TOWN OF JACKSON
PLANNING & BUILDING DEPARTMENT

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Special Districts
- ☒ START
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- ☐ Irrigation Company
- ☐ Regional Transportation

Date: December 6, 2024

Item #: P24-168 (Lot 53)
P24-174 (Lot 57)
P24-175 (Lot 58)

Planner: Tyler Valentine

Phone: 733-0440 ext. 1305

Email: tvalentine@jacksonwy.gov

Owner
BREG SK57A, LLC & BREG SK57B,LLC &
BREG SK57C, LLC
4011 80th Street
Kenosha, WI 53142

Applicant
Joe Bongiorno
Northworks Architects
185 E Hansen Ave.
Jackson, WY 83001

REQUESTS:

The applicant is submitting a request for a Development Plan for Snow King Condos at 553, 510 & 725 Upper Snow King Loop, at the parcels legally described as Lots 53, 57, & 58, Grand View Lodges, Third Addition.

PIDNs: 22-41-16-34-3-04-001
22-41-16-34-3-07-001
22-41-16-34-3-07-002

For questions, please call Tyler Valentine at 733-0440 x 1305 or email the address shown below. Thank you.

Please respond by: December 27, 2024 (with Comments)

RESPONSE: For Departments not using SmartGov, please send responses via email to planning@jacksonwy.gov

Snow King Condominiums



DEVELOPMENT PLAN REVISED SUBMISSION

MARCH 24, 2024

NORTHWORKS | BEAR DEVELOPMENT

NORTHWORKS

March 24, 2025

Tyler Valentine, Senior Planner
Town of Jackson

RE: Development Plan for Snow King Resort Lots 53, 57, and 58

Tyler,

We are pleased to submit these three development plan applications for Lots 53, 57, and 58 of the Snow King Resort. In total we propose 110,897 square feet and 240 APOs of development along with 12 affordable housing units spread through 4 buildings. Each building is 3-stories over a basement, with on-site parking. We intend to phase the construction, building Lot 57 first.

Our proposal was approved as consistent with the Snow King Resort Master Plan Design Guidelines by both SKRMA (May 23, 2024) and the Town Design Review Committee (June 12, 2024). SKRMA's approval letter is attached and also attests to the allocation of floor area and APOs from the Master Plan pool to this project. Since our original submission SKRMA has revised its accounting of floor area and APOs and the new accounting is reattached for reference; none of the changes impact Lots 53, 57 & 58.

Because this project is governed by the Snow King Resort Master Plan, the high-level character, location, bulk, and infrastructure have already been approved. Our application demonstrates compliance with the approved Master Plan. A summary of the proposed development relative to the Master Plan requirements is in the table below, with more details on the following pages.

Topic	Master Plan Standard	Lot 53	Lot 57	Lot 58
Location	Build within lot lines	Within Lot 53	Within Lot 57	Within Lot 58
Landscaping	10% LSR (min)	20% LSR 7,245 sf	17% LSR 6,500 sf	57% LSR 27,401 sf
Floor Area	915,000 sf across Resort 334,675 sf exist; 580,325 sf allowed	112,952 sf purchased by owner 110,897 sf proposed		
		42,314 sf	43,678 sf	24,905 sf
Height	3 stories over basement	3 stories over basement	3 stories over basement	3 stories over basement
Bulk	1 building or many	1 building	2 buildings	1 building
Design	SKRMA approval, DRC review	SKRMA and DRC approval	SKRMA and DRC approval	SKRMA and DRC approval
APOs	2,208 across Resort 832 exist; 1,376 allowed	240 APOs purchased by owner 240 APOs proposed		
		104 APOs	88 APOs	48 APOs
Parking	1 space per unit, on-site	1.3/unit, on-site	1.1/unit, on-site	1.6/unit, on-site
Housing	Meet LDR standard	5.925 units req. 5 units on Lot 53 + fee-in-lieu	5.516 units req. 5 units on Lot 57 + fee-in-lieu	2.962 units req. 2 units on Lot 53 + fee-in-lieu

Please let us know if any questions arise during your review.

Sincerely,

Nick Orthmann, Bear Development

NORTHWORKS

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NORTHWORKS

Project Narratives

SITE OVERVIEW

The proposed project is comprised of four condominium buildings across 3 lots, located at Snow King Resort Lots 53, 57 & 58 (Sub-Area #3). These parcels are bounded by Snow King Loop Road and the Grand View Condos to the north and the Cowboy Coaster to the south. For purposes of this application, we are referring to each building as “Lot 53”, “Lot 58”, “Lot 57 North” and “Lot 57 South”.

Each building includes 3 stories of residential condo units above basement parking. The market units will be sold to individual owners, and those individuals can rent the units out short-term at their discretion. Affordable housing units are also included in the project. The goal of this development is to create a strong sense of place between the three lots while also relating to the overall design elements of the Snow King Resort and surrounding context.

	Lot 53	**Lot 57**	**Lot 58**
PIDN	22-41-16-34-3-04-001	22-41-16-34-3-07-001	22-41-16-34-3-07-002
Address	553, Upper Snow King Loop	510, Upper Snow King Loop	725, Upper Snow King Loop
Legal	Lot 53, Grand View Lodges 2nd Addition	Lot 57, Grand View Lodges 3rd Addition	Lot 58, Grand View Lodges 3rd Addition
Zone	PR-SK	PR-SK	PR-SK
Subarea	Master Plan Subarea 3	Master Plan Subarea 3	Master Plan Subarea 3
GSA	34,412 sf	36,155 sf	47,916 sf

The three lots sit on relatively steep terrain with ski-in, ski-out access to the Snow King Ski Resort. The plazas, roads, and interstitial spaces between these four buildings shall be enlivened with plantings and materials that connect to the style of the Snow King Resort and create a safe and welcoming environment. Parking garages will be enclosed with solid garage doors, and pedestrian walking will be encouraged. The buildings will be connected to the surrounding landscape for easy access to the ski slopes and the town center.

In addition to the development proposed on the above sites, access and utilities will be constructed in easements that access the site across SKRMA land. Discussions with SKRMA are ongoing, and agreements will be worked out prior to construction.

SUMMARY OF DESIGN CHANGES SINCE OCT. 2024 DEVELOPMENT PLAN SUBMISSION

In response to feedback received on the initial design, the design team has reduced the mass of each building to better align building with neighbouring structures, moved the Lot 53 building further south and provided increased landscaping throughout the project site. The changes outlined below show updates to the site and building designs relative to our initial October 2024 Development Plan submission. All the design updates fit within the design guidelines and dimensional limitations of the Snow King Planned Resort District Master Plan.



Revised Aerial Rendering of Lots 57, 53, & 58

Lot 57 – Summary of Design Changes

Change 1: Increased landscaped areas. The sidewalk leading downhill from the 57 South building to the 57 North building was removed, allowing for additional planting to buffer between the North building and the street. The sidewalk to the east of the 57 South building was also removed to introduce more planting, including a planter along the north façade. This will further screen the South building's east entry and driveway. Crosswalks will be used to delineate the pedestrian walking paths from Lot 57 up to Lot 53 and 58.



Lot 57 – Previous Site Plan



Lot 57 – New Site Plan

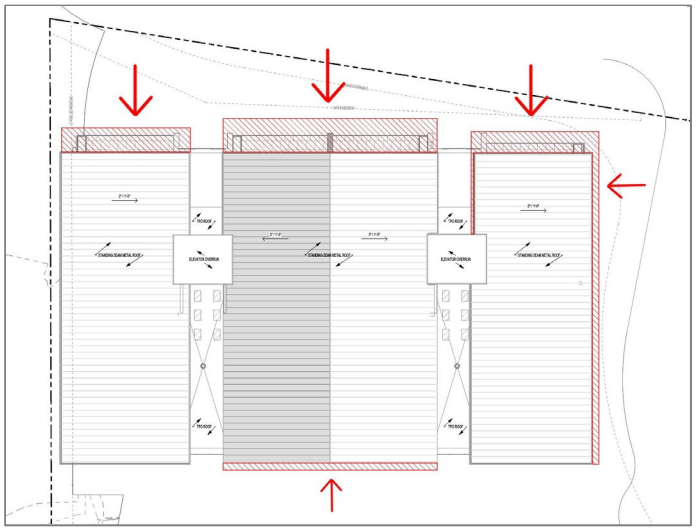
Change 2: North Building roof adjustments. The eastern shed roof was mirrored to slope in the opposite direction, resulting in a lower building height along the facade closest to Grand View. Additionally, all roofs were lowered by 1'-0" in height, and roof overhangs were pulled back to only extend 3'-0" from the exterior wall.



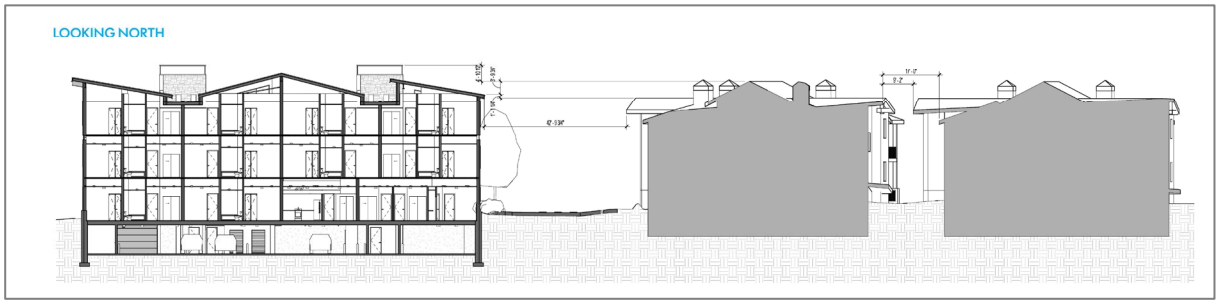
Lot 57 North – Previous Elevation



Lot 57 North – New Elevation

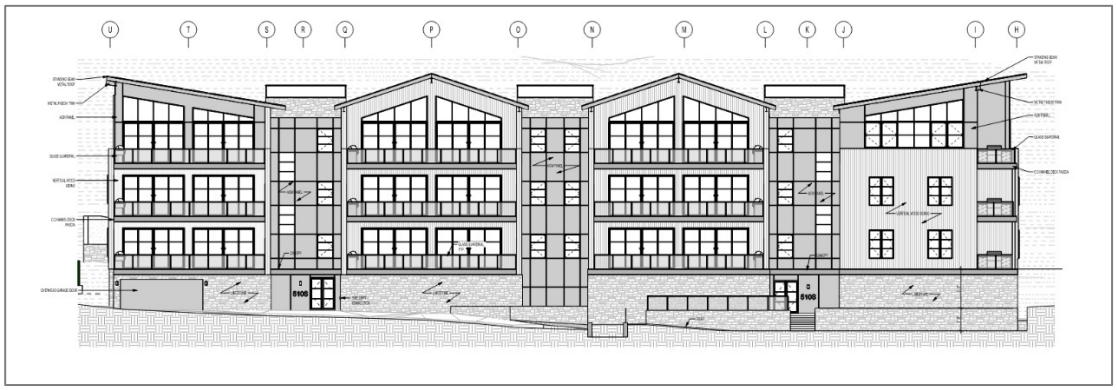


Lot 57 North – Reductions in Roof Footprint Noted in Red

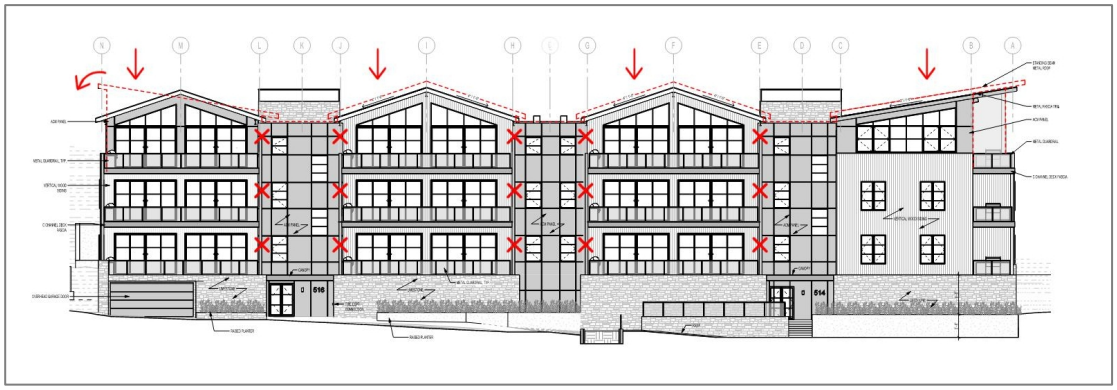


Site Section showing the relationship in heights between Lot 57 North and the adjacent Grand View buildings

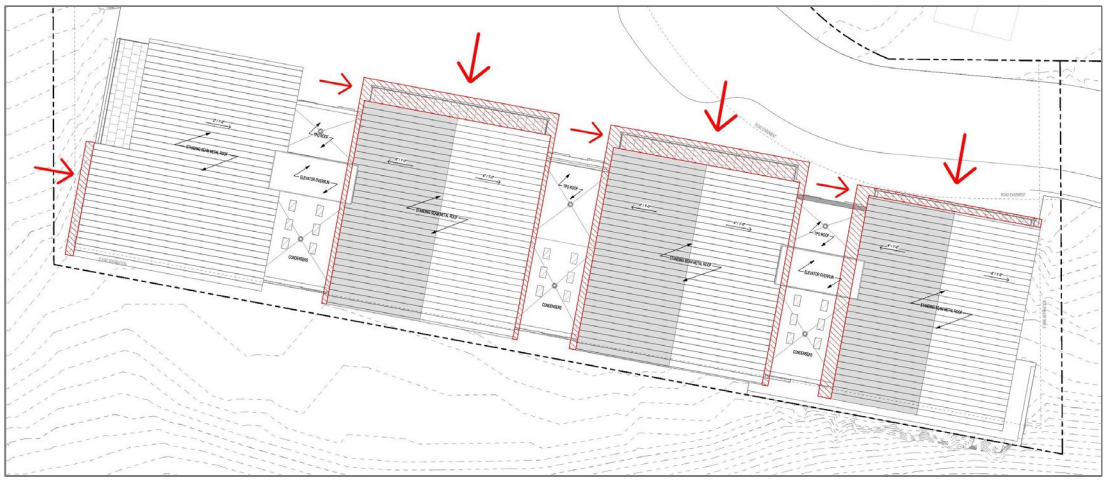
Change 3: South Building roof adjustments. The easternmost roof was changed to a gable roof, which greatly reduces the height of the building at the east façade. Additionally, all roofs were lowered by 1’-0” in height, and roof overhangs were pulled back to only extend 3’-0” from the exterior wall.



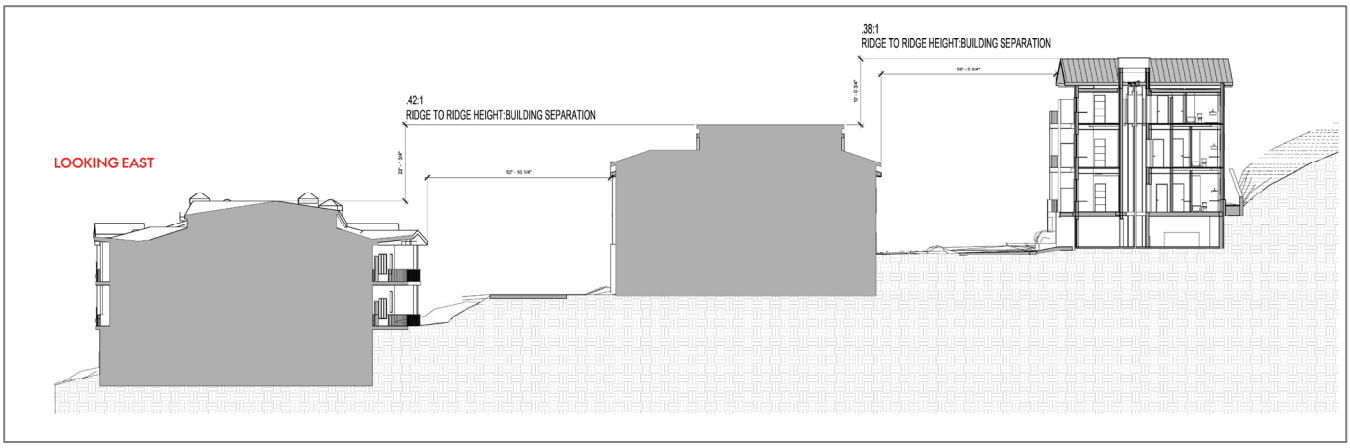
Lot 57 South – Previous Elevation



Lot 57 South – New Elevation



Lot 57 South – Reductions in Roof Footprint Noted in Red



Site Section showing the relationship in heights between Lot 57 South and the downhill Grand View buildings

Change 4: Reduction of solid walls at balconies. As shown in red 'X' labels on the preceding elevation diagrams, both the North and South buildings' balconies were redesigned to be more open-air and less enclosed by solid walls flanking each end.



Lot 57 North – Previous Solid Balcony Walls



Lot 57 North – New Open Balcony Guardrails

Lot 53 – Summary of Design Changes

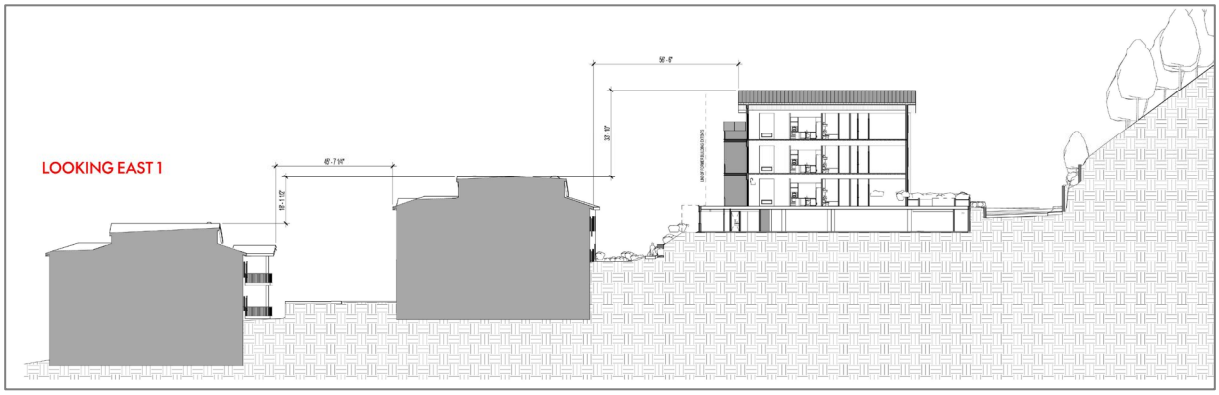
Change 5: Pushed back the entire Lot 53 building away from Grand View. The first, second, and third floor units were pulled south 15'-0" on average and 5'-0" at the central fire truck turnaround. The north basement floor plan was also pulled south an average of 5'-0" to create more space between this building and the neighbours to the north. A secondary retaining wall was removed at the north setback, allowing for additional planting and boulders to mediate the space between the two lots. Linear planter boxes were also added along the north edge of the basement roof to help create a screen between Grand View and the Lot 53 first floor terraces.



Lot 53 – Previous Site Plan



Lot 53 – New Site Plan



Site Section showing the relationship in heights between Lot 53 and the downhill Grand View buildings



Lot 53 – Setbacks and Landscape Buffers Between Lot 53 & Grand View

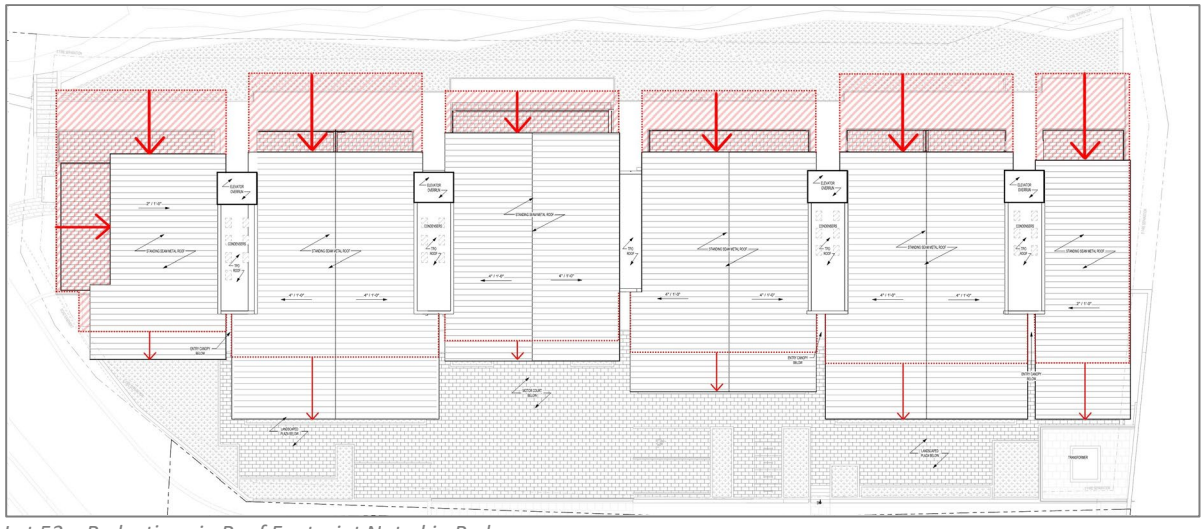
Change 6: Roof adjustments. In additional to pulling the building south, the third floor roofs were also reduced in size and in height. All the gable roofs were lowered by 1’-0” in height, and the shed roofs on the east and west end were lowered by 2’-0”. Additionally, roof overhangs were pulled back to only extend 3’-0” from the exterior walls.



Lot 53 – Previous Elevation



Lot 53 – New Elevation



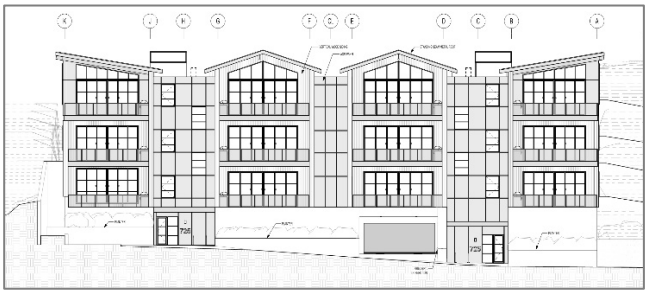
Lot 53 – Reductions in Roof Footprint Noted in Red

Change 7: Western unit stepback. As shown in the roof plan above, the third-floor western unit footprint was adjusted to greatly reduce the visual massing along the west façade. Its western exterior wall was pushed east another 10’-6”, and its roof footprint was also drastically pulled back to reduce the visual overhang.

Change 8: Reduction of solid walls at balconies. As shown in red ‘X’ labels on the preceding elevation diagrams, both the Lot 53 balconies were redesigned to be surrounded by more open-air guardrails and fewer solid walls at each end.

Lot 58 – Summary of Design Changes

Change 9: Reduction of solid walls at balconies. As shown in red ‘X’ labels below, both the Lot 53 balconies were redesigned to be surrounded by more open-air guardrails and fewer solid walls at each end.



Lot 58 – Previous Elevation



Lot 58 – New Elevation

MASTER PLAN COMPLIANCE NARRATIVE

The Snow King Resort Master Plan (Master Plan) that governs development on the subject property was approved in 2019. It establishes the entitlements and development standards for the site, addresses the major questions of development character, location, bulk, and scale, and addresses infrastructure and other considerations on a Resort-wide basis. It also serves as the Sketch Plan for all development within the Resort . The Master Plan has 12 Chapters. Applicability of each chapter to this application is discussed below.

Introduction

While the introduction does not include any standards for new development, it is instructive on how to read and use the various chapters of the Master Plan. In general, Chapters I-III of the Master Plan memorializes the compliance of the Master Plan with the Land Development Regulations and Comprehensive Plan. Chapters IV-X establish standards for new development and are the primary focus of this application. Finally, Chapters XI-XII establish standards for the continued operation of the ski hill and administration of the Resort.

More specifically, the introduction is clear that the site plans are conceptual (p.3). They establish the general location of development, open space, and pedestrian connectivity through lot lines and subarea boundaries. They illustrate the example development used to plan for the overall impact on public infrastructure. Where specific setbacks and heights, setbacks, and other dimensional limitations are required to achieve the desired character, they are specified in Chapter VII, Dimensional Limitations Plan. Where dimensions are not specified, the Master Plan relies on the Design Guidelines in Chapter VI to ensure consistency with the Master Plan (p.5). SKRMA administers the Snow King Design Guidelines with review by the Town DRC (p.54).

I. Statement of Purpose

This Chapter states the purpose of the Master Plan. Demonstration of our proposal's consistency with that purpose is the product of the totality of this application.

II. Consistent with Comp Plan

This Chapter outlines compliance of the Master Plan with the Jackson/Teton County Comprehensive Plan. By demonstrating compliance with the Master Plan, our application is also consistent with the Comprehensive Plan.

III. Compliance with LDRs

This Chapter outlines compliance of the Master Plan with the Town of Jackson Land Development Regulations. By demonstrating compliance with the Master Plan, our application is also consistent with the Land Development Regulations governing Resorts (Div. 4.3). See below for additional demonstration of compliance with the LDRs not addressed by the Master Plan.

IV. Master Site Plans

The Master Plan divides the Resort into subareas. The proposed development is in Subarea 3, which also includes the Love Ridge and Grand View condominiums and the Grand View Lodge. The Master Site Plans establish the lot lines within which the development must occur. While the Master Site Plans depict buildings to illustrate the overall location and scale of development, the bounds of the development location for Subarea 3 are the lot lines with no additional setbacks. Throughout the Master Plan, the site plans are referred to as conceptual except where setbacks are established for specific subarea – no setbacks are established for Subarea 3. The lots are

already set back from neighboring properties. Our proposed buildings are within each lot and, on Lot 58, pulled down the hill to limit disturbance.

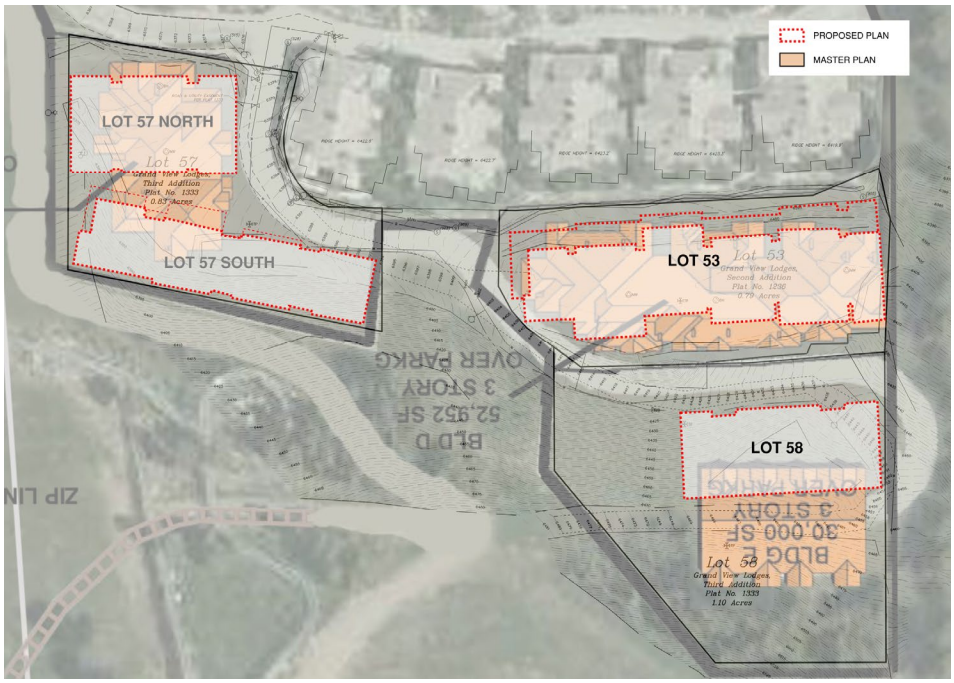


Figure 1 - Proposed site plan overlayed on Master Site Plan

The Master Site Plan also includes a circulation plan that indicates where sidewalks should be provided. Our proposal provides not only the Master Plan sidewalks but additional pedestrian connectivity of the site to the Resort's recreational amenities.

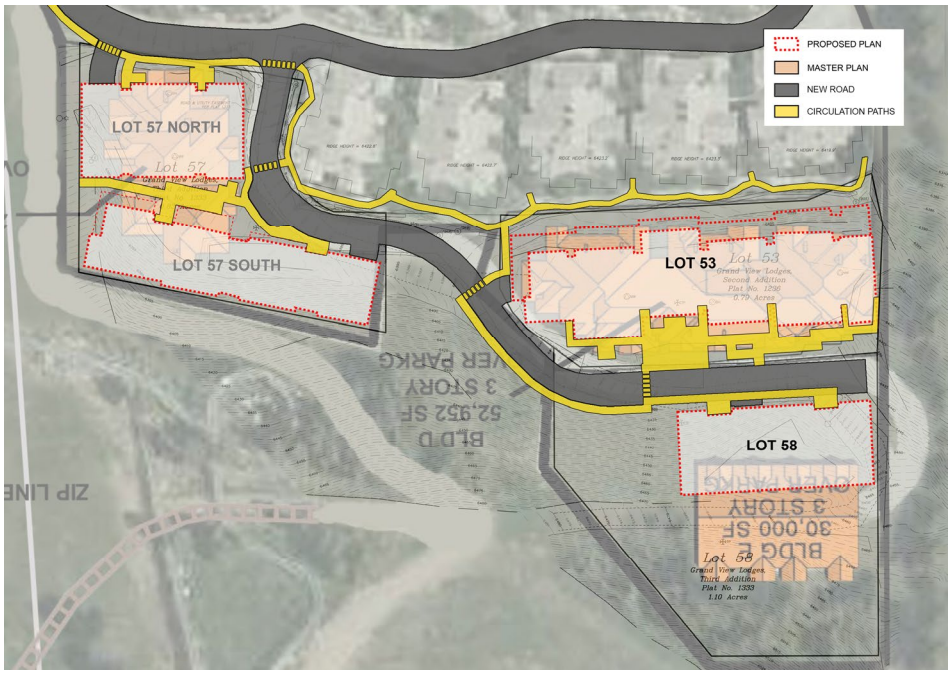


Figure 2 - Proposed pedestrian circulation plan overlayed on Master Sidewalk Plan

V. Land Use Plan

The proposed residential and short-term rental of the market condominiums are each a by-right use in Subarea 3 of the Snow King Master Plan, as is affordable workforce housing (also referred to as “Employee Housing” in the Master Plan). These uses are also the type of development anticipated in the example development table, making the proposal consistent with the resort-wide impact planning done during Master Plan approval. Below is a table showing the mix of market and affordable units by bedroom.

AREA & UNIT MIX OVERVIEW

SITE	FAR SUBTOTAL (SF)	GROSS AREA SUBTOTAL (SF)	# 1 BEDS	# 2 BEDS	# 3 BEDS	# 4 BEDS	MARKET UNIT COUNT	REQ. # OF AFF. UNITS	AFF. 1-BEDS REQ.	AFF. 1-BEDS PROVIDED	AFF. 2-BEDS REQ.	AFF. 2-BEDS PROVIDED	AFF. 3-BEDS REQ.	AFF. 3-BEDS PROVIDED	TOTAL AFF. UNITS REQ.	TOTAL AFF. UNITS PROVIDED	TOTAL REQUIRED PARKING	PARKING PROVIDED	PARKING PROV. INCL. TANDEM
LOT 57 NORTH	18,552	32,005	0	10	0	0	10	5.516	2	2	2	1	1	1	5	4	14	15	19
LOT 57 SOUTH	25,126	37,317	0	4	6	2	12			0		1		0		1	13	14	22
								PHASE 1: LOT 57	2	2	2	2	1	1	5	5			
										AFF. 1-BEDS OK		AFF. 2-BEDS OK		AFF. 3-BEDS OK	TOTAL REQ.	TOTAL AFF. OK			
LOT 53	42,314	71,705	1	18	7	0	26	5.822	2	3	2	3	1	1	5	7	33	42	57
LOT 58	24,905	34,849	0	7	5	0	12	2.962	1	0	1	0	0	0	2	0	12	19	19
								PHASE 2: LOTS 53 & 58	3	3	3	3	1	1	7	7			
										AFF. 1-BEDS OK		AFF. 2-BEDS OK		AFF. 3-BEDS OK	TOTAL REQ.	TOTAL AFF. OK			
	110,897	175,876	1	39	18	2	60	ALL LOTS TOTAL	REQ. 5	PROVIDED 5	REQ. 5	PROVIDED 5	REQ. 2	PROVIDED 2	REQ. 12	PROVIDED 12	72	90	117
	TOTAL FAR AREA	TOTAL GROSS AREA	1-BEDS 2%	2-BEDS 65%	3-BEDS 30%	4-BEDS 3%	MARKET UNITS			AFF. 1-BEDS OK		AFF. 2-BEDS OK		AFF. 3-BEDS OK	TOTAL REQ.	TOTAL AFF. OK	REQ.	PROVIDED	PROVIDED INCL. TANDEM

MAX. SHORT TERM	112,952
OVER/UNDER	-2,055
	UNDER

VI. Design Guidelines

The Master Plan Design Guidelines (not the Town Design Guidelines) govern development in the Resort. The Master Plan Design Guidelines are administered by SKRMA with review by the Town DRC. As required by the Master Plan, the proposal has been approved as consistent with the Master Plan Design Guidelines by both the Snow King Resort Master Association (SKRMA), on May 23, 2024, and the Town of Jackson Design Review Committee (DRC), on June 12, 2024. SKRMA’s approval letter is attached. Since the reviews by SKRMA and the DRC, the configuration of the units and Lot 53 entrance has changed slightly – increasing the pedestrian space and further breaking up the massing Lot 53 so that it reads as multiple buildings similar to the neighboring Grand View development.

Below is a detailed description of the project’s compliance with the Design Guidelines, which is unchanged from the SKRMA and DRC submittals. See also the Architectural, Civil & Landscape Plans for plans and renderings of the proposed development.

A. Introduction.

The introduction establishes the Snow King Master Plan Design Guidelines (Design Guidelines) as the method by which a proposal is evaluated for compliance with Section 4.3.1.F.7 of the Town of Jackson Land Development Regulations (LDRs). It establishes SKRMA as the administrator of the Design Guidelines and the DRC as a review entity.

B. Design Guidelines. Character and Design Objectives.

Despite its title, Section B applies specifically to the portion of the resort fronting Snow King Avenue and is not applicable to Lots 53, 57, and 58. The general statements regarding pathways and relationship to the ski hill (B.8 and B.9) are addressed later in the guidelines as they apply to Lots 53, 57, and 58 (C.6).

C. Design Guidelines. General Purposes. The general purpose of the design guidelines is to create visual variety while maintaining a sense of cohesiveness- balancing control and connectivity with enough flexibility in choice of materials and style to give life to the resort. New architecture in the Resort is to have, "clean rooflines, taper-sawn shake roofs, and clearly expressed structure." "While rustic character has been adopted for other resorts, a more direct simple architecture that capitalizes on large areas of glass, simple roof forms and tautly detailed elegant materials, will distinguish Snow King from other Jackson experiences."

The proposed development on Lots 53, 57 & 58 achieves this by integrating the materials and forms from the Grand View development with the more recent development at the Rafferty base area and Snow King summit. The vertical elements, recessed forms, stone base, siding, and roof gables all reference Grand View design and massing, while the single-pitch roofs and larger windows on the building ends reference the on-mountain design and desire for simpler forms and more glass.

The remainder of Section C spells out the LDR requirements for the Design Guidelines, which are specified for Snow King in the Sections that follow.

D. Architectural Design Guidelines.

1. Building Form, Massing and Character:

The design fits in with the ToJ context with its simple but elegant architectural forms and materials. The public spaces between buildings shall be comfortable landscaped plazas that encourage pedestrian activity.

> Buildings must feel as if they fit in the context of the Town of Jackson. They should not seem "imported" from someplace else. They must not overwhelm the pedestrian scale. Building masses will be broken down through the use of covered arcades at pedestrian levels and through the use of building envelopes that require the structures to step back away from the street or plaza.

The design references all of the surrounding development in a way that cohesively completes Subarea 3. The vertical elements of the hotel, siting and materials of Grand View and modern roof lines of the Rafferty base are all incorporated into the proposal.

> Architectural forms will be simple and practical, not elaborate. They must reflect an ability to deal with the severe climate and have honesty and directness similar to the best indigenous structures such as barns and sheds, or some of the structures in Yellowstone and Grand Teton National Parks.

The architecture forms reference the Grand View development while also introducing some of the simplicity and practicality incorporated into the more modern development at the base of Rafferty.

In general, building forms should be used to create definable public spaces between buildings. Buildings affronting plazas should create an edge that defines the space. Buildings on the south side of a plaza step back above the second story to allow light into the plaza. Where building facades face the mountains or non-pedestrian spaces, buildings will be allowed to rise without necessarily stepping back.

The proposal includes an east-west pedestrian experience that begins with a plaza on Lot 53 and extends to the west via sidewalk to another plaza between the buildings on Lot 57 feeding out onto the ski slopes at the base of Rafferty. The south building on Lot 57 is set back from the plaza by pedestrian scale landscape terraces that provide form for the plaza while setting back the building to provide light. On Lot 58 especially, the building has to be tall enough as viewed from the downhill side so that the retaining wall holding back the hill is not taller than the building itself. The terraced pedestrian experience is what maintains the human scale given the steep slopes. The largest facade, on Lot 53, faces away from the primary pedestrian axis of the development, but includes stepbacks at the first and third floors to provide light to the pedestrian path behind the adjacent Grand View development.

Buildings should be sited to help shape the spaces around them and to create a sense of "street space" by lining up with adjacent buildings where possible.

The buildings are sited to continue the east-west pattern of Grand View that follows the contours around the hill and breaks mass into separate buildings that step up the hill so that lower buildings hide the lower floors of the buildings above and behind them instead of singular masses running up the hill. Where this is most evident is Lot 57, where the single building shown on the Master Site Plan is broken into 2 buildings that better align and connect the development to Grand View.

Buildings should employ various architectural devices to help bring the masses to a more friendly, pedestrian scale. Changing materials, breaking the wall line, using different roof forms and adding balconies or projecting bays are some of these devices.

The proposal breaks the development on the 3 lots into four separate buildings, literally breaking the mass, while also employing balconies, varied roof forms and wall recesses that break up the mass further. The development is also socketed into the hillside so that the mass of each building varies on each side.

Larger buildings may be broken into smaller elements that appear to be an aggregation of smaller buildings. Overly differentiated facades on a single building are to be avoided however.

The vertical recesses along each building's front façade, which range in width between 10 to 18 feet, help to break down each building into a language of aggregated masses separated by recessed gaps. These mirror the Grand View development, where buildings are separated by gaps of a similar scale and, once landscaped, create the same mass-breaking effect.

2. Roofs:

The project's roofs reflect the neighboring architecture, namely: the majority of the roofs, which are gabled, tie into the Love Ridge condos to the north; and a few shed roofs pay homage to the long, sloped roofs of the Snow King Resort Hotel. The majority of roofs are 4:12 gable roofs, with a few shallower shed roofs.

In order to be sympathetic to the existing Snow King Resort, new buildings must relate to existing architecture by using similar roof forms, generous roof overhangs, and some similar materials such as heavy timber beams holding up roof overhangs.

The roof forms reference the Grand View and Rafferty base area developments.

Primary roofs must be sloped and in keeping with existing roofs, their slopes should predominantly be in the range of 4:12 to 7:12. Flat roofs and parapet roofs will be allowed where they act as connectors from one gabled roof to another and at larger spaces where necessary and not visible from street or plaza levels or where practical for best incorporating structures into the surrounding built environment. Special consideration is to be given to designing roofs in reference with nearby pedestrian uses. Roof materials should be as consistent as possible throughout the Resort.

Gabled roofs throughout each Lot have a 4:12 slope, except at the Lot 57 North building, which has one gable roof with a 3:12 slope in order to reduce the overall height. Across all lots, shed roof lines at the edge of each building are 2:12 while referencing the Rafferty base area development.

Large roof overhangs should be held up by heavy timber beams or knee braces. Eave lines should be kept thin to avoid the heavy look of typical cold roof structures with 20" fascias.

Roof overhangs are held up by vertical wood structures that reference the vertical elements of the nearby hotel. Roof lines are kept thin.

3. Exterior Materials: Buildings shall sit on masonry bases, and feel as if they are firmly rooted in the ground. Stone, cultured stone, stucco, synthetic stucco and concrete will withstand the extreme weather conditions and pilling up of snow along the foundations.

   Appropriate materials above the ground level will predominantly be stone, cultured stone, wood siding, wood shingles, heavy timber, logs and glass. Other materials such as brick, stucco, synthetic stucco, oxidized steel, and board-formed concrete will also be allowed to a lesser extent. Buildings should have texture and visible structural purpose.

The buildings sit on stone bases in order to appear “rooted” in the natural hillside environment. Upper stories use wood, metal, and glass to give a lightweight appearance to the structure, and to create a feeling of connection with the surrounding forest. Like its neighbors, this project incorporates natural wood cladding to blend in with the surrounding environment. The warm hues of the stained wood pay homage to the range of wood tones found throughout the Resort. Each building sits on a stone base whose texture references the natural rock found on the mountain while also serving as a contemporary corollary to the stone bases of neighboring buildings. Metal accents on the facades and roofs connect the project to the other modern buildings at the resort.

4. Windows: Windows at the pedestrian level should be as large as possible given the function behind them. For retail and/or hotel frontage windows should represent approximately 75% of the linear frontage.

Ground level windows are larger at pedestrian entries; they are limited at basement garages in order to hide vehicles from sight. Due to the steep nature of the hillside, portions of the 1st and 2nd floors are visible to pedestrians and also use large glassy window openings at residential balconies.

Above the ground floor, there is no minimum requirement of window to wall. In keeping with the existing Snow King Hotel and its available views in all directions, large windows are encouraged. When in heavy walls of stone or concrete, windows should appear to be "punched", and they should have lintels of timber or stone. Metal clad windows, wood windows, and nonreflective aluminum storefront windows are all permitted. Darker colors of the windows are encouraged.

The proposal incorporates large metal-clad windows in all directions very much in keeping with the hotel. Cladding will be black.

Divided light windows, if used, must have real divisions, either true divided light or simulated divided light with metal spacers between the double panes of glass. Snap-in false mountings will not be permitted. Generally larger expanses of glass are preferred to small divisions.

Proposed windows will have real divisions, and the larger expanses of glass match the scale of the glass on the Rafferty base area and Hotel lobby/restaurant windows.

5. Commercial Frontage, Entryways: The proposal does not include retail or hotel storefronts.

6. Decks and Balconies: Decks and balconies add functional amenity to the resort but also become part of the design palette used to add character and create variety on the building exterior. Where possible balconies and decks should be located to take advantage of solar exposure and/or views. Long, linear balconies are not permitted.

Decks and balconies with strong vertical orientation similar to the hotel are a key aspect of the design. They are oriented toward mountain views due to the south aspect of the development being set into the slope. Each residential unit has a generous balcony with views toward the Resort, the town, and Tetons beyond. Balconies are broken up by vertical walls and stepped back portions of the façade to create variety and depth in the massing.

7. Walkways: To promote the sense of a unified resort with pedestrian accessibility, buildings should have covered walkways on facades along which connections can be made to other buildings in the village. Wherever possible these walkways should have retail stores and restaurants and other visually interesting spaces along them. All buildings must take into account pedestrian access to all adjacent buildings and the rest of the Snow King Resort.

Pedestrian accessibility is promoted through outdoor walkways and planted areas that encourage outdoor activity. The proposal connects to the pedestrian paths and sidewalks of the Grand View Lodge and condominiums and moves visitors through two plazas toward the hotel and Rafferty base area. The proposal does not include any retail frontage.

8. Color: The use of color should support and reinforce the overall design theme for Snow King Resort. As a year-round resort, colors chosen must work well in all seasons and help the resort blend with its town context as well as with the natural landscape. Color schemes should be built around natural materials, such as stone and wood. Earth hues, natural colors of foliage, deadfall timber and dried grasses are all appropriate. Primary or bright colors should be used sparingly, as accents to highlight the more muted color schemes. Use of "day glow" colors is not allowed. On wood, stains are preferred over paint.

The overarching warm brown wood tones, interspersed with some gray metal and light concrete tones, will blend in nicely with the environment in all seasons. The proposal employs warm hues of stained wood above stone bases. No bright colors are employed and recessed areas utilize darker colors that pull them back further.

9. Lighting: The lighting systems will serve functional and aesthetic roles that include:
    - Providing security and visual safety
    - Serving as directional indicators for vehicular and pedestrian traffic
    - Providing extended outdoor use time, particularly in pedestrian areas,
    - Reinforcing the identity and character through form, color, and materials of fixtures, visual light quality and placement

    Lighting must be designed and configured in conformance to Town of Jackson standards. Light sources must be shielded so as not to reflect direct light upon adjacent buildings or properties.

Lighting will be designed to comply with Sec. 5.3.1 of the LDRs.

Pedestrian scale lighting: The use of low level light sources at the pedestrian scale to accent or illuminate the ground plane provides a special opportunity to reinforce Snow King's unique identity and character. This is achieved by the use of proper fixtures at lower mounting heights to produce a more intimate effect. At night, the fixtures provide light necessary for safety and visual effect. By day, the fixtures should lend animation and scale to the pedestrian environment. Fixtures at a maximum height of 16 feet will be used for these pedestrian areas. Painted steel will only be used for accent.

Additional pedestrian scale lights may be used including bollard lights at approximately 42" in height, and canister type lights on overhead structures. Lighting for pedestrian areas should be incorporated into the buildings whenever possible.

The lighting design across the site will provide a sense of comfort, safety, and elegance to the project. A combination of low-level pedestrian light sources along pathways and recessed lighting at entry canopies will create a welcoming environment.

9. Disabled Accessibility: Consideration for the disabled must be a part of the design process for any project. Every structure shall be accessible by the disabled through the use of ramps (not to exceed 8%) and/or elevators. All outdoor pedestrian areas must be accessible.

All buildings and walkways will be accessible.

10. Sub Area 2. Specific Guidelines. The proposal is not in Subarea 2.

E. Site Design Guidelines. Plant Palette.

The landscaping and architectural design of site walkways and walls will integrate the building into the hillside; indigenous plantings will screen the building and enhance the shared plazas.

Site design at the Snow King Resort focuses on plant palette and design, pedestrian circulation, site architectural features and the colors and materials that comprise the build environment. Snow King's setting is both urban and rural. On the one hand the in- town location provides a diverse urban design context. This context generally implies that the site design will be dominated by landscape with formal plantings. Conversely, the resort is built into the base of a forested mountain and is bounded by the Bridger-Teton National Forest. This context usually implies a more random or natural site design. The objective will be to intertwine these two design goals, in a transitional manner, without creating confusion.

The landscape plans manage the tension between the urban and rural, formal and natural, tame and wild that are inherent to the site's relationship to town and the Bridger-Teton National forest through the use of inward facing planting spaces that reference the plantings in relationship to the built and urban nature of the site, and views outward from these "internal" planting areas that form a relationship between the on-site landscape outward to the broader context of the surrounding natural landscape. Planting scale and proximity to the pedestrian experience further enhances this relationship with planters and plantings at the pedestrian scale expanding outward to terraced landscaping areas in keeping with the natural slope and scale of plant material surrounding the site.

Just as the resort straddles a seam between the urban and rural environments it is located at the interface of three different plant communities. The lower portions of the site are dominated by the sage/grassland and the Aspen/Chokecherry communities; remnants of these communities still exist along the eastern boundary of the PRD. The higher, moister portions of the site exhibit a Douglas Fir and Spruce plant community.

The landscape plan is developed with a sensitivity to the varying plant communities on and around the site and responds accordingly to, where appropriate, integrate and complement plant species from each of the surrounding distinct plant communities.

Plantings around the resort should mimic these existing communities. Replication of the endemic plants also provides an excellent opportunity to provide visitors with information about the local flora. These plants will also provide an adaptable palette necessary to flourish in the wide variety of moisture, light and temperature conditions, which large buildings create and will also help to weave the rural with the urban environments.

Endemic plants are most suited for use in the climatic and seasonal conditions in which they naturally thrive and are used as such in the landscape design. Plantings of local flora further consider the unique microclimatic conditions created by buildings on the site and are designed in such a way to provide seasonal planting interest year-round throughout the site.

Other planting materials of sufficient caliper will be used to screen and enhance the buildings. In general, the plant material will be in accordance with the Land Development Regulations, except for areas designated as Ski Trails and Outdoor Recreation.

In accordance with the Land Development Regulations, the plant material, landscape plans, and architecture of the buildings on the site seek a symbiotic relationship where each complement and enhance the others, developing visual interests from within and outside of the site, creating, and where appropriate, screening views.

Detailed Landscape Plans will be part of each Final Development Permit Application.

See the Landscape Details. These landscape plans provide plant material in accordance with the Land Development Regulations that enhance the pedestrian experience of the site and buildings, and weaves together the unique urban and rural nature of surroundings.

F. Pathways and Circulation Elements. The proposal includes concrete sidewalks and stairs that connect the development to the existing and planned trail system and the rest of the Resort. The sidewalks encourage visitors to the development to access Resort amenities by foot and provide direct access to the ski hill. The sidewalks connect outdoor plazas on Lots 53 and 57. The open plazas at Lots 53 & 57 are meant to encourage outdoor activity; the ski-in/ski-out nature of the property also encourages pedestrian activity on all 3 lots.

G. Signage. Signage will be provided in non-reflective matte metals that are earth-toned with lighting incorporated. Lighting will comply with Town standards.

VII. Dimensional Limitations

The Master Plan's dimensional limitations include a pool of floor area and lodging capacity, conceptual three-dimensional building envelopes, and sub-area-specific considerations. Where dimensional limitations are not specified, the Design Guidelines are relied upon to achieve the desired character with the conceptual illustrations as guidance for developers, SKRMA, and the Town DRC. For Subarea 3, the only specified dimensional limitations are:

- Overall Master Plan Floor Area and APOs
- An LSR of 10%
- A limit of 3 stories over a basement.

Each is addressed below. Unlike Subareas 2 and 5, the illustrations for Subarea 3 are not dimensioned, emphasizing their conceptual nature for use in relating the Design Guidelines to the site rather than specifying an exact three-dimensional envelope. As discussed above, both SKRMA and the Town DRC have found the proposal consistent with the Design Guidelines and intent of the subarea.

FAR and APOs

Topic	Master Plan Standard	Lot 53	Lot 57	Lot 58
Floor Area	915,000 sf across Resort 334,675 sf exist;	112,952 sf purchased by owner 110,897 sf proposed		
	580,325 sf allowed	42,314 sf	43,678 sf	24,905 sf
APOs	2,208 across Resort 832 exist;	240 APOs purchased by owner 240 APOs proposed		
	1,376 allowed	104 APOs	88 APOs	48 APOs

The Master Plan has a pool of allowed floor area (915,000 sf) and lodging capacity (2,208 APOs) that can be built throughout the Resort. We have purchased 112,952 sf of floor area and 240 APOs for the development of this site. Beyond this development, about 470,000 sf and 1,140 APOs will be left to be developed in the Resort. A more detailed accounting and verification of development rights is included in the SKRMA approval letter and attachments. Since our original submittal, SKRMA has updated its accounting of APOs on other sites within the resort, an updated table of APOs is attached to the resubmittal.

The Master Plan also establishes cumulative FARs for Subareas 1-5 and Subareas 1-4, but they are irrelevant because the allowed floor area from those FARs is greater than the 915,000 sf limit on overall development.

Building Envelope

For an individual development, the Master Plan relies on the concept of three-dimensional building envelopes to define the appropriate bulk and scale. The site of this proposal is tucked into the hillside behind the interface of the resort with the rest of the Town of Jackson, and as a result, the building envelope for this site has limited definition. The Master Plan emphasizes that the building envelopes are intended to be flexible and should be used in coordination with the Design Guidelines. The Master Plan also includes renderings to illustrate how the building envelopes can be implemented for some sites. For Lots 53 and 57, the Master Plan includes undimensioned sketches of previously approved buildings. Please see the Master Plan Analysis section of the Architectural Plans for comparisons of those sketches to our proposal.

Our proposal meets the design guidelines as approved by SKRMA and the DRC, the dimensional limitations as demonstrated throughout the rest of this section, and is consistent with the three-dimensional building envelope illustrations for Lots 53 and 57 as demonstrated in the Architectural Plans.

Subarea 3 Standards – Bulk, scale, mass, and height

Topic	Master Plan Standard	Lot 53	Lot 57	Lot 58
Bulk	1 building or many	1 building	2 buildings	1 building
Height	3 stories over basement	3 stories over basement	3 stories over basement	3 stories over basement

The master plan allows for development on lots 53, 57 & 58 to be in one or many buildings (p. 70). On Lot 57 there are 2 buildings. On Lots 53 and 58, there is one building per lot. The building and unit mix table above in the Land Use section details how the mass is broken up across the buildings.

The Master Plan also limits development in Subarea 3 to three stories above a basement. Each building has three stories above a basement. The floor area allowances of the Master Plan exempt basement floor area and floor area for required housing. The Proposed Design Overview in the Architectural Plans outlines the floor area that is and is not exempt on each level of each building.

Compliance with the definition of basement is demonstrated for each building in the Architectural Plans specific to each lot. That the isolated area around the garage entrance on Lot 58 is taller than 10’ to meet grade is consistent with how underground parking entrances have been accommodated throughout Town. The retaining walls used for site grading are not relevant to the basement definition because their purpose is not to elevate the buildings. They are necessary to accommodate the slope and build a road that meets fire protection standards. The existing grading and retaining wall on Lot 53 are evidence of the fact that the Master Plan has always contemplated site grading and retaining as being necessary. The Master Plan Analysis section of the Architectural Plans demonstrates the site retention that would have been needed under the previously approved development on Lots 53 and 57 and the anticipated development of Lot 58.

Our proposal lowers the buildings from what is suggested in the Master Plan, with the retaining walls representing the infrastructure that was always anticipated by the Master Site Plan. If the building on Lot 58 were

any lower, the retaining wall behind the building would be taller than the building itself. And, with the building on Lot 58 set as low as possible, the buildings below it cannot be lowered without making the road too steep.
The Master Plan Analysis section of the Architectural Plans of the attached drawings illustrates how our proposed building location on Lot 58 reduces the amount of disturbance anticipated by the Master Plan and significantly lowers the building.

Subarea 3 Standards – Parking (LDR Standards also discussed)

SITE	TOTAL REQUIRED PARKING	PARKING PROVIDED	PARKING PROV. INCL. TANDEM	TOTAL # BEDROOMS	REQ. BIKE PARKING	REQ. BIKES, SHORT-TERM (25% x .75/bed)	REQ. BIKES, LONG-TERM (75% x .75/bed)	NOTES
LOT 57 NORTH	14	**15**	**19**	27	21	6	15	Short term bike parking provided at public spaces; long-term in unit storage lockers in each garage
LOT 57 SOUTH	13	**14**	**22**	36	27	7	20	
LOT 53	33	**42**	**57**	70	53	14	39	
LOT 58	12	**19**	**19**	29	22	6	16	
	72	**90**	**117**					
	REQ.	PROVIDED	PROVIDED INCL. TANDEM					

Topic	Master Plan Standard	Lot 53	Lot 57 S	Lot 57 N	Lot 58
Vehicle Parking	1 space per unit, on-site	1.3/unit, on-site (1.8 w/tandem)	1.1/unit, on-site (1.7 w/tandem)	1.1/unit, on-site (1.4 w/tandem)	1.6/unit, on-site
	Market Units	26	12	10	12
	Affordable Units	7	1	4	0
Total Spaces		42	14	15	19
	Single Spaces	27	6	11	19
	Tandem Spaces	15	8	4	-
	Assigned (Garage)	39	14	15	19
	Guest (Garage)	-	-	-	-
	Guest (Level 1)	3	-	-	-
Topic	LDR Standards				
ADA Total (1/25)		3 (1/15)	1 (1/14)	1 (1/15)	1 (1/19)
	ADA Van (1/8 ADA)	1 (1/3)	1 (1/1)	1 (1/1)	1 (1/1)
	ADA Tandem	1	-	-	-
EVSE Total (30%)		13 (30%)	6 (43%)	5 (33%)	6 (32%)
	EVSE Capable	10	5	4	5
	EVSE Installed (5%)	3 (7%)	1 (7%)	1 (7%)	1 (5%)
Bike Parking Total (0.75/bedroom)		53 (.76)	27 (.75)	21 (.78)	22 (.76)
	Bedrooms	70	36	27	29
	Short-Term (25%)	14 (26%)	7 (26%)	6 (29%)	6 (27%)

The Parking minimum for the site is 1 space per unit, which our proposal exceeds. The Master Plan's parking discussion is largely focused on ensuring that there is ample public/semi-public shared parking in the other Subareas of the Resort to accommodate recreation uses. The intent for Subarea 3 is that development will be parked on-site and neither impact nor contribute to the shared parking elsewhere in the Resort. By exceeding the parking minimum and managing the parking spaces as part of the property management, we more than meet the Master Plan expectations.

Each parking space is numbered and dimensioned In the Architectural Plans for each lot. ADA compliance is also demonstrated on the parking drawings. Which spaces will be EVSE Installed and Capable will be finalized at building permit with final electrical plans.

The required bike parking meets the 25% short-term bike parking requirement for all units because the market condos can be used residentially or as short-term rentals. Short-term bike parking is provided through public spaces that meet the Town's design requirements and can be found on the Landscape Plan for each lot. Long-term bike parking is accommodated in the storage locker provided for each unit.

Subarea 3 Standards- Landscaping

Topic	Master Plan Standard	Lot 53	Lot 57	Lot 58
Landscaping	10% LSR (min)	20% LSR 7,245 sf	17% LSR 6,500 sf	57% LSR 27,401 sf

As discussed on page 72 of the Master Plan, hardscape surfaces composing pedestrian plazas, patios, and outdoor function areas are considered landscape surfaces. See the Landscape Plan for additional detail on the landscaping. Note the landscape screening that works with the topography and setting of the development into the hillside to screen the development from the existing neighborhoods to the east.

Subarea 3 Standards – Alternative Transportation

The alternative transportation connection to Cache Creek Drive that is required in the Master Plan has already been completed.

VIII. Housing Element

Applicability

Div. 6.3 of the LDRs applies to the sites with no credits. Required housing is calculated for each development plan in the attached Housing Calculator pages.

Amount, Type and Method of Housing Provision

The Snow King Master Plan allows for required housing to be built anywhere within or outside of the Resort. We will build 7 of the required units on Lot 53 and the other 5 required units on Lot 57. The project will be phased (see Phasing Plan below) so that the required housing is built before or concurrent to the development generating the requirement. In-lieu fees will be paid prior to certificate of occupancy for the fee-generating lot.

See the Housing Calculator for each lot below. The amount, type, and method of housing required on each lot is summarized below:

	Lot 53	Lot 57	Lot 58
Required Housing	5.925	5.516	2.962
Total Units Provided	5 (Lot 53)	5 (Lot 57)	2 (Lot 53)
Type and Method			
1 bed/studio, <50% FMI	$381,588.71	$212,944.76	
2 bed, <50% FMI	1 unit (Lot 53)	1 unit (Lot 57)	1 unit (Lot 53)
1 bed/studio, <80% FMI	1 unit (Lot 53)	1 unit (Lot 57)	
1 bed/studio, <120% FMI	1 unit (Lot 53)	1 unit (Lot 57)	1 unit (Lot 53)
2 bed, <120% FMI	1 unit (Lot 53)	1 unit (Lot 57)	$261,687.53
3 bed, <120% FMI	1 unit (Lot 53)	1 unit (Lot 57)	

Special Restriction

All units are intended to be condominiumized for sale at the designated level of affordability. We will complete the deed restriction worksheet at building permit and sign the deed restrictions prior to certificate of occupancy for the requirement generating units to ensure requirement provision remains at pace with or ahead of requirement generation.

Livability Standards

We are aware of the livability requirements for kitchens, bathrooms, closets, storage, floor coverings, room size, windows, laundry, heating, and parking. We will demonstrate detailed compliance of each unit at building permit as we finalize the design. See Architectural Plans for draft floor plans.

IX. Transportation Element

The Transportation Element focuses on how traffic, transit, and parking throughout the Resort will interface and connect to the larger Town of Jackson transportation system. Our proposal is consistent with the assumed impacts from Subarea 3 buildout. See the Engineering Report for demonstration of how our proposal is consistent with the assumptions made about Subarea 3 in the Master Plan.

X. Capital Improvements Plan

The Capital Improvement Plan focuses on how the Resort water, sewer, and stormwater systems will interface and connect to the larger Town of Jackson systems. Our proposal is consistent with the assumed impacts from Subarea 3 buildout. See the Engineering Report for demonstration of how our proposal is consistent with the assumptions made about Subarea 3 in the Master Plan.

XI. Phasing and SKRMA

The eleventh chapter is about SKRMA's responsibilities and is not relevant to approval of this application.

XII. Community Services Element

The final chapter is about the community services provided by the Resort and is not relevant to approval of this application.

ADDITIONAL LDR COMPLIANCE NARRATIVE

Phasing Plan

While there are three development plans, a single phasing plan is proposed. The first building permit(s) will be submitted within 18 months of development plan approval, and will likely be for Lot 57. Each subsequent building permit(s) will be submitted within 18 months of completion of the prior building permit. The building permits will be sequenced so that the required affordable workforce housing is produced concurrently or prior to the generating development.

Construction Management Plan

Please refer to the Construction Management Plan chapter

Environmental Standards

Master Plan approval demonstrated compliance; no additional Environmental Analysis is required.

Scenic Standards

Exterior lighting compliance will be demonstrated at building permit.

Natural Hazards

Steep Slopes

See Engineering Narrative and Geotechnical Report.

Wildland Urban Interface

Wildland Urban Interface compliance will be demonstrated at building permit.

Grading, Erosion Control, and Stormwater

See Engineering Narrative

Operational Standards

Storage for each unit is provided. There will be no outside storage. Compliance will be managed through property management.

Refuse and recycling facilities are provided in the parking garage of each unit. See the garage floor plan of each building.

Subdivision

The applicant intends to plat the units as condominiums once they are built.

School Exactions

Page 102-103 of the Master Plan exempt short-term rental development from park and school exactions.

Park Exactions

Page 102-103 of the Master Plan exempt short-term rental development from park and school exactions.

Transportation Facilitates

See Engineering Narrative

Utilities

See Engineering Narrative

PROPOSED FINDINGS FOR APPROVAL

A development plan shall be approved upon finding the application:

1. Is consistent with the purposes and organization of the LDRs;

Complies. The purpose of the LDRs, and by extension the Snow King Resort Master Plan, is to implement the Jackson/Teton County Comprehensive Plan and promote the health, safety, and general welfare of the present and future community. is By being consistent with the Master Plan and LDRs, the proposal is consistent with that purpose.

2. Achieves the standards and objective of the Natural Resource Overlay (NRO) and Scenic Resources Overlay (SRO), if applicable;

Complies. The Snow King Resort Master Plan demonstrated compliance with the NRO and SRO. The proposed development is consistent with the Snow King Resort Master Plan.

3. Does not have significant impact on public facilities and services, including transportation, potable water and wastewater facilities, parks, schools, police, fire, and EMS facilities;

Complies. The proposed development is consistent with the transportation, water, wastewater, parks, schools, police, fire, and EMS assumptions of the Snow King Resort Master Plan. The cumulative impact of all development entitled under the Master Plan was evaluated and approved with Master Plan approval.

4. Complies with the Town of Jackson Design Guidelines, if applicable;

Complies. While the Town of Jackson Design Guidelines are not applicable, the proposed development was found to comply with the Snow King Resort Master Plan Design Guidelines by SKRMA on May 23, 2024 and the Town Design Review Committee on June 12, 2024.

5. Complies with all relevant standards of these LDRs and other Town Ordinances; and

Complies. The proposed development complies with all LDRs and Town Ordinances not otherwise addressed by the Snow King Resort Master Plan.

6. Is in substantial conformance with all standards or conditions of any prior applicable permits or approvals.

Complies. The proposed development complies with the Snow King Resort Master Plan. It complies with the Site Plan by being located within Lots 53, 57, and 58. It complies with the land use plan by being residential or short-term rental and affordable employee housing. It complies with the design guidelines as approved by SKRMA (May 23, 2024) and the Town DRC (June 12, 2024). It complies with the dimensional limitations by being 3-stories above basement with at least 10% LSR and within the overall Floor Area and Peak Occupancy allowances for the Resort. It complies with the housing element by providing the required housing on-site. Finally, it complies with the transportation and utility elements by being consistent with the Master Plan assumptions for the cumulative impact of the development of the Resort.

ENGINEERING NARRATIVE

JORGENSEN
PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

Introduction

Snow King Condominiums is a proposed development within the Snow King Planned Resort District Master Plan (Sub-Area 3) located at 510, 553 and 725 Upper Snow King Loop Road. Upper Snow King Loop Road is located at the upper end of Grand View/Love Ridge Condo area and is within the Town of Jackson. The properties border lands owned by the Snow King Mountain Resort, LLC and the Grand View Condos. The land included in this proposal is comprised of property owned by affiliates of Bear Real Estate Group, described as Lot 53 of the Grand View Lodges 2nd Addition (553 Upper Snow King Loop Road) and Lots 57 (510 Upper Snow King Loop Road) and 58 (725 Upper Snow King Loop Road) of the Grand View Lodges Third Addition. The total combined property site is approximately 2.72 acres. Lot 57 is separated from Lots 53 and 58 (which are contiguous) by approximately 100' of land owned by Snow King Mountain Resort, LLC. Currently Lots 53 and 57 are used by Snow King Resort for material and equipment storage, while Lot 58 has a road that has historically been used to access Snow King Mountain but has been abandoned. Development of these Lots is governed by the Town of Jackson Land Development Regulations (LDRs) and the Snow King Planned Resort District Master Plan (Master Plan).



Figure 1: Project Vicinity Map

The building program is for a residential condominium development consisting of four buildings spread over the three lots, which includes both short term rental market units and deed restricted affordable units. Unit bedroom breakdown and building square footage is detailed in the Development Plan's Architectural Narrative.

Vehicular access to the three lots from the Town of Jackson street network is from the intersection of Snow King Avenue and Vine Street via Snow King Loop Road and Upper Snow King Loop Road. Snow King Loop Road is a 2-lane paved road, maintained by Snow King Resort Master Association (SKRMA) accessing the Love Ridge and Grand View Condos as well as the Grand View Lodge. Upper Snow King Loop Road is a steep dirt road that has historically provided access up Snow King Mountain. The three lots can be accessed by cyclists and pedestrians from the northwest (Snow King Avenue) and northeast (Cache Creek Drive) using a combination of existing trails, sidewalks and low volume streets.

This Final Development Plan Engineer's Report is intended to provide the engineering basis for the design and discuss engineering related items for the development of the project. Site infrastructure associated with the project is described including the expected infrastructure connections to existing Town of Jackson (TOJ) and SKRMA owned utilities. Design details will advance as the plan moves into construction permitting and construction phases of the project.

Site and Soils Conditions

The project site is located on the north-facing slope of Snow King Mountain and each lot has significant vertical relief with the hill sloping upward to the south. A geotechnical investigation by Jorgensen Geotechnical, LLC was conducted on each parcel in the fall of 2023 and explored Subsurface Soil Conditions and conducted a Geophysical Exploration. The reports of the investigations include Subsurface Preparation recommendations and Slope Stability Modeling for the current design in Attachment A.

Groundwater

The hillside nature of this site does not lend itself to persistent shallow groundwater but its location on the lower reaches of Snow King Mountain makes groundwater related to precipitation and snowmelt likely. Groundwater was encountered during the drilling of test bores performed as part of the Geotechnical Investigation at depths between 27 and 47 ft below ground surface. The proposed building is unlikely to be impacted by static groundwater at these depths, even during the construction of below grade parking structures. Lateral water flow through the soil can be expected from snow melt and stormwater and structures should provide foundation drains to mitigate this moisture.

Parking and Access

Analysis and calculation of parking required for each lot is provided in the Master Plan Compliance Narrative, Section VII – Dimensional Limitations. The parking stalls discussed in that section will be provided in parking garages beneath each of the buildings. All proposed parking meets the dimensional limitation criteria and design standards. Plan views of each parking garage detailing key dimensions, layouts and drainage patterns are provided in the plan set.

Access to the site will be from Snow King Loop Road and Upper Snow King Loop Road, with all parking located in basement garages except a few surface spaces provided for short-term guest parking.

Upper Snow King Loop Road will be realigned and vertically adjusted to meet the Fire Protection Resolution for New Subdivisions, and a Fire Apparatus Turnaround will be provided at the Lot 53 drop off.

With construction and occupancy of Lot 57 happening first, an interim Fire Apparatus Turnaround can be provided near the western property boundary of Lot 53, which will serve until the completion of the final turnaround discussed above.

Lot 53

Two vehicular access points are provided to the Lot 53 Building; the first is directly into the basement garage via a door on the west end of the building. The second is a vehicular drop off/turnaround/courtyard at the first-floor elevation accessed from the access road to the south of the building.

Multi-modal access will be provided to the Lot 53 building from a sidewalk along the south side of Upper Snow King Loop Road, with safe crossing points provided to both the basement door and first floor courtyard. A door into the parking garage will be located near the garage door and individual units will be accessed from the first floor from the courtyard. A dirt walking path will also be provided from the termination point of Upper Snow King Loop Road, near the southeast corner of the building, up to existing grade to the east of the building and along the east face of the building, to the existing sidewalk at the northeast corner of the building.

Lot 57

The two buildings proposed on Lot 57 will have individual garage vehicular access points. The north building will be accessed from Snow King Loop Road, near the northwest corner of the lot and the south building will be accessed from Upper Snow King Loop Road, near the east boundary of the lot.

Multi-modal access will be provided to the Lot 57 buildings via the courtyard between the buildings from a sidewalk along the west side of Upper Snow King Loop Road. Multi-modal access into each garage will also be provided through a separate garage level access door.

Lot 58

The building on Lot 58 will have a vehicular access point from Upper Snow King Loop Road into the garage located approximately in the middle of the north side of the building.

Multi-modal access will be provided to the Lot 58 building from a sidewalk along the south side of Upper Snow King Loop Road. There will be several access points along the north side of the building providing access to both the garage and to stair/elevator towers into the individual units.

Transportation Element

Existing traffic (vehicular and multi-modal) was evaluated as part of the Traffic Impact Study prepared for the Master Plan. Physical counts of traffic were collected and analyzed as part of the Master Plan Traffic Impact Study.

The proposed uses and scale of development on Lots 53, 57 and 58 are consistent with the Master Plan. Trip generation for the project, using the trip generation rates from the Master Plan, is summarized in Table 1.

Table 1 – Trip Generation

Traffic, Trip Generation			
	Number of Units	Unit Type	Trip Generation
Lot 53	26	Condominium	$26\ units * 8.0\ \frac{trips}{unit} = 208\ trips$
	7	Affordable Housing*	$7\ units * 4.0 \frac{trips}{unit} = 28\ trips$
Lot 57	22	Condominium	$22\ units * 8.0\ \frac{trips}{unit} = 176\ trips$
	5	Affordable Housing*	$5\ units * 4.0 \frac{trips}{unit} = 20\ trips$
Lot 58	12	Condominium	$12\ units * 8.0\ \frac{trips}{unit} = 96\ trips$
Subtotal; this Development Plan			

Existing Sub-Area 3	86	Condominium; (assumption)	688 trips
		Total Sub-Area 3	**1,216 trips**
		Assumed Master Plan Sub-Area 3	1,710 trips

*The proposed Affordable Housing in this project is assumed to have a traffic impact similar to "Employee Housing" used in the Master Plan Analysis

This project reflects full buildout of Sub-Area 3 of the Master Plan; based on the Example Development Table, approximately 1,710 trips per day for residential uses was used to perform the Traffic Impact analysis. Based on the above information, the scale of traffic impact is less than was assumed in the master plan.

Grading, Drainage, and Stormwater Management

The access road location and elevation are integral to the building placement on each lot. Providing fire apparatus access to each building, vehicular access to each garage and multi-modal access to the various entrances to each building were key considerations to the site layout and grading. The topography of the site, particularly the steepness of the hillside in the north-south direction is also integral to the grading and building placement on each lot. This consideration resulted in buildings that present a tall elevation from the North and a much smaller elevation from the South.

The current TOJ Land Development Regulations (LDR's) allow post-development stormwater flows to be released from a proposed development at a rate equal to or lower than the pre-development runoff rate. The Master Plan identifies the use of on-site stormwater facilities for storage and controlled release. As previously described, parking for each building is provided in basement garages. The surface of the parking areas will be sloped such that runoff from vehicles will collect at low points through inlet grates and trench drains to route all drainage through a detention system and a controlled progressive discharge prior to release into the public stormwater collection system. Coordination with the mechanical engineering design of the buildings will be required for this effort. Stormwater treatment will be installed in the development area to treat runoff from streets and parking on-site prior to leaving the property.

Preliminary stormwater runoff calculations for each lot for pre and post development are included in Attachment B. These calculations and the grading and stormwater management plans will be refined through the Grading and Erosion Control Permit process as the project develops and as various volume solutions and basin layouts are explored.

This development will utilize the existing storm sewer collection system in Upper Snow King Loop Road which will ultimately discharge into the Town of Jackson system. The routing of this existing system downstream of the development is currently unknown, however this will be determined, and if necessary, the system will be reconfigured to effectively deliver project storm sewer to the Town of Jackson system.

Stormwater design calculations for the 100-year storm are summarized in Table 2. Runoff flowrates and volumes were computed using the modified-rational method and the Intensity-Duration-Frequency Curve Data provided in the TOJ LDRs. Pre and Post Development ground cover coefficients were used with those calculations. Calculations were done separately for each lot.

Table 2 – Stormwater Rational Method Runoff

Stormwater Rational Method Runoff Design Storm Frequency = 100 years			
Lot	Pre-Development Peak Flow Rate (cfs)	Post-Development Peak Flow Rate (cfs)	Water Quantity Storage Required (gal)
Lot 53	0.78	2.37	4,915
Lot 58	1.58	2.48	2,061
Lot 57	0.98	2.49	4,345
Total	**3.35**	**7.34**	**11,321**

Lot 53

Due to the drainage pattern of the proposed improvements on this lot, nearly all the stormwater, including roof drainage, will be captured, routed below grade and stored with a controlled release into the TOJ stormwater system. Positive drainage away from the building will be provided in the landscaped perimeter area though volumes of runoff will be negligible due to the small areas involved and the capture of runoff from developed areas.

Lot 57

Due to the drainage pattern of the proposed improvements on this lot, nearly all the stormwater, besides the road, including roof drainage, will be captured, routed below grade and stored with a controlled release into the TOJ stormwater system. Positive drainage away from the building will be provided in the landscaped perimeter area. Runoff volumes generated on these portions of Lot 57 will be negligible due to the small areas involved and the capture of runoff from developed areas. Runoff from the hillside above the building will be intercepted on the south side of the building using a cutoff ditch and routed around the building to the west. Road drainage will be routed and collected using curb and gutter and existing stormwater inlets which will be adjusted to function with the realigned and regraded roadway.

Lot 58

A large portion of this lot, on the South and West sides of the proposed building will remain undisturbed and drainage patterns will be unchanged. The stormwater in the developed portion of the lot, including roof drainage, will be captured, routed below grade and stored with a controlled release into the TOJ stormwater system. Positive drainage away from the building will be provided in the landscaped perimeter areas immediately adjacent to the building and runoff from the hillside above the building, retaining walls and road will be routed around the development using a combination of surface and subsurface drainage improvements.

Water Supply and Distribution System

Water (domestic and fire) will be supplied to this development by the Snow King Resort Public Water System, a consecutive public water system administered by SKRMA and supplied by the TOJ water system. The system consists of duplex booster pumps located in the garage of Love Ridge Condominium Building 48, an 8" diameter water supply line running uphill to a 110,000 gallon storage tank south/above Lot 58. This system has two fire hydrants in the project vicinity that will be relocated slightly to accommodate the proposed structures and sitework.

Domestic water demand values were developed using 2018 Wyoming DEQ values based on the current building program. Those values are detailed in the Attachment C and summarized in Table 3 below.

Table 3 – Domestic Water Demand

Domestic Water Demand				
	Number of Units	Average TOTAL gpd	Maximum TOTAL gpd	Peak Hour gpm
Lot 53	33	8,750	23,800	66.1
Lot 57	27	7,875	21,420	59.5
Lot 58	12	3,625	9,860	27.4
Subtotal; this Development Plan	**72**	**20,250**	**55,080**	**153.0**
Existing Sub-Area 3	86		60,200	
Total Sub-Area 3			**115,280**	
Assumed Master Plan Sub-Area 3			127,500	

Water demand for domestic use was also calculated using the AWWA M22 method and estimated at 75 gpm based on fixture counts for the proposed buildings. The lower value of the M22 is likely due to the peak hour factor used in the 2018 Wyoming DEQ method (Peak Hour 4) being above average and the irrigation demand

not included in the M22 calculation. Large irrigation demand is not expected as part of this development due to limited landscaped areas.

