH HALF OF LOT 6

MUNICIPAL ADDRESS:

111 GRAND AVENUE, NORGLENVOLD, ALBERTA
CLIENT: GWS CONTRACTING LTD.

I hereby certify that this Report was prepared and performed under my personal supervision.
The information shown on this Surveyor's Sketch reflects the status of this Property as of the
date of survey only.

Dated this 2nd of February 2023

[Signature]

ALBERTA LAND SURVEYOR
© CONNIE MCKEE, A.L.S. 2023

THIS DOCUMENT IS NOT VALID UNLESS IT BEARS AN ORIGINAL SIGNATURE IN BLUE INK
AND A RED ACCELERATED SURVEYS LTD. PERMIT STAMP.



NOTES

- Date of Survey: November 21, 2022 and January 22, 2023
- Distances are in metres and decimals thereof.
- Elevations are Local, Mean Tidal Ocean at F.D. 1 at South Corner of Lot 1A Block K Plan 1037 R/S.



Scale: 1:200 | Cur File: P-200-22 | Drawn By: CCM

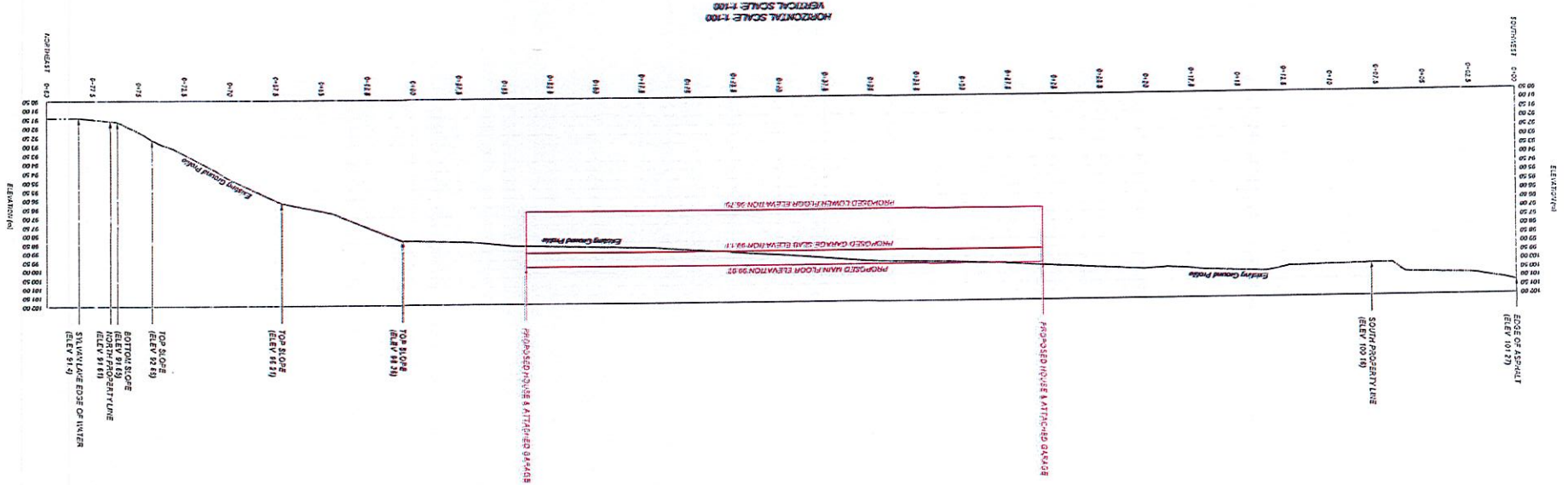
Sheet 1 of 3

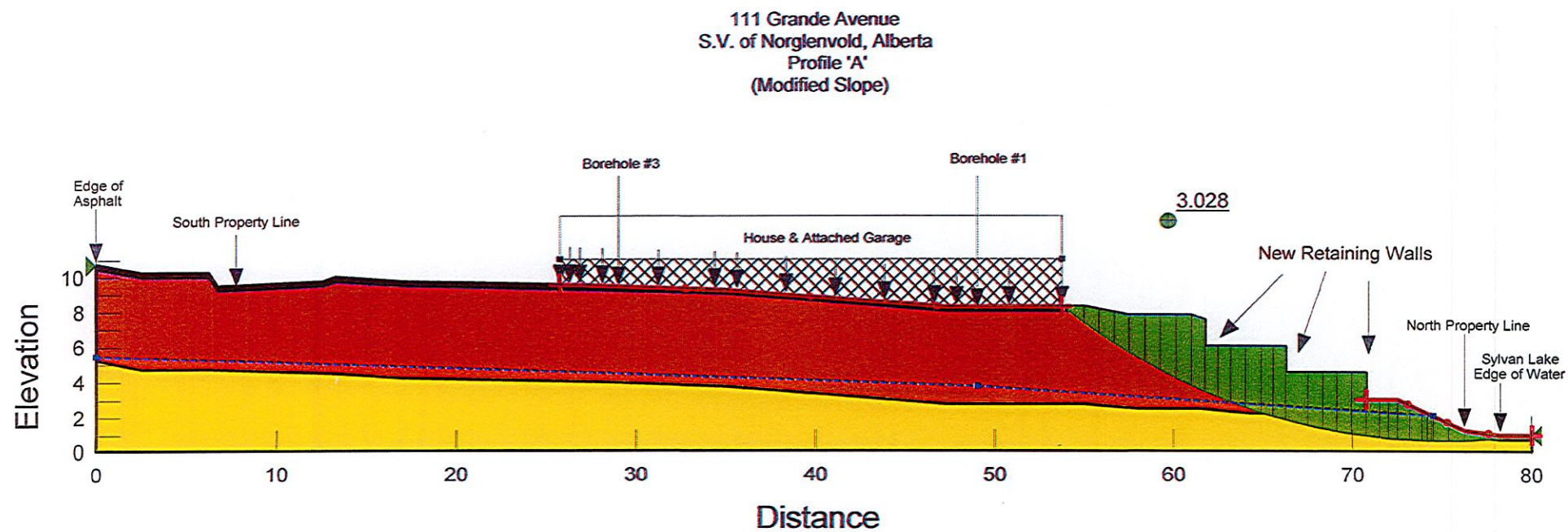
LEGEND
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The information shown on this plan is for informational purposes only and does not constitute a warranty of any kind.
The information shown on this plan is for informational purposes only and does not constitute a warranty of any kind.
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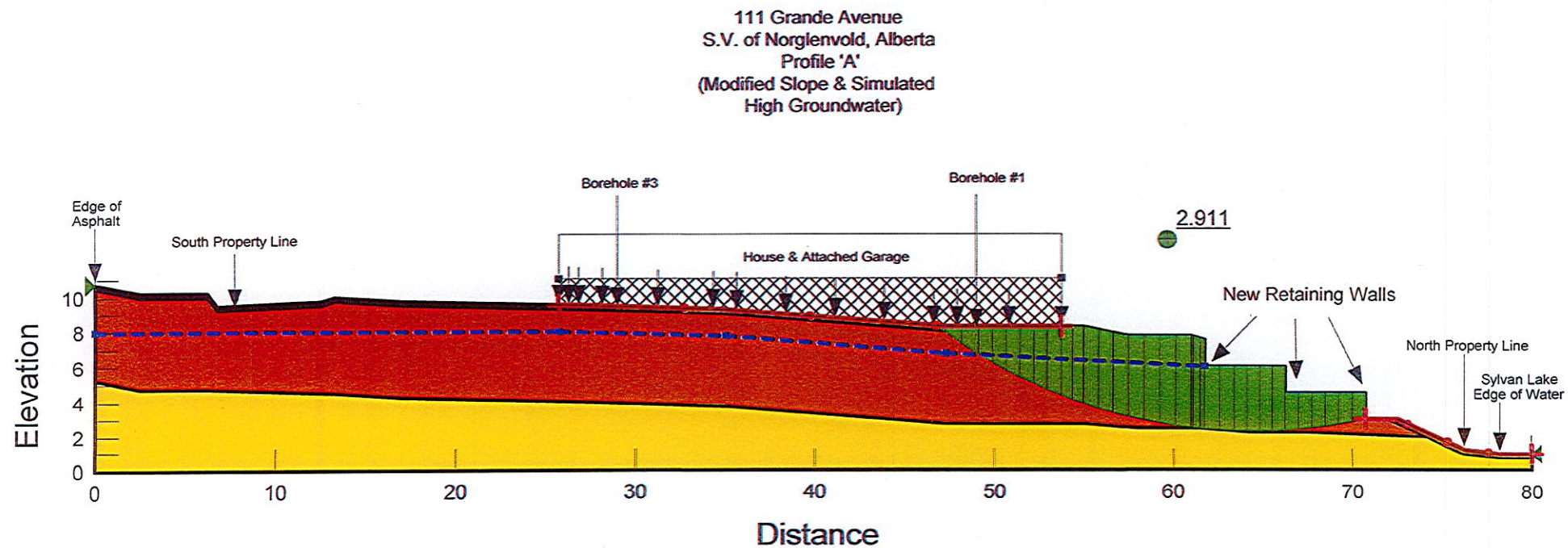
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SURVEYOR'S SKETCH
DRAINAGE PLAN
 LOTS 4, 5 & 28 HALF LOT 6 BLOCK 8 PLAN 5108 EO
 DESEPERING THROUGH
 THE MOST SOUTHWESTLY 75 FEET OF LOT 4 AND THE
 NORTHWESTLY 75 FEET OF SOUTH HALF OF LOT 6
 MUNICIPAL ADDRESS:
 1111 GRAND AVENUE, MONTREAL, ALBERTA
 CLIENT: CHOP CONTRACTING LTD.
 THIS SURVEY WAS COMPLETED BY THE SURVEYOR OF THE PROVINCE OF ALBERTA
 DATE OF SURVEY: 17th of February 2023
 SURVEYOR: ALBERTA LAND SURVEYOR
 O. DOMKE INC. A.S. 2073
 THIS DOCUMENT IS THE PROPERTY OF THE SURVEYOR AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE SURVEYOR.
 PLAN 5108 EO
 DATE OF SURVEY: 17th of February 2023
 SURVEYOR: ALBERTA LAND SURVEYOR
 O. DOMKE INC. A.S. 2073
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PROFILE 'A'











