TOWN OF JACKSON
PLANNING & BUILDING DEPARTMENT

TRANSMITTAL MEMO

Town of Jackson
- ☒ Public Works/Engineering
- ☒ Building
- ☐ Title Company
- ☒ Town Attorney
- ☒ Police

Joint Town/County
- ☒ Parks and Recreation
- ☒ Pathways
- ☒ Housing Department

Teton County
- ☐ Planning Division
- ☐ Engineer
- ☐ Surveyor- *Nelson*
- ☐ Assessor
- ☐ Clerk and Recorder
- ☐ Road and Levee

State of Wyoming
- ☐ Teton Conservation
- ☐ WYDOT
- ☐ TC School District #1
- ☐ Game and Fish
- ☐ DEQ

Federal Agencies
- ☐ Army Corp of Engineers

Utility Providers
- ☐ Qwest
- ☒ Lower Valley Energy
- ☐ Bresnan Communications

Special Districts
- ☒ START
- ☒ Jackson Hole Fire/EMS
- ☐ Irrigation Company

Date: February 10, 2025

Item #: P25-015

Planner: Andrew Bowen

Phone: 733-0440 ext. 1306

Email: abowen@jacksonwy.gov

Owner:
Scott Brian Anderson
225 Spruce Drive
Jackson, WY 83001

Applicant:
Rachel Ravitz
PO Box 2406
Jackson, WY 83001

REQUESTS:

The applicant is submitting a request for a Pre-Application Conference for a Conditional Use Permit on a Steep Slopes lot for a single-family home and detached ARU located at 225 Spruce Drive, legally known as LOT 2, ASPEN HILL LOTS, 3RD ADDITION.

PIDN: 22-41-16-33-4-37-002

For questions, please call Andrew Bowen at 307-733-0440 x1306, or email abowen@jacksonwy.gov. Thank you.

RESPONSE: by March 3, 2025 with Comments**.**
For Departments not using SmartGov, please send responses via email to planning@jacksonwy.gov

PRE-APPLICATION CONFERENCE REQUEST (PAP)
Planning & Building Department

150 E Pearl Ave.
P.O. Box 1687
Jackson, WY 83001

ph: (307) 733-0440 fax:
www.townofjackson.com

For Office Use Only

Fees Paid_____ Time & Date Received _____

Application # _____ _____

Please note: *Applications received after 3 PM will be process the next business day.*

APPLICABILITY. *This application should be used when applying for a* ***Pre-application Conference.*** *The purpose of the pre-application conference is to identify the standards and procedures of these LDRs that would apply to a potential application prior to preparation of the final proposal and to identify the submittal requirements for the application.*

For additional information go to www.townofjackson.com/204/Pre-Application

PROJECT.

Name/Description: Anderson House and Detached ARU

Physical Address: 225 Spruce Drive Jackson WY 83001

Lot, Subdivision: Lot 2 Aspen Hill Lots Subdivision 3rd Addition PIDN: 22-41-16-33-4-37-002

PROPERTY OWNER.

Name: Scott Brian Anderson Phone: (307) 690-0467

Mailing Address: po box 927 Jackson WY ZIP: 83001

E-mail: sba@ScottAnderson.biz

APPLICANT/AGENT.

Name, Agency: Rachel Ravitz, CoRRnice Architecture LLC Phone: (307) 699-2454

Mailing Address: po box 2406 Jackson WY ZIP: 83001

E-mail: Rachel@coRRnice.com

DESIGNATED PRIMARY CONTACT.

_____ Property Owner X Applicant/Agent 225 Spruce Drive Jackson WY 83001

ENVIRONMENTAL PROFESSIONAL. *For EA pre-application conferences, a qualified environmental consultant is required to attend the pre-application conference. Please see Subsection 8.2.2.C, Professional Preparation, of the Land Development Regulations, for more information on this requirement. Please provide contact information for the Environmental Consultant if different from Agent.*

Name, Agency: Vince Roux, Harmony Design & Engineering Phone: (208) 354-1331 ext 4022

Mailing Address: po box 369 Driggs, ID 83422 ZIP: 83001

E-mail: Vince.Roux@HarmonyDesignInc.com

TYPES OF PRE-APPLICATION NEEDED. *Check all that apply; see Section 8.1.2 of the LDRs for a description of review process types.*

_____Physical Development Permit
X Use Permit Conditional Use Permit
_____Development Option or Subdivision Permit
_____Interpretations of the LDRs
_____Amendments to the LDRs
_____Relief from the LDRs
_____Environmental Analysis

This pre-application conference is:
X Required
_____Optional
_____For an Environmental Analysis
_____For grading

SUBMITTAL REQUIREMENTS. *Please ensure all submittal requirements are included. The Planning Department will not hold or process incomplete applications. Provide **one electronic copy** (via email to planning@jacksonwy.gov) of the submittal packet.*

Have you attached the following?

$199 **Application Fee.** Go to www.townofjackson.com/204/Pre-Application.com for the fees.

LOA **Notarized Letter of Authorization.** A notarized letter of consent from the landowner is required if the applicant is not the owner, or if an agent is applying on behalf of the landowner. Please see the Letter of Authorization template at http://www.townofjackson.com/DocumentCenter/View/845/LetterOfAuthorization-PDF.

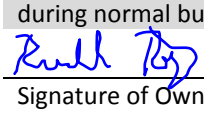
YES **Narrative Project Description.** Please attach a short narrative description of the project that addresses:
- _____Existing property conditions (buildings, uses, natural resources, etc)
- _____Character and magnitude of proposed physical development or use
- _____Intended development options or subdivision proposal (if applicable)
- _____Proposed amendments to the LDRs (if applicable)

YES **Conceptual Site Plan.** For pre-application conferences for physical development, use or development option permits, a conceptual site plan is required. For pre-application conferences for interpretations of the LDRs, amendments to the LDRs, or relief from the LDRs, a site plan may or may not be necessary. Contact the Planning Department for assistance. If required, please attach a conceptual site plan that depicts:
- _____Property boundaries
- _____Existing and proposed physical development and the location of any uses not requiring physical development
- _____Proposed parcel or lot lines (if applicable)
- _____Locations of any natural resources, access, utilities, etc that may be discussed during the pre-application conference

YES **Grading Information (REQUIRED ONLY FOR GRADING PRE-APPS).** Please include a site survey with topography at 2-foot contour intervals and indicate any areas with slopes greater than 25% (or 30% if in the NC Zoning District), as well as proposed finished grade. If any areas of steep slopes are man-made, please identify these areas on the site plan.

Soils **Other Pertinent Information.** Attach any additional information that may help Staff in preparing for the pre-app or identifying possible key issues. Geotech Report from Phil Gyr, Nelson Engineering

Under penalty of perjury, I hereby certify that I have read this application and state that, to the best of my knowledge, all information submitted in this request is true and correct. I agree to comply with all county and state laws relating to the subject matter of this application, and hereby authorize representatives of Teton County to enter upon the above-mentioned property during normal business hours, after making a reasonable effort to contact the owner/applicant prior to entering.



Signature of Owner or Authorized Applicant/Agent

Feb 4 2025

Date

Rachel Ravitz

Name Printed

Architect

Title

Town of Jackson
150 E Pearl Avenue
PO Box 1687, Jackson, WY 83001
P: (307)733-3932 F: (307)739-0919
www.jacksonwy.gov

Date:

LETTER OF AUTHORIZATION

NAMING APPLICANT AS OWNER'S AGENT

PRINT full name of property owner as listed on the deed when it is an individual OR print full name and title of President or Principal Officer when the owner listed on the deed is a corporation or an entity other than an individual: _____ Title: _____

Being duly sworn, deposes and says that Scott Brian Anderson is the owner in fee of the premises located at:
Name of legal property owner as listed on deed

Address of Premises: 225 Spruce Drive Jackson WY 83001

Legal Description: Lot 2 Aspen Hill Lots Subdivision 3rd Addition 22-41-16-33-4-37-002

Please attach additional sheet for additional addresses and legal descriptions

And, that the person named as follows: Name of Applicant/agent: Rachel Ravitz, AIA

Mailing address of Applicant/agent: po box 2406 Jackson WY 83001

Email address of Applicant/agent: Rachel@coRRnice.com

Phone Number of Applicant/agent: (307) 699-2454

Is authorized to act as property owner's agent and be the applicant for the application(s) checked below for a permit to perform the work specified is this(these) application(s) at the premises listed above:

☐ Development/Subdivision Plat Permit Application ☒ Building Permit Application

☐ Public Right of Way Permit ☒ Grading and Erosion Control Permit ☐ Business License Application

☐ Demolition Permit ☐ Home Occupation ☒ Other (describe) Elective Pre-App Conference re: setbacks

Under penalty of perjury, the undersigned swears that the foregoing is true and, if signing on behalf of a corporation, partnership, limited liability company or other entity, the undersigned swears that this authorization is given with the appropriate approval of such entity, if required.

_____
Property Owner Signature

_____
Title if signed by officer, partner or member of corporation, LLC (secretary or corporate owner) partnership or other non-individual Owner

STATE OF Wyoming)
) SS.
COUNTY OF Teton)

The foregoing instrument was acknowledged before me by Scott Brian Anderson this 8th day of January, 2025. WITNESS my hand and official seal.

KARISSA DABEL
NOTARY PUBLIC
STATE OF WYOMING
COMMISSION ID: 159708
MY COMMISSION EXPIRES: 06/24/2030

Karissa Dabel
Notary Public

My commission expires: 06/24/2030

Pre Application Narrative Feb 03 2025

For: Scott Anderson
Po box 927
225 Spruce Drive
Jackson, WY 83001

By: Rachel Ravitz
coRRnice Architecture, LLC
P.O. Box 2406
Jackson, WY 83001

Main house + ARU Master planning

Mr. Anderson is required to apply for a Conditional Use Permit because of his lot's location on a Hillside Area in the Town of Jackson. Per LDR Section 5.4.1 Steep Slopes, the lot's contours exceed 10% grade. It is important to note that the lot cannot be developed for any use without this C.U.P. He intends to pursue a building permit in 2025 for a single family house, 2 bedrooms, 1000 sq ft, which requires 2 parking spaces. We'd like to plan for a future detached 500 sq ft ARU, which would require a 3rd parking spot. The intent of the Master Plan is to accommodate parking and utilities with tight site constraints.