This project reflects full buildout of Sub-Area 3 of the Master Plan; based on the Master Plan Example Development Table, approximately 127,500 gpd (maximum day) domestic water demand for residential uses was used to analyze the availability of water supply. Based on the above information, the scale of the domestic water demand impact on TOJ systems is less than was assumed in the master plan.

The fire suppression system demand was calculated utilizing Appendix B, Table B105.2 and Table 105.1(2) of the 2021 International Fire Code based on building area and Type IIB construction. All buildings will provide a full sprinkler system designed per NFPA 13.

The total water supply available from the SKRMA water system is expected to exceed the total water demanded in a scenario where fire flow is superimposed on the maximum day demand. Water supply and demand calculations are provided in Attachment D.

Wastewater Collection and Treatment Systems

Sanitary sewer will be connected to the existing Town of Jackson sewage collection lines via an extension of the existing sanitary sewer main in Upper Snow King Loop Road and eventually be treated at the TOJ Wastewater Treatment Plant in South Park. The project will extend the existing sewage collection lines approximately 250 lineal feet to a point in Upper Snow King Loop Road in front of the Lot 58 building. The service lines to each building will be the responsibility of the development for operation and maintenance. The sewer system extensions consist of an 8-inch sewer line from an existing manhole near the western property boundary of Lot 53. Each building will connect to the Sanitary sewer main adjacent to the building. Building sewer will be 6" with cleanouts within 5 feet of the building foundation. The building mechanical design plans will show the specific internal layout and location.

Wastewater generation values were developed using 2018 Wyoming DEQ values for the current building program. Those values are detailed in Attachment E and summarized in Table 4 below.

Table 4 – Wastewater Generation

Sanitary Sewer Generation				
	Number of Units	Average TOTAL gpd	Maximum TOTAL gpd	Peak Hour gpm
Lot 53	33	6,300	10,500	29.2
Lot 57	27	5,670	9,450	26.3
Lot 58	12	2,610	4,350	12.1
Subtotal; this Development Plan		**14,580**	**24,300**	**67.5**
Existing Sub-Area 3	86		38,700	
Total Sub-Area 3			**63,000**	
Assumed Master Plan Sub-Area 3			78,750	

This project reflects full buildout of Sub-Area 3 of the Master Plan; based on the Master Plan Example Development Table, approximately 78,750 gpd (maximum day) sanitary sewer generation for residential uses was used to analyze the capacity of the TOJ sewer system. Based on the above information, the scale of the sanitary sewer generation impact on TOJ systems is less than was assumed in the master plan and was approved by the Town at the time of Master Plan approval.

The Master Plan discusses various other offsite infrastructure improvements related to buildout of the master plan area and indicates that the Town of Jackson should coordinate with SKRMA on the necessity and timing of these improvements.

Cable Utilities and Gas

Cable utilities and natural gas connections will be coordinated with Lower Valley Energy (Electric and Gas), Century Link Communications (telephone and communication services), Charter Communications (cable television, internet, and other communications), and SilverStar Communications (fiber optic internet). There is an existing Lower Valley 3 phase switch cabinet north of the northeast corner of Lot 53 that will likely serve as the power connection for the project. Service connection pedestals for the other cable utilities, and an existing natural gas main are located along Snow King Loop Road. Utilities will be routed to the proposed building either along a proposed easement on the SKRMA parcel to the east of Lots 53 and 58 or along the Upper Snow King Loop Road. Transformers, meters and service locations are shown on the plans.

Refuse, Trash, and Recycling

Refuse, garbage, and recycling is proposed in a dedicated area within the parking garage level of each building. These areas will not be visible from the exterior of the building and will be inaccessible to wildlife.

Snow Storage

A snow storage area sized to be a minimum of 10% of the area of the plowed off-street parking will be provided for storage of the large amount of snow that can be expected at the bottom of Snow King Mountain. The area between Lots 53 and 58, with a pending snow storage easement from SKRMA, is proposed for snow storage use for all three lots. This will be coordinated with landscaping, fire hydrants, cable utility structures and considered in the design and placement of storm drainage infrastructure.

JORGENSEN

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

DEVELOPMENT PLAN P24-168, 174, 175 submitted 11/8/2024
Response to Town Engineering comments dated 2/3/2025
DEVELOPMENT – Approved with CONDITIONS

Jorgensen Response to Conditions or comments provided in Blue

CONDITIONS OF APPROVAL

A. LDR 5.7.1.D.3
Review and revise the geotechnical reports and provide updated plans and reports with the Building Permit Application as necessary. The applicant is responsible for the cost of any third-party review of the geotechnical analysis.
Geotechnical report will be updated to reflect final building plans at Building Permit Submittal.

B. LDR 5.7.2.A.1
Provide signed and stamped reports from ATLAS. Update Geotechnical Reports for any changes in design or analysis.
Updated ATLAS Report provided in this submittal.

C. LDR 5.7.2.A
Prior to presenting to Town Council, provide a narrative and exhibits that show how the buildings conform to the general natural form and minimize cuts and fills. In particular, forty-foot-deep retaining walls on the south side of Lot 58 provide a significant break in the form and require a large cut without offsetting fill.

Site Design – Constraints

1. The road must extend along the length of the buildings constructed on Lots 53 and 58. Due to the height of the building on Lot 58 above the road elevation, the road width must be 26’ wide for aerial firefighting equipment use (fire department guidance)
2. A fire apparatus turnaround must be provided within 150’ of the end of the road (fire resolution).
3. Road grades on sections of roadway with a horizontal curve radius greater than 100’ may be up for 15% for no more than 200’ (Fire resolution).
4. The maximum elevation delta between the Lot 53 basement FFE and first floor FFE is 10’ (LDRs)

Site Design Logic

1. Assumptions
    a. The building site on Lot 58 will be on the east end of the lot to take advantage of the least steep slopes (minimizing cut and fill to the extent possible).
    b. The building on Lot 53 will sit no higher than the existing “Flat Spot”.
2. The location of the fire apparatus turnaround was set by:
    a. The fire access road must extend to the east end of the easternmost building on Lot 53 or 58 (approximately the east lot line).
        i. The fire apparatus turnaround must be within 150’ of the end of this road. It is proposed at 146’ from the end of the road.
        ii. It is desirable to place the turnaround as far from the end of the road as allowed; to construct the turnaround requires either an extreme cut into the hillside (for the perpendicular leg of the turnaround) or to be constructed on top of the Lot 53 first floor deck (as is proposed).
3. The lot 53 garage elevation was set at 6402’, 3-4’ below the “flat spot” Elevation to limit the perceived height of the building, which has been a major point of contention in town planning and neighbor reviews

a. This in turn made it necessary to set the fire apparatus turnaround elevation at 6412' (one floor above).

Lot 58: cut and south side well

The garage FFE was initially placed to correspond to the end of the road, thus minimizing the cut required to construct this building. Initial negative feedback from TOJ planning department (the comment that it appears the garage entrance was placed to make the building as high as possible) lead the design team to adjust this elevation downward, placing the garage entrance in the middle of the building and at a correspondingly lower elevation. This lead to a larger total cut to construct this building.

Placement of the garage FFE that near the lowest elevation location on the lot lead to several design challenges including the large cut associated with the building and the deep well on the south side of the building to allow for egress from the bedrooms. The well on the back of the building has been designed in a tiered manner to be a more natural form, however the reduction of tier height and the extension of tier width was limited by diminishing returns due to the steep slope above. It was desirable to avoid disturbing the existing forested portion of the lot above the proposed building. According to the project code consultant, MAP:

At Lot 58, each unit is permitted to have access to only one means of egress per IBC Section 1006.3.4, since they are R-2 occupancy, with occupant loads not exceeding 20 people, and the common path of egress through the stairwells does not exceed 125'-0". Because these dwelling units have access to only one exit, Section 1031 requires that all sleeping rooms be provided with at least one emergency escape and rescue opening. These window openings must open onto a public way or a yard or a court and meet minimum dimensional requirements. Additionally, bedrooms are required to have access to natural ventilation and light per IBC Chapter 12.

At Lot 58, the area on the south side of the building would be viewed as a court, as it is enclosed on at least 3 sides. Section 202 defines a court as "an open, uncovered space, unobstructed to the sky, bounded on three or more sides by exterior building walls or other enclosing devices." Per Section 1205.3: A court that is not bounded on one end by a public way or yard must be a minimum 3' in width and 10'-0" in length. The width must be increased by 1' in width and 2' in length for each additional story above 2 stories in height. Additionally, per 1031.5.2, emergency escape and rescue openings below the adjacent grade may open into area wells, which can be equipped with permanently affixed ladder or steps. The ladder or steps shall not be obstructed by the window when it is in an open position. Ladders shall be at least 12 inches wide, 3 inches from the wall, and spaced no more than 18 inches on center; the code does not state a height limit for a ladder.

D. LDR 5.7.2.B.6

Provide details on the interceptor ditches uphill of the developments that are stable and have the capacity for runoff. Clearly define where the runoff is conveyed. For conveyance off-site, see notes on LDR 5.7.2.B.8.

Drainage swales to be provided on the southern sides of Lot 57 South Building and Lot 58 terraced retaining walls. These will convey stormwater and snowmelt around the buildings, discharging to the west of lot 57 and the west of lot 58, which is consistent with existing hillside general drainage flow paths. Swales will be designed to carry the large amount of water expected to run off the hillsides above and ends of swales will provide large cobbles to dissipate flow velocities and prevent erosion. Details to be provided with Building Permit submittal.

E. LDR 5.7.2.B.8

In the absence of a mutual grading easement between adjacent landowners, the tops and toes of cut and fill slopes shall be within the property lines of the proposal.

a. Permit drawings must show grading within the property lines or submit proposed easements with the building permit and show them on the plans, noting that they need to be executed and recorded prior to permit issuance.
b. Prior to permit approval, the easements need to be executed and recorded.
c. Where work is being completed within an existing road and easement, e.g., between Lots 57 and 58, provide a Letter of Authorization from the landowner to do the work. Show the easements clearly on the plans and cite the legal document that creates them.

Mutual grading easements have been discussed and favorably received with Snow King Mountain Resort. Grading and modification to the retaining wall along the north side of Lot 53 have been discussed with Grand View Townhouses. If an agreement cannot be reached with Grand View, construction methods have been discussed to eliminate grading/modifications beyond the Lot 53 property line. Extents of grading and areas of grading easement to be provided with Building Permit submittal.

F. LDR 5.7.2.B.4 / IBC 1807.2
Provide structural calculations and factors of safety for all retaining walls. Stability analyses must demonstrate minimum factors of safety of at least 1.50 under static conditions and 1.10 under seismic loading conditions. Walls with a separation of at least 2H (H of largest of two walls) from face of wall to face of wall should be considered as separate walls. In a terrace of retaining walls, a minimum horizontal separation of H/2 should be maintained, measured from the back of the lower wall to the face of the higher wall. Provide notes on the plans and details that require Special Inspections by the design professional in responsible charge (IBC 1704 and 1705.1.1). Provide guards as required by IBC 1807.2.5 or as needed to protect wildlife.
Structural calculations to be provided with Building Permit submittal. Some terraced walls do not adhere to H/2 separation due to steep hillsides above walls and inability to provide separation without significantly increasing overall height of walls, however lower terraced walls will be designed to account for the influence of terraces above.

G. LDR 5.7.4.B.1
For connection to the downstream storm system, determine the actual path of discharge, certify that the lines and detention areas are clear and functioning, confirm that the new connections align with the original design, and verify that capacity exists in the system.
Investigation of the existing storm system including path of discharge and pipe sizes to be undertaken in the summer of 2025. Exhibit of storm system information will be provided to the Town prior to or at the time of Building Permit submittal. Final design of storm system to consider actual configuration.

H. LDR 5.7.4.B.2.h
Provide pollution abatement treatment prior to any discharge to a stormwater or infiltration system.
Stormwater pollution abatement to be provided prior to discharge to downstream stormwater system. Final design may include abatement for each lot individually or one point of treatment for all (3) lots.

I. LDR 5.7.1.D.4
Grading Pre-Applications are required for each building prior to Building Permit submittal. If all of the necessary information is prepared for all sites and building permits will be submitted within 6 months of the meeting, then one grading pre-application meeting could be used to cover the projects.
Grading Pre-Application conference will be completed prior to Building Permit submittals.

J. LDR 7.2.2.A.1.b
Provide a striping and signage plan for the development.
To be provided with Building Permit submittal.

K. LDR 7.7.2.A/G
Show compliance with ISO, DEQ, and Fire standards for the number of hydrants and hydrants served on 6-inch lines.
To be provided with Building Permit submittal.

L. LDR 7.7.2.A
Provide a will-serve letter from Snow King Resort that clarifies the entity that owns the improvements

and the status of the water tank (e.g., when last cleaned and if the full volume of the tank is in use or if the tank is partitioned for half capacity). Ownership should coincide with the easements and parcels where the utilities are located. Unless isolated and master metered, the water and sewer need to be owned by Snow King Mountain Resort, which owns the system the development is connecting to.
To be provided with Building Permit submittal and DEQ Permit to construct submittal.

M. LDR 7.7.2.A
Provide hydraulic analysis for the development and its flows. The analysis provided was limited to volume—provide the source for the assumed water demands.
To be provided with Building Permit submittal.

N. LDR 7.7.2.G
Provide a letter from the Fire Marshal confirming that the fire supply, protection, and hydrants proposed are acceptable.
To be provided with Building Permit submittal.

O. LDR 7.7.2
Provide size and location of water meters and backflow devices for each building. Adhere to Town Standards for utility connections. Each building must have a single tap at the main, with branched domestic and fire outside of the building and an individual domestic meter for the building. Provide separate meters for irrigation. Reduced Pressure Backflow is required on domestic, irrigation, and fire systems. Locate meters and backflow as close as possible to the point of entry to the building.
To be provided with Building Permit submittal.

P. P. LDR 7.7.3
Town inspection showed that the sewer line is full of dirt and rocks. Provide a note on the plans to isolate/plug the connection to the active sewer before cleaning and inspecting the line. DO NOT DISCHARGE THE DEBRIS INTO THE ACTIVE SEWER. Depending on the line condition, the lines may need to be retested, repaired, or replaced. Provide video inspections to Town Engineering. Check the status of manholes on the access road—ensure they are open, functioning, and accessible.
To be provided with Building Permit submittal.

Q. LDR 7.7.3
Revise wastewater volumes to correspond with Town of Jackson Capacity Fee Max Day, Code 13.08.020.
To be provided with Building Permit submittal.

R. LDR 8.3.3.C.3
For each building, provide a plan for mail delivery that does not have a significant impact on public facilities and services, e.g., mail and parcel room with USPS Caller service, private mail delivery, etc.

S. IBC CHAPTER 11 / ADA ACCESSIBILITY
Provide an accessibility plan. Final design and compliance are required with the Building Permit Application, but the Development Plan needs to show feasibility. Show compliance with accessibility regulations, including but not limited to:

a. 1104.1: At least one accessible route within the site must be provided from public transportation stops, accessible parking, accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.
b. 1104.2: At least one accessible route must connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.
c. 1104.5: Accessible routes must coincide with or be located in the same area as a general circulation path.
d. Prioritize pedestrian access through intersections and curb cuts with elevated sidewalks adhering to ADA standards and show how drainage will be achieved.

Accessible routes are provided from the pullout on Lot 57 to Lot 57 building, note however that the road grade along this section is greater than 5% so sidewalk grade corresponds to road grade. Accessible route provided from unloading zone near Lot 53 Fire Apparatus Turnaround to buildings on Lots 53 and 58. Accessible routes provided from accessible parking stalls in all garages to elevators/units.

PROJECT SPECIFIC COMMENTS

1. LDR 7.6.3.F.1: Development should provide a reasonable connection to Snow King Drive. The Town of Jackson has an easement in the Snow King Estates development between Lots 10 and 11, which was used during construction in 2018-2019. It would be beneficial to both the Town and the Developer to maintain this alternative access in the event of emergencies or construction. The Town would like to coordinate with the developer and Snow King Mountain Resort to see if there is a feasible design that could be implemented to preserve this access.
   Providing roadway access to Snow King drive through easement is not possible while maintaining road grades that comply with Fire Resolution. See C. LDR 5.7.2.A discussion.
2. The Town standard is no longer for concrete collars on surface features in roadways. It is recommended to remove the concrete collar from manhole and water valve details. Show completion with hot or cold mix pavement.
   Revised details to be provided with Building Permit submittal.
3. Our records show that the stormwater from this development routes to Vine Drive and then out to Kelly Ave.
   Noted
4. Is it necessary to replace the entire 8" line uphill of Building 57, or can the new line tie in at the crossing of the existing near station 2+30?
   The water main on Lot 57 must be replaced because it is beneath or too close to the Lot 57 South building foundation. From roughly STA 2+30 up, the line must be replaced due to modification (lowering) of the road grade and reduction of the cover over the line.

Accounting of Master Plan Development Potential

Floor Area

	Master Plan Allowance	Existing at Master Plan Adoption	Master Plan Example & Site Plan	Development Rights Sales	Remaining Potential (Rights - Built)
Subarea 1-5	915,000	334,675	915,000	915,000	580,325
Subarea 1		135,688	331,000	255,688	120,000
Hotel		135,688	135,688	135,688	0
New		0	195,312	120,000	120,000
Subarea 2		0	244,000	250,000	250,000
Subarea 3		143,655	252,000	256,607	112,952
Love Ridge/Grand View		143,655	143,655	143,655	0
Lot 53		0	52,952	52,952	52,952
Lot 57		0	25,393	30,000	30,000
Lot 58		0	30,000	30,000	30,000
Subarea 4 & 5		55,332	88,000	152,705	97,373
One Town Hill		50,398		57,000	6,602
Snow King Mountain Resort		0		95,705	90,771
King Grill/Ticket Office		4,934			
Mountain Sports		0			
Mountain Maintenance		0			

Notes:

- The existing development numbers for the hotel and Love Ridge implied in the Master Plan by subtracting the Master Site Plan from the Example Development match the Town's GIS record of existing development on January 1, 2023.
- The allowed FARs of 0.4 for Subareas 1-5 and 0.6 for Subareas 1-4 are not applicable because the 915,000 sf total limit meets both FARs.
- The existing development was assumed to have been allocated its existing development rights even though there was no “transfer” documented.
- The One Town Hill floor area is based on the approval staff report for the Development Plan. In addition to the counted floor area, 34,112 sf of exempt parking and 4,255 sf of exempt housing are in the building.

Guests (APOs)

	Master Plan Allowance	Existing at Master Plan Adoption	Master Plan Example & Site Plan	Development Rights Sales	Remaining Potential (Rights - Built)
Subarea 1-5	2,208	832	2,208	2,208	1,376
Subarea 1		408	964	808	400
Hotel		408	408	408	0
New		0	556	400	400
Subarea 2		0	400	400	400
Subarea 3		280	700	520	240
Love Ridge/Grand View		280	280	280	0
Lot 53		0		144	144
Lot 57		0	420	50	50
Lot 58		0		46	46
Subarea 4 & 5		144	144	480	336
One Town Hill		144	144	144	
Snow King Mountain Resort		0	0	336	336
King Grill/Ticket Office		0			
Mountain Sports		0			
Mountain Maintenance		0			

Notes:

- The existing Hotel allocation is based on the 204 rooms identified as existing in the Master Plan.
- The One Town Hill allocation is based on 36 units at 4 APO per unit, consistent with the Development Plan unit count and Town building permit record.
- The 280 APO Love Ridge/Grand View allocation is based on SKRMA's accounting of existing APOs less the existing Hotel and One Town Hill allocations. It is generally consistent with the Town's GIS record of existing development on January 1, 2023.

HOUSING CALCULATORS

LOT 57 (NORTH & SOUTH COMBINED)

Housing Mitigation Plan

updated 1/8/21

Development of a new house, hotel, or commercial space generates the need for employees. The construction workforce builds the space, the commercial workforce or residential service workforce works in the space, and first responders are needed to protect the space. Only about 27% of the employees generated by development can afford housing in the community, but the community's "community first" character goal is that 65% of employees live locally. To bridge this affordability gap, each development is required to include affordable workforce housing proportional to the employees it generates. These housing mitigation requirements are established in Division 6.3 of the Land Development Regulations. This worksheet is intended to assist in meeting the requirements for a project. However, an error in the worksheet does not amend the actual standard; if you find an error please notify the Planning Department. Fill in the highlighted cells, all the other cells will autopopulate.

Calculating the Requirement (Sec. 6.3.2 & 6.3.3)

Step 1: Location — Town of Jackson

The applicable regulations vary by jurisdiction please identify the location of your project using the above dropdown options.

The required housing is based on the existing and proposed use of the site. Step 2 is to enter the existing use and Step 3 is to enter the proposed use. Section 6.3.2 of the LDRs establishes the applicability of the affordable workforce housing standards and Section 6.3.3 establishes the specifics on calculation of the requirement. Enter each use in its own row, add rows if needed. If a building has multiple units with the same use, describe each unit in its own row. (For example: if a duplex is composed of a 2,300 sf attached unit and a 1,700 sf attached unit, put each unit in its own row do not put in 4,000 sf of attached single-family.) If a unit type (e.g. apartment floor plan, or commercial tennant space) is replicated exactly multiple times, you may use the "Use Quantity" column to avoid adding multiple rows.

Step 2: Existing Development

Housing is only required for new development. Please describe the existing use of the site so that it can be credited from the housing requirement. The definition of existing use is Section 6.3.2.A.1 of the LDRs. Generally, the existing use to enter is the use with the highest housing requirement that either existed in 1995, or has been permitted since 1995. Please attach proof of existence.

Existing Use (Sec. 6.3.2.A)	Housing Requirement (Sec. 6.3.3.A)	Use Size: bedrooms	Use Size: habitable sf	Use Quantity	Housing Required
Short-Term Rental Unit	0.102*bedrooms		0	0	0.000

Existing Workforce Housing Credit 0.000

Step 3: Proposed Development

Please describe the proposed use of the site to determine if affordable workforce housing is required as part of the development. Describe the end result of the proposed development. (For example: in the case of an addition do not enter the square footage of the addition, enter the size of the unit upon completion of the addition.)

Proposed Use	Housing Requirement (Sec. 6.3.3.A)	Use Size: bedrooms	Use Size: habitable sf	Use Quantity	**Housing Required**
Short-Term Rental Unit	0.102*bedrooms	4	2557	2	**0.817**
Short-Term Rental Unit	0.102*bedrooms	3	1947	6	**1.839**
Short-Term Rental Unit	0.102*bedrooms	2	1692	14	**2.860**

Affordable Workforce Housing Required: 5.516 units Fee-in-Lieu Amount: n/a

If the amount of required affordable workforce housing is less than one unit, you may pay the above fee in-lieu of providing the required housing. If you elect to pay the fee, your Housing Mitgation Plan is complete. If the requirement is greater than one unit, or you would like to provide a unit to meet the requirement, please proceed to the Unit Type Sheet.

Housing Mitigation Plan

updated 1/8/21

Type of Units Required (Sec. 6.3.4)

Step 4: Type of Units Required

The LDRs include a schedule for how many units have to be affordable to each income range and how many units have to have 1, 2, or 3 bedrooms. The LDRs also allow for adjustment, subject to approval by the Housing Director. To propose an adjusted allocation, change the values in the gold cells; the customized allocation must meet the customization rules provided. If a rule is violated, the cell will turn red. See also Section 6.3.4 of the LDRs.

Affordability	LDR Schedule	Proposed	Custom %	Customization Rules
Units Affordable to Households making 50% Median Income	1.516	**1.516**	27%	Custom % shall be ≥ 25%
Units Affordable to Households making 80% Median Income	1.000	**1.000**	18%	Custom % shall be ≥ 19%
Units Affordable to Households making 120% Median Income	3.000	**3.000**	54%	Custom % shall be < 43%
Workforce Units	0.000	**0.000**	0%	Custom % shall be < 13%
Total	5.516	5.516	Proposed total sall be >= Required	

Bedroom Mix	1 Bed/Studio	2 Bedroom	3 Bedroom	Total Units	Total Employees Housed	Customization Rule
LDR Schedule	2.516	2.000	1.000	5.516	9.929	The Proposed total shall be greater than or equal to the Schedule total
Proposed Allocation	**2.516**	**2.000**	**1.000**	5.516	9.748	
Employees per Unit per LDRs	1.45	2.00	2.10	1.80		

Step 5: Distribution of Affordability by Unit Size

The bedroom mix must be proportionaly distributed among the affordability mix. If you modify the distribution (gold cells) the totals must match your allocation totals (they will turn red if they do not). A customized distribution should be within 1 (rounded up or down) of the even distribution displayed (it will turn red if it is not). See also Section 6.3.4 of the LDRs.

Requirement Distribution					Even Distribution		
	1 Bed/Studio	2 Bedroom	3 Bedroom	Total	1 Bed/Studio	2 Bedroom	3 Bedroom
Affordable to 50% Median Income	**0.516**	**1.000**	**0.000**	1.516	0.650	0.650	0.217
Affordable to 80% Median Income	**1.000**	**0.000**	**0.000**	1.000	0.429	0.429	0.143
Affordable to 120% Median Income	**1.000**	**1.000**	**1.000**	3.000	1.286	1.286	0.429
Workforce Restriction	**0.000**	**0.000**	**0.000**	0.000	0.000	0.000	0.000
Total	2.516	2.000	1.000				

Once you have determined the proposed distribution please fill out the Method Sheet regarding how the required housing will be provided.

Housing Mitigation Plan

updated 1/8/21

Method for Providing the Required Units (Sec. 6.3.5)

Step 6: Method of Housing Unit Provision

The LDRs require that unlesss impractical, any housing requirement of 1 unit or greater be provided through consturction of housing. If impractical, the units my be provided by dedication of land, use of a banked unit, or restriction of an existing unit. Only as a last option shall a fee be paid. The distribution of housing types selected in Step 5 is reflected in the chart below. The default method for providing a whole housing unit is on-site construction. If you would like to propose an alternate method, or provide the requirement through various methods, adjust the gold cells. A red cell indicates the adjustment does not match Step 5. The intructions cell indicates the standards that apply to each method. In addition, each unit shall comply with the Jackson Teton/County Housing Department Rules and Regulations. Response to the applicable standards shall be provided with this Housing Mitigation Plan. The in-lieu fee will calculate.

Unit Type	Units	Method	Instructions
2 bed, < 50% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 80% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 120% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
2 bed, < 120% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
3 bed, < 120% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 50% Median Income	0.516	Fee In-Lieu	please document compliance with Sec. 6.3.5.C
Total Units:	**5.516**	**Fee In-Lieu:**	**$212,944.76**

Step 7: Attachments

Please attach to this worksheet any demonstration of existence, independent calculation, rationale for adjustment of unit type, rationale for the proposed method, documentation of the proposed method that is requried by Division 6.3. Please contact the Planning Department with any questions. Information regarding the source of the numbers in this worksheet is available in the Source Sheets.

LOT 53

Housing Mitigation Plan

updated 1/8/21

Development of a new house, hotel, or commercial space generates the need for employees. The construction workforce builds the space, the commercial workforce or residential service workforce works in the space, and first responders are needed to protect the space. Only about 27% of the employees generated by development can afford housing in the community, but the community's "community first" character goal is that 65% of employees live locally. To bridge this affordability gap, each development is required to include affordable workforce housing proportional to the employees it generates. These housing mitigation requirements are established in Division 6.3 of the Land Development Regulations. This worksheet is intended to assist in meeting the requirements for a project. However, an error in the worksheet does not amend the actual standard; if you find an error please notify the Planning Department. Fill in the highlighted cells, all the other cells will autopopulate.

Calculating the Requirement (Sec. 6.3.2 & 6.3.3)

Step 1: Location — Town of Jackson

The applicable regulations vary by jurisdiction please identify the location of your project using the above dropdown options.

The required housing is based on the existing and proposed use of the site. Step 2 is to enter the existing use and Step 3 is to enter the proposed use. Section 6.3.2 of the LDRs establishes the applicability of the affordable workforce housing standards and Section 6.3.3 establishes the specifics on calculation of the requirement. Enter each use in its own row, add rows if needed. If a building has multiple units with the same use, describe each unit in its own row. (For example: if a duplex is composed of a 2,300 sf attached unit and a 1,700 sf attached unit, put each unit in its own row do not put in 4,000 sf of attached single-family.) If a unit type (e.g. apartment floor plan, or commercial tennant space) is replicated exactly multiple times, you may use the "Use Quantity" column to avoid adding multiple rows.

Step 2: Existing Development

Housing is only required for new development. Please describe the existing use of the site so that it can be credited from the housing requirement. The definition of existing use is Section 6.3.2.A.1 of the LDRs. Generally, the existing use to enter is the use with the highest housing requirement that either existed in 1995, or has been permitted since 1995. Please attach proof of existence.

Existing Use (Sec. 6.3.2.A)	Housing Requirement (Sec. 6.3.3.A)	Use Size: bedrooms	Use Size: habitable sf	Use Quantity	Housing Required
Short-Term Rental Unit	0.102*bedrooms		0	0	0.000

Existing Workforce Housing Credit 0.000

Step 3: Proposed Development

Please describe the proposed use of the site to determine if affordable workforce housing is required as part of the development. Describe the end result of the proposed development. (For example: in the case of an addition do not enter the square footage of the addition, enter the size of the unit upon completion of the addition.)

Proposed Use	Housing Requirement (Sec. 6.3.3.A)	Use Size: bedrooms	Use Size: habitable sf	Use Quantity	**Housing Required**
Short-Term Rental Unit	0.102*bedrooms	4	2557	0	**0.000**
Short-Term Rental Unit	0.102*bedrooms	3	2124	7	**2.145**
Short-Term Rental Unit	0.102*bedrooms	2	1528	18	**3.677**
Short-Term Rental Unit	0.102*bedrooms	1	1500	1	**0.102**

Affordable Workforce Housing Required: 5.925 units Fee-in-Lieu Amount: n/a

If the amount of required affordable workforce housing is less than one unit, you may pay the above fee in-lieu of providing the required housing. If you elect to pay the fee, your Housing Mitgation Plan is complete. If the requirement is greater than one unit, or you would like to provide a unit to meet the requirement, please proceed to the Unit Type Sheet.

Housing Mitigation Plan

updated 1/8/21

Type of Units Required (Sec. 6.3.4)

Step 4: Type of Units Required

The LDRs include a schedule for how many units have to be affordable to each income range and how many units have to have 1, 2, or 3 bedrooms. The LDRs also allow for adjustment, subject to approval by the Housing Director. To propose an adjusted allocation, change the values in the gold cells; the customized allocation must meet the customization rules provided. If a rule is violated, the cell will turn red. See also Section 6.3.4 of the LDRs.

Affordability	LDR Schedule	Proposed	Custom %	Customization Rules
Units Affordable to Households making 50% Median Income	1.925	**1.925**	32%	Custom % shall be ≥ 25%
Units Affordable to Households making 80% Median Income	1.000	**1.000**	17%	Custom % shall be ≥ 19%
Units Affordable to Households making 120% Median Income	3.000	**3.000**	51%	Custom % shall be < 43%
Workforce Units	0.000	**0.000**	0%	Custom % shall be < 13%
Total	5.925	5.925	Proposed total sall be >= Required	

Bedroom Mix	1 Bed/Studio	2 Bedroom	3 Bedroom	Total Units	Total Employees Housed	Customization Rule
LDR Schedule	2.925	2.000	1.000	5.925	10.664	The Proposed total shall be greater than or equal to the Schedule total
Proposed Allocation	**2.925**	**2.000**	**1.000**	5.925	10.341	
Employees per Unit per LDRs	1.45	2.00	2.10	1.80		

Step 5: Distribution of Affordability by Unit Size

The bedroom mix must be proportionaly distributed among the affordability mix. If you modify the distribution (gold cells) the totals must match your allocation totals (they will turn red if they do not). A customized distribution should be within 1 (rounded up or down) of the even distribution displayed (it will turn red if it is not). See also Section 6.3.4 of the LDRs.

Requirement Distribution					Even Distribution		
	1 Bed/Studio	2 Bedroom	3 Bedroom	Total	1 Bed/Studio	2 Bedroom	3 Bedroom
Affordable to 50% Median Income	**0.925**	**1.000**	**0.000**	1.925	0.825	0.825	0.275
Affordable to 80% Median Income	**1.000**	**0.000**	**0.000**	1.000	0.429	0.429	0.143
Affordable to 120% Median Income	**1.000**	**1.000**	**1.000**	3.000	1.286	1.286	0.429
Workforce Restriction	**0.000**	**0.000**	**0.000**	0.000	0.000	0.000	0.000
Total	2.925	2.000	1.000				

Once you have determined the proposed distribution please fill out the Method Sheet regarding how the required housing will be provided.

Housing Mitigation Plan

updated 1/8/21

Method for Providing the Required Units (Sec. 6.3.5)

Step 6: Method of Housing Unit Provision

The LDRs require that unlesss impractical, any housing requirement of 1 unit or greater be provided through consturction of housing. If impractical, the units my be provided by dedication of land, use of a banked unit, or restriction of an existing unit. Only as a last option shall a fee be paid. The distribution of housing types selected in Step 5 is reflected in the chart below. The default method for providing a whole housing unit is on-site construction. If you would like to propose an alternate method, or provide the requirement through various methods, adjust the gold cells. A red cell indicates the adjustment does not match Step 5. The intructions cell indicates the standards that apply to each method. In addition, each unit shall comply with the Jackson Teton/County Housing Department Rules and Regulations. Response to the applicable standards shall be provided with this Housing Mitigation Plan. The in-lieu fee will calculate.

Unit Type	Units	Method	Instructions
2 bed, < 50% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 80% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 120% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
2 bed, < 120% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
3 bed, < 120% Median Income	1.000	On-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 50% Median Income	0.925	Fee In-Lieu	please document compliance with Sec. 6.3.5.C
Total Units:	**5.925**	**Fee In-Lieu:**	**$381,588.71**

Step 7: Attachments

Please attach to this worksheet any demonstration of existence, independent calculation, rationale for adjustment of unit type, rationale for the proposed method, documentation of the proposed method that is requried by Division 6.3. Please contact the Planning Department with any questions. Information regarding the source of the numbers in this worksheet is available in the Source Sheets.

LOT 58

Housing Mitigation Plan

updated 1/8/21

Development of a new house, hotel, or commercial space generates the need for employees. The construction workforce builds the space, the commercial workforce or residential service workforce works in the space, and first responders are needed to protect the space. Only about 27% of the employees generated by development can afford housing in the community, but the community's "community first" character goal is that 65% of employees live locally. To bridge this affordability gap, each development is required to include affordable workforce housing proportional to the employees it generates. These housing mitigation requirements are established in Division 6.3 of the Land Development Regulations. This worksheet is intended to assist in meeting the requirements for a project. However, an error in the worksheet does not amend the actual standard; if you find an error please notify the Planning Department. Fill in the highlighted cells, all the other cells will autopopulate.

Calculating the Requirement (Sec. 6.3.2 & 6.3.3)

Step 1: Location: Town of Jackson

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Step 2: Existing Development

Housing is only required for new development. Please describe the existing use of the site so that it can be credited from the housing requirement. The definition of existing use is Section 6.3.2.A.1 of the LDRs. Generally, the existing use to enter is the use with the highest housing requirement that either existed in 1995, or has been permitted since 1995. Please attach proof of existence.

Existing Use (Sec. 6.3.2.A)	Housing Requirement (Sec. 6.3.3.A)	Use Size: bedrooms	Use Size: habitable sf	Use Quantity	Housing Required
Short-Term Rental Unit	0.102*bedrooms		0	0	0.000

Existing Workforce Housing Credit: 0.000

Step 3: Proposed Development

Please describe the proposed use of the site to determine if affordable workforce housing is required as part of the development. Describe the end result of the proposed development. (For example: in the case of an addition do not enter the square footage of the addition, enter the size of the unit upon completion of the addition.)

Proposed Use	Housing Requirement (Sec. 6.3.3.A)	Use Size: bedrooms	Use Size: habitable sf	Use Quantity	**Housing Required**
Short-Term Rental Unit	0.102*bedrooms	3	1800	5	**1.532**
Short-Term Rental Unit	0.102*bedrooms	2	2100	7	**1.430**

Affordable Workforce Housing Required: 2.962 units

Fee-in-Lieu Amount: n/a

If the amount of required affordable workforce housing is less than one unit, you may pay the above fee in-lieu of providing the required housing. If you elect to pay the fee, your Housing Mitgation Plan is complete. If the requirement is greater than one unit, or you would like to provide a unit to meet the requirement, please proceed to the Unit Type Sheet.

Type of Units Required (Sec. 6.3.4)

Step 4: Type of Units Required

The LDRs include a schedule for how many units have to be affordable to each income range and how many units have to have 1, 2, or 3 bedrooms. The LDRs also allow for adjustment, subject to approval by the Housing Director. To propose an adjusted allocation, change the values in the gold cells; the customized allocation must meet the customization rules provided. If a rule is violated, the cell will turn red. See also Section 6.3.4 of the LDRs.

Affordability	LDR Schedule	Proposed	Custom %	Customization Rules
Units Affordable to Households making 50% Median Income	1.000	**1.000**	34%	Custom % shall be ≥ 25%
Units Affordable to Households making 80% Median Income	0.000	**0.000**	0%	Custom % shall be ≥ 19%
Units Affordable to Households making 120% Median Income	1.962	**1.962**	66%	Custom % shall be < 43%
Workforce Units	0.000	**0.000**	0%	Custom % shall be < 13%
Total	2.962	2.962	Proposed total sall be >= Required	

Bedroom Mix	1 Bed/Studio	2 Bedroom	3 Bedroom	Total Units	Total Employees Housed	Customization Rule
LDR Schedule	1.000	1.962	0.000	2.962	5.332	The Proposed total shall be greater than or equal to the Schedule total
Proposed Allocation	**1.000**	**1.962**	**0.000**	2.962	5.375	
Employees per Unit per LDRs	1.45	2.00	2.10	1.80		

Step 5: Distribution of Affordability by Unit Size

The bedroom mix must be proportionaly distributed among the affordability mix. If you modify the distribution (gold cells) the totals must match your allocation totals (they will turn red if they do not). A customized distribution should be within 1 (rounded up or down) of the even distribution displayed (it will turn red if it is not). See also Section 6.3.4 of the LDRs.

Requirement Distribution					Even Distribution		
	1 Bed/Studio	2 Bedroom	3 Bedroom	Total	1 Bed/Studio	2 Bedroom	3 Bedroom
Affordable to 50% Median Income	**0.000**	**1.000**	**0.000**	1.000	0.429	0.429	0.143
Affordable to 80% Median Income	**0.000**	**0.000**	**0.000**	0.000	0.000	0.000	0.000
Affordable to 120% Median Income	**1.000**	**0.962**	**0.000**	1.962	0.841	0.841	0.280
Workforce Restriction	**0.000**	**0.000**	**0.000**	0.000	0.000	0.000	0.000
Total	1.000	1.962	0.000				

Once you have determined the proposed distribution please fill out the Method Sheet regarding how the required housing will be provided.

Housing Mitigation Plan

updated 1/8/21

Method for Providing the Required Units (Sec. 6.3.5)

Step 6: Method of Housing Unit Provision

The LDRs require that unlesss impractical, any housing requirement of 1 unit or greater be provided through consturction of housing. If impractical, the units my be provided by dedication of land, use of a banked unit, or restriction of an existing unit. Only as a last option shall a fee be paid. The distribution of housing types selected in Step 5 is reflected in the chart below. The default method for providing a whole housing unit is on-site construction. If you would like to propose an alternate method, or provide the requirement through various methods, adjust the gold cells. A red cell indicates the adjustment does not match Step 5. The intructions cell indicates the standards that apply to each method. In addition, each unit shall comply with the Jackson Teton/County Housing Department Rules and Regulations. Response to the applicable standards shall be provided with this Housing Mitigation Plan. The in-lieu fee will calculate.

Unit Type	Units	Method	Instructions
2 bed, < 50% Median Income	1.000	Off-Site Construction	please document compliance with Sec. 6.3.5.D.1
1 bed, < 120% Median Income	1.000	Off-Site Construction	please document compliance with Sec. 6.3.5.D.1
2 bed, < 120% Median Income	0.962	Fee In-Lieu	please document compliance with Sec. 6.3.5.C
Total Units:	**2.962**	**Fee In-Lieu:**	**$261,687.53**

Step 7: Attachments

Please attach to this worksheet any demonstration of existence, independent calculation, rationale for adjustment of unit type, rationale for the proposed method, documentation of the proposed method that is requried by Division 6.3. Please contact the Planning Department with any questions. Information regarding the source of the numbers in this worksheet is available in the Source Sheets.

NORTHWORKS

Architectural, Civil & Landscape Plans

NORTHWORKS

Existing Site



LEGEND

- PK nail with washer inscribed "PLS 4270"
- reinforcing steel bar without cap
- reinforcing steel bar with 1" diameter aluminum cap inscribed "PLS 4270" with other appropriate markings
- sectional subdivision line
- boundary, subject property
- boundary, adjoining property
- boundary, road right-of-way
- boundary, record road right-of-way
- N25°25'25"E 100.00' — measured bearing & distance or curve geometry
- [N25°25'25"E] [100.00'] — calculated bearing & distance or curve geometry
- (N25°25'25"E) (100.00') — record bearing & distance or curve geometry, Plat 1236 & Plat 1333
- edge of pavement
- top back of curb
- edge of gravel
- sidewalk, concrete
- flowline
- toe of slope
- top of bank
- 6205 — index contour, 5' interval
- 6208 — intermediate contour, 1' interval
- 6207.5 — spot elevation
- sign
- fence, rail
- BH 1 — bore hole
- MW 1 — monitoring well
- TP 1 — geotechnical test pit
- sewer manhole
- sanitary sewer line
- storm drain inlet
- storm drain manhole
- storm drain line
- hydrant, fire suppression
- water valve
- water line

SCALE: 1 INCH = 30 FEET
THIS SCALE VALID ONLY FOR 36x48 PRINTS

NORTHWORKS
185 E. Hansen Avenue
T 307-201-5324
Jackson, Wyoming 83001
www.nwkrg.com

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JORGENSEN
JACKSON, WYOMING
307.733.5150
www.jorgeng.com

NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
2	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

23072	Project No.
SS	Drawn By
JL	Checked By

Discipline & Drawing Number
C1.1

Drawing Name
EXISTING CONDITIONS

EXISTING SITE CONDITIONS


1


2


3


4


5


6


7

SITE PHOTOS









SITE PHOTOS

SITE CONTEXT

The design team has worked hard to incorporate each building into the hillside as much as possible, and to reduce the visual impact of each building at its down-slope facade.

Each building is sunk as deep into in the hillside as the topography will allow for pedestrian and vehicular access. The uphill side of each building is deeply nestled into the terrain (at Lot 58, almost entirely buried at the south).

At the down-slope elevations, stepped terraced walls with planters help to reduce the vertical impact of the facade. Exposed basement walls are no more than 10 feet high, and material changes are used to further break down the appearance of the facade.



SITE CONTEXT

1. SNOW KING MOUNTAIN RESORT BASE



2. LOVE RIDGE CONDOMINIUMS



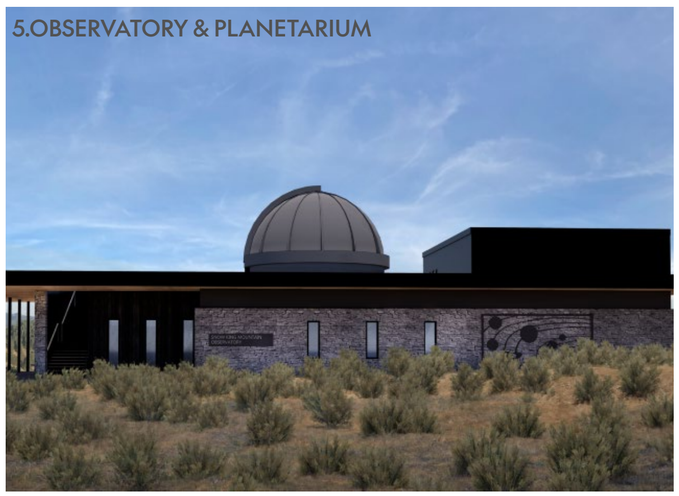
3. ONE TOWN HILL



4. SUMMIT RESTAURANT



5.OBSERVATORY & PLANETARIUM



SURROUNDING CONTEXT

1. Sloped shed roofs, exposed structure on overhangs, modern chimney form, vertical wood siding & “punched” windows

2. Varied siding materials including stone near base and wood siding higher on facade, exposed structure, gabled roof forms and chimney

3. Gabled roof forms, varied siding materials (light and dark), overhangs at base level, dark/metal balconies

4. Flat roof, large overhang, “punched” windows

5. Flat roof, large overhang, varied facade materials including stone and dark wood/metal panels











SURROUNDING CONTEXT

1, 2, 3. Horizontal brown wood siding, green trim windows, gabled roofs, chimneys, garages separate from units

4, 5. Large and varied angled roofs, vertical wood siding, exterior rhythm of balconies with slatted wood railings & vertical wood posts, horizontal bands of windows

NORTHWORKS

Proposed Design Overview



PROPOSED SITE PLAN – LANDSCAPE



GENERAL CONSTRUCTION NOTES

1. ALL SITE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF WYOMING PUBLIC WORKS STANDARD SPECIFICATIONS AND ARTICLE 4 OF THE TOWN OF JACKSON LAND DEVELOPMENT REGULATIONS.
2. EXISTING BASE MAPPING WAS PERFORMED BY JORGENSEN ASSOCIATES, INC.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN A WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY NPDES STORMWATER PERMIT PRIOR TO COMMENCING ANY LAND DISTURBING ACTIVITIES.
4. CONTRACTOR SHALL CONSTRUCT EROSION CONTROL STRUCTURES PRIOR TO ANY EARTHWORK OR CONSTRUCTION. CONTROL STRUCTURES SHALL BE CONSTRUCTED AND MAINTAINED BY CONTRACTOR UNTIL VEGETATION IS REESTABLISHED IN DISTURBED AREAS.
5. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND SHALL PROMPTLY NOTIFY THE ENGINEER OF ANY VARIATIONS OR DISCREPANCIES.
6. BURIED UTILITIES
   - 6.1. CONTRACTOR SHALL VERIFY LOCATION OF ALL BURIED AND OVERHEAD UTILITIES PRIOR TO ANY EXCAVATION IN THE VICINITY. UTILITY LOCATIONS SHOWN ON THESE DRAWINGS ARE APPROXIMATE AND BASED ON THE BEST INFORMATION AVAILABLE TO THE ENGINEER. ENGINEER DOES NOT WARRANT THE ACCURACY NOR COMPLETENESS OF THE INFORMATION SHOWN FOR EXISTING UTILITIES.
   - 6.2. CONTRACTOR SHALL COORDINATE WITH THE PROJECT REPRESENTATIVE TO LOCATE AND AVOID DAMAGE TO ANY FUEL PUMPING FACILITIES, IRRIGATION FACILITIES, WATER UTILITIES, AND STATE MONITORING WELLS AND PIPING.
   - 6.3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES PRIOR TO INSTALLING IMPROVEMENTS.
   - 6.4. CONTRACTOR SHALL NOTIFY WYOMING ONE CALL, 1-800-348-1030, A MINIMUM OF 48 HOURS PRIOR TO EXCAVATION FOR UTILITY LOCATES.
7. ALL EXCAVATION ACTIVITIES SHALL COMPLY WITH PERMIT REQUIREMENTS ISSUED FOR THE PROJECT. CONTRACTOR SHALL REVIEW AND BE RESPONSIBLE FOR PERMIT COMPLIANCE.
8. CONTRACTOR TO CONFIRM STOCKPILE AND STAGING LOCATIONS WITH THE OWNER.
9. CONTRACTOR TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.
10. FILL MATERIAL SHALL BE SUITABLE ON-SITE OR IMPORTED MATERIAL WITH ROCKS NO LARGER THAN 6 INCHES IN DIAMETER. LARGER MATERIAL MAY BE PLACED ONLY WHEN AUTHORIZED BY THE ENGINEER.
11. CRUSHED GRAVEL BASE COURSE MATERIAL SHALL BE GRADING H. BASE COURSE SHALL BE MECHANICALLY COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (AASHTO T-180 - MODIFIED PROCTOR DENSITY).
12. DESTRUCTION AND DAMAGE TO TREES AND OTHER NATURAL VEGETATION SHALL BE MINIMIZED AND ALL DISTURBED SURFACES SHALL BE RESEEDED AS SOON AS PRACTICAL IN ACCORDANCE TO THE REVEGETATION SPECIFICATIONS.
13. STRIP AND SALVAGE TOPSOIL FROM ALL EXCAVATED AREAS.
14. WEEDS SHALL BE CONTROLLED BY SPRAYING, LIMITING DISTURBANCE AREA, OR OTHER MEANS PRIOR TO REVEGETATION AND AFTER REVEGETATION IS COMPLETE.
15. FUGITIVE DUST WILL BE CONTROLLED BY WATERING DURING DRY PERIODS OR AS REQUIRED BY ENGINEER.
16. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED AND PROCESSED ON-SITE ONLY AT LOCATIONS AS DESIGNATED ON THE PLANS.
17. TOPS OF CUT AND FILL SLOPES SHALL BE ROUNDED TO AVOID RAVELING AND EROSION.
18. CUT AND FILL SLOPES SHALL NOT EXCEED 2:1.

WATER AND SEWER UTILITY NOTES

1. WATER AND SEWER INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY, WATER QUALITY DIVISION RULES AND REGULATIONS AND THE TOWN OF JACKSON STANDARDS FOR CONSTRUCTION.
2. CONTRACTOR SHALL NOTIFY THE TOWN OF JACKSON PUBLIC WORKS DEPARTMENT AT PHONE NUMBER (307) 733-3079, PRIOR TO START OF CONSTRUCTION AND PRIOR TO EACH WATER AND SEWER TEST.
3. CONTRACTOR SHALL MAINTAIN WATER AND SEWER SLOPES CONSISTENT WITH THE PLANS. ABRUPT ELEVATION CHANGES ARE NOT PERMITTED AND MAY REQUIRE ADDITIONAL AIR RELEASE VALVES OR BLOW-OFFS AT THE CONTRACTORS EXPENSE.
4. TYPE A TRENCH BACKFILL SHALL APPLY TO ALL PAVED SURFACES AND AROUND ALL APPURTENANCES INCLUDING VALVES, FIRE HYDRANTS AND MANHOLES. TYPE B TRENCH BACKFILL SHALL APPLY TO NON-TRAVELED AREAS. SEE SPECIFICATION WPWSS 02225.
5. CONTINUOUS RIGID TYPE B PIPELINE INSULATION SHALL BE PROVIDED AS SHOWN ON THE TYPICAL TRENCH DETAIL, UNDER ALL TRAVELED AREAS AND AT ALL LOCATIONS WHERE DEPTH OF COVER IS LESS THAN 5 FEET FOR SEWER MAINS AND SERVICES; LESS THAN 7 FEET FOR SEWER FORCE MAINS, WATER MAINS AND SERVICES OR AS SHOWN ON THE PLANS.
6. MAINTAIN A MINIMUM OF 10 FEET HORIZONTAL SEPARATION BETWEEN WATER PIPES AND SEWER PIPES/MANHOLES, MEASURED EDGE TO EDGE. MAINTAIN A MINIMUM OF 18 INCHES VERTICAL SEPARATION AT WATER-SEWER PIPE CROSSINGS. WHERE SEWER PIPE CROSSES ABOVE WATER PIPE, SPECIAL CONSTRUCTION IS REQUIRED. SEE TYPICAL DETAILS.
7. WATER SERVICE LINES 4" AND LARGER SHALL BE DUCTILE IRON PIPE, OR APPROVED EQUAL. FITTINGS FOR WATER MAINS SHALL BE DUCTILE IRON, CONFORMING TO AWWA C110 OR C153. MINIMUM DEPTH OF BURY FOR ALL WATER LINES SHALL BE 7'.
8. SANITARY SEWER LINES AND FITTINGS SHALL BE SCHEDULE 40 PVC AND CONFORM TO ASTM D-3034, OR APPROVED EQUAL.

LEGEND

- ASPHALT PAVEMENT
- CONCRETE SIDEWALK
- SNOWMELTED HARDSCAPE
- RETAINING WALL
- 8"W — 8" WATER
- 6"W — 6" WATER
- W — WATER SERVICE
- 8"S — 8" SEWER
- S — SEWER SERVICE
- STM — STORMWATER
- GAS — GAS
- P — POWER
- FIRE HYDRANT
- WATER VALVE
- SEWER MANHOLE
- STORMWATER MANHOLE
- STORM INLET
- TRANSFORMER
- ELECTRIC VAULT

0 30 60 90
SCALE: 1 INCH = 30 FEET
THIS SCALE VALID ONLY FOR 36x48 PRINTS

NORTHWORKS
185 E. Hansen Avenue
T 307-201-5324
Jackson, Wyoming 83001
www.nwks.com

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JORGENSEN
JACKSON, WYOMING
307.733.5150
www.jorgeng.com

NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
2	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

23072	Project No.
SS	Drawn By
JL	Checked By

Discipline & Drawing Number
C1.0

Drawing Name
PROPOSED OVERVIEW

PROPOSED SITE PLAN - CIVIL

AREA & UNIT MIX OVERVIEW

SITE	FAR SUBTOTAL (SF)	GROSS AREA SUBTOTAL (SF)	# 1 BEDS	# 2 BEDS	# 3 BEDS	# 4 BEDS	MARKET UNIT COUNT
LOT 57 NORTH	18,552	32,005	0	10	0	0	10
LOT 57 SOUTH	25,126	37,317	0	4	6	2	12
LOT 53	42,314	71,705	1	18	7	0	26
LOT 58	24,905	34,849	0	7	5	0	12
	110,897	**175,876**	**1**	**39**	**18**	**2**	**60**
	TOTAL FAR AREA	TOTAL GROSS AREA	1-BEDS	2-BEDS	3-BEDS	4-BEDS	MARKET UNITS
			2%	65%	30%	3%	

	REQ. # OF AFF. UNITS	AFF. 1-BEDS		AFF. 2-BEDS		AFF. 3-BEDS		TOTAL AFF. UNITS	
		REQ.	PROVIDED	REQ.	PROVIDED	REQ.	PROVIDED	REQ.	PROVIDED
	5.516	2	**2**	2	**1**	1	**1**	5	**4**
			0		**1**		**0**		**1**
PHASE 1: LOT 57		2	**2**	2	**2**	1	**1**	5	**5**
			AFF. 1-BEDS **OK**		AFF. 2-BEDS **OK**		AFF. 3-BEDS **OK**	TOTAL REQ.	TOTAL AFF. **OK**
	5.822	2	**3**	2	**3**	1	**1**	5	**7**
	2.962	1	**0**	1	**0**	0	**0**	2	**0**
PHASE 2: LOTS 53 & 58		3	**3**	3	**3**	1	**1**	7	**7**
			AFF. 1-BEDS **OK**		AFF. 2-BEDS **OK**		AFF. 3-BEDS **OK**	TOTAL REQ.	TOTAL AFF. **OK**
		REQ.	PROVIDED	REQ.	PROVIDED	REQ.	PROVIDED	REQ.	PROVIDED
ALL LOTS TOTAL		5	**5**	5	**5**	2	**2**	12	**12**
			AFF. 1-BEDS **OK**		AFF. 2-BEDS **OK**		AFF. 3-BEDS **OK**	TOTAL REQ.	TOTAL AFF. **OK**

MAX. SHORT TERM	**112,952**
OVER/UNDER	*-2,055*
	UNDER

PARKING COUNTS

SITE	TOTAL REQUIRED PARKING	PARKING PROVIDED	PARKING PROV. INCL. TANDEM	TOTAL # BEDROOMS	REQ. BIKE PARKING	REQ. BIKES, SHORT-TERM (25% x .75/bed)	REQ. BIKES, LONG-TERM (75% x .75/bed)	NOTES
LOT 57 NORTH	14	**15**	**19**	27	21	6	15	Short term bike parking provided at public spaces; long-term in unit storage lockers in each garage
LOT 57 SOUTH	13	**14**	**22**	36	27	7	20	
LOT 53	33	**42**	**57**	70	53	14	39	
LOT 58	12	**19**	**19**	29	22	6	16	
	72	**90**	**117**					
	REQ.	PROVIDED	PROVIDED INCL. TANDEM					

OVERALL UNIT MIX SUMMARY

FAR Area Legend

- Market 2-Bedroom
- Market 3-Bedroom
- Market 4-Bedroom
- Market Circulation Stair/Elev
- Market Circulation Corridor
- Market Circulation N/A
- Affordable Studio
- Affordable 1-Bedroom
- Affordable 2-Bedroom
- Affordable 3-Bedroom
- Mechanical
- Parking

LOT 57 NORTH - FAR AREA

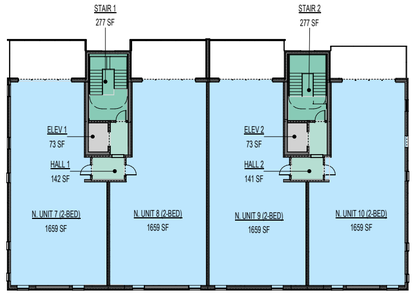
AREA TYPE	ROOM NAME	AREA
T.O. LEVEL 3 SLAB		
Market 2-Bedroom	N. UNIT 10 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 9 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 8 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 7 (2-BED)	1,659 SF
Market Circulation Corridor	HALL 2	141 SF
Market Circulation Corridor	HALL 1	142 SF
Market Circulation Stair/Elev	STAIR 2	277 SF
Market Circulation Stair/Elev	STAIR 1	277 SF
		7,473 SF
T.O. LEVEL 2 SLAB		
Market 2-Bedroom	N. UNIT 6 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 5 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 4 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 3 (2-BED)	1,659 SF
Market Circulation Corridor	N. HALL 2	141 SF
Market Circulation Corridor	N. HALL 1	142 SF
		8,919 SF
T.O. LEVEL 1 SLAB		
Market 2-Bedroom	N. UNIT 2 (2-BED)	1,659 SF
Market 2-Bedroom	N. UNIT 1 (2-BED)	1,659 SF
Market Circulation Corridor	N. HALL 1	142 SF
Market Circulation Stair/Elev	N. STAIR 2	277 SF
Market Circulation Stair/Elev	N. STAIR 1	277 SF
Market Circulation Stair/Elev	N. ELEV 2	73 SF
Market Circulation Stair/Elev	N. ELEV 1	73 SF
		4,160 SF
TOTAL FAR AREA		18,932 SF

LOT 57 NORTH - NOT COUNTED IN FAR

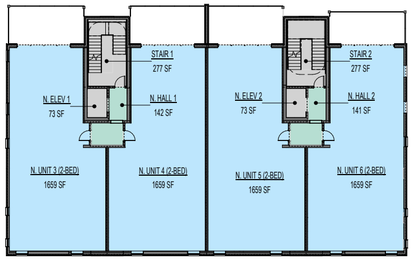
AREA TYPE	ROOM NAME	AREA
T.O. LEVEL 3 SLAB		
Market Circulation N/A	ELEV 1	73 SF
Market Circulation N/A	ELEV 2	73 SF
		146 SF
T.O. LEVEL 2 SLAB		
Market Circulation N/A	N. ELEV 1	73 SF
Market Circulation N/A	N. ELEV 2	73 SF
Market Circulation N/A	STAIR 1	277 SF
Market Circulation N/A	STAIR 2	277 SF
		700 SF
T.O. LEVEL 1 SLAB		
Affordable 1-Bedroom	AFF. UNIT 3	787 SF
Affordable 1-Bedroom	AFF. UNIT 4	760 SF
Affordable 2-Bedroom	AFF. UNIT 1	855 SF
Affordable 3-Bedroom	AFF. UNIT 2	1,317 SF
Market Circulation N/A	AFF. HALL	209 SF
		3,928 SF
T.O. BASEMENT SLAB		
Market Circulation N/A	N. ELEV 1	68 SF
Market Circulation N/A	N. ELEV 2	68 SF
Market Circulation N/A	N. STAIR 1	334 SF
Market Circulation N/A	N. STAIR 2	334 SF
Mechanical	N. MECH	206 SF
Mechanical	N. MECH	198 SF
Mechanical	N. TRASH	218 SF
Parking	N. PARKING	7,253 SF
		8,679 SF
TOTAL AREA NOT COUNTED TOWARD FAR		13,453 SF

LOT 57 NORTH - AREA TOTALS

LEVEL	AREA TOTALS BY FLOOR
T.O. LEVEL 3 SLAB	7,819 SF
T.O. LEVEL 2 SLAB	7,819 SF
T.O. LEVEL 1 SLAB	8,088 SF
T.O. BASEMENT SLAB	8,679 SF
TOTAL AREA	32,005 SF



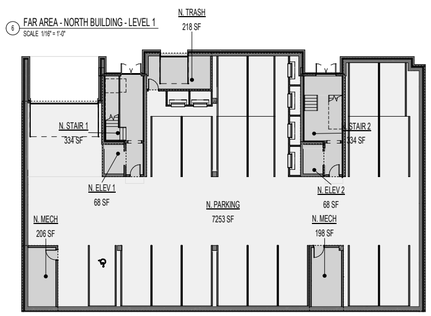
8 FAR AREA - NORTH BUILDING - LEVEL 3
SCALE: 1/16" = 1'-0"



7 FAR AREA - NORTH BUILDING - LEVEL 2
SCALE: 1/16" = 1'-0"



6 FAR AREA - NORTH BUILDING - LEVEL 1
SCALE: 1/16" = 1'-0"



5 FAR AREA - NORTH BUILDING - BASEMENT
SCALE: 1/16" = 1'-0"

FAR Area Legend

- Market 2-Bedroom
- Market 3-Bedroom
- Market 4-Bedroom
- Market Circulation Stair/Elev
- Market Circulation Corridor
- Market Circulation N/A
- Affordable Studio
- Affordable 1-Bedroom
- Affordable 2-Bedroom
- Affordable 3-Bedroom
- Mechanical
- Parking

LOT 57 SOUTH - FAR AREA

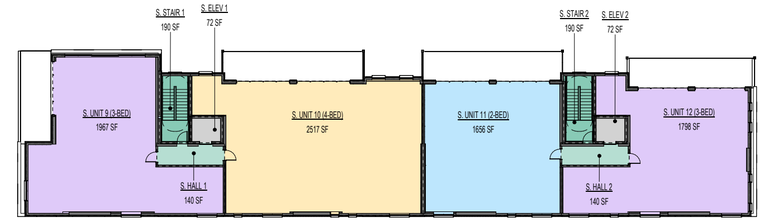
AREA TYPE	ROOM NAME	AREA
T.O. LEVEL 3 SLAB		
Market 3-Bedroom	S. UNIT 12 (3-BED)	1,798 SF
Market 3-Bedroom	S. UNIT 11 (2-BED)	1,656 SF
Market 4-Bedroom	S. UNIT 10 (4-BED)	2,517 SF
Market 2-Bedroom	S. UNIT 9 (3-BED)	1,967 SF
Market Circulation Stair/Elev	S. STAIR 2	190 SF
Market Circulation Stair/Elev	S. STAIR 1	190 SF
Market Circulation Corridor	S. HALL 2	140 SF
Market Circulation Corridor	S. HALL 1	140 SF
		8,598 SF
T.O. LEVEL 2 SLAB		
Market 3-Bedroom	S. UNIT 8 (3-BED)	1,858 SF
Market 2-Bedroom	S. UNIT 7 (2-BED)	1,656 SF
Market 4-Bedroom	S. UNIT 6 (4-BED)	2,514 SF
Market 3-Bedroom	S. UNIT 5 (3-BED)	2,054 SF
Market Circulation Corridor	S. HALL 2	141 SF
Market Circulation Corridor	S. HALL 1	141 SF
		8,364 SF
T.O. LEVEL 1 SLAB		
Market 3-Bedroom	S. UNIT 4 (3-BED)	1,859 SF
Market 3-Bedroom	S. UNIT 3 (2-BED)	1,657 SF
Market 2-Bedroom	S. UNIT 2 (2-BED)	1,778 SF
Market 3-Bedroom	S. UNIT 1 (3-BED)	2,035 SF
Market Circulation Stair/Elev	S. STAIR 2	194 SF
Market Circulation Stair/Elev	S. STAIR 1	190 SF
Market Circulation Corridor	S. HALL 2	134 SF
Market Circulation Corridor	S. HALL 1	170 SF
Market Circulation Stair/Elev	S. ELEV 2	75 SF
Market Circulation Stair/Elev	S. ELEV 1	72 SF
		8,194 SF
TOTAL FAR AREA		25,156 SF

LOT 57 SOUTH - NOT COUNTED IN FAR

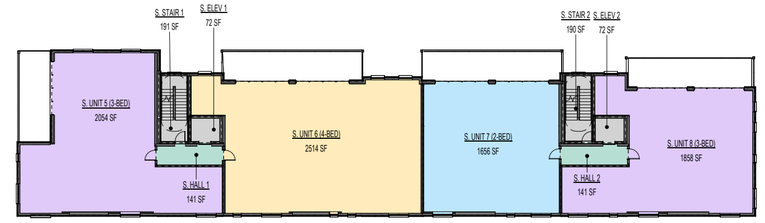
AREA TYPE	ROOM NAME	AREA
T.O. LEVEL 3 SLAB		
Market Circulation N/A	S. ELEV 1	72 SF
Market Circulation N/A	S. ELEV 2	72 SF
		144 SF
T.O. LEVEL 2 SLAB		
Market Circulation N/A	S. ELEV 1	72 SF
Market Circulation N/A	S. ELEV 2	72 SF
Market Circulation N/A	S. STAIR 1	191 SF
Market Circulation N/A	S. STAIR 2	190 SF
		525 SF
T.O. LEVEL 1 SLAB		
Affordable 2-Bedroom	AFF. UNIT 5 (2-BED)	726 SF
		726 SF
T.O. BASEMENT SLAB		
Market Circulation N/A	S. ELEV 1	75 SF
Market Circulation N/A	S. ELEV 2	78 SF
Market Circulation N/A	S. HALL 1	121 SF
Market Circulation N/A	S. HALL 2	127 SF
Market Circulation N/A	S. STAIR 1	201 SF
Market Circulation N/A	S. STAIR 2	193 SF
Mechanical	TRASH / MECH	367 SF
Parking	S. PARKING	9,634 SF
		10,796 SF
TOTAL AREA NOT COUNTED TOWARD FAR		12,191 SF

LOT 57 SOUTH - AREA TOTALS

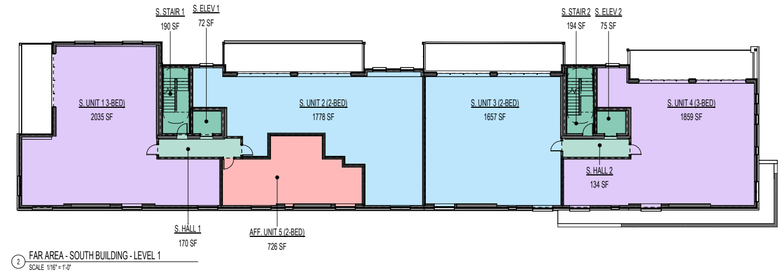
LEVEL	AREA TOTALS BY FLOOR
T.O. LEVEL 3 SLAB	8,742 SF
T.O. LEVEL 2 SLAB	8,889 SF
T.O. LEVEL 1 SLAB	8,898 SF
T.O. BASEMENT SLAB	10,796 SF
TOTAL AREA	37,317 SF



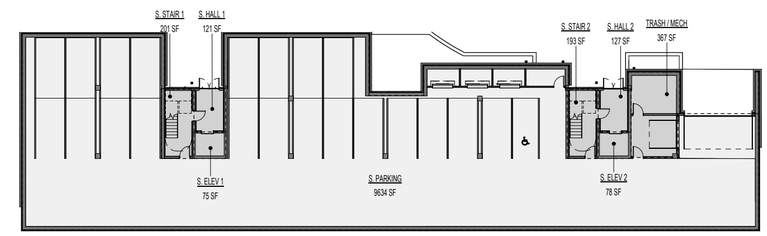
4 FAR AREA - SOUTH BUILDING - LEVEL 3
SCALE: 1/16" = 1'-0"



3 FAR AREA - SOUTH BUILDING - LEVEL 2
SCALE: 1/16" = 1'-0"



2 FAR AREA - SOUTH BUILDING - LEVEL 1
SCALE: 1/16" = 1'-0"



1 FAR AREA - SOUTH BUILDING - GARAGE
SCALE: 1/16" = 1'-0"

0 8 16 32 64

UNIT MIX & F.A.R. AREAS – LOT 57

LOT 53 - FAR AREA SCHEDULE

AREA TYPE	ROOM NAME	AREA
LEVEL 3		
Market 2-Bedroom	UNIT 26 (2-BED)	1,271 SF
Market 2-Bedroom	UNIT 25 (2-BED)	1,371 SF
Market 2-Bedroom	UNIT 24 (2-BED)	1,359 SF
Market 3-Bedroom	UNIT 23 (3-BED)	2,433 SF
Market 3-Bedroom	UNIT 22 (3-BED)	2,302 SF
Market 2-Bedroom	UNIT 21 (2-BED)	1,365 SF
Market 2-Bedroom	UNIT 20 (2-BED)	1,359 SF
Market 3-Bedroom	UNIT 19 (3-BED)	1,269 SF
Market Circulation Stair	STAIR 5	235 SF
Market Circulation Stair	STAIR 4	235 SF
Market Circulation Stair	STAIR 2	232 SF
Market Circulation Stair	STAIR 1	235 SF
Market Circulation Corridor	HALL 5	65 SF
Market Circulation Corridor	HALL 4	65 SF
Market Circulation Corridor	HALL 2	64 SF
Market Circulation Corridor	HALL 1	65 SF
		13,925 SF
LEVEL 2		
Market 2-Bedroom	UNIT 18 (2-BED)	1,277 SF
Market 2-Bedroom	UNIT 17 (2-BED)	1,371 SF
Market 2-Bedroom	UNIT 16 (2-BED)	1,359 SF
Market 3-Bedroom	UNIT 15 (3-BED)	2,434 SF
Market 3-Bedroom	UNIT 14 (3-BED)	2,296 SF
Market 2-Bedroom	UNIT 13 (2-BED)	1,365 SF
Market 2-Bedroom	UNIT 12 (2-BED)	1,359 SF
Market 3-Bedroom	UNIT 11 (3-BED)	1,823 SF
Market Circulation Corridor	HALL 5	65 SF
Market Circulation Corridor	HALL 4	65 SF
Market Circulation Corridor	HALL 2	65 SF
Market Circulation Corridor	HALL 1	65 SF
		13,544 SF
LEVEL 1		
Market 2-Bedroom	UNIT 10 (2-BED)	1,276 SF
Market 2-Bedroom	UNIT 9 (2-BED)	1,371 SF
Market 2-Bedroom	UNIT 8 (2-BED)	1,365 SF
Market 1-Bedroom	UNIT 7 (1-BED+DEN)	1,116 SF
Market 2-Bedroom	UNIT 6 (2-BED)	1,428 SF
Market 2-Bedroom	UNIT 5 (2-BED)	1,078 SF
Market 2-Bedroom	UNIT 4 (2-BED)	1,067 SF
Market 2-Bedroom	UNIT 3 (2-BED)	1,365 SF
Market 2-Bedroom	UNIT 2 (2-BED)	1,359 SF
Market 3-Bedroom	UNIT 1 (3-BED)	1,823 SF
Market Circulation Stair	STAIR 5	235 SF
Market Circulation Stair	STAIR 4	232 SF
Market Circulation Stair	STAIR 2	235 SF
Market Circulation Stair	STAIR 1	235 SF
Market Circulation Corridor	HALL 5	65 SF
Market Circulation Corridor	HALL 4	64 SF
Market Circulation Corridor	HALL 3	81 SF
Market Circulation Corridor	HALL 2	65 SF
Market Circulation Corridor	HALL 1	65 SF
Market Circulation Elevator	ELEV 5	83 SF
Market Circulation Elevator	ELEV 4	81 SF
Market Circulation Elevator	ELEV 2	78 SF
Market Circulation Elevator	ELEV 1	78 SF
		14,845 SF
TOTAL FAR AREA		42,314 SF

LOT 53 - NOT COUNTED TOWARD FAR AREA

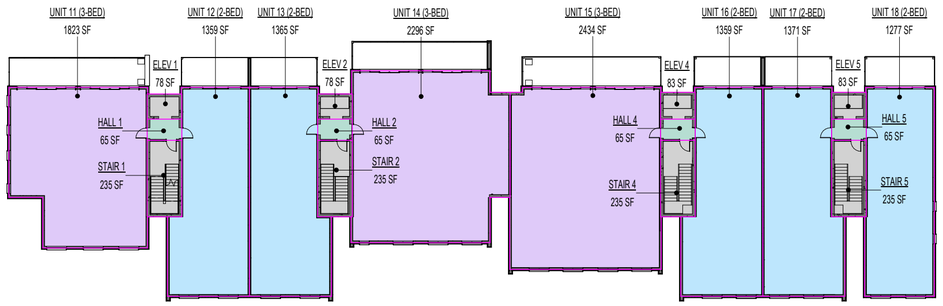
AREA TYPE	ROOM NAME	AREA
LEVEL 3		
Market Circulation N/A	ELEV 1	78 SF
Market Circulation N/A	ELEV 2	76 SF
Market Circulation N/A	ELEV 4	78 SF
Market Circulation N/A	ELEV 5	83 SF
		315 SF
LEVEL 2		
Market Circulation N/A	ELEV 1	78 SF
Market Circulation N/A	ELEV 2	78 SF
Market Circulation N/A	ELEV 4	83 SF
Market Circulation N/A	ELEV 5	83 SF
Market Circulation N/A	STAIR 1	235 SF
Market Circulation N/A	STAIR 2	235 SF
Market Circulation N/A	STAIR 4	235 SF
Market Circulation N/A	STAIR 5	235 SF
		1,262 SF
BASEMENT		
Affordable 1-Bedroom	AFF. UNIT 3 (1-BED)	530 SF
Affordable 1-Bedroom	AFF. UNIT 6 (1-BED)	527 SF
Affordable 1-Bedroom	AFF. UNIT 7 (STUDIO)	490 SF
Affordable 2-Bedroom	AFF. UNIT 1 (2-BED)	832 SF
Affordable 2-Bedroom	AFF. UNIT 2 (2-BED)	817 SF
Affordable 2-Bedroom	AFF. UNIT 5 (2-BED)	706 SF
Affordable 3-Bedroom	AFF. UNIT 4 (3-BED)	1,004 SF
Market 2-Bedroom non-FAR	UNIT 4 (2-BED)	508 SF
Market 2-Bedroom non-FAR	UNIT 5 (2-BED)	553 SF
Market Circulation N/A	ELEV 1	73 SF
Market Circulation N/A	ELEV 2	73 SF
Market Circulation N/A	ELEV 4	75 SF
Market Circulation N/A	ELEV 5	83 SF
Market Circulation N/A	HALL 1	404 SF
Market Circulation N/A	HALL 2	149 SF
Market Circulation N/A	HALL 4	215 SF
Market Circulation N/A	HALL 5	170 SF
Market Circulation N/A	STAIR 1	210 SF
Market Circulation N/A	STAIR 2	206 SF
Market Circulation N/A	STAIR 3	133 SF
Market Circulation N/A	STAIR 4	210 SF
Market Circulation N/A	STAIR 5	210 SF
Mechanical	MECH	443 SF
Parking	PARKING	19,193 SF
		27,814 SF
TOTAL AREA NOT COUNTED TOWARD FAR		29,391 SF

LOT 53 - AREA TOTALS

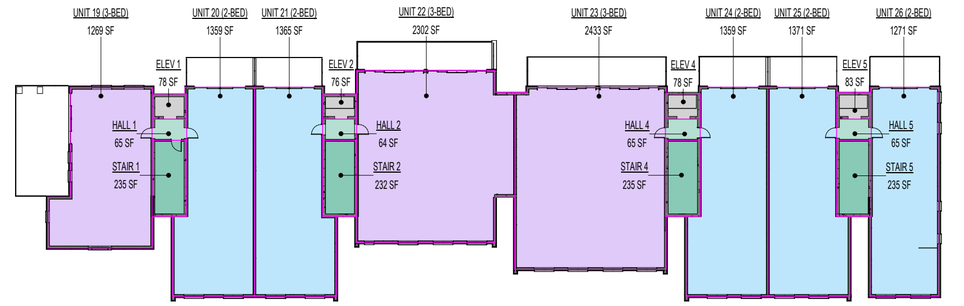
LEVEL	AREA TOTALS BY FLOOR
LEVEL 3	14,240 SF
LEVEL 2	14,806 SF
LEVEL 1	14,845 SF
BASEMENT	27,814 SF
TOTAL AREA	71,705 SF