-----Engineering Consultants-----

Project: 111 Grand Avenue
Norglenwold, Alberta

| DWN | MK | CKD | AK | DATE | December 9, 2022 | FILE # | HOLE | 2 | | |
|--|----|-----|----|--|------------------|-----------------------------------|-------------|--------|-------|--------|
| STRENGTH----- MOISTURE----- PENETRATION----- | | | | ▲ DATUM ● GROUND ELEV.- X | | SYMBOL | TEST DATA | SAMPLE | Depth | |
| ▲ 100 200 300 400 500 ● 10 20 30 40 5 X 0 10 20 30 40 50 60 70 80 90 100 | | | | CLASSIFICATION | | | | | feet | meters |
| | | | | | | | | | | |
| | | | | Asphalt / Fill 60mm asphalt, 225mm gravel / conc Silty Clay Till grey brown, frozen to 0.7m grey mottling stones to pebbles, sandy silt layer firm, medium plastic, olive firm stiff stones to pebbles, sandy silt layer medium to low plastic, olive firm to stiff | | N= 8 N=36 N= 63 | X X X | 1 | | |
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|  | FILL |
|  | TOPSOIL |
|  | SAND |
|  | SILT |

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|  | CLAY |
|  | PEAT |
|  | GRAVEL |
|  | SHALE |

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|---|--------|
|  | TILL |
|  | COAL |
|  | WATER |
|  | LIMITS |

| |
|---|
| Q - Unconfirmed Strength, kN/m ² |
| d - Dry Unit Weight, kN/m ³ |
| S - Sulphate Concentration, % |
| N - Penetration Resistance, blows |

| | |
|--------------|---|
| Tube | / |
| Penetrometer | X |
| No Recovery | |

TEST HOLE LOG AND LAB DATA

DWG # 3



SMITH DOW & ASSOCIATES LTD.

-----Engineering Consultants-----

Project: 111 Grand Avenue
Norglenwold, Alberta

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| DWN | MK | CKD | AK | DATE December 9, 2022 | FILE # | HOLE 3 |
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| STRENGTH----- MOISTURE----- PENETRATION----- | ▲ • X | DATUM GROUND ELEV- CLASSIFICATION | SYMBOL | TEST DATA | SAMPLE | Depth | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">▲</td> <td style="width:5%;">100</td> <td style="width:5%;">200</td> <td style="width:5%;">300</td> <td style="width:5%;">400</td> <td style="width:5%;">500</td> </tr> <tr> <td>•</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>5</td> </tr> <tr> <td>X</td> <td>0</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> </tr> </table> | ▲ | 100 | 200 | 300 | 400 | 500 | • | 10 | 20 | 30 | 40 | 5 | X | 0 | 10 | 20 | 30 | 40 | | Topsoil 150mm, humus, rootlets, frozen Silty Clay Till tan to light olive, frost firm, white mineral traces medium plastic, pebbles to stones silty, rust stains stones to pebbles grey mottling silt and sand specks / lenses coal and bedrock fragments olive / brown End of Hole (Backfilled w/ auger cuttings) | N= 8 | | X | feet meters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▲ | 100 | 200 | 300 | 400 | 500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| • | 10 | 20 | 30 | 40 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X | 0 | 10 | 20 | 30 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>1</td><td></td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td></td></tr> <tr><td>4</td><td></td></tr> <tr><td>5</td><td></td></tr> <tr><td>6</td><td></td></tr> <tr><td>7</td><td></td></tr> <tr><td>8</td><td></td></tr> <tr><td>9</td><td></td></tr> <tr><td>10</td><td></td></tr> <tr><td>11</td><td></td></tr> <tr><td>12</td><td></td></tr> <tr><td>13</td><td></td></tr> <tr><td>14</td><td></td></tr> <tr><td>15</td><td></td></tr> <tr><td>16</td><td></td></tr> <tr><td>17</td><td></td></tr> <tr><td>18</td><td></td></tr> <tr><td>19</td><td></td></tr> <tr><td>20</td><td></td></tr> <tr><td>21</td><td></td></tr> <tr><td>22</td><td></td></tr> <tr><td>23</td><td></td></tr> <tr><td>24</td><td></td></tr> <tr><td>25</td><td></td></tr> <tr><td>26</td><td></td></tr> <tr><td>27</td><td></td></tr> <tr><td>28</td><td></td></tr> <tr><td>29</td><td></td></tr> <tr><td>30</td><td></td></tr> </table> | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | 25 | | 26 | | 27 | | 28 | | 29 | | 30 | | | | | | | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 |
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| FILL TOPSOIL SAND SILT | CLAY PEAT GRAVEL SHALE | TILL COAL WATER LIMITS | Q - Unconfirmed Strength, kN/m2 d - Dry Unit Weight, kN/m3 S - Sulphate Concentration, % N - Penetration Resistance, blows | Tube / Penetrometer X No Recovery |
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| TEST HOLE LOG AND LAB DATA | DWG # 4 |
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