Several challenges exist with this small lot:

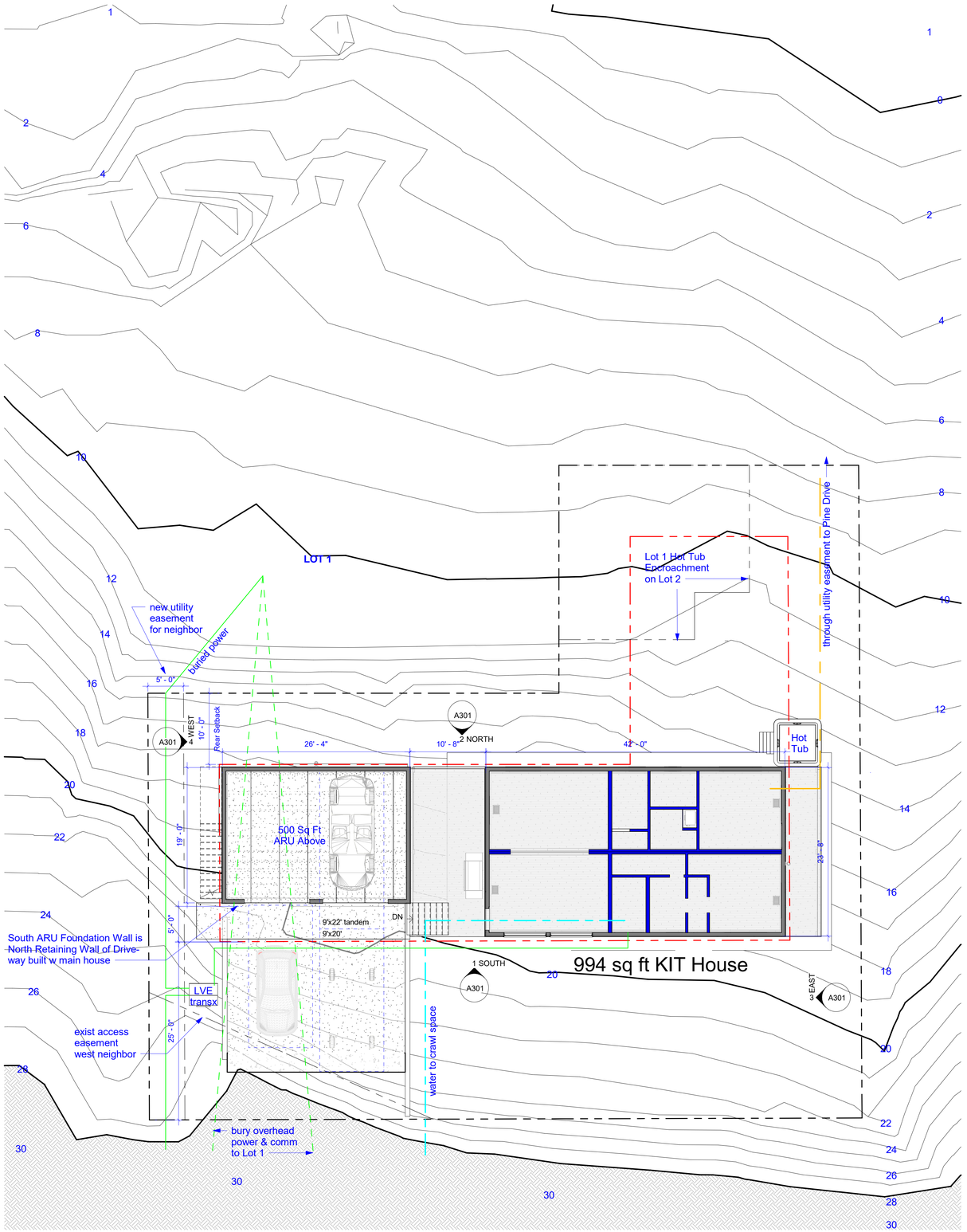
1. Steep contours, especially as the land drops off from Spruce Drive
2. Tight Building Envelope in L shape
3. Access Easement to West Neighbor 235 Spruce Drive (Triangular Shape)
4. Encroachment Agreement with North Neighbor 230 Pine Drive
5. Overhead Power to 230 Pine Drive
6. Location in the WUI with several mature trees

Topography: The attached site plan is an accurate depiction of existing slopes, taken from a survey by Nelson Engineering. The spot chosen for the main house is the flattest, at roughly 8%. Much of the lot is sloped at 15%, with some areas almost 20%, including the area best suited for driveway access. The intent is to retain soil in this area to bring the driveway up to roughly 12 % grade.

Utlities:

1) Sewer will likely use the east easment to connect at Pine Drive.
2) Electrical will need a new easement on the west edge of 225 Spruce to allow for underground burial of electrical to 230 Spruce. The owner of 230 Spruce would incur the cost of burying electrical from a newly set transformer at the southwest corner of Mr. Anderson's lot, to their house's electrical service on the south side. Due to the exsiting access easement to 235 Spruce Drive, the transformer will need to be set back further from the street.
3) Water will come from Spruce Drive

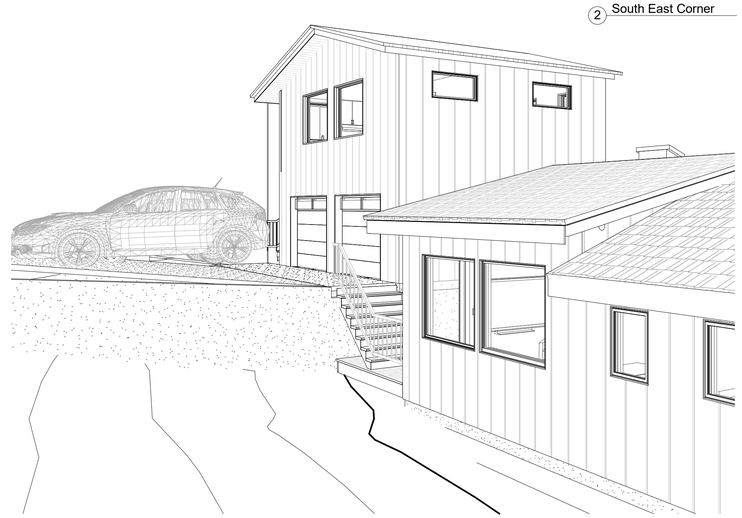
We look forward to discussing this project at the pre-application conference and moving forward with the CUP.



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

SHEET LIST		
Number	Sheet Name	Engineer
A101	SITE & VICINITY PLANS	Ravitz
A301	ELEVATIONS	Ravitz
A401	HOUSE SECTIONS	Ravitz
Kit CS-1	COVER PAGE	Century
Kit CS-2	General Modular Notes	Century
Kit EE-1	Exterior Elevations	Century
Kit EL-1	Electrical & Lighting	Century
Kit EL-2	Electrical Panel Layout	Century
Kit FD-1	Foundation	Century
Kit FD-2	Foundation Details	Century
Kit FP-1	FLOOR PLAN	Century
Kit FS-1	Fastening Schedule	Century
Kit M-1	HVAC Plan & Details	Century
Kit P-1	Plumbing Isometric & Details	Century
Kit P-2	Water Isometric	Century
Kit R-1	Roof Truss Layout	Century
Kit ST-1	STRUCTURAL Floor Plan	Century
Kit ST-2	Structural House Sections	Century
Kit ST-3	Roof & Dormer Framing Details	Century
Kit ST-4	Structural Details	Century
Kit ST-5	Structural Details - Beams	Century
S1	RETAINING WALL	TSE

2 South East Corner



3 South West Corner

REGIONAL RELEVANCE
CORRNICE ARCHITECTURE

Rachel Ravitz
AIA LEED AP NCARB
p.o. box 2406 Jackson WY 83001
p.o. box 3290 A l p ine WY 83128
(307)699-2454
Rachel@coRRnice.com

NELSON ENGINEERING
ANSEL LEE, P.E.
Civil Engineer
PO Box 1599
Jackson, WY 83001
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ALee@NelsonEngineering.net

SCOTT ANDERSON
OWNER / DEVELOPER
p.o. box 927 Jackson WY 83001
(307)690-0467
sba@scottanderson.biz