FAR Area Legend

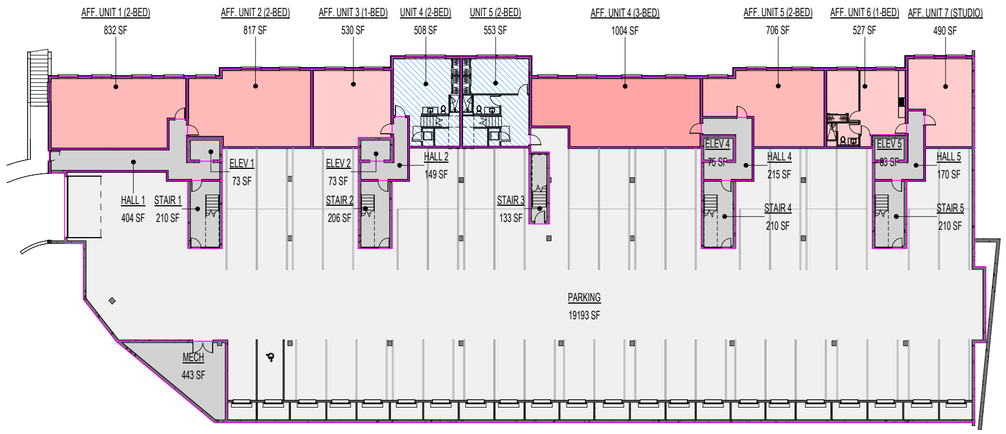
- Market 2-Bedroom
- Market 2-Bedroom non-FAR
- Market 3-Bedroom
- Affordable Studio
- Affordable 1-Bedroom
- Market 1-Bedroom
- Affordable 2-Bedroom
- Affordable 3-Bedroom
- Market Circulation Elevator
- Market Circulation Corridor
- Market Circulation Stair
- Market Circulation N/A
- Mechanical
- Parking



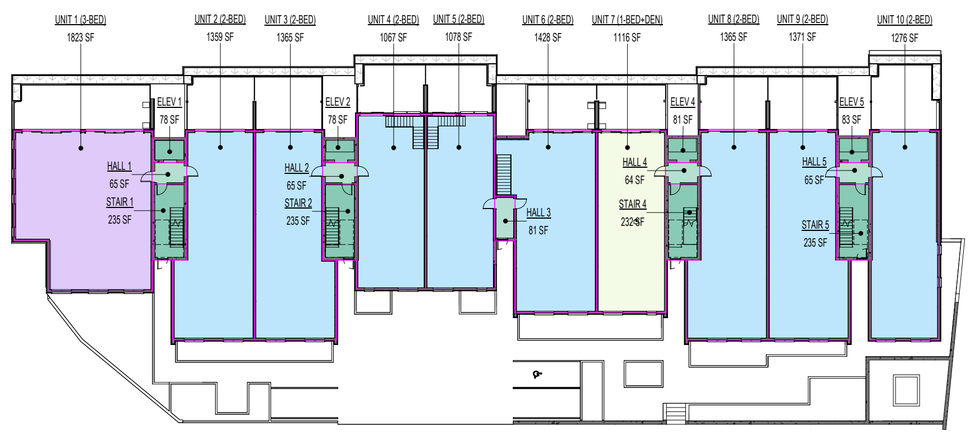
3 LOT 53 - FAR AREA PLAN - 2ND FLOOR
SCALE 1" = 20'-0"



4 LOT 53 - FAR AREA PLAN - 3RD FLOOR
SCALE 1" = 20'-0"



2 LOT 53 - FAR AREA PLAN - BASEMENT
SCALE 1" = 20'-0"



1 LOT 53 - FAR AREA PLAN - 1ST FLOOR
SCALE 1" = 20'-0"

0 10 20 40 80

UNIT MIX & F.A.R. AREAS – LOT 53

LOT 58 - FAR AREA SCHEDULE

AREA TYPE	ROOM NAME	AREA
LEVEL 3		
Market 3-Bedroom	UNIT 12 (3-BED)	2,086 SF
Market 2-Bedroom	UNIT 11 (2-BED)	1,790 SF
Market 2-Bedroom	UNIT 10 (2-BED)	1,790 SF
Market 3-Bedroom	UNIT 9 (3-BED)	2,086 SF
Market Circulation Stair	STAIR 2	197 SF
Market Circulation Stair	STAIR 1	197 SF
Market Circulation Corridor	HALL 2	116 SF
Market Circulation Corridor	HALL 1	116 SF
		8,378 SF
LEVEL 2		
Market 3-Bedroom	UNIT 8 (3-BED)	2,086 SF
Market 2-Bedroom	UNIT 7 (2-BED)	1,790 SF
Market 2-Bedroom	UNIT 6 (2-BED)	1,790 SF
Market 3-Bedroom	UNIT 5 (3-BED)	2,086 SF
Market Circulation Corridor	HALL 2	116 SF
Market Circulation Corridor	HALL 1	116 SF
		7,984 SF
LEVEL 1		
Market 2-Bedroom	UNIT 4 (2-BED)	2,087 SF
Market 2-Bedroom	UNIT 3 (2-BED)	1,790 SF
Market 2-Bedroom	UNIT 2 (2-BED)	1,790 SF
Market 3-Bedroom	UNIT 1 (3-BED)	2,086 SF
Market Circulation Stair	STAIR 2	197 SF
Market Circulation Stair	STAIR 1	197 SF
Market Circulation Corridor	HALL 2	116 SF
Market Circulation Corridor	HALL 1	116 SF
Market Circulation Elevator	ELEV 1	82 SF
Market Circulation Elevator	ELEV 1	82 SF
		8,543 SF
TOTAL FAR AREA		24,905 SF

LOT 58 - NOT COUNTED TOWARD FAR AREA

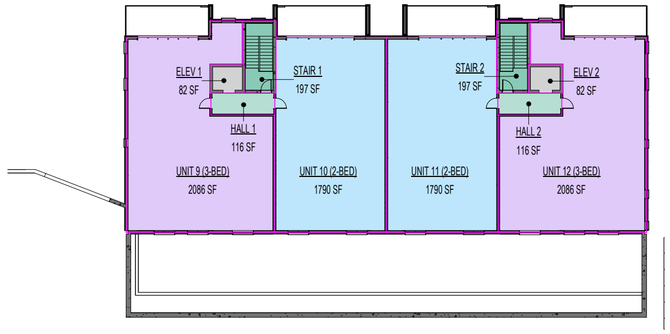
AREA TYPE	ROOM NAME	AREA
LEVEL 3		
Market Circulation N/A	ELEV 1	82 SF
Market Circulation N/A	ELEV 2	82 SF
		164 SF
LEVEL 2		
Market Circulation N/A	ELEV 1	82 SF
Market Circulation N/A	ELEV 2	82 SF
Market Circulation N/A	STAIR 1	197 SF
Market Circulation N/A	STAIR 2	197 SF
		558 SF
BASEMENT		
Market Circulation N/A	ELEV 1	77 SF
Market Circulation N/A	ELEV 2	77 SF
Market Circulation N/A	HALL 1	129 SF
Market Circulation N/A	HALL 2	129 SF
Market Circulation N/A	STAIR 1	196 SF
Market Circulation N/A	STAIR 2	196 SF
Mechanical	MECH	207 SF
Mechanical	TRASH	167 SF
Parking	PARKING GARAGE	8,044 SF
		9,222 SF
TOTAL AREA NOT COUNTED TOWARD FAR		9,944 SF

LOT 58 - AREA TOTALS

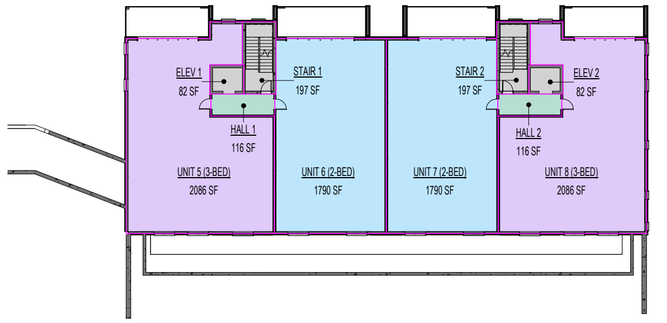
LEVEL	AREA TOTALS BY FLOOR
LEVEL 3	8,542 SF
LEVEL 2	8,542 SF
LEVEL 1	8,543 SF
BASEMENT	9,222 SF
TOTAL AREA	34,849 SF

FAR Area Legend

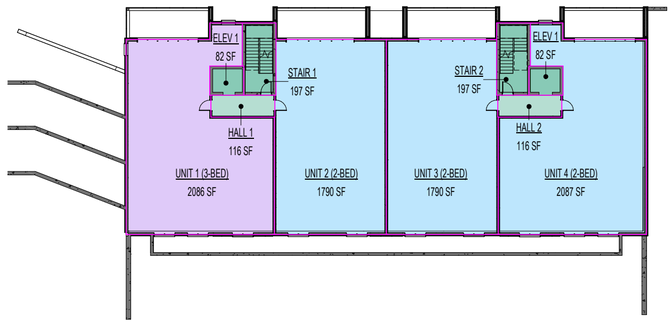
- Market 1-Bedroom
- Market 2-Bedroom
- Market 3-Bedroom
- Market Circulation Elevator
- Market Circulation Corridor
- Market Circulation Stair
- Market Circulation N/A
- Mechanical
- Parking



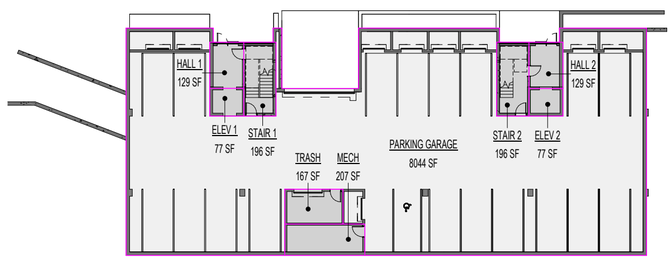
4 LOT 58 - FAR AREA PLAN - 3RD FLOOR
SCALE 1" = 20'-0"



3 LOT 58 - FAR AREA PLAN - 2ND FLOOR
SCALE 1" = 20'-0"



1 LOT 58 - FAR AREA PLAN - 1ST FLOOR
SCALE 1" = 20'-0"



2 LOT 58 - FAR AREA PLAN - BASEMENT
SCALE 1" = 20'-0"

0 10 20 40 80

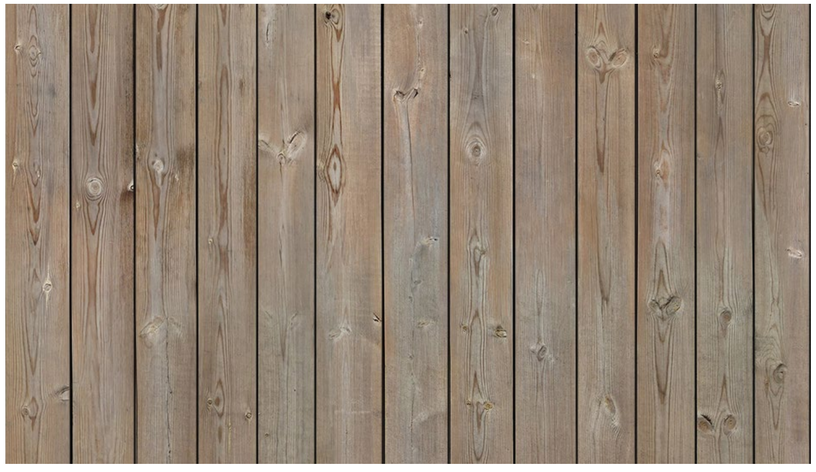
UNIT MIX & F.A.R. AREAS – LOT 58

NORTHWORKS

Overall Renderings



BLACK METAL
BUILDING WALL AND ROOF
CLADDING



WOOD SIDING
BUILDING WALL CLADDING



SILVERTIP LIMESTONE
BUILDING WALL CLADDING



MATERIAL PALETTE





FULL SITE AERIAL - WINTER





FULL SITE AERIAL - SUMMER





LOT 57 NORTH – RENDERED ELEVATION





LOVE RIDGE CONDOS & LOT 57 NORTH BUILDING





LOT 57 SOUTH RENDERED ELEVATION





LOT 57 COURTYARD





LOT 53 APPROACH





LOT 53 RENDERED ELEVATION





LOT 53 MAIN ENTRY & VEHICULAR DROPOFF





LOT 53 NORTH PATH AT LOVE RIDGE CONDOS





LOT 58 RENDERED ELEVATION

NORTHWORKS

Lot 57



LOT 57 SITE PLAN - LANDSCAPE



LOT 57 SITE PLAN – CIVIL



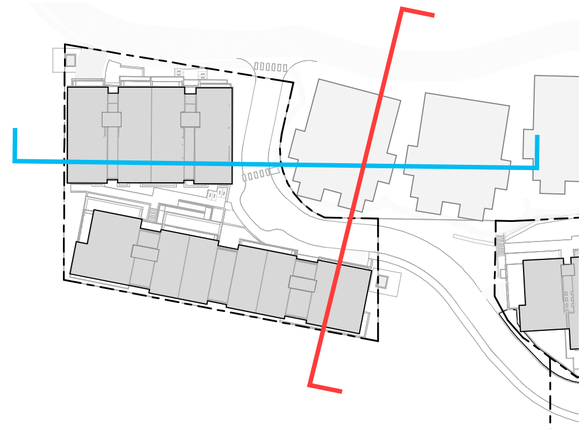
NORTH BUILDING, NORTH ELEVATION

LOT 57 NORTH – RENDERED ELEVATION



SOUTH BUILDING, NORTH ELEVATION

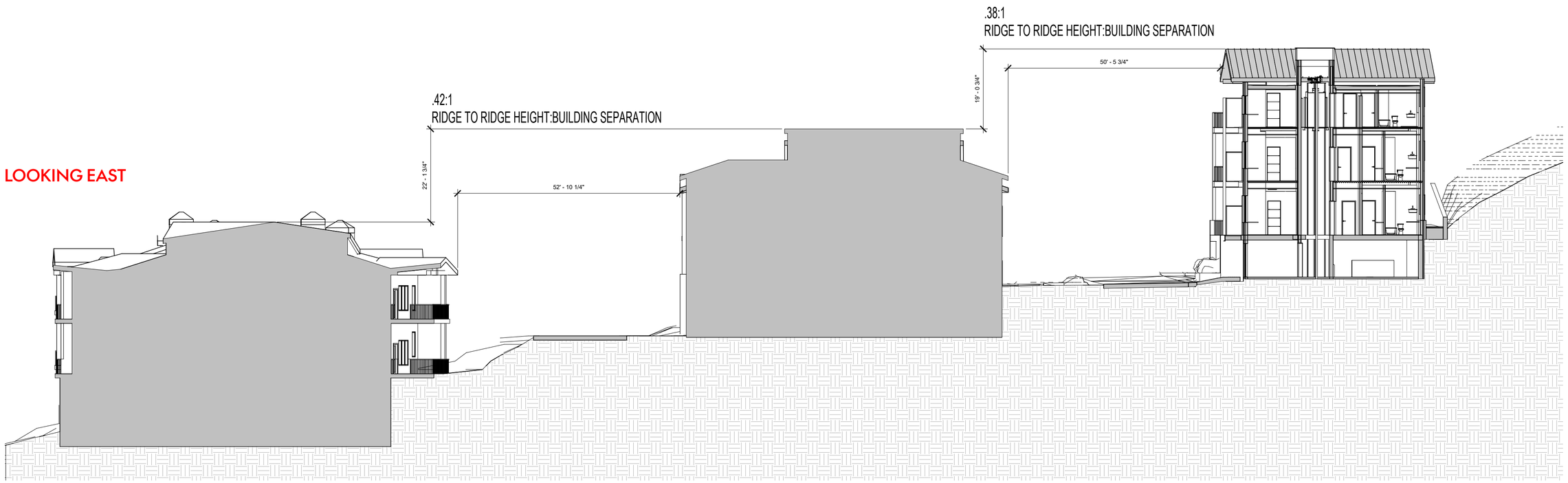
LOT 57 SOUTH – RENDERED ELEVATION



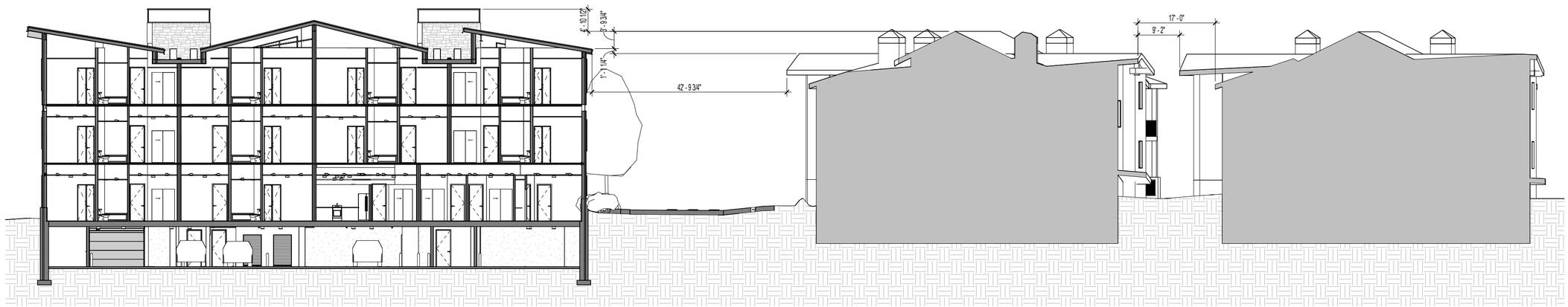
.38:1
RIDGE TO RIDGE HEIGHT:BUILDING SEPARATION

.42:1
RIDGE TO RIDGE HEIGHT:BUILDING SEPARATION

LOOKING EAST



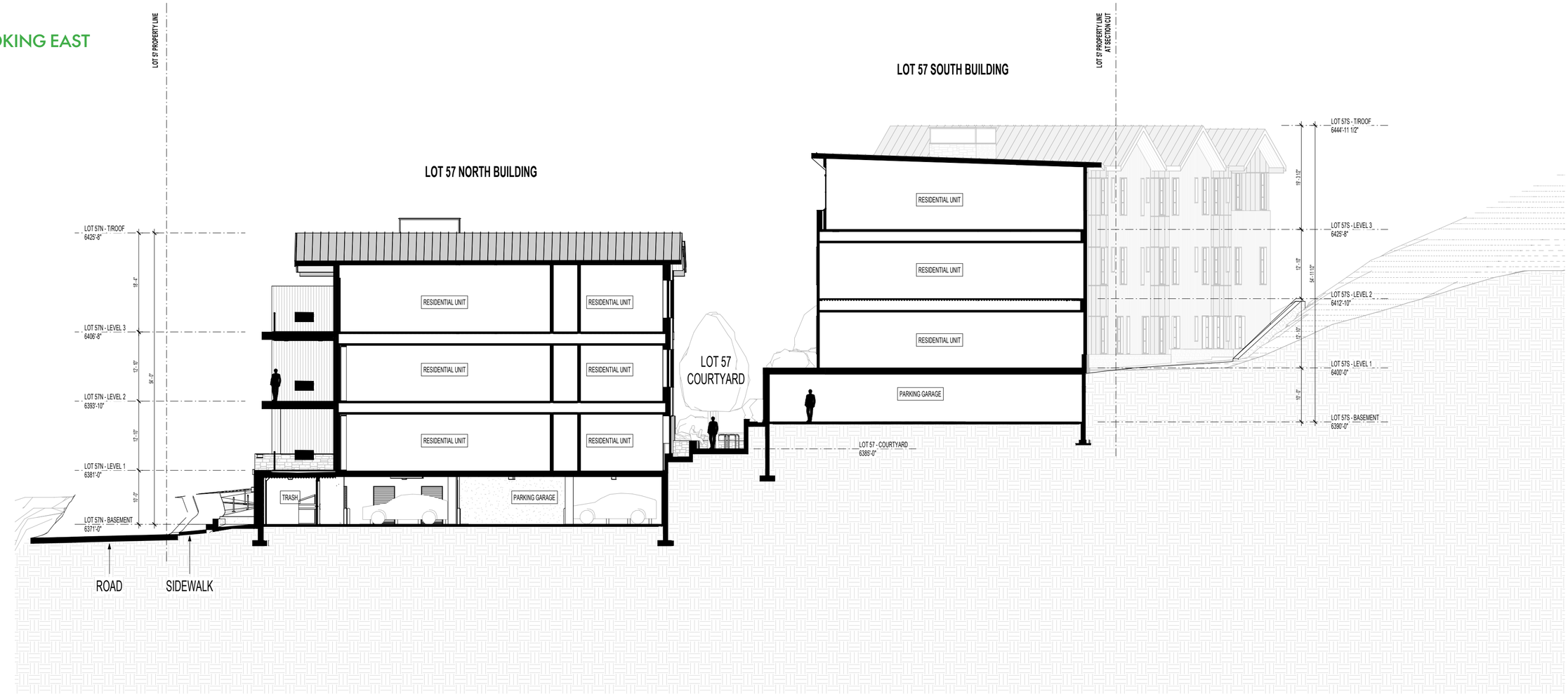
LOOKING NORTH



SITE SECTIONS THROUGH LOVE RIDGE CONDOS & LOT 57



LOOKING EAST



SITE SECTION THROUGH LOT 57 NORTH & SOUTH, LOOKING EAST

SUMMARY

NORTH BUILDING

- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

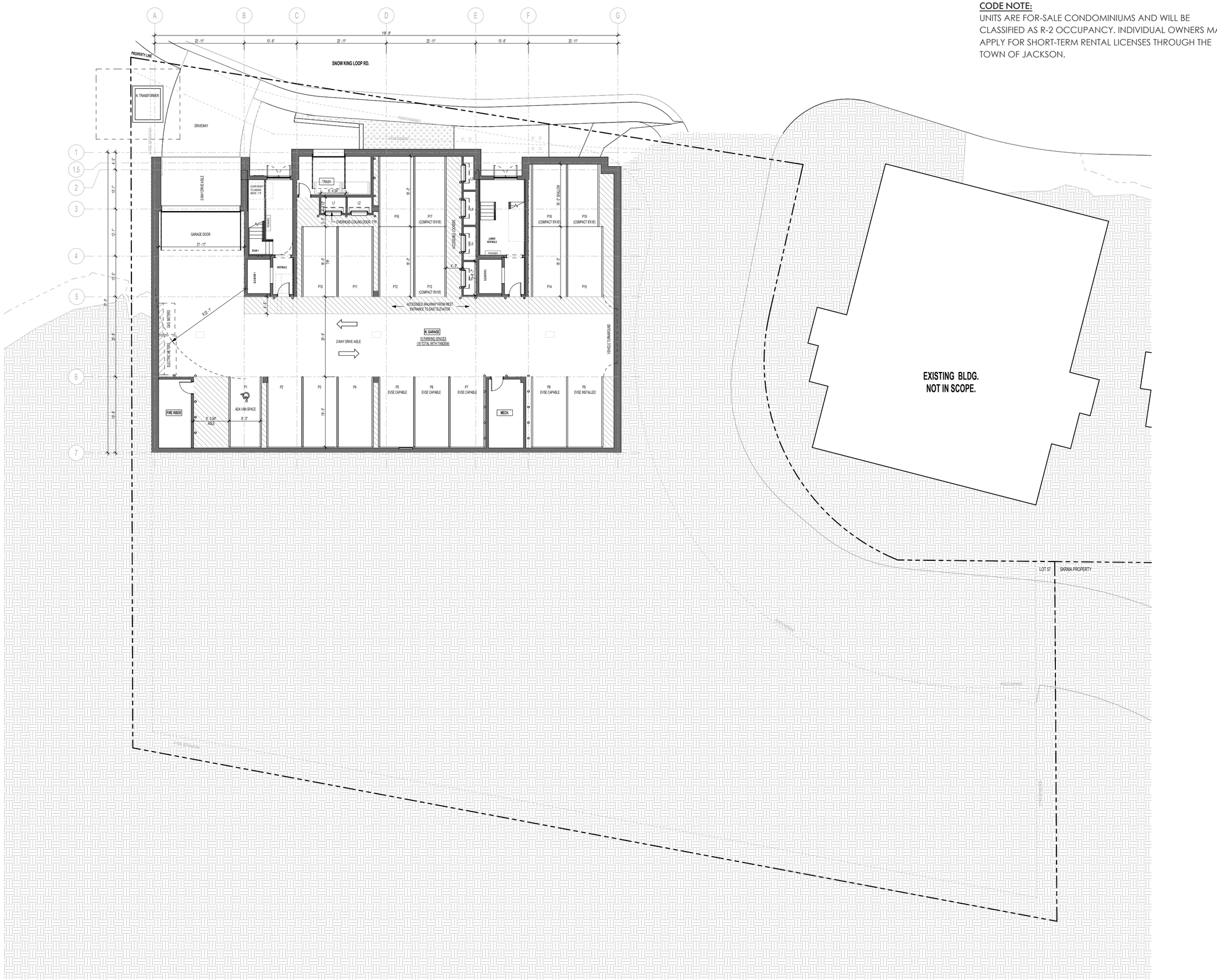
SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

57 NORTH:
BASEMENT

57 SOUTH:
SUBGRADE



LOT 57 PLANS

SCALE: 1 / 16" = 1' - 0"

SUMMARY

NORTH BUILDING

- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

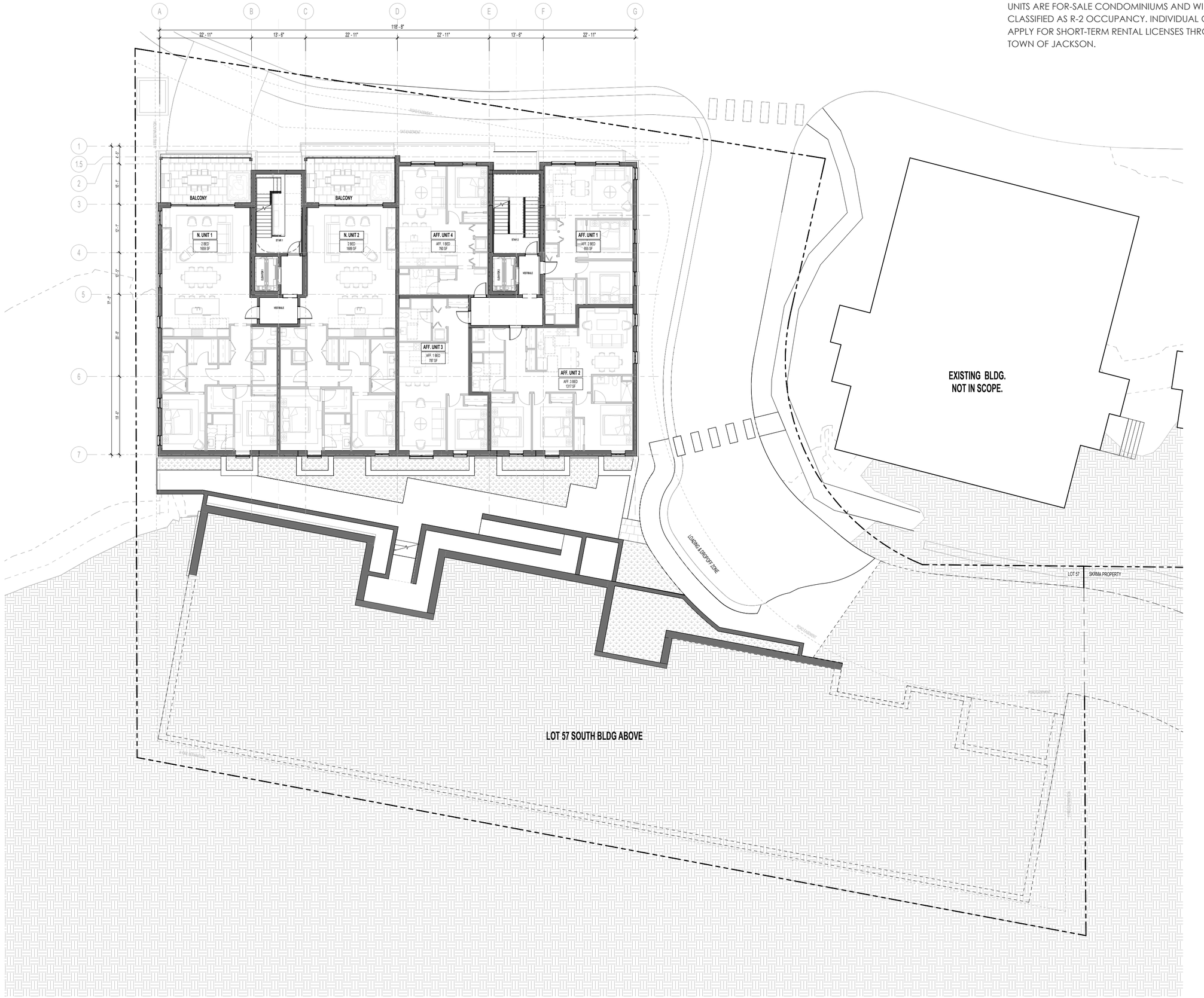
SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

57 NORTH:
LEVEL 1

57 SOUTH:
SUBGRADE



SCALE: 1 / 16" = 1' - 0"

LOT 57 PLANS

SUMMARY

NORTH BUILDING

- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

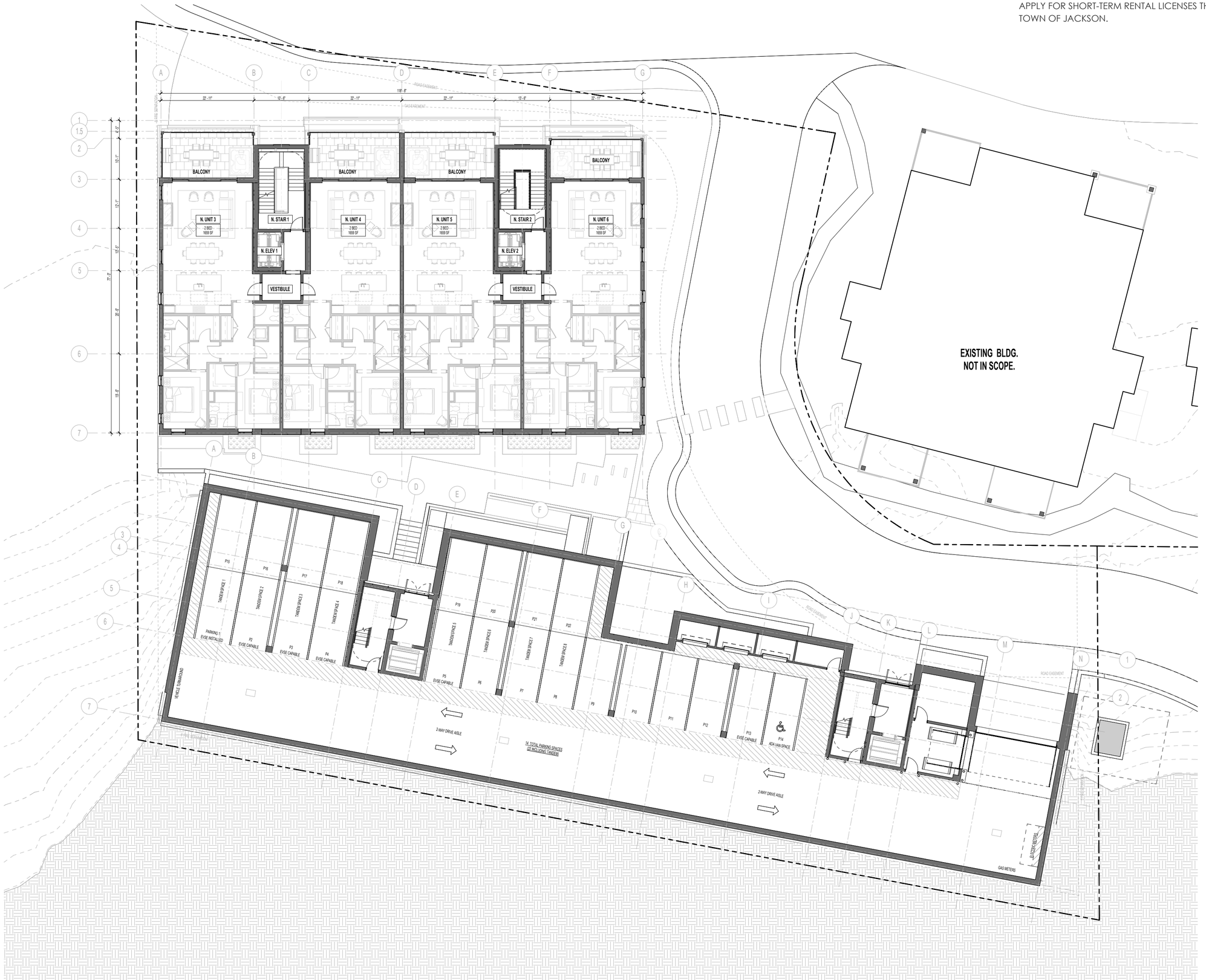
SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

57 NORTH:
LEVEL 2

57 SOUTH:
BASEMENT



SCALE: 1 / 16" = 1' - 0"

LOT 57 PLANS

SUMMARY

NORTH BUILDING

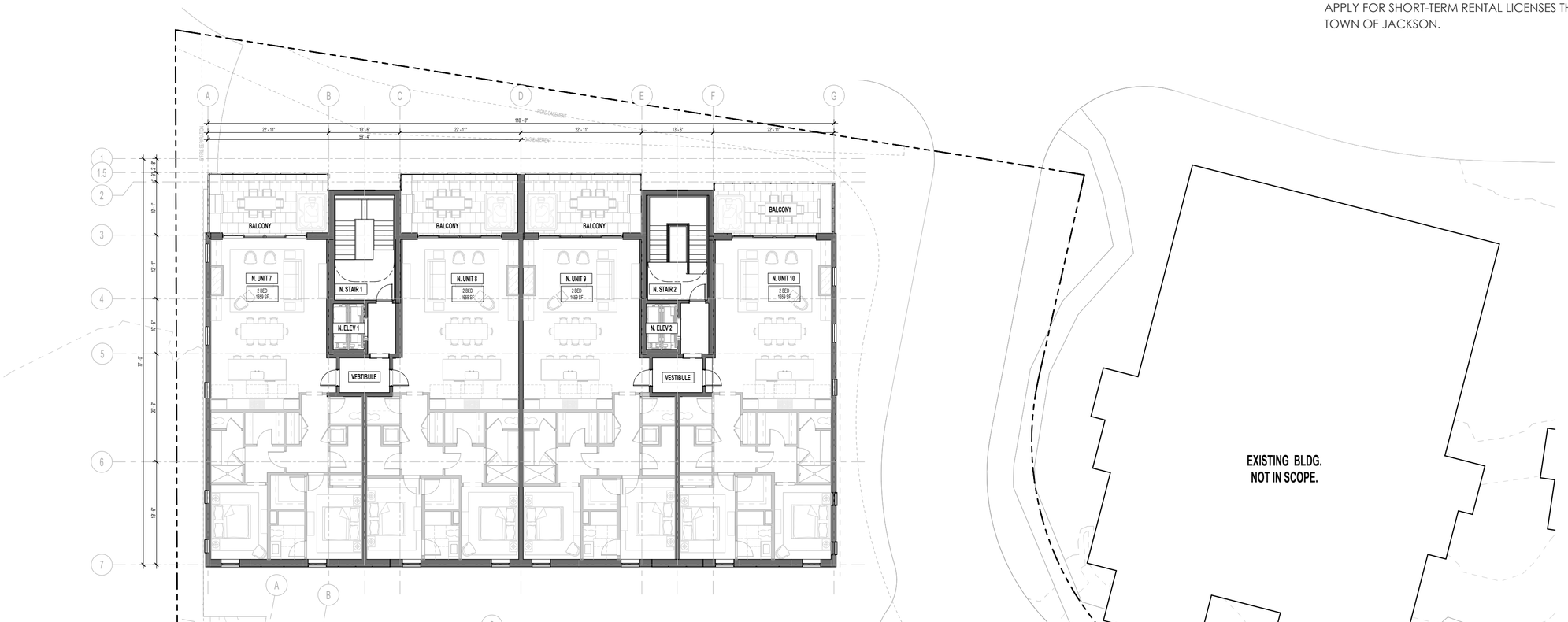
- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

57 NORTH:
LEVEL 3



57 SOUTH:
LEVEL 1



LOT 57 PLANS

SCALE: 1 / 16" = 1' - 0"

SUMMARY

NORTH BUILDING

- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

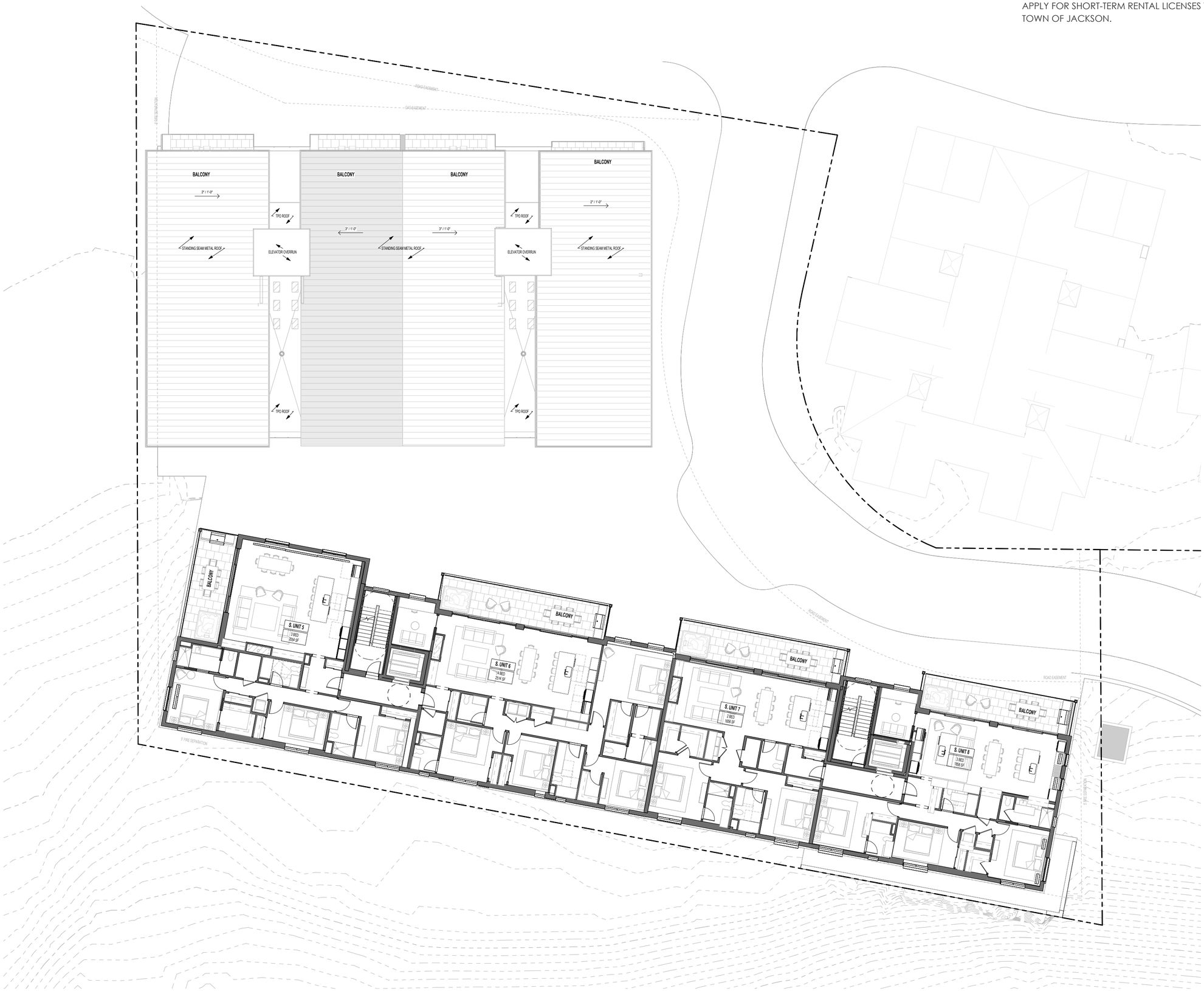
SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

57 NORTH:
ROOF

57 SOUTH:
LEVEL 2



LOT 57 PLANS

SCALE: 1 / 16" = 1' - 0"

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

SUMMARY

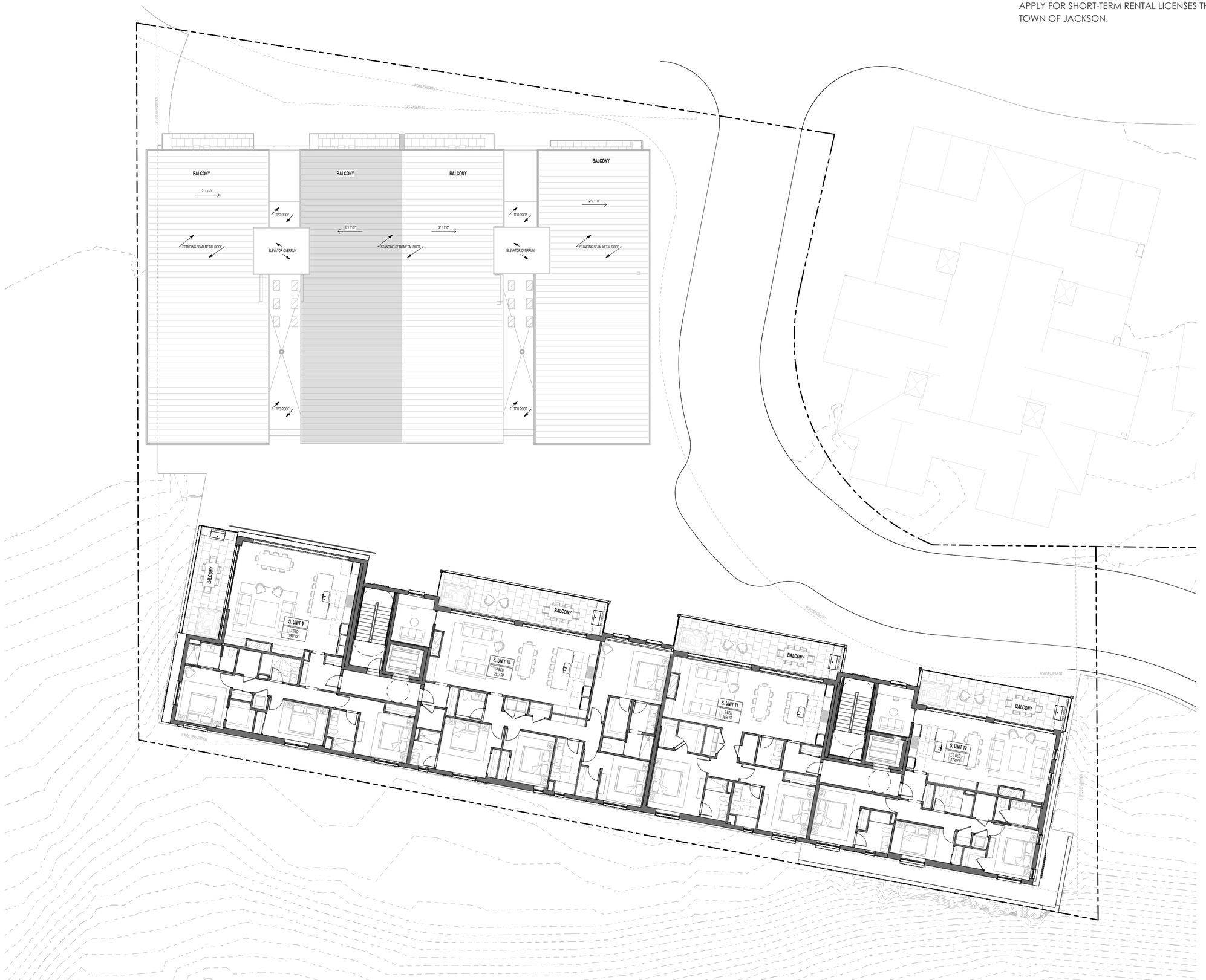
NORTH BUILDING

- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

57 NORTH:
ROOF BELOW



57 SOUTH:
LEVEL 3

SCALE: 1 / 16" = 1' - 0"

LOT 57 PLANS

SUMMARY

NORTH BUILDING

- PARKING SPACES : 15
- 2-BEDROOMS: 10
- AFFORDABLE UNITS: 4

SOUTH BUILDING

- PARKING SPACES : 14
- 2-BEDROOMS: 5
- 3-BEDROOMS: 5
- 4-BEDROOMS: 2
- AFFORDABLE UNITS: 1

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

57 NORTH:
ROOF BELOW

57 SOUTH:
LEVEL 3



LOT 57 PLANS

SCALE: 1 / 16" = 1' - 0"

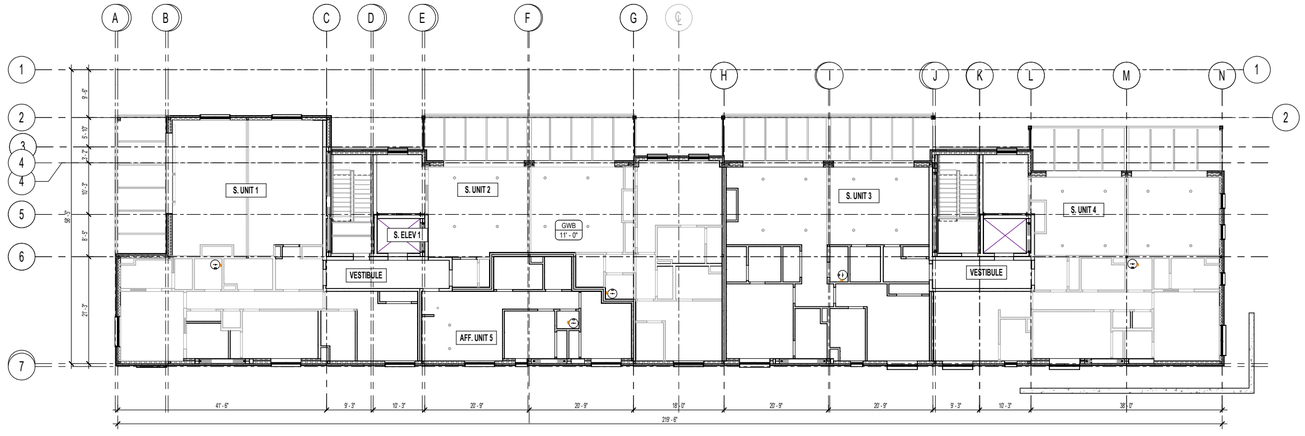
RCP LEGEND	
○	RECESSED LIGHT FIXTURE
□	EXTERIOR LIGHT FIXTURE
═	CEILING-MOUNTED STRIP LIGHT

ELECTRICAL NOTES:
1. ALL ELECTRICAL WORK SHALL FULLY COMPLY WITH CURRENT EDITIONS OF ALL APPLICABLE CODES.
2. GENERAL CONTRACTOR TO COORDINATE WALKTHROUGH WITH OWNER & ARCHITECT TO VERIFY FINAL LOCATIONS OF ALL FIXTURES & SWITCHES PRIOR TO INSTALLATION.
3. ELECTRICIAN TO COORDINATE WITH GENERAL CONTRACTOR, ARCHITECT, & HVAC CONTRACTOR FOR LOCATIONS OF ALL THERMOSTATS & THERMOSTATIC SENSORS.
4. ELECTRICIAN & GENERAL CONTRACTOR TO COORDINATE WORK WITH ALL THIRD-PARTY CONTRACTORS (SECURITY, AUDIO/VIDEO, HOME AUTOMATION AND SIMILAR).

LOW VOLTAGE NOTES:
1. ALL SPEAKER WIRE SHALL BE FOUR CONDUCTOR WIRE (UNLESS OTHERWISE NOTED)
2. ALL SPEAKER WIRED TO SINGLE HOMERUN POINT (UNLESS OTHERWISE NOTED)



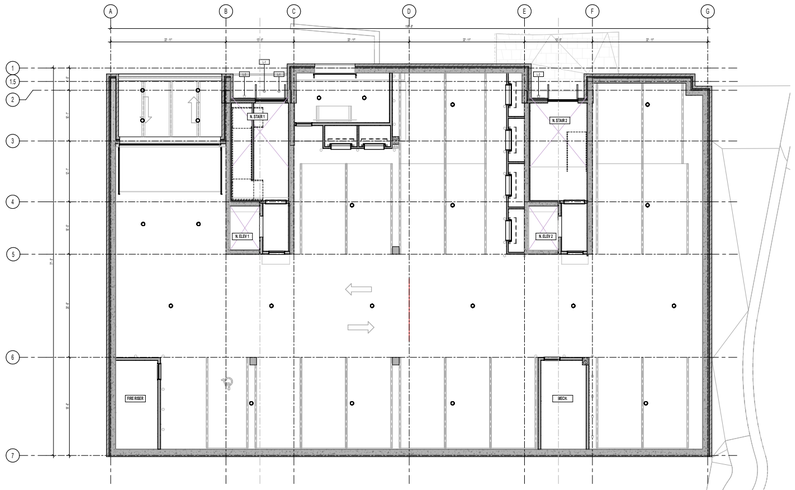
1 REFLECTED CEILING PLAN - N. LEVEL 1
SCALE: 3/16" = 1'-0"



4 REFLECTED CEILING PLAN - S. LEVEL 1
SCALE: 3/32" = 1'-0"

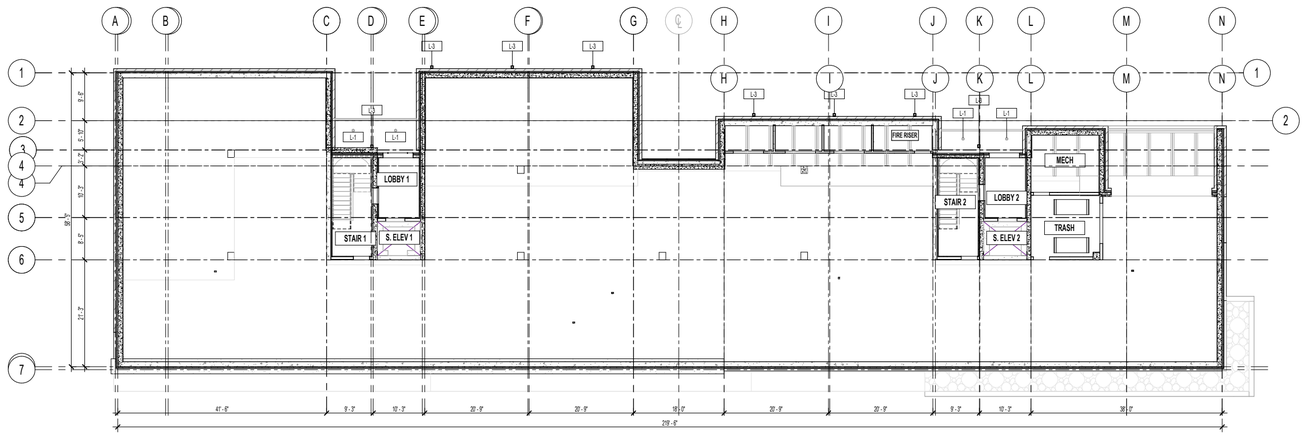
PROJECT NORTH

0 4 8 16 32



1 RFLECTED CEILING PLAN - N. BASEMENT
SCALE: 3/16" = 1'-0"

0 4 8 16 32

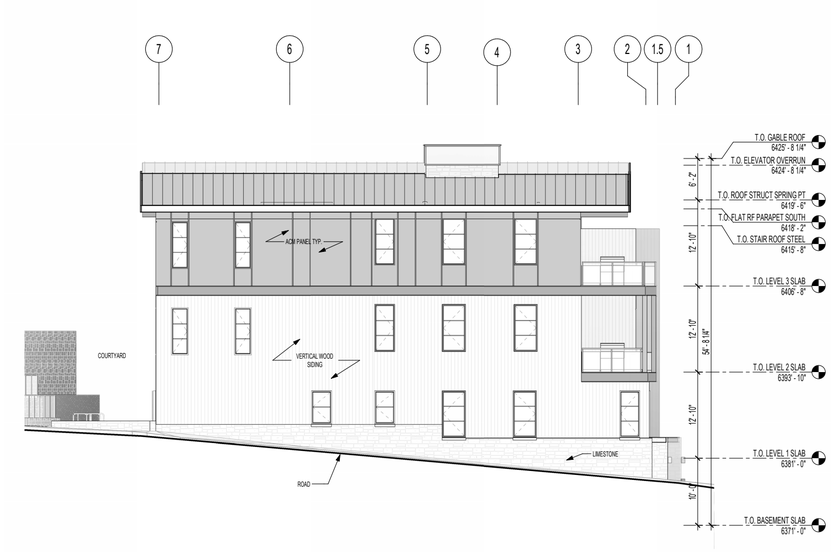


3 REFLECTED CEILING PLAN - S. BASEMENT
SCALE: 3/32" = 1'-0"

PROJECT NORTH

0 4 8 16 32

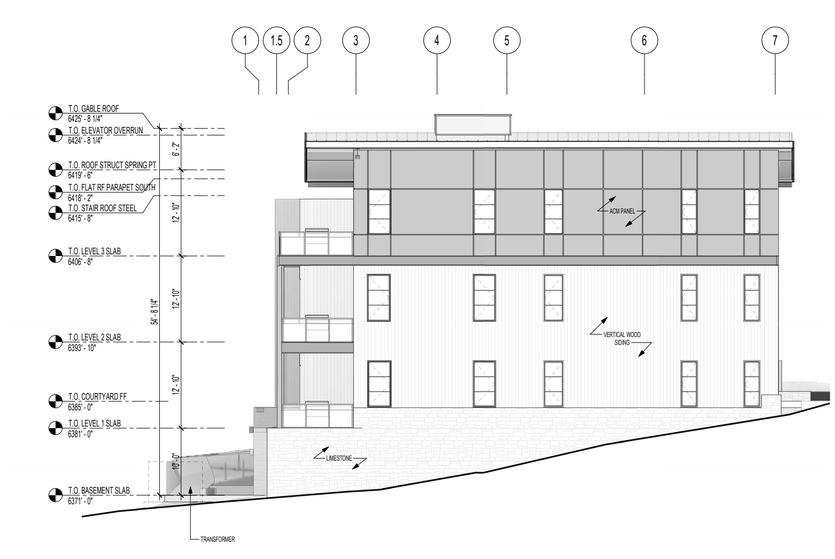
LOT 57 – EXTERIOR LIGHTING PLANS



EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION

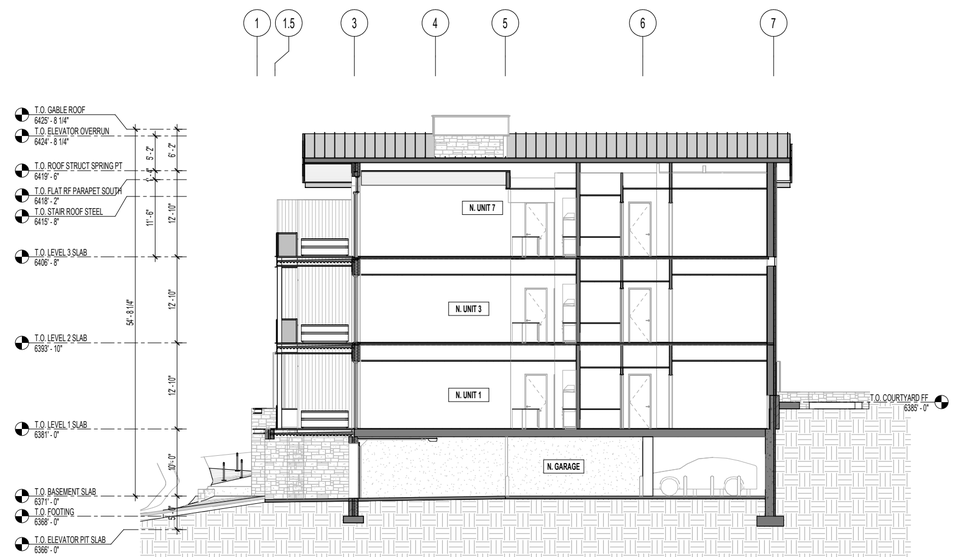


SOUTH ELEVATION

LOT 57 NORTH BUILDING – ELEVATIONS

0 4 8 16 32

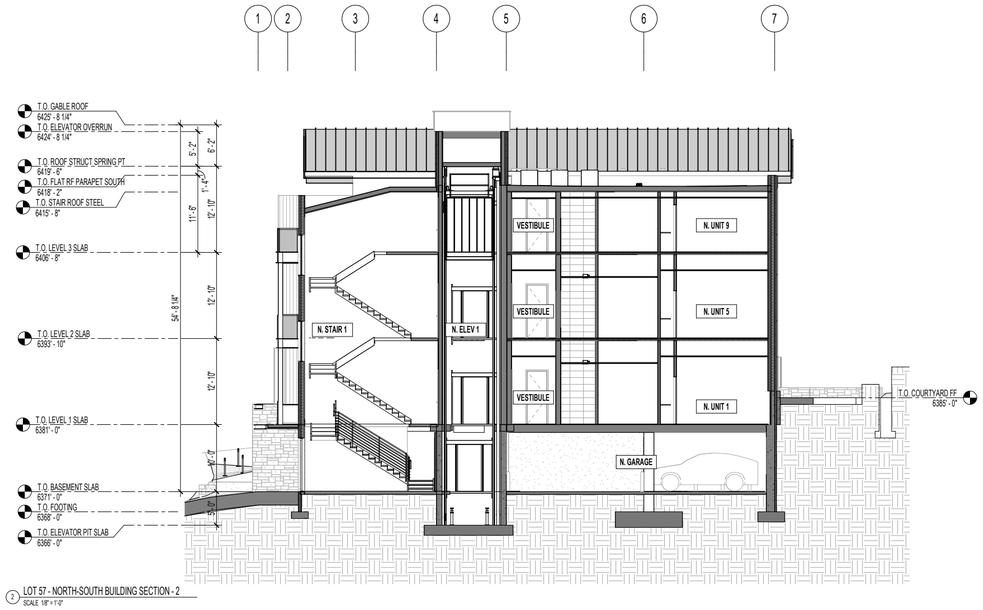
SCALE: 1 / 16" = 1' - 0"



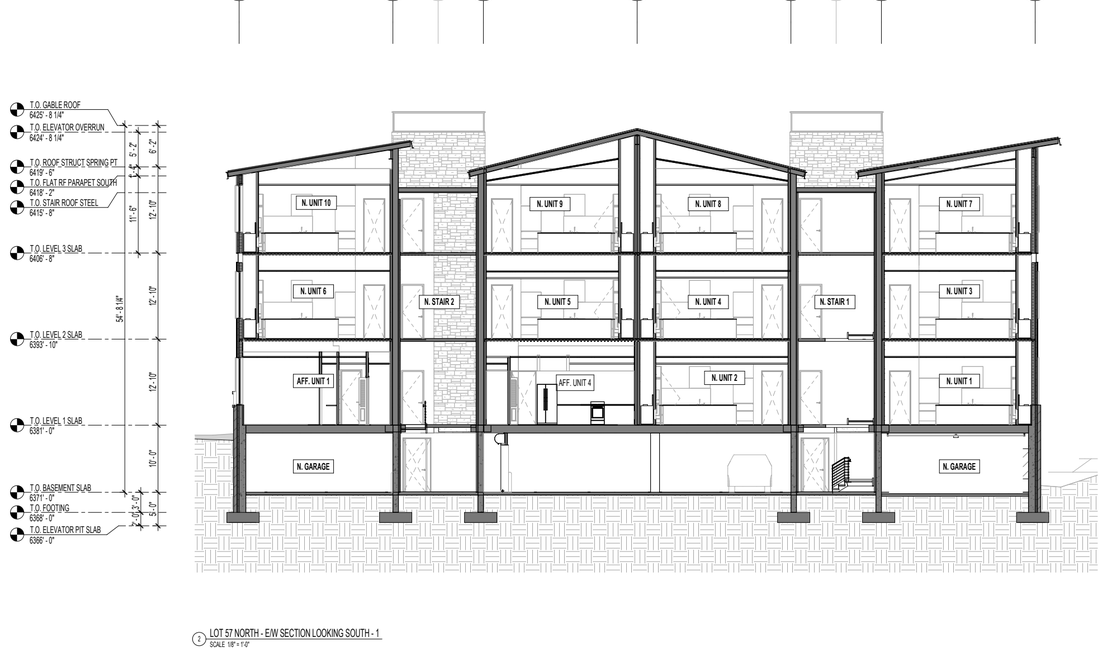
1 LOT 57 - NORTH-SOUTH BUILDING SECTION - 1
SCALE: 1/8" = 1'-0"



1 LOT 57 NORTH - E/W SECTION LOOKING SOUTH - 11
SCALE: 1/8" = 1'-0"



2 LOT 57 - NORTH-SOUTH BUILDING SECTION - 2
SCALE: 1/8" = 1'-0"

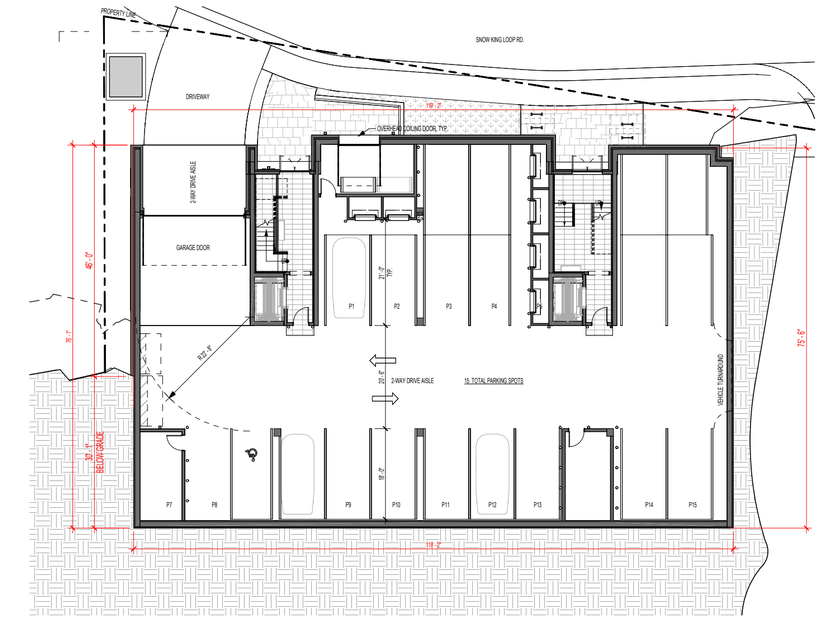


2 LOT 57 NORTH - E/W SECTION LOOKING SOUTH - 1
SCALE: 1/8" = 1'-0"

LOT 57 NORTH BUILDING – BUILDING SECTIONS

0 4 8 16 32

SCALE: 1 / 16" = 1' - 0"

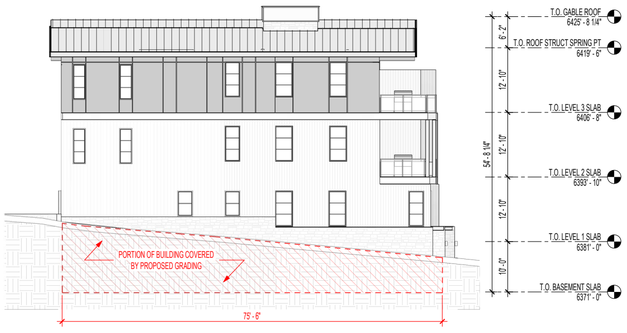


3 DEV PLAN_BASEMENT DIAGRAM - NORTH
SCALE 3/32" = 1'-0"

BASEMENT DEFINITION
1. NO MORE THAN 4'-0" OF WALL FROM THE T/1ST FLOOR SLAB DOWN CAN BE EXPOSED (6'-0" FROM THE T/BASEMENT SLAB MUST BE BELOW GRADE).
2. AT LEAST 50% OF THE PERMITER MUST MEET THIS REQUIREMENT.

LOT 57 NORTH BUILDING
NORTH ELEVATION - 119'-2"
EAST ELEVATION - 75'-6" (75'-6" BELOW GRADE)
SOUTH ELEVATION - 119'-2" (119'-2" BELOW GRADE)
WEST ELEVATION - 76'-1" (30'-1" BELOW GRADE)

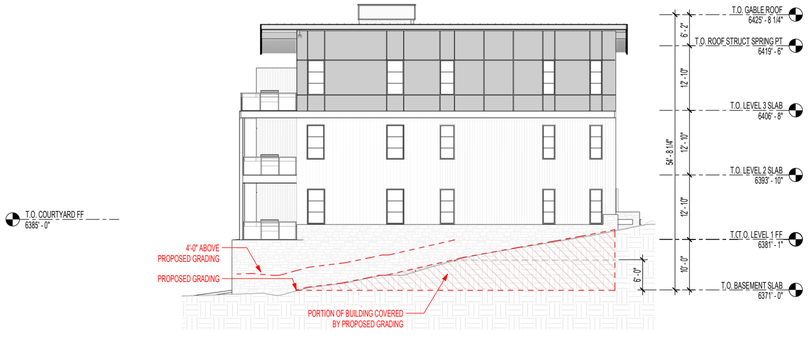
TOTAL PERIMETER = 389'-11" (224'-9" BELOW GRADE)
TOTAL PERCENTAGE BELOW GRADE = 58%



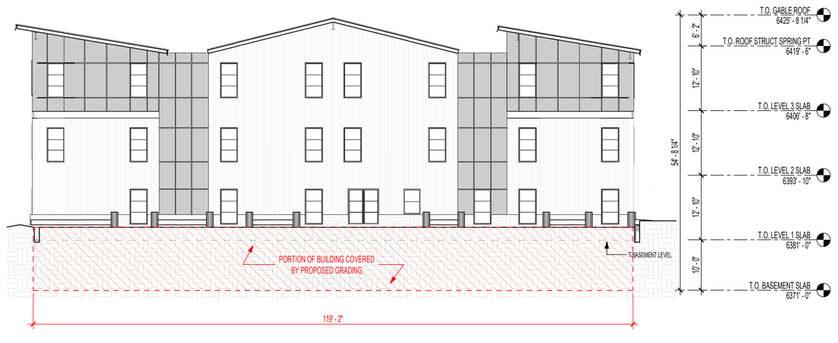
3 NORTH BUILDING BASEMENT DIAGRAM - EAST
SCALE 3/32" = 1'-0"



1 NORTH BUILDING BASEMENT DIAGRAM - NORTH
SCALE 3/32" = 1'-0"



4 NORTH BUILDING BASEMENT DIAGRAM - WEST
SCALE 3/32" = 1'-0"



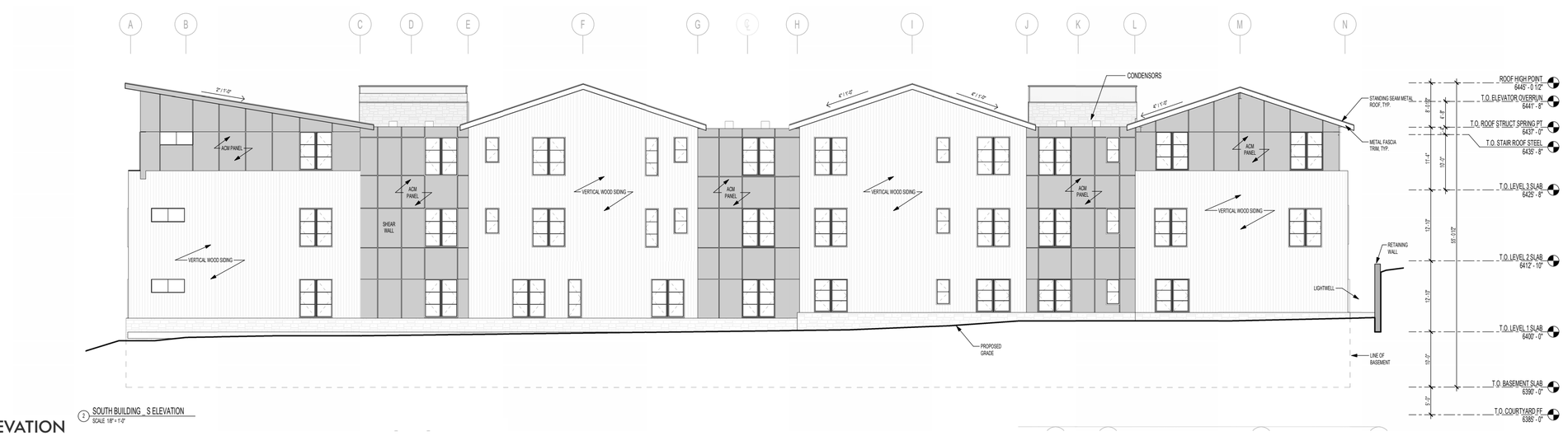
2 NORTH BUILDING BASEMENT DIAGRAM - SOUTH
SCALE 3/32" = 1'-0"

0 4 8 16 32

LOT 57 NORTH BUILDING – BASEMENT CALCULATIONS



NORTH ELEVATION

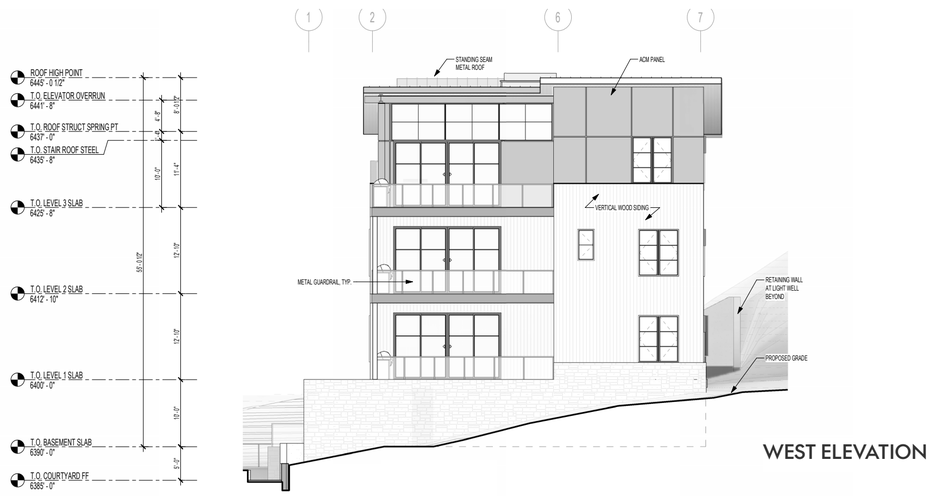


2 SOUTH BUILDING _ S ELEVATION
SCALE: 1/8" = 1'-0"

SOUTH ELEVATION



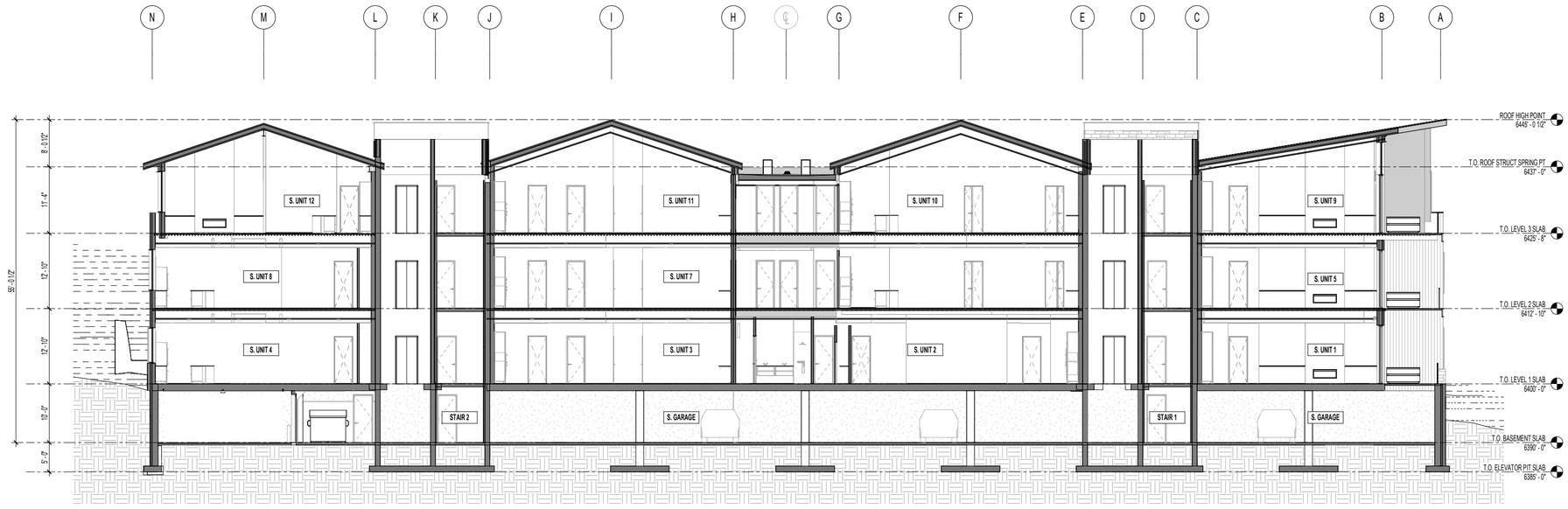
EAST ELEVATION



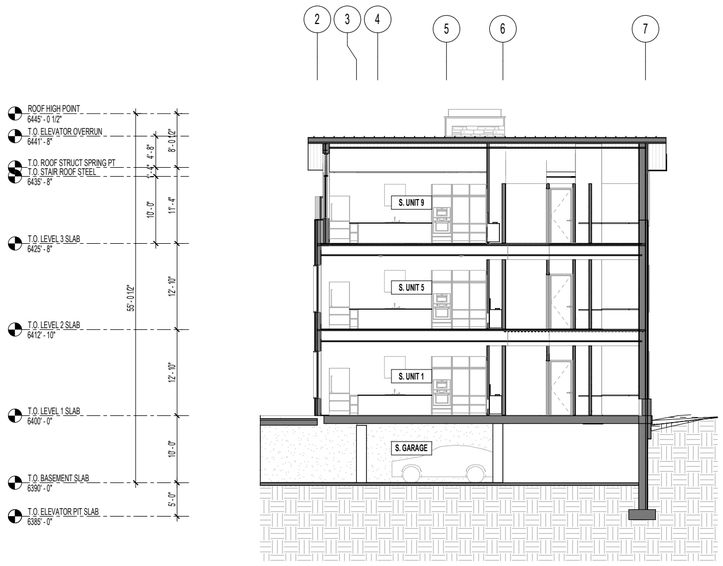
WEST ELEVATION

LOT 57 SOUTH BUILDING – ELEVATIONS

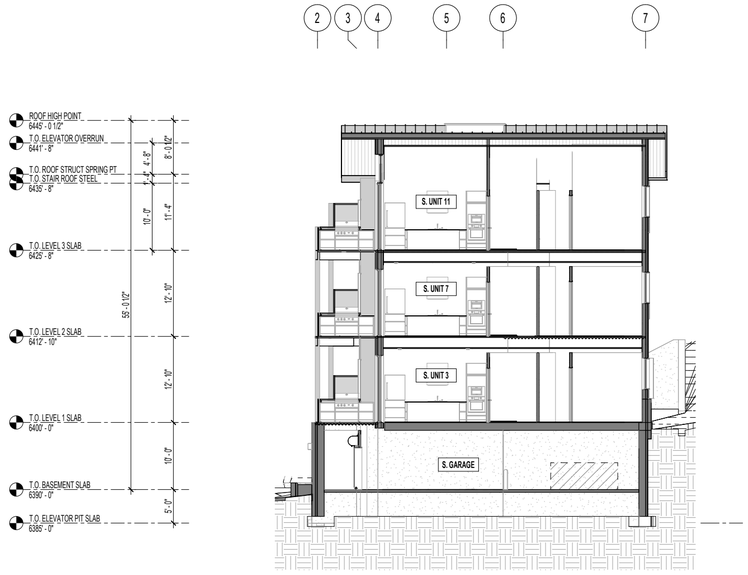
SCALE: 1 / 16" = 1' - 0"



E/W SECTION LOOKING SOUTH



N/S SECTION LOOKING EAST - 1

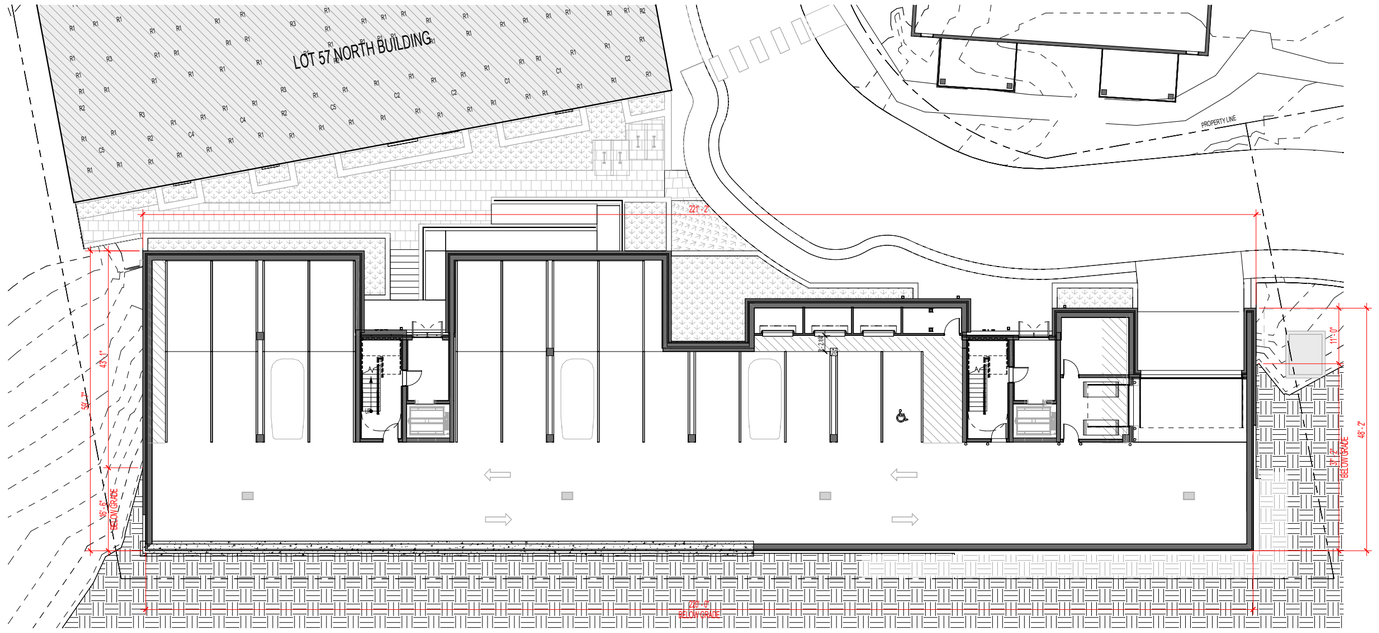


N/S SECTION LOOKING EAST - 2

LOT 57 SOUTH BUILDING – SECTIONS

0 4 8 16 32

SCALE: 1 / 16" = 1' - 0"



5 BASEMENT DIAGRAM - SOUTH
SCALE: 3/32" = 1'-0"

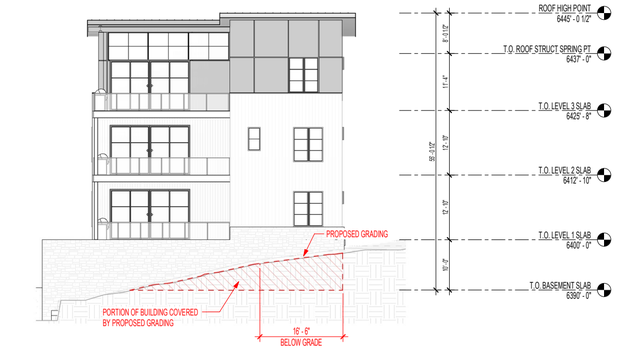
BASEMENT DEFINITION
1. NO MORE THAN 4'-0" OF WALL FROM THE T/1ST FLOOR SLAB DOWN CAN BE EXPOSED (6'-0" FROM THE T/BASEMENT SLAB MUST BE BELOW GRADE).
2. AT LEAST 50% OF THE PERMITER MUST MEET THIS REQUIREMENT.