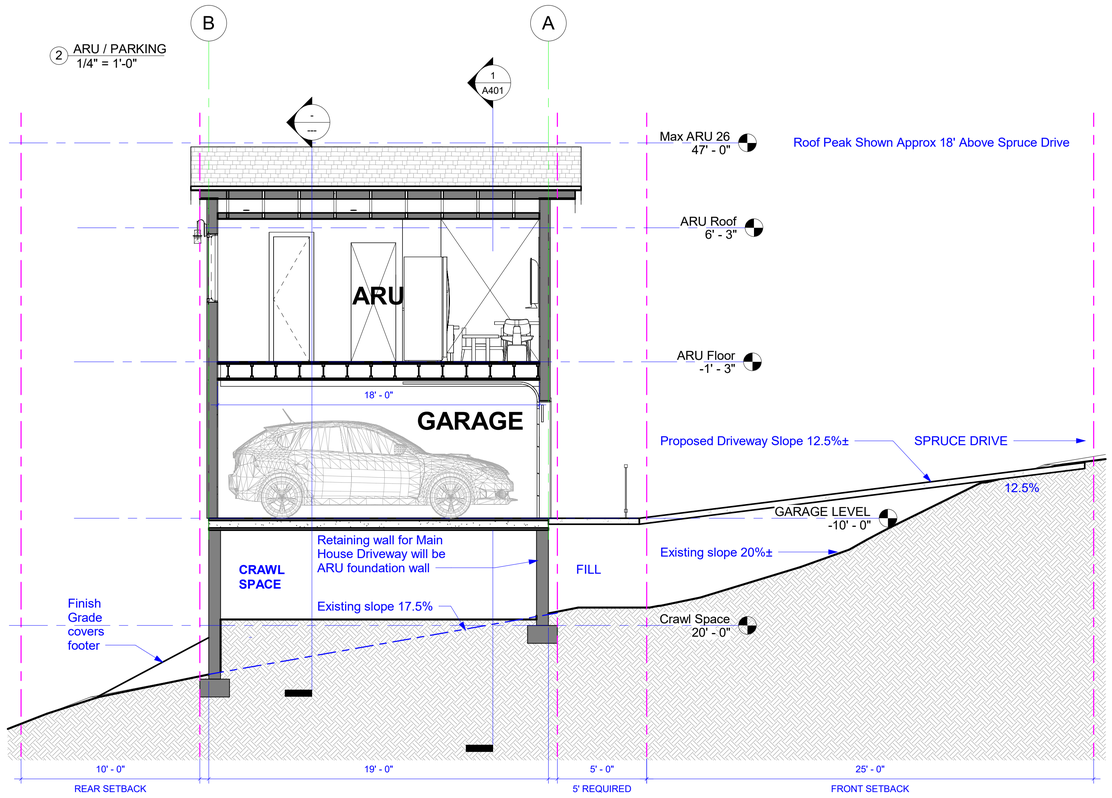
ANDERSON LOT
225 SPRUCE
SITE & VICINITY PLANS

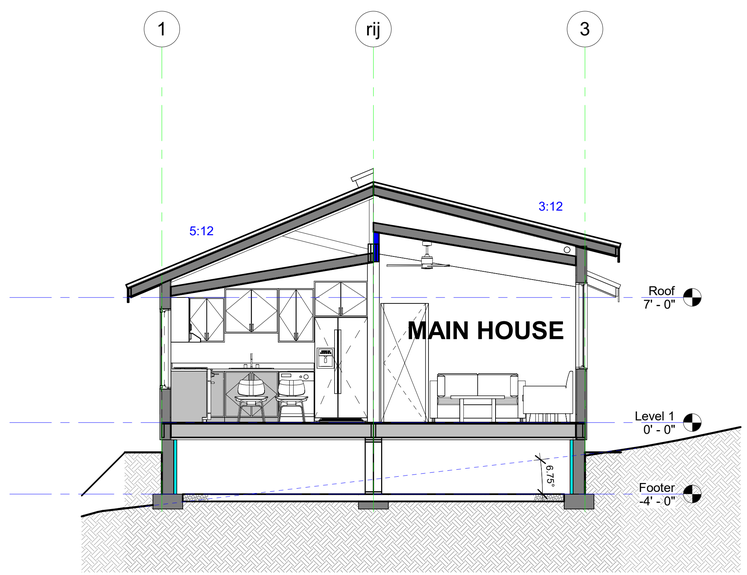
INFORMATION ONLY NOT FOR CONSTRUCTION

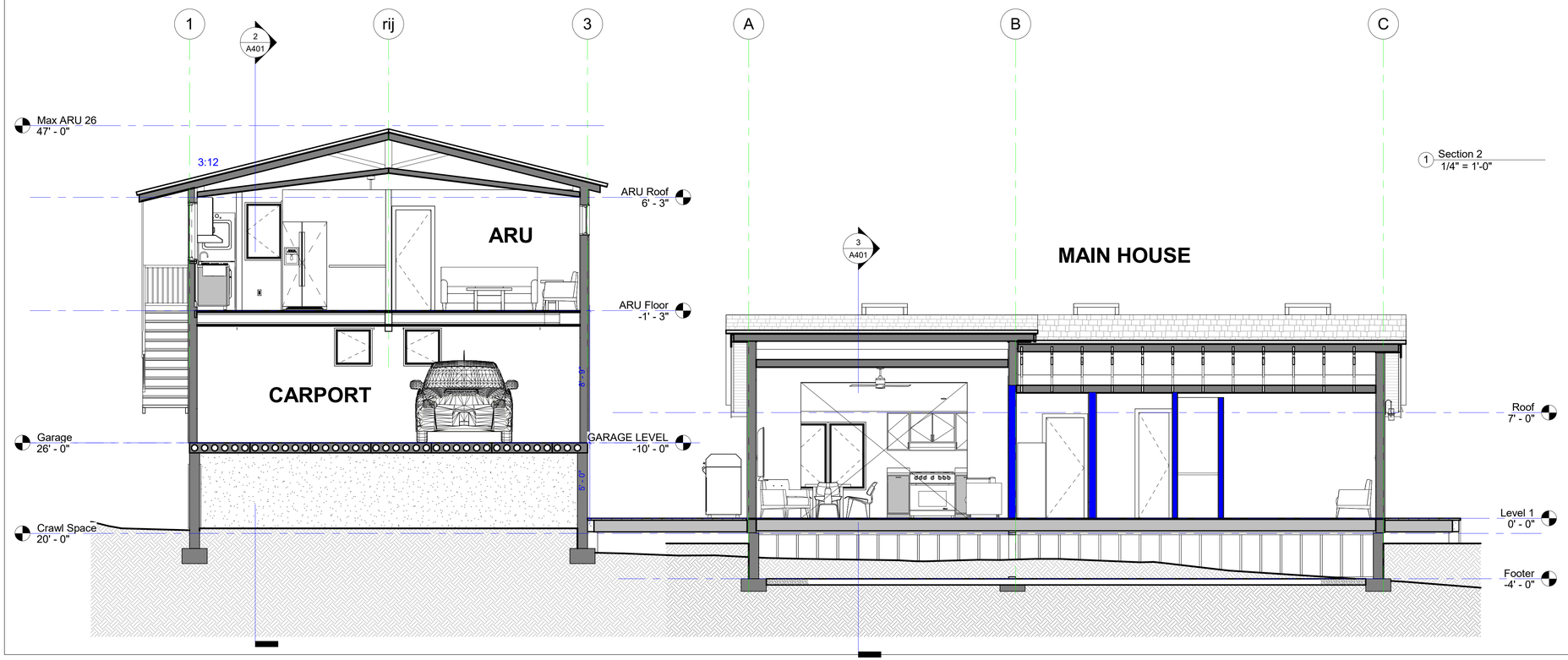
Date	FEB 03 2025

A101

Scale	1/8" = 1'-0"







REGIONAL RELEVANCE
CORRNICE ARCHITECTURE

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SCOTT ANDERSON
OWNER / DEVELOPER
p.o. box 927 Jackson WY 83001
(307)690-0467
sba@scottanderson.biz

ANDERSON LOT
225 SPRUCE

HOUSE SECTIONS

INFORMATION ONLY - NOT FOR CONSTRUCTION

Date	FEB 03 2025

A401

Scale	1/4" = 1'-0"

GEOTECHNICAL INVESTIGATION

ANDERSON RESIDENCE
225 SPRUCE DRIVE
LOT 2, ASPEN HILL LOTS 3RD ADDITION
JACKSON, WYOMING

PREPARED FOR:
SCOTT ANDERSON
JACKSON, WYOMING

PREPARED BY:
NELSON ENGINEERING
JACKSON, WYOMING

SEPTEMBER 2020
Project No. 20-219-01

TABLE OF CONTENTS

GENERAL AND PROJECT DESCRIPTION

This is the report of geotechnical investigation for proposed residential development at Lot 2 of the Aspen Hill Lots 3rd Addition in Jackson, Wyoming. Project plans were being formulated at the time of this report. Anticipated improvements include a multi-story residence, auxiliary rental unit, entrance drives, utilities, and site retaining walls. Recommendations contained in this report are based on preliminary project information from ESTEAM Architecture and Scott Anderson.

Scope of Services

The scope of services for this investigation was to provide geotechnical recommendations based on a subsurface investigation and soils laboratory testing for the proposed residence. The purpose of the subsurface investigation was to determine soil and groundwater characteristics. The results of the subsurface investigation and subsequent laboratory testing were utilized in engineering analyses for foundation, retaining wall, and roadway sections. Slope stability analyses were not conducted, as it is our engineering judgment that the existing and proposed slope geometry and soil composition indicate stability. Specific recommendations for drainage and surface water conveyance were not within the scope of work for this report.

The geotechnical analysis and resulting recommendations contained herein are based on typical loads for the type of structures envisioned in the design. It is critical that structural loads be properly communicated to the geotechnical engineer to verify that the imposed loading conditions on the proposed foundation configuration do not cause excessive settlement, exceed the recommended bearing capacity, or exceed the seismic loading capacity of the foundation elements. It is assumed that foundation elements would not be subjected to unusual loading conditions such as eccentric loads or vibratory equipment. Unusual load conditions can induce settlement or reduce the bearing capacity of foundation elements. Lateral earth pressure recommendations contained within this report are general in nature; it is critical that final retaining wall designs are reviewed by the geotechnical engineer for review and approval. Customary and conventional excavation and construction methods are assumed for the recommendations given.

SITE CONDITIONS

Description

Lot 2 of the Aspen Hill Lots 3rd Addition Subdivision is a 0.17 acre property located on the lower north-facing slopes of Snow King Mountain. The lot is undeveloped and occupied by sparse mature conifer forest with grass and shrub understory. A steep primitive gravel driveway provides access from the southwest property corner from Spruce Drive. The lot slopes to the north at 20-25% in the undisturbed area and at over 30% for the manmade fill slopes adjacent to Spruce Drive. No surface water channels were observed within the lot.

Geologic and Soil Mapping

The area's surface geology is mapped on the USGS "Geologic Map of the Jackson Quadrangle, Teton County, Wyoming," Love, J.D. and Albee, H.F., 2004. Mapped deposits on the site are "Qc – Colluvium – Mostly slope wash of silt- to boulder-sized fragments derived from underlying and adjacent formations."

The Natural Resources Conservation Services Soil Survey has mapped the Greyback gravelly loam on 0 to 3 percent slopes throughout the property. The soil is described as deep, somewhat excessively drained alluvial and/or glaciofluvial deposits composed of gravelly loam, very gravelly sandy loam and very gravelly loamy sand.

Seismic Hazard

Jackson Hole is located within the Intermountain Seismic Belt, a zone extending from southern Utah through eastern Idaho and western Montana, and encompassing western Wyoming and the Teton Range as referenced by Robert B. Smith and Walter J. Arabasz in "Seismicity of the Intermountain Seismic Belt, Neotectonics of North America," 1991. The USGS Earthquake Hazards Program has mapped Quaternary faults and folds in the United States as displayed on Google Earth. Active faults mapped in the vicinity are the Teton Fault, the Phillips Valley Fault, and secondary faults within the Jackson Hole Valley. In particular, the Teton Fault is thought to be capable of producing major earthquakes of a magnitude of six or greater. The portion of the Teton Fault mapped as active in the Quaternary is approximately 7.2 miles northwest of the site. The "Geologic Map of the Jackson Quadrangle" Love, J.D. and Albee, H.F., 2004, shows the concealed postulated trace of the Jackson Thrust Fault approximately 700 feet south of the site. The Jackson Thrust Fault is not classified by the USGS as an active fault. Multiple minor earthquakes with epicenters near the site have occurred in recent years (USGS Earthquake Database).

Landslide Hazard

Topography shows slopes of 5 to 25 percent in the vicinity of the project between Aspen Drive, Pine Drive and north of Spruce Drive, slopes steepen to greater than 30 percent upslope and south of Spruce Drive. Aerial photographs dating to 1945 show no indications of slope movement upslope of the project with development of the area first occurring in the 1950's. A landslide complex on the lower slopes of Snow King Mountain, as mapped by The Geologic Hazards Section of the Wyoming State Geologic Survey, is located to the east of the site. The nearest portion of the slide is a toe/deposition zone about 850 feet to the east within the Snow King Ski Area. The slide complex is classified as a multiple rock slide/multiple slump/multiple flow type with its origin thought to be within the Bacon Ridge formation below the Jackson Thrust Fault. Neither the terrain nor the subsurface profiles found in the test pits are commensurate with landslide deposits.

Geologic mapping, subsurface profiles, geomorphology, and historic photography indicate stability within the lot and the adjacent developments. An evaluation of the stability of the general project area would require multiple deep geotechnical borings both up slope and down slope of the project, with borings located on both private and USFS land. Boring information and laboratory testing would then be used in a detailed and thorough geotechnical and geological analysis. This type of comprehensive effort might best be conducted by a governmental entity.

SITE INVESTIGATIONS

Field Investigations

On July 24, 2020, three test pits, TP-1 through TP-3, were excavated throughout the property as shown on the **Test Pit Location Map** drawing in the Appendix. Test pits were located approximately using a Leica Zeno 20 GPS unit. Test pit locations and depths were selected to determine subsurface conditions within the proposed development. All geotechnical test pits were backfilled with excavated material after logging was completed.

FC Excavation of Jackson, Wyoming, excavated the test pits with a Hitachi 75US tracked excavator. Andy Pruett, a Professional Geologist at Nelson Engineering, logged the test pits and directed the sampling. Soils were classified in the field and logged by the geologist. The soil classifications, moisture conditions, and presence of organic or other notable features were recorded in the field logs. Bulk samples were sealed in plastic bags and transported to our laboratory for testing and further classification. A relatively undisturbed sample of loess was obtained in a cylindrical stainless-steel liner for consolidation testing. Groundwater observations were made at the time of the excavation based on field observations of soil moisture conditions. Field observations and laboratory testing results are presented both on the test pit logs and in the test result presentation sheets in the Appendix.

The stratification lines shown on the test pit logs represent the approximate boundary between soil types. The actual in-situ transition may be either gradual or abrupt. Due to the nature and depositional characteristics of natural soils and fills, care should be taken in interpolating subsurface conditions beyond the location of the test pits. Soil conditions can change rapidly in both the lateral and vertical directions. Groundwater conditions shown on the logs are only for the dates indicated.

The subsurface conditions were interpreted from the described test pits at the site. The soil properties inferred from the field and laboratory analyses supported by our experience formed the basis for developing our conclusions and recommendations.

Laboratory Investigations

Samples obtained during the field investigation were taken to the laboratory where they were visually classified in accordance with ASTM Test Method D-2487-93, which is based on the Unified Soils Classification System. Representative samples were selected for testing to determine the physical properties of the in-place soils and to estimate engineering properties. Engineering properties of concern at this location included bearing capacity, seismic response, drainage characteristics, and site-specific construction recommendations that are influenced by soil type and condition.

Laboratory testing was conducted to provide additional information to determine the suitability of the soils for use as foundation and subgrade materials and to verify field observations and classification estimates. The finalized laboratory observations were used to estimate soil strength and compressibility characteristics for bearing capacity determinations. Specific tests included Atterberg Limits Tests - ASTM Designation D4318, Grain Size Analysis - ASTM Designation C117 & C136, Soil Moisture Content Determinations - ASTM Designation D2226, and Soil Classification - ASTM Designation D2487. A relatively undisturbed sample of loess obtained in a cylindrical stainless-steel liner was subjected to consolidation and collapse testing per ASTM D2435.

The soil samples stored in our laboratory will be discarded after 30 days from the date this report is submitted unless we receive a specific request to retain them.

SUBSURFACE CONDITIONS

Soil Profiles

Surficial soils to 1-foot depth in TP-3 were roadway embankment fill consisting of imported pit run fill. Fill was composed of dry, brown poorly-graded round gravel with silt and sand.

From ground surface to 2.5 feet in TP-1 and 2 feet in TP-2 was dry, dark brown silty gravel/gravelly silt with cobbles. The surficial layer was found below the fill in TP-3. Silty gravel was medium dense to dense with moderate roots throughout and contained approximately 50 percent angular to sub-angular gravels and cobbles and 50 percent silt matrix. The silt matrix had a very stiff to hard consistency with pocket penetrometer readings greater than 2 tons per square foot (TSF). Below surficial deposits in TP-2 to 5 feet was loess composed of dry, mottled brown, light brown, and dark brown silt with approximately 15 percent gravels and cobbles. Loess had minor pinole voids, minor white calcareous stringers, and hard consistency with pocket penetrometer greater than 4 TSF. At depth in TP-2 and TP-3 to the bottom depth of both test pits and from 2 to 7.5 feet in TP-1 was colluvium composed of dry, brown/light brown, dense to very dense, silty gravel with cobbles and boulders to greater than 5-feet maximum dimension. Colluvium contained approximately 65 to 75 percent angular gravels to boulders and 25 to 35 percent silt matrix. Matrix consistency was stiff to very stiff with pocket penetrometer readings between 1.5 to 2.5 TSF. At depth in TP-1 from 7.5 feet to test pit bottom at 12 feet was loess composed of slightly moist, brown silt with minor gravels, cobbles, and boulders up to 3-feet maximum dimension. Loess was homogenous, contained minor pinhole voids, minor white calcareous stringers and had a very stiff to hard consistency with pocket penetrometer readings greater than 3.5 TSF. Refusal was encountered at the bottoms of TP-2 and TP-3 on large/multiple boulders. Excavation was characterized as easy through surficial deposits and moderate to hard through colluvium using a Hitachi 75US excavator.

Groundwater

Groundwater was not encountered during the investigation. Soil moisture contents in the test pits were field-classified as moist to dry. Indications of seasonal high groundwater were not observed in the test pits. Groundwater is not expected to occur within 50 of feet of ground surface.

ENGINEERING ANALYSIS AND RECOMMENDATIONS

General

Design level architectural plans were not available at the time of this report. Preliminary site plans show an ARU and residence inset into the hillside with entrance drives at the level of Spruce Drive on the south. Spread footings bearing on native colluvium and loess are the appropriate to support the structures.

Seismic Design Parameters

The 2018 International Building Code (IBC) designates site class per ASCE 7 Chapter 20. Data obtained in this investigation is not sufficient to determine soil parameters as required by ASCE 7; therefore, the IBC directs that seismic coefficients and design spectra shall be determined using **Site Class D**, a Latitude of **43.471°** and a Longitude of**-110.766°**.

Boulders

Several boulders up to 5 feet in size were encountered in the test pits. Numerous boulders have been unearthed in adjacent lots. Large boulders may be encountered and require special techniques to remove them. Boulders occurring at footing grade will require evaluation on an individual basis; boulder removal and backfill with structural fill to achieve footing grades may be required.

Loess

Loess is defined as a wind-deposited or aeolian fine-grained soil with a low-density structure. In loess, individual silt and fine sand particles are typically coated with clay that acts as a cementing agent between particles, preventing consolidation. As a bearing soil, loess may exhibit undesirable characteristics, primarily when wetted. Loess is susceptible to collapse and/or loss of strength when wetted. Collapse coupled with loss of strength in loess bearing soils when wetted may cause excessive settlement resulting in damage to the supported structure. Loess observed in the investigation is susceptible to collapse and will significantly lose strength when saturated.

Drainage and Moisture Infiltration Prevention

It is critical to prevent moisture from penetrating loess bearing soils. Measures to prevent moisture migration include:

1. **Domestic Water Distribution:** Domestic water supply piping should be carefully constructed and hydrostatically tested. Within 30 feet of the foundation the water line shall be cased and a waterline leak capture system shall be constructed consisting of lined transmission line trench with drain pipes per Drawing **4** in the Appendix.

2. **Subgrade Compaction:** Loess forming the subgrade under all reinforced fills and fills, slabs, footings, crawlspaces, and hardscape shall be compacted to a depth of 8 inches to greater than 95% of maximum density per Standard Proctor (ASTM-D698). A well-documented testing program shall be conducted to ensure compliance. Compaction of native loess subgrade creates a dense low permeability barrier that prevents moisture infiltration.

3. **Foundation Drains:** Foundation drains graded to drain and brought to daylight shall be designed and installed as per **Drawing 3** of the Appendix. Project designers shall design a foundation drain system meeting the requirements of this report in general conformance with **Drawing 3**. Drainage design shall be submitted to and approved by this office prior to construction.

4. **Irrigation Systems:** Systems must be properly installed and well maintained. Irrigation piping shall be placed a minimum of 10 feet from foundations of structure and hardscape. Irrigation distribution pipes shall be equipped with automatic shut off valves that sense leakage downstream.

5. **Backfill:** At a minimum, the upper one foot of backfill for external stem walls shall be composed of well compacted fine-grained silts and clays. A compacted silt and clay water stop with drain pipe shall be constructed at the bottom of footing in accordance with **Drawing 3.**

6. **Surface Drainage**: Stormwater and snowmelt shall be directed away from structures and hardscape. Ponding near structures and hardscape shall be prevented.

Conventional Spread Footings

Structures can be supported on conventional spread footings bearing on compacted, native colluvium soils or structural fills provided moisture is prevented from infiltrating loess soils.

Loess lenses encountered at footing subgrade shall be removed until competent colluvium bearing soils are revealed, or a minimum thickness of 2 feet. A typical foundation and backfill configuration is shown on the **Foundation Backfill Typical** drawing in the Appendix**.** All footings and structural fills shall be placed on native subgrades compacted to a depth of 8 inches to 95% of maximum density per ASTM D 698 (Standard Proctor). Site grading plans should be carefully reviewed to ensure surface waters, snowmelt, and irrigation systems drain away from foundation elements. A minimum burial depth for foundation elements of **36 inches** for frost protection is recommended.

A net allowable bearing capacity of **2500 PSF** is appropriate. Minimum footing depth of **3 feet** below **existing** grade, maximum continuous footing width of **5 feet**, maximum isolated or pad footing dimension of **8 feet**.

Construction of large footing sizes can lead to increased settlement as the bearing pressure bulb can extend deeper into the soil profile resulting in settlement of greater than that specified. The net allowable soil pressure includes dead load plus maximum live load. These calculations assume a maximum total settlement of **0.5 inches** can be tolerated on any one footing and the maximum differential settlement between footings that can be tolerated is **0.5 inches**. Any soil type encountered at the bottom of footing excavations other than those described in this report, including isolated boulders, should be analyzed by this office.

Upon the completion of preliminary structural foundation design, bearing capacity values and settlement should be checked by this office for each combination of load to determine whether settlement or bearing capacity will control the response of the footing. Isolated footings with bearing areas larger than those described above or those foundation elements supporting large concentrated loads such as stone fireplaces should be analyzed on an individual basis to determine settlement and bearing characteristics. Other foundation parameters are as noted below:

1. A **one-third increase** in allowable bearing capacity may be used for short duration loads such as wind or seismic.
2. For shallower footings, lateral loads may be resisted by friction between the footing base and supporting soil and lateral bearing pressure against the sides of the footings. For design purposes, **a coefficient of friction of 0.45** at the footing base is appropriate. A **lateral passive bearing pressure of 350 PSF per foot of depth** is appropriate.
3. Backfill below and against footings and stem walls shall conform to the **Foundation Backfill Typical** drawing in the Appendix. Material greater than 6 inches in diameter shall not bear directly on or against foundation elements. Placing oversized material against rigid surfaces can damage the structure and interferes with proper compaction.

Any soil type encountered at the bottom of footing excavations other than the ones described above should be analyzed by Nelson Engineering. Isolated boulders at footing grade shall be excavated and removed unless approved by Nelson Engineering. Any excessively loose material or soft spots encountered in the footing subgrade will require over-excavation and backfilling with structural fill. All footings shall be suitably reinforced to make them as rigid as possible.

Lateral Earth Pressures for Conventional Backfill

For this analysis, it is assumed that 1) all foundation or retaining walls are founded on compacted, native colluvium or structural fills, 2) all foundation and retaining walls will be backfilled with compacted fill per **Foundation Backfill Typical** drawing in the Appendix.

The lateral earth pressures given here are NOT APPLICABLE to walls retaining slopes of greater than 10%, these walls shall be evaluated on an individual basis. For foundation or stem walls restrained from movement such that active earth pressures will not be allowed to develop, an at-rest equivalent fluid pressure of **60 PCF** is appropriate.

The Mononobe-Okabe (M-O) equations are often used to estimate dynamic forces against retaining walls. The M-O analysis is theoretically derived using active earth pressure conditions. Although there is debate about the theoretical applicability of this methodology to restrained or rigid walls, the method has been used for many years for the seismic design of such walls. The performance record of underground walls during earthquakes has generally been good. Appropriate parameters for the M-O analysis are: 1) soil unit weight 135 pounds per cubic foot, 2) Internal Friction Angle= 35˚. The more limiting case, at-rest or active seismic pressure, shall be utilized in the structural design of restrained or rigid retaining walls.

For foundation or stem walls with active earth pressure loading, an equivalent fluid pressure of **45 PCF** is appropriate.

Interior Slabs-On-Grade

In interior slab areas, a **minimum of 12-inch** thickness of the topsoil shall be excavated and removed. Interior slabs shall be founded upon the following section from top to bottom: 1) a leveling course mat 4 inches in thickness composed of a ¾-inch minus free draining material (WYDOT Grade W or equivalent) compacted to a minimum of 95% of maximum density as determined by ASTM D 1557, 2) 12 inches of structural fill, and 3) the upper 8 inches of native subgrade soils compacted to a minimum of 95% density as determined by ASTM D 698. Any excessively loose material or soft spots encountered in slab subgrade will require over-excavation and backfilling with structural fill. Where native colluvium forms the subgrade the requirement for structural fill may be waived when approved by this office.

All slabs should be a minimum of 4 inches thick. A moisture retardant barrier can be placed beneath all floor slabs to minimize potential ground moisture effects on floor coverings and to minimize the potential for radon infiltration. Testing for the presence of radon has not been conducted at this location. If desired, placing ASTM C33 size 5 aggregate for the granular mat beneath slabs can enhance radon remediation.

Concrete slab-on-grade control joints should be saw-cut as early as possible. Nelson Engineering recommends the use of a soft cut system, which allows saw cutting as soon as the concrete can support foot traffic. Successful crack control is dependent upon proper joint spacing. Control joints should be placed in accordance with current Portland Cement Concrete Paving Association guidelines.

Sidewalks and Exterior Slabs

Sidewalks and exterior concrete slabs for foot traffic shall be placed upon a minimum of 3 inches of ¾-inch minus crushed gravel placed upon 8 inches of structural fill. The native subgrade must be compacted to a minimum of 95% of maximum dry density per ASTM D698 and inspected to 8-inch depth. Any fill required to increase the elevation of the slab should meet the requirements for granular structural fill. (Refer to Earthwork Section for requirements). All fill material within 2 feet of the slabs must be compacted to a minimum 95% of the maximum density as determined by ASTM D698.

Driveway and Parking Lot Recommendations
Recommended road and parking lot sections are given in the table below. Proper drainage is essential for satisfactory road and parking area performance.

PAVEMENT SECTION COMPONENTS	Paved	Gravel Surfaced
Asphaltic Concrete	2.0 inches	
¾ inches Minus Crushed Aggregate	4.0 inches	6.0 inches
Structural Fill*	12 inches	12 inches
Nonwoven Geotextile* – Mirafi 160N – Placed on Compacted Native Soils		
Compacted Subgrade	Upper 8 inches of native in-place material compacted to 95% of the maximum density determined by ASTM D698.	

* *Where Nelson Engineering determines suitably dense native soils form the subgrade, the requirement for structural fill and nonwoven geotextile may waived.*

CONSTRUCTION CONSIDERATIONS

Earthwork and Site Grading
Excavation work and heavy equipment access will be difficult when wet conditions exist due to moisture sensitive soils. A protracted period of wet conditions can be expected during and after seasonal snowmelt. Placement of gravel surfacing and/or free-draining native material supported by geotextiles may be required to provide construction access. General recommendations for earthwork suitability, placement, and compaction procedures are provided below:

- Within structure footprints, hardscape, and areas to be paved, all organic material, undocumented fill, and debris should be stripped and removed. Loose and disturbed native soils should be scarified, moisture-conditioned, and compacted. Finish surfaces should be sloped away from the foundations at a minimum of five percent.