LOT 57 SOUTH BUILDING
NORTH ELEVATION - 221'-2"
EAST ELEVATION - 48'-2" (37'-2" BELOW GRADE)
SOUTH ELEVATION - 220'-0" (220'-0" BELOW GRADE)
WEST ELEVATION - 59'-7" (16'-6" BELOW GRADE)

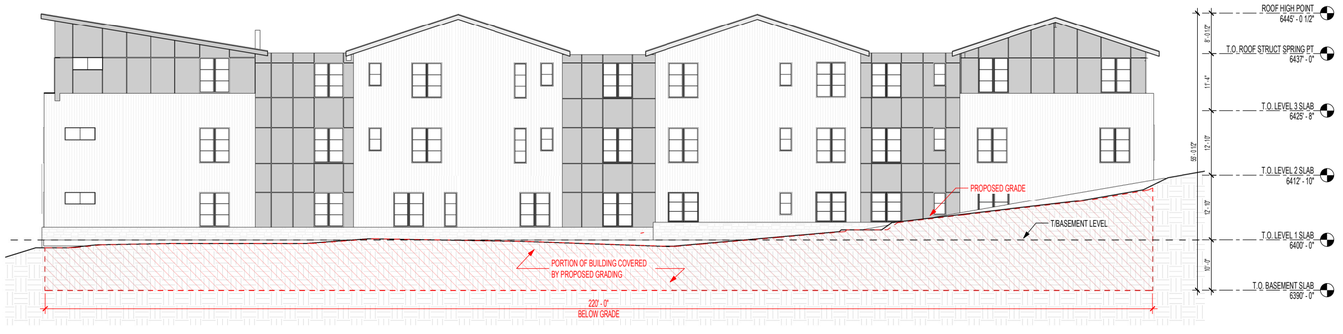
TOTAL PERIMETER = 548'-11" (273'-8" BELOW GRADE)
TOTAL PERCENTAGE BELOW GRADE = 50%



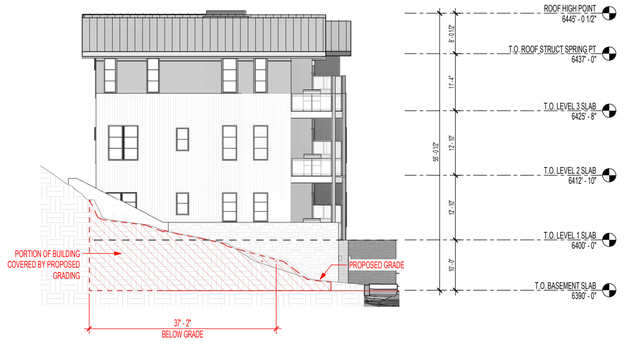
1 SOUTH BUILDING BASEMENT DIAGRAM - NORTH
SCALE: 3/32" = 1'-0"



4 SOUTH BUILDING BASEMENT DIAGRAM - WEST
SCALE: 3/32" = 1'-0"



2 SOUTH BUILDING BASEMENT DIAGRAM - SOUTH
SCALE: 3/32" = 1'-0"



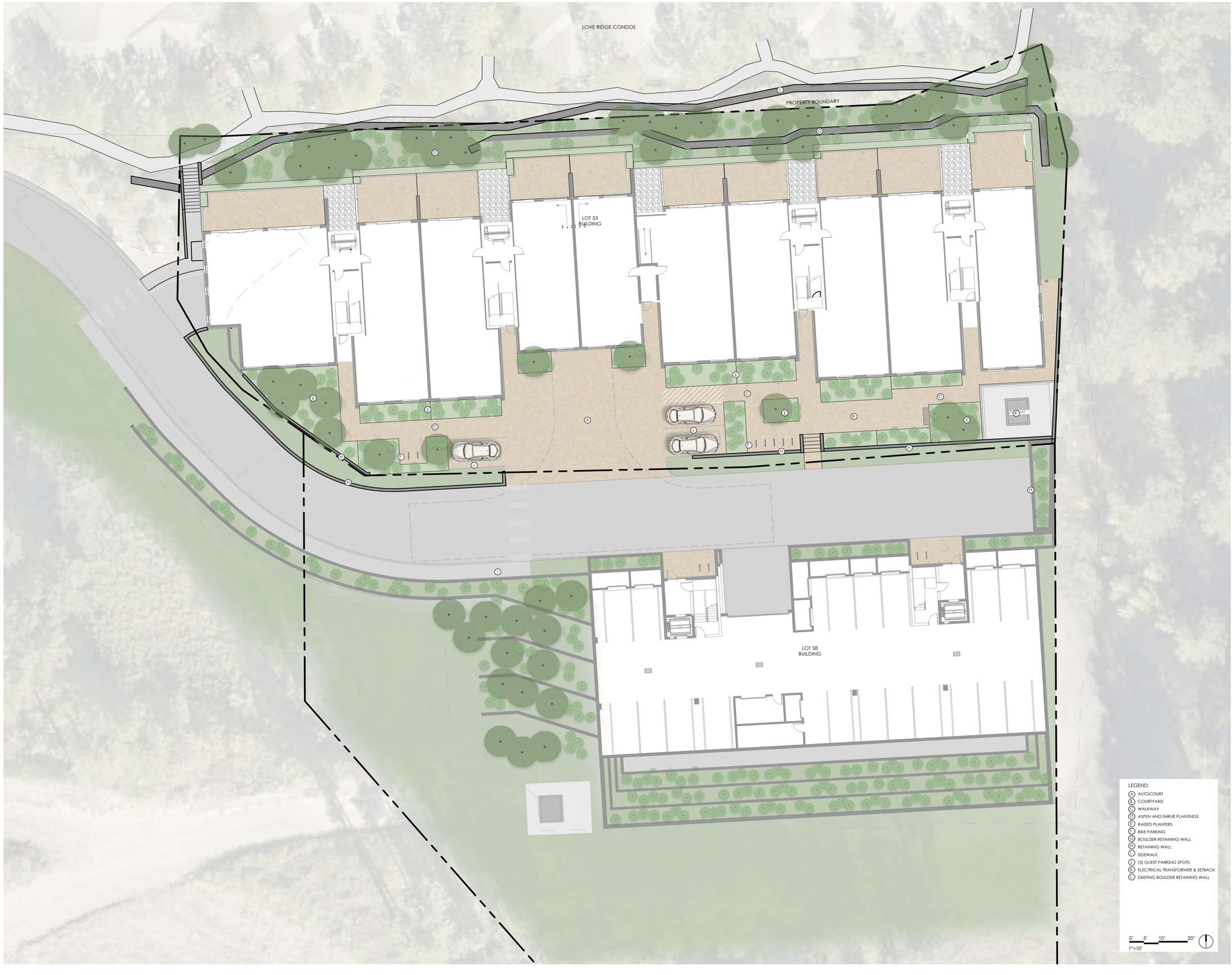
3 SOUTH BUILDING BASEMENT DIAGRAM - EAST
SCALE: 3/32" = 1'-0"

0 4 8 16 32

LOT 57 SOUTH BUILDING – BASEMENT CALCULATIONS

NORTHWORKS

Lot 53



LOT 53 SITE PLAN – LANDSCAPE



LOT 53 SITE PLAN – CIVIL

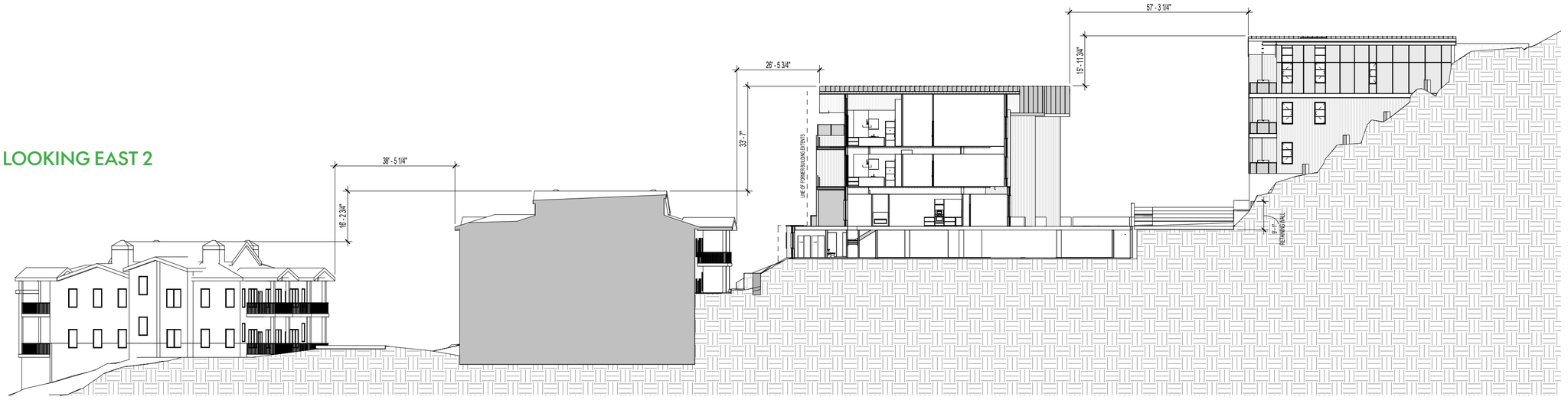


NORTH ELEVATION

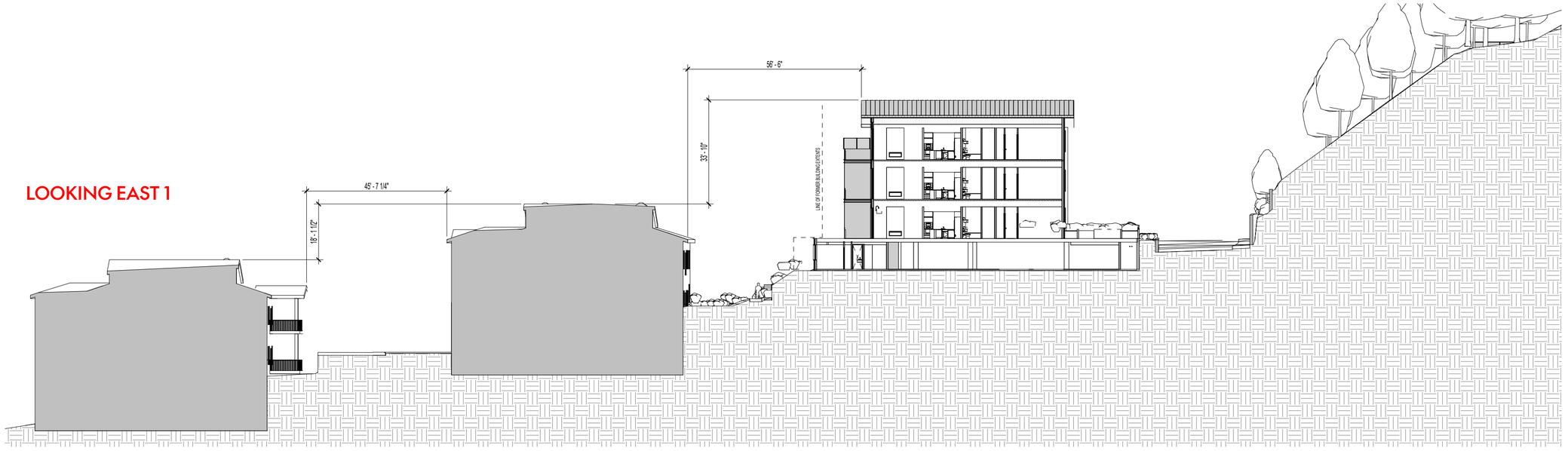
LOT 53 – RENDERED ELEVATION



LOOKING EAST 2



LOOKING EAST 1

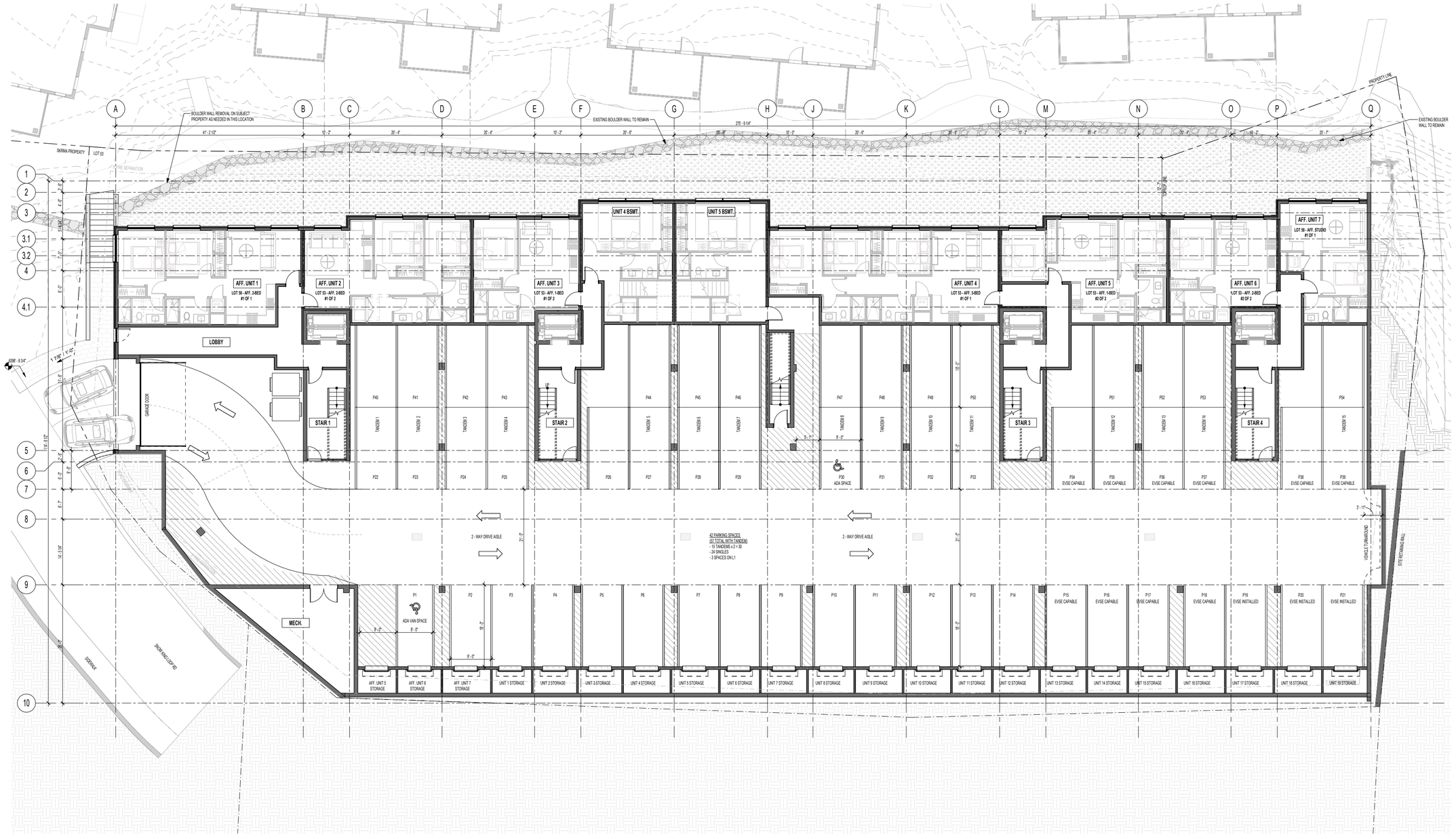


SITE SECTIONS THROUGH LOVE RIDGE CONSOS & LOT 53

LOT 53 SUMMARY

- PARKING SPACES : 43
- 1-BEDROOMS: 1
- 2-BEDROOMS: 18
- 3-BEDROOMS: 7
- AFFORDABLE UNITS: 7

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



0 4 8 16 32

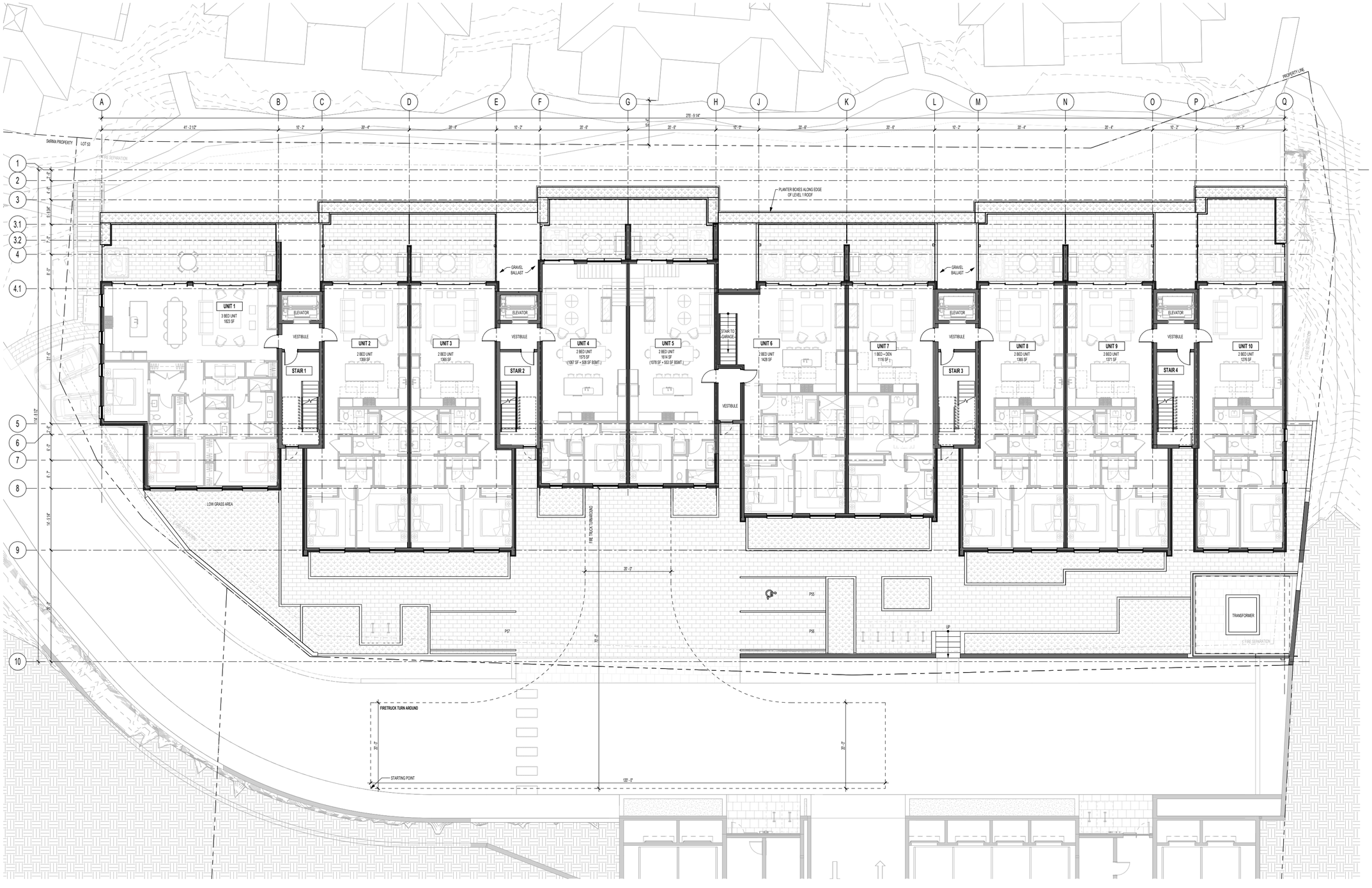
LOT 53 – BASEMENT FLOOR PLAN

SCALE: 1 / 16" = 1' - 0"

LOT 53 SUMMARY

- PARKING SPACES : 43
- 1-BEDROOMS: 1
- 2-BEDROOMS: 18
- 3-BEDROOMS: 7
- AFFORDABLE UNITS: 7

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



0 4 8 16 32

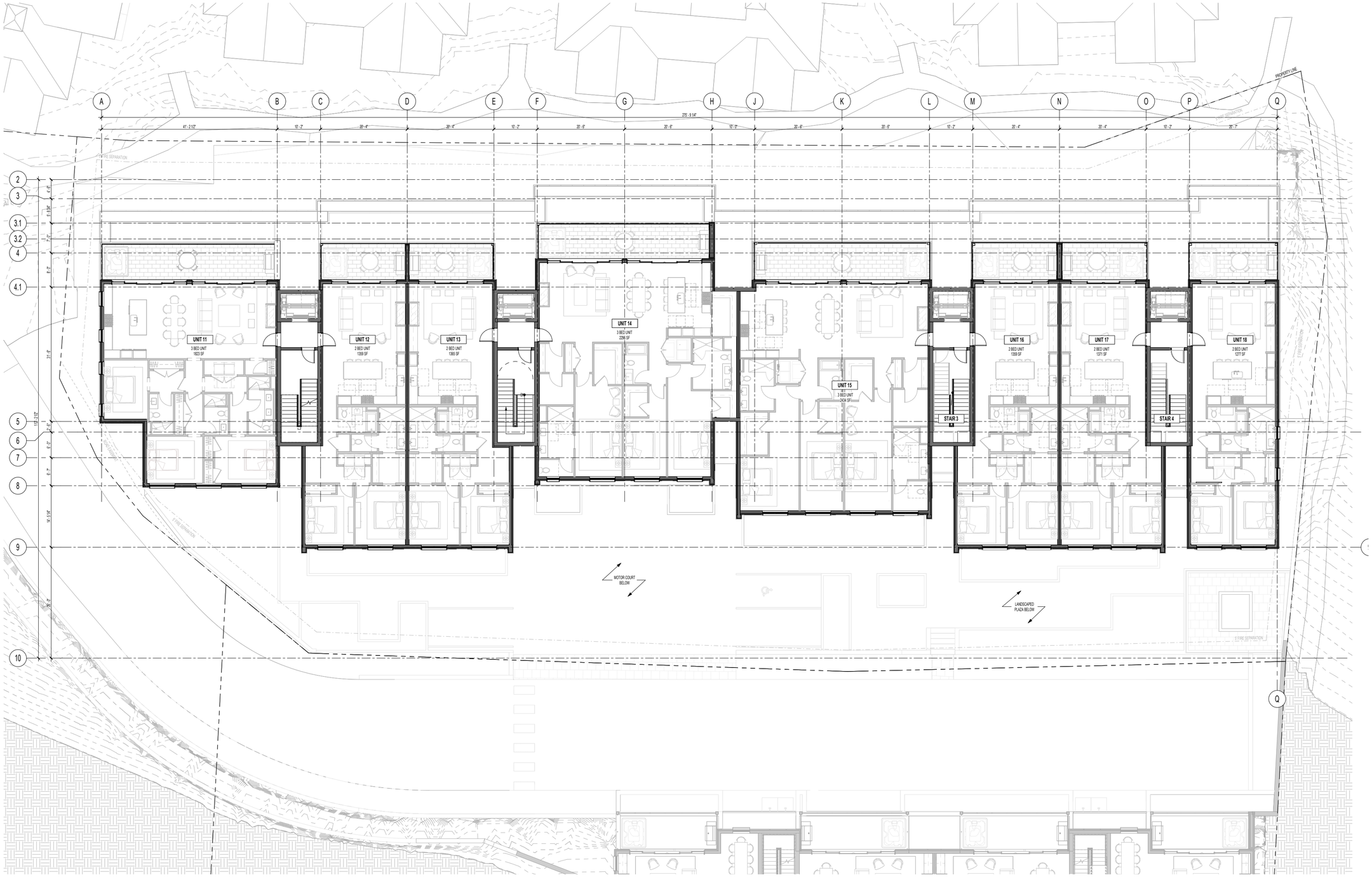
LOT 53 – FIRST FLOOR PLAN

SCALE: 1 / 16" = 1' - 0"

LOT 53 SUMMARY

- PARKING SPACES : 43
- 1-BEDROOMS: 1
- 2-BEDROOMS: 18
- 3-BEDROOMS: 7
- AFFORDABLE UNITS: 7

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



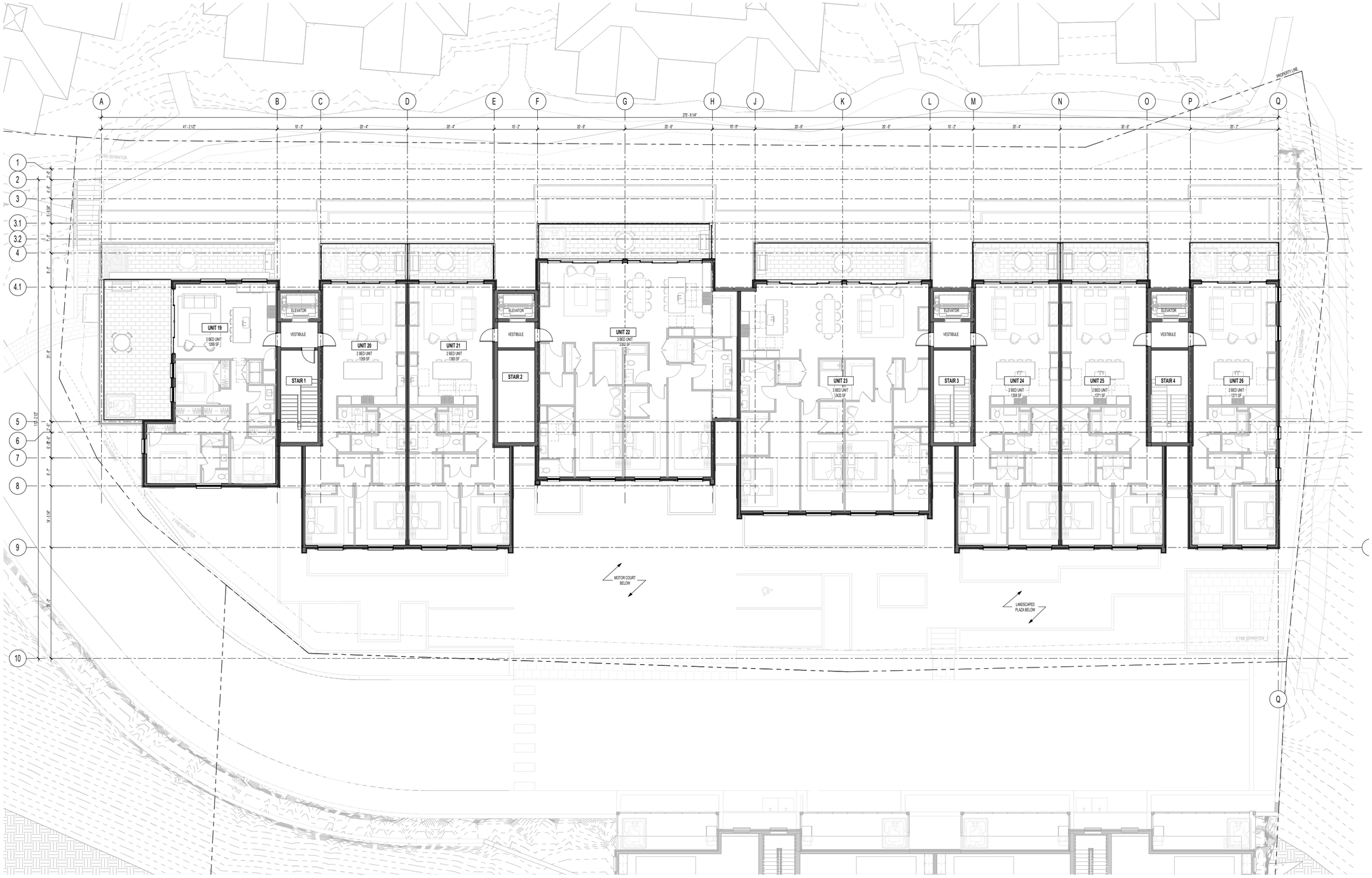
LOT 53 – SECOND FLOOR PLAN

SCALE: 1 / 16" = 1' - 0"

LOT 53 SUMMARY

- PARKING SPACES : 43
- 1-BEDROOMS: 1
- 2-BEDROOMS: 18
- 3-BEDROOMS: 7
- AFFORDABLE UNITS: 7

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



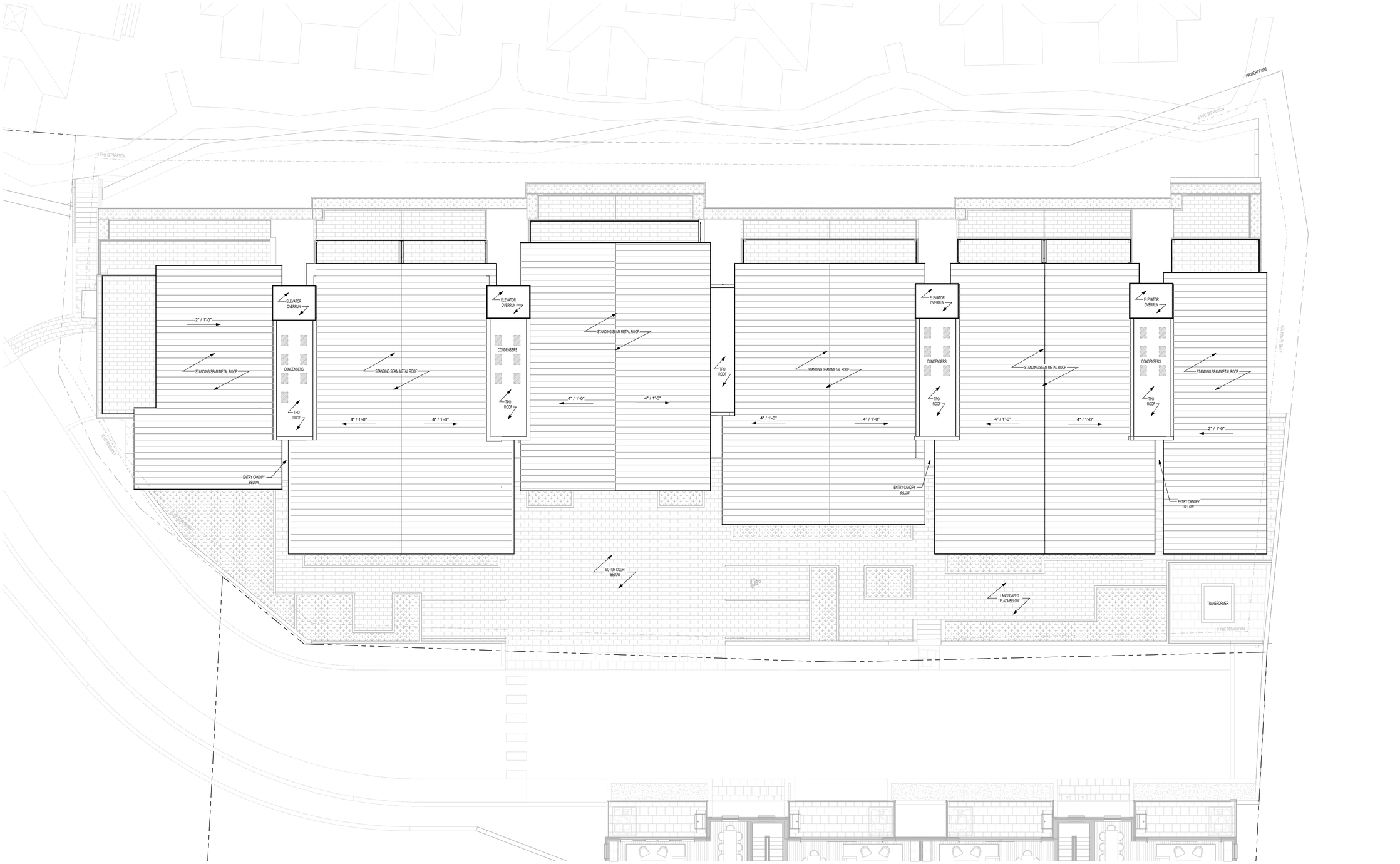
LOT 53 – THIRD FLOOR PLAN

SCALE: 1 / 16" = 1' - 0"

LOT 53 SUMMARY

- PARKING SPACES : 43
- 1-BEDROOMS: 1
- 2-BEDROOMS: 18
- 3-BEDROOMS: 7
- AFFORDABLE UNITS: 7

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.

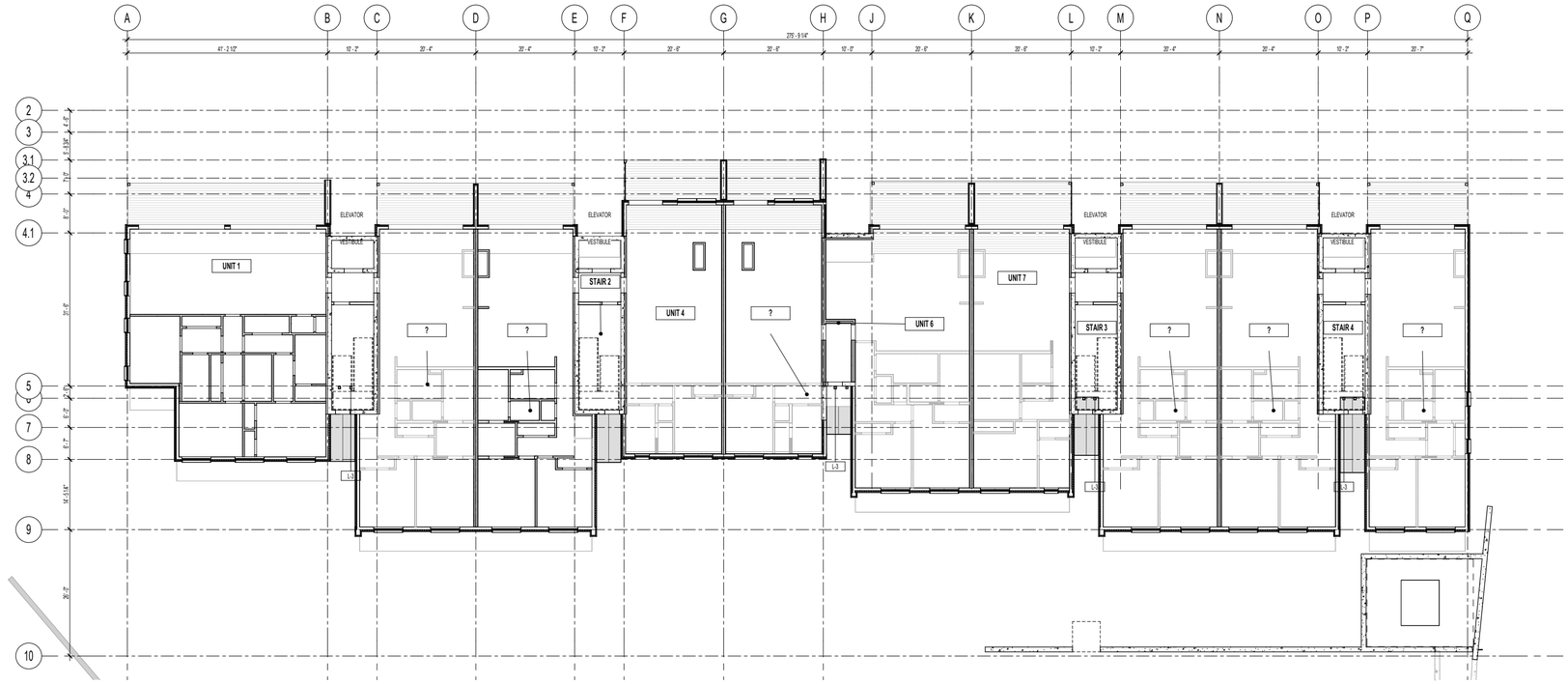


0 4 8 16 32

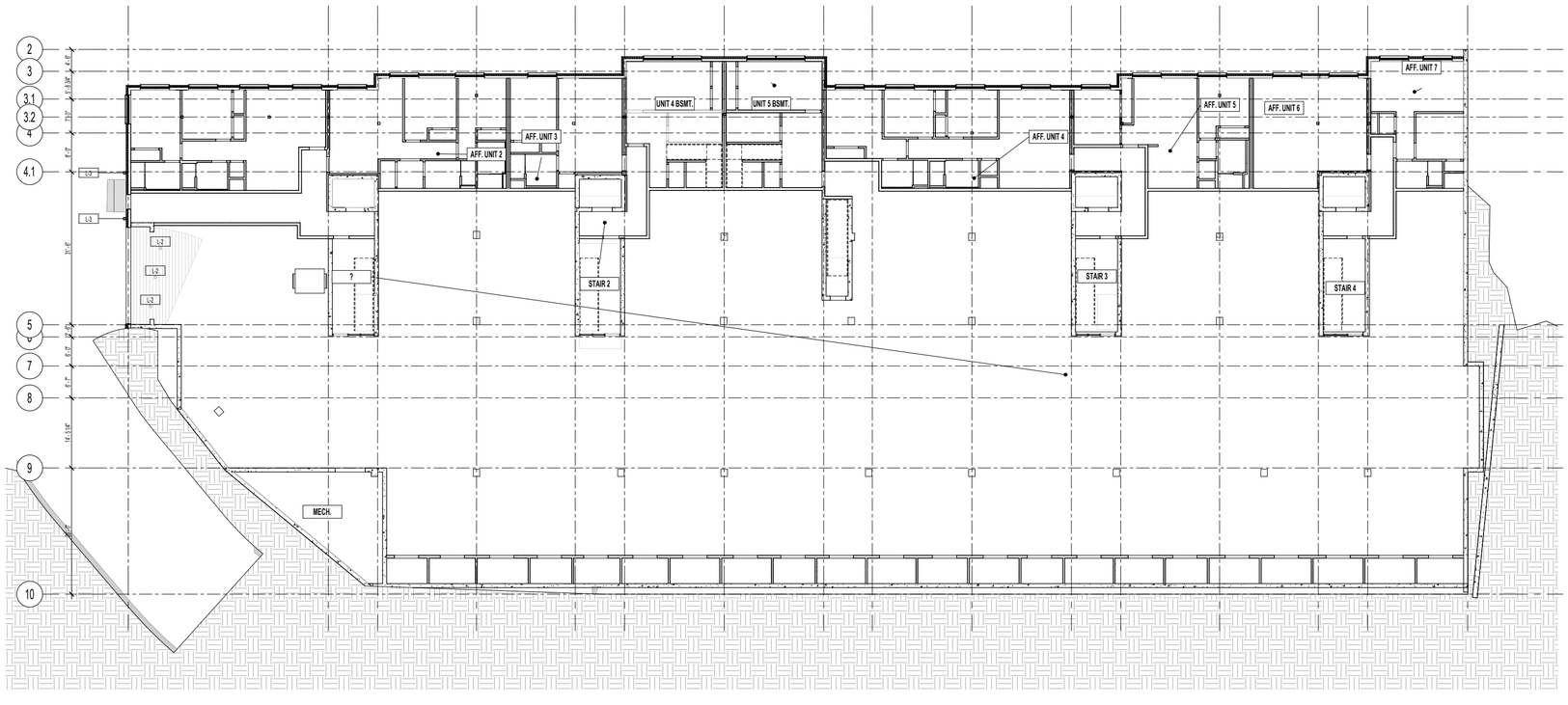
SCALE: 1 / 16" = 1' - 0"

LOT 53 – ROOF PLAN

LEVELS 1-3



BASEMENT



RCP LEGEND	
○	RECESSED LIGHT FIXTURE
□	EXTERIOR LIGHT FIXTURE
▭	CEILING-MOUNTED STRIP LIGHT

ELECTRICAL NOTES:
1. ALL ELECTRICAL WORK SHALL FULLY COMPLY WITH CURRENT EDITIONS OF ALL APPLICABLE CODES.
2. GENERAL CONTRACTOR TO COORDINATE WALKTHROUGH WITH OWNER & ARCHITECT TO VERIFY FINAL LOCATIONS OF ALL FIXTURES & SWITCHES PRIOR TO INSTALLATION.
3. ELECTRICIAN TO COORDINATE WITH GENERAL CONTRACTOR, ARCHITECT, & HVAC CONTRACTOR FOR LOCATIONS OF ALL THERMOSTATS & THERMOSTATIC SENSORS.
4. ELECTRICIAN & GENERAL CONTRACTOR TO COORDINATE WORK WITH ALL THIRD-PARTY CONTRACTORS (SECURITY, AUDIO/VIDEO, HOME AUTOMATION AND SIMILAR).

LOW VOLTAGE NOTES:
1. ALL SPEAKER WIRE SHALL BE FOUR CONDUCTOR WIRE (UNLESS OTHERWISE NOTED)
2. ALL SPEAKER WIRED TO SINGLE HOMERUN POINT (UNLESS OTHERWISE NOTED)

NOTE: INTERIOR LIGHTING NOT SHOWN.

0 4 8 16 32

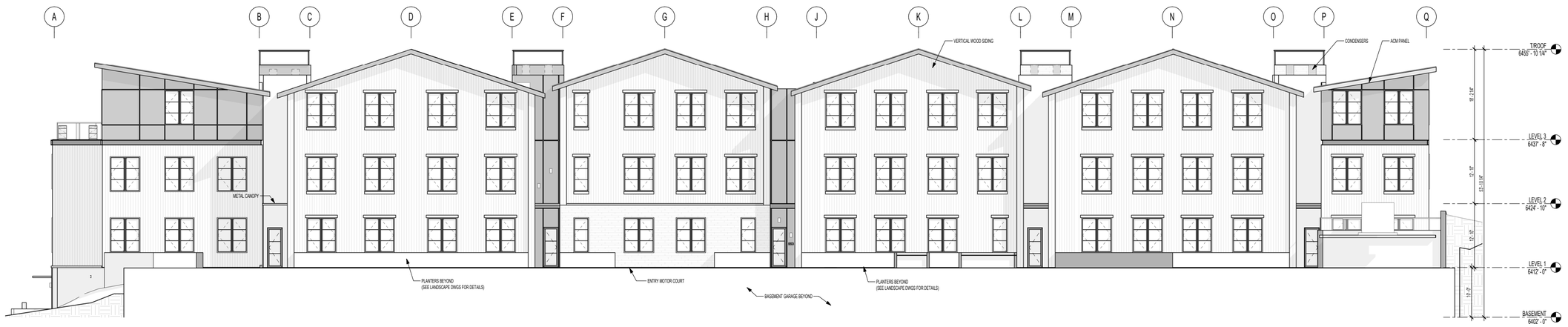
SCALE: 3/64" = 1' - 0"

LOT 53 – EXTERIOR LIGHTING PLANS

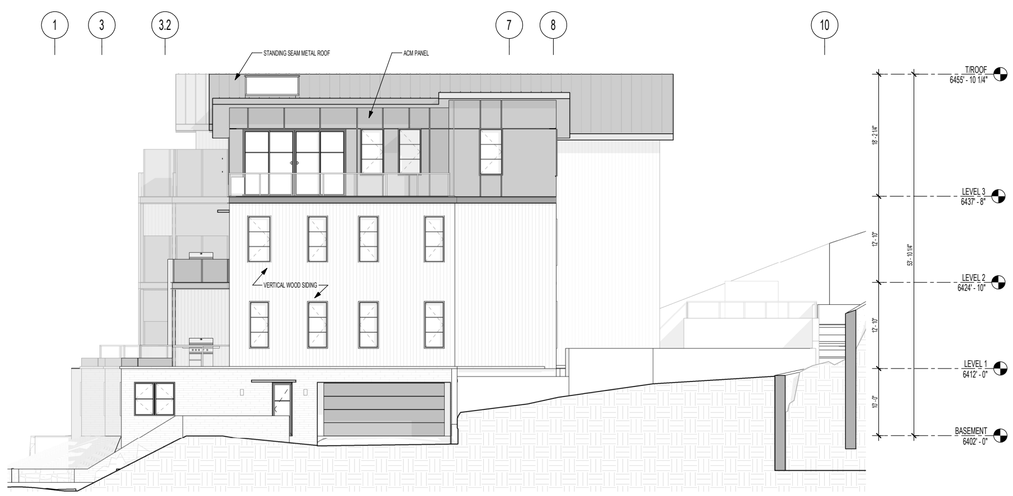
NORTH ELEVATION

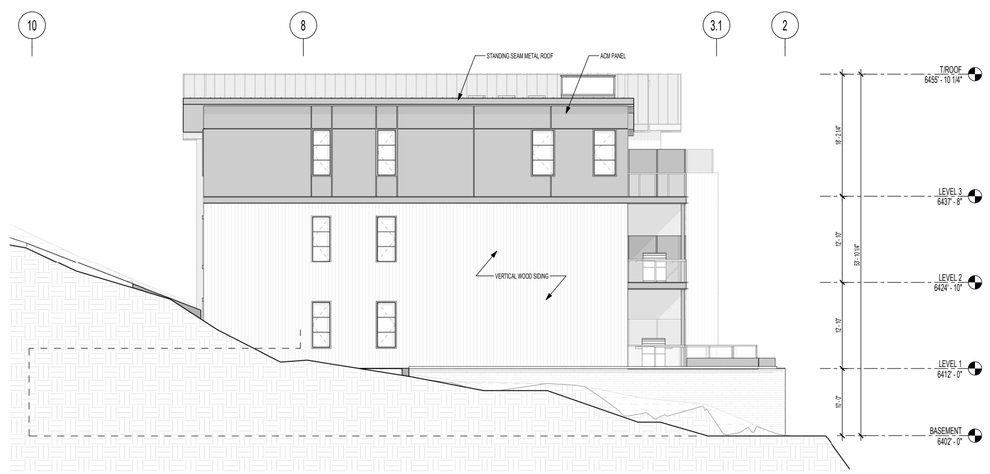


SOUTH ELEVATION



WEST ELEVATION







SCALE: 1 / 16" = 1' - 0"

LOT 53 – ELEVATIONS (REVISED)

E/W SECTION LOOKING SOUTH - 1



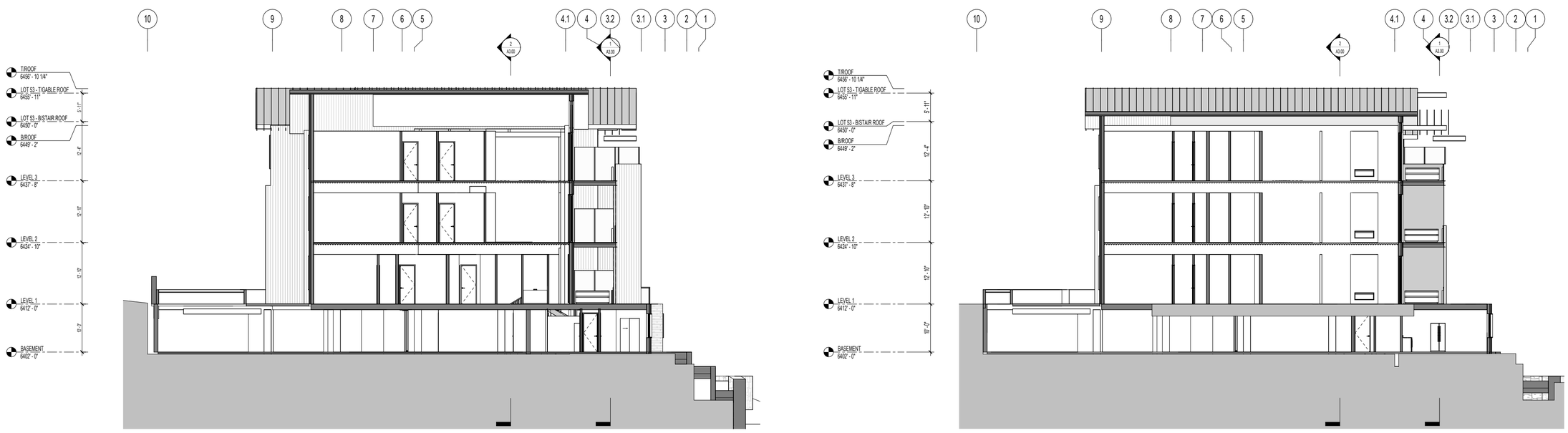
1 LOT 53 - E/W SECTION LOOKING SOUTH - 1
SCALE: 1/8" = 1'-0"

E/W SECTION LOOKING SOUTH - 2

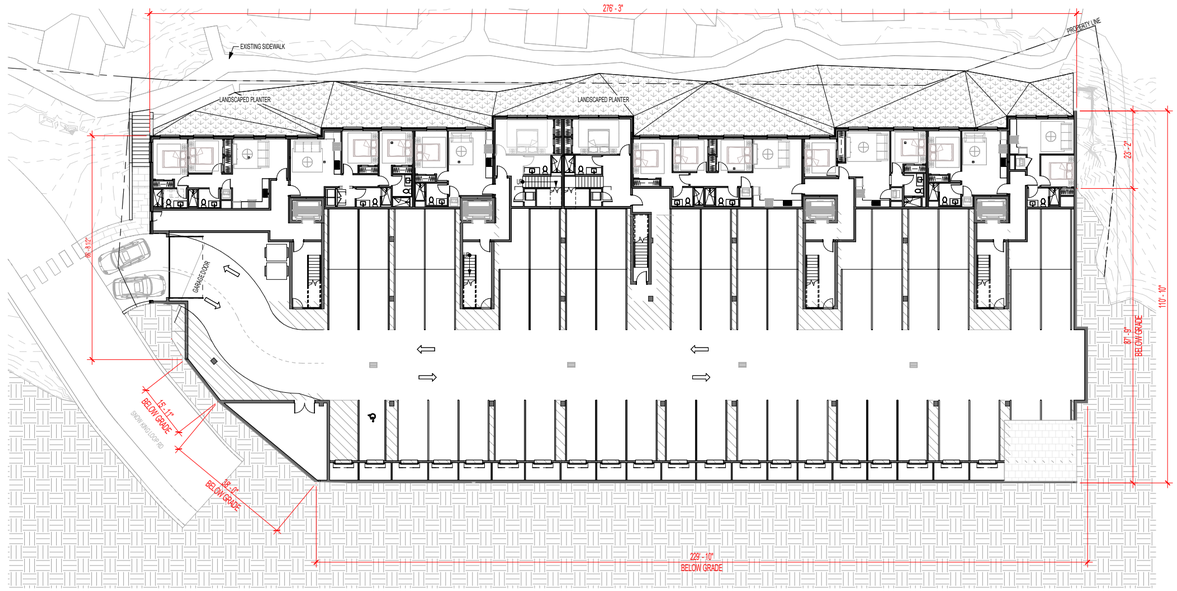


2 LOT 53 - E/W SECTION LOOKING SOUTH - 2
SCALE: 1/8" = 1'-0"

N/S SECTION LOOKING EAST - 1



LOT 53 – BUILDING SECTIONS (REVISED)



5 BASEMENT PLAN DIAGRAM
SCALE: 1/16" = 1'-0"

BASEMENT DEFINITION
1. NO MORE THAN 4'-0" OF WALL FROM THE T/1ST FLOOR SLAB DOWN CAN BE EXPOSED (6'-0" FROM THE T/BASEMENT SLAB MUST BE BELOW GRADE).
2. AT LEAST 50% OF THE PERMITER MUST MEET THIS REQUIREMENT.

LOT 53 SOUTH BUILDING
NORTH ELEVATION - 276'-3"
EAST ELEVATION - 110'-10" (87'-9" BELOW GRADE)
SOUTH ELEVATION - 229'-10" (229'-10" BELOW GRADE)
SOUTHWEST ELEVATION - 53'-11" (53'-11" BELOW GRADE)
WEST ELEVATION - 66'-8 1/2"

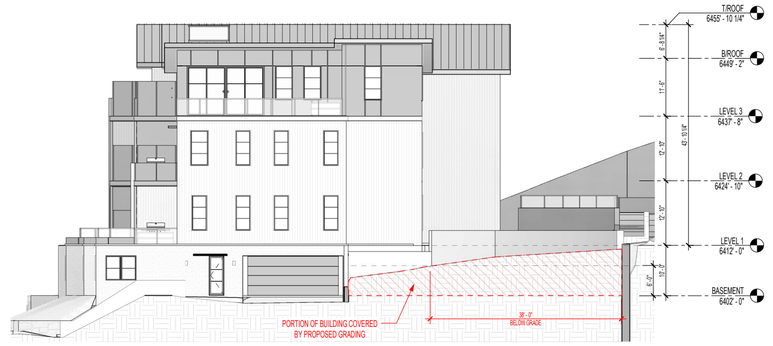
TOTAL PERIMETER = 737'-6 1/2" (371'-6" BELOW GRADE)
TOTAL PERCENTAGE BELOW GRADE = 50%



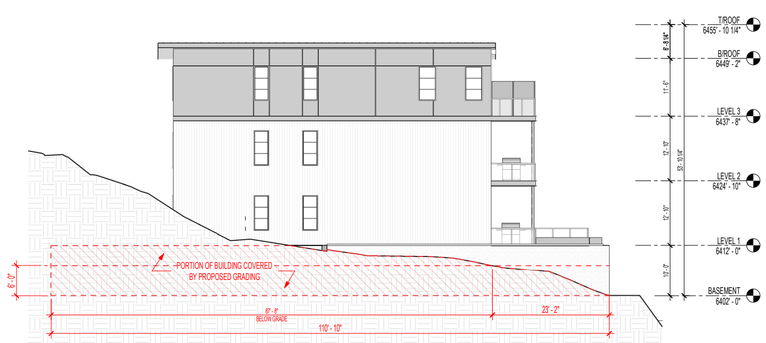
2 BASEMENT DIAGRAM - NORTH
SCALE: 3/32" = 1'-0"



1 BASEMENT DIAGRAM - SOUTH
SCALE: 3/32" = 1'-0"



3 BASEMENT DIAGRAM - WEST
SCALE: 3/32" = 1'-0"



4 BASEMENT DIAGRAM - EAST
SCALE: 3/32" = 1'-0"



LOT 53 – BASEMENT CALCULATIONS

NORTHWORKS

Lot 58

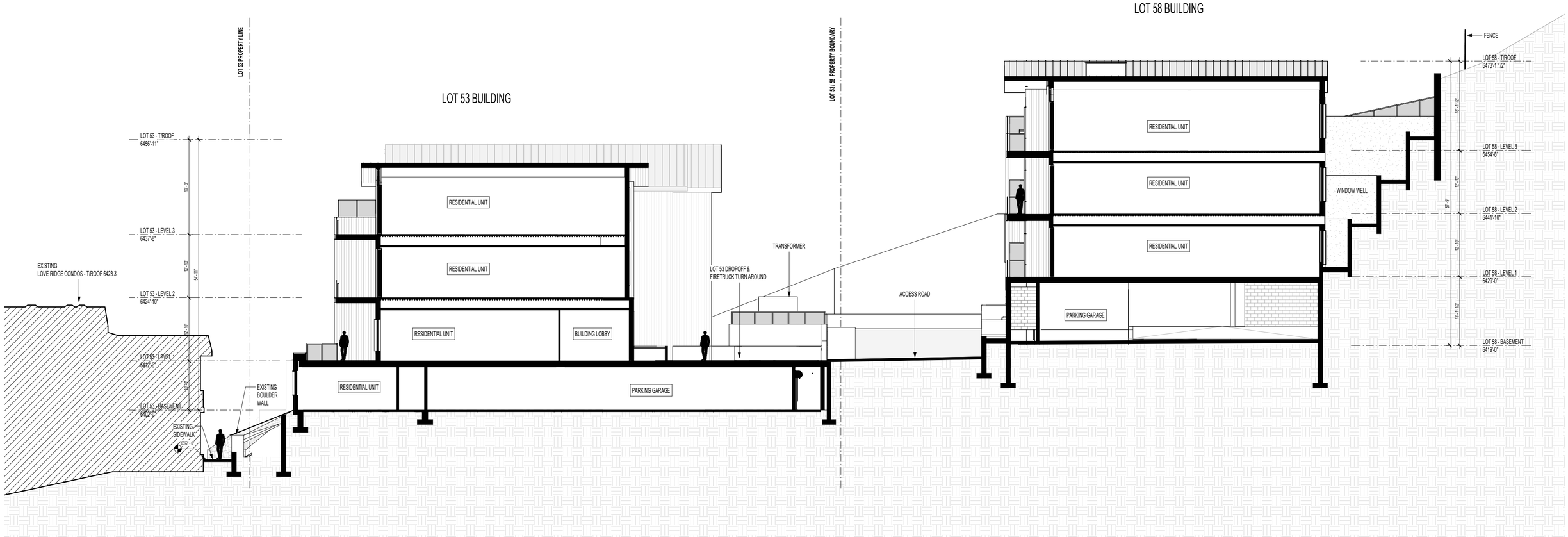


LOT 58 SITE PLAN – LANDSCAPE



LOT 58 SITE PLAN – CIVIL





SITE SECTION THROUGH LOT 53 & LOT 58, LOOKING EAST



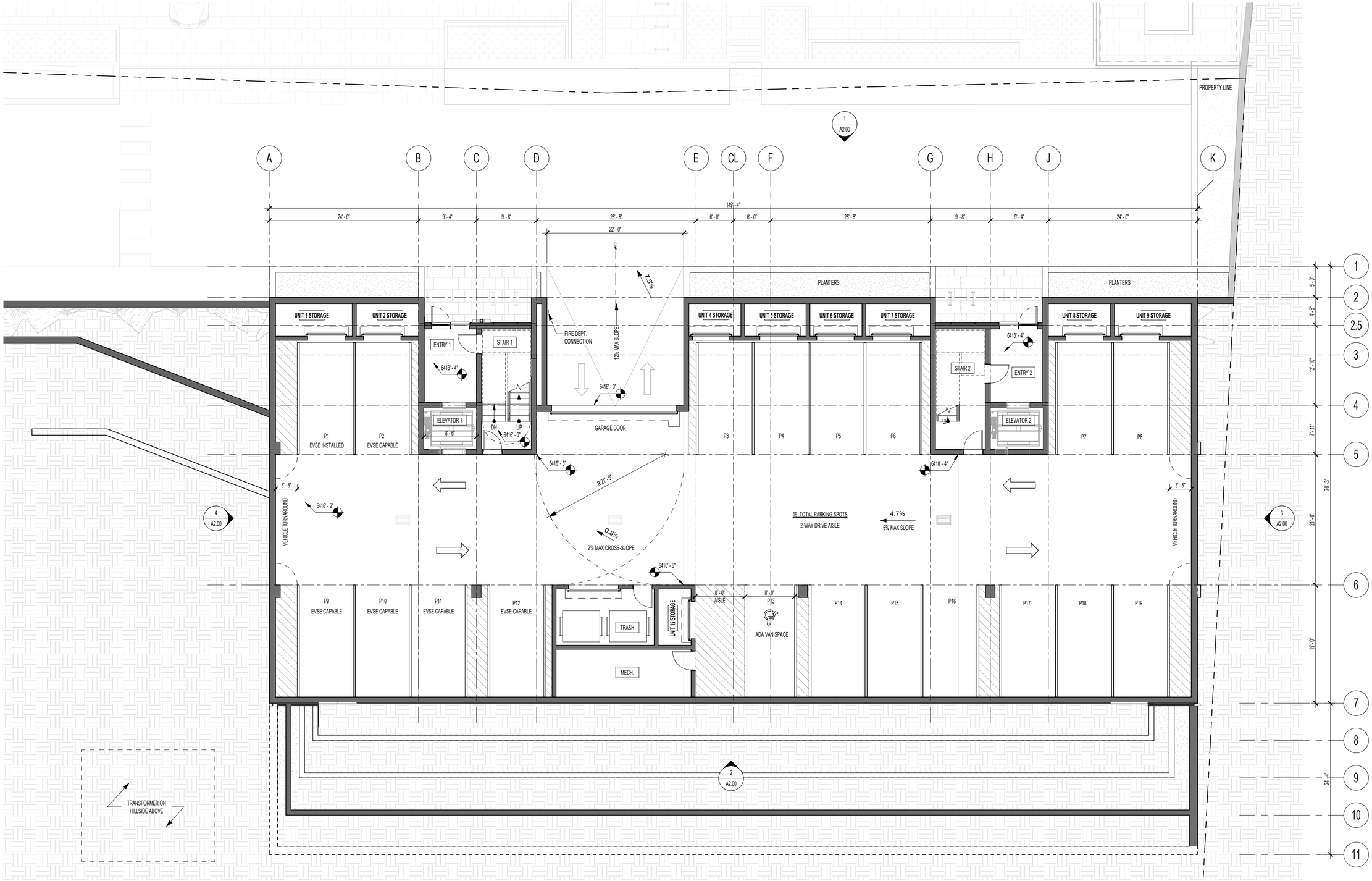
NORTH ELEVATION

LOT 58 – RENDERED ELEVATION

LOT 58 SUMMARY

- PARKING SPACES : 19
- 2-BEDROOMS: 7
- 3-BEDROOMS: 5
- AFFORDABLE UNITS: 0

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



LOT 58 – BASEMENT FLOOR PLAN

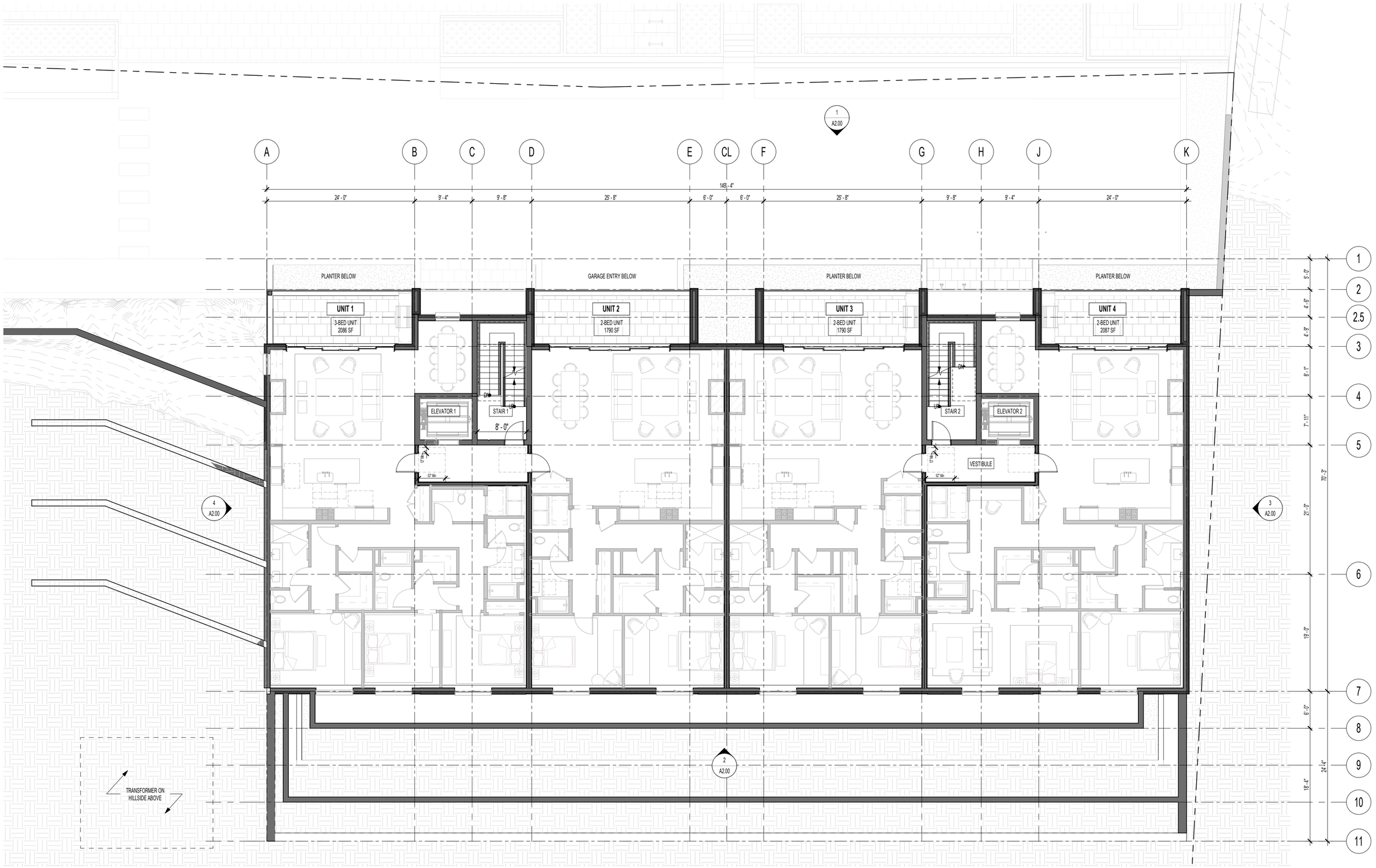
0 4 8 16

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

LOT 58 SUMMARY

- PARKING SPACES : 19
- 2-BEDROOMS: 7
- 3-BEDROOMS: 5
- AFFORDABLE UNITS: 0

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



LOT 58 – FIRST FLOOR PLAN

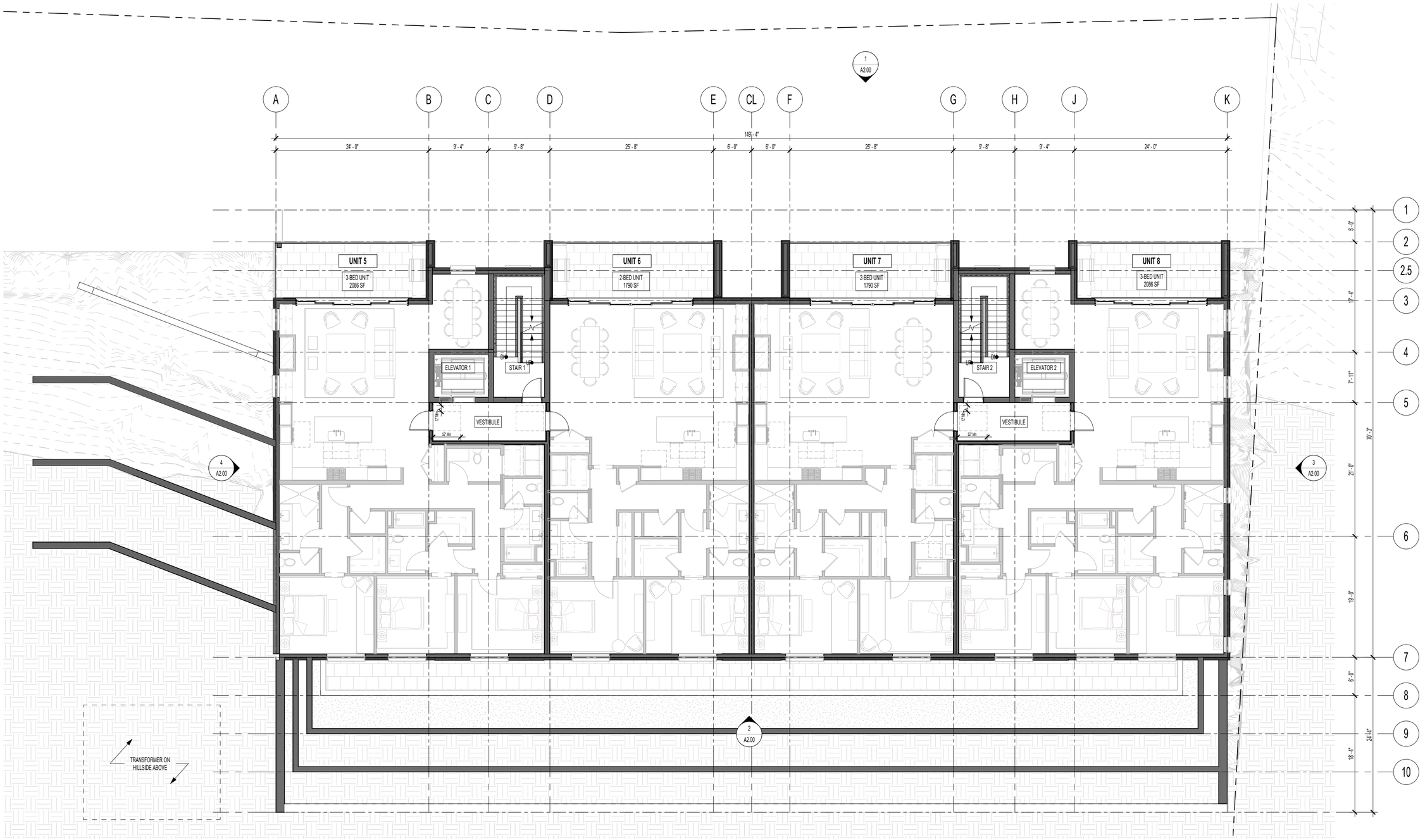
0 4 8 16

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

LOT 58 SUMMARY

- PARKING SPACES : 19
- 2-BEDROOMS: 7
- 3-BEDROOMS: 5
- AFFORDABLE UNITS: 0

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



LOT 58 – SECOND FLOOR PLAN

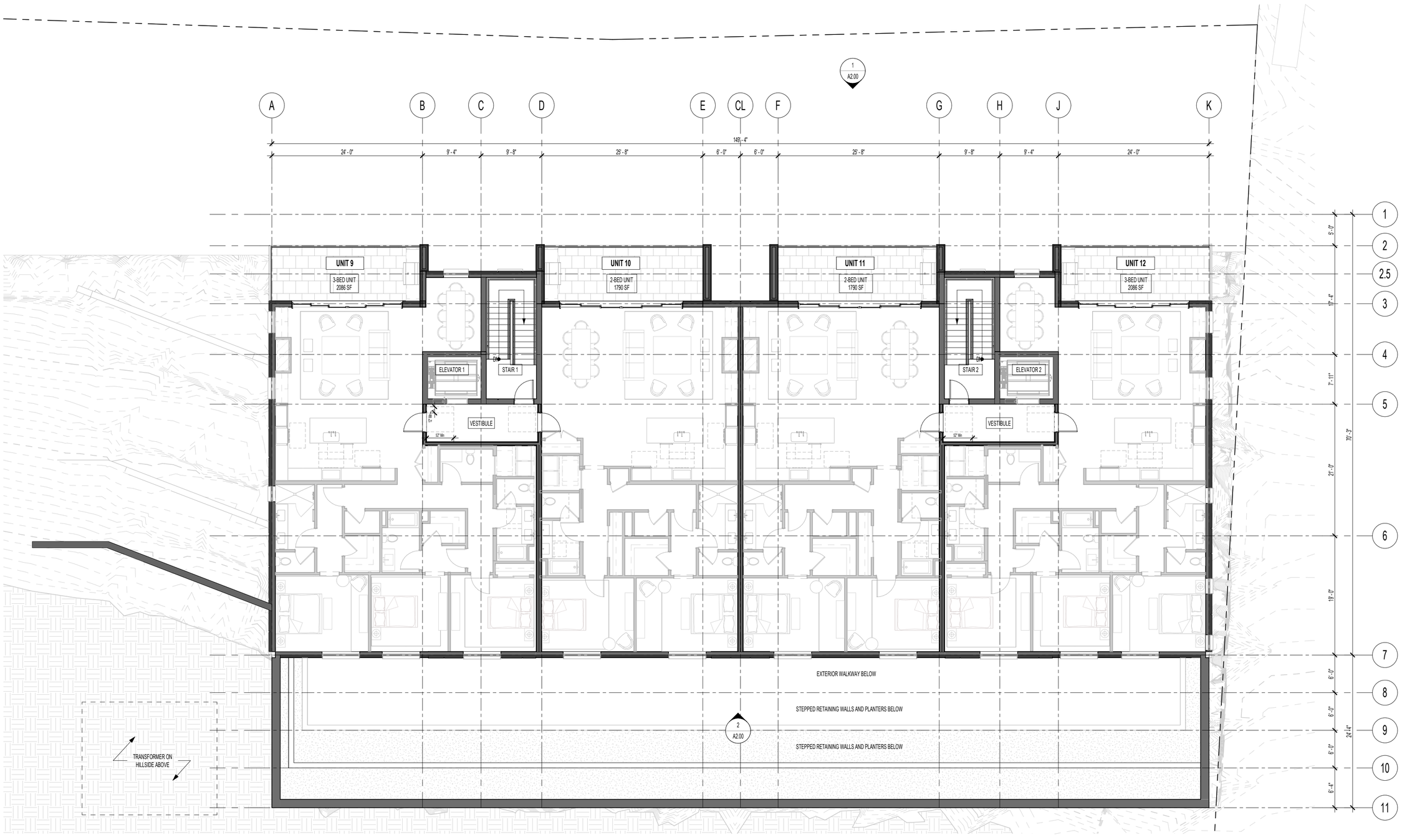
0 4 8 16

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

LOT 58 SUMMARY

- PARKING SPACES : 19
- 2-BEDROOMS: 7
- 3-BEDROOMS: 5
- AFFORDABLE UNITS: 0

CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



LOT 58 – THIRD FLOOR PLAN

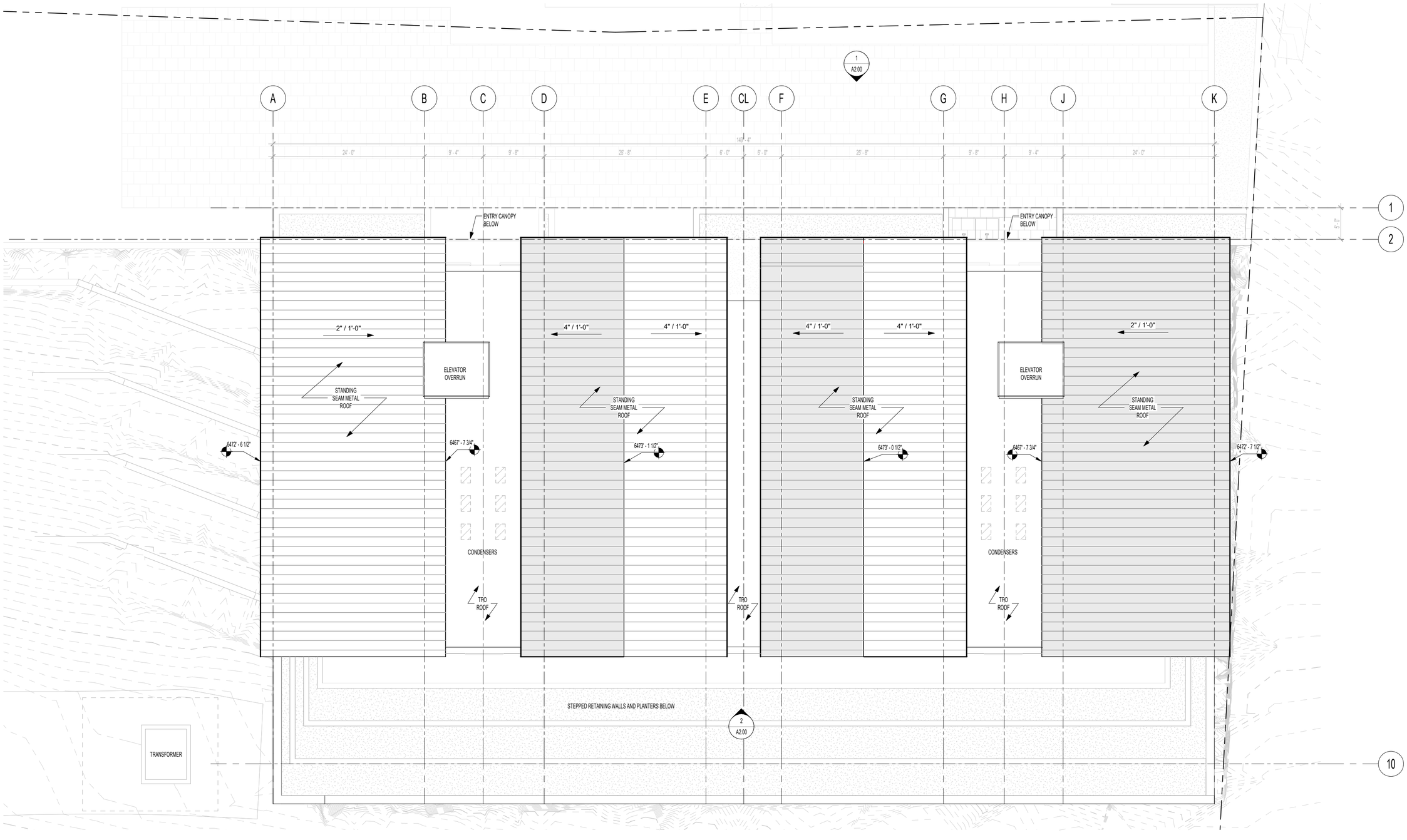
0 4 8 16

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

LOT 58 SUMMARY

- PARKING SPACES : 19
- 2-BEDROOMS: 7
- 3-BEDROOMS: 5
- AFFORDABLE UNITS: 0

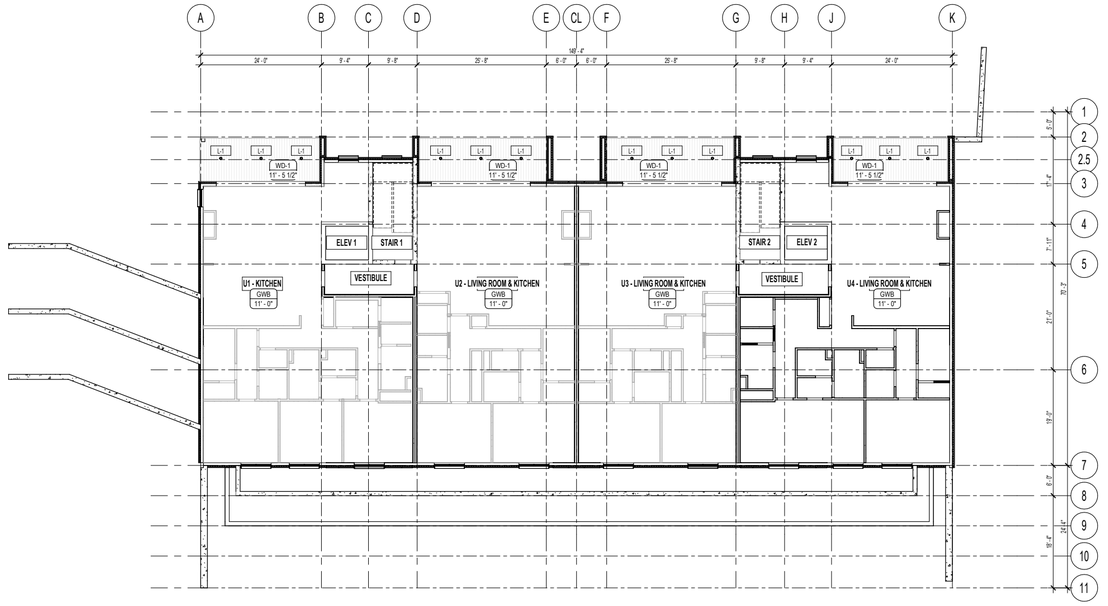
CODE NOTE:
UNITS ARE FOR-SALE CONDOMINIUMS AND WILL BE CLASSIFIED AS R-2 OCCUPANCY. INDIVIDUAL OWNERS MAY APPLY FOR SHORT-TERM RENTAL LICENSES THROUGH THE TOWN OF JACKSON.