- Fill materials shall not be placed, spread, or compacted while the ground is frozen or during unfavorable weather conditions. Fill materials should be at the proper moisture content prior to compaction and should contain no frozen soil. When site grading is interrupted by precipitation, filling operations should not resume until Nelson Engineering approves the moisture and density conditions of the previously placed fill.

- Loess and silt soils are present that will exhibit undesirable engineering properties when wetted. Every effort should be made to ensure that moisture from precipitation or other sources does not infiltrate foundation bearing, slab, and roadway subgrade during construction. Grading during construction shall be provided to drain storm water from the exposed excavations during precipitation and snowmelt events. In case of rain or snow, excavation work shall stop and exposed soils shall be covered to prevent moisture infiltration. If moisture has been allowed to infiltrate the subgrade and bearing soils in any fashion, filling and excavation operations shall not resume until Nelson Engineering approves the moisture and density conditions of the subgrade soils.

- **Structural Fill** shall consist of Clean Rock Fill or Crushed Concrete, or gravels (USCS classification GW or GP).

  Gravels shall have the following characteristics: 6-inch maximum particle size with no more than 40% oversize (greater than ¾") and no more than 5% fines passing the #200 sieve. Structural fill shall be placed in layers of not more than 8 inches in thickness. Each layer of structural fill should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum density of 95% of the maximum dry density as determined by ASTM Designation D 698. The maximum density of material containing more than 30% oversize (greater than ¾" diameter) cannot be determined by use of the ASTM Designation D 698. In this case, a field maximum density may be determined by a test strip method. The material shall be compacted at or near optimum moisture content and a field density test shall be taken after each pass of the compaction equipment. This sequence shall continue until the maximum field density is achieved. This maximum field density shall be used for subsequent field compaction tests. Enough density tests should be taken to monitor proper compaction.

  Crushed Concrete shall meet the gradation requirements of gravels and shall be free of all debris and rebar. Proposed gradation, source, and compaction methods shall be submitted to Nelson Engineering for approval prior to use.

  Clean Rock fill consisting of hard durable crushed or screened rock of 3/4"-4" size. Proposed gradation, source, and compaction methods shall be submitted to Nelson Engineering for approval prior to use.

- Excavations and utility trenches should be laid back to safe slopes or properly shored. Excavations and shoring operations should be conducted in accordance with the most recent versions of the OSHA Construction Standards for Excavations, Part 1926, Subpart P and Wyoming Public Works Standard Specifications. Cut slopes no steeper than 0.5 (H):1(V) for excavations less than 10 feet height and 0.75(H):1(V) for excavations less than 25 feet height are acceptable during construction. Some rockfall can be expected in excavations. Safety of construction personnel is the responsibility of the contractor. Excavations for utilities shall be shored if the proper slope cannot be maintained.

- During earthwork phases of the project, a representative of Nelson Engineering should be present to observe exposed native soils and fill materials for suitability and consistency. A documented testing program should be conducted to determine that soil compaction is in accordance with requirements.

- Backfill placed against structures (i.e., pipes and walls) shall be of a character and in a manner that will not damage that structure. In no case shall material greater than 6 inches in diameter bear directly on or against these structures. Placing oversized material against rigid surfaces can damage the structure and interferes with proper compaction.

-

GENERAL COMMENTS

It is critical that the structural engineer, civil engineer and other project designers review this report. When project plans and specifications are complete, a consultation with this

office should be arranged to ensure compliance with this report. Additional or supplementary recommendations concerning foundations and earthwork may be required at this time. Monitoring and testing should also be performed to verify that suitable materials are used for structural fills and backfills and that fills are properly placed and compacted. Concrete testing and special inspections should be performed prior to and during placement of all concrete to ensure concrete and reinforcing steel bar comply with project plans and specifications.

WARRANTY AND LIMITING CONDITIONS

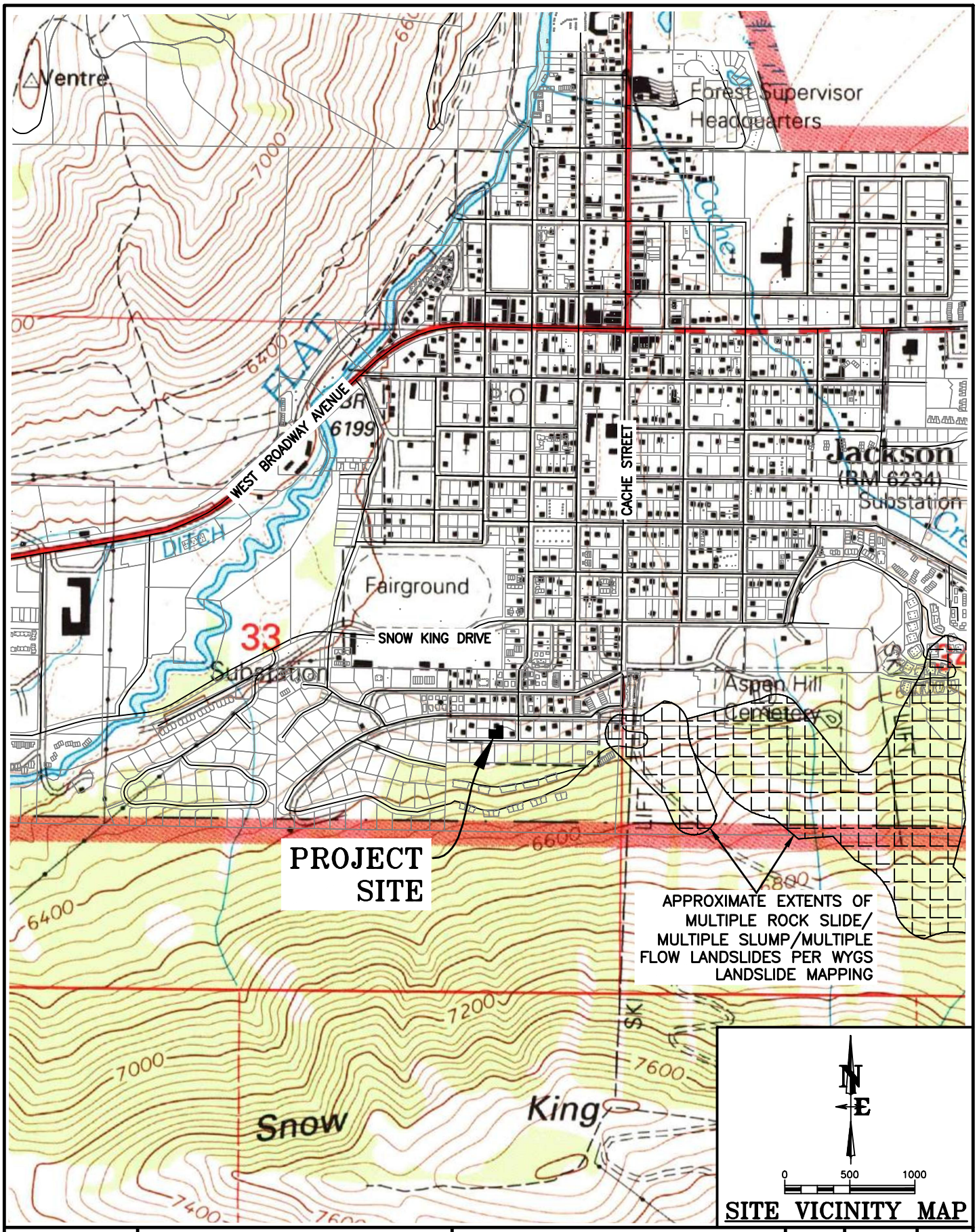
The field observations and research reported herein are considered sufficient in detail and scope to form a reasonable basis for the purposes cited above. Nelson Engineering warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology, only for the site described in this report. No other warranties are implied or expressed.

These engineering methods have been developed to provide the client with information regarding apparent or potential engineering conditions relating to the subject property within the scope cited above and are limited to the conditions observed at the time of the site visit and research. There is a distinct possibility that conditions may exist which could not be identified within the scope of the investigation or which were not apparent during the site investigation. The report is also limited to the information available at the time it was prepared. In the event additional information is provided to Nelson Engineering following this report, it will be forwarded to the client in the form received for evaluation by the client. This report was prepared for use by Scott Anderson in Jackson, Wyoming ("Client") and the conclusions and recommendations presented in this report are based on the agreed-upon scope of work outlined in the report and the contract for professional services between Client and Nelson Engineering ("Consultant"). Use or misuse of this report, or reliance upon the findings hereof by any parties other than the Client, is at their own risk. Neither the Client nor Consultant may make any representation of warranty to such other parties as to the accuracy or completeness of this report or the suitability of its use by such other parties for any purpose whatsoever, known or unknown, to the Client or Consultant. Neither Scott Anderson nor Nelson Engineering shall have any liability to, or indemnifies or holds harmless third parties for any losses incurred, by the actual or purported use or misuse of this report. No other warranties are implied or expressed.

Philip Gyr, PE
Geotechnical Engineer

APPENDIX

DRAWINGS



SITE VICINITY MAP

DRAWING NO: 1	TITLE: LOT 2 ASPEN HILL LOTS 225 SPRUCE DRIVE GEOTECHNICAL INVESTIGATION	NELSON ENGINEERING P.O. BOX 1599, JACKSON WYOMING (307) 733-2087	DATE	8/12/2020	REV.
JOB NO: 20-219-01			SURVEYED	-	
			DRAWN	AP	
			CHECKED	PG	
			APPROVED	PG	

LOT 1, ASPEN
HILL LOTS

PROPERTY
BOUNDARY, TYP.

6244

6246

6248

6250

6252

6254

6256

6258

TP-2

TP-3

TP-1

PROPOSED
CABIN/ARU
FOOTPRINT

FUTURE
RESIDENCE
FOOTPRINT

LOT 3B, BLOCK 6
ASPEN HILL LOTS

LOT 1B, BLOCK 6
ASPEN HILL LOTS

SPRUCE DRIVE RIGHT-OF-WAY

N

E

0 10 20

PROPERTY BOUNDARIES FROM TETON COUNTY GIS. CONTOURS FROM TETON COUNTY GIS AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUcTION. SITE PLAN BY ESTEAM ARCHITECTURE. TEST PITS LOCATED WITHIN ±3 FEET USING HANDHELD GPS UNIT.

		REV.
DATE	8/13/2020	-
SURVEYED		
ENGINEERED	AP	
DRAWN	AP	
CHECKED	PG	
APPROVED	PG	

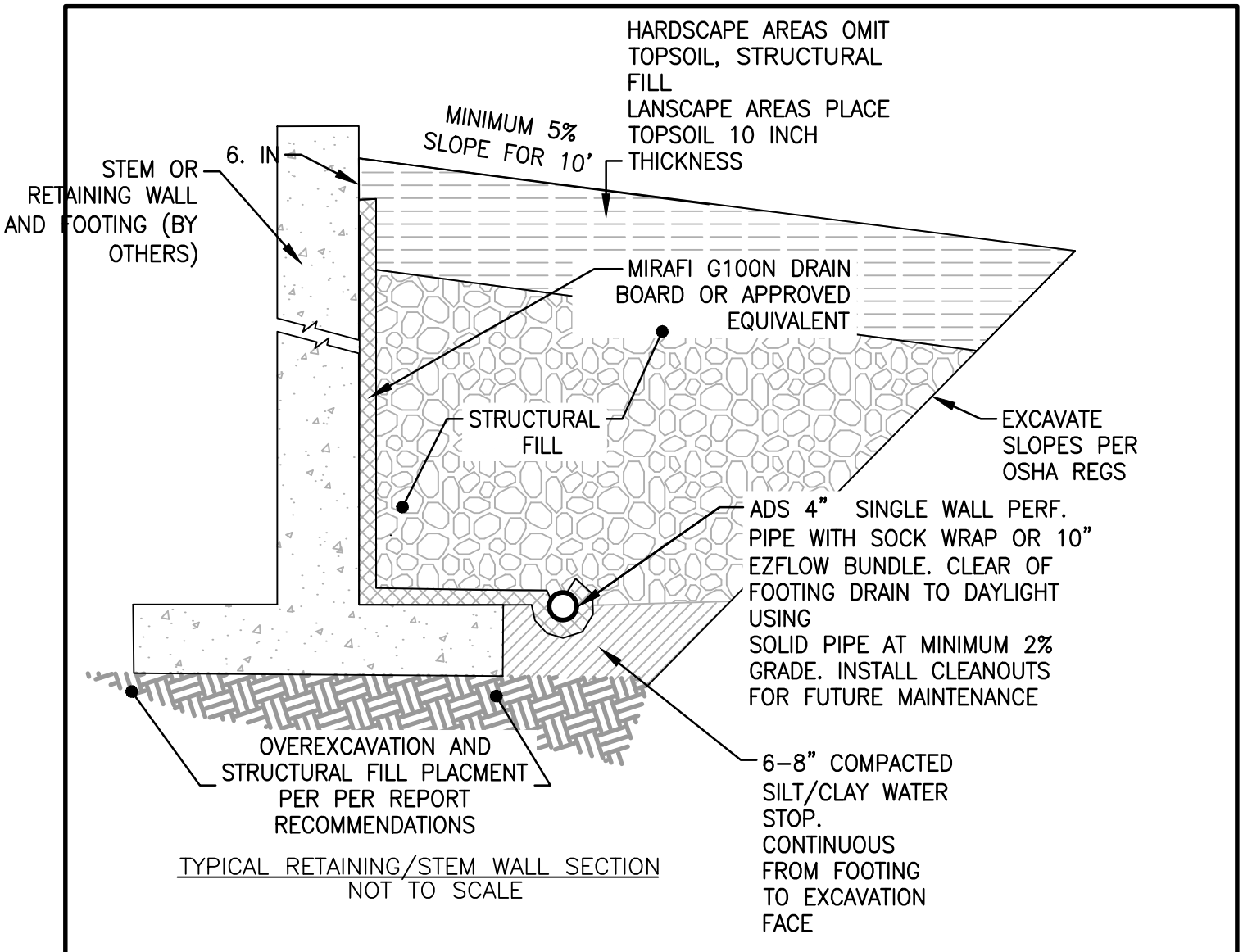
NELSON ENGINEERING
P.O. BOX 1599, JACKSON WYOMING (307) 733-2087

DRAWING TITLE
TEST PIT LOCATION MAP

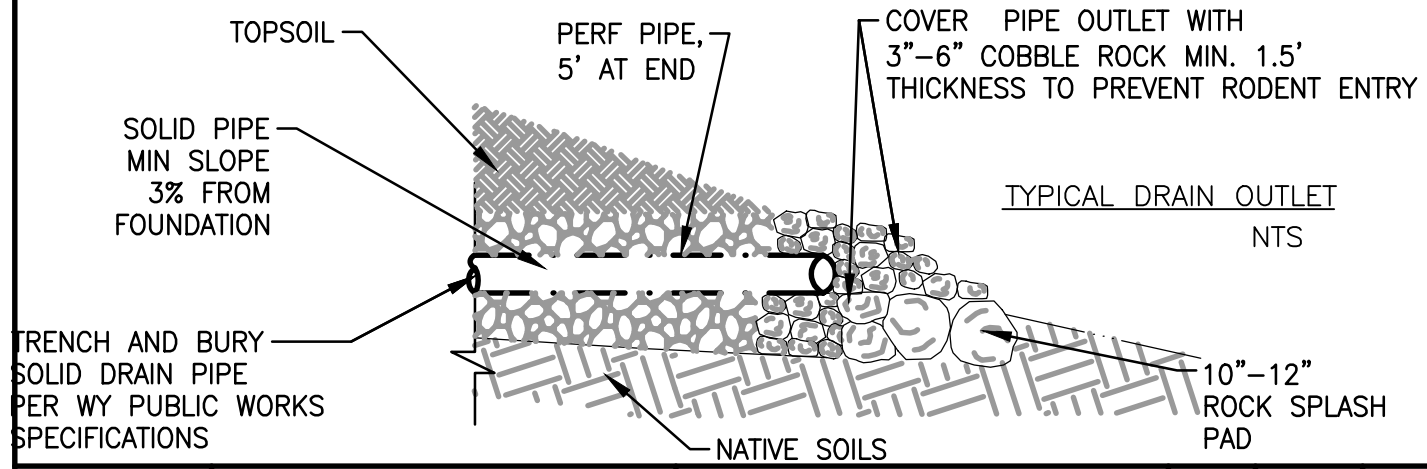
JOB TITLE
LOT 2, ASPEN HILL LOTS
225 SPRUCE DRIVE
GEOTECHNICAL INVESTIGATION

DRAWING NO
2

JOB NO
20-219-01



TYPICAL RETAINING/STEM WALL SECTION
NOT TO SCALE



TYPICAL DRAIN OUTLET
NTS

DRAWING NO 3	TITLE LOT 2 ASPEN HILL TYPICAL FOUNDATION BACKFILL AND DRAIN	NELSON ENGINEERING P.O. BOX 1599, JACKSON WYOMING (307) 733-2087	DATE	9 23 20	REV.
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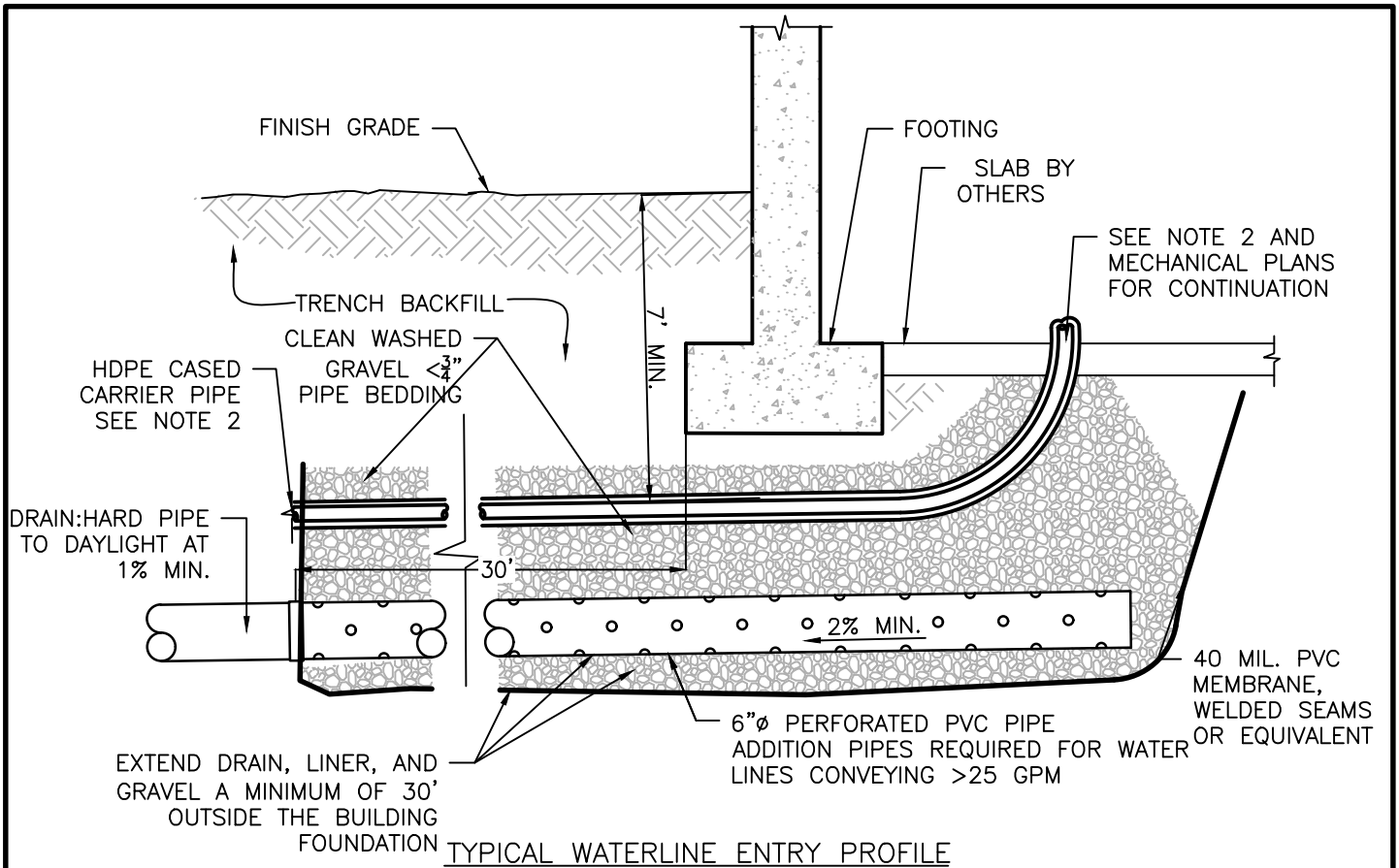
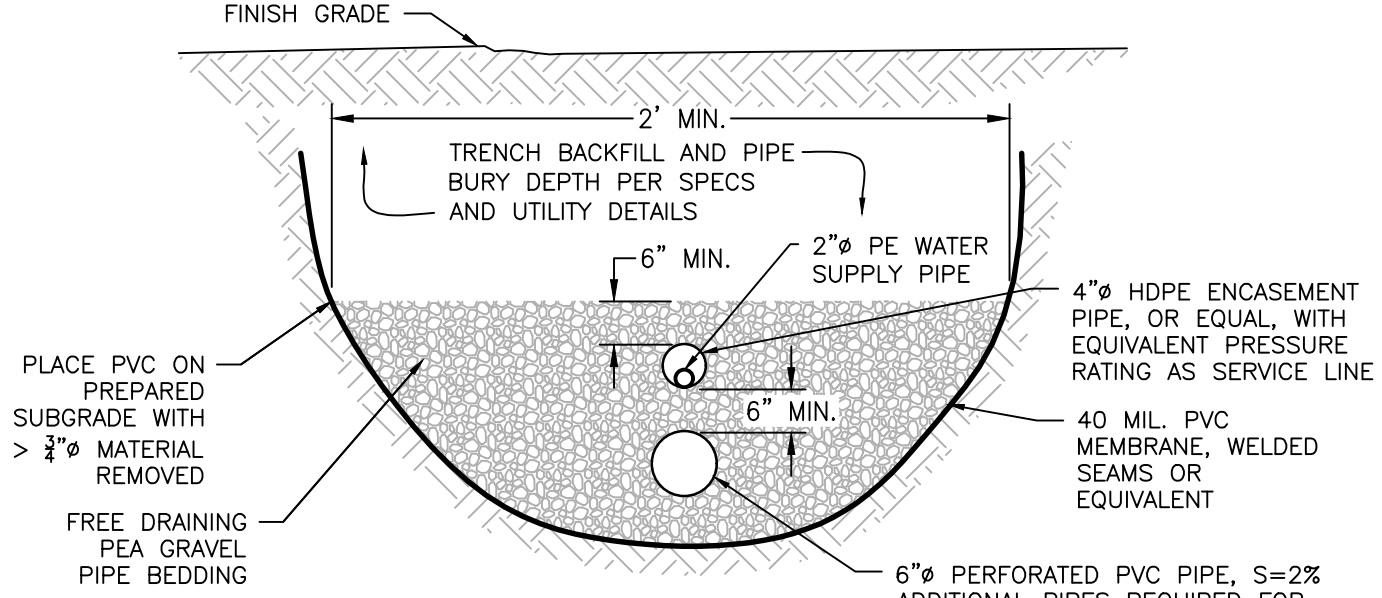


TYPICAL WATERLINE ENTRY PROFILE

NTS

NOTES:

1. SLOPE WATER LINE, MEMBRANE LINER AND PERFORATED DRAIN AT A MINIMUM OF 2% AWAY FROM THE BUILDING FOR A DISTANCE OF 30 LINEAL FEET.
2. ENCASE THE WATER SERVICE LINE IN A LARGER PIPE FROM FOUNDATION EXTERIOR TO THE MECHANICAL ROOM. ENCASEMENT PIPE (SLEEVE) SHALL BE HDPE, OR EQUAL, WITH EQUIVALENT PRESSURE RATING AS THE SERVICE LINE. SEAL THE CASING TO CARRIER PIPE WITH A PRESSURE RATED SEAL TO PREVENT LEAKAGE AT BOTH TEMINATIONS
3. MEMBRANE SHALL FORM A LEAK PROOF CONTINUOUS LAYER OVER THE BOTTOM AND SIDES OF TRENCH 2 FEET ABOVE PIPE. INSTALL MEMBRANE PER MANUFACTURER'S RECOMMENDATIONS FOR SUBGRADE AND WELDS.