LOT 58 – ROOF PLAN

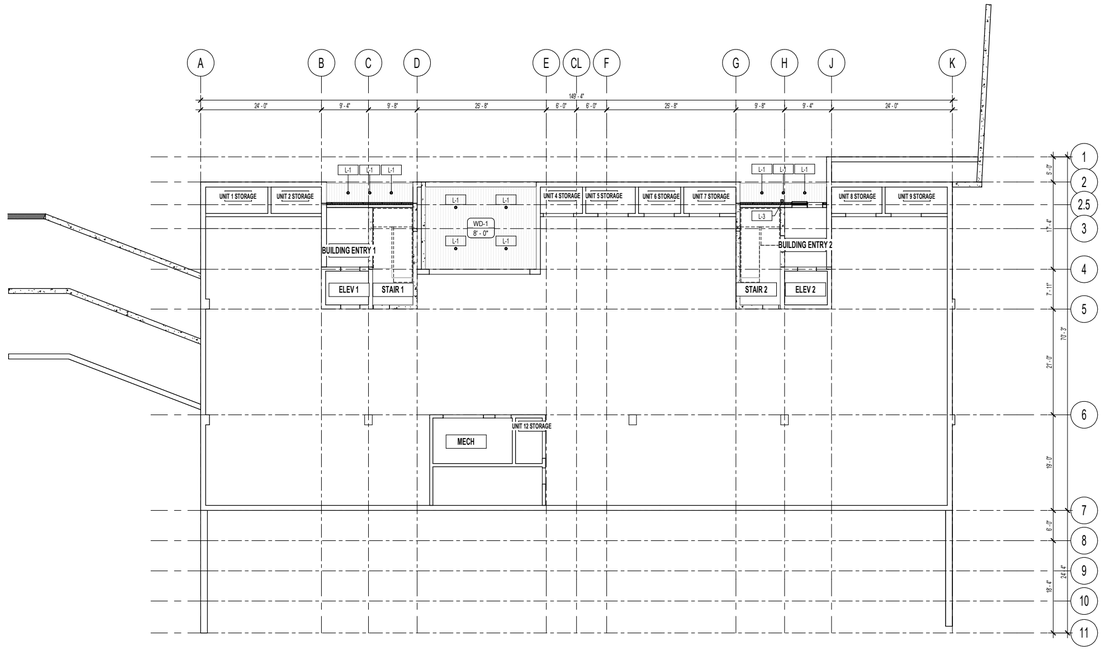
0 4 8 16

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



2 REFLECTED CEILING PLAN - 1ST FLOOR PLAN
SCALE: 3/32" = 1'-0"

0 4 8 16 32



1 REFLECTED CEILING PLAN - BASEMENT
SCALE: 3/32" = 1'-0"

0 4 8 16 32

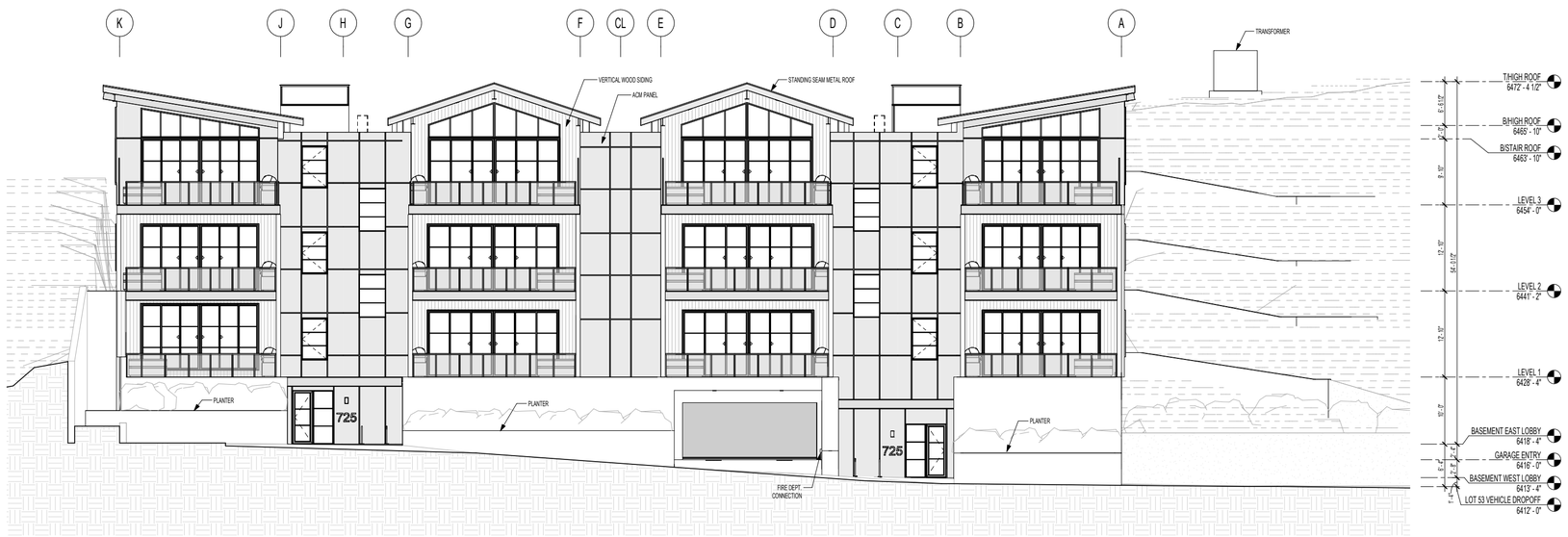
RCP LEGEND	
○	RECESSED LIGHT FIXTURE
▢	EXTERIOR LIGHT FIXTURE
═══	CEILING-MOUNTED STRIP LIGHT

ELECTRICAL NOTES:
1. ALL ELECTRICAL WORK SHALL FULLY COMPLY WITH CURRENT EDITIONS OF ALL APPLICABLE CODES.
2. GENERAL CONTRACTOR TO COORDINATE WALKTHROUGH WITH OWNER & ARCHITECT TO VERIFY FINAL LOCATIONS OF ALL FIXTURES & SWITCHES PRIOR TO INSTALLATION.
3. ELECTRICIAN TO COORDINATE WITH GENERAL CONTRACTOR, ARCHITECT, & HVAC CONTRACTOR FOR LOCATIONS OF ALL THERMOSTATS & THERMOSTATIC SENSORS.
4. ELECTRICIAN & GENERAL CONTRACTOR TO COORDINATE WORK WITH ALL THIRD-PARTY CONTRACTORS (SECURITY, AUDIO/VIDEO, HOME AUTOMATION AND SIMILAR).

LOW VOLTAGE NOTES:
1. ALL SPEAKER WIRE SHALL BE FOUR CONDUCTOR WIRE (UNLESS OTHERWISE NOTED)
2. ALL SPEAKER WIRED TO SINGLE HOMERUN POINT (UNLESS OTHERWISE NOTED)

NOTE: INTERIOR LIGHTING NOT SHOWN.

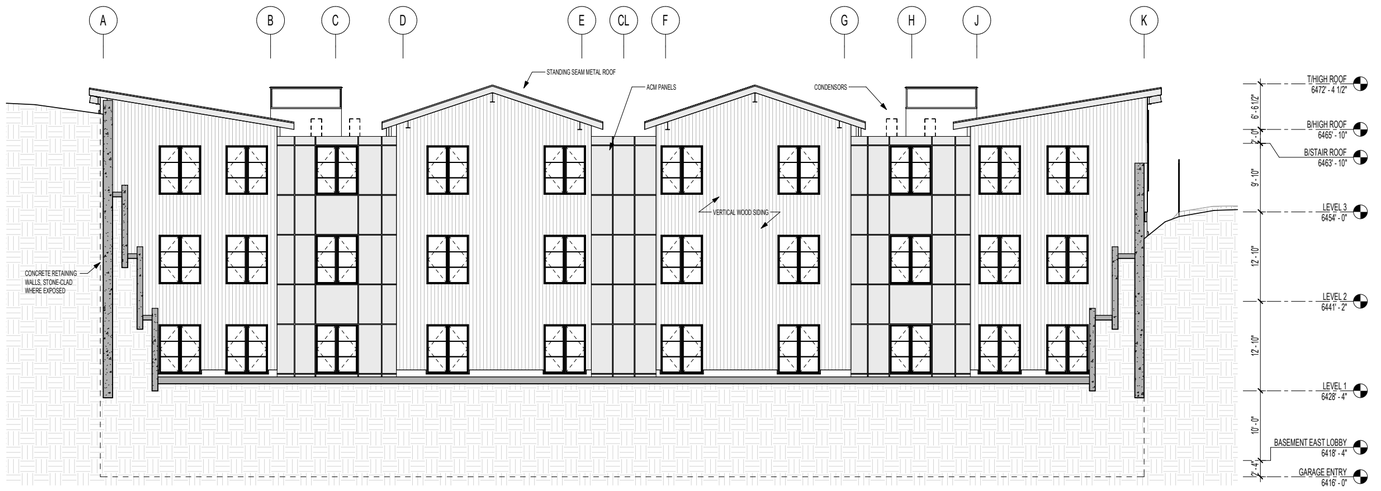
LOT 58 – EXTERIOR LIGHTING PLANS



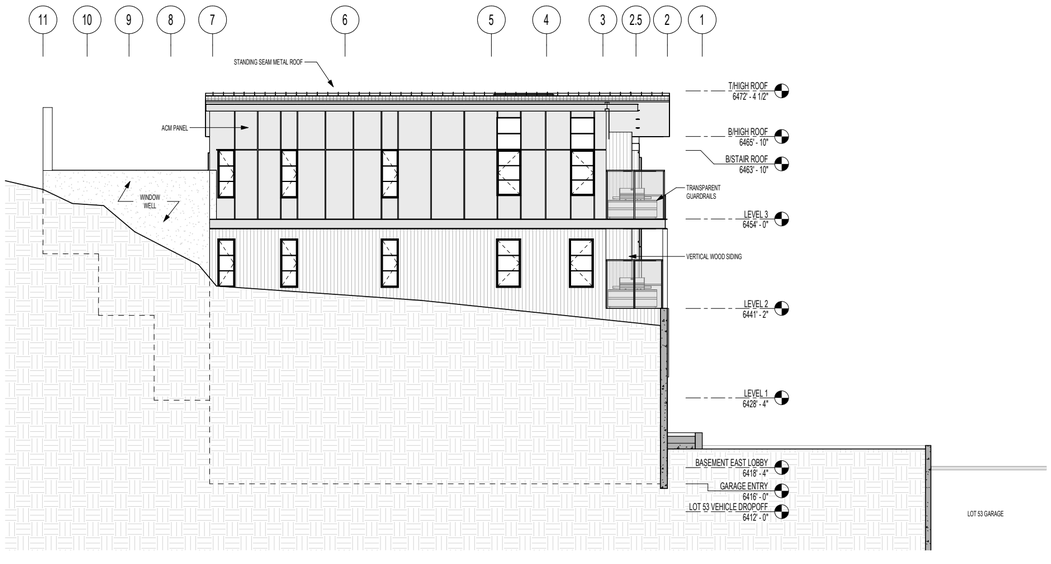
MATERIAL LEGEND

- VERTICAL WOOD SIDING
- HORIZONTAL WOOD SIDING
- ACM PANEL
- BOARD FORM CONCRETE

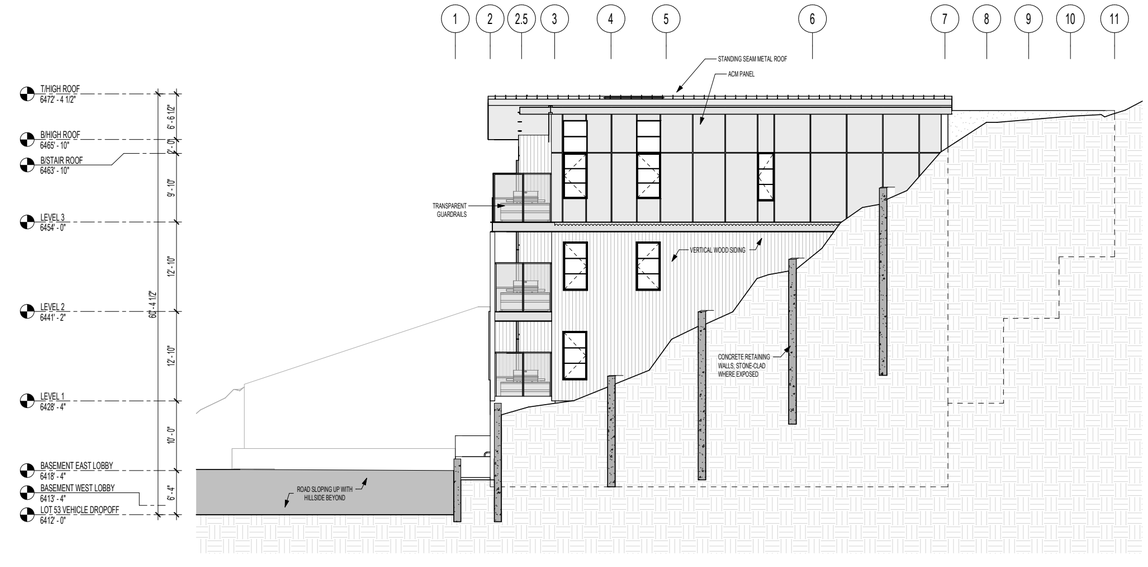
NORTH ELEVATION



SOUTH ELEVATION



EAST ELEVATION



WEST ELEVATION

LOT 58 – ELEVATIONS

SCALE: 1 / 16" = 1' - 0"

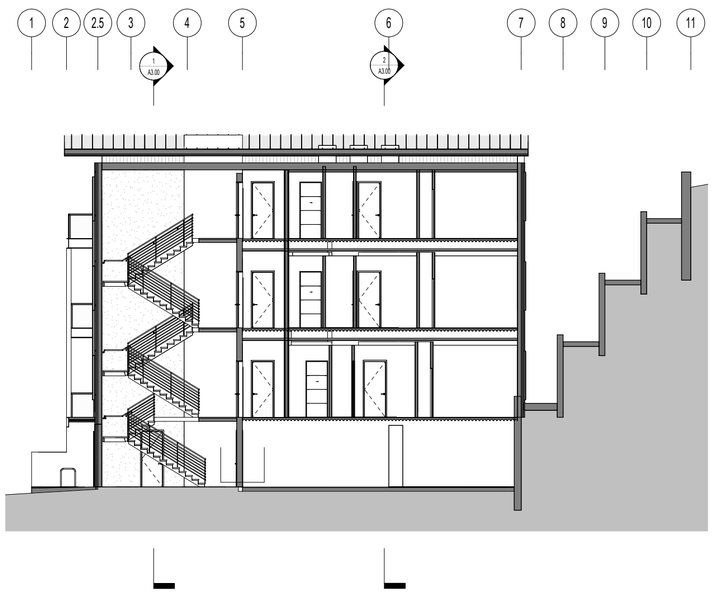
E/W SECTION LOOKING SOUTH - 1



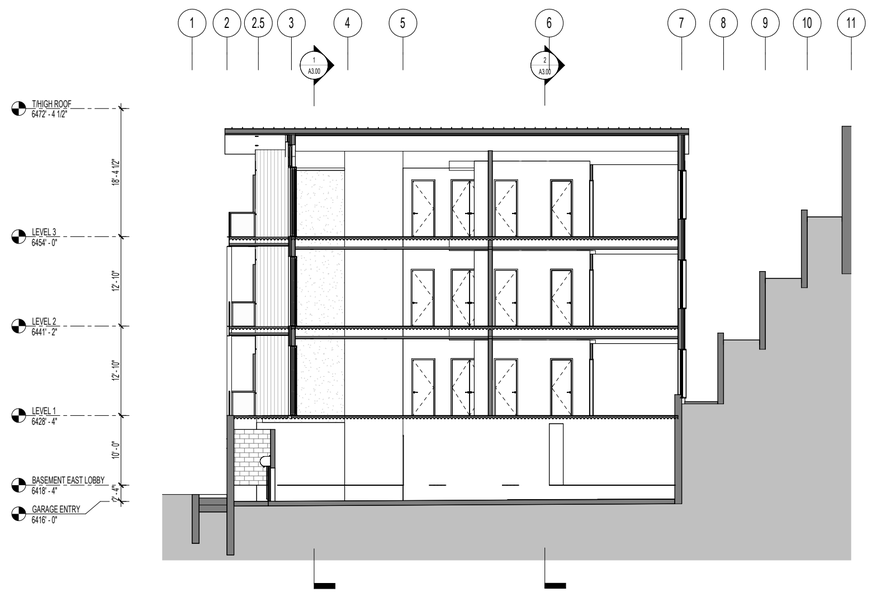
E/W SECTION LOOKING SOUTH - 2



N/S SECTION LOOKING EAST - 1



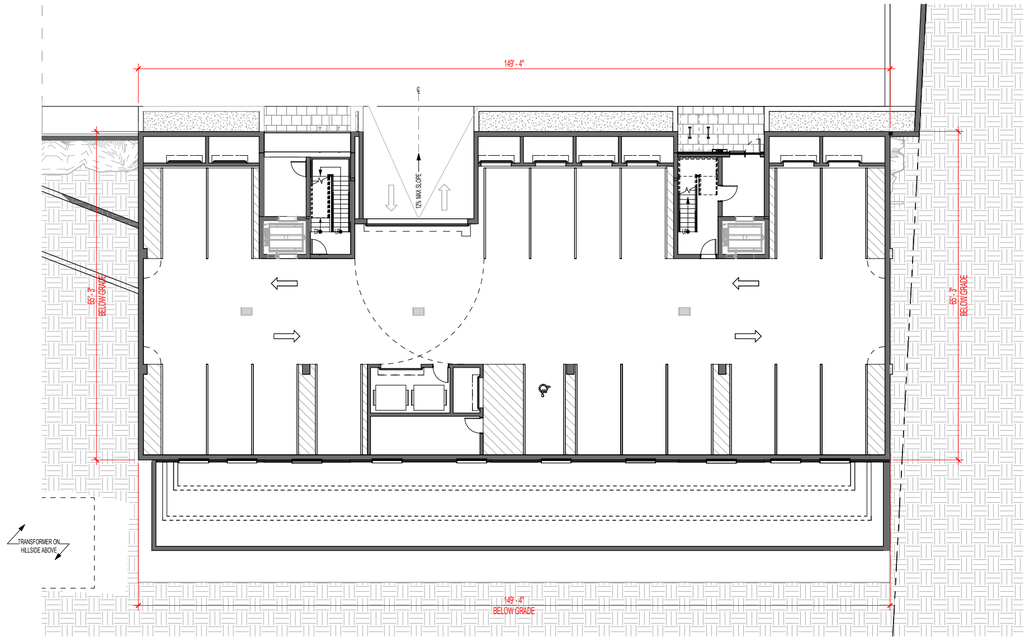
N/S SECTION LOOKING EAST- 2



LOT 58 – BUILDING SECTIONS

0 4 8 16 32

SCALE: 1 / 16" = 1' - 0"

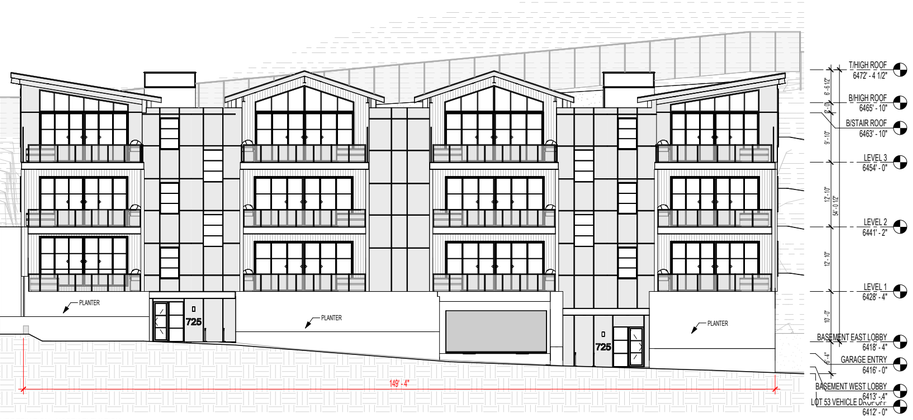


5 BASEMENT DEFINITION PLAN
SCALE: 3/32" = 1'-0"

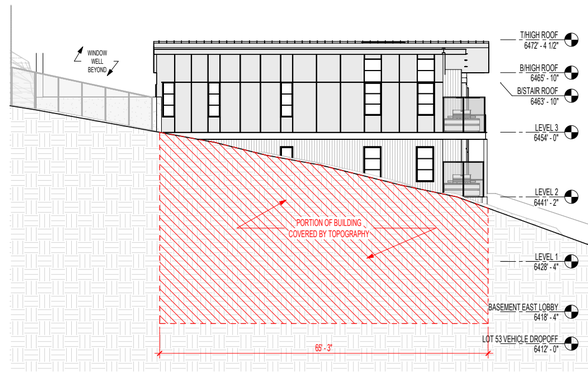
BASEMENT DEFINITION
1. NO MORE THAN 4'-0" OF WALL FROM THE T/1ST FLOOR SLAB DOWN CAN BE EXPOSED (6'-0" FROM THE T/BASEMENT SLAB MUST BE BELOW GRADE).
2. AT LEAST 50% OF THE PERMITER MUST MEET THIS REQUIREMENT.

LOT 58 BUILDING
NORTH ELEVATION - 149'-4"
EAST ELEVATION - 65'-3" (65'-3" BELOW GRADE)
SOUTH ELEVATION - 149'-4" (149'-4" BELOW GRADE)
WEST ELEVATION - 65'-3" (65'-3" BELOW GRADE)

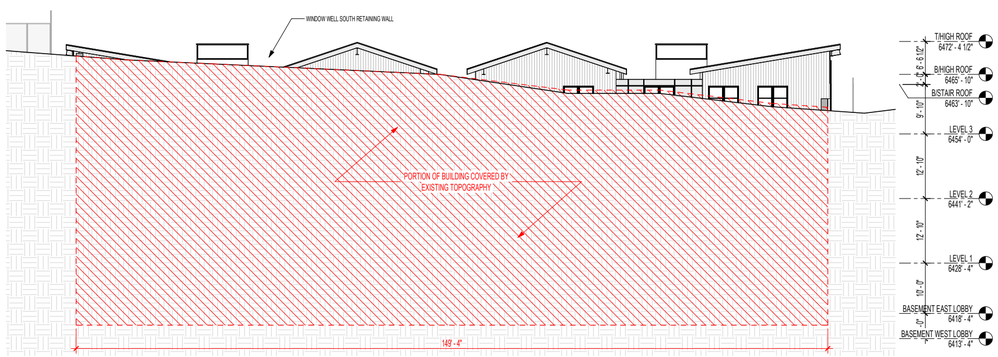
TOTAL PERIMETER = 429'-2" (279'-10" BELOW GRADE)
TOTAL PERCENTAGE BELOW GRADE = 65%



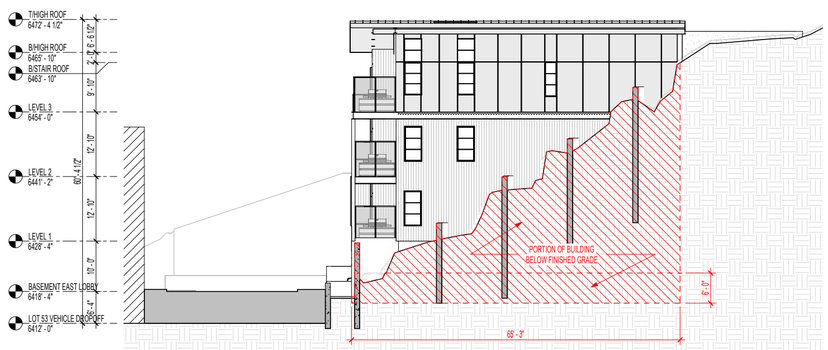
1 BASEMENT DEFINITION - NORTH ELEVATION
SCALE: 3/32" = 1'-0"



3 BASEMENT DEFINITION - EAST ELEVATION
SCALE: 3/32" = 1'-0"



2 BASEMENT DEFINITION - SOUTH ELEVATION
SCALE: 3/32" = 1'-0"



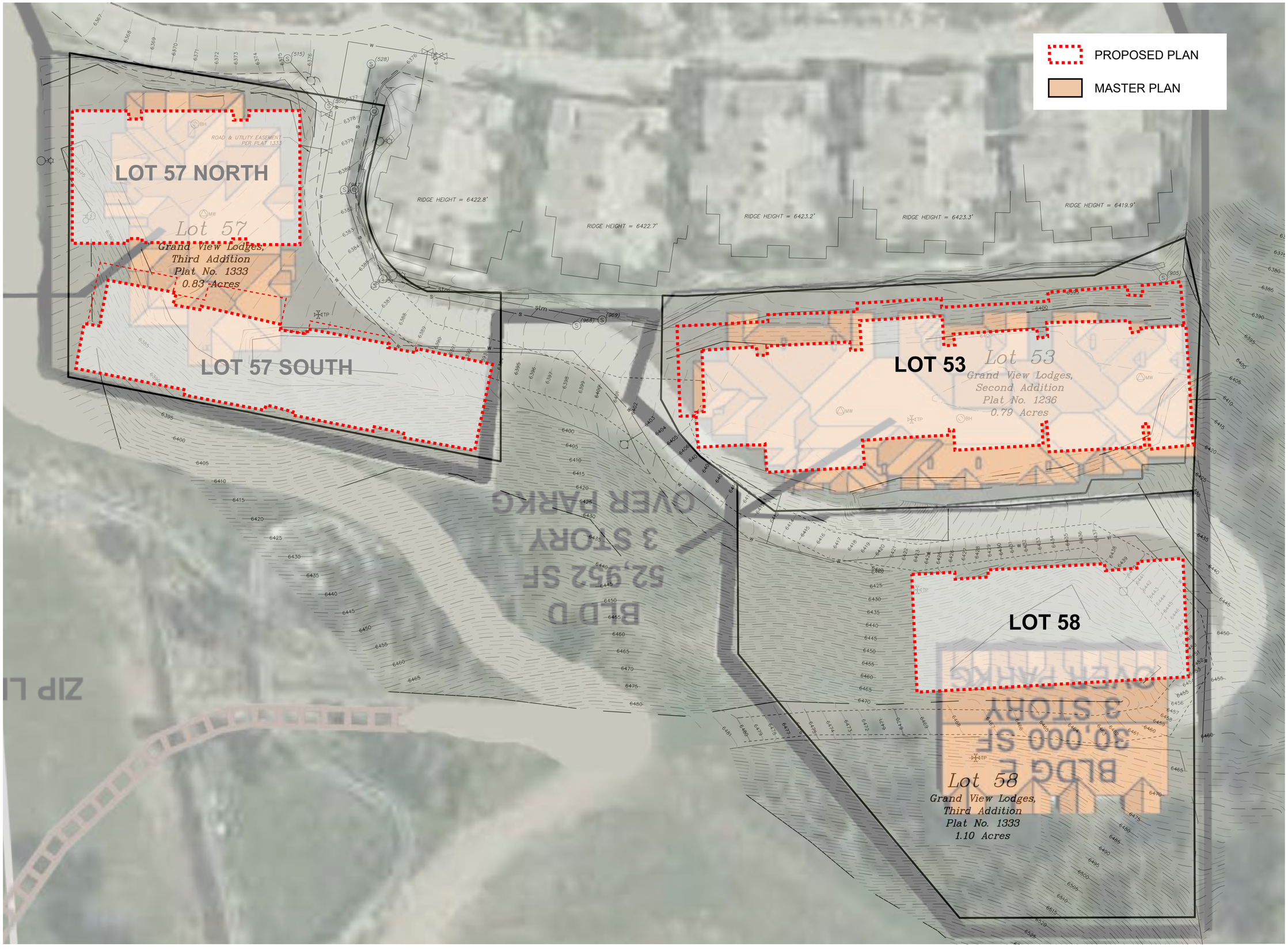
4 BASEMENT DEFINITION - WEST ELEVATION
SCALE: 3/32" = 1'-0"

0 4 8 16 32

LOT 58 – BASEMENT CALCULATIONS

NORTHWORKS

Master Plan Analysis



SITE PLAN OVERLAY – MASTER PLAN & NEW PROPOSAL

MASTER PLAN - WEST ELEVATION



PROPOSED PLAN - WEST ELEVATION

MASTER PLAN - NORTH ELEVATION





PROPOSED PLAN - NORTH ELEVATION

The original Master Plan design for Lot 57 did not account for garage access from the road with allowable road slopes. Our proposal splits the site into 2 buildings to solve this issue, while maintaining a scale that matches that of the original design.

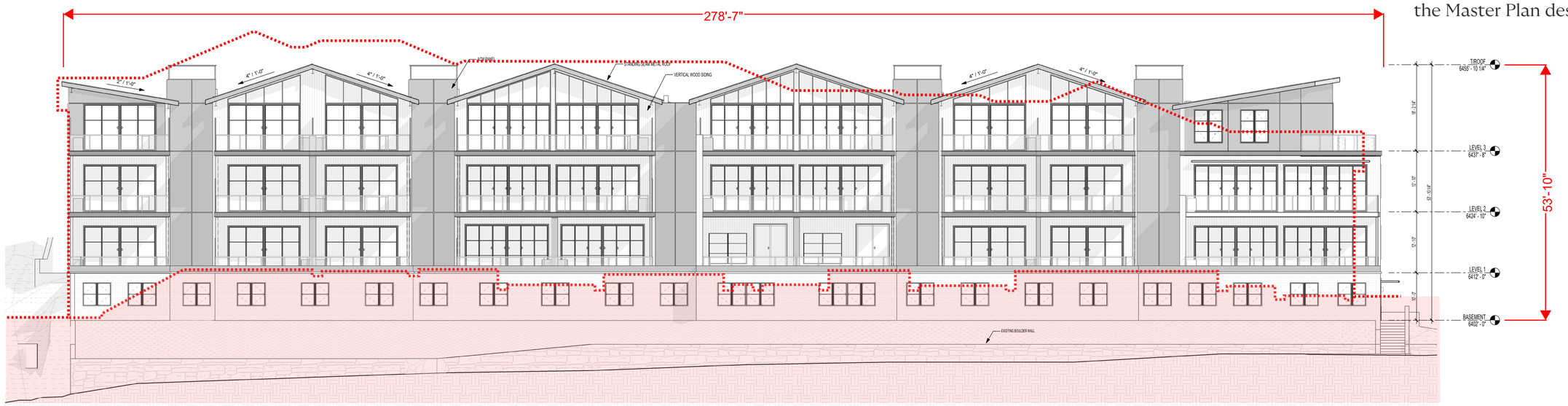
LOT 57 MASTER PLAN VS. NEW PROPOSAL



MASTER PLAN - NORTH ELEVATION

This design would have created a very tall retaining wall along the Love Ridge condos.

The proposed design at Lot 53 is shorter on average than the Master Plan design.

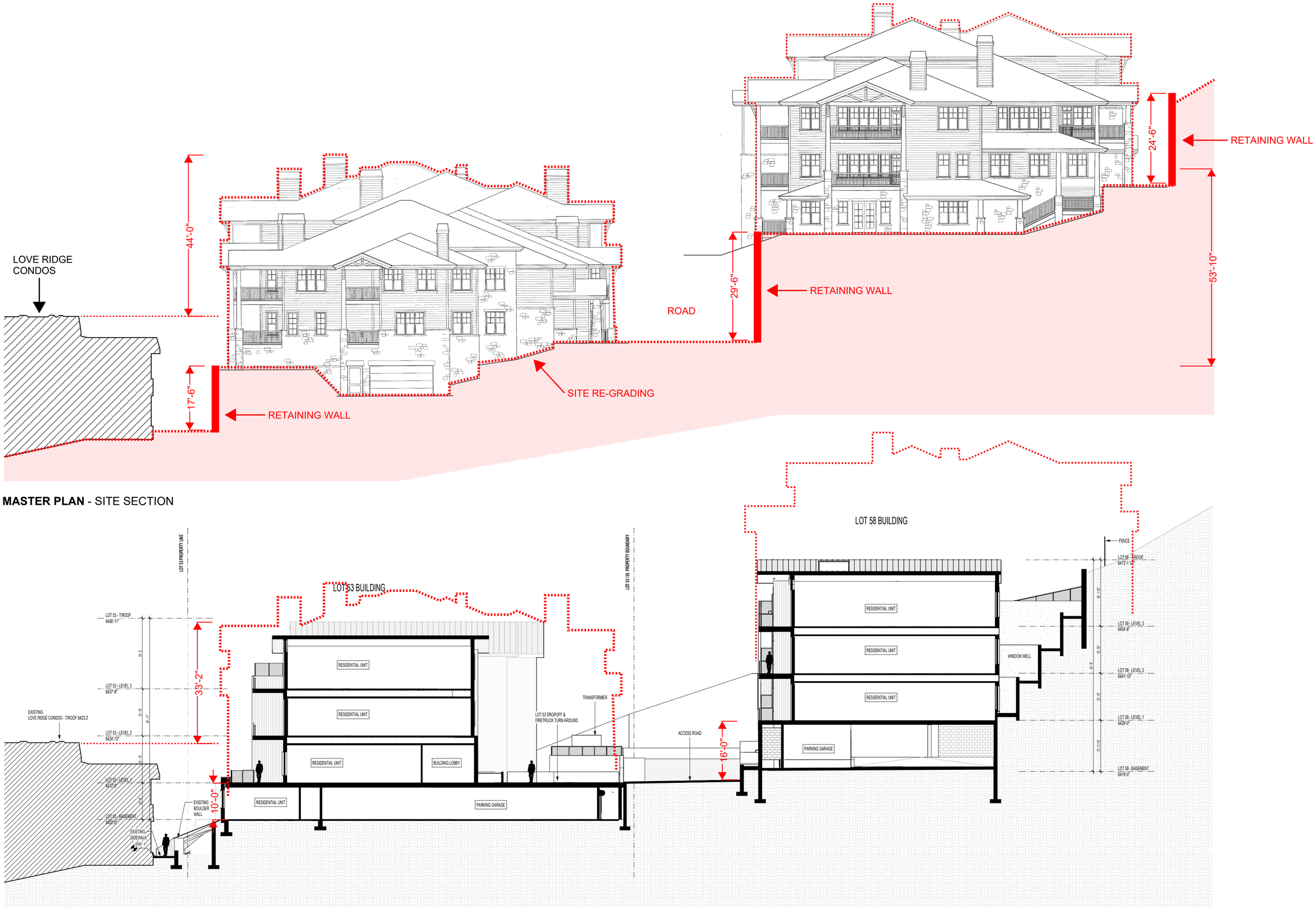


PROPOSED PLAN - NORTH ELEVATION



MASTER PLAN - WEST ELEVATION

LOT 53 MASTER PLAN VS. NEW PROPOSAL



MASTER PLAN - SITE SECTION

PROPOSED PLAN - SITE SECTION

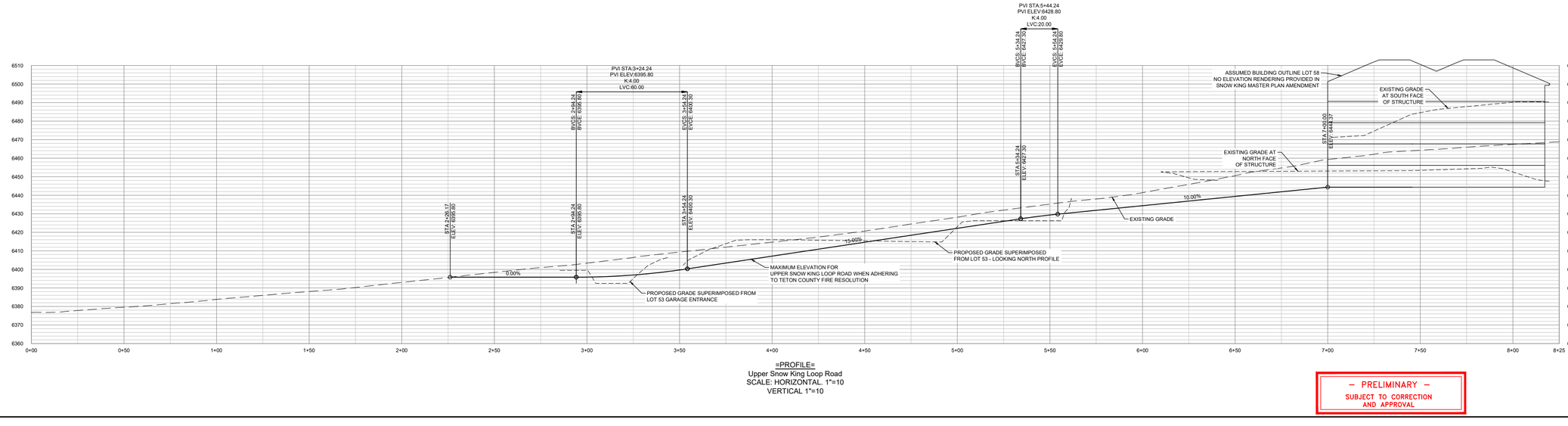
LOT 53 AND LOT 58 – MASTER PLAN VS. NEW PROPOSAL – SITE SECTION

NOTE:

1. WITHOUT EXTENSIVE RETAINING SYSTEM, NO FEASIBLE LOCATION FOR FIRE TRUCK TURNAROUND WITHIN 150 LF OF END OF ROAD.

SNOW KING LOOP ROAD
REQUIRED RETAINING SYSTEM
REQUIRED RETAINING SYSTEM
LOT 57 BUILDING
UPPER SNOW KING LOOP ROAD
APPROXIMATE CENTERLINE OF EXISTING UPPER SNOW KING LOOP ROAD
REQUIRED RETAINING SYSTEM
REQUIRED RETAINING SYSTEM
LOT 53 BUILDING
EXISTING RETAINING WALL
LOT 58 BUILDING

SCALE: 1 INCH = 10 FEET
THIS SCALE VALID ONLY FOR 36x48 PRINTS



=PROFILE=
Upper Snow King Loop Road
SCALE: HORIZONTAL: 1"=10
VERTICAL 1"=10

– PRELIMINARY –
SUBJECT TO CORRECTION AND APPROVAL

JORGENSEN
KEMMERER, WYOMING
307.877.9093
www.jorgeng.com

PROJECT TITLE:
SNOW KING - BEAR DEVELOPMENT

SHEET TITLE:
SNOW KING MASTER PLAN AMENDMENT - SUB-AREA 3
SITE OVERVIEW ANALYSIS

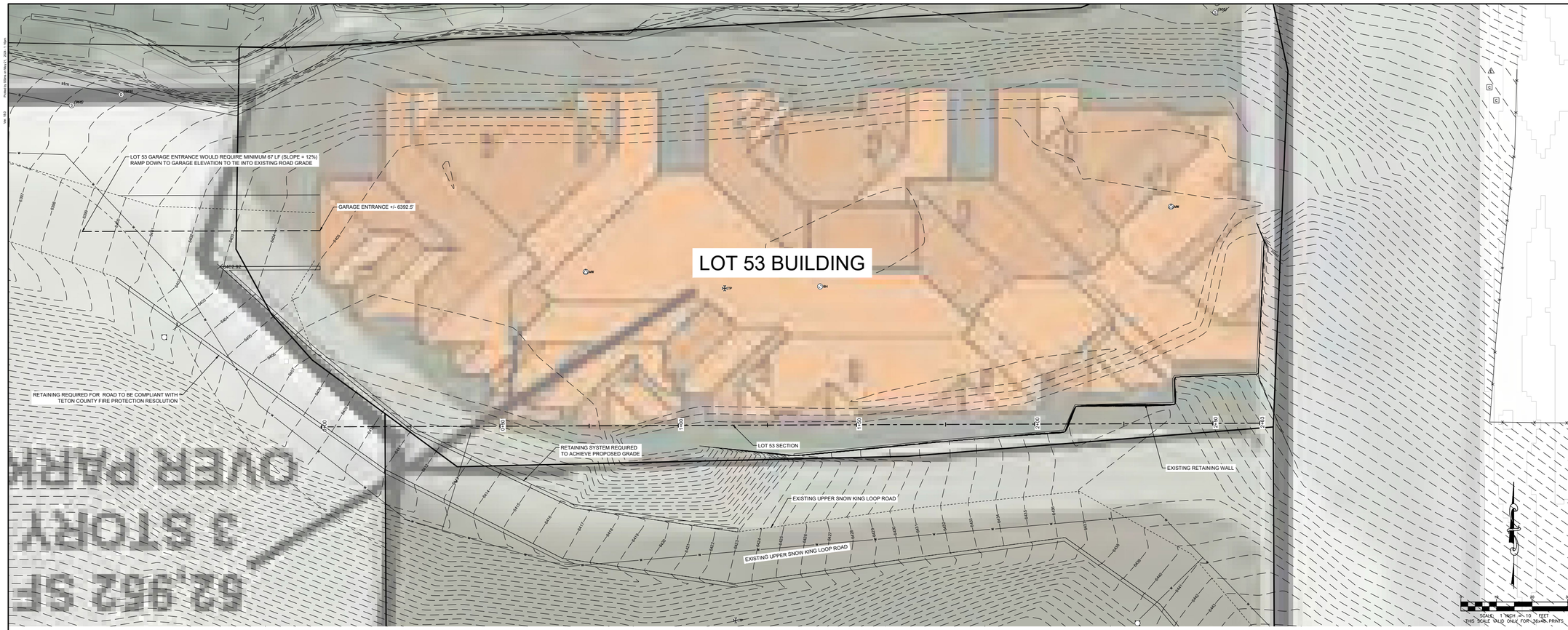
DESIGNED BY:	SS
REVIEWED BY:	JL
PLAN VERSION	DATE
EXHIBIT	2024-05-21

PROJECT NUMBER
23072

SHEET
1

© 2024 JORGENSEN Date Plotted: Wed, May 01, 2024 - 11:12am

MASTER PLAN – CIVIL ENGINEER COMMENTARY





=PROFILE=
Lot 53 XS-Looking North
SCALE: HORIZONTAL 1"=10
VERTICAL 1"=10

– PRELIMINARY –
SUBJECT TO CORRECTION AND APPROVAL

JORGENSEN
KEMMERER, WYOMING
307.877.9093
www.jorgeng.com

PROJECT TITLE:
SNOW KING - BEAR DEVELOPMENT

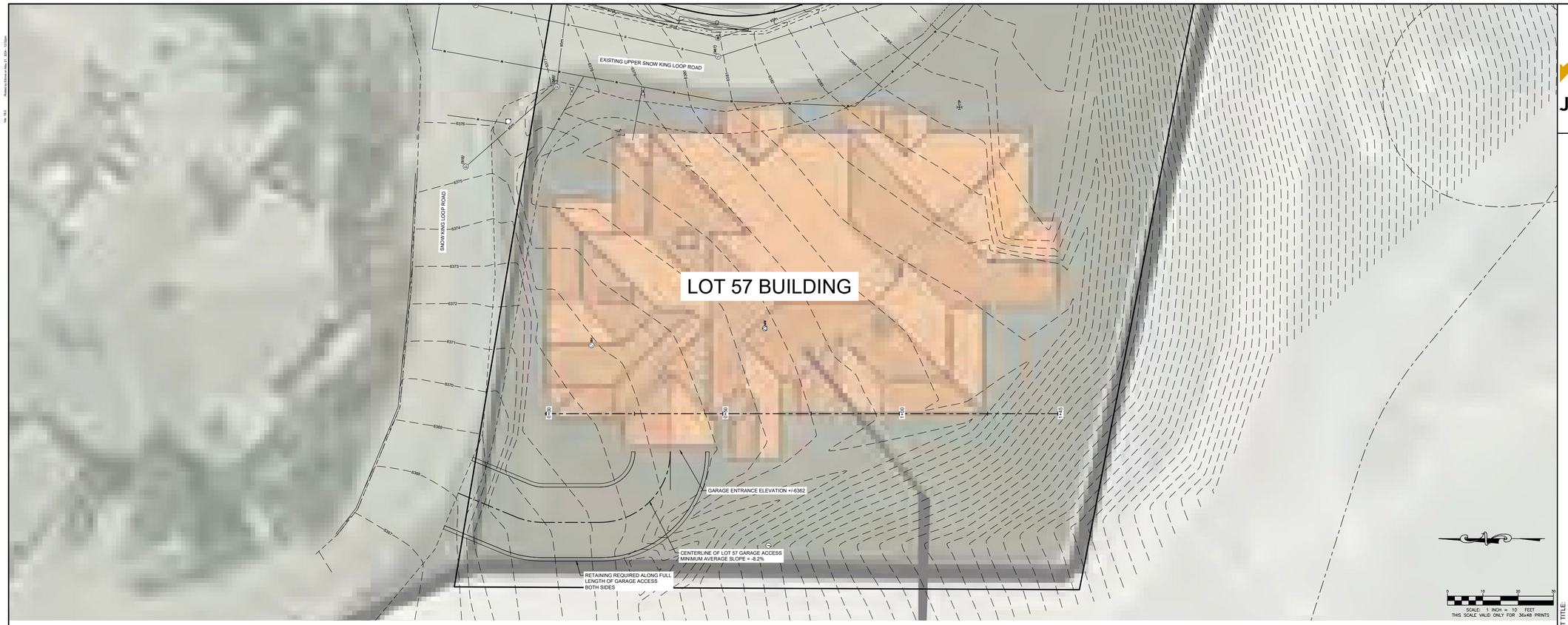
SHEET TITLE:
SNOW KING MASTER PLAN AMENDMENT - SUB-AREA 3
LOT 53 ANALYSIS

DESIGNED BY:	SS
REVIEWED BY:	JL
PLAN VERSION	DATE
EXHIBIT	2024-05-21

PROJECT NUMBER
23072

SHEET
2

MASTER PLAN – CIVIL ENGINEER COMMENTARY





=PROFILE=
Lot 57 - Looking East
SCALE: HORIZONTAL 1"=10
VERTICAL 1"=10

– PRELIMINARY –
SUBJECT TO CORRECTION
AND APPROVAL

JORGENSEN
KEMMERER, WYOMING
307.877.9093
www.jorgeng.com

PROJECT TITLE
SNOW KING - BEAR DEVELOPMENT

SHEET TITLE
SNOW KING MASTER PLAN AMENDMENT - SUB-AREA 3
LOT 57 ANALYSIS

DESIGNED BY:	SS
REVIEWED BY:	JL
PLAN VERSION	DATE
EXHIBIT	2024-05-21

PROJECT NUMBER
23072

SHEET
3

MASTER PLAN – CIVIL ENGINEER COMMENTARY

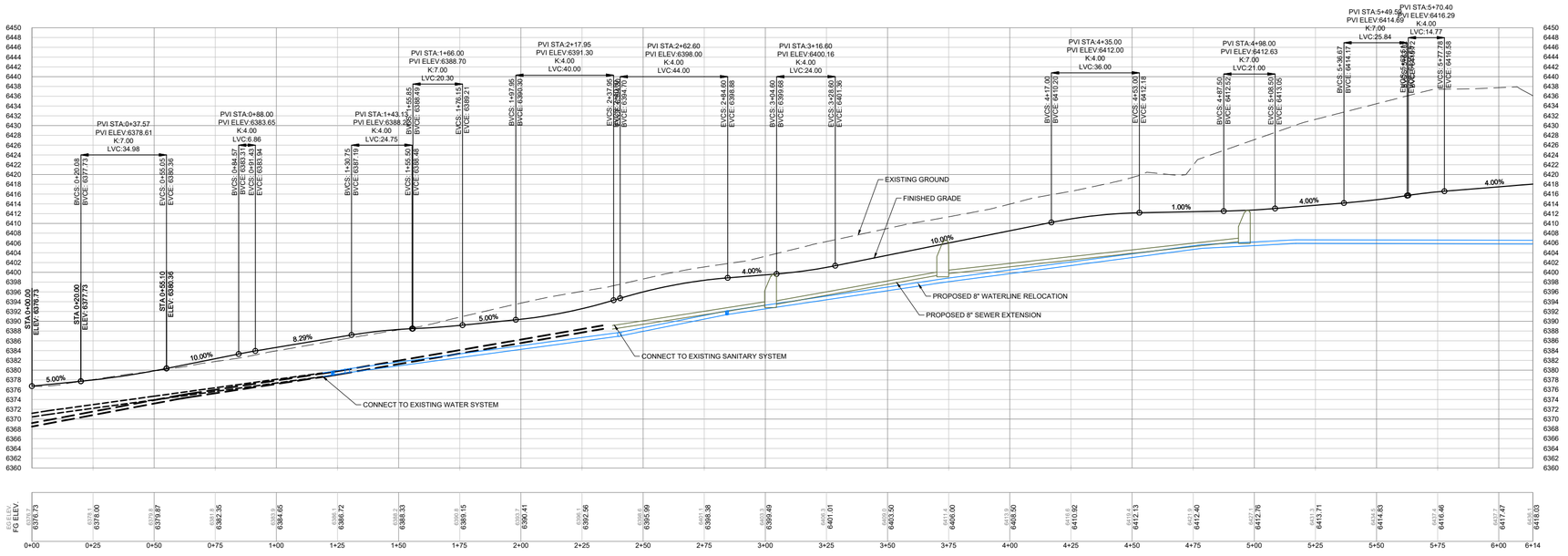
NORTHWORKS

Civil & Landscape Details



NOTE:

REFER TO RESPONSE TO TOWN ENGINEERING COMMENTS DATED 2/3/2025, CONDITIONS OF APPROVAL C. LDR 5.7.2.A FOR DISCUSSION OF ROAD STEEPNESS, FIRE APPARATUS TURN AROUND AND DEVELOPMENT ROAD CONNECTION TO THE EAST.



=PROFILE=
UPPER SNOW KING LOOP ROAD
SCALE: HORIZONTAL 1"=20'
VERTICAL 1"=10'

NORTHWORKS
185 E. Hansen Avenue
T 307-201-5324
Jackson, Wyoming 83001
www.nwkz.com

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JORGENSEN
JACKSON, WYOMING
307.733.5150
www.jorgeng.com

NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
2	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

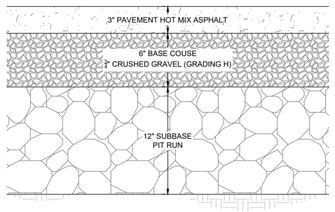
23072	Project No.
SS	Drawn By
JL	Checked By

Discipline & Drawing Number

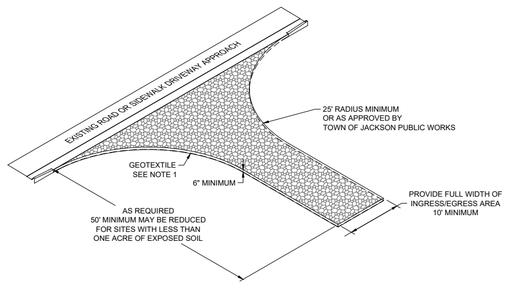
C2.3

Drawing Name

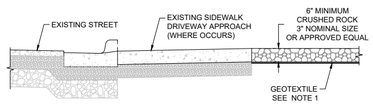
UPPER SNOW KING LOOP PLAN & PROFILE



PAVEMENT SECTION
NOT TO SCALE



CONSTRUCTION ENTRANCE ISOMETRIC VIEW

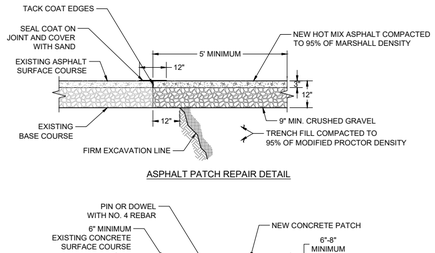


CONSTRUCTION ENTRANCE SECTION

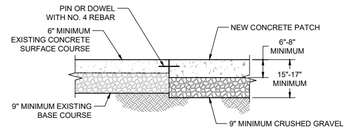
NOTE

1. PLACE CONSTRUCTION GEOTEXTILE FOR SOIL STABILIZATION UNDER THE CRUSHED ROCK FROM THE EDGE OF THE EXISTING ROADWAY OR SIDEWALK TO THE RADIUS RETURNS, OR AS DIRECTED BY PUBLIC WORKS.
2. ENTRANCE SHALL BE REMOVED ABD RECONSTRUCTED AS REQUIRED TO PREVENT EXCESS TRACKING OF MATERIALS INTO RIGHT-OF-WAY, OR WHEN DIRECTED BY THE TOWN PUBLIC WORKS DEPARTMENT.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE TOJ ST-119



ASPHALT PATCH REPAIR DETAIL

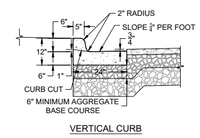


CONCRETE PATCH REPAIR DETAIL

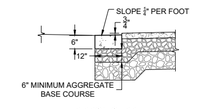
NOTE

1. REPLACEMENT ASPHALT SHALL BE 1" THICKER THAN EXISTING WITH A MINIMUM THICKNESS OF 3".
2. ASPHALT SHALL BE PLACED IN TWO (2) LIFTS, EACH NO LESS THEN ½" IN THICKNESS, AND COMPACTED TO 95% OF MARSHALL DENSITY.
3. BITUMINOUS MATERIAL SHALL MEET THE APPLICABLE REQUIREMENTS OF SECTION 02545 BITUMINOUS MATERIAL OF WYOMING PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
4. PORTLAND CEMENT CONCRETE PAVEMENT SHALL MEET APPLICABLE REQUIREMENTS OF SECTION 02520, 02776 AND 03304 AS DIRECTED BY TOWN OF JACKSON PUBLIC WORKS DEPARTMENT.

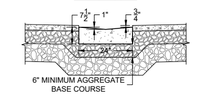
CONCRETE AND ASPHALT PATCH DETAIL
NOT TO SCALE TOJ ST-118



VERTICAL CURB



RIBBON CURB

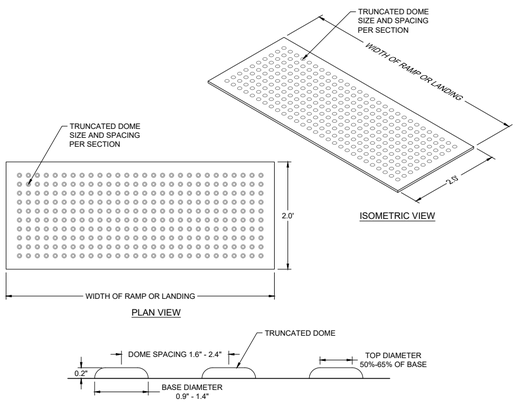


2' WIDE VALLEY GUTTER

NOTE

1. CURBS SHALL CONFORM TO WPWSS SECTION 02525, EXCEPT THAT PORTLAND CEMENT CONCRETE SHALL BE FIBERMESH-REINFORCED CLASS 4000 CONCRETE CONFORMING WITH WPWSS SECTION 03304, PART 2.07.
2. AGGREGATE BASE COURSE SHALL BE SIX INCH MINIMUM THICKNESS, CONFORM TO WPWSS SECTION 02190, PART 2.03, GRADING H, AND BE INSTALLED PER WPWSS SECTION 02231, PART 3.03.
3. REMOVAL AND REPLACEMENT OF CURB SHALL TAKE PLACE IN FULL PANELS.
4. ROLL CURB SHALL NOT BE ALLOWED.

CURB SECTION DETAIL
NOT TO SCALE TOJ ST-110 mod



ISOMETRIC VIEW

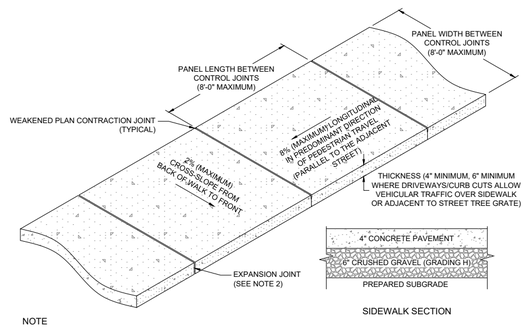
PLAN VIEW

TRUNCATED DOME SECTION

NOTE

1. DETECTABLE WARNING PANELS SHALL BE RED BRICK COLORED CAST IRON
2. PANELS PLACED ON PUBLIC SIDEWALKS SHALL BE PROVIDED BY TOWN OF JACKSON

DETECTABLE WARNING PANEL DETAIL
NOT TO SCALE

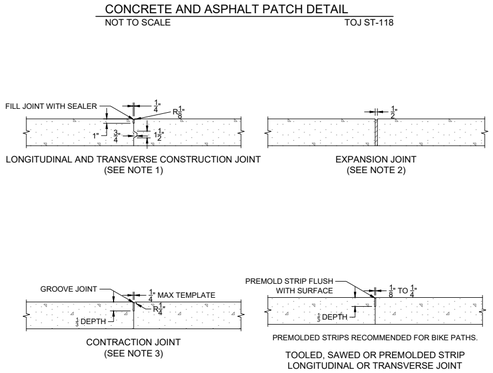


SIDEWALK SECTION

NOTE

1. SIDEWALK SHALL CONFORM TO ALL APPLICABLE ADA STANDARD REQUIREMENTS SIDEWALKS SHALL CONFORM TO WPWSS SECTION 02776, EXCEPT THAT PORTLAND CEMENT CONCRETE SHALL BE FIBERMESH-REINFORCED CLASS 4000 CONCRETE CONFORMING WITH WPWSS SECTION 03304, PART 2.07.
2. EXPANSION JOINTS SHALL BE PLACED IN SIDEWALK AT THE SAME LOCATIONS AS THOSE IN CURB AND GUTTER WHEN SIDEWALK IS ADJACENT TO CURB. (PER WPWSS SECTION 03251, PART 3.04 SPACING SHALL NOT EXCEED 32'-0" ON CENTER.)
3. FOR SIDEWALKS GREATER THAN EIGHT FEET IN WIDTH, A LONGITUDINAL CONTROL JOINT SHALL BE INSTALLED AT THE CENTER OF THE WALK.
4. REMOVAL AND REPLACEMENT OF SIDEWALK SHALL TAKE PLACE IN FULL PANELS.
5. AGGREGATE BASE COURSE SHALL BE FOUR INCH MINIMUM THICKNESS, CONFORM TO WPWSS SECTION 02190, PART 2.03 GRADING H, AND BE INSTALLED PER WPWSS SECTION 02231, PART 3.03.
6. CLEAR VEGETATION AND STRIP TOPSOIL TO SUBGRADE. SCARIFY, CONDITION, AND COMPACT. PROOF ROLL IN THE PRESENCE OF THE ENGINEER
7. MATERIAL STRIPPED TO DEPTH LOWER THAN SUBGRADE SHALL BE REPLACED WITH STRUCTURAL MATERIAL TO SUBGRADE ELEVATION.
8. WHERE UNSUITABLE SUBGRADE SOIL EXISTS, OVER EXCAVATION AND REPLACEMENT WILL BE REQUIRES. GEOGRID MAY BE SUBSTITUTED FOR OVER EXCAVATION UPON APPROVAL FROM GEOTECHNICAL ENGINEER.

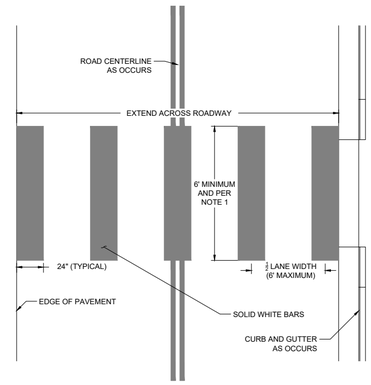
TYPICAL CONCRETE SIDEWALK DETAIL
NOT TO SCALE TOJ ST-127



NOTES

1. KEYWAY FORMED BY FASTENING METAL KEY TO FORM.
2. ¼" PREMOLDED NON-EXTRUDING EXPANSION JOINT MATERIAL TO MEET AASHTO M-59. EXPANSION MATERIAL SHALL BE INSTALLED WHEN ABUTTING EXISTING CONCRETE OR FIXED STRUCTURES SUCH AS INLETS AND DRIVEWAYS, AND EVERY 300' ON LONG STRAIGHT CONCRETE STRETCHES.
3. FORM WITH TEMPLATE OR SAWCUT JOINTS. IF SAWCUT JOINTS ARE USED, THEY SHALL BEGIN AS SOON AS CONCRETE IS HARDENED SUFFICIENTLY TO PERMIT SAWING WITHOUT EXCESSIVE RAVELING AND BEFORE UNCONTROLLABLE CRACKING OCCURS. MAXIMUM DISTANCE BETWEEN JOINTS IS 8'. MINIMUM DISTANCE IS 4'.
4. EXPANSION JOINTS SHALL BE PLACED IN SIDEWALK AT THE SAME LOCATIONS AS THOSE IN CURB AND GUTTER WHEN SIDEWALK IS ADJACENT TO CURB. (PER WPWSS SECTION 03251, PART 3.04 SPACING SHALL NOT EXCEED 32'-0" ON CENTER.)

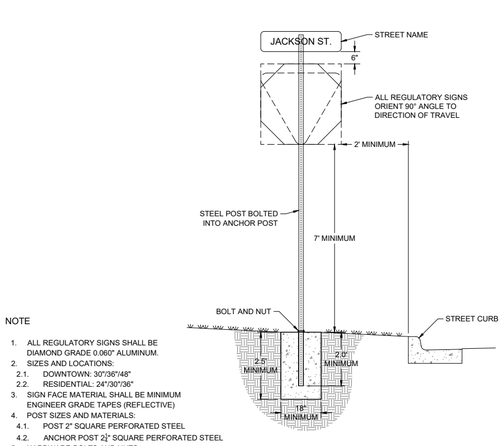
PAVING AND CONCRETE JOINT DETAILS
NOT TO SCALE



NOTE

1. CROSSWALK WIDTH SHALL BE 2' WIDER THAN THE WIDEST APPROACH SIDEWALK.
2. TO REDUCE WEAR, SPACE CROSSWALK LINES TO AVOID VEHICLE WHEEL PATHS. GENERALLY LOCATE CROSSWALK LINES AT THE EDGE AND CENTER OF LANES.
3. ROAD SURFACE SHALL BE CLEANED THOROUGHLY WITH A PRESSURE WASHER AND ALLOWED TO DRY COMPLETELY PRIOR TO PAINTING.

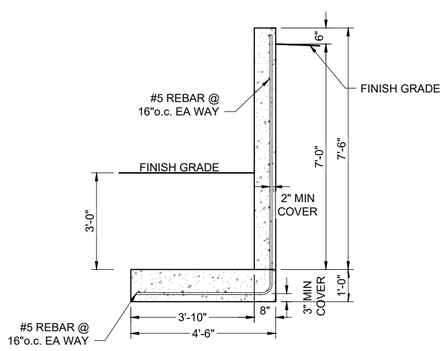
CROSSWALK STRIPING DETAIL
NOT TO SCALE TETON COUNTY STANDARD



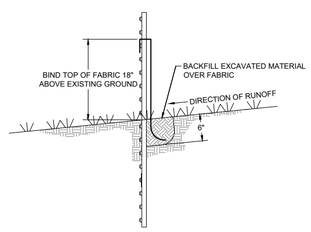
NOTE

1. ALL REGULATORY SIGNS SHALL BE DIAMOND GRADE 0.060" ALUMINUM.
2. SIZES AND LOCATIONS:
   2.1. DOWNTOWN: 30"/36"/48"
   2.2. RESIDENTIAL: 24"/30"/36"
3. SIGN FACE MATERIAL SHALL BE MINIMUM ENGINEER GRADE TAPES (REFLECTIVE)
4. POST SIZES AND MATERIALS:
   4.1. POST 2" SQUARE PERFORATED STEEL
   4.2. ANCHOR POST 2½" SQUARE PERFORATED STEEL
5. HARDWARE-BOLTS AND NUTS.
6. STREET NAMES SHALL BE 6" ABOVE STOP OR YIELD SIGNS.
7. MINIMUM EMBEDMENT OF ANCHOR POST SHALL BE 2' FROM GROUND LEVEL.
8. ALL TRAFFIC SIGNS SHALL MEET THE TOWN OF JACKSON STANDARDS. REFER TO WYDOT SPECIFICATIONS OR MUTCD FOR ITEMS NOT FOUND IN THE TOWN OF JACKSON STANDARDS.

TYPICAL TRAFFIC SIGN DETAIL
NOT TO SCALE



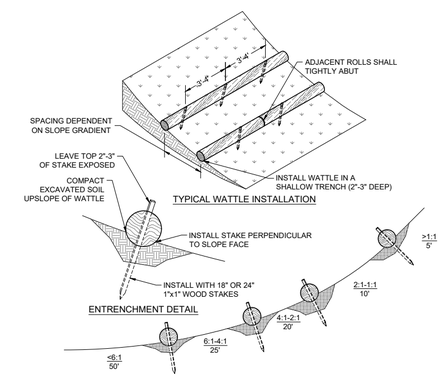
RETAINING WALL DETAIL
NOT TO SCALE



NOTE

1. USE MIRAFI 100X FILTER FABRIC WITH STEEL FENCE POSTS AT 10' ON CENTER OR APPROVED EQUAL.
2. PLACE SILT FENCE DOWN GRADIENT OF CONSTRUCTION OPERATIONS AS SHOWN ON THE PLANS TO CONTROL SILF FROM LEAVING SITE.

SILT FENCE DETAIL
NOT TO SCALE



TYPICAL WATTLE INSTALLATION

TYPICAL WATTLE SPACING BASE ON SLOPE GRADIENT

NOTE

1. BEGIN AT THE LOCATION WHERE THE WATTLE IS TO BE INSTALLED BY EXCAVATING A 2"-3" DEEP BY 9" WIDE TRENCH ALONG THE CONTOUR OF THE SLOPE. EXCAVATED SOIL SHALL BE PLACED UP-SLOPE FROM THE ANCHOR TRENCH.
2. PLACE THE WATTLE IN THE TRENCH SO THAT IT CONTOURS TO THE SOIL SURFACE. COMPACT SOIL FROM THE EXCAVATED TRENCH AGAINST THE WATTLE ON THE UPHILL SIDE. ADJACENT WATTLES SHOULD TIGHTLY ABUT.
3. SECURE THE WATTLE WITH 18"-24" STAKES EVERY 3'-4' AND WITH A STAKE ON EACH END. STAKES SHALL BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE LEAVING AT LEAST 2"-3" OF STAKE EXTENDING ABOVE THE WATTLE. STAKES SHALL BE DRIVEN PERPENDICULAR TO THE SLOPE FACE.
4. EROSION CONTROL PLAN AND LOCATION OF STRAW WATTLES SHALL BE AS SHOWN ON PLANS OR AS APPROVED BY THE ENGINEER.

TYPICAL STRAW WATTLE DETAIL
NOT TO SCALE

NORTHWORKS
185 E. Hansen Avenue
T 307-201-5324
Jackson, Wyoming 83001
www.nwkrg.com

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JORGENSEN
JACKSON, WYOMING
307.733.5150
www.jorgeng.com

NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

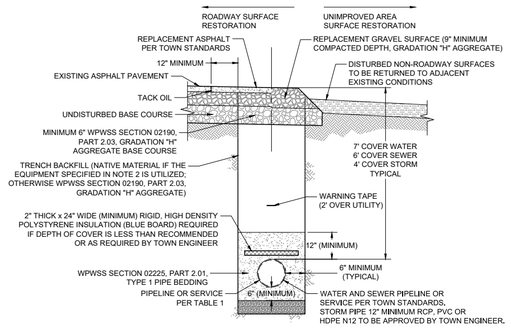
23072	Project No.
SS	Drawn By
JL	Checked By

Discipline & Drawing Number

C3.0

Drawing Name

GRADING DETAILS

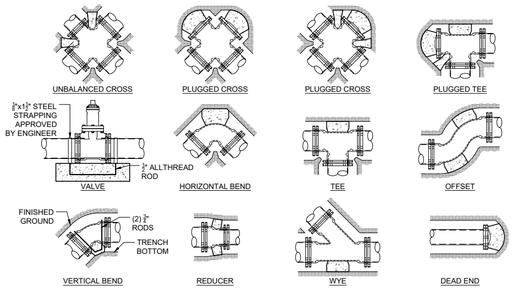


NOTE

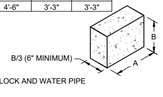
1. TRENCH BACKFILL BELOW THE SURFACE SHALL MEET THE FOLLOWING CRITERIA:
   - 95% MODIFIED PROCTOR DENSITY WITHIN STREET AND ALLEY RIGHTS-OF-WAY.
   - 90% MODIFIED PROCTOR DENSITY OUTSIDE STREET AND ALLEY RIGHTS-OF-WAY.
2. COMPACTION OF NATIVE TRENCH BACKFILL, WITH ALL ROCK LARGER THAN 6" REMOVED, SHALL BE CARRIED OUT IN 2' LIFTS WITH A HOE-PACK OR A VIBRATORY SHEEPS FOOT ROLLER (COMPACTION METHOD AND EQUIPMENT SHALL BE REVIEWED AND APPROVED BY TOWN ENGINEER PRIOR TO BACKFILLING).
3. PIPE BEDDING SHALL BE PLACED IN 6" LIFTS AND THOROUGHLY COMPACTED WITH A JUMPING JACK TO PROVIDE UNIFORM PIPE SUPPORT.
4. UNLESS OTHERWISE DIRECTED, ALL BASE COURSE AND GRAVEL SURFACE REPLACEMENT SHALL BE INSTALLED PER WPWSS SECTION 02231, PART 3.03.
5. ALL TRENCH EXCAVATION SHALL CONFORM TO WYOMING OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (WYOSHA) REGULATIONS.
6. PROVIDE INSULATION WHERE COVER OVER WATER LINES AND FORCE MAINS ARE LESS THAN 7 FEET AND WHERE SANITARY SEWER AND STORM LINES ARE LESS THAN 5 FEET.

PIPE TRENCH DETAIL

NOT TO SCALE — TOJ W-100, SS-100, STM-100



MINIMUM DIMENSIONS FOR THRUST BLOCKING NOTES										
FITTING SIZE	TEES AND PLUGS		90° BENDS		45° BENDS AND WYES		REDUCERS AND 22 1/2° BENDS		11 1/2° BENDS	
	A	B	A	B	A	B	A	B	A	B
4"	1'-7"	1'-2"	1'-9"	1'-6"	1'-8"	0'-10"	1'-7"	0'-6"	0'-6"	0'-6"
6"	2'-0"	1'-11"	2'-5"	2'-2"	1'-10"	1'-7"	1'-9"	0'-10"	1'-0"	0'-6"
8"	2'-8"	2'-6"	3'-2"	3'-0"	2'-5"	2'-1"	1'-9"	1'-6"	1'-0"	1'-0"
10"	3'-4"	3'-3"	4'-0"	3'-10"	3'-0"	2'-9"	2'-2"	1'-11"	1'-6"	1'-0"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"	2'-7"	2'-3"	2'-0"	1'-0"
14"	5'-5"	3'-10"	6'-6"	4'-11"	4'-9"	3'-5"	3'-5"	2'-5"	2'-0"	1'-6"
20"	5'-0"	5'-0"	6'-0"	6'-0"	5'-0"	4'-0"	3'-6"	3'-0"	3'-0"	2'-0"
24"	6'-0"	6'-0"	7'-0"	7'-0"	5'-0"	5'-0"	4'-6"	3'-0"	3'-0"	3'-0"
30"	7'-6"	7'-6"	8'-0"	8'-0"	6'-3"	6'-3"	4'-9"	4'-6"	3'-3"	3'-3"

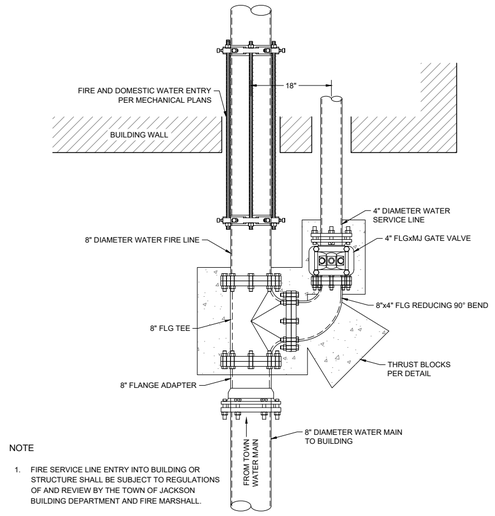


NOTE

1. SIZE BLOCKS SHALL BE A MINIMUM OF 6" THICK
2. ALL BLOCKING SHALL BEAR AGAINST UNDISTRIBUTED MATERIAL
3. DESIGN IS BASED ON 150 PSI MAIN PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.
4. 4 MIL POLYETHELENE PLASTIC BOND BREAKER SHALL BE PROVIDED BETWEEN THRUST BLOCK AND WATER PIPE

THRUST BLOCK DETAIL

NOT TO SCALE — TOJ W-111

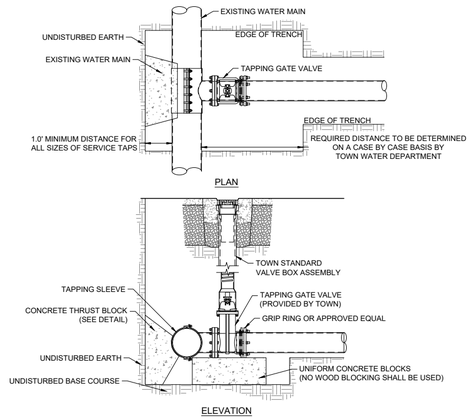


NOTE

1. FIRE SERVICE LINE ENTRY INTO BUILDING OR STRUCTURE SHALL BE SUBJECT TO REGULATIONS OF AND REVIEW BY THE TOWN OF JACKSON BUILDING DEPARTMENT AND FIRE MARSHALL.

WATER CONNECTION DETAIL

NOT TO SCALE

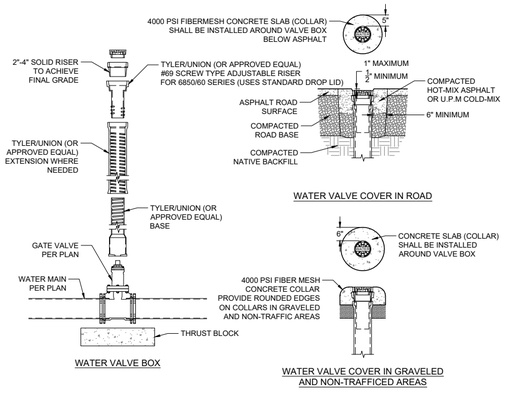


NOTE

1. THE TOWN SHALL COMPLETE THE TAPPING OF THE MAIN. NO OTHER PERSONS SHALL COMPLETE TAP WITHOUT CONSENT OF TOWN. ALL OTHER WATER MAIN WORK SHALL BE THE RESPONSIBILITY OF THE OWNER.
2. TRENCH WILL BE EXCAVATED TO MEET ALL WYOSHA STANDARDS PRIOR TO TAPPING.
3. EXCAVATION OF TAPPING LOCATION SHALL BE APPROVED BY TOJ WATER DEPARTMENT PRIOR TO TAPPING.

WATER MAIN TAPPING DETAIL

NOT TO SCALE — TOJ W-118

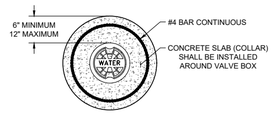


NOTE

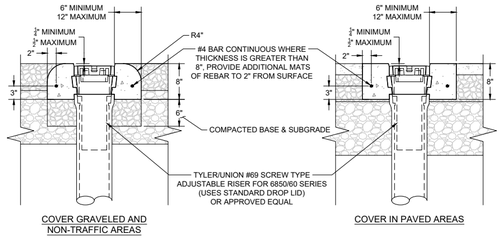
1. ADJUST WATER VALVE BOX UPWARD OR DOWNWARD AS REQUIRED. FINAL ADJUSTMENT SHALL BE MADE AFTER PAVING AND BEFORE SEAL COATING
2. THE TOWN SHALL INSPECT THE VERTICAL ALIGNMENT BEFORE AND AFTER BACKFILLING.
3. MUD PLUGS ARE REQUIRED TO BE PLACED IN ALL VALVE BOXES

WATER GATE VALVE DETAIL

NOT TO SCALE — TOJ W-106



WATER VALVE COVER

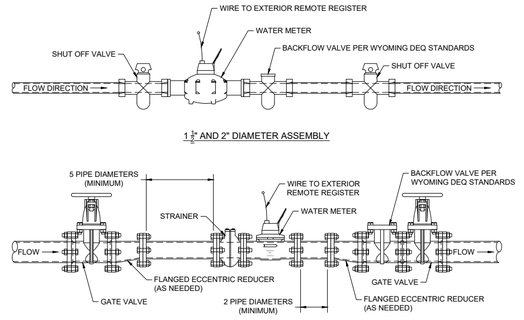


NOTE

1. ADJUST WATER VALVES UPWARD OR DOWNWARD AS REQUIRED.
2. FIBERMESH CONCRETE MAY BE SUBSTITUTED FOR REBAR.

WATER VALVE ADJUSTMENT DETAIL

NOT TO SCALE

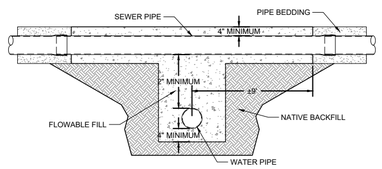


NOTE

1. SERVICE PIPE MATERIAL SHALL MEET ADOPTED PLUMBING CODE REQUIREMENTS.
2. METER SHALL BE INSTALLED IN HORIZONTAL ALIGNMENT ONLY.
3. CONNECTIONS WITHIN THE ASSEMBLY SHALL BE THREADED OR BOLTED FLANGED, AS APPROPRIATE.
4. METER SHALL BE PURCHASED FROM AND SUPPLIED BY THE TOWN OF JACKSON

1 ½" & LARGER WATER METER INSTALLATION DETAIL

NOT TO SCALE — INTERIOR TOJ W-113



NOTE

PARALLEL INSTALLATION:
NORMAL CONDITIONS:
SEWER MAINS AND MANHOLES SHALL BE LAID AT LEAST 10' HORIZONTALLY FROM ANY WATER MAIN WHENEVER POSSIBLE.

UNUSUAL CONDITIONS:
WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF 10 FEET, A SEWER MAIN MAY BE LAID CLOSER TO A WATER MAIN, PROVIDED THAT:

1. THE TOP OF THE SEWER MAIN IS AT LEAST 18" BELOW THE BOTTOM OF THE WATER MAIN;
2. WHERE 18" VERTICAL SEPARATION AS NOTED ABOVE CANNOT BE OBTAINED, THE SEWER MAIN SHALL BE:
   2A. CONSTRUCTED OF MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS OF CONSTRUCTION, AND TESTED TO ASSURE WATERTIGHTNESS BY SEWER LINE METHODS, OR;
   2B. PLACED IN A SEPARATE CASING PIPE, OR;
   2C. THE PIPE ENCASED IN CEMENT TREATED FILL (FLOW FILL).

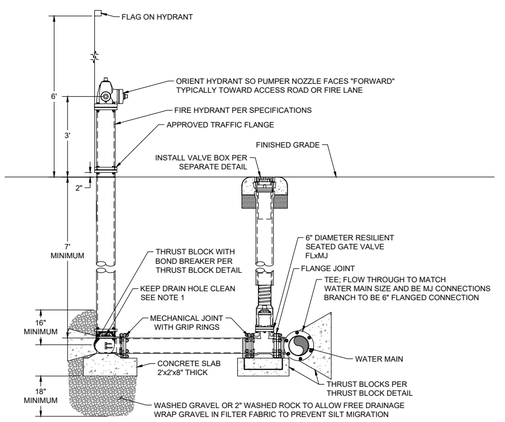
CROSSING:
NORMAL CONDITIONS:
SEWERS CROSSING WATER MAINS SHALL BE LAID BELOW THE WATER MAINS TO PROVIDE A VERTICAL SEPARATION OF AT LEAST 18" WHENEVER POSSIBLE. THE DISTANCE SHALL BE MEASURED BETWEEN THE BOTTOM OF THE WATER MAIN AND THE TOP OF THE SEWER.

UNUSUAL CONDITIONS:
WHEN LOCAL CONDITIONS PREVENT A VERTICAL SEPARATION OF AT LEAST 18" AS NOTED ABOVE, THE FOLLOWING CONSTRUCTION SHALL BE USED:

1. THE SANITARY SEWER, STORM SEWER OR WATER MAIN SHALL BE PLACED IN A SEPARATE CASING PIPE EXTENDING A MINIMUM OF 9' EACH SIDE OF THE CROSSING; OR
2. THE SEWER LINE SHALL BE CONSTRUCTED OF MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS OF CONSTRUCTION AND TESTED TO ASSURE WATER TIGHTNESS BY SEWER LINE METHODS, AND SHALL EXTEND A MINIMUM OF 9' EACH SIDE OF THE CROSSING
3. WATER MAINS PASSING UNDER A SEWER LINE SHALL, IN ADDITION TO THE ABOVE REQUIREMENTS, BE PROTECTED BY PROVIDING ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER LINE. SOIL STRUCTURAL SUPPORT SHALL CONSIST OF CEMENT TREATED BACKFILL (FLOW FILL).

WATER SEWER UNUSUAL PROXIMITY DETAIL

NOT TO SCALE

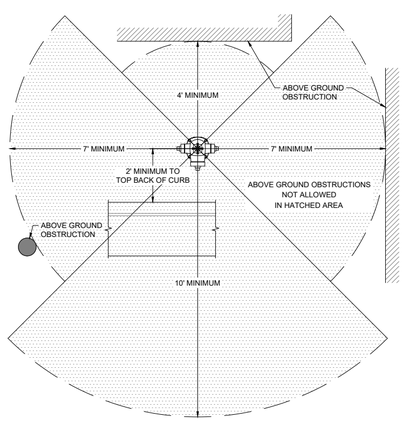


NOTE

1. REFER TO THE FIRE HYDRANT CLEARANCE REQUIREMENTS DETAIL FOR PLACEMENT INFORMATION
2. HYDRANT DRAIN HOLE NOT PERMITTED IF IT IS LOCATED BELOW THE WATER TABLE
3. HYDRANT TO BE LOCATED AS SHOWN ON PLANS

FIRE HYDRANT ASSEMBLY DETAIL

NOT TO SCALE

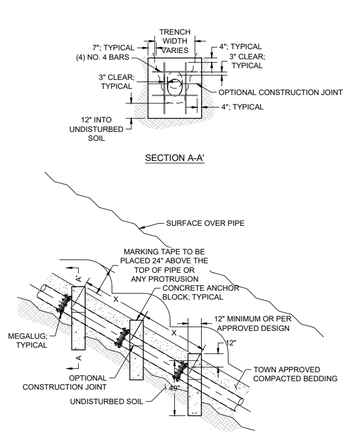


NOTE

1. REFER TO THE FIRE HYDRANT CLEARANCE REQUIREMENTS DETAIL FOR PLACEMENT INFORMATION
2. HYDRANT DRAIN HOLE NOT PERMITTED IF IT IS LOCATED BELOW THE WATER TABLE
3. HYDRANT TO BE LOCATED AS SHOWN ON PLANS

FIRE HYDRANT CLEARANCE REQUIREMENTS

NOT TO SCALE



NOTE

1. DRAINS TO DAYLIGHT ARE TO BE LOCATED ON THE UPHILL SIDE OF CONCRETE BLOCKS.
2. DISTANCE "X" TO BE DETERMINED BY THE ENGINEER AND SUBMITTED TO THE TOWN FOR REVIEW PRIOR TO CONSTRUCTION.

WATER PIPE ANCHOR BLOCK DETAIL

NOT TO SCALE — W-109

NORTHWORKS
185 E. Hansen Avenue
T 307-201-5324
Jackson, Wyoming 83001
www.nwkrj.com

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NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

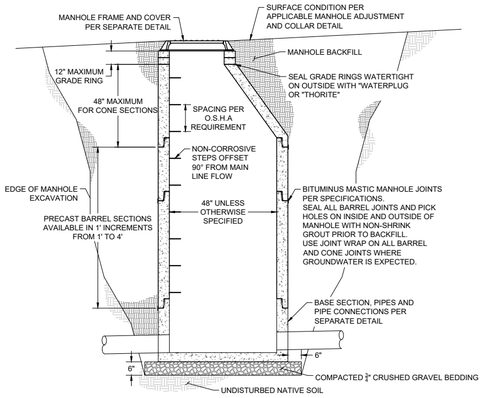
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SS	Drawn By
JL	Checked By

Discipline & Drawing Number

C3.1

Drawing Name

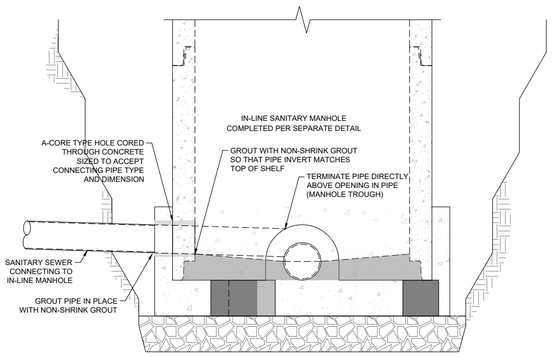
WATER DETAILS



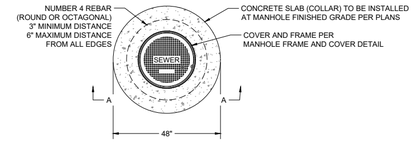
NOTE

1. REINFORCEMENT FOR PRECAST SECTIONS SHALL BE AS PER ASTM C-478.
2. C.I. RING AND COVER HS-20-44 ONE VENT HOLE OR AS SHOWN ON PLAN SHEET.
3. MOUND CRUSHED GRAVEL BASE AROUND TOP OF MANHOLE AT ROAD SURFACING LOCATIONS.
4. ALL SEWER MANHOLE BASES, BARRELS, AND CONES SHALL BE VACUUM TESTED.

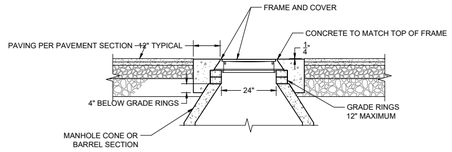
STANDARD MANHOLE CONSTRUCTION DETAIL
NOT TO SCALE



SEWER CONNECTION TO IN-LINE MANHOLE DETAIL
NOT TO SCALE



COVER AND COLLAR PLAN

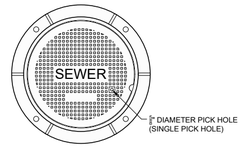


ADJUSTMENT DETAIL SECTION A-A

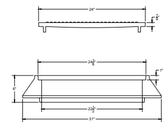
NOTE

1. ADJUST MANHOLE UPWARD WITH ADJUSTING RINGS UNDER FRAME. ADJUST MANHOLE DOWNWARD BY REMOVING A PORTION OF THE MANHOLE RISER AND REBUILDING TO PROPER HEIGHT. SLOPE MANHOLE RING AS REQUIRED TO MATCH STREET GRADE AND CROSS SLOPE. MAKE FINAL MANHOLE ADJUSTMENT AFTER PAVING AND BEFORE SEAL COATING. IF REQUIRED ADJUSTMENT EXCEEDS GRADE RINGS, REMOVE MANHOLE CONE AND ADD OR SUBTRACT BARREL SECTIONS.

MANHOLE ADJUSTMENT & COLLAR IN ASPHALT
NOT TO SCALE



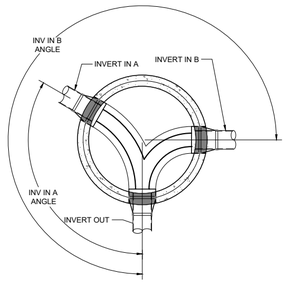
MANHOLE COVER



NOTE

1. MANHOLE FRAME AND COVER SHALL BE MODEL NO. A-1055, AS MANUFACTURED BY D&L SUPPLY OF LINDON, UTAH, MODIFIED AS SHOWN, OR APPROVED SUBSTITUTE.
2. GREY IRON CONFORMS TO ASTM A-48, CLASS 35B. MEETS H-20 WHEEL LOAD.

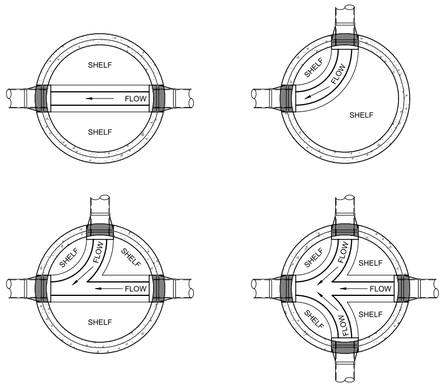
SEWER MANHOLE FRAME AND COVER DETAIL
NOT TO SCALE



NOTE

INVERT IN ANGLES LESS THAN 90° OR GREATER THAN 270° ARE PROHIBITED

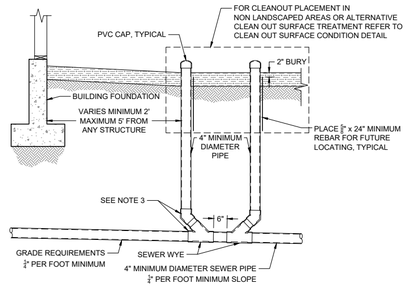
MANHOLE ANGLE MEASUREMENT METHOD



NOTE

1. SLOPE ALL SHELVES TO CHANNEL AT 1" PER FOOT.
2. SLOPE OF CHANNEL SHALL BE 0.1' ACROSS MANHOLE FOR ALL MAIN RUNS. SEE PROFILE SHEETS.
3. MANHOLE INVERTS SHALL MATCH INFLOW AND OUTFLOW PIPE INVERTS
4. 4" SERVICE PIPES ENTERING MANHOLES SHALL HAVE CROWN OF 4" PIPE MATCH CROWN OF MAIN WHERE INVERTS INDICATE.

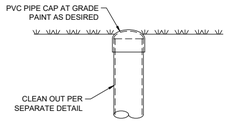
TYPICAL MANHOLE CHANNEL DETAILS
NOT TO SCALE



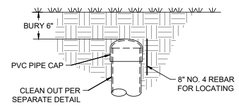
NOTE

1. PRIOR TO BACKFILLING THE TOWN PUBLIC WORKS DEPARTMENT MUST INSPECT ALL PIPE, FITTINGS, COUPLINGS, GRADE AND COMPLETE LEAK TESTING.
2. INSTALL AND COMPACT ALL BACKFILL MATERIAL PER TOWN PUBLIC WORKS DEPARTMENT STANDARD SPECIFICATIONS AND AS SHOWN WITHIN THE TRENCH DETAIL.
3. ALL PVC FITTINGS SHALL MEET ASTM D3034 SPECIFICATIONS, AND SHALL ALSO MEET ASTM D312 SPECIFICATIONS FOR RUBBER GASKETED BELL AND SPIGOT TYPE WITH INTEGRAL BELL.

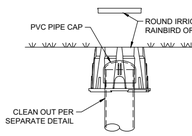
BUILDING CLEANOUT DETAIL
NOT TO SCALE REV TOJ SS-114



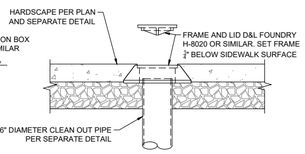
DAYLIGHT IN LANDSCAPE AREA



BURIED IN LANDSCAPE AREA



IRRIGATION BOX IN LANDSCAPE AREA



HARDSCAPE AREA

CLEAN OUT SURFACE CONDITION DETAIL
NOT TO SCALE

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NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

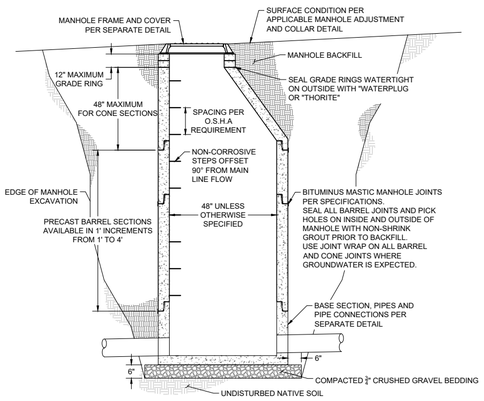
Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

23072	Project No.
SS	Drawn By
JL	Checked By

Discipline & Drawing Number
C3.2

Drawing Name
SEWER DETAILS

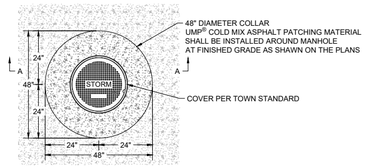


NOTE

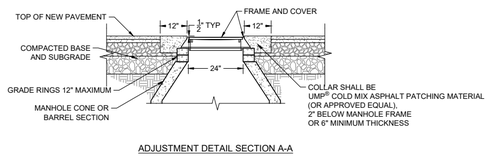
1. REINFORCEMENT FOR PRECAST SECTIONS SHALL BE AS PER ASTM C-478.
2. C.I. RING AND COVER HS-20-44 ONE VENT HOLE OR AS SHOWN ON PLAN SHEET.
3. MOUND CRUSHED GRAVEL BASE AROUND TOP OF MANHOLE AT ROAD SURFACING LOCATIONS.
4. ALL SEWER MANHOLE BASES, BARRELS, AND CONES SHALL BE VACUUM TESTED.

STANDARD MANHOLE CONSTRUCTION DETAIL

NOT TO SCALE



COVER AND COLLAR PLAN



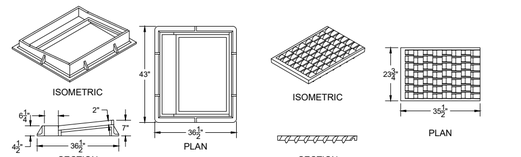
ADJUSTMENT DETAIL SECTION A-A

NOTE

1. ADJUST MANHOLE UPWARD WITH ADJUSTING RINGS UNDER FRAME. ADJUST MANHOLE DOWNWARD BY REMOVING A PORTION OF THE MANHOLE RISER AND REBUILDING TO PROPER HEIGHT. SLOPE MANHOLE RING AS REQUIRED TO MATCH STREET GRADE AND CROSS SLOPE. MAKE FINAL MANHOLE ADJUSTMENT AFTER PAVING AND BEFORE SEAL COATING.
2. IF SEWER MANHOLE IS WITHIN UNPAVED AREA USE TAPERED COLLAR. SEE TOWN SANITARY SEWER DETAIL SS-110.

MANHOLE ADJUSTMENT & COLLAR IN ASPHALT

NOT TO SCALE TOJ STM-103

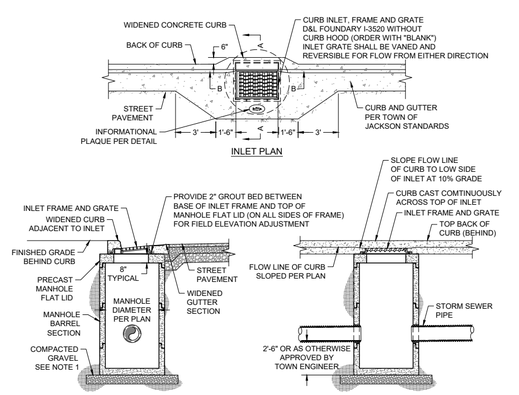


NOTE

1. INLET GRATE AND FRAME SHALL BE MODEL NOUMBER I-3520 AS MANUFACTURED BY D&L SUPPLY OF LINDON UTAH, OR APPROVED EQUAL.
2. INLET GRATE SHALL BE VANED AND REVERSIBLE FOR EITHER LEFT-TO-RIGHT OR RIGHT-TO-LEFT FLOW.
3. PLAQUE SHALL BE SUBSTANTIALLY AS SHOWN, AS SUPPLIED BY D&L SUPPLY OF LINDON, UTAH, OR APPROVED EQUAL.

INLET FRAME, GRATE, LID AND PLAQUE DETAIL

NOT TO SCALE



NOTE

1. GRAVEL SHALL BE EIGHT INCH MINIMUM THICKNESS, CONFORM TO WPWSS SECTION 02190, PART 2.03, GRADING H, AND BE INSTALLED PER WPWSS SECTION 02231, PART 3.03.

CURB INLET WITHOUT HOOD DETAIL

NOT TO SCALE REVISED TOJ STM-101

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NO.	ISSUED DATE	ISSUED FOR
1	2024-10-29	DEVELOPMENT PLAN REVIEW
	2025-03-24	DEVELOPMENT PLAN REVISION

PROFESSIONAL SEAL

Project
SNOW KING LOOP CONDOMINIUMS

553, 725, & 510 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

23072	Project No.
SS	Drawn By
JL	Checked By

Discipline & Drawing Number

C3.3

Drawing Name

STORMWATER DETAILS

LOVE RIDGE CONDOS

EXISTING SIDEWALK

EXISTING RETAINING WALL- SEE CIVIL/ ARCH

RETAINING WALL- SEE CIVIL

PROPERTY BOUNDARY

EXTERIOR STAIRS- SEE CIVIL/ ARCH

RAISED PLANTER OVER STRUCTURE

EXTERIOR DECK- SEE ARCH

COBBLE OVER STRUCTURE- SEE ARCH

LOT 53

EXTERIOR SITE LIGHTING-
SEE SHEET L3.00, TYP.

RAISED PLANTER OVER STRUCTURE

2
L6.0

16
L6.0
TYP. OF 2

16
L6.0
TYP. OF 5

TRANSFORMER

TRANSFORMER-
SEE CIVIL/ ARCH

BENCH

RAISED PLANTER OVER STRUCTURE

SITE WALL- SEE CIVIL/ ARCH

HANDRAIL TO MATCH ARCH

EXTERIOR STAIRS- SEE CIVIL/ ARCH

RAISED PLANTER OVER STRUCTURE

SITE WALL- SEE CIVIL/ ARCH

CROSSWALK- SEE CIVIL

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

DETAIL REPORT

NUMBER	TITLE
1/L6.0	MORTAR-SET CONCRETE PAVERS
2/L6.0	MORTAR-SET CONCRETE PAVERS W/SNOWMELT
3/L6.0	MORTAR-SET PAVERS
4/L6.0	MORTAR-SET PAVERS W/ SNOWMELT
5/L6.0	PED SLAB TURNDOWN - TYP REINFORCEMENT
6/L6.0	PATH LIGHT IN MORTAR-SET PAVERS
7/L6.0	MORTAR-SET STONE ENTRY - FLUSH CONDITION
8/L6.0	PAVERS / PAVERS W/ SNOWMELT
9/L6.0	EXPANSION JOINT
10/L6.0	MORTAR-SET PAVER ENTRY - FLUSH CONDITION
11/L6.0	CONIFEROUS TREE PLANTING
12/L6.0	SHRUB PLANTING
13/L6.0	ORNAMENTAL GRASS / PERENNIAL PLANTING
14/L6.0	MEADOW SOD
15/L6.0	DECIDUOUS TREE PLANTING
16/L6.0	INVERTED U-STYLE BIKE RACK
17/L6.0	RECESSED WALL LIGHT
18/L6.0	COBBLE MULCH

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NO.	ISSUED DATE	ISSUED FOR
	10/29/2024	DEVELOPMENT PLAN
	03/24/2025	DEVELOPMENT PLAN REVISION

Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

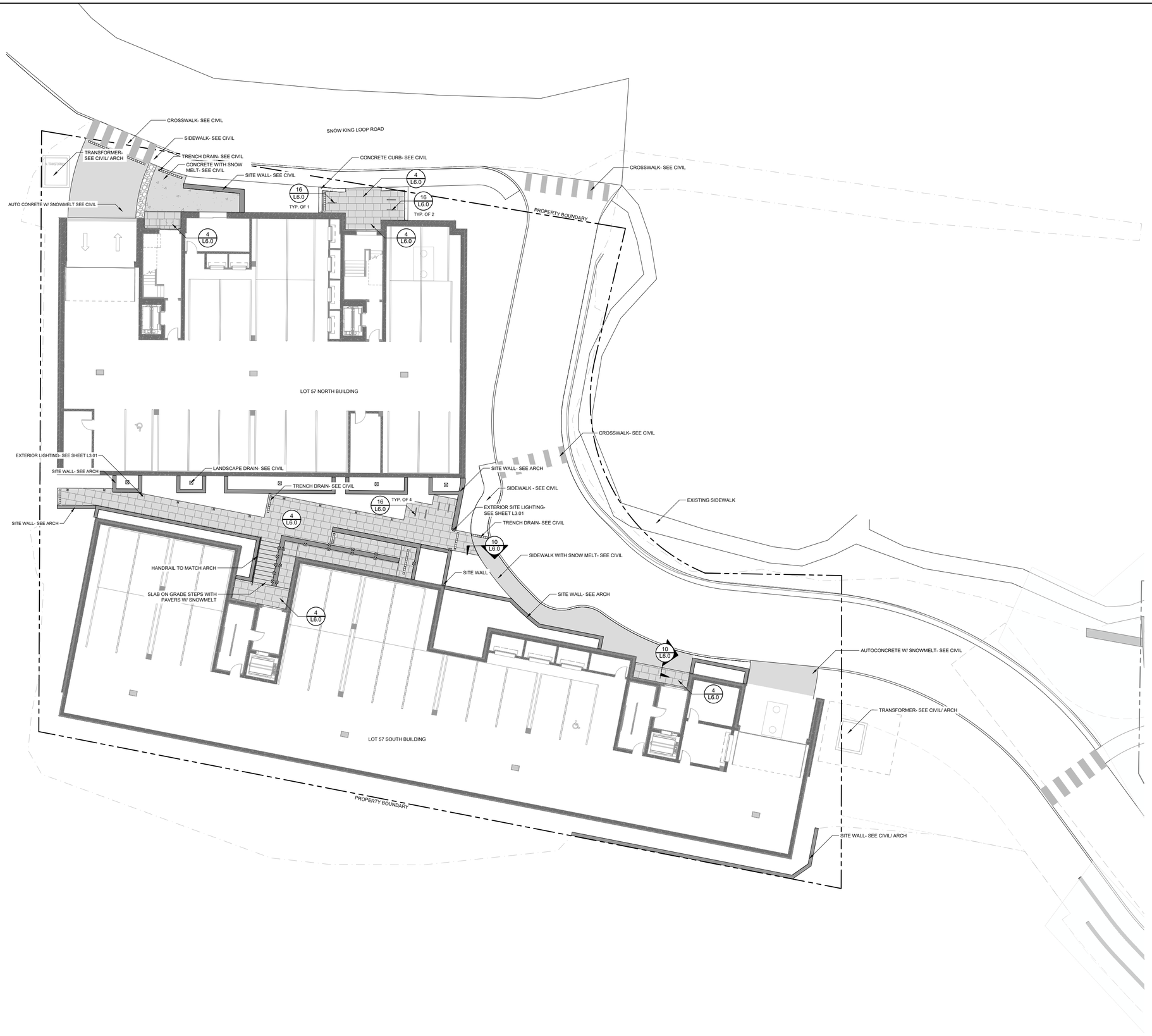
Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number

LOT 53
MATERIALS PLAN

Drawing Name

L2.00



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

DETAIL REPORT

NUMBER	TITLE
1/L6.0	MORTAR-SET CONCRETE PAVERS
2/L6.0	MORTAR-SET CONCRETE PAVERS W/SNOWMELT
3/L6.0	MORTAR-SET PAVERS
4/L6.0	MORTAR-SET PAVERS W/ SNOWMELT
5/L6.0	PED SLAB TURNDOWN - TYP REINFORCEMENT
6/L6.0	PATH LIGHT IN MORTAR-SET PAVERS
7/L6.0	MORTAR-SET STONE ENTRY - FLUSH CONDITION
8/L6.0	PAVERS / PAVERS W/ SNOWMELT
9/L6.0	EXPANSION JOINT
10/L6.0	MORTAR-SET PAVER ENTRY - FLUSH CONDITION
11/L6.0	CONIFEROUS TREE PLANTING
12/L6.0	SHRUB PLANTING
13/L6.0	ORNAMENTAL GRASS / PERENNIAL PLANTING
14/L6.0	MEADOW SOD
15/L6.0	DECIDUOUS TREE PLANTING
16/L6.0	INVERTED U-STYLE BIKE RACK
17/L6.0	RECESSED WALL LIGHT
18/L6.0	COBBLE MULCH

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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NO.	ISSUED DATE	ISSUED FOR
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	03/24/2025	DEVELOPMENT PLAN REVISION

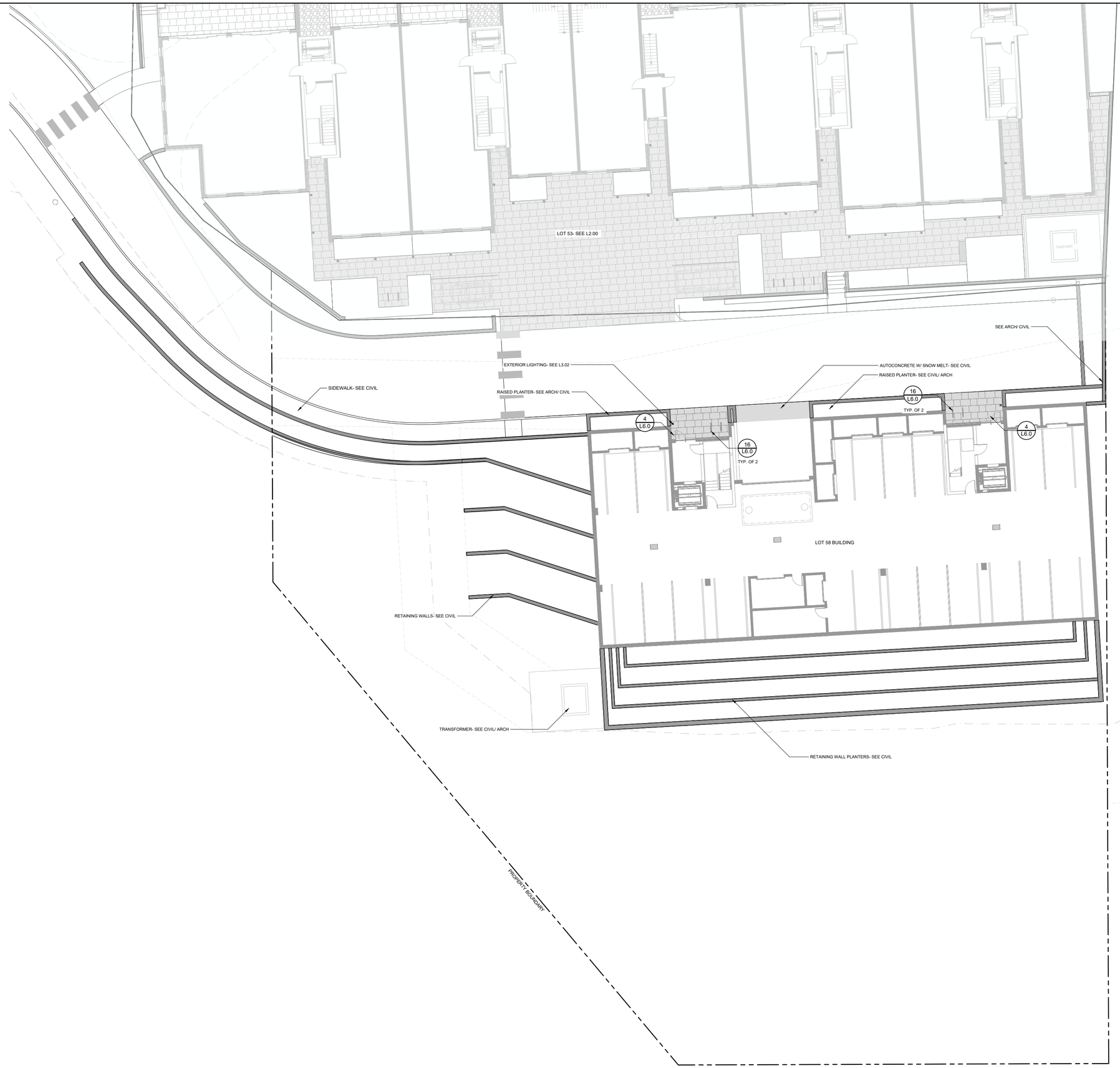
Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number
LOT 57
MATERIALS PLAN

Drawing Name
L2.01



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

DETAIL REPORT

NUMBER	TITLE
1/L6.0	MORTAR-SET CONCRETE PAVERS
2/L6.0	MORTAR-SET CONCRETE PAVERS W/SNOWMELT
3/L6.0	MORTAR-SET PAVERS
4/L6.0	MORTAR-SET PAVERS W/ SNOWMELT
5/L6.0	PED SLAB TURNDOWN - TYP REINFORCEMENT
6/L6.0	PATH LIGHT IN MORTAR-SET PAVERS
7/L6.0	MORTAR-SET STONE ENTRY - FLUSH CONDITION
8/L6.0	PAVERS / PAVERS W/ SNOWMELT
9/L6.0	EXPANSION JOINT
10/L6.0	MORTAR-SET PAVER ENTRY - FLUSH CONDITION
11/L6.0	CONIFEROUS TREE PLANTING
12/L6.0	SHRUB PLANTING
13/L6.0	ORNAMENTAL GRASS / PERENNIAL PLANTING
14/L6.0	MEADOW SOD
15/L6.0	DECIDUOUS TREE PLANTING
16/L6.0	INVERTED U-STYLE BIKE RACK
17/L6.0	RECESSED WALL LIGHT
18/L6.0	COBBLE MULCH

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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NO.	ISSUED DATE	ISSUED FOR
	10/29/2024	DEVELOPMENT PLAN
	03/24/2025	DEVELOPMENT PLAN REVISION

Project
SNOW KING LOOP

563 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

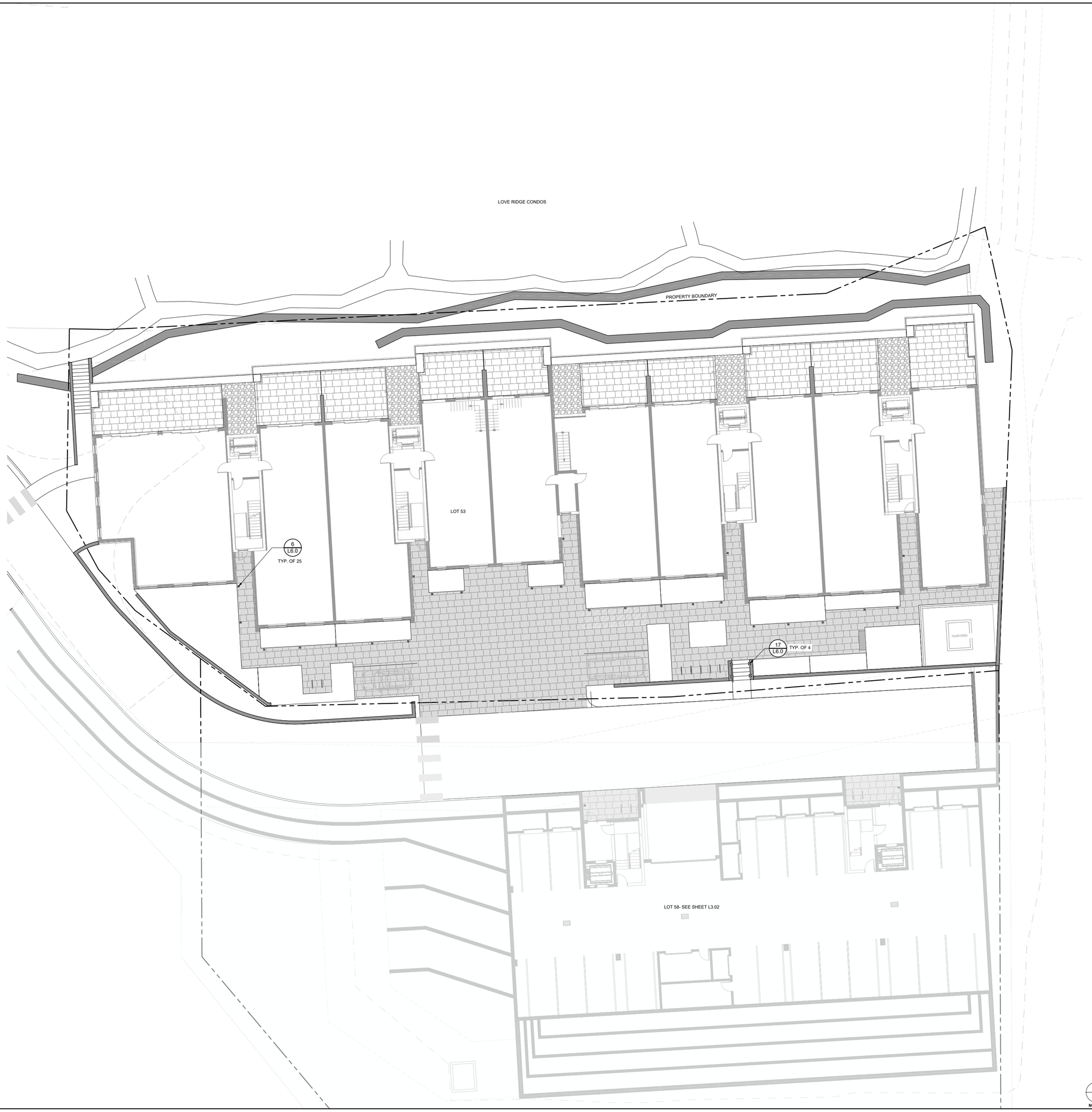
Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number

LOT 58 MATERIALS PLAN

Drawing Name

L2.02



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

SITE LIGHTING SCHEDULE

		QTY	LIGHT COLOR	DETAIL
	BK LIGHTING MINI-MICRO DRIVESTAR (EXACT MODEL, COLOR, FINISH TBD)	25	2700k	6 / L6.0
	BEGA B24202 LED 2.9W (EXACT MODEL, COLOR, FINISH TBD)	18	2700k	17 / L6.0

NOTES:
1. Light symbols are not to scale.
2. See Architecture and Electrical drawings for all circuitry/control/conduit, etc. and ALL exterior lighting associated with the building.

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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NO.	ISSUED DATE	ISSUED FOR
	10/29/2024	DEVELOPMENT PLAN
	03/24/2025	DEVELOPMENT PLAN REVISION

Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.
Drawn By LN
Checked By MK

Discipline & Drawing Number LOT 53
EXTERIOR SITE LIGHTING PLAN

Drawing Name
L3.00



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

SITE LIGHTING SCHEDULE

		QTY	LIGHT COLOR	DETAIL
	BK LIGHTING MINI-MICRO DRIVESTAR PATHWAY LIGHT (EXACT MODEL, COLOR, FINISH TBD)	10	2700k	6 / L6.0
	BEGA B24202 LED 2.9W (EXACT MODEL, COLOR, FINISH TBD)	18	2700k	17 / L6.0

NOTES:
1. Light symbols are not to scale.
2. See Architecture and Electrical drawings for all circuitry/control/conduit, etc. and ALL exterior lighting associated with the building.

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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	03/24/2025	DEVELOPMENT PLAN REVISION

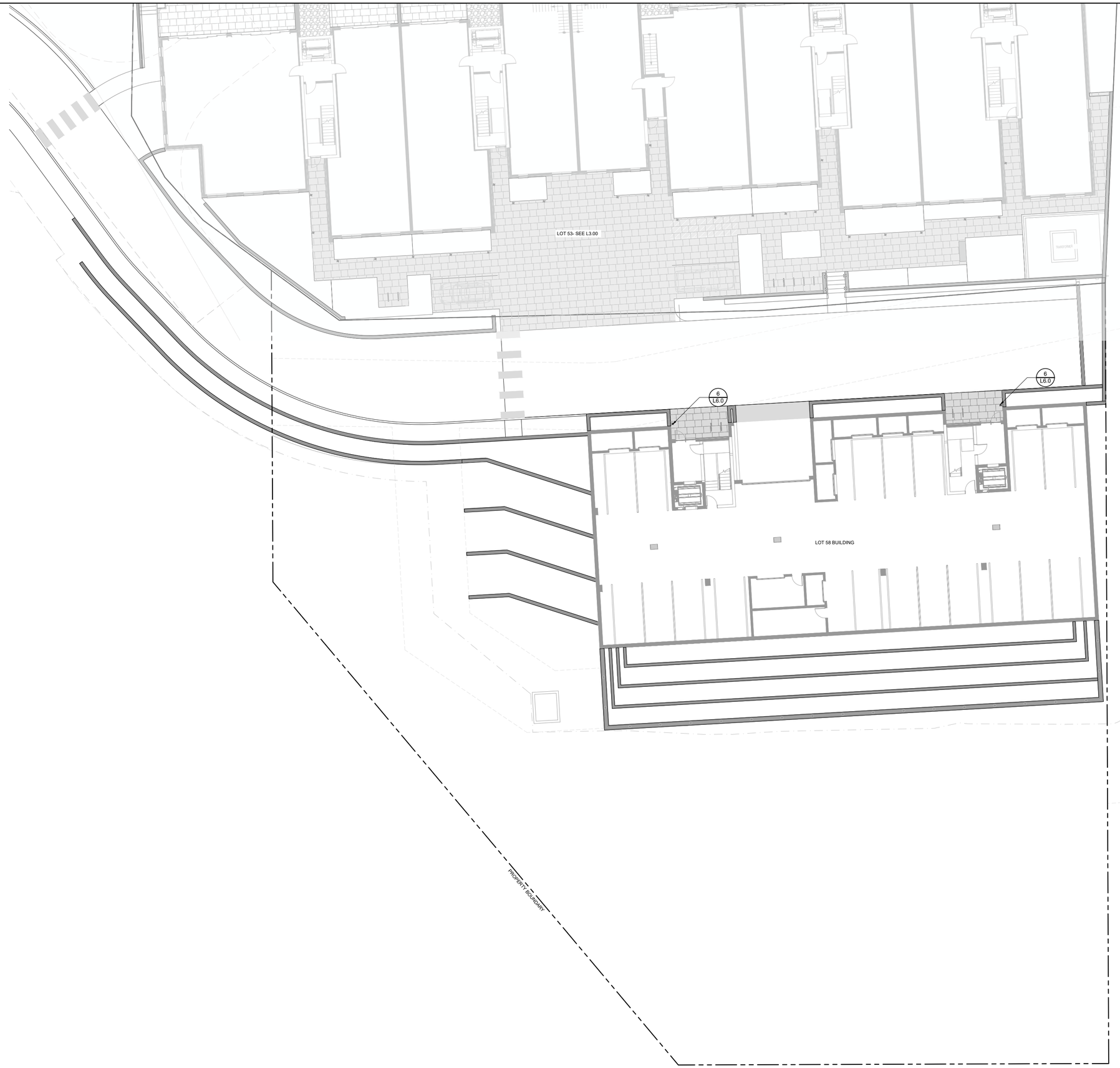
Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number L3.01

Drawing Name
LOT 57
EXTERIOR SITE
LIGHTING PLAN



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

SITE LIGHTING SCHEDULE

	QTY	LIGHT COLOR	DETAIL
BK LIGHTING MINI-MICRO DRIVESTAR (EXACT MODEL, COLOR, FINISH TBD)	2	2700k	6 / L6.0

NOTES:
1. Light symbols are not to scale.
2. See Architecture and Electrical drawings for all circuitry/control/conduit, etc. and ALL exterior lighting associated with the building.

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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NO.	ISSUED DATE	ISSUED FOR
	10/29/2024	DEVELOPMENT PLAN
	03/24/2025	DEVELOPMENT PLAN REVISION

Project
SNOW KING LOOP

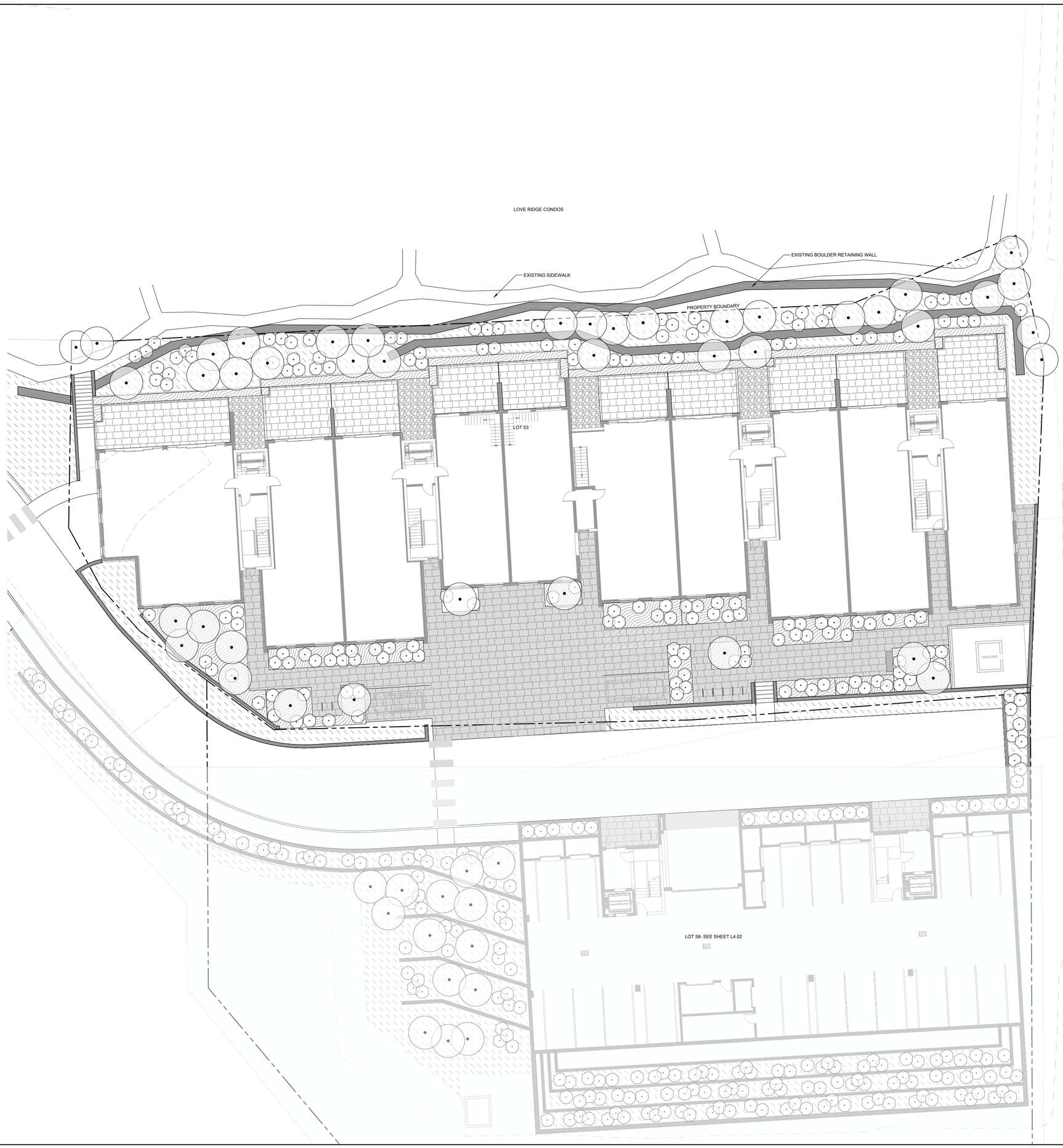
563 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number: LOT 58

Drawing Name: EXTERIOR SITE LIGHTING PLAN

L3.02



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

PLANT SCHEDULE- LOT 53

TREES:

	NAME	SIZE	CONT.	QTY
	Quaking Aspen/ Populous tremuloides	3" Cal. 3.5" Cal.	B&B B&B	30 19

SHRUBS:

	Native Shrubs- species TBD	5-6' H	B&B	146

GROUND COVERS:

Native Meadow Sod	SOD	3,060 SF
Perennials and ornamental grasses - Species TBD	1 gal 18" OC	1,245

BIKE PARKING SUMMARY - LOT 53

Required Short-Term Bike Parking Spaces, Lot 53: 14 spaces (4 must accommodate Cargo Bikes)
Proposed Short-Term Bike Parking Spaces, Lot 53: 14 spaces (4 accommodate Cargo Bikes)

LSR SUMMARY - LOT 53

Required LSR, Lot 53: 3,441 SF (34,412 SF x .1)
Proposed LSR, Lot 53: 7,245 SF
Proposed LSR Ratio, Lot 53: 2

PLANTING & IRRIGATION NOTES

1. Refer to Civil Engineer's utility and grading plans. If site conditions vary from what is shown, contact the Landscape Architect and Civil Engineer for direction before proceeding.
2. Verify locations and timing of site improvements installed under other sections. If any part of the work cannot be completed due to site conditions, contact the Landscape Architect for direction before proceeding.
3. Excavation near underground utilities shall be done carefully and, if necessary, by hand. The Contractor is fully responsible for this work and any disruption to utilities or damage to the site and/or improvements shall be repaired immediately at no expense to the Owner.
4. Obtain approval of finish grading from Landscape Architect prior to installing any plant material. The finish grades of planting areas and lawns shall be 1½ inches below adjacent edging or paving. Confirm mulch depth and whether lawns are to be seed or sod.
5. Confirm all plant counts and square footages. Quantities shown are provided as Owner information only. If quantities indicated in the plant list differ from symbols shown on the plans, then the plans shall govern the plant count.
6. Contractor to verify suitability of native or imported topsoil. Suitable topsoil shall be free of roots, plants, sod, stones greater than ½" in any dimension, clay lumps, and other extraneous materials detrimental to plant growth.
7. For areas to receive sod or seed and/or to produce planting soil for areas indicated on details, amend suitable topsoil with organic compost to a ratio of 1 part compost to 4 parts topsoil by volume.
8. Compost shall be organic, well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8.0; moisture content 35 to 55 percent by weight, with organic matter content 50 to 60 percent of dry weight with 16-16-8 nutrient composition. If compost is not 16-16-8 composition, add commercial fertilizer in necessary quantities to meet 16-16-8 nutrient composition. Source: Glacier Gold Compost or approved equal.
9. Contractor to supplement existing native surface topsoil as necessary. Obtain supplemental topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep. Do not obtain from agricultural lands, bogs, or marshes.
10. Compost mulch shall be organic, well-composted, stable, and weed-free organic matter, pH range of 5.5-8.0; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not to exceed 0.5 percent inert contaminants and free of substances toxic to planting; organic matter content 50 to 60 percent of dry weight. Source: Glacier Gold Compost or approved equal.
11. The Landscape Architect shall review all plant materials at the source or nursery or by photographs provided by Contractor prior to shipment. The Landscape Architect reserves the right to reject any unacceptable plant material either at the source or when delivered to the project site.
12. Carefully align and space plant materials as indicated in these notes, drawings, and details. The final location of plant materials is to be approved by the Landscape Architect on site prior to installation. The Contractor is responsible for staking or marking the location of all plant materials on site for review by the Landscape Architect. The Landscape Architect reserves the right to adjust the exact locations of plants on site.
13. All plants shall be planted at the same level with relation to finish grade as they were grown in the field or nursery.
14. All plant material shall be irrigated by a pressurized subsurface irrigation system with automatic controller. All trees, shrubs, and perennials shall be drip irrigated and all turf areas shall be irrigated with a spray or rotor system. Irrigation system shall be design-build by Contractor. Contractor shall provide an irrigation shop-drawing for review by Landscape Architect before proceeding. Contractor shall demonstrate full system coverage prior to acceptance and before plant material installation. Contractor shall provide a reproducible as-built drawing of installed irrigation system at conclusion of project.
15. The irrigation system shall be operational prior to plant installation or temporary irrigation measures shall be provided in the interim. The method of temporary irrigation shall be approved by the Landscape Architect prior to plant material installation.
16. No pruning of existing or newly planted trees or shrubs shall be allowed without the direction and approval of the Landscape Architect.
17. For ball & burlap trees, remove burlap from top 1/3 of rootball and entire wire basket as tree pits are backfilled.
18. All installed trees shall be staked. The Landscape Architect shall review and reserves the right to reject the method and/or installation of tree staking and guying systems prior to acceptance.
19. During construction and prior to final acceptance, Contractor shall observe the project site for the growth of noxious weeds. Contractor shall report the growth of noxious weeds to the Teton County Weed and Pest District Office. Contractor and Owner shall implement a weed control program to control noxious weeds.
20. All disturbed areas not receiving other planting treatment shall be seeded with specified or subdivision-specific seed mix.
21. Apply 16-16-8 fertilizer at the rate of 15 lbs per 1,000 SF and till into top 4" of areas to receive sod or seed.
22. Planting period for seed and sod shall be immediately after finish grading and irrigation installation are accepted but no later than September 30 for sod. Seed shall be installed after September 30 or no later than June 1.
23. Final sod and seed quantities shall be calculated by Contractor based on sod perimeter marked in field by Landscape Architect, and all remaining areas of disturbance for seed.

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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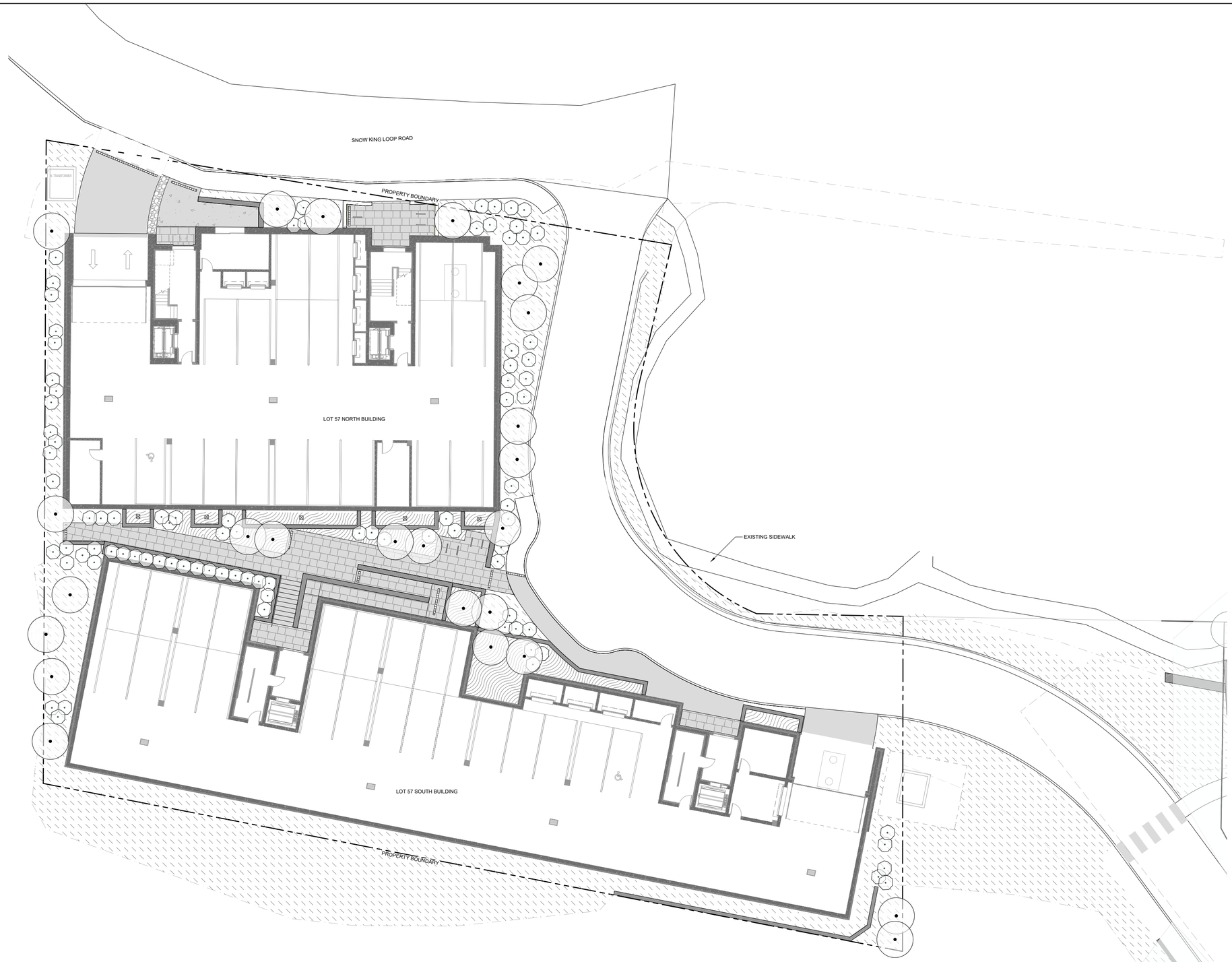
Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number
LOT 53
PLANTING PLAN

Drawing Name
L4.00



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

PLANT SCHEDULE- LOT 57

TREES:

	NAME	SIZE	CONT.	QTY
	Quaking Aspen/ Populous tremuloides	3" Cal. 3.5" Cal.	B&B B&B	14 11

SHRUBS:

	Native Shrubs- species TBD	5-6' H	B&B	94

GROUND COVERS:

	Native Meadow Sod	SOD	4,685 SF
	Perennials and ornamental grasses - Species TBD	1 gal. 18" OC	735

BIKE PARKING SUMMARY - LOT 57

Required Short-Term Bike Parking Spaces, Lot 57 North: 6 spaces (2 must accommodate Cargo Bikes)
Proposed Short-Term Bike Parking Spaces, Lot 57 North: 6 spaces (4 accommodate Cargo Bikes)

Required Short-Term Bike Parking Spaces, Lot 57 South: 7 spaces (2 must accommodate Cargo Bikes)
Proposed Short-Term Bike Parking Spaces, Lot 57 South: 8 spaces (4 accommodate Cargo Bikes)

LSR SUMMARY - LOT 57

Required LSR, Lot 57: 3,611 SF (36,115 x .1)
Proposed LSR, Lot 57: 6,925 SF
Proposed LSR Ratio, Lot 57: .19

PLANTING & IRRIGATION NOTES

1. Refer to Civil Engineer's utility and grading plans. If site conditions vary from what is shown, contact the Landscape Architect and Civil Engineer for direction before proceeding.
2. Verify locations and timing of site improvements installed under other sections. If any part of the work cannot be completed due to site conditions, contact the Landscape Architect for direction before proceeding.
3. Excavation near underground utilities shall be done carefully and, if necessary, by hand. The Contractor is fully responsible for this work and any disruption to utilities or damage to the site and/or improvements shall be repaired immediately at no expense to the Owner.
4. Obtain approval of finish grading from Landscape Architect prior to installing any plant material. The finish grades of planting areas and lawns shall be 1½ inches below adjacent edging or paving. Confirm mulch depth and whether lawns are to be seed or sod.
5. Confirm all plant counts and square footages. Quantities shown are provided as Owner information only. If quantities indicated in the plant list differ from symbols shown on the plans, then the plans shall govern the plant count.
6. Contractor to verify suitability of native or imported topsoil. Suitable topsoil shall be free of roots, plants, sod, stones greater than ½" in any dimension, clay lumps, and other extraneous materials detrimental to plant growth.
7. For areas to receive sod or seed and/or to produce planting soil for areas indicated on details, amend suitable topsoil with organic compost to a ratio of 1 part compost to 4 parts topsoil by volume.
8. Compost shall be organic, well-composted, stable, and weed-free organic matter; pH range of 5.5 to 8.0; moisture content 35 to 55 percent by weight, with organic matter content 50 to 60 percent of dry weight with 16-16-8 nutrient composition. If compost is not 16-16-8 composition, add commercial fertilizer in necessary quantities to meet 16-16-8 nutrient composition. Source: Glacier Gold Compost or approved equal.
9. Contractor to supplement existing native surface topsoil as necessary. Obtain supplemental topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep. Do not obtain from agricultural lands, bogs, or marshes.
10. Compost mulch shall be organic, well-composted, stable, and weed-free organic matter, pH range of 5.5-8.0; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not to exceed 0.5 percent inert contaminants and free of substances toxic to planting, organic matter content 50 to 60 percent of dry weight. Source: Glacier Gold Compost or approved equal.
11. The Landscape Architect shall review all plant materials at the source or nursery or by photographs provided by Contractor prior to shipment. The Landscape Architect reserves the right to reject any unacceptable plant material either at the source or when delivered to the project site.
12. Carefully align and space plant materials as indicated in these notes, drawings, and details. The final location of plant materials is to be approved by the Landscape Architect on site prior to installation. The Contractor is responsible for staking or marking the location of all plant materials on site for review by the Landscape Architect. The Landscape Architect reserves the right to adjust the exact locations of plants on site.
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18. All installed trees shall be staked. The Landscape Architect shall review and reserves the right to reject the method and/or installation of tree staking and guying systems prior to acceptance.
19. During construction and prior to final acceptance, Contractor shall observe the project site for the growth of noxious weeds. Contractor shall report the growth of noxious weeds to the Teton County Weed and Pest District Office. Contractor and Owner shall implement a weed control program to control noxious weeds.
20. All disturbed areas not receiving other planting treatment shall be seeded with specified or subdivision-specific seed mix.
21. Apply 16-16-8 fertilizer at the rate of 15 lbs per 1,000 SF and till into top 4" of areas to receive sod or seed.
22. Planting period for seed and sod shall be immediately after finish grading and irrigation installation are accepted but no later than September 30 for sod. Seed shall be installed after September 30 or no later than June 1.
23. Final sod and seed quantities shall be calculated by Contractor based on sod perimeter marked in field by Landscape Architect, and all remaining areas of disturbance for seed.

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

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NO.	ISSUED DATE	ISSUED FOR
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	03/24/2025	DEVELOPMENT PLAN REVISION

Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

	Project No.	
	Drawn By	LN
	Checked By	MK

Discipline & Drawing Number
LOT 57
PLANTING PLAN

Drawing Name
L4.01



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

PLANT SCHEDULE- LOT 58

TREES:

NAME	SIZE	CONT.	QTY
Quaking Aspen/ Populous tremuloides	3" Cal.	B&B	7
	3.5" Cal.	B&B	7

SHRUBS:

Native Shrubs- species TBD	5-6' H	B&B	165

GROUND COVERS:

Native Meadow Sod		SOD	4,330 SF

BIKE PARKING SUMMARY - LOT 58

Required Short-Term Bike Parking Spaces: 6 spaces (2 must accommodate Cargo Bikes)
Proposed Short-Term Bike Parking Spaces: 8 spaces (8 accommodate Cargo Bikes)

LSR SUMMARY - LOT 58

Required LSR, Lot 58: 4,792 SF (47,916 x .1)
Proposed LSR, Lot 58: 27,401SF
Proposed LSR Ratio, Lot 58: .57

PLANTING & IRRIGATION NOTES

1. Refer to Civil Engineer's utility and grading plans. If site conditions vary from what is shown, contact the Landscape Architect and Civil Engineer for direction before proceeding.
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19. During construction and prior to final acceptance, Contractor shall observe the project site for the growth of noxious weeds. Contractor shall report the growth of noxious weeds to the Teton County Weed and Pest District Office. Contractor and Owner shall implement a weed control program to control noxious weeds.
20. All disturbed areas not receiving other planting treatment shall be seeded with specified or subdivision-specific seed mix.
21. Apply 16-16-8 fertilizer at the rate of 15 lbs per 1,000 SF and till into top 4" of areas to receive sod or seed.
22. Planting period for seed and sod shall be immediately after finish grading and irrigation installation are accepted but no later than September 30 for sod. Seed shall be installed after September 30 or no later than June 1.
23. Final sod and seed quantities shall be calculated by Contractor based on sod perimeter marked in field by Landscape Architect, and all remaining areas of disturbance for seed.

NORTH
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ORIGINAL SCALE: 1"=10'

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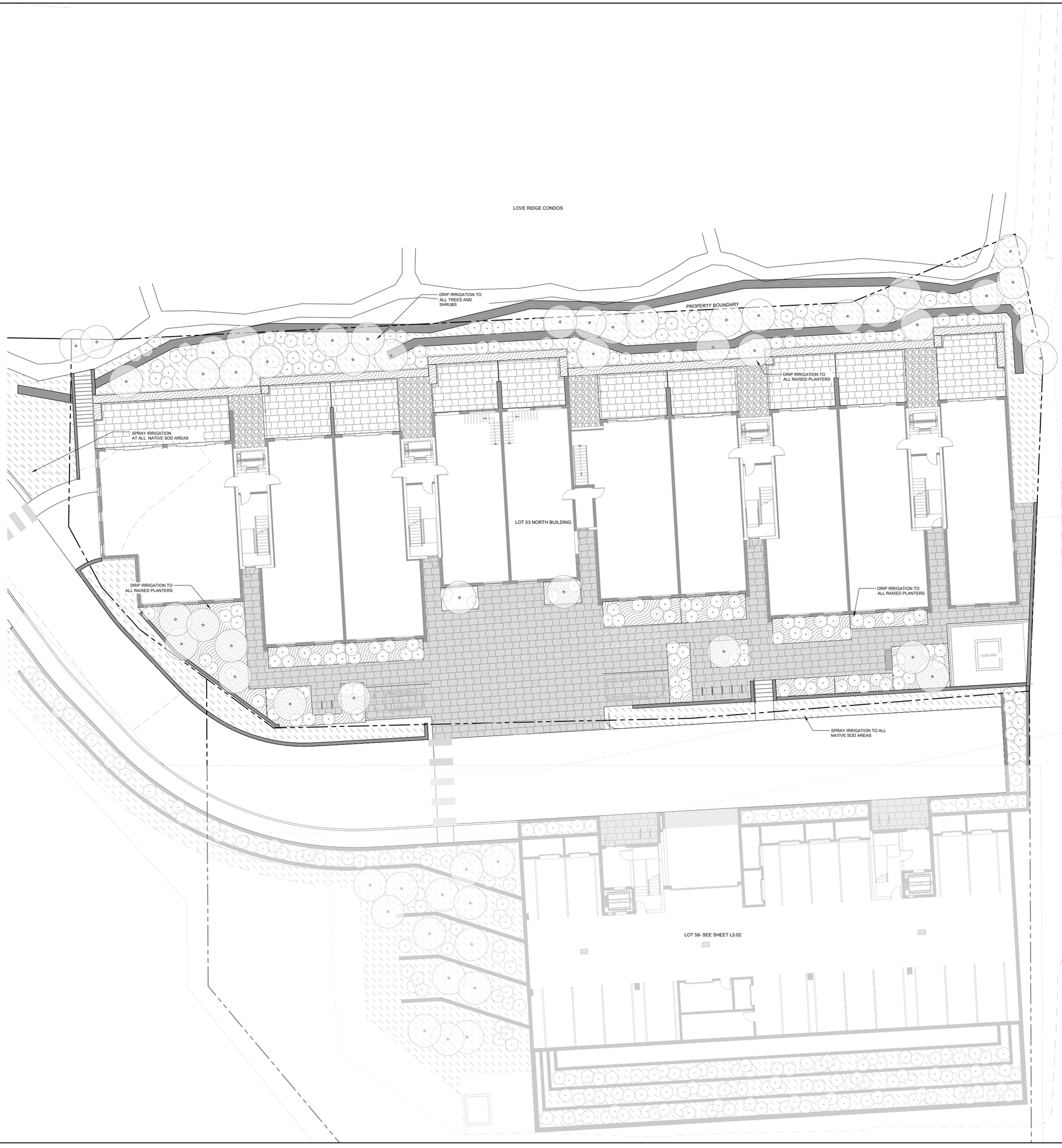
Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number
LOT 58
PLANTING PLAN

Drawing Name
L4.02



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

IRRIGATION NOTES

1. All plant material shall be irrigated by a pressurized subsurface irrigation system with automatic controller. All trees, shrubs, and perennials shall be drip irrigated and all turf areas shall be irrigated with a spray system. Irrigation system shall be design-build by Contractor based on the specifications identified on this irrigation intent plan. Contractor shall provide an irrigation shop-drawing for review by Landscape Architect before proceeding. Contractor shall demonstrate full system coverage prior to acceptance and before plant material installation. Contractor shall provide a reproducible as-built drawing of installed irrigation system at conclusion of project.
2. The irrigation system shall be operational prior to plant installation or temporary irrigation measures shall be provided in the interim. The method of temporary irrigation shall be approved by the Landscape Architect prior to plant material installation.
3. Irrigation Main Line shall be HDPE DR-11, size TBD by contractor based on required GPM and pressure.
4. Irrigation controller shall be located in the mechanical room of the building. Exact location to be determined in coordination with architect, mechanical engineer and landscape architect.
5. Point of irrigation connection and backflow preventer location to be determined in coordination with architect, mechanical engineer and landscape architect. Backflow Preventer specification TBD by landscape contractor and plumber and shall be installed by a licensed plumber and meet all local codes. If backflow preventer is located in an exterior location, an appropriate enclosure (Hot-Box or similar) shall be provided.
6. Irrigation sleeving shall be PVC Class 160 pipe.
7. Irrigation lateral lines shall be #100 NSF.
8. Irrigation spray heads within the native sod areas shall be 12" Rainbird Pop-Up Spray Heads or equal.
9. Qty (2) Netafim drip rings shall be installed at each tree location shown on the plans.
10. Irrigation valves shall be Rain Bird EFB-CO Series valves for all spray zones and Rain Bird XCZ-100-PRF for all drip zones. Utilize a two-wire decoder system for all irrigation valves. Coordinate exact locations with Landscape Architect prior to installation.
11. Install a manual drain valve at the termination of the mainline at all dead ends. Manual drain valve shall be set in a 10" round valve box and shall allow a 3/4" globe valve to be opened to allow the water in the pressurized mainline to be blown out (after water supply is shut off) through the manual drain valve. Following the main line being blown out, each lateral and drip zone can then be winterized.

NORTH

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ORIGINAL SCALE: 1"=10'

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SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

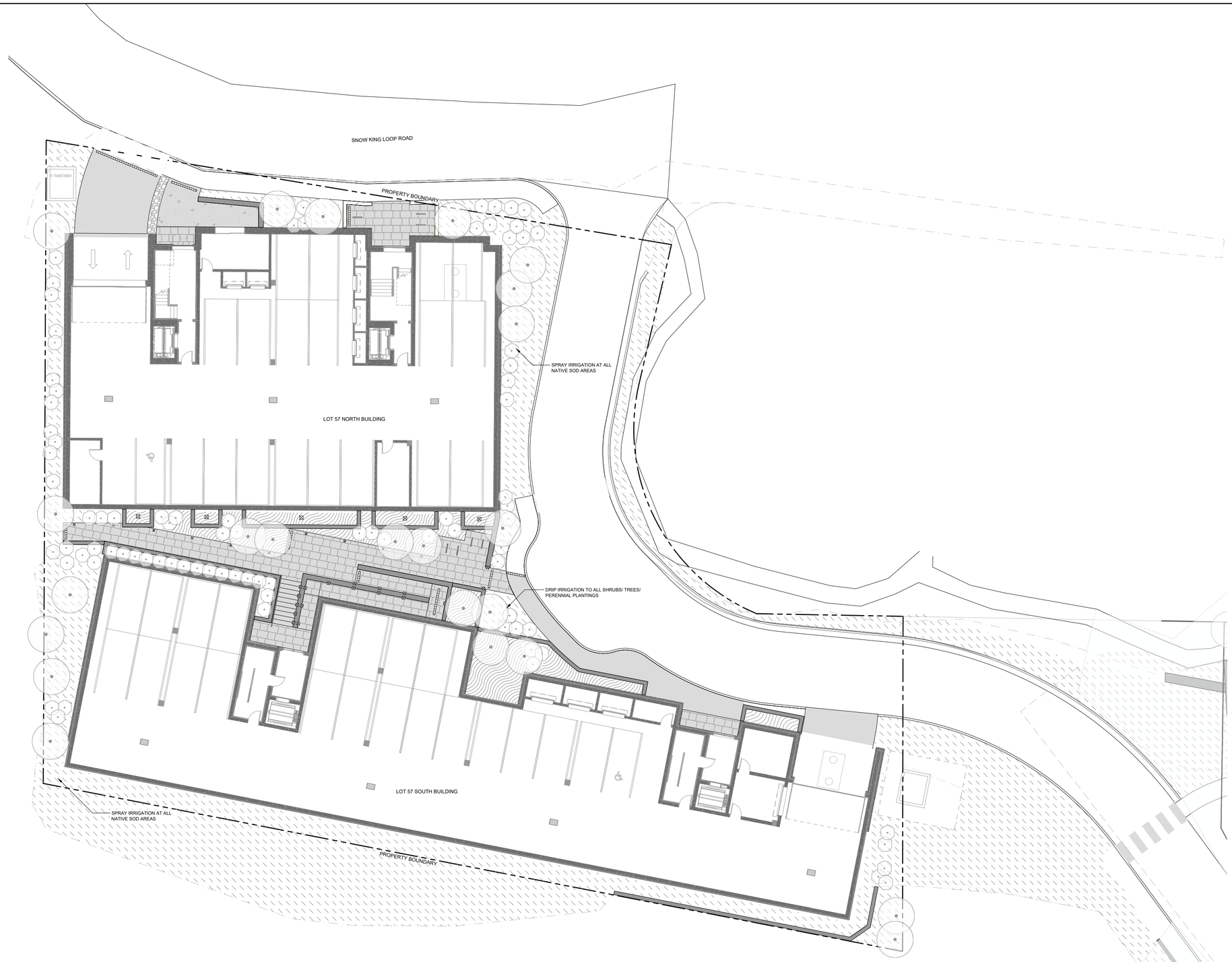
Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number

LOT 53 IRRIGATION PLAN

Drawing Name

L5.00



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
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IRRIGATION NOTES

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2. The irrigation system shall be operational prior to plant installation or temporary irrigation measures shall be provided in the interim. The method of temporary irrigation shall be approved by the Landscape Architect prior to plant material installation.
3. Irrigation Main Line shall be HDPE DR-11, size TBD by contractor based on required GPM and pressure.
4. Irrigation controller shall be located in the mechanical room of the building. Exact location to be determined in coordination with architect, mechanical engineer and landscape architect.
5. Point of irrigation connection and backflow preventer location to be determined in coordination with architect, mechanical engineer and landscape architect. Backflow Preventer specification TBD by landscape contractor and plumber and shall be installed by a licensed plumber and meet all local codes. If backflow preventer is located in an exterior location, an appropriate enclosure (Hot-Box or similar) shall be provided.
6. Irrigation sleeving shall be PVC Class 160 pipe.
7. Irrigation lateral lines shall be #100 NSF.
8. Irrigation spray heads within the native sod areas shall be 12" Rainbird Pop-Up Spray Heads or equal.
9. Qty (2) Netafim drip rings shall be installed at each tree location shown on the plans.
10. Irrigation valves shall be Rain Bird EFB-CO Series valves for all spray zones and Rain Bird XCZ-100-PRF for all drip zones. Utilize a two-wire decoder system for all irrigation valves. Coordinate exact locations with Landscape Architect prior to installation.
11. Install a manual drain valve at the termination of the mainline at all dead ends. Manual drain valve shall be set in a 10" round valve box and shall allow a $\frac{3}{4}$" globe valve to be opened to allow the water in the pressurized mainline to be blown out (after water supply is shut off) through the manual drain valve. Following the main line being blown out, each lateral and drip zone can then be winterized.