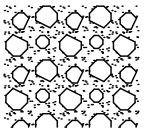
WATERLINE ENTRY CROSS-SECTION

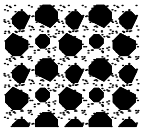
NTS

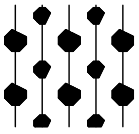
DRAWING NO: 4	TITLE: Lot 2 Aspen Drive WATERLINE LEAK CAPTURE SYSTEM	NELSON ENGINEERING P.O. BOX 1599, JACKSON WYOMING (307) 733-2087	DATE	9 22 20	REV.
JOB NO: x			SURVEYED	N/A	
			DRAWN	BR	
			CHECKED	PG	
			APPROVED	PG	

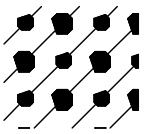
TEST PIT LOGS

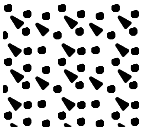
SOIL GRAPHICS

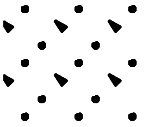
GW 

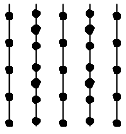
GP 

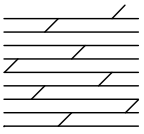
GM 

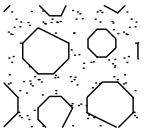
GC 

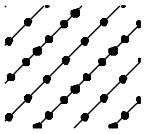
SW 

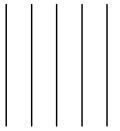
SP 

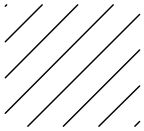
SM 

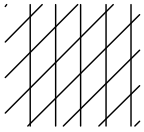
BEDROCK 

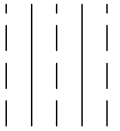
COBBLES/BOULDERS 

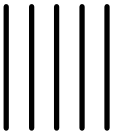
SC 

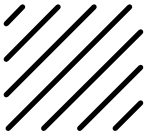
ML 

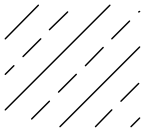
CL 

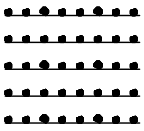
ML–CL 

OL 

MH 

CH 

OH 

PT 

NOTE: ANGLED DEMARCATIONS ON THE LOGS INDICATE APPROXIMATE OR POORLY DEFINED BOUNDARIES BETWEEN SOIL TYPES.

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GEOTECHNICAL GENERAL NOTES

CORRECTED SPT: Standard Penetration Test values corrected to $N1_{60}$ correcting for theoretical free-fall hammer energy and overburden pressure per 7th edition of the AASHTO Bridge Design Specifications.

DRILLING, SAMPLING, AND SOIL PROPERTIES ABBREVIATIONS AND SYMBOLS

N: Standard Penetration Test
U_c: Unconfined compressive strength, Pounds/ft^2 (PSF)
Pp: Pocket Penetrometer values, Ton/ft^2 (TSF)
FILGC: Fragments indicate gravels and cobbles larger than split spoon diameter.
w: Water content, %
LL: Liquid limit, %
PI: Plasticity index, %
gd: In-situ dry density, lbs/ft^3 (PCF)
▽: Ground water level
SS: Split-Spoon Sample
ST: Shelby Tube Sampler
CS: Cylindrical Brass Lined Sample


Monitoring Well, diagonal hatching indicates screen and sand packed interval

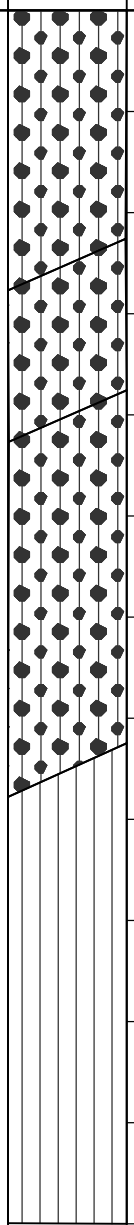
SOIL RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

Non-Cohesive Soils	SPT	Cohesive Soils	Pp-(tons/ft^2)
Very Loose	0 - 4	Very Soft	0 - 0.25
Loose	4 - 10	Soft	0.25 - 0.50
Slightly Compact	8 - 15	Medium Stiff	0.50 - 1.00
Medium Dense	10 - 30	Stiff	1.00 - 2.00
Dense	30 - 50	Very Stiff	2.00 - 4.00
Very Dense	50+	Hard	4.00+

PARTICLE SIZE

Boulders:	12 in.+	**Coarse Sand:**	5 mm(#4)-2 mm(#10)	**Silts and Clays:** **<#200**
Cobbles:	12 in.-3in.	**Medium Sand:**	2 mm(#10)-0.4mm(#40)	
Gravel:	3in.-5mm(#4)	**Fine Sand:**	0.4mm(#40)-0.075mm(#200)	

PROJECT NAME: **LOT 2, ASPEN HILL LOTS**	**TEST PIT No. 1** PAGE: 1
DATE STARTED / FINISHED: **7/24/2020**	OPERATOR: **FC EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **HITACHI 75US TRACKED EXCAVATOR**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	



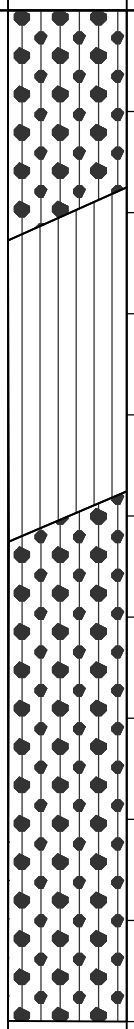
DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
				This log is part of a report prepared by Nelson Engineering for this project and should be read with the report. This summary applies only at the location of the test pit and at the time of the excavation. Subsurface conditions may differ at other locations and may change at this location with passage of time. The data presented is a simplification of actual conditions encountered.					
1				*0'–2.5' DRY, DK BROWN SILTY GRAVEL/GRAVELLY SILT WITH COBBLES, MODERATE ROOTS THROUGHOUT, MEDIUM DENSE TO DENSE, ~50% ANGULAR TO SUB–ANGULAR GRAVELS AND COBBLES, ~50% SILT MATRIX, MATRIX PP=2–3 TSF, VERY STIFF*					*~15–20% NORTH–FACING SLOPE WITHIN SPARSE CONIFER FOREST WITH GRASS AND SHRUB UNDERSTORY NEAR SOUTHEAST PROPERTY CORNER*
2									
3				*2.5'–4.0' DRY, BROWN SILTY GRAVEL WITH COBBLES UP TO 12" MAXIMUM DIMENSION, DENSE, ~65% ANGULAR TO SUB–ANGULAR GRAVELS AND COBBLES, ~35% SILT MATRIX, MATRIX PP=1.5–2.5 TSF, STIFF TO VERY STIFF, COLLUVIUM*					*EASY DIGGING TO 4'*
4				*4.0'–7.5' DRY, LT BROWN SILTY GRAVEL WITH COBBLES AND BOULDERS UP TO 4' MAXIMUM DIMENSION, DENSE TO VERY DENSE, ~65% ANGULAR TO SUB–ANGULAR GRAVELS TO BOULDERS, ~35% SILT MATRIX, MATRIX PP=1.5–2.5 TSF, STIFF TO VERY STIFF, COLLUVIUM*					
5									
6									*4' BOULDER FROM 5'–7'*
7									
8		X	*TP1–1 8'–9'*	*7.5'–BOP SLIGHTLY MOIST, BROWN SILT LOESS WITH MINOR GRAVELS, COBBLES AND BOULDERS UP TO 3' MAXIMUM DIMENSION, HOMOGENOUS, MINOR PINHOLE VOIDS, MINOR WHITE CALCAREOUS STRINGERS, PP>3.5 TSF, VERY STIFF TO HARD*					*MODERATE TO HARD DIGGING THROUGH GRAVELS, COBBLES, AND BOULDERS BELOW 4'*
9									
10									
11									
12				*BOP=12.0'*					
13				*NO CAVING* *NO GROUNDWATER ENCOUNTERED*					
14									
15									

NELSON ENGINEERING
P.O. BOX 1599, JACKSON WYOMING (307) 733–2087

CLIENT: **SCOTT ANDERSON**
JACKSON, WYOMING

JOB NO. 20–219–01

PROJECT NAME: **LOT 2, ASPEN HILL LOTS**	**TEST PIT No. 2** PAGE: 1
DATE STARTED / FINISHED: **7/24/2020**	OPERATOR: **FC EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **HITACHI 75US TRACKED EXCAVATOR**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	



DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
				This log is part of a report prepared by Nelson Engineering for this project and should be read with the report. This summary applies only at the location of the test pit and at the time of the excavation. Subsurface conditions may differ at other locations and may change at this location with passage of time. The data presented is a simplification of actual conditions encountered.					
1				*0'–2.0' DRY, DK BROWN SILTY GRAVEL/GRAVELLY SILT WITH COBBLES, MODERATE ROOTS THROUGHOUT, MEDIUM DENSE TO DENSE, ~50% ANGULAR TO SUB–ANGULAR GRAVELS AND COBBLES, ~50% SILT MATRIX, MATRIX PP>3.0 TSF, VERY STIFF TO HARD*					*~10–15% NORTH–FACING SLOPE WITHIN SPARSE CONIFER FOREST WITH GRASSY UNDERSTORY ALONG NORTH PROPERTY LINE*
2				*2.0'–5.0' DRY, MOTTLED BROWN/LT BROWN/DK BROWN SILT LOESS WITH ~15% GRAVELS AND COBBLES UP TO 12" MAXIMUM DIMENSION, MINOR PINHOLE VOIDS, MINOR WHITE CALCAREOUS STRINGERS, PP>4.0 TSF, HARD*					
3									*EASY DIGGING TO 5'*
4	X	X	*TP2–1 4'–5'*	*USCS CLASSIFICATION – ML (SILT)*	*28*	*24*	*86.6*	*10.7*	
5		X		*5.0'–BOP DRY, LT BROWN SILTY GRAVEL WITH COBBLES AND BOULDERS UP TO 4' MAXIMUM DIMENSION, VERY DENSE, ~75% ANGULAR TO SUB–ANGULAR GRAVELS TO BOULDERS, ~25% SILT MATRIX, MATRIX PP=1.5–2.5 TSF, STIFF TO VERY STIFF, COLLUVIUM*					
6									*HARD DIGGING THROUGH GRAVELS, COBBLES, AND BOULDERS BELOW 5'*
7									
8									
9									
10				*REFUSAL DUE TO MULTIPLE BOULDERS AT BOP BOP=10.0'*					
11				*NO CAVING NO GROUNDWATER ENCOUNTERED*					
12									
13									
14									
15									

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CLIENT: **SCOTT ANDERSON JACKSON, WYOMING**

JOB NO. 20–219–01

PROJECT NAME: **LOT 2, ASPEN HILL LOTS**	**TEST PIT No. 3** PAGE: 1
DATE STARTED / FINISHED: **7/24/2020**	OPERATOR: **FC EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **HITACHI 75US TRACKED EXCAVATOR**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	

This log is part of a report prepared by Nelson Engineering for this project and should be read with the report. This summary applies only at the location of the test pit and at the time of the excavation. Subsurface conditions may differ at other locations and may change at this location with passage of time. The data presented is a simplification of actual conditions encountered.