NORTH

0 5 10 20
ORIGINAL SCALE: 1"=10'

1512 N. Throop Street
T 312-440-9550
Chicago, Illinois 60642
F 312-440-9851
www.nwks.com

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HDLA
560 South
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307.739.1001
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NO.	ISSUED DATE	ISSUED FOR
	10/29/2024	DEVELOPMENT PLAN
	03/24/2025	DEVELOPMENT PLAN REVISION

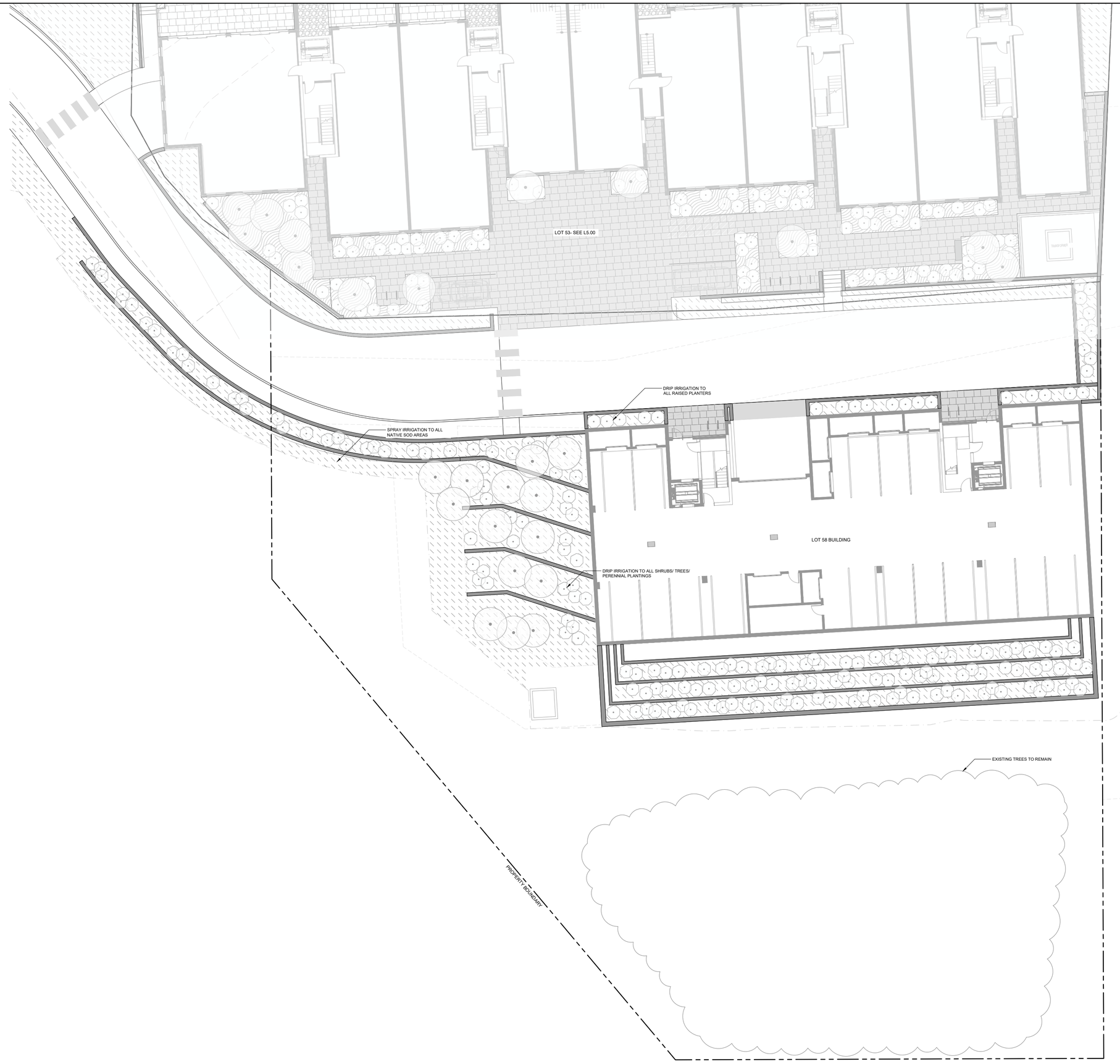
Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number
LOT 57
IRRIGATION PLAN

Drawing Name
L5.01



LEGEND

- PROPERTY BOUNDARY
- ROADWAY
- RETAINING WALL
- PAVERS
- PAVERS WITH SNOWMELT
- CONCRETE WITH SNOWMELT
- COBBLE
- STEPS
- AUTO CONCRETE
- BIKE PARKING
- EXTERIOR SITE LIGHTING
- EXTERIOR SITE DRAINAGE

IRRIGATION NOTES

1. All plant material shall be irrigated by a pressurized subsurface irrigation system with automatic controller. All trees, shrubs, and perennials shall be drip irrigated and all turf areas shall be irrigated with a spray system. Irrigation system shall be design-build by Contractor based on the specifications identified on this irrigation intent plan. Contractor shall provide an irrigation shop-drawing for review by Landscape Architect before proceeding. Contractor shall demonstrate full system coverage prior to acceptance and before plant material installation. Contractor shall provide a reproducible as-built drawing of installed irrigation system at conclusion of project.
2. The irrigation system shall be operational prior to plant installation or temporary irrigation measures shall be provided in the interim. The method of temporary irrigation shall be approved by the Landscape Architect prior to plant material installation.
3. Irrigation Main Line shall be HDPE DR-11, size TBD by contractor based on required GPM and pressure.
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NORTH

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ORIGINAL SCALE: 1"=10'

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NO.	ISSUED DATE	ISSUED FOR
	10/29/2024	DEVELOPMENT PLAN
	03/24/2025	DEVELOPMENT PLAN REVISION

Project
SNOW KING LOOP

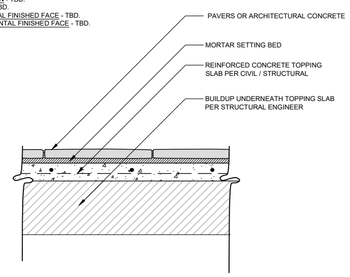
953 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number
LOT 58
IRRIGATION PLAN

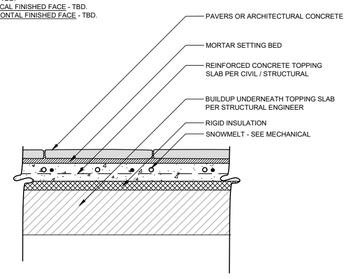
Drawing Name
L5.02

NOTES:
PAVERS - TYPE TBD.
PATTERN - TBD.
SIZE - TBD.
VERTICAL FINISHED FACE - TBD.
HORIZONTAL FINISHED FACE - TBD.



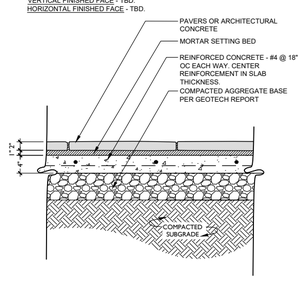
1 MORTAR-SET PAVERS OVER STRUCTURE
1" = 1'-0"

NOTES:
PAVERS - TYPE TBD.
PATTERN - TBD.
SIZE - TBD.
VERTICAL FINISHED FACE - TBD.
HORIZONTAL FINISHED FACE - TBD.



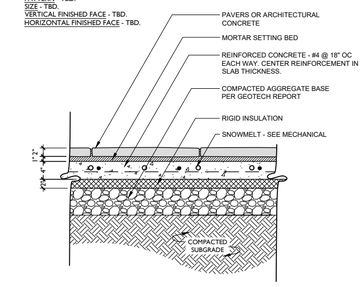
2 MORTAR-SET PAVERS W/SNOWMELT OVER STRUCTURE
1" = 1'-0"

NOTES:
PAVERS - TYPE TBD.
PATTERN - TBD.
SIZE - TBD.
VERTICAL FINISHED FACE - TBD.
HORIZONTAL FINISHED FACE - TBD.

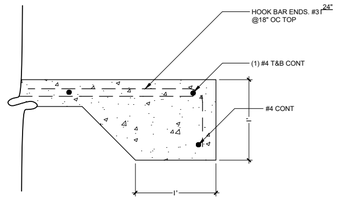


3 MORTAR-SET PAVERS
1" = 1'-0"

NOTES:
PAVERS - TYPE TBD.
PATTERN - TBD.
SIZE - TBD.
VERTICAL FINISHED FACE - TBD.
HORIZONTAL FINISHED FACE - TBD.

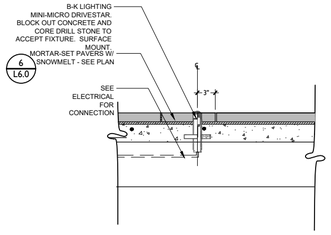


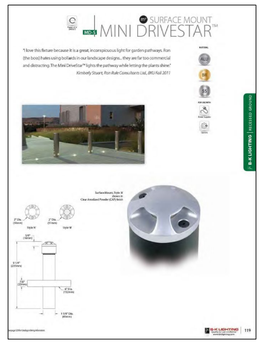
4 MORTAR-SET PAVERS W/ SNOWMELT
1" = 1'-0"



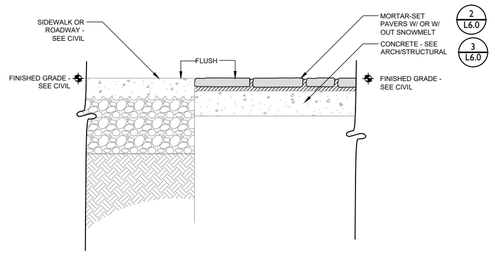
5 PED SLAB TURNDOWN - TYP REINFORCEMENT
1 1/2" = 1'-0"

NOTES:
1. CONTRACTOR TO SEE ELECTRICAL FOR ALL FIXTURE AND CONNECTION INFORMATION
2. CONTRACTOR TO FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION
3. WHEN PATH LIGHT IS INSTALLED ON A STAIR TREAD, LIGHT FIXTURE SHALL BE CENTERED IN TREAD, 3" FROM EDGE OF VERTICAL STRUCTURE.

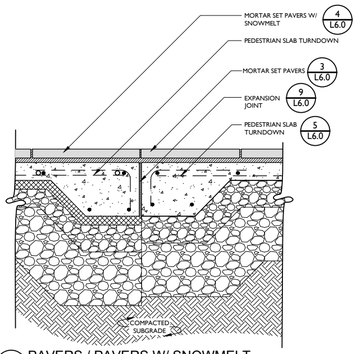




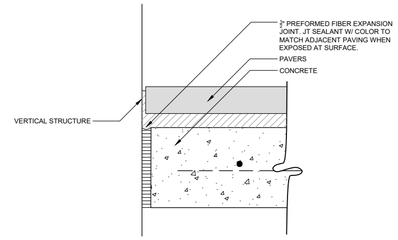
6 PATH LIGHT IN MORTAR-SET PAVERS
1" = 1'-0"



7 MORTAR-SET PAVER ENTRY ABOVE STRUCTURE - FLUSH CONDITION
1" = 1'-0"

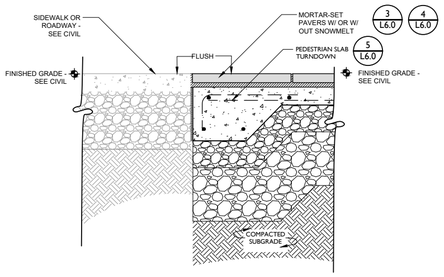


8 PAVERS / PAVERS W/ SNOWMELT
1" = 1'-0"

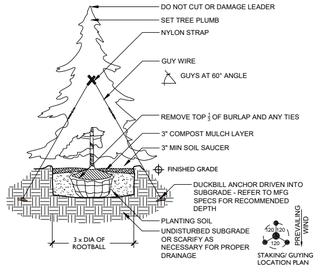


9 EXPANSION JOINT
3" = 1'-0"

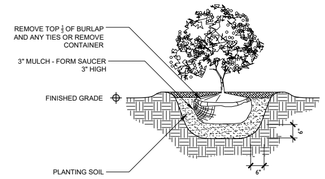
NOTE:
1. SEE CIVIL/ARCH FOR NUMBER OF RISERS AND RISER DIMENSIONS AT EACH STEP LOCATION.



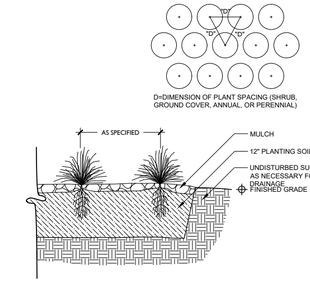
10 MORTAR-SET PAVER ENTRY - FLUSH CONDITION
1" = 1'-0"



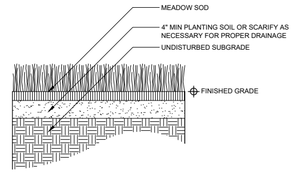
11 CONIFEROUS TREE PLANTING
1/4" = 1'-0"



12 SHRUB PLANTING
1/2" = 1'-0"

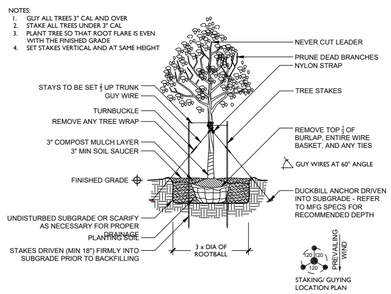


13 ORNAMENTAL GRASS / PERENNIAL PLANTING
1" = 1'-0"



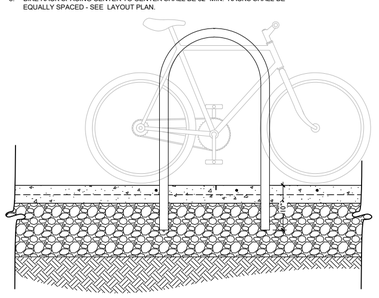
14 MEADOW SOD
1" = 1'-0"

NOTES:
1. GUY ALL TREES 3" CAL AND OVER
2. STAKE ALL TREES UNDER 3" CAL
3. PLANT TREE SO THAT ROOT FLARE IS EVEN WITH THE FINISHED GRADE
4. SET STAKES VERTICAL AND AT SAME HEIGHT

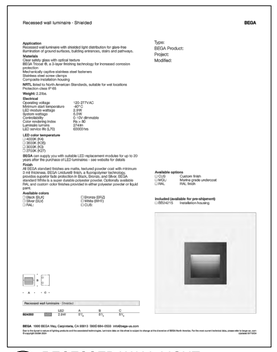


15 DECIDUOUS TREE PLANTING
1/4" = 1'-0"

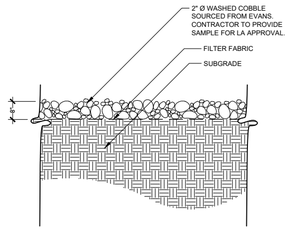
NOTES:
1. DOWNTOWN RACK BY DERO INVERTED U-STYLE BIKE RACK OR APPROVED EQUAL TO BE IN-GROUND MOUNTED PER MFG SPECS
2. FINISH AND GAUGE TBD BY CLIENT AND LANDSCAPE ARCHITECT
3. BIKE RACK SPACING CENTER TO CENTER SHALL BE 32" MIN. RACKS SHALL BE EQUALLY SPACED - SEE LAYOUT PLAN.



16 INVERTED U-STYLE BIKE RACK
1" = 1'-0"



17 RECESSED WALL LIGHT
1" = 1'-0"



18 COBBLE MULCH
1" = 1'-0"

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Project
SNOW KING LOOP

553 UPPER SNOW KING LOOP ROAD
JACKSON, WY 83001

Project No.	
Drawn By	LN
Checked By	MK

Discipline & Drawing Number
SITE DETAILS

Drawing Name
L6.00

NORTHWORKS

Construction Management Plan

Shaw Wyoming
460 South Cache
Jackson, WY 83001
TEL: 303-733-8401

SHAW CONSTRUCTION
www.shawwyoming.com

October 28, 2024

Construction Management Plan: Snow King Condos Phase 1 (Lot 57)

Project Scope:

The Snow King Condos Phase 1 will consist of 2 buildings on Lot 57 which will yield 22 market units and 5 affordable units. The Phase 1 buildings square feet total to 43,678 sf. The buildings generally include repeating floor plans with three levels of living area(s) and common stairs and elevators. Parking spaces are included in the building floor plan, with 41 total spaces including designated ADA spaces. Public utilities will include domestic water tie in, sanitary sewer tie in, and storm sewer tie-in. Electricity will be brought to the site and coordinated with Lower Valley Energy and the Town of Jackson as necessary. The estimated start of construction activities is June 1st, 2025 upon approved building permit. The total approximate project duration 36 months, finishing up in approximately June 2028. During construction of Phase 1, Lot 53 (Phase 2) will be used as construction base of operations, snow storage, laydown, and parking. A construction fence will be erected to connect all three lots for safety. This construction management and staging plan will cover and review the stages starting from Mobilization to Completion.

Phase 2 construction management and staging plan will be submitted prior to start of construction of Phase. It includes 2 additional buildings with a total of 38 market units and 7 affordable units in 67,219 sf of Lot 53 & 58.

Public Impact:

Shaw will coordinate with Town of Jackson (TOJ) to identify the properties and businesses most impacted by the construction to create an email contact list, to provide information as the project schedule and work. This list is attached at the end of this submission and includes the TOJ Engineering Division. Shaw will work to minimize any effect on adjacent properties by maintaining proactive communication including giving a minimum 48-hour notice of any closures and after-hours work. Shaw acknowledges that the right-of-way (R.O.W.) is a shared public use area and will coordinate with TOJ and neighbors for special event planning and construction activities that will encroach on the R.O.W. of the surrounding streets. Activities that will affect the Town of Jackson include domestic water tie in and the storm system connection, but impact to the neighbors should be minimal if any. During said activities best practice traffic control practices will be implanted including a well-defined drive aisle, signage at intersections and property boundaries, and personnel for the direction and control of traffic flow. Pedestrian traffic will be re-routed to the opposite side of the street when necessary. The inconvenience to pedestrian traffic should be noted as our entrance will be disrupting the sidewalk. All necessary permits will be obtained prior to any closures including a traffic control plan.

Shaw Wyoming
460 South Cache
Jackson, WY 83001
TEL: 303-733-8401

In the event that intermittent sidewalk closures are required, they will be coordinated with neighboring property owners. Please note that public safety will be best served by temporarily rerouting all pedestrians to the sidewalk on the North side of Snow King Loop Rd. The reasons for this are as follows: 1) Trucks will be entering and exiting the property at most hours of the day. 2) The North sidewalk of Snow King Loop Rd is not impacted by construction. 3) Public Safety is paramount and would not be best served by allowing foot traffic in front of the main construction entrance and exit. The Town has the authority to require modifications to the Construction Management Plan.

Construction Parking:

Contractor shall implement a clear and self-enforcing construction parking plan that does not use or encumber downtown on street and/or public parking lot parking spaces. Contractor will encourage carpooling and bus riding, and when possible, provide shuttles into the project. The site plan as designed will allow for all construction parking, deliveries and staging to the site alone. The size of the site gives ample room for all the parking required for all onsite construction personnel.

Site Logistics, General Staging Plan:

A site logistics and general staging plan is attached to this document. Throughout the entirety of the project staging and parking will be strictly maintained within the project boundary, no offsite yard needs are foreseen for Phase 1. The construction lot will contain the job office trailer, dumpsters, concrete washout, recycling, temporary toilets, and an area designated to snow storage based on the master site plan.

Due to the site steep slopes, site fences will be erected around Lot 57 and the laydown/storage area (Lot 53) separately. The construction fences will be a temporary metal fence with fabric screens. At the south edge of the property, to protect pedestrians & skiers, signage and a wood & fabric fence will be erected. The fence will be placed along the property line around the designated areas of the site, with a silt fence along the inner margin as part of the erosion control BMP's. Worker and vehicle access is minimized to one access point along Snow King Loop Rd to minimize disturbance for the businesses and residences. The vehicle entrance gates will include vehicle tracking control pads as needed and a skid steer with sweeper attachment will remain on site to maintain clean roads. Throughout all stages, trucks arriving or leaving the site will utilize the town truck route.

Construction work hours, unless by special exception, will be Monday-Friday 7AM-7PM and 8AM-5PM during weekends and holidays.

During construction, a tower crane will be utilized. The crane will not encroach on any PROW and will be installed interior to the site itself.

Shaw Wyoming
460 South Cache
Jackson, WY 83001
TEL: 303-733-8401

Parking, Street, and Alley Encroachments:

It is not anticipated that site logistics will require portions of the adjacent street travel lanes (Snow King Loop Rd) to be occupied by construction equipment or staging at different times during the project. The attached Staging Plan shows those areas that will be occupied on a continuous basis and those areas that will be occupied on an intermittent basis throughout the project.

Shaw will coordinate with Town officials and adjacent property owners to minimize the impact of these encroachment activities and to assure all Town rules and permitting procedures are properly followed. The intermittent encroachments for Utility improvements along the surrounding streets will be necessary during construction activities. All necessary permits will be obtained prior to any closures, including a traffic control plan. Site barriers shall not interfere with Town snow removal. Contractor shall be responsible for all snow removal from along the barrier after each time the town plows. Public safety will be held paramount during crane and concrete pumping activities.

Performance Bonds and Guarantees:

All required bonds, guarantees, and warranty to be provided by Owner at prior to permit release. Town to notify Owner of required amounts.

Stormwater Management:

All erosion control measures and BMPs will be implemented per plan as developed by the civil engineer, including inlet protection and perimeter controls. All stormwaters of the site will be managed in accordance to TOJ standards & will not affect TOJ stormwater systems. During any rain event, storm water monitoring and reporting will be recorded. A stabilized entrance with tracking control mats will be installed and maintained at the vehicle access point. Concrete washout location clearly defined and accessible. Temporary toilets will be properly bedded and staked. Gas, diesel, and oils will be stored in proper containment vessels. Spoils piles will be covered and staked. Final measures will be reviewed with the building or grading permit.

Snow Removal:

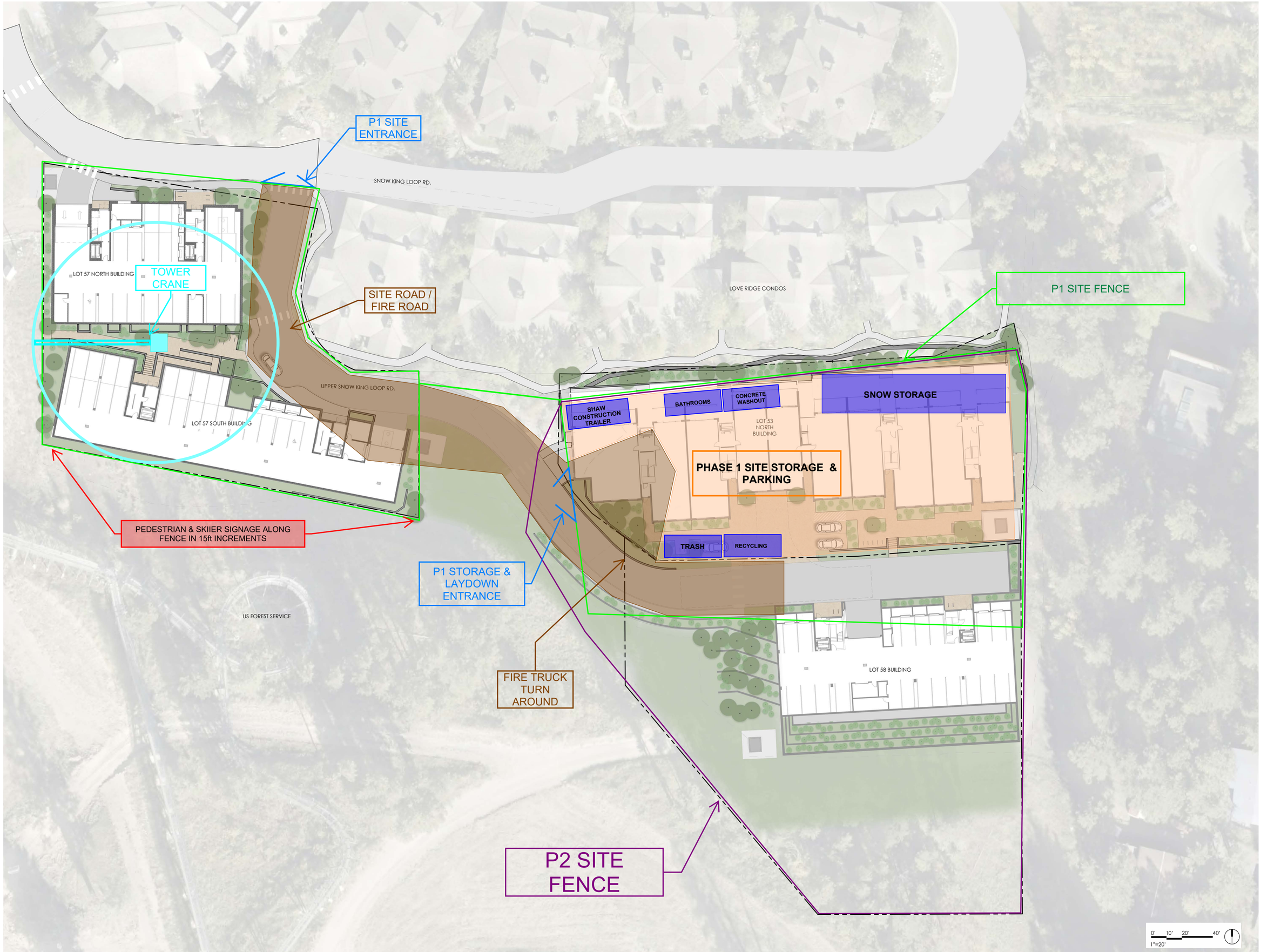
Snow removal within the property will be collected and relocated to the closest locations shown on the site logistics map. Any snow that accumulates along property margins, will be removed after city plows have been through and the snow has accumulated enough to restrict access. Shaw will have the snow removed each time the Town plows. Site barriers shall not interfere with Town snow removal.

Shaw Wyoming
460 South Cache
Jackson, WY 83001
TEL: 303-733-8401

SHAW CONSTRUCTION
www.shawwyoming.com

Neighborhood Contact List

Business Name	Contact Name	Phone	Email
Town of Jackson			townengineering@jacksonwy.gov
Grand View Lodge		(307) 734 3000	
Snow King Mountain Resort		(307) 201-5464	info@Snowkingmountain.Com
Snow King Resort & Condos		(307) 733-5200	


P1 SITE ENTRANCE
SNOW KING LOOP RD.
LOT 57 NORTH BUILDING
TOWER CRANE
SITE ROAD / FIRE ROAD
LOT 57 SOUTH BUILDING
UPPER SNOW KING LOOP RD.
LOVE RIDGE CONDOS
P1 SITE FENCE
SHAW CONSTRUCTION TRAILER
BATHROOMS
CONCRETE WASHOUT
SNOW STORAGE
LOT 53 NORTH BUILDING
PHASE 1 SITE STORAGE & PARKING
TRASH
RECYCLING
PEDESTRIAN & SKIIER SIGNAGE ALONG FENCE IN 15ft INCREMENTS
P1 STORAGE & LAYDOWN ENTRANCE
US FOREST SERVICE
FIRE TRUCK TURN AROUND
LOT 58 BUILDING
P2 SITE FENCE
0' 10' 20' 40'
1"=20'

NORTHWORKS

Engineering Report Attachments

JORGENSEN ASSOCIATES, PC
PO Box 9550
Jackson, WY 83002
307.733.5150

BY: SS & JL
Date: 2025-03-24

Average Day Occupancy Rate [1]	50%
Max Day Factor [1], MDF	2.72
Peak Hour Factor [2], PHF	4

WATER DEMAND							
a				b	c=a*b	d=MDF*c	e=d/1440 * PHF
Unit Type			No. of Units	Average gpd/unit	Average TOTAL, gpd	Maximum TOTAL, gpd	PEAK HOUR, gpm
Lot 53							
Condo	1	Bedroom	1	125	125	340	0.9
Affordable	1	Bedroom	3	125	375	1020	2.8
Condo	2	Bedroom	18	125	4500	12240	34.0
Affordable	2	Bedroom	3	125	750	2040	5.7
Condo	3	Bedroom	7	125	2625	7140	19.8
Affordable	3	Bedroom	1	125	375	1020	2.8
Condo	4	Bedroom	0	125	0	0	0.0
Subtotal Domestic Water Demand					8750	23800	66.1
Lot 58							
Condo	1	Bedroom	0	125	0	0	0.0
Condo	2	Bedroom	7	125	1750	4760	13.2
Condo	3	Bedroom	5	125	1875	5100	14.2
Condo	4	Bedroom	0	125	0	0	0.0
Subtotal Domestic Water Demand					3625	9860	27.4
Lot 57 North							
Condo	1	Bedroom	0	125	0	0	0.0
Affordable	1	Bedroom	2	125	250	680	1.9
Condo	2	Bedroom	10	125	2500	6800	18.9
Affordable	2	Bedroom	1	125	250	680	1.9
Condo	3	Bedroom	0	125	0	0	0.0
Affordable	3	Bedroom	1	125	375	1020	2.8
Condo	4	Bedroom	0	125	0	0	0.0
Subtotal Domestic Water Demand					3375	9180	25.5
Lot 57 South							
Condo	1	Bedroom	0	125	0	0	0.0
Affordable	1	Bedroom	0	125	0	0	0.0
Condo	2	Bedroom	4	125	1000	2720	7.6
Affordable	2	Bedroom	1	125	250	680	1.9
Condo	3	Bedroom	6	125	2250	6120	17.0
Affordable	3	Bedroom	0	125	0	0	0.0
Condo	4	Bedroom	2	125	1000	2720	7.6
Subtotal Domestic Water Demand					4500	12240	34.0
Total Domestic Water Demand					20,250	55,080	153.0

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FIRE SUPPRESSION						
Total Building Size	Building Type	Required Pressure [4]	Required Duration [4]	Total Fire Flow [4]	Sprinkler Reduction [5]	Adjusted Fire Flow [5]
(SF)	(IBC)	(psi)	(hours)	(gpm)	(%)	(gpm)
Lot 53						
73,743	IIB	20	4	6000	75%	1500
Lot 58						
34,849	IIB	20	4	4000	75%	1000
Lot 57 North						
32,455	IIB	20	3	3750	75%	1000
Lot 57 South						
38,378	IIB	20	4	4000	75%	1000

Note:

[1] Based on daily rates from the WYDEQ CH 12, Section 8

[2] Peak Hour Factor based on busiest hour occuring during the busiest quarter of the day.

[3] IFC - Appendix B, Table B105.1, Type II-B

[4] IFC - Appendix B, Section B105.2, 75% reduction for automatic sprinkler systems, minimum 1500 gpm

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BY: SS & JL
Date: 2025-03-24

WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**
Lot 53					
Condo 1 Bedroom	1	Lavatory Sink	1	1.5	2
		Shower	1	2.5	3
		Bath Tub	1	8	8
		Toilet	1	6	6
		Kitchen Sink	1	1.8	2
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	3
		Utility Sink	0	4	0
Affordable 1 Bedroom	3	Lavatory Sink	1	1.5	5
		Shower	1	2.5	8
		Bath Tub	1	8	24
		Toilet	1	6	18
		Kitchen Sink	1	1.8	5
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	9
		Utility Sink	0	4	0
Condo 2 Bedroom	18	Lavatory Sink	3	1.5	81
		Shower	1	2.5	45
		Bath Tub	1	8	144
		Toilet	2	6	216
		Kitchen Sink	1	1.8	32
		Dishwasher	1	1.3	23
		Laundry (washer)	1	3	54
		Utility Sink	0	4	0
Additional Sinks		Lavatory Sink	12	1.5	18
Additional Toilets		Toilet	5	6	30
Affordable 2 Bedroom	3	Lavatory Sink	2	1.5	9
		Shower	1	2.5	8
		Bath Tub	1	8	24
		Toilet	2	6	36
		Kitchen Sink	1	1.8	5
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	9
		Utility Sink	0	4	0
Condo 3 Bedroom	7	Lavatory Sink	5	1.5	53
		Shower	3	2.5	53
		Bath Tub	1	8	56

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**
		Toilet	3	6	126
		Kitchen Sink	1	1.8	13
		Dishwasher	1	1.3	9
		Laundry (washer)	1	3	21
		Utility Sink	0	4	0
Affordable 3 Bedroom	1	Lavatory Sink	1	1.5	2
		Bath Tub	1	8	8
		Shower	1	2.5	3
		Toilet	1	6	6
		Kitchen Sink	1	1.8	2
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	3
		Utility Sink	0	4	0
Lot 58					
Condo 2 Bedroom	7	Lavatory Sink	3	1.5	32
		Shower	1	2.5	18
		Bath Tub	1	8	56
		Toilet	2	6	84
		Kitchen Sink	1	1.8	13
		Dishwasher	1	1.3	9
		Laundry (washer)	1	3	21
		Utility Sink	0	4	0
Condo 3 Bedroom	5	Lavatory Sink	5	1.5	38
		Shower	3	2.5	38
		Bath Tub	1	8	40
		Toilet	3	6	90
		Kitchen Sink	1	1.8	9
		Dishwasher	1	1.3	7
		Laundry (washer)	1	3	15
		Utility Sink	0	4	0
Lot 57					
Affordable 1 Bedroom	2	Lavatory Sink	1	1.5	3
		Shower	1	2.5	5
		Bath Tub	1	8	16
		Toilet	1	6	12
		Kitchen Sink	1	1.8	4
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	6
		Utility Sink	0	4	0
Condo 2 Bedroom	14	Lavatory Sink	3	1.5	63
		Shower	1	2.5	35

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**
		Bath Tub	1	8	112
		Toilet	2	6	168
		Kitchen Sink	1	1.8	25
		Dishwasher	1	1.3	18
		Laundry (washer)	1	3	42
		Utility Sink	0	4	0
Additional Sinks		Lavatory Sink	3	1.5	5
Affordable 2 Bedroom	2	Lavatory Sink	2	1.5	6
		Shower	1	2.5	5
		Bath Tub	1	8	16
		Toilet	2	6	24
		Kitchen Sink	1	1.8	4
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	6
		Utility Sink	0	4	0
Affordable 3 Bedroom	1	Lavatory Sink	2	1.5	3
		Shower	2	2.5	5
		Bath Tub	1	8	8
		Toilet	2	6	12
		Kitchen Sink	1	1.8	2
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	3
		Utility Sink	0	4	0
Condo 3 Bedroom	6	Lavatory Sink	3	1.5	27
		Shower	2	2.5	30
		Bath Tub	1	8	48
		Toilet	2	6	72
		Kitchen Sink	1	1.8	11
		Dishwasher	1	1.3	8
		Laundry (washer)	1	3	18
		Utility Sink	0	4	0
Condo 4 Bedroom	2	Lavatory Sink	6	1.5	18
		Shower	3	2.5	15
		Bath Tub	1	8	16
		Toilet	3	6	36
		Kitchen Sink	1	1.8	4
		Dishwasher	1	1.3	3
		Laundry (washer)	1	3	6
		Utility Sink	0	4	0

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**

TOTAL FIXTURE VALUE	2,541
Probable Water Flow Demand (AWWA M22 - Figure 4-3)	75
Design Pressure Adjustment Factor (AWWA M22 - 60 psi)	1.00
Adjusted Probable Demand (gpm)[3]	**75**

Note:

[1] Fixture Value based on AWWA M22

[2] Fixture count based 2024.07.02 program

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**

[3] *Domestic use only, no irrigation*

JORGENSEN

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www.jorgeng.com

Attachment D: Water System Evaluation

The existing Snow King Resort Public Water System consists of a duplex booster pump located in the garage of Love Ridge Condominium Building 48, at 6,372 feet, a 1,160LF long, 8" diameter water supply line running uphill to a 110,000 gallon storage tank south/above at roughly 6,600 feet.

System Configuration

The following information was drawn from the Grand View Lodges – Phase B Wyoming DEQ Permit to Construct.

Static Headloss:

Water surface elevation in tank, full:

Tank Floor Elevation:	6583.0'
Depth to shutoff:	+ 13.0'
	6596.0'

	6596.0'
Booster Station Elevation:	- 6,372.0'
	224.0'

Friction Loss:

Fittings	Number of Fittings
8" Diameter Gate Valve	3
8" Diameter Tee; flow through	5
8" Diameter Tee; branch flow	1
8" Diameter 90° Bend	2
8" Diameter 45° Bend	6
8" Diameter 22.5° Bend	2
8" Diameter 11.25° Bend	2

Minor Head Loss; calculated for various flow scenarios

$$H_m = \frac{K*V^2}{2*g}$$

Flowrate	136 gpm	272 gpm	1,000 gpm	1,190.6 gpm
Minor Losses	0.05 ft-H_2O	0.19 ft-H_2O	2.59 ft-H_2O	3.67 ft-H_2O

Pipe

1,160 LF of 8" Diameter CL-350 Ductile Iron Pipe, Cement Lined

C coefficient	140.0
Inside Diameter	8.43"

Major Head Loss; calculated for various flow scenarios using Flowmaster

Flowrate	136 gpm	272 gpm	1,000 gpm	1,190.6 gpm
Major Losses	0.36' ft-H_2O	1.28 ft-H_2O	14.32 ft-H_2O	19.78 ft-H_2O

System Total Head Loss

Flowrate	136 gpm	272 gpm	1,000 gpm	1,190.6 gpm
Head	224.41' ft-H_2O	225.47 ft-H_2O	240.91 ft-H_2O	247.45 ft-H_2O

Water Available

Storage Tank

The tank provides 110,000 gallons of water storage

Pumped

Using 272 gpm flow scenario, for both pumps operating simultaneously

System Total Head: 45psi = 225.47 ft-H_2O

Pump Intake Head: - 103.83 ft-H_2O

121.64 ft-H_2O → 60.82 ft-H_2O per stage

National Pump M6HC Pump Curve used, 2-stage, 4.400 impeller configuration

Pump flowrate, Q = 155 gpm

System Demands

Existing Demands

Existing Love Ridge Condominiums Water Demand				
	Units No. of Units	Average TOTAL, gpd	Maximum TOTAL, gpd	Peak Hour gpm
Condos	20	10,944	27,072	37.6

Proposed Demands

Domestic Water Demand				
Lot	Units No. of Units	Average TOTAL, gpd	Maximum TOTAL, gpd	Peak Hour gpm
Lot 53	33	8,750	23,800	66.1
Lot 58	12	3,625	9,860	27.4
Lot 57	27	7,750	21,080	58.6
Total	**72**	**20,125**	**54,740**	**152.1**

Fire Flow

Combined fire sprinkler and hydrant flow: 1,000 gpm for 2 hours

System Capacity Analysis

Fire Flow Event: 2-hour duration

Water Supply

Storage Tank; at pump on level, assuming 5,000-gallon operating range between pump on and pump off level

105,000 gallons

Pumped; both booster pumps operating

Pump 1, starts at beginning of fire flow event

$$155\ gpm * 120\ minutes = 18{,}600\ gallons$$

Pump 2, starts when lag pump on level is reached in the tank. Assuming 5,000 gallons to lag pump on, this takes 4 minutes at fire flows

$$155\ gpm * 116\ minutes = 17{,}980\ gallons$$

Total volume of water available: $105{,}000 + 18{,}600 + 17{,}980 = \mathbf{141{,}580\ gallons}$

Water Demands

Existing Domestic Demands

Peak Hour: $37.6\ gpm * 60\ minutes = 2{,}256\ gallons$

Typical hour of maximum day: $27{,}072\ gpd \Big/ 24\ \frac{hours}{day} = 1{,}128\ gallons$

$$2{,}256 + 1{,}128 = 3{,}384\ gallons$$

Proposed Domestic Demands

Peak Hour: $152.1\ gpm * 60\ minutes = 9{,}126\ gallons$

Typical hour of maximum day: $54{,}740\ gpd \Big/ 24\ \frac{hours}{day} = 2{,}281\ gallons$

$$9{,}126 + 2{,}281 = 11{,}407\ gallons$$

Fire Flow, sprinklers and hydrants: $1{,}000\ gpm * 120\ minutes = 120{,}000\ gallons$

Total volume of water demanded: $3{,}384 + 11{,}407 + 120{,}000 = \mathbf{134{,}791\ gallons}$

Total volume of water available exceeds total volume of water demanded

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BY: SS & JL
Date: 2025-03-24

Average Daily Flow	60%
Peak Hour Factor	4

SANITARY SEWER DEMAND						
Unit Type			No. of Units[2]	Max Flow per Bedroom, gpd[1]	Average TOTAL, gpd	Maximum TOTAL, gpd	PEAK HOUR, gpm
Lot 53							
Condo	1	Bedroom	1	150	90	150	0.4
Affordable	1	Bedroom	3	150	270	450	1.3
Condo	2	Bedroom	18	150	3240	5400	15.0
Affordable	2	Bedroom	3	150	540	900	2.5
Condo	3	Bedroom	7	150	1890	3150	8.8
Affordable	3	Bedroom	1	150	270	450	1.3
Condo	4	Bedroom	0	150	0	0	0.0
SUBTOTAL SANITARY SEWER DEMAND					6300	10500	29.2
Lot 58							
Condo	1	Bedroom	0	150	0	0	0.0
Condo	2	Bedroom	7	150	1260	2100	5.8
Condo	3	Bedroom	5	150	1350	2250	6.3
Condo	4	Bedroom	0	150	0	0	0.0
SUBTOTAL SANITARY SEWER DEMAND					2610	4350	12.1
Lot 57 North							
Condo	1	Bedroom	0	150	0	0	0.0
Affordable	1	Bedroom	2	150	180	300	0.8
Condo	2	Bedroom	10	150	1800	3000	8.3
Affordable	2	Bedroom	1	150	180	300	0.8
Condo	3	Bedroom	0	150	0	0	0.0
Affordable	3	Bedroom	1	150	270	450	1.3
Condo	4	Bedroom	0	150	0	0	0.0
SUBTOTAL SANITARY SEWER DEMAND					2430	4050	11.3
Lot 57 South							
Condo	1	Bedroom	0	150	0	0	0.0
Affordable	1	Bedroom	0	150	0	0	0.0
Condo	2	Bedroom	4	150	720	1200	3.3
Affordable	2	Bedroom	1	150	180	300	0.8
Condo	3	Bedroom	6	150	1620	2700	7.5
Affordable	3	Bedroom	0	150	0	0	0.0
Condo	4	Bedroom	2	150	720	1200	3.3
SUBTOTAL SANITARY SEWER DEMAND					3240	5400	15.0
TOTAL SANITARY SEWER DEMAND					14,580	24,300	67.5

Notes:

[1] *Based on daily flow rates from the WYDEQ CH 11, Part B, Table 1*

[2] *Bedroom count shown based on Development Plan Review, 10.25.2019*

NORTHWORKS

Application Documents

PLANNING PERMIT APPLICATION
Planning & Building Department

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

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

For Office Use Only

Fees Paid_____ Date & Time Received _____

Application #s _____ _____ _____

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

PROJECT.

Name/Description: Snow King Lot 57

Physical Address: 510 Upper Snow King Loop

Lot, Subdivision: LOT 57, GRAND VIEW LODGES, THIRD ADDITION PIDN: 22-41-16-34-3-07-001

PROPERTY OWNER.

Name: BREG SK57A, LLC & BREG SK57B,LLC & BREG SK57C, LLC Phone: (262) 308-2656

Mailing Address: 4011 80th Street, Kenosha, Wisconsin ZIP: 53142

E-mail: northmann@beardevelopment.com

APPLICANT/AGENT.

Name: Joe Bongiorno (Northworks Architects) Phone: (307) 201-5324

Mailing Address: 185 East Hansen Ave. Jackson, WY 83001 ZIP: 83001

E-mail: jbongiorno@nwks.com

DESIGNATED PRIMARY CONTACT.

_____Property Owner X_____Applicant/Agent

TYPE OF APPLICATION. *Please check all that apply; review the type of application at www.townofjackson/200/Planning*

Use Permit

_____Basic Use

_____Conditional Use

_____Special Use

Relief from the LDRs

_____Administrative Adjustment

_____Variance

_____Beneficial Use Determination

_____Appeal of an Admin. Decision

Physical Development

_____Sketch Plan

X_____Development Plan

_____Design Review

Subdivision/Development Option

_____ Subdivision Plat

_____Boundary Adjustment (replat)

_____Boundary Adjustment (no plat)

_____Development Option Plan

Interpretations

_____Formal Interpretation

_____Zoning Compliance Verification

Amendments to the LDRs

_____LDR Text Amendment

_____Map Amendment

Miscellaneous

_____**Other:**_____

_____ Environmental Analysis

PRE-SUBMITTAL STEPS. *To see if pre-submittal steps apply to you, go to www.townofjackson.com/200/Planning and select the relevant application type for requirements. Please submit all required pre-submittal steps with application.*

Pre-application Conference #: P23-010 Environmental Analysis #: _____

Original Permit #: _____ Date of Neighborhood Meeting: _____

SUBMITTAL REQUIREMENTS. *Please ensure all submittal requirements are included. The Planning Department will not hold or process incomplete applications. Partial or incomplete applications will be returned to the applicant. Go to www.townofjackson.com/200/Planning and select the relevant application type for submittal requirements.*

Have you attached the following?

X **Application Fee.** Fees are cumulative. Go to www.townofjackson.com/200/Planning and select the relevant application type for the fees.

X **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.

X **Response to Submittal Requirements**. The submittal requirements can be found on the TOJ website for the specific application. If a pre-application conference is required, the submittal requirements will be provided to applicant at the conference. The submittal requirements are at www.townofjackson.com/200/Planning under the relevant application type.

Note: Information provided by the applicant or other review agencies during the planning process may identify other requirements that were not evident at the time of application submittal or a Pre-Application Conference, if held. Staff may request additional materials during review as needed to determine compliance with the LDRs.

Under penalty of perjury, I hereby certify that I have read this application and associated checklists 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.

Joe. Bongiorno 10/23/2024

Signature of Property Owner or Authorized Applicant/Agent Date

Joe Bongiorno (Northworks Architects) Senior Architect

Name Printed Title

PLANNING PERMIT APPLICATION
Planning & Building Department

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P.O. Box 1687
Jackson, WY 83001

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

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Fees Paid_____ Date & Time Received _____

Application #s _____ _____ _____

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

PROJECT.

Name/Description: Snow King Lot 53

Physical Address: 553 Upper Snow King Loop

Lot, Subdivision: LOT 53, GRAND VIEW LODGES 2ND ADDITION PIDN: 22-41-16-34-3-04-001

PROPERTY OWNER.

Name: BREG SK53, LLC Phone: (262) 308-2656

Mailing Address: 4011 80th Street, Kenosha, Wisconsin ZIP: 53142

E-mail: northmann@beardevelopment.com

APPLICANT/AGENT.

Name: Joe Bongiorno (Northworks Architects) Phone: (307) 201-5324

Mailing Address: 185 East Hansen Ave. Jackson, WY 83001 ZIP: 83001

E-mail: jbongiorno@nwks.com

DESIGNATED PRIMARY CONTACT.

_____Property Owner X_____Applicant/Agent

TYPE OF APPLICATION. *Please check all that apply; review the type of application at www.townofjackson/200/Planning*

Use Permit

_____Basic Use

_____Conditional Use

_____Special Use

Relief from the LDRs

_____Administrative Adjustment

_____Variance

_____Beneficial Use Determination

_____Appeal of an Admin. Decision

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_____Sketch Plan

X_____Development Plan

_____Design Review

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_____ Subdivision Plat

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Amendments to the LDRs

_____LDR Text Amendment

_____Map Amendment

Miscellaneous

_____**Other:**_____

_____Environmental Analysis

PRE-SUBMITTAL STEPS. *To see if pre-submittal steps apply to you, go to www.townofjackson.com/200/Planning and select the relevant application type for requirements. Please submit all required pre-submittal steps with application.*

Pre-application Conference #: P23-010 Environmental Analysis #: _____

Original Permit #: _____ Date of Neighborhood Meeting: _____

SUBMITTAL REQUIREMENTS. *Please ensure all submittal requirements are included. The Planning Department will not hold or process incomplete applications. Partial or incomplete applications will be returned to the applicant. Go to www.townofjackson.com/200/Planning and select the relevant application type for submittal requirements.*

Have you attached the following?

X **Application Fee.** Fees are cumulative. Go to www.townofjackson.com/200/Planning and select the relevant application type for the fees.

X **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.

X **Response to Submittal Requirements**. The submittal requirements can be found on the TOJ website for the specific application. If a pre-application conference is required, the submittal requirements will be provided to applicant at the conference. The submittal requirements are at www.townofjackson.com/200/Planning under the relevant application type.

Note: Information provided by the applicant or other review agencies during the planning process may identify other requirements that were not evident at the time of application submittal or a Pre-Application Conference, if held. Staff may request additional materials during review as needed to determine compliance with the LDRs.

Under penalty of perjury, I hereby certify that I have read this application and associated checklists 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.

Joe. Bongiorno 10/23/2024

Signature of Property Owner or Authorized Applicant/Agent Date

Joe Bongiorno (Northworks Architects) Senior Architect

Name Printed Title

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Planning & Building Department

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Fees Paid_____ Date & Time Received _____

Application #s _____ _____ _____

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

PROJECT.

Name/Description: Snow King Lot 58

Physical Address: 725 Upper Snow King Loop

Lot, Subdivision: LOT 58, GRAND VIEW LODGES, THIRD ADDITION PIDN: 22-41-16-34-3-07-002

PROPERTY OWNER.

Name: BREG SK58, LLC Phone: (262) 308-2656

Mailing Address: 4011 80th Street, Kenosha, Wisconsin ZIP: 53142

E-mail: northmann@beardevelopment.com

APPLICANT/AGENT.

Name: Joe Bongiorno (Northworks Architects) Phone: (307) 201-5324

Mailing Address: 185 East Hansen Ave. Jackson, WY 83001 ZIP: 83001

E-mail: jbongiorno@nwks.com

DESIGNATED PRIMARY CONTACT.

_____Property Owner X_____Applicant/Agent

TYPE OF APPLICATION. *Please check all that apply; review the type of application at www.townofjackson/200/Planning*

Use Permit

_____Basic Use

_____Conditional Use

_____Special Use

Relief from the LDRs

_____Administrative Adjustment

_____Variance

_____Beneficial Use Determination

_____Appeal of an Admin. Decision

Physical Development

_____Sketch Plan

X_____Development Plan

_____Design Review

Subdivision/Development Option

_____ Subdivision Plat

_____Boundary Adjustment (replat)

_____Boundary Adjustment (no plat)

_____Development Option Plan

Interpretations

_____Formal Interpretation

_____Zoning Compliance Verification

Amendments to the LDRs

_____LDR Text Amendment

_____Map Amendment

Miscellaneous

_____**Other:**_____

_____ Environmental Analysis

PRE-SUBMITTAL STEPS. *To see if pre-submittal steps apply to you, go to www.townofjackson.com/200/Planning and select the relevant application type for requirements. Please submit all required pre-submittal steps with application.*

Pre-application Conference #: P23-010 Environmental Analysis #: _____

Original Permit #: _____ Date of Neighborhood Meeting: _____

SUBMITTAL REQUIREMENTS. *Please ensure all submittal requirements are included. The Planning Department will not hold or process incomplete applications. Partial or incomplete applications will be returned to the applicant. Go to www.townofjackson.com/200/Planning and select the relevant application type for submittal requirements.*

Have you attached the following?

X **Application Fee.** Fees are cumulative. Go to www.townofjackson.com/200/Planning and select the relevant application type for the fees.

X **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.

X **Response to Submittal Requirements**. The submittal requirements can be found on the TOJ website for the specific application. If a pre-application conference is required, the submittal requirements will be provided to applicant at the conference. The submittal requirements are at www.townofjackson.com/200/Planning under the relevant application type.

Note: Information provided by the applicant or other review agencies during the planning process may identify other requirements that were not evident at the time of application submittal or a Pre-Application Conference, if held. Staff may request additional materials during review as needed to determine compliance with the LDRs.

Under penalty of perjury, I hereby certify that I have read this application and associated checklists 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.

Joe. Bongiorno 10/23/2024

Signature of Property Owner or Authorized Applicant/Agent Date

Joe Bongiorno (Northworks Architects) Senior Architect

Name Printed 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

Being duly sworn, deposes and says that BREG SK 53, LLC, BREG SK58, LLC, BREG SK57A, LLC, BREG SK57B, LLC & BREG SK 57C, LLC is the owner in fee of the premises located at:

Name of property owner as listed on deed

Address of Premises: 553 Upper Snow King Loop, 725 Upper Snow King Loop & 510 Upper Snow King Loop

Legal Description: See attached

Please attach additional sheet for additional addresses and legal descriptions

And, that the person named as follows: Name of Applicant/agent: Joe Bongiorno (Northworks Architects)

Mailing address of Applicant/agent: 185 E Hanson Avenue, Jackson, WY 83001

Email address of Applicant/agent: jbongiorno@nwks.com

Phone Number of Applicant/agent: 630-254-9111

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 ☒ Demolition Permit

☒ Other (describe) Design Review Committee Application

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

Authorized Member

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

STATE OF WISCONSIN)
) SS.
COUNTY OF KENOSHA)

The foregoing instrument was acknowledged before me by Stephen R. Mills this 25th day of March. WITNESS my hand and official seal.

Janis E. Hagerty

Notary Public

My commission expires:

JANIS E. HAGERTY
NOTARY PUBLIC - STATE OF WISCONSIN
MY COMMISSION EXPIRES
FEBRUARY 10, 2028

WTE
WYOMING TITLE & ESCROW
A MOTHER LODE COMPANY

Date: October 16, 2023
Please direct correspondence to:
1110 Maple Way Suite A, P.O. Box 4429
Jackson, WY 83001
Telephone: (307)732-2983
Fax: (307) 732-0200
Email: nicole@wyomingtitle.com
Escrow Number: W-28577
Property:
553 Upper Snow King Loop, Jackson, WY 83001
510 Upper Snow King Loop, Jackson, WY 83001
725 Upper Snow King Loop, Jackson, WY 83001

BREG SK53, LLC, a Wyoming limited liability company and BREG SK57A, LLC, a Wyoming limited liability company and BREG SK57B, LLC, a Wyoming limited liability company and BREG SK57C, LLC, a Wyoming limited liability company and BREG SK58, LLC, a Wyoming limited liability company
C/O Bear Development, LLC 4011 80th Street
Kenosha, WI 53124

Dear BREG SK53, LLC, a Wyoming limited liability company and BREG SK57A, LLC, a Wyoming limited liability company and BREG SK57B, LLC, a Wyoming limited liability company and BREG SK57C, LLC, a Wyoming limited liability company and BREG SK58, LLC, a Wyoming limited liability company

Congratulations on the purchase of your property. It was a pleasure working on the escrow for this purchase and WTE looks forward to working with you again.

Enclosed herein are the following:

- Warranty Deed
- Owner's Title Insurance Policy

The enclosed policy insures you against certain risks to your land title, subject to the conditions & exclusions as set forth therein. Your policy premium shown on Schedule A is a one-time charge. It was collected and paid for in your closing costs.

We believe in delivering quality products that meet your needs, and our goal is to provide the most efficient and reliable service in the industry. Thank you for giving us the opportunity to serve you! We invite you to call upon us whenever we can be of assistance with your title and escrow needs..

Sincerely,

Jennifer Krall
for Nicole Uhl
Escrow Officer

First American Title™	Owner's Policy of Title Insurance
	ISSUED BY **First American Title Insurance Company**
Owner's Policy	POLICY NUMBER **5011456-0013847e**

Any notice of claim and any other notice or statement in writing required to be given to the Company under this policy must be given to the Company at the address shown in Section 18 of the Conditions.

COVERED RISKS

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B, AND THE CONDITIONS, **FIRST AMERICAN TITLE INSURANCE COMPANY**, a Nebraska corporation (the "Company") insures, as of Date of Policy and, to the extent stated in Covered Risks 9 and 10, after Date of Policy, against loss or damage, not exceeding the Amount of Insurance, sustained or incurred by the Insured by reason of:

1. Title being vested other than as stated in Schedule A.
2. Any defect in or lien or encumbrance on the Title. This Covered Risk includes but is not limited to insurance against loss from
   (a) A defect in the Title caused by
      (i) forgery, fraud, undue influence, duress, incompetency, incapacity, or impersonation;
      (ii) failure of any person or Entity to have authorized a transfer or conveyance;
      (iii) a document affecting Title not properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
      (iv) failure to perform those acts necessary to create a document by electronic means authorized by law;
      (v) a document executed under a falsified, expired, or otherwise invalid power of attorney;
      (vi) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
      (vii) a defective judicial or administrative proceeding.
   (b) The lien of real estate taxes or assessments imposed on the Title by a governmental authority due or payable, but unpaid.
   (c) Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
3. Unmarketable Title.
4. No right of access to and from the Land.

(Covered Risks Continued on Page 2)

In Witness Whereof, First American Title Insurance Company has caused its corporate name to be hereunto affixed by its authorized officers as of Date of Policy shown in Schedule A.

First American Title Insurance Company

Kenneth D. DeGiorgio, President

Greg L. Smith, Secretary

For Reference:

File #: W-28577
Policy #: 5011456-0013847e

(This Policy is valid only when Schedules A and B are attached)

This jacket was created electronically and constitutes an original document

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COVERED RISKS (Continued)

5. The violation or enforcement of any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (a) the occupancy, use, or enjoyment of the Land;
   (b) the character, dimensions, or location of any improvement erected on the Land;
   (c) the subdivision of land; or
   (d) environmental protection
   if a notice, describing any part of the Land, is recorded in the Public Records setting forth the violation or intention to enforce, but only to the extent of the violation or enforcement referred to in that notice.
6. An enforcement action based on the exercise of a governmental police power not covered by Covered Risk 5 if a notice of the enforcement action, describing any part of the Land, is recorded in the Public Records, but only to the extent of the enforcement referred to in that notice.
7. The exercise of the rights of eminent domain if a notice of the exercise, describing any part of the Land, is recorded in the Public Records.
8. Any taking by a governmental body that has occurred and is binding on the rights of a purchaser for value without Knowledge.
9. Title being vested other than as stated in Schedule A or being defective
   (a) as a result of the avoidance in whole or in part, or from a court order providing an alternative remedy, of a transfer of all or any part of the title to or any interest in the Land occurring prior to the transaction vesting Title as shown in Schedule A because that prior transfer constituted a fraudulent or preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws; or
   (b) because the instrument of transfer vesting Title as shown in Schedule A constitutes a preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws by reason of the failure of its recording in the Public Records
      (i) to be timely, or
      (ii) to impart notice of its existence to a purchaser for value or to a judgment or lien creditor.
10. Any defect in or lien or encumbrance on the Title or other matter included in Covered Risks 1 through 9 that has been created or attached or has been filed or recorded in the Public Records subsequent to Date of Policy and prior to the recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The Company will also pay the costs, attorneys' fees, and expenses incurred in defense of any matter insured against by this Policy, but only to the extent provided in the Conditions.

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
      (i) the occupancy, use, or enjoyment of the Land;
      (ii) the character, dimensions, or location of any improvement erected on the Land;
      (iii) the subdivision of land; or
      (iv) environmental protection;
      or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

CONDITIONS

1. DEFINITION OF TERMS

The following terms when used in this policy mean:

(a) "Amount of Insurance": The amount stated in Schedule A, as may be increased or decreased by endorsement to this policy, increased by Section 8(b), or decreased by Sections 10 and 11 of these Conditions.

(b) "Date of Policy": The date designated as "Date of Policy" in Schedule A.

(c) "Entity": A corporation, partnership, trust, limited liability company, or other similar legal entity.

(d) "Insured": The Insured named in Schedule A.

(i) The term "Insured" also includes

(A) successors to the Title of the Insured by operation of law as distinguished from purchase, including heirs, devisees, survivors, personal representatives, or next of kin;

(B) successors to an Insured by dissolution, merger, consolidation, distribution, or reorganization;

(C) successors to an Insured by its conversion to another kind of Entity;

(D) a grantee of an Insured under a deed delivered without payment of actual valuable consideration conveying the Title

(1) if the stock, shares, memberships, or other equity interests of the grantee are wholly-owned by the named Insured,

(2) if the grantee wholly owns the named Insured,

(3) if the grantee is wholly-owned by an affiliated Entity of the named Insured, provided the affiliated Entity and the named Insured are both wholly-owned by the same person or Entity, or

(4) if the grantee is a trustee or beneficiary of a trust created by a written instrument established by the Insured named in Schedule A for estate planning purposes.

(ii) With regard to (A), (B), (C), and (D) reserving, however, all rights and defenses as to any successor that the Company would have had against any predecessor Insured.

(e) "Insured Claimant": An Insured claiming loss or damage.

(f) "Knowledge" or "Known": Actual knowledge, not constructive knowledge or notice that may be imputed to an Insured by reason of the Public Records or any other records that impart constructive notice of matters affecting the Title.

(g) "Land": The land described in Schedule A, and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is insured by this policy.

(h) "Mortgage": Mortgage, deed of trust, trust deed, or other security instrument, including one evidenced by electronic means authorized by law.

(i) "Public Records": Records established under state statutes at Date of Policy for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge. With respect to Covered Risk 5(d), "Public Records" shall also include environmental protection liens filed in the records of the clerk of the United States District Court for the district where the Land is located.

(j) "Title": The estate or interest described in Schedule A.

(k) "Unmarketable Title": Title affected by an alleged or apparent matter that would permit a prospective purchaser or lessee of the Title or lender on the Title to be released from the obligation to purchase, lease, or lend if there is a contractual condition requiring the delivery of marketable title.

2. CONTINUATION OF INSURANCE

The coverage of this policy shall continue in force as of Date of Policy in favor of an Insured, but only so long as the Insured retains an estate or interest in the Land, or holds an obligation secured by a purchase money Mortgage given by a purchaser from the Insured, or only so long as the Insured shall have liability by reason of warranties in any transfer or conveyance of the Title. This policy shall not continue in force in favor of any purchaser from the Insured of either (i) an estate or interest in the Land, or (ii) an obligation secured by a purchase money Mortgage given to the Insured.

3. NOTICE OF CLAIM TO BE GIVEN BY INSURED CLAIMANT

The Insured shall notify the Company promptly in writing (i) in case of any litigation as set forth in Section 5(a) of these Conditions, (ii) in case Knowledge shall come to an Insured hereunder of any claim of title or interest that is adverse to the Title, as insured, and that might cause loss or damage for which the Company may be liable by virtue of this policy, or (iii) if the Title, as insured, is rejected as Unmarketable Title. If the Company is prejudiced by the failure of the Insured Claimant to provide prompt notice, the Company's liability to the Insured Claimant under the policy shall be reduced to the extent of the prejudice.

4. PROOF OF LOSS

In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Insured Claimant furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter insured against by this policy that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

5. DEFENSE AND PROSECUTION OF ACTIONS

(a) Upon written request by the Insured, and subject to the options contained in Section 7 of these Conditions, the Company, at its own cost and without unreasonable delay, shall provide for the defense of an Insured in litigation in which any third party asserts a claim covered by this policy adverse to the Insured. This obligation is limited to only those stated causes of action alleging matters insured against by this policy. The Company shall have the right to select counsel of its choice (subject to the right of the Insured to object for reasonable cause) to represent the Insured as to those stated causes of action. It shall not be liable for and will not pay the fees of any other counsel. The Company will not pay any fees, costs, or expenses incurred by the Insured in the defense of those causes of action that allege matters not insured against by this policy.

(b) The Company shall have the right, in addition to the options contained in Section 7 of these Conditions, at its own cost, to institute and prosecute any action or proceeding or to do any

other act that in its opinion may be necessary or desirable to establish the Title, as insured, or to prevent or reduce loss or damage to the Insured. The Company may take any appropriate action under the terms of this policy, whether or not it shall be liable to the Insured. The exercise of these rights shall not be an admission of liability or waiver of any provision of this policy. If the Company exercises its rights under this subsection, it must do so diligently.

(c) Whenever the Company brings an action or asserts a defense as required or permitted by this policy, the Company may pursue the litigation to a final determination by a court of competent jurisdiction, and it expressly reserves the right, in its sole discretion, to appeal any adverse judgment or order.

6. DUTY OF INSURED CLAIMANT TO COOPERATE

(a) In all cases where this policy permits or requires the Company to prosecute or provide for the defense of any action or proceeding and any appeals, the Insured shall secure to the Company the right to so prosecute or provide defense in the action or proceeding, including the right to use, at its option, the name of the Insured for this purpose. Whenever requested by the Company, the Insured, at the Company's expense, shall give the Company all reasonable aid (i) in securing evidence, obtaining witnesses, prosecuting or defending the action or proceeding, or effecting settlement, and (ii) in any other lawful act that in the opinion of the Company may be necessary or desirable to establish the Title or any other matter as insured. If the Company is prejudiced by the failure of the Insured to furnish the required cooperation, the Company's obligations to the Insured under the policy shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation, with regard to the matter or matters requiring such cooperation.

(b) The Company may reasonably require the Insured Claimant to submit to examination under oath by any authorized representative of the Company and to produce for examination, inspection, and copying, at such reasonable times and places as may be designated by the authorized representative of the Company, all records, in whatever medium maintained, including books, ledgers, checks, memoranda, correspondence, reports, e-mails, disks, tapes, and videos whether bearing a date before or after Date of Policy, that reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Insured Claimant shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect, and copy all of these records in the custody or control of a third party that reasonably pertain to the loss or damage. All information designated as confidential by the Insured Claimant provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Insured Claimant to submit for examination under oath, produce any reasonably requested information, or grant permission to secure reasonably necessary information from third parties as required in this subsection, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this policy as to that claim.

7. OPTIONS TO PAY OR OTHERWISE SETTLE CLAIMS; TERMINATION OF LIABILITY

In case of a claim under this policy, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Insurance.

To pay or tender payment of the Amount of Insurance under this policy together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay.

Upon the exercise by the Company of this option, all liability and obligations of the Company to the Insured under this policy, other than to make the payment required in this subsection, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

(b) To Pay or Otherwise Settle With Parties Other Than the Insured or With the Insured Claimant.

(i) To pay or otherwise settle with other parties for or in the name of an Insured Claimant any claim insured against under this policy. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay; or

(ii) To pay or otherwise settle with the Insured Claimant the loss or damage provided for under this policy, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in subsections (b)(i) or (ii), the Company's obligations to the Insured under this policy for the claimed loss or damage, other than the payments required to be made, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

8. DETERMINATION AND EXTENT OF LIABILITY

This policy is a contract of indemnity against actual monetary loss or damage sustained or incurred by the Insured Claimant who has suffered loss or damage by reason of matters insured against by this policy.

(a) The extent of liability of the Company for loss or damage under this policy shall not exceed the lesser of

(i) the Amount of Insurance; or

(ii) the difference between the value of the Title as insured and the value of the Title subject to the risk insured against by this policy.

(b) If the Company pursues its rights under Section 5 of these Conditions and is unsuccessful in establishing the Title, as insured,

(i) the Amount of Insurance shall be increased by 10%, and

(ii) the Insured Claimant shall have the right to have the loss or damage determined either as of the date the claim was made by the Insured Claimant or as of the date it is settled and paid.

(c) In addition to the extent of liability under (a) and (b), the Company will also pay those costs, attorneys' fees, and expenses incurred in accordance with Sections 5 and 7 of these Conditions.

9. LIMITATION OF LIABILITY

(a) If the Company establishes the Title, or removes the alleged defect, lien, or encumbrance, or cures the lack of a right of access to or from the Land, or cures the claim of Unmarketable Title, all as insured, in a reasonably diligent manner by any method, including litigation and the completion of any appeals, it shall have fully performed its obligations

with respect to that matter and shall not be liable for any loss or damage caused to the Insured.

(b) In the event of any litigation, including litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals, adverse to the Title, as insured.

(c) The Company shall not be liable for loss or damage to the Insured for liability voluntarily assumed by the Insured in settling any claim or suit without the prior written consent of the Company.

10. REDUCTION OF INSURANCE; REDUCTION OR TERMINATION OF LIABILITY

All payments under this policy, except payments made for costs, attorneys' fees, and expenses, shall reduce the Amount of Insurance by the amount of the payment.

11. LIABILITY NONCUMULATIVE

The Amount of Insurance shall be reduced by any amount the Company pays under any policy insuring a Mortgage to which exception is taken in Schedule B or to which the Insured has agreed, assumed, or taken subject, or which is executed by an Insured after Date of Policy and which is a charge or lien on the Title, and the amount so paid shall be deemed a payment to the Insured under this policy.

12. PAYMENT OF LOSS

When liability and the extent of loss or damage have been definitely fixed in accordance with these Conditions, the payment shall be made within 30 days.

13. RIGHTS OF RECOVERY UPON PAYMENT OR SETTLEMENT

(a) Whenever the Company shall have settled and paid a claim under this policy, it shall be subrogated and entitled to the rights of the Insured Claimant in the Title and all other rights and remedies in respect to the claim that the Insured Claimant has against any person or property, to the extent of the amount of any loss, costs, attorneys' fees, and expenses paid by the Company. If requested by the Company, the Insured Claimant shall execute documents to evidence the transfer to the Company of these rights and remedies. The Insured Claimant shall permit the Company to sue, compromise, or settle in the name of the Insured Claimant and to use the name of the Insured Claimant in any transaction or litigation involving these rights and remedies.

If a payment on account of a claim does not fully cover the loss of the Insured Claimant, the Company shall defer the exercise of its right to recover until after the Insured Claimant shall have recovered its loss.

(b) The Company's right of subrogation includes the rights of the Insured to indemnities, guaranties, other policies of insurance, or bonds, notwithstanding any terms or conditions contained in those instruments that address subrogation rights.

14. ARBITRATION

Either the Company or the Insured may demand that the claim or controversy shall be submitted to arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association ("Rules"). Except as provided in the Rules, there shall be no joinder or consolidation with claims or controversies of other persons. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Insured arising out of or relating to this policy, any service in connection with its issuance or the breach of a policy provision, or to any other controversy or claim arising out of the transaction giving rise to this policy. All arbitrable matters when the Amount of Insurance is $2,000,000 or less shall be arbitrated at the option of either the Company or the Insured. All arbitrable matters when the Amount of Insurance is in excess of $2,000,000 shall be arbitrated only when agreed to by both the Company and the Insured. Arbitration pursuant to this policy and under the Rules shall be binding upon the parties. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court of competent jurisdiction.

15. LIABILITY LIMITED TO THIS POLICY; POLICY ENTIRE CONTRACT

(a) This policy together with all endorsements, if any, attached to it by the Company is the entire policy and contract between the Insured and the Company. In interpreting any provision of this policy, this policy shall be construed as a whole.

(b) Any claim of loss or damage that arises out of the status of the Title or by any action asserting such claim shall be restricted to this policy.

(c) Any amendment of or endorsement to this policy must be in writing and authenticated by an authorized person, or expressly incorporated by Schedule A of this policy.

(d) Each endorsement to this policy issued at any time is made a part of this policy and is subject to all of its terms and provisions. Except as the endorsement expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsement, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance.

16. SEVERABILITY

In the event any provision of this policy, in whole or in part, is held invalid or unenforceable under applicable law, the policy shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

17. CHOICE OF LAW; FORUM

(a) Choice of Law: The Insured acknowledges the Company has underwritten the risks covered by this policy and determined the premium charged therefor in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or enforcement of policies of title insurance of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims against the Title that are adverse to the Insured and to interpret and enforce the terms of this policy. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

(b) Choice of Forum: Any litigation or other proceeding brought by the Insured against the Company must be filed only in a state or federal court within the United States of America or its territories having appropriate jurisdiction.

18. NOTICES, WHERE SENT

Any notice of claim and any other notice or statement in writing required to be given to the Company under this policy must be given to the Company at **First American Title Insurance Company, Attn: Claims National Intake Center, 1 First American Way, Santa Ana, CA 92707. Phone: 888-632-1642.**

ALTA OWNER'S POLICY (6-17-06)

SCHEDULE A

Order No.:	W-28577	**Name and Address of Insurer:**
Policy No.:	5011456-0013847e	First American Title Insurance Company
Date of Policy:	August 30, 2023 at 4:03PM	1 First American Way
Amount of Insurance:	$19,000,000.00	Santa Ana, CA 927070
Premium:	$24,383.00	

Address Reference: 553 Upper Snow King Loop, Jackson, WY 83001
510 Upper Snow King Loop, Jackson, WY 83001
725 Upper Snow King Loop, Jackson, WY 83001
For information purposes only and not for insurance.

1. Name of Insured:

   BREG SK53, LLC, a Wyoming limited liability company and BREG SK57A, LLC, a Wyoming limited liability company and BREG SK57B, LLC, a Wyoming limited liability company and BREG SK57C, LLC, a Wyoming limited liability company and BREG SK58, LLC, a Wyoming limited liability company

2. The estate or interest in the Land that is insured by this policy is:

   Fee Simple

3. Title is vested in:

   As to Lot 53:

   BREG SK53, LLC, a Wyoming limited liability company

   As to Lot 57:

   BREG SK57A, LLC, a Wyoming limited liability company, as to a proportionate 26.76% undivided tenant in common interest, and BREG SK57B, LLC, a Wyoming limited liability company as to a proportionate 25.85% undivided tenant in common interest, and BREG SK57C, LLC, a Wyoming limited liability company as to a proportionate 47.39% undivided tenant in common interest, collectivley

   As to Lot 58:

   BREG SK58, LLC, a Wyoming limited liability company

4. The Land referred to in this policy is described as follows:

   SEE EXHIBIT "A" ATTACHED FOR LEGAL DESCRIPTION

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052



Authorized Countersignature

EXHIBIT "A" LEGAL DESCRIPTION

Lot 53 of Grand View Lodges Second Addition to the Town of Jackson, Teton County, Wyoming, according to that plat recorded in the Office of the Teton County Clerk on April 11, 2008 as Plat No. 1236.

AND

Lots 57 and 58 of Grand View Lodges Third Addition to the Town of Jackson, Teton County, Wyoming, according to that plat recorded in the Office of the Teton County Clerk on November 14, 2013 as Plat No. 1333.

PIDN: 22-41-16-34-3-04-001, 22-41-16-34-3-07-001, 22-41-16-34-3-07-002

SCHEDULE B
EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Unpatented mining claims; (b) Reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) Water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the Public Records.

2. Any claim to (a) ownership of or rights to minerals and similar substances, including but not limited to ores, metals, coal, lignite, oil, gas, uranium, clay, rock, sand and gravel located in, on or under the Land or produced from the Land, whether such ownership or rights arise by lease, grant, exception, conveyance, reservation, or otherwise; and (b) any rights, privileges, immunities, rights of way, and easements associated therewith or appurtenant thereto, whether or not the interests excepted in (a) or (b) appear in the Public Records or are shown in Schedule B.

3. General taxes for the year 2024, and subsequent years, a lien in the process of assessment, not yet due or payable.

4. Assessments for the Snow King Resort Master Association ("SKRMA"), if any, which are excluded from the coverage afforded hereby.

5. Terms, conditions and provisions of that easement as contained in that Warranty Deed recorded October 26, 1998, as (instrument) 476401 (book) 363 (page) 1068, Official Records:
   Purpose: ingress, egress, driveway and utility
   B363P1068

6. Terms, conditions and provisions contained in easement for the purpose shown below and rights incidental thereto as granted in a document recorded July 14, 2005, as (instrument) 654812 (book) 595 (page) 540, Official Records:
   Purpose: driveway and utility
   B595P540

   NOTE: Includes road maintenance and snow removal fees.