WELL LOG	GRAPHICS LOG	DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1				*0'–1.0' DRY, BROWN GRAVEL WITH SILT AND SAND, POORLY GRADED, ~60% ROUND GRAVELS, ~40% SILTY SAND, IMPORTED PIT RUN DRIVEWAY FILL*					*WITHIN FILL SLOPE OF MAKESHIFT ACCESS DRIVEWAY WITHIN SPARSE CONIFER FOREST WITH GRASSY AND SHRUB UNDERSTORY*
		2				*1.0'–5.5' DRY, DK BROWN SILTY GRAVEL/GRAVELLY SILT WITH COBBLES, MODERATE ROOTS THROUGHOUT, MEDIUM DENSE TO DENSE, ~50% ANGULAR TO SUB–ANGULAR GRAVELS AND COBBLES, ~50% SILT MATRIX, MATRIX PP=2–3 TSF, VERY STIFF*					*EASY DIGGING TO 5.5'*
		3									
		4									
		5									
		6				*5.5'–BOP DRY, LT BROWN SILTY GRAVEL WITH COBBLES AND BOULDERS UP TO 4' MAXIMUM DIMENSION, VERY DENSE, ~75% ANGULAR TO SUB–ANGULAR GRAVELS TO BOULDERS, ~25% SILT MATRIX, MATRIX PP=1.5–2.5 TSF, STIFF TO VERY STIFF, COLLUVIUM*					*HARD DIGGING THROUGH GRAVELS, COBBLES, AND BOULDERS BELOW 5.5'*
		7									
		8									
		9									
		10									
		11				*REFUSAL DUE TO LARGE BOULDER AT BOP* *BOP=11.0'* *NO CAVING* *NO GROUNDWATER ENCOUNTERED*					
		12									
		13									
		14									
		15									

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CLIENT: **SCOTT ANDERSON**
JACKSON, WYOMING

JOB NO. 20–219–01

LABORATORY RESULTS

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USCS CLASSIFICATION

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Sample ID: TP2-1 Depth (ft): 4'-5'

Unified Soils Classification
Silt (ML)

Gravel	**4%**
Sand	**7%**
Fines	**90%**

Liquid Limit:	**28**
Plastic Limit:	**24**
Plasticity Index:	**4**

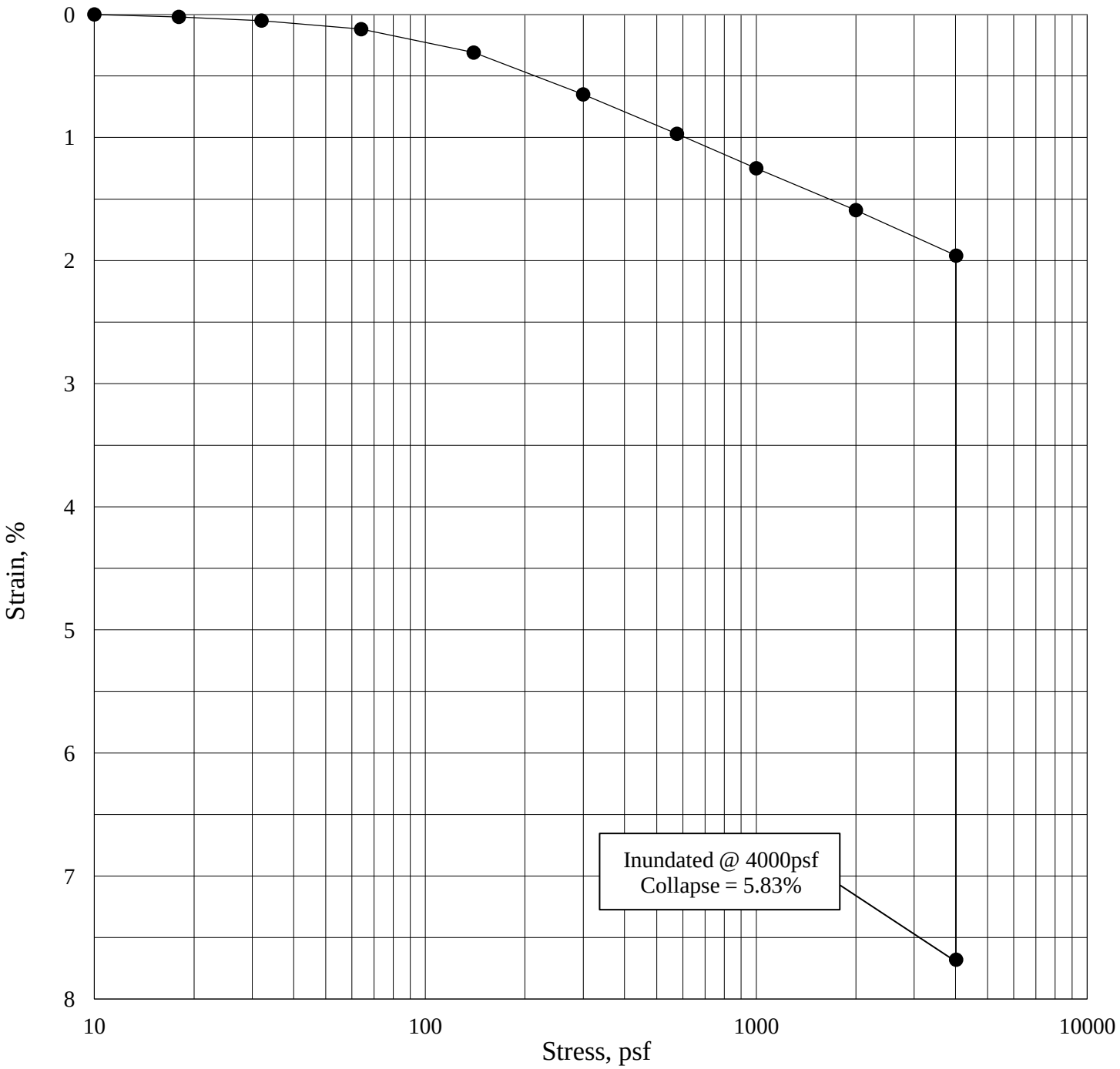
In-Situ Moisture Content	**10.7%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	270.6	270.6	0.0	0%	100%
1"	25	270.6	270.6	0.0	0%	100%
3/4"	18.75	270.6	270.6	0.0	0%	100%
3/8"	9.5	270.6	281.8	11.2	2%	98%
#4	4.75	270.6	285.2	14.6	4%	96%
#10	2.00	270.6	275.7	5.1	4%	96%
#40	0.425	270.6	277.3	6.7	5%	95%
#100	0.15	270.6	284.9	14.3	7%	93%
#200	0.075	270.6	293.7	23.0	10%	90%
Pan	0	270.6	910.7	640.1	100%	0%
		Total Weight of Sample (g)		**715.0**		

Moisture Content	
Wet Wt + Tare (g)	1061.9
Dry Wt. + Tare (g)	985.7
Wt of Water (g)	76.3
Tare Wt. (g)	270.7
Dry Wt. (g)	715.0
Moisture Content	10.7%
Wash	
Wet Wt. + Tare (g)	1061.9
Pre Wash Dry (g)	715.0
Post Wash Dry (g)	74.9
Tare Wt. (g)	270.7
Wt.Of Minus #200 =	640.1

Project:	Lot 2 Aspen Hill Lots
Job Number	20-219-01
Visual ID:	Mottled Silt Loess

Sampled By:	AP
Date:	7/24/2020
Tested By:	PR
Date:	7/28/2020



				Initial Dry Density (pcf)	Initial Moisture Content (%)
Boring No.	TP2-1	Depth:	4 - 4.5 '	**86.6**	**10.7**
Sampled By:	AP/NE, 7/23/20	Date Received:	7/29/20		

Soil Description: Silt (ML), trace to low plasticity, trace pinholes, roots,gravel, salts, orangish brown, rather dry, loose

8/11/20

SK GEOTECHNICAL
P. O. Box 80190
Billings, MT 59108-0190
Phone: 406.652.3930
Fax: 406.652.3944

Consolidation/Swell Test

SK Project Number: 08-2506
Nelson Project Number: 20-219-01
Lot 2 Aspen Hill Lots

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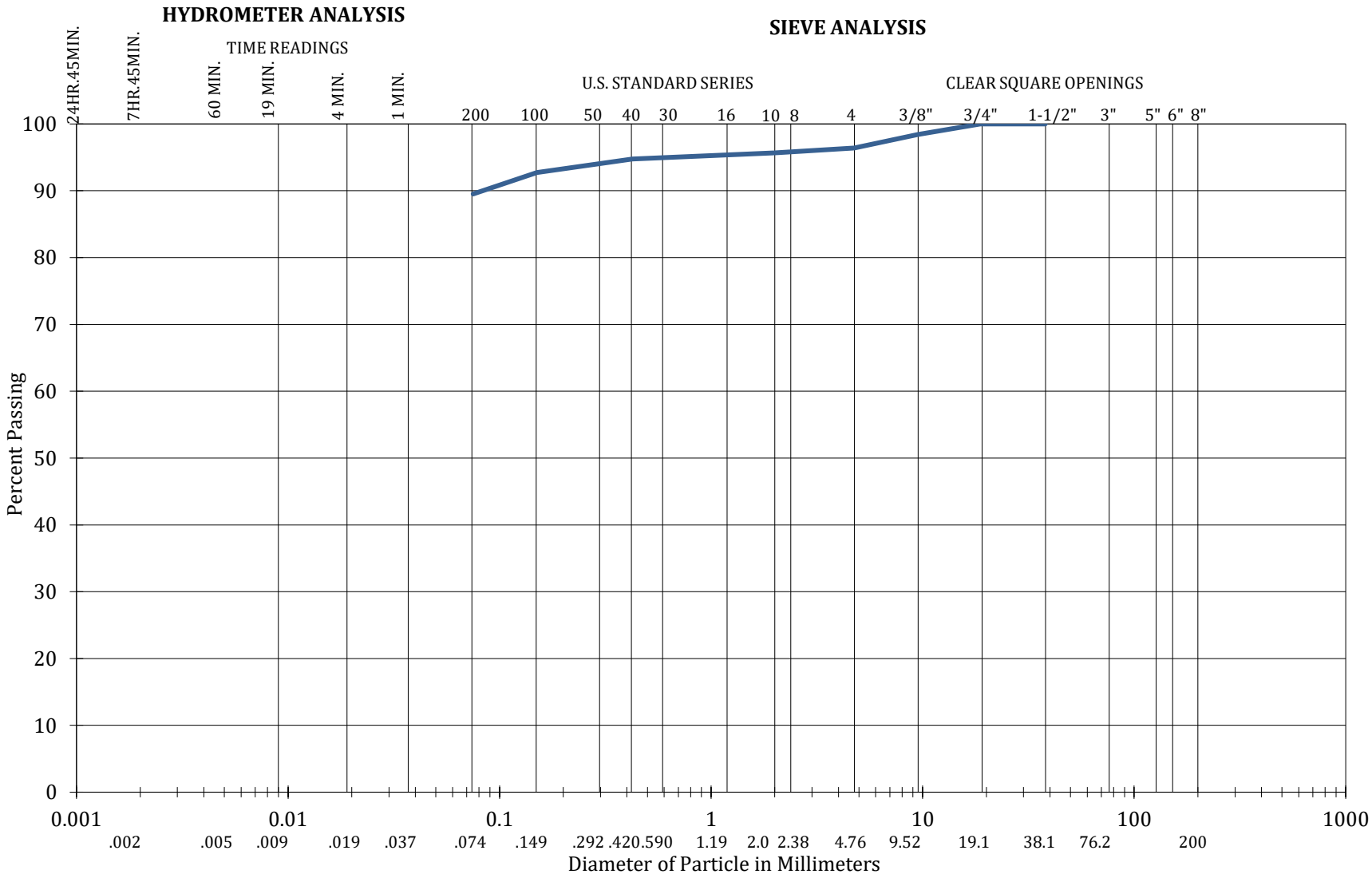
USCS CLASSIFICATION SIEVE CHART



CLAY (plastic) TO SILT (non-plastic)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

TP2-1

Lot 2 Aspen Hill Lots