7. Affidavit Affecting Title Re: Snow King Planned Resort District Master Plan, and the terms, conditions, provisions contained therein, recorded July 19, 2001, as (instrument) 0547519 (book) 429 (page) 1, Official Records.
   B429P1

   Amendment to Affidavit, recorded April 12, 2012, as (instrument) 0812028 (book) 805 (page) 651 Official Records.
   B805P651

   Amendment, recorded June 30, 2021, as (instrument) 1019143 Official Records.
   1019143

   Transfer and Allocation of Development Rights, recorded May 11, 2015, as (instrument) 881535 (book) 894 (page) 802 Official Records.

B894P802

Transfer and Allocation of Development Rights, recorded May 11, 2015, as (instrument) 881537 (book) 894 (page) 809 Official Records.
B894P809

Transfer and Allocation of Development Rights, recorded September 22, 2015, as (instrument) 891174 (book) 905 (page) 43 Official Records.
B905P43

Transfer and Allocation of Development Rights, recorded November 25, 2020, as (instrument) 1003885 Official Records.
1003885

Transfer and Allocation of Development Rights, recorded August 27, 2021, as (instrument) 1023205 Official Records.
1023205

Transfer and Allocation of Development Rights, recorded October 8, 2021, as (instrument) 1025921 Official Records.
1025921

Transfer and Assignment of Development Rights (KM6 Parcel), by and between Snow King Mountain Resort, LLC, a Wyoming limited liability company and Jackson Village Acquisition Group, LLC, a Delaware limited liability company, dated November 12, 2021, recorded November 12, 2021, as (instrument) 1028558, Official Records.
1028558

Transfer and Assignment of Entitlements, by and between Snow King Mountain Resort, LLC, a Wyoming limited liability company and Jackson Hole Acquisition Manager, LLC, a Delaware limited liability company, dated November 19, 2021, recorded November 19, 2021, as (instrument) 1028565, Official Records.
1028565

Transfer and Allocation of Development Rights, recorded June 24, 2022, as (instrument) 1041207 Official Records.
1041207

Transfer and Allocation of Development Rights, by and between Jackson 53, LP, a Texas limited partnership and BREG SK53, LLC, a Wyoming limited liability company and BREG SK57A, LLC, a Wyoming limited liability company and BREG SK57B, LLC, a Wyoming limited liability company and BREG SK58, LLC, a Wyoming limited liability company, and the terms and conditions contained therein, recorded August 30, 2023, as (instrument) 1066438 Official Records.
1066438

8. All matters as delineated on the Official Plat of Grand View Lodges Second Addition to the Town of Jackson and Grand View Lodges Third Addition to the Town of Jackson, including but not limited to the terms and conditions of roadway and utility easements as shown on and/or reconfigured and rededicated therein, on file and of record with the Teton County Clerk, Official Records of Teton County, State of Wyoming, Plat No. 1236 and 1333.
Plat 1236, Plat 1333

Partial Vacation of Plat 1333, recorded December 7, 2022, as (instrument) 1051034 Official Records.
1051034

9. Terms, conditions and provisions of that easement recorded November 19, 2008, as (instrument) 742183 (book) 713 (page) 130, Official Records:
Purpose: ingress, egress and driveway access
B713P130

NOTE: Includes fee per residential and/or commercial units to be constructed.

10. Terms, provisions, covenants, conditions, restrictions and easements, provided in the Declaration of Covenants, Conditions and Restrictions for the Snow King Planned Resort District, but omitting covenants or restrictions, if any, based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, or source of income, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, in document recorded June 18, 2009, as (instrument) 0754332 (book) 733 (page) 179, Official Records.
B733P179

Contains: Master resort association charges, assessments and liens.

First Amendment of the Declaration of Covenants, Conditions and Restrictions for the Snow King Planned Resort District recorded December 15, 2011, as (instrument) 0806353 (book) 796 (page) 428, Official Records.
B796P428

Amended and Restated Declaration of Covenants, Conditions and Restrictions recorded August 31, 2012, as (instrument) 0821160 (book) 818 (page) 118, Official Records.
B818P118

11. The terms, conditions and provisions as contained in the Agreement entitled "Agreement to Convey Easements", by and between Town of Jackson and Grand View Development, LLC, a Wyoming Limited Liability, dated January 18, 2011, recorded January 19, 2011, as (instrument) 0788116 (book) 774 (page) 738, Official Records.
B774P738

12. An agreement by and between Grand View Development, LLC and Town of Jackson, setting forth terms, recorded January 19, 2011, as (instrument) 788118 (book) 774 (page) 770, Official Records.
B774P770

Relocation of Roadway Access Easement Agreement, recorded December 30, 2021, as (instrument) 1030716 Official Records.
1030716

13. The terms, conditions and provisions as contained in the Agreement entitled "Water Storage Tank, Access and Maintenance Easements", by and between Grand View Development, LLC, a Wyoming limited liability company and Town of Jackson, recorded January 19, 2011, as (instrument) 0788119 (book) 774 (page) 775, Official Records. (Maybe Lots 57 & 58; Lot 59, which is not part of this commitment)
B774P775

14. The terms, conditions and provisions as contained in the Agreement entitled "Utility, Water Supply Line and Drainage Pipe Access and Maintenance Easement", by and between Grand View Development, LLC, a Wyoming limited liability company and Town of Jackson, recorded January 19, 2011, as (instrument) 0788121 (book) 774 (page) 785, Official Records. (Maybe Lots 57 & 58; Lot 59, which is not part of this commitment)
B774P785

15. Restrictive Covenant Regarding Hotel Development, Condominium Rental Management Operations and Right of First Refusal, recorded August 31, 2012, as (instrument) 0821169 (book) 818 (page) 188, Official Records.
B818P188

NOTE: Subject to expirations and terminations as set out in 2, 3, and 4, therein.

First Amendment to Restrictive Covenant Regarding Hotel Development, Condominium Rental Management Operations and Right of First Refusal, recorded November 14, 2014, as (instrument) 0848316 (book) 858 (page) 827 Official Records.
B858P827

16. An easement over said land for natural gas distribution lines and incidental purposes, as granted to Lower Valley Energy, recorded July 22, 2015, as (book) 900 (page) 728, Official Records.
B900P728

17. Lease for Construction Staging, including the terms and conditions contained therein, recorded August 27, 2021, as (instrument) 1023206 , Official Records.
1023206

18. Any rights, easements, interests or claims which may exist or arise by reason of or reflected by the following facts shown on the ALTA/NSPS Survey for lot 57 of Grand View Lodges Third Addition to the Town of Jackson, Plat No. 1333, dated June 1, 2022, Job No. 22-133-01, by Nelson Engineering, Lucas D. Rudolph, Wyoming Professional Land Surveyor 15442.
Survey

19. Any rights, easements, interests or claims which may exist or arise by reason of or reflected by the following facts shown on the ALTA/NSPS Survey of Lot 53 of Grand View Lodges Second Addition to the Town of Jackson, Plat No. 1236, and Lot 58 of Grand View Lodges Third Addition to the Town of Jackson, Plat No. 1333, dated June 7, 2022, Job No. 21-222-01, by Nelson Engineering, Lucas D. Rudolph Professional Land Surveyor 15442.
Survey

********** End of Schedule B **********

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No. **W-28577**
Policy No. **5011456-0013847e**

ALTA Endorsement 3-06
CLTA Endorsement 123.1-06
Fee: $3167.00

1. The Company insures against loss or damage sustained by the Insured in the event that, at Date of Policy,

   a. According to applicable zoning ordinances and amendments, the Land is not classified Zone Planned Resort-Snow King aka PR-SK;

   b. The following use or uses are not allowed under that classification:
   (i) residential condominiums or townhouses, (ii) short-term rental units, and (iii) the uses contained on the Snow King Resort Land Use Schedule that are marked "Y" for the "Building Envelope Zone"

2. There shall be no liability under this endorsement based on

   a. Lack of compliance with any conditions, restrictions, or requirements contained in the zoning ordinances and amendments, including but not limited to the failure to secure necessary consents or authorizations as a prerequisite to the use or uses. This paragraph 2.a. does not modify or limit the coverage provided in Covered Risk 5.

   b. The invalidity of the zoning ordinances and amendments until after a final decree of a court of competent jurisdiction adjudicating the invalidity, the effect of which is to prohibit the use or uses.

   c. The refusal of any person to purchase, lease or lend money on the Title covered by this policy.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052

Authorized Countersignature

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No.	**W-28577**	**ALTA Endorsement 19-06**
Policy No.	**5011456-0013847e**	**CLTA Endorsement 116.4.1-06**
		Fee:

The Company insures against loss or damage sustained by the Insured by reason of:

1. the failure of South boundary line of Lot 53 of Grand View Lodges Second Addition to the Town of Jackson, Plat 1236 of the Land to be contiguous to the North boundary of Lot 58, Grand View Lodges Third Addition to the Town of Jackson, Plat 1333; as approximately shown on survey made by Nelson Engineering dated June 6, 2022 and designated as Job No. 21-222-01, or

2. the presence of any gaps, strips, or gores separating any of the contiguous boundary lines described above.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052

Authorized Countersignature

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No. **W-28577**
Policy No. **5011456-0013847e**

ALTA Endorsement 17.1-06
CLTA Endorsement 103.12-06
Fee: **$4750.00**

The Company insures against loss or damage sustained by the Insured if, at Date of Policy (i) easements in Book 363 of photo, page 1068 recorded October 26, 1998, in Book 713 of Photo, page 130 recorded November 19, 2008, in Book 595 of Photo, page 540 recorded July 14, 2005, and easements contained in Plat Nos. 1236 and 1333 does not provide that portion of the Land identified in Schedule A both actual vehicular and pedestrian access to and from Snow King Avenue (the "Street"), (ii) the Street is not physically open and publicly maintained, or (iii) the Insured has no right to use existing curb cuts or entries along that portion of the Street abutting the Easement.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052

Authorized Countersignature

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No. **W-28577**
Policy No. **5011456-0013847e**

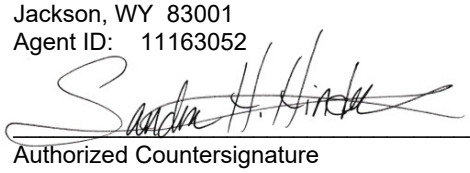
ALTA Endorsement 26-06
CLTA Endorsement 116.8-06
Fee: **$3167.00**

The Company insures against loss or damage sustained by the Insured by reason of the failure of the Land to constitute a lawfully created parcel according to the subdivision statutes and local subdivision ordinances applicable to the Land.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052



Authorized Countersignature

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No. **W-28577**
Policy No. **5011456-0013847e**

ALTA Endorsement 25-06
CLTA Endorsement 116.1-06
Fee: **$3167.00**

The Company insures against loss or damage sustained by the Insured by reason of the failure of the Land as described in Schedule A to be the same as that identified on the survey made by Nelson Engineering, Lucas D. Rudolph, Wyoming Professional Land Surveyor 15442 dated 6/1/2022 and dated 6/7/2022, and designated Job No. 22-133-01 and 21-222-01.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052

Authorized Countersignature

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No. **W-28577**
Policy No. **5011456-0013847e**

ALTA Endorsement 9.1-06
CLTA Endorsement 100.9-06
Fee: **$1584.00**

1. The insurance provided by this endorsement is subject to the exclusions in Section 4 of this endorsement; and the Exclusions from Coverage, the Exceptions from Coverage contained in Schedule B, and the Conditions in the policy.
2. For the purposes of this endorsement only, "Covenant" means a covenant, condition, limitation or restriction in a document or instrument in effect at Date of Policy.
3. The Company insures against loss or damage sustained by the Insured by reason of:
   a. A violation on the Land at Date of Policy of an enforceable Covenant, unless an exception in Schedule B of the policy identifies the violation; or
   b. A notice of a violation, recorded in the Public Records at Date of Policy, of an enforceable Covenant relating to environmental protection describing any part of the Land and referring to that Covenant, but only to the extent of the violation of the Covenant referred to in that notice, unless an exception in Schedule B of the policy identifies the notice of the violation.
4. This endorsement does not insure against loss or damage (and the Company will not pay costs, attorneys' fees, or expenses) resulting from:
   a. any Covenant contained in an instrument creating a lease;
   b. any Covenant relating to obligations of any type to perform maintenance, repair, or remediation on the Land; or
   c. except as provided in Section 3.b, any Covenant relating to environmental protection of any kind or nature, including hazardous or toxic matters, conditions, or substances.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052

Authorized Countersignature

Wyoming Title & Escrow, Inc.

Policy Issuing Agent for First American Title Insurance Company

Order No. **W-28577**
Policy No. **5011456-0013847e**

ALTA Endorsement 18.1-06
CLTA Endorsement 129.1-06
Fee: $75.00

The Company insures against loss or damage sustained by the Insured by reason of:

1. those portions of the Land identified below not being assessed for real estate taxes under the listed tax identification numbers or those tax identification numbers including any additional land:

Parcel:	1. Lot 53 of Grand View Lodges Second Addition, Plat 1236 2. Lot 57 of Grand View Lodges Third Addition, Plat 1333 3. Lot 58 of Grand View Lodges Third Addition, Plat 1333	Tax Identification Numbers:	1. OJ-007194 (Lot 53) 2. OJ-008086 (Lot 57) 3. OJ-008087 (Lot 58)

2. the easements, if any, described in Schedule A being cut off or disturbed by the nonpayment of real estate taxes, assessments or other charges imposed on the servient estate by a governmental authority.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Dated: August 30, 2023 at 4:03PM

Issued By:
Wyoming Title & Escrow, Inc.
1110 Maple Way Suite A
P.O. Box 4429
Jackson, WY 83001
Agent ID: 11163052

Authorized Countersignature

CERTIFICATE OF SURVEYOR

State of Wyoming)
)ss.
County of Teton)

I, Michael J. Quinn, a Professional Land Surveyor of Wilson, Wyoming, hereby certify, to the best of my knowledge and belief:

that by authority of the owners I have subdivided the lands shown on this plat into lots to be known as **GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON.**

that the lands of this subdivision are described as:
Lots 54 and 56 of Grand View Lodges Second Addition to the Town of Jackson, Plat No. 1236 as recorded in the Office of the Teton County Clerk, and located in the SE1/4 NW1/4 and the NE/14 SW1/4 of Section 34, Township 41 North, Range 116 West, 6th P.M., Town of Jackson, Teton County, Wyoming.

Containing 28.85 acres, more or less, subject to and together with easements, rights-of-way, reservations, restrictions, and agreements, of sight and/or of record.

that this plat was made from the notes of surveys made by me or under my direction, and from records in the Office of the Teton County Clerk;

that all dimensions and areas are correctly shown;

that all corners will be monumented as shown by November 1, 2013.

Professional Land Surveyor MICHAEL J. QUINN 4270 Date WYOMING

Michael J. Quinn, Wyoming Professional Land Surveyor 4270

30 OCT 2013

The foregoing instrument was acknowledged before me by Michael J. Quinn this 30TH day of OCTOBER, 2013.
Witness my hand and official seal.

JOHN B. BAENEN - NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES - APR. 20, 2016

Notary Public

My commission expires: 4/20/16

CERTIFICATE OF ENGINEER

State of Wyoming)
)ss.
County of Teton)

I, Robert R. Norton hereby certify that the water distribution and sewer collection facilities designed for the foregoing subdivision are adequate and safe, and meet Federal, State, and Town of Jackson requirements if built as designed and operated correctly.

Robert R. Norton, Wyoming Professional Engineer and Land Surveyor 2910

Professional Engineer (Civil) & Land Surveyor ROBERT R. NORTON 2910 Date WYOMING

The foregoing instrument was acknowledged before me by Robert R. Norton, this 31ST day of OCT. 2013.

Witness my hand and official seal.

JOHN B. BAENEN - NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES - APR. 20, 2016

Notary Public

My commission expires: 4/20/16

CERTIFICATE OF ACCEPTANCE

State of Wyoming)
County of Teton)ss.
City of Jackson)

The foregoing Subdivision, **GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON**, was approved at the regular meeting of the Jackson Town Council on the 7TH day of OCTOBER, 2013 in accordance with Section 15-1-415 Wyoming Statutes.

SEAL

ATTEST:
Town Clerk

Town of Jackson
Mayor

Town Engineer

Planning Director

CERTIFICATE OF MORTGAGEE

State of Wyoming)
)ss.
County of Teton)

The undersigned hereby certifies that they are the holder of a mortgage on the lands shown and described hereon, recorded in Book 821, Pages 1039–1044, in the Office of the Teton County Clerk, Wyoming. That they do hereby join in and consent to the dedication of the land and easements as shown hereon and described of the land in the Certificate of Owner, that they do hereby agree that their mortgage shall be subordinate to the dedications and easements shown hereon and described thereon.

Cache Peak LLC, a Wyoming limited liability company

William B. Resor

The foregoing instrument was acknowledged before me by WILLIAM B. RESOR, as MANAGER of Cache Peak LLC, a Wyoming limited liability company, this 31ST day of OCT. 2013.

JOHN B. BAENEN - NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES - APR. 20, 2016

Notary Public
My Commission Expires 4/20/16

CERTIFICATE OF OWNER

State of Wyoming)
)ss
County of Teton)

The undersigned owners and proprietors of the lands described in the Certificate of Surveyor and shown hereon hereby certify;

that the foregoing subdivision as shown hereon is with the free consent and in accordance with the desires of the undersigned owners and proprietors;

that the name of the subdivision shall be **GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON;**

that this subdivision is subject to that Affidavit Affecting Title regarding Snow King Planned Resort District Master Plan, as recorded in Book 429 of Photo, page 1–211, and Amendment to Affidavit recorded in Book 805, pages 651–659, records of Teton County;

that this subdivision is subject to that easement to Lower Valley Power and Light, Inc. as recorded in Book 4 of Photo, page 85, records of the Clerk of Teton County;

that this subdivision is subject to and benefited by those Beneficial Driveway and Utility Easements as recorded in Book 595 of Photo, pages 526–532, Book 595 of Photo, pages 533–539, Book 595 of Photo, pages 540–546 and Book 595 of Photo, pages 547–553, and to those easements, covenants, conditions and restrictions as shown on Grand View Lodges Second Addition to the Town of Jackson, Plat no. 1236, records of Teton County;

that this subdivision is subject to: that Declaration of Covenants, Conditions and Restrictions for the Snow King Planned Resort District as recorded in Book 733, pages 179–187, First Amendment of the Declaration of Covenants, Conditions and Restrictions for the Snow King Planned Resort as recorded in Book 796, pages 428–430, and the Amended and Restated Declaration of Covenants, Conditions and Restrictions as recorded in Book 818, pages 118–125, records of Teton County;

that this subdivision is subject to that Agreement to Convey Easements as recorded in Book 774, pages 738–769, records of Teton County;

that this subdivision is subject to that Roadway Access Easement, location to be determined, as recorded in Book 774, pages 770–774, records of Teton County;

that this subdivision is subject to that Restrictive Covenant Regarding Hotel Development, Condominium Rental Management Operations and Right of First Refusal as recorded in Book 818, pages 188–201, records of Teton County;

that all Common Elements and Areas to be located upon Lot 57 and Lot 58 as shown hereon, as the same are planned to be further subdivided for condominium ownership, are to be granted to the Grand View Lodges Homeowners Association;

that all Common Elements and Areas to be located upon Lot 57 and Lot 58 as shown hereon, as the same are planned to be further subdivided for condominium ownership, are to be dedicated to the owners, their heirs, assigns, and guests, of a lot within this subdivision and future additions hereto;

that an easement across the General Common Elements and Areas to be located upon Lot 57 and Lot 58 as shown hereon, as the same are planned to be further subdivided for condominium ownership, but excluding any areas occupied or to be occupied by lodges or structures, is hereby reserved to the undersigned owners and proprietors for use as skier, pedestrian, and bicycling pathway easements to be granted to third parties at the sole discretion of the undersigned owners and proprietors;

that Limited Common Elements to be located upon Lot 57, Lot 58, and Lot 59 as shown hereon, as the same are planned to be further subdivided for condominium ownership, are to be dedicated to the exclusive use and enjoyment of the owner of the appurtenant unit, subject to the easements granted herein and subject to the rights of the Homeowners Association and its authorized representatives to enter upon said Limited Common Elements for the purpose of installing, maintaining, inspecting, or repairing, utility features and structures of this subdivision;

that the undersigned owners and proprietors hereby reserve to themselves, their heirs and assigns, the right to create future easements for access, utilities, encroachments, construction and related activities, ski area, recreation, pedestrian, snow storage, and pathways across the lands of this plat;

that access to this subdivision is from Snow King Loop Road through that easement recorded in Book 713, pages 130 through 140, records of the Clerk of Teton County;

that the roadway and utility easements as show hereon, are reconfigured and rededicated and shown hereon as roadway and utility easements for the use of the owners, their heirs and assigns of a lot or unit within this subdivision and to those owners of lots or units located upon the lands of the Love Ridge Lodge Homes Additions to the Town of Jackson and Grand View Lodges Additions to the Town of Jackson and subsequent subdivisions thereof;

that a non–exclusive easement across the roadway and utility easements as shown hereon is hereby granted to those companies or entities supplying utility services to the subdivision, including Lower Valley Energy, Century Link Corporation, Bresnan Communication, and their heirs, assigns, and successors in interest for the installation, repair, and maintenance of underground utility lines and appurtenances, including underground electrical, gas, and communications lines;

that the 30 foot wide storm sewer easement across a portion of lot 59 as shown hereon is hereby granted to the Town of Jackson;

that access to sewer and water facilities, including pipelines, manholes, meters and valves, is hereby granted to the Town of Jackson;

that access across the roads and driveways located within this subdivision is hereby granted to emergency vehicles including ambulances, fire fighting vehicles, and police vehicles;

that the lands of this plat are subject to noise, lighting, traffic, and other disturbances associated with ski area operation, recreation, construction, and resort uses on the lands of this plat and on adjoining lands, and that substantial future additions to the adjacent resort facilities may be constructed on the lands of this plat or on adjoining lands;

that Lot 54 and Lot 56 of Grand View Lodges Second Addition to the Town of Jackson, Plat 1236 as recorded in the Office of the Teton County Clerk, are hereby vacated in accordance with the Town of Jackson Land Development Regulations, Article VI, Division 6200 and sections 34–12–106 through 110, Wyoming Statues, and the Clerk of Teton County is hereby respectfully requested to write "vacated" across said Lots, they being reconfigured as shown hereon;

that the seller does not warrant to purchaser that he shall have any rights to the continued natural flow of any stream or river within or adjacent to the subdivision;

that Wyoming law does not recognize any riparian rights to the continued natural flow of a stream or river to persons living on the bank of the stream or river;

that all rights under and by virtue of the homestead exemption laws of the State of Wyoming are hereby waived and released;

that this subdivision is subject to rights–of–way, easements, restrictions, reservations, and conditions, of sight and/or of record, including but not limited to those shown hereon.

Grand View Development LLC, a Wyoming limited liability company

BY: Manuel Lopez, manager

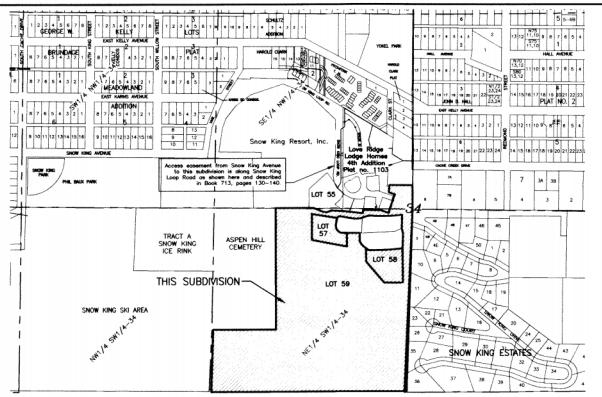
The foregoing instrument was acknowledged before me by Manuel Lopez as manager of Grand View Development LLC, a Wyoming limited liability company, this 31ST day of OCT, 2013.

WITNESS my hand and official seal.

JOHN B. BAENEN - NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES - APR. 20, 2016

Notary Public

My commission expires: 4/20/16



Vicinity Map

(Part) Section 34, T41N, R116W
scale: 1" = 400'

Zoning District: Planned Resort District
Number of Lots: 3 Lots

Total Acreage: 28.85 Acres

SUBMITTAL DATE: 8/01/13
FINAL SUBMITTAL REVISION: 10/28/13

CERTIFICATE OF MORTGAGEE

State of Wyoming)
)ss.
County of Teton)

The undersigned hereby certifies that they are the holders of mortgages on the lands shown and described hereon, recorded in Book 821, Pages 1010–1016, and in Book 821, pages 1017–1022, in the Office of the Teton County Clerk, Wyoming. That they do hereby join in and consent to the dedication of the land and easements as shown hereon and described of the land in the Certificate of Owner, that they do hereby agree that their mortgage shall be subordinate to the dedications and easements shown hereon and described thereon.

The Bank of Jackson Hole

BY: D. Wayne Ruby
ITS: Sr. V.P.

Attest:

BY: _____
ITS:

State of Wyoming)
)ss.
County of Teton)

On the ____day of _____ 2013, before me personally appeared, _____ and _____ known to me, and who executed the foregoing instrument as _____ and _____ of The Bank of Jackson Hole, and being by me duly sworn, did depose and say they executed the foregoing instrument on behalf of said corporation and that said instrument is the free act and deed of said corporation.

WITNESS my hand and official seal.

Attest:

Bank of Jackson Hole

The foregoing instrument was acknowledged before me by D. WAYNE RUBY and _____ the _____ and _____ of the Bank of Jackson Hole, respectively, this 31ST day of OCT., 2013.

Witness my hand and official seal.

JOHN B. BAENEN - NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES APR 20, 2016

Notary Public
My Commission Expires 4/20/2016

CERTIFICATE OF MORTGAGEE

State of Wyoming)
)ss.
County of Teton)

The undersigned hereby certifies that they are the holder of a mortgage on the lands shown and described hereon, recorded in Book 821, Pages 1052–1057, in the Office of the Teton County Clerk, Wyoming. That they do hereby join in and consent to the dedication of the land and easements as shown hereon and described of the land in the Certificate of Owner, that they do hereby agree that their mortgage shall be subordinate to the dedications and easements shown hereon and described thereon.

Manuel Lopez

Deborah Lopez

The foregoing instrument was acknowledged before me by Manuel Lopez and Deborah Lopez, this 31ST day of OCT, 2013.

JOHN B. BAENEN - NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES APR 20, 2016

Notary Public
My Commission Expires 4/20/16

GRANTOR: GRAND VIEW DEVELOPMENT LLC
GRANTEE: THE PUBLIC PLAT #1333
Doc 0848315 bk 1333 pg 827-827 Filed At 13:19 ON 11/14/13
Sherry L. Daigle Teton County Clerk fees 75.00
By Mary D Arrobus Deputy

Owner and Subdivider:
Grand View Development, LLC
Box 928
Jackson, Wyoming 83001
(307) 733–5200

Engineer and Surveyor:
Nelson Engineering
Box 1599
Jackson, Wyoming 83001
(307) 733–2087

THIS SUBDIVISION SHALL NOT BE SUBJECT TO FURTHER DIVISION EXCEPT AS PERMITTED BY THE TOWN OF JACKSON LAND DEVELOPMENT REGULATIONS.

THIS SUBDIVISION WILL BE CONNECTED TO THE TOWN OF JACKSON WATER SUPPLY AND SEWAGE COLLECTION AND TREATMENT SYSTEMS

SELLER DOES NOT WARRANT TO PURCHASER THAT HE HAS ANY RIGHTS TO THE NATURAL FLOW OF ANY STREAM OR RIVER WITHIN OR ADJACENT TO THE SUBDIVISION

WYOMING LAW DOES NOT RECOGNIZE ANY RIPARIAN RIGHTS TO THE CONTINUED NATURAL FLOW OF A STREAM OR RIVER TO PERSONS LIVING ON THE BANKS OF THE STREAM OR RIVER

THE SURFACE ESTATE OF THE LAND TO BE SUBDIVIDED IS SUBJECT TO FULL AND EFFECTIVE DEVELOPMENT OF THE MINERAL ESTATE

THE ROADS OF THIS SUBDIVISION ARE PRIVATELY OWNED AND MAINTAINED. NO PUBLIC MAINTENANCE OF STREETS OR ROADS.

THE WATER DISTRIBUTION AND SEWER COLLECTION SYSTEMS WITHIN THIS SUBDIVISION ARE PRIVATELY OWNED AND MAINTAINED.

THIS SUBDIVISION IS SUBJECT TO SIGNIFICANT IMPACTS FROM SKI AREA, RESORT, AND RECREATIONAL USES UPON THE LANDS OF THIS SUBDIVISION AND ADJOINING LANDS, INCLUDING NOISE, SNOWMAKING, LIGHTING, AND TRAFFIC IMPACTS ASSOCIATED WITH THESE USES AND THE CONSTRUCTION OF ADDITIONAL FACILITIES

SNOW KING RESORT PLANS SUBSTANTIAL FUTURE ADDITIONS TO THEIR FACILITIES. THESE ADDITIONS WILL INCLUDE CONDOMINIUM, HOTEL, CONVENTION, AND OTHER RESORT AND RECREATION FACILITIES. THESE ADDITIONS WILL OCCUR UPON THE LANDS OF THIS SUBDIVISION AND ADJOINING LANDS WITH SIGNIFICANT NOISE, LIGHTING, AND TRAFFIC IMPACTS.

DEVELOPMENT OF ANY OF THE LOTS OF THIS SUBDIVISION SHALL BE IN CONFORMANCE WITH THE APPROVED DEVELOPMENT PLAN ON FILE WITH THE TOWN OF JACKSON AND ANY AMENDMENTS THERETO.

GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON

a subdivision of Lots 54 and 56 of Grand View Lodges Second Addition to the Town of Jackson Plat no. 1236

located within the SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 34, T41N, R116W, 6th P.M., Town of Jackson, Teton County, Wyoming

1333

NELSON ENGINEERING
P.O. BOX 1569, JACKSON WYOMING (307) 733–2087

DATE	8/01/13
SURVEYED	
ENGINEERED	NE
DRAWN	SK
CHECKED	MJQ
APPROVED	
REV.	10/28/13

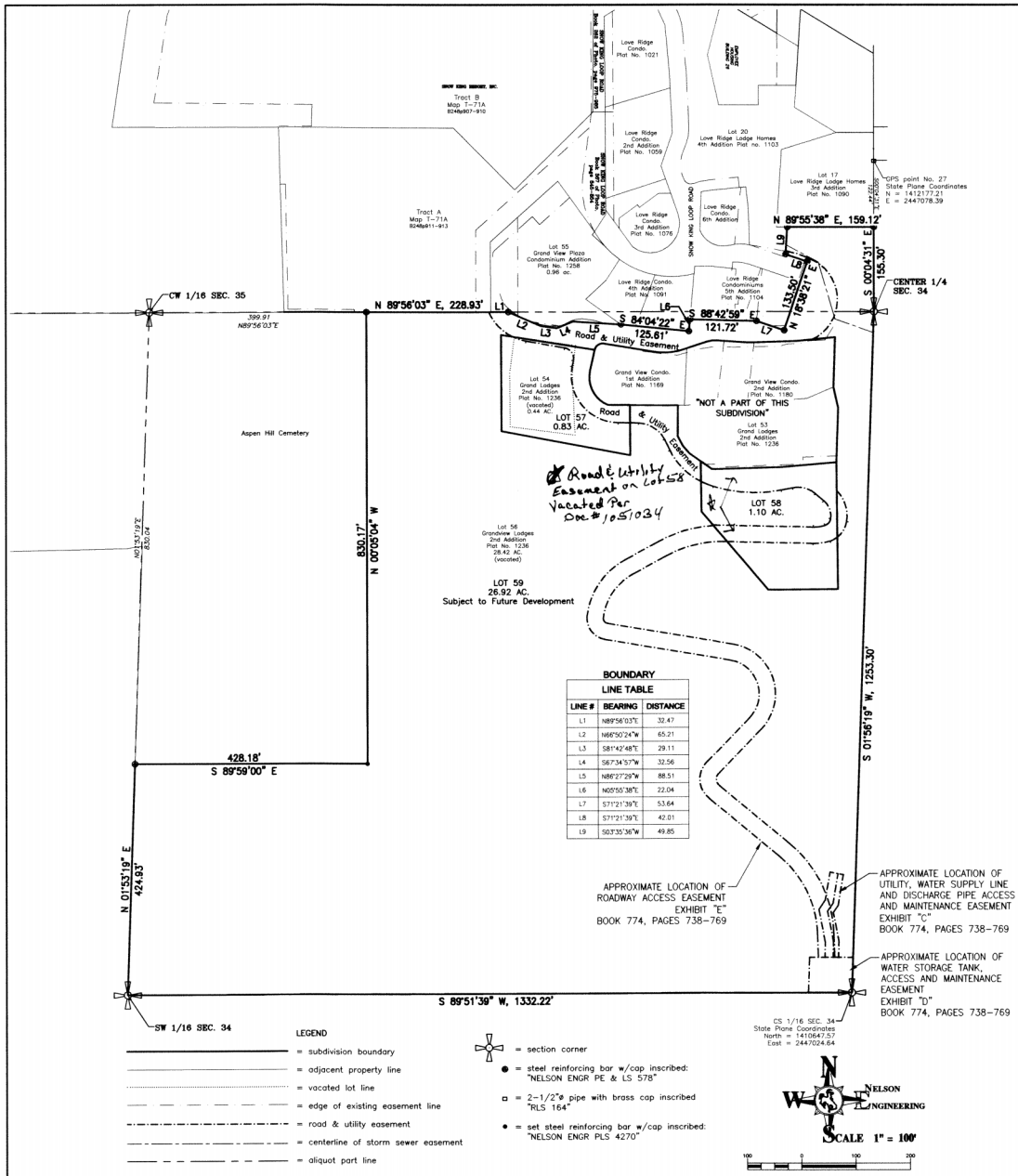
DRAWING TITLE: CERTIFICATE PAGE

JOB TITLE: GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON

DRAWING NO: 1 of 3

JOB NO: 13-102-01

S:\Proj\2013\102-01 Grand View Lodges 3rd Addition Plat\Plat\Cert.dwg, 10/29/2013 8:52:59 AM, PLOTTED BY: Hardhauer



LINE TABLE

LINE #	BEARING	DISTANCE
L1	N89°56'03"E	32.47
L2	N66°50'24"W	65.21
L3	S81°42'48"E	29.11
L4	S67°34'57"W	32.56
L5	N86°27'29"W	88.51
L6	N05°55'38"E	22.04
L7	S71°21'39"E	53.64
L8	S71°21'39"E	42.01
L9	S03°35'36"W	49.85

LEGEND

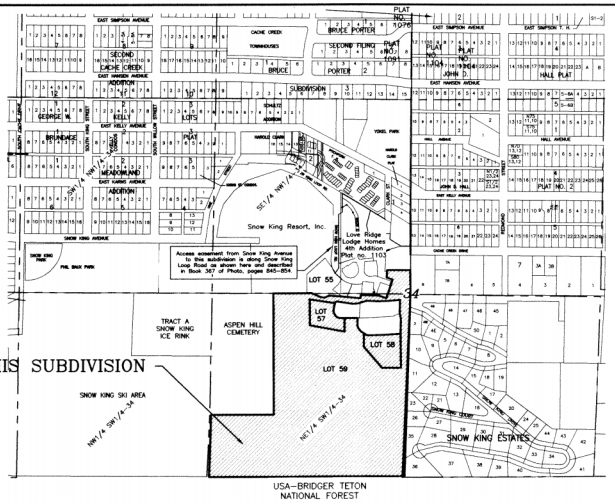
- = subdivision boundary
- = adjacent property line
- = vacated lot line
- = edge of existing easement line
- = road & utility easement
- = centerline of storm sewer easement
- = aliquot part line

- = section corner
- ● = steel reinforcing bar w/cap inscribed: "NELSON ENGR PE & LS 578"
- □ = 2-1/2"ø pipe with brass cap inscribed "RLS 164"
- ● = set steel reinforcing bar w/cap inscribed: "NELSON ENGR PLS 4270"

NELSON ENGINEERING

SCALE 1" = 100'

100 0 100 200



Vicinity Map

(Part) Section 34, T41N, R116W
scale: 1" = 400'

Zoning District: Planned Resort District
Number of Lots: 3 Lots

Total Acreage: 28.85 Acres

SUBMITTAL DATE: 8/01/13
FINAL SUBMITTAL REVISION: 10/28/13

THIS SUBDIVISION SHALL NOT BE SUBJECT TO FURTHER DIVISION EXCEPT AS PERMITTED BY THE TOWN OF JACKSON LAND DEVELOPMENT REGULATIONS.

THIS SUBDIVISION WILL BE CONNECTED TO THE TOWN OF JACKSON WATER SUPPLY AND SEWAGE COLLECTION AND TREATMENT SYSTEMS

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SNOW KING RESORT PLANS SUBSTANTIAL FUTURE ADDITIONS TO THEIR FACILITIES. THESE ADDITIONS WILL INCLUDE CONDOMINIUM, HOTEL, CONVENTION, AND OTHER RESORT AND RECREATION FACILITIES. THESE ADDITIONS WILL OCCUR UPON THE LANDS OF THIS SUBDIVISION AND ADJOINING LANDS WITH SIGNIFICANT NOISE, LIGHTING, AND TRAFFIC IMPACTS.

DEVELOPMENT OF ANY OF THE LOTS OF THIS SUBDIVISION SHALL BE IN CONFORMANCE WITH THE APPROVED DEVELOPMENT PLAN ON FILE WITH THE TOWN OF JACKSON AND ANY AMENDMENTS THERETO.

GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON

a subdivision of Lots 54 and 56
of Grand View Lodges
Second Addition to the Town of Jackson
Plat no. 1236

located within the
SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 34,
T41N, R116W, 6th P.M.,
Town of Jackson,
Teton County, Wyoming

1333

Owner and Subdivider:
Grand View Development, LLC
Box 928
Jackson, Wyoming 83001
(307) 733-5200

Engineer and Surveyor:
Nelson Engineering
Box 1599
Jackson, Wyoming 83001
(307) 733-2087

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

	DATE	BY
SURVEYED	8/01/13	NE
ENGINEERED		
DRAWN		SK
CHECKED		MAQ
APPROVED		
REV.	10/30/13	

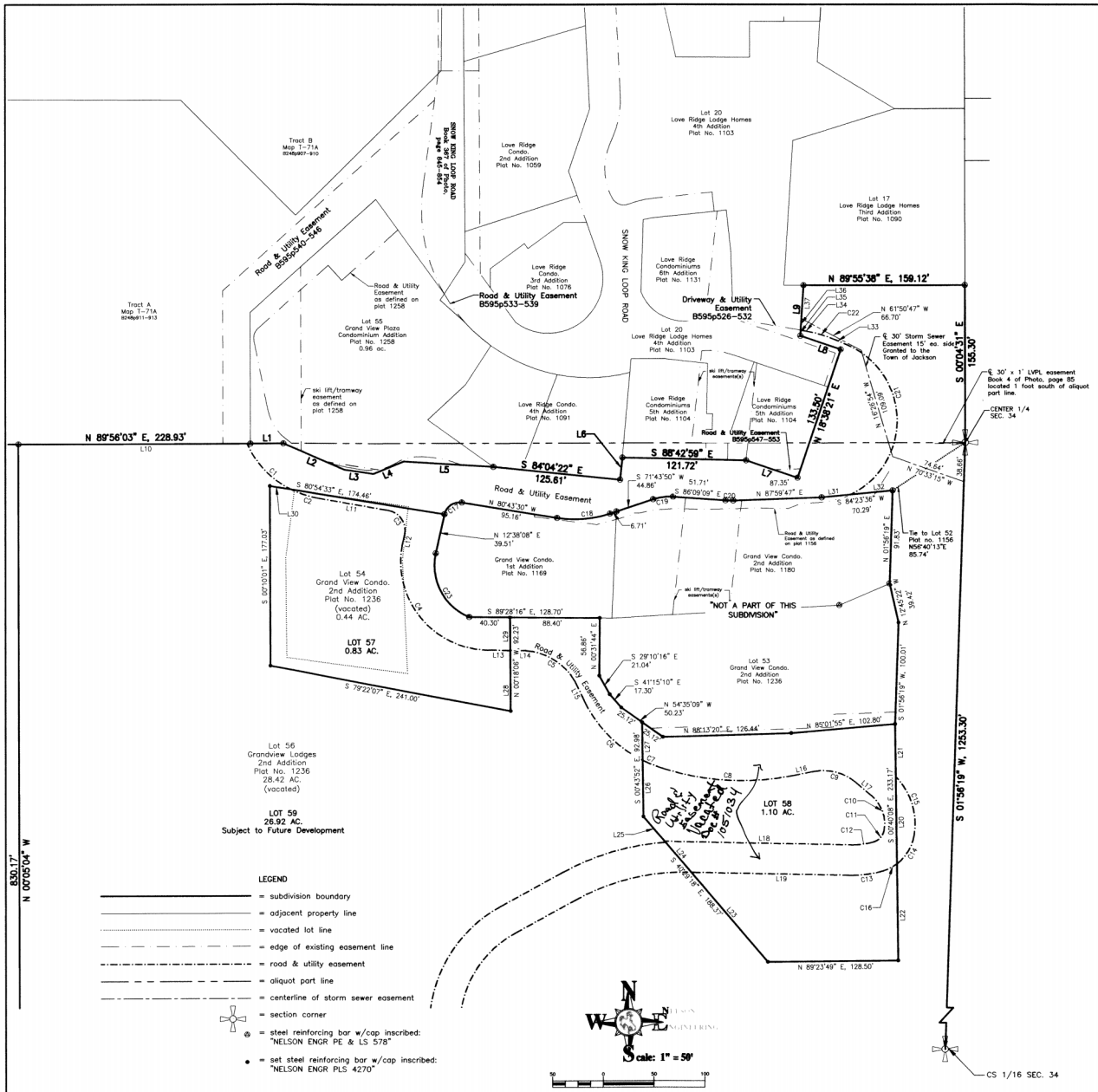
DRAWING TITLE: SITE PLAN

JOB TITLE: GRAND VIEW LODGES THIRD ADDITION TO THE TOWN OF JACKSON

DRAWING NO: 2 of 3

JOB NO: 13-102-01

S:\PROJOBS\13-102-01\DWG\13-102-01.PLAT.DWG 103 SCALE PG 01 MAR 18 2015 3:39:26 AM PLOTTED BY: KARCHNER



ROAD & UTILITY EASEMENT

LINE TABLE			
	LINE #	BEARING	DISTANCE
TIE	L10	N89°56'03"E	225.66
	L11	N80°13'23"W	72.16
	L12	N12°38'09"E	10.87
	L13	N89°05'47"W	21.73
	L14	S89°05'47"E	15.49
	L15	S25°34'21"E	22.36
	L16	N78°50'51"E	21.45
	L17	S49°52'02"E	20.40
	L18	N88°54'43"W	184.85
	L19	N88°54'43"W	158.24
TIE	L20	S00°40'08"E	85.63
	L21	S00°40'08"E	52.15
	L22	S00°40'08"E	95.39
	L23	S40°29'18"E	116.26
	L24	N40°29'18"W	40.10
TIE	L25	N40°29'18"W	32.01
TIE	L26	S00°43'52"E	54.76
TIE	L27	N00°43'52"W	38.22
	L28	S00°18'08"E	54.41
	L29	N00°18'08"W	37.81

LINE TABLE			
LINE #	BEARING	DISTANCE	
L30	N80°54'33"W	20.64	

ROAD & UTILITY EASEMENT

CURVE TABLE					
CURVE #	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	63.47	91.07	39°56'03"	S43°28'47"E	62.20
C2	26.66	91.07	16°46'35"	S71°50'06"E	26.57
C3	32.41	20.00	92°51'32"	N33°47'37"W	28.98
C4	152.09	87.05	100°06'03"	S39°28'16"E	133.47
C5	59.25	61.35	55°20'24"	N57°54'03"W	56.98
C6	82.66	125.00	37°53'25"	S44°31'03"E	81.17
C7	23.65	136.16	9°56'59"	S68°40'55"E	23.62
C8	126.33	255.43	28°20'13"	S86°58'40"E	125.05
C9	44.75	50.00	51°17'07"	N75°30'36"W	43.28
C10	37.59	36.40	59°09'57"	N20°17'04"W	35.94
C11	16.12	14.62	63°09'17"	N40°52'34"E	15.31
C12	21.89	70.00	17°54'55"	N82°07'50"E	21.80
C13	31.27	100.00	17°54'55"	N82°07'50"E	31.14
C14	33.97	44.62	43°37'31"	N31°06'41"E	33.16
C15	62.30	66.40	53°45'25"	N17°34'47"W	60.04
C16	15.21	44.62	19°31'46"	N62°41'19"E	15.14

LINE TABLE		
LINE #	BEARING	DISTANCE
L31	N84°23'36"E	28.67
L32	N84°23'36"E	41.62
L33	N66°45'50"W	13.34
L34	S79°26'15"E	6.54
L35	N03°35'36"E	5.68
L36	N03°35'36"E	11.32
L37	N03°35'36"E	32.86

CURVE TABLE					
CURVE #	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C17	22.68	15.00	86°38'22"	S55°57'19"W	20.58
C18	52.88	110.00	27°32'41"	N85°30'10"E	52.37
C19	19.69	51.00	22°07'01"	S82°47'20"W	19.56
C20	7.66	75.00	5°51'04"	S89°04'41"E	7.66
C21	185.36	81.00	131°06'46"	S01°12'27"E	147.48
C22	28.53	129.00	12°40'25"	N73°06'03"W	28.48
C23	77.06	55.00	80°16'40"	S27°42'37"E	70.91

GRAND VIEW LODGES
THIRD ADDITION
TO THE TOWN OF JACKSON

a subdivision of Lots 54 and 56
of Grand View Lodges
Second Addition to the Town of Jackson
Plat no. 1236

located within the
SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 34,
T41N, R116W, 6th P.M.,
Town of Jackson,
Teton County, Wyoming

1333

REV.	10/28/15
DATE	6/01/15
SURVEYED	NE
ENGINEERED	
DRAWN	SK
CHECKED	MAQ
APPROVED	

NELSON ENGINEERING
P.O. BOX 1569, JACKSON WYOMING (307) 733-2087

DRAWING TITLE
SITE PLAN

JOB TITLE
GRAND VIEW LODGES
THIRD ADDITION
TO THE TOWN OF JACKSON

DRAWING NO 3 of 3

JOB NO 13-102-01

S:\PROJECTS\13-102-01\PLATS\ 05 SCALE PG 3 MAR 28, 2005 10:59 AM PLOTTED BY: AARONMER

CERTIFICATE OF SURVEYOR

State of Wyoming)
)ss
County of Teton)

I, Michael J. Quinn, a Professional Land Surveyor of Wilson, Wyoming, hereby certify, to the best of my knowledge and belief:

that by authority of the owners I have subdivided the lands shown on this plat into lots to be known as **GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON**.

that the lands of this subdivision are described as:
Lots 37 and 47 of Grand View Lodges Addition to the Town of Jackson, Plat No. 1156 as recorded in the Office of the Teton County Clerk, and located in the SE1/4 NW1/4 and the NE/14 SW1/4 of Section 34, Township 41 North, Range 116 West, 6th P.M., Town of Jackson, Teton County, Wyoming.

Containing 30.60 acres, more or less, subject to and together with easements, rights-of-way, reservations, restrictions, and agreements, of sight and/or of record.

that this plat was made from the notes of surveys made by me or under my direction, and from records in the Office of the Teton County Clerk;

that all dimensions and areas are correctly shown;

that all corners will be monumented as shown by September 30, 2008.

Professional Land Surveyor MICHAEL J. QUINN 4270 WYOMING

Michael J. Quinn, Wyoming Professional Land Surveyor 4270 — 4 April 2008

The foregoing instrument was acknowledged before me by Michael J. Quinn this 4TH day of April, 2008.
Witness my hand and official seal.

JOHN N. BATSON NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES APR. 20, 2012

Notary Public — My commission expires:_____

CERTIFICATE OF ENGINEER

State of Wyoming)
)ss
County of Teton)
I, Robert R. Norton hereby certify that the water distribution and sewer collection facilities designed for the foregoing subdivision are adequate and safe, and meet Federal, State, and Town of Jackson requirements if built as designed and operated correctly.

Robert R. Norton, Wyoming Professional Engineer and Land Surveyor 2910

The foregoing instrument was acknowledged before me by Robert R. Norton, this 4TH day of APRIL, 2008.

Witness my hand and official seal.

JOHN N. BATSON NOTARY PUBLIC COUNTY OF TETON STATE OF WYOMING MY COMMISSION EXPIRES APR. 20, 2012

Notary Public

My commission expires:_____

CERTIFICATE OF MORTGAGEE

Jackson State Bank & Trust (by separate affidavit)

CERTIFICATE OF ACCEPTANCE

State of Wyoming)
County of Teton)ss
City of Jackson)

The foregoing Subdivision, **GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON**, was approved at the regular meeting of the Jackson Town Council on the 17th day of March, 2008 in accordance with Section 15-1-415 Wyoming Statutes, 1977, as amended.

Attest: Town of Jackson

Clerk — Mayor

Jackson Town Engineer

THE TOWN OF JACKSON INCORPORATED SEAL 1914 TETON COUNTY, WYOMING

CERTIFICATE OF OWNER

State of Wyoming)
)ss
County of Teton)

The undersigned owners and proprietors of the lands described in the Certificate of Surveyor and shown hereon hereby certify:

that the foregoing subdivision as shown hereon is with the free consent and in accordance with the desires of the undersigned owners and proprietors;

that the name of the subdivision shall be **GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON;**

that this subdivision is subject to that Affidavit Affecting Title regarding Snow King Planned Resort District Master Plan, as recorded in Book 429 of Photo, page 1-211, records of Teton County;

that this subdivision is subject to that easement to Lower Valley Power and Light, Inc. as recorded in Book 4 of Photo, page 85, records of Teton County;

that this subdivision is subject to those Beneficial Driveway and Utility Easements as recorded in Book 595 of Photo, pages 526 through 532, Book 595 of Photo, pages 533 through 539, Book 595 of Photo, pages 540 through 546 and Book 595 of Photo, pages 547 through 553, records of Teton County;

that all Common Elements and Areas to be located upon lots 53 through 55 as shown hereon, as the same are planned to be further subdivided for condominium ownership, are to be granted to the Grand View Lodges Homeowners Association;

that all Common Elements and Areas to be located upon lots 53 through 55 as shown hereon, as the same are planned to be further subdivided for condominium ownership, are to be dedicated to the owners, their heirs, assigns, and guests, of a lot within this subdivision and future additions hereto;

that an easement across the General Common Elements and Areas to be located upon lots 53 through 55 as shown hereon, as the same are planned to be further subdivided for condominium ownership, but excluding any areas occupied or to be occupied by buildings or structures, is hereby reserved to the undersigned owners and proprietors for use as skier, pedestrian, and bicycling pathway easements to be granted to third parties at the sole discretion of the undersigned owners and proprietors;

that Limited Common Elements to be located upon lots 53 through 55 as shown hereon, as the same are planned to be further subdivided for condominium ownership, are to be dedicated to the exclusive use and enjoyment of the owner of the appurtenant unit, subject to the easements granted herein and subject to the rights of the Homeowners Association and its authorized representatives to enter upon said Limited Common Elements for the purpose of installing, maintaining, inspecting, or repairing, utility features and structures of this subdivision;

that the undersigned owner and proprietors hereby reserve to themselves, their heirs and assigns, the right to create future easements for access, utilities, encroachments, construction and related activities, ski area, recreation, pedestrian, snow storage, and pathways across the lands of this plat and on adjoining parcels;

that access to this subdivision is from Snow King Loop Road through that easement recorded in Book 367 of Photo, pages 845 through 854, records of Said Clerk;

that the roadway and utility easements as show on Grand View Lodges Addition to the Town of Jackson, Plat no. 1156, are reconfigured and rededicated and shown hereon as roadway and utility easements for the use of the owners, their heirs and assigns of a lot or unit within this subdivision and to those owners of lots or units located upon the lands of the Love Ridge Lodge Homes Addition to the Town of Jackson and subsequent subdivisions thereof;

that a non-exclusive easement across the roadway and utility easements as shown hereon is hereby granted to those companies or entities supplying utility services to the subdivision, including Lower Valley Energy, QWest Corporation, Bresnan Communication, and their heirs, assigns, and successors in interest for the installation, repair, and maintenance of underground utility lines and appurtenances, including underground electrical, gas, and communications lines;

that the 30 foot wide storm sewer easement across a portion of lot 56 as shown hereon is hereby granted to the Town of Jackson;

that access to sewer and water facilities, including pipelines, manholes, meters and valves, is hereby granted to the Town of Jackson;

that access across the roads and driveways located within this subdivision is hereby granted to emergency vehicles including ambulances, fire fighting vehicles, and police vehicles;

that the lands of this plat are subject to noise, lighting, traffic, and other disturbances associated with ski area operation, recreation, construction, and resort uses on the lands of this plat and on adjoining lands, and that substantial future additions to the adjacent resort facilities may be constructed on the lands of this plat or on adjoining lands;

that Lot 37 and Lot 47 of Grand View Lodges Addition to the Town of Jackson, Plat 1156 as recorded in the Office of the Teton County Clerk, are hereby vacated in accordance with the Town of Jackson Land Development Regulations, Article VI, Division 6200 and sections 34-12-106 through 110, Wyoming Statues, 1977, as amended, and the Clerk of Teton County is hereby respectfully requested to write "vacated" across said Lots they being reconfigured as shown hereon;

that the seller does not warrant to purchaser that he shall have any rights to the continued natural flow of any stream or river within or adjacent to the subdivision;

that Wyoming law does not recognize any riparian rights to the continued natural flow of a stream or river to persons living on the bank of the stream or river;

that all rights under and by virtue of the homestead exemption laws of the State of Wyoming are hereby waived and released;

that this subdivision is subject to rights-of-way, easements, restrictions, reservations, and conditions, of sight and/or of record, including but not limited to those shown hereon.

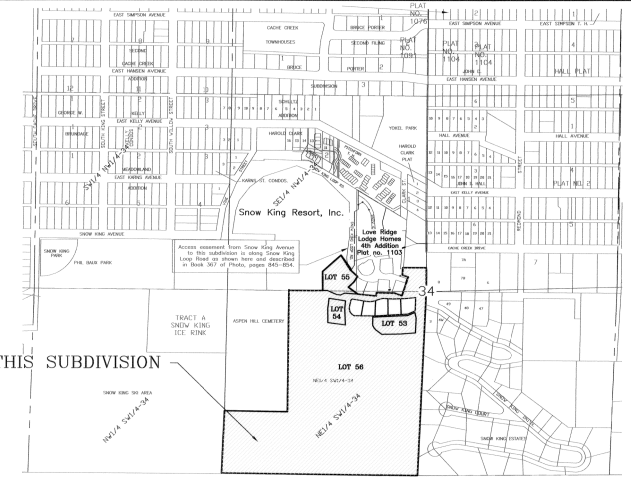
Grand View Development LLC, a Wyoming limited liability company

BY: SEPARATE AFFIDAVIT
Manuel Lopez, manager

The foregoing instrument was acknowledged before me by Manuel Lopez as manager of Grand View Development LLC, a Wyoming limited liability company, this _____ day of _____, 2008.

WITNESS my hand and official seal.

_____
Notary Public — My commission expires: _____



Vicinity Map
(Part) Section 34, T41N, R116W
scale: 1" = 400'

DEFINITIONS FOR FUTURE CONDOMINIUM UNITS TO BE LOCATED UPON LOTS OF THIS SUBDIVISION

(a) "UNIT" means an individual air space unit which is contained within the perimeter walls, floors, ceilings, windows, and doors of each unit of a Condominium Plat to be filed for record upon a lot of this subdivision, together with all fixtures and improvements therein contained but not including any structural components of the building, if any, located within the unit.

(b) "CONDOMINIUM" or "CONDOMINIUM UNIT" means the fee simple title in and to a unit together with an appurtenant undivided fractional interest in and to the general common elements of this subdivision.

(c) "GENERAL COMMON ELEMENTS" means and includes the land located within the subdivision and the structural components of the buildings, and all other parts of such land and the improvements thereon necessary or convenient to its existence, maintenance, and safety which are normally and reasonably in common use, including the air above such land. It shall also mean and include the limited common elements unless such elements are hereinafter or in the Declaration of Condominium specifically excluded as to any specific situation. (Common "Areas" refers to the lands within the General Common Elements not located within or under the buildings)

(d) "LIMITED COMMON ELEMENTS" means those portions of the general common elements which are either limited to and reserved for the exclusive use of an owner of a condominium unit or are limited to and reserved for the common use of more than one but fewer than all of the condominium unit owners.

THE LOTS OF THIS SUBDIVISION ARE SUBJECT TO FURTHER DIVISION.

THIS SUBDIVISION WILL BE CONNECTED TO THE TOWN OF JACKSON WATER SUPPLY AND SEWAGE COLLECTION AND TREATMENT SYSTEMS

SELLER DOES NOT WARRANT TO PURCHASER THAT HE HAS ANY RIGHTS TO THE NATURAL FLOW OF ANY STREAM OR RIVER WITHIN OR ADJACENT TO THE SUBDIVISION

WYOMING LAW DOES NOT RECOGNIZE ANY RIPARIAN RIGHTS TO THE CONTINUED NATURAL FLOW OF A STREAM OR RIVER TO PERSONS LIVING ON THE BANKS OF THE STREAM OR RIVER

THE ROADS OF THIS SUBDIVISION ARE PRIVATELY OWNED AND MAINTAINED.

THE WATER DISTRIBUTION AND SEWER COLLECTION SYSTEMS WITHIN THIS SUBDIVISION ARE PRIVATELY OWNED AND MAINTAINED.

THIS SUBDIVISION IS SUBJECT TO SIGNIFICANT IMPACTS FROM SKI AREA, RESORT, AND RECREATIONAL USES UPON THE LANDS OF THIS SUBDIVISION AND ADJOINING LANDS, INCLUDING NOISE, SNOWMAKING, LIGHTING, AND TRAFFIC IMPACTS ASSOCIATED WITH THESE USES AND THE CONSTRUCTION OF ADDITIONAL FACILITIES

SNOW KING RESORT PLANS SUBSTANTIAL FUTURE ADDITIONS TO THEIR FACILITIES. THESE ADDITIONS WILL INCLUDE CONDOMINIUM, HOTEL, CONVENTION, AND OTHER RESORT AND RECREATION FACILITIES. THESE ADDITIONS WILL OCCUR UPON THE LANDS OF THIS SUBDIVISION AND ADJOINING LANDS WITH SIGNIFICANT NOISE, LIGHTING, AND TRAFFIC IMPACTS.

DEVELOPMENT OF ANY OF THE LOTS OF THIS SUBDIVISION SHALL BE IN CONFORMANCE WITH THE APPROVED DEVELOPMENT PLAN ON FILE WITH THE TOWN OF JACKSON AND ANY AMENDMENTS THERETO.

1236

GRANTOR: GRAND VIEW DEVELOPMENT LLC
GRANTEE: THE PUBLIC PLAT #1236
Doc #726947 bk 2RAP pg 84-84 Filed At 11:54 AM 04/11/08
Sherry L. Daigle Teton County Clerk fees: 58.00
By Mary Smith Deputy

Zoning District: Planned Resort District
Number of Lots: 4 Lots

Total Acreage: 30.60 Acres

SUBMITTAL DATE: 1/25/08

FINAL SUBMITTAL REVISION: 4/04/08

Owner and Subdivider:
Grand View Development, LLC
Box 928
Jackson, Wyoming 83001
(307) 733-5200

Engineer and Surveyor:
Nelson Engineering
Box 1599
Jackson, Wyoming 83001
(307) 733-2087

GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON

a subdivision of Lots 37 and 47 of Grand View Lodges Addition to the Town of Jackson Plat no. 1156

located within the SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 34, T41N, R116W, 6th P.M., Town of Jackson, Teton County, Wyoming

DATE	1/07/08
SURVEYED	ns
ENGINEERED	
DRAWN	ak
CHECKED	mjq
APPROVED	
REV.	2/20/08

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

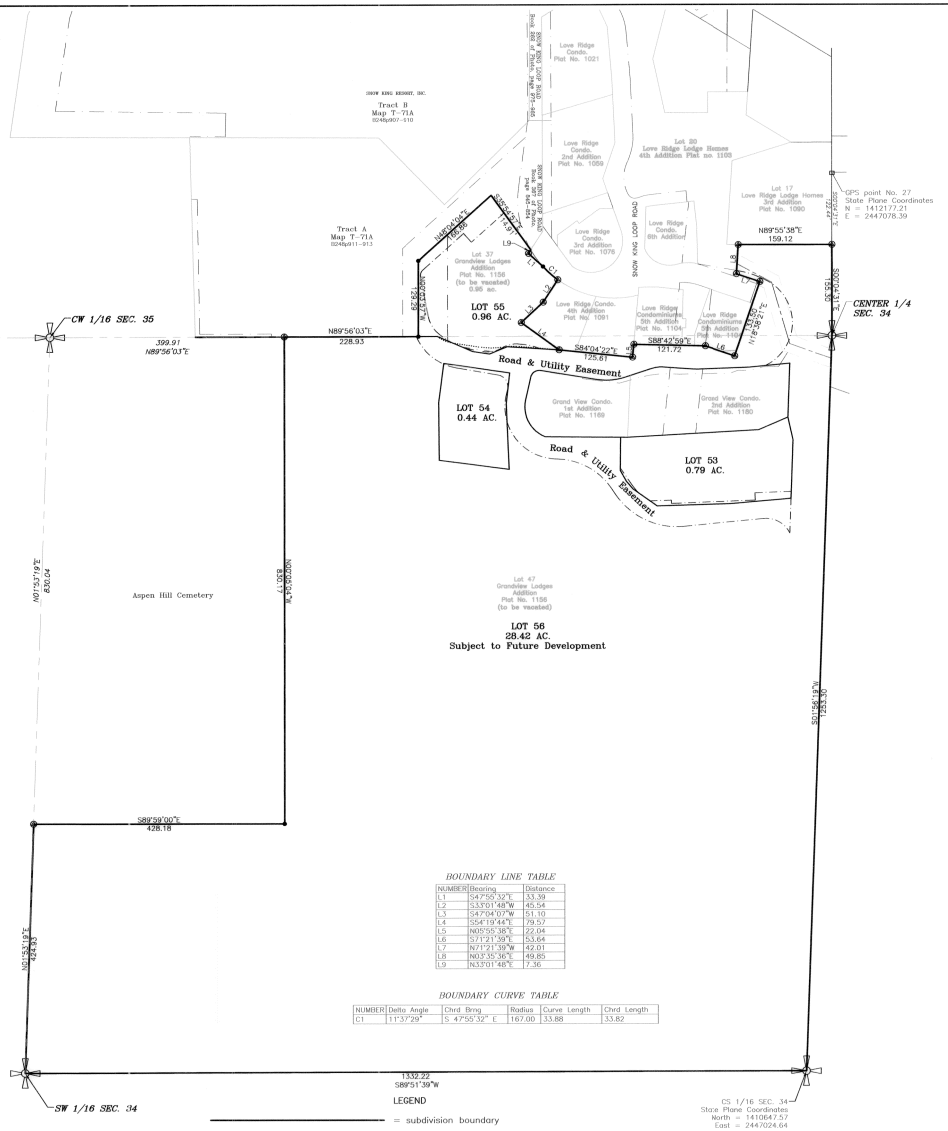
DRAWING TITLE: Final Plat Certificate Sheet

JOB TITLE: GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON

DRAWING NO 1 of 3

JOB NO 07-317-01

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BOUNDARY LINE TABLE

NUMBER	Bearing	Distance
L1	S47°55'32"E	33.39
L2	S33°01'48"W	45.54
L3	S47°04'07"W	51.10
L4	S54°19'44"E	79.57
L5	N05°55'38"E	22.04
L6	S71°21'39"E	53.64
L7	N71°21'39"W	42.01
L8	N03°39'36"E	49.85
L9	N33°01'48"E	7.36

BOUNDARY CURVE TABLE

NUMBER	Delta Angle	Chrd Brng	Radius	Curve Length	Chrd Length
C1	11°37'29"	S 47°55'32" E	167.00	33.88	33.82



Vicinity Map
(Part) Section 34, T41N, R116W
scale: 1" = 400'

THE LOTS OF THIS SUBDIVISION ARE SUBJECT TO FURTHER DIVISION.

THIS SUBDIVISION WILL BE CONNECTED TO THE TOWN OF JACKSON WATER SUPPLY AND SEWAGE COLLECTION AND TREATMENT SYSTEMS

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Zoning District: Planned Resort District
Number of Lots: 4 Lots

Total Acreage: 30.60 Acres

SUBMITTAL DATE: 1/09/08

FINAL SUBMITTAL REVISION: 4/04/08

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Owner and Subdivider:
Grand View Development, LLC
Box 928
Jackson, Wyoming 83001
(307) 733-5200

Engineer and Surveyor:
Nelson Engineering
Box 1599
Jackson, Wyoming 83001
(307) 733-2087

1236

DATE	11/19/07	REV 5/11/08
SURVEYED	NE	
ENGINEERED		
DRAWN	SK	
CHECKED		
APPROVED		

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

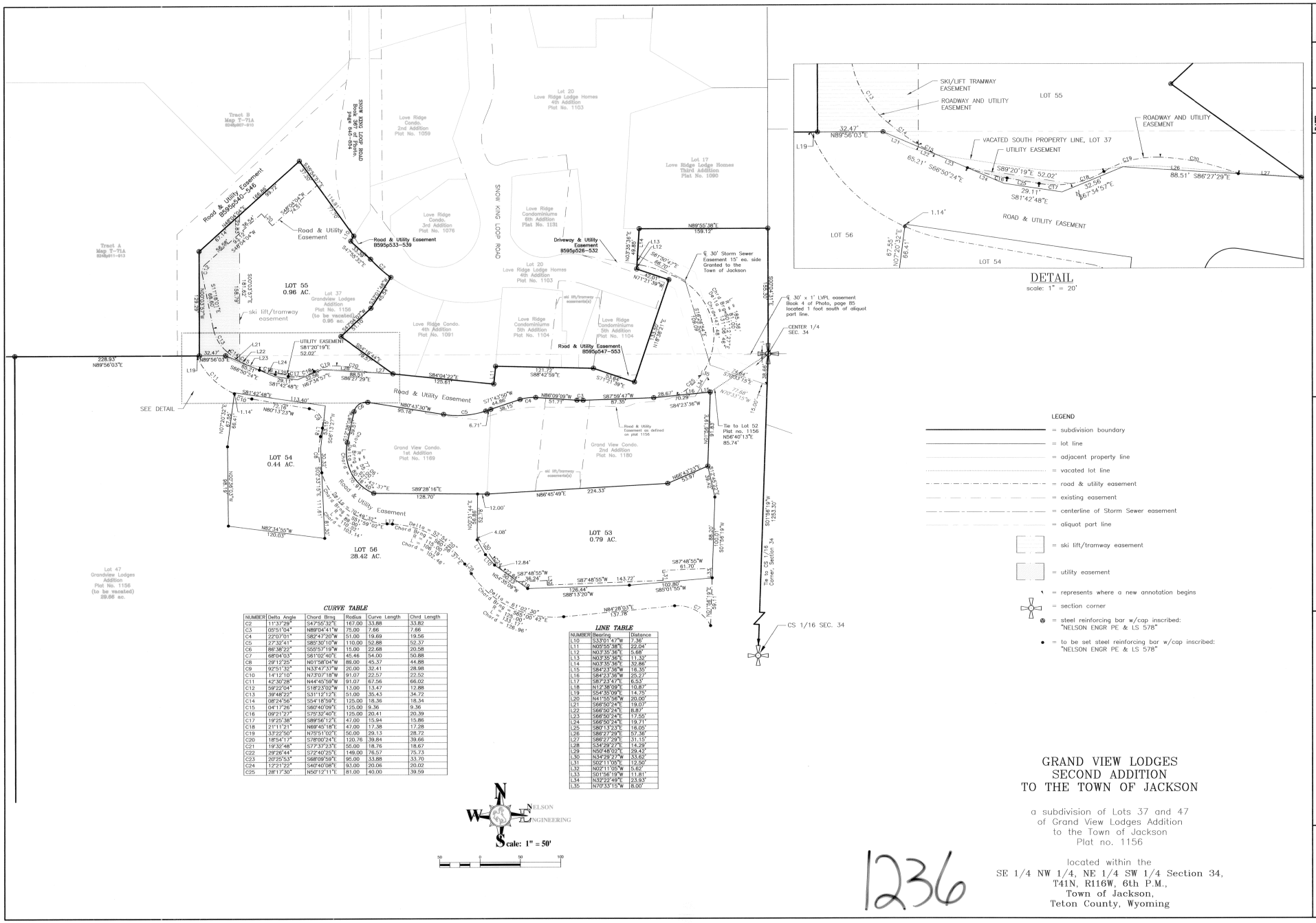
DRAWING TITLE: SITE PLAN

JOB TITLE: GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON

DRAWING NO 2 of 3

JOB NO 07-317-01

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CURVE TABLE

NUMBER	Delta Angle	Chord Brng	Radius	Curve Length	Chrd Length
C2	11°37'29"	S47°55'32"E	167.00	33.88	33.82
C3	05°51'04"	N89°04'41"W	75.00	7.66	7.66
C4	22°07'01"	S82°47'20"W	51.00	19.69	19.56
C5	27°32'41"	S85°30'10"W	110.00	52.88	52.37
C6	86°38'22"	S55°57'19"W	15.00	22.68	20.58
C7	68°04'03"	S61°02'40"E	45.46	54.00	50.88
C8	29°12'25"	N01°58'04"W	86.00	45.37	44.88
C9	92°51'32"	N33°47'37"W	26.00	32.41	28.98
C10	14°12'10"	N73°07'18"W	91.07	22.57	22.52
C11	42°30'28"	N44°45'59"W	91.07	67.56	66.02
C12	59°22'04"	S16°23'02"W	13.00	13.47	12.88
C13	39°48'22"	S31°12'12"E	51.00	35.43	34.72
C14	08°24'56"	S54°18'59"E	125.00	18.36	18.34
C15	04°17'26"	S60°40'09"E	125.00	9.36	9.36
C16	09°21'27"	S75°32'40"E	125.00	20.41	20.39
C17	19°25'38"	S89°56'12"E	47.00	15.94	15.86
C18	21°11'21"	N69°45'18"E	47.00	17.38	17.28
C19	33°22'50"	N75°51'02"E	50.00	29.13	28.72
C20	18°54'17"	S78°00'24"E	120.76	39.84	39.66
C21	19°32'48"	S77°37'23"E	55.00	18.76	18.67
C22	29°26'44"	S72°40'25"E	149.00	76.57	75.73
C23	20°25'53"	S68°09'59"E	95.00	33.88	33.70
C24	17°21'22"	S40°40'08"E	93.00	20.06	20.02
C25	28°17'30"	N50°12'11"E	81.00	40.00	39.59

LINE TABLE

NUMBER	Bearing	Distance
L10	S33°01'47"W	7.36'
L11	N05°55'38"E	22.04'
L12	N03°35'36"E	5.68'
L13	N03°35'36"E	11.30'
L14	N03°35'36"E	32.88'
L15	S84°23'36"W	18.35'
L16	S84°23'36"W	25.27'
L17	S87°23'47"E	6.53'
L18	N12°38'09"E	10.80'
L19	S54°35'09"E	14.75'
L20	N41°55'56"W	20.00'
L21	S68°50'24"E	19.07'
L22	S66°50'24"E	8.87'
L23	S66°50'24"E	17.55'
L24	S66°50'24"E	19.71'
L25	S80°13'53"E	16.05'
L26	S86°27'29"E	57.38'
L27	S86°27'29"E	31.15'
L28	S34°29'27"E	14.29'
L29	N50°48'02"E	29.43'
L30	N34°29'27"W	33.62'
L31	S05°11'05"E	12.50'
L32	N02°11'05"W	5.62'
L33	S01°58'19"W	11.81'
L34	N32°22'49"E	23.93'
L35	N70°33'15"W	8.00'

LEGEND

- = subdivision boundary
- = lot line
- = adjacent property line
- = vacated lot line
- = road & utility easement
- = existing easement
- = centerline of Storm Sewer easement
- = aliquot part line
- = ski lift/tramway easement
- = utility easement
- = represents where a new annotation begins
- = section corner
- = steel reinforcing bar w/cap inscribed: "NELSON ENGR PE & LS 578"
- = to be set steel reinforcing bar w/cap inscribed: "NELSON ENGR PE & LS 578"

GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON

a subdivision of Lots 37 and 47 of Grand View Lodges Addition to the Town of Jackson Plat no. 1156

located within the SE 1/4 NW 1/4, NE 1/4 SW 1/4 Section 34, T41N, R116W, 6th P.M., Town of Jackson, Teton County, Wyoming

1236

NELSON ENGINEERING
P.O. BOX 1569, JACKSON WYOMING (307) 733-2087

DATE	REV. 9/11/08
SURVEYED	NE
ENGINEERED	
DRAWN	SK
CHECKED	MAQ
APPROVED	

DRAWING TITLE: SITE PLAN
50 SCALE

JOB TITLE: GRAND VIEW LODGES SECOND ADDITION TO THE TOWN OF JACKSON

DRAWING NO 3 of 3

JOB NO 07-317-01

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Geotechnical Report

REFER TO ADDENDUM

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

December 20, 2023

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosh, WI 53142

RE: GEOTECHNICAL-ENGINEERING REPORT, BEAR DEVELOPMENT – SNOW KING LOOP LOTS 53 AND 58, TETON COUNTY, WYOMING
PROJECT NO: 23072

Dear Nick,

We are pleased to present this Geotechnical-Engineering Report on our geotechnical site exploration for the proposed development at Lots 53 and 58 on Snow King Loop in Teton County, Wyoming. This report describes site conditions observed during the subsurface exploration, presents engineering analyses and recommendations to support the design and construction of foundation elements, and presents pre-construction and post-construction slope stability analyses.

Jorgensen Geotechnical explored subsurface conditions by drilling seven (7) boreholes and excavating four (4) exploratory test pits throughout Lots 53 and 58. A geophysical exploration was also performed comprising MASW and ReMi exploration techniques. In general, the site is underlain primarily by landslide debris, a chaotic mixture lean clay (CL), clayey gravel (GC), and clayey sands (SC). The site sits on a mapped landslide which likely mobilized prior to the Quaternary period. As such, we assume the soil at the site to be well consolidated. We also observed weathered sandstone bedrock during the subsurface exploration. The weathered bedrock was only observed in one borehole, BH-02, at 67.5-ft below ground surface (bgs), and is assumed to be part of the Cretaceous-age Bacon Ridge Formation (Kb).

Building locations and foundation elevations are based on preliminary design data provided by Hoyt Architecture, dated July 19, 2023. As the design progresses, we will be able to make site-specific recommendations.

If you have any questions about this report, or if we may provide other services to you, please contact us. As the project progresses, we will be available to answer questions for you.

Respectfully submitted,
JORGENSEN GEOTECHNICAL







Bruce Jackson G.I.T.
Geotechnical Design Engineer Technician

Harrison Carter, P.E.
Geotechnical Project Manager

Dominique Brough, P.G.
Geotechnical Project Manager

Geotechnical-Engineering Report

Bear Development – Snow King Loop Lots 53 and 58 | Teton County, Wyoming



43.471263°N, -110.753274°W

December 20, 2023

PREPARED FOR

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosh, WI 53142

PREPARED BY

Jorgensen Geotechnical, LLC
PO Box 9550
1315 HIGHWAY 89 S., Ste. 201
Jackson, WY 83002

PROFESSIONAL GEOLOGIST
DOMINIQUE KIMBERLY BROUGH
PG-4010
12/20/23
WYOMING

Professional Engineer
HARRISON CARTER
17289
Date: 12/20/2023
WYOMING

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Appendix E: Calculations
Appendix F: Slope Stability Analyses

1.0 INTRODUCTION

Jorgensen Geotechnical, LLC was commissioned by Bear Development, LLC to perform a subsurface surface exploration and geotechnical engineering and analyses for the proposed development for Lots 53 and 58 accessed by Snow King Loop in Teton County, Wyoming. The purposes of the exploration were to provide information and geotechnical-engineering recommendations pertaining to:

- Subsurface soil conditions
- Site preparation and earthwork
- Geophysical exploration
- Seismic site classification per the International Building Code
- Evaluation of settlement and/or collapse potential
- General foundation design and construction recommendations
- Slabs-on-grade design and construction recommendations
- Lateral earth pressures for retaining structures
- Subgrade preparation
- Slope Stability Analyses
    - Existing Conditions
    - Proposed Conditions
    - Proposed Seismic Conditions

A detailed description of the subsurface exploration and graphical logs are shown in Appendix A, Figures in Appendix B, laboratory testing results are included as Appendix C, determination of soil engineering parameters in Appendix D, Calculations for settlement in Appendix E, and Slope Stability Analyses in Appendix F.

2.0 PROJECT DESCRIPTION

The project site is located in Jackson, Wyoming and is situated at the base of Snow King Resort. Preliminary plans were provided by Hoyt Architecture, dated July 19, 2023. The plans indicate the development for lots 53 and 58 will include two housing units: each with a first-floor parking garage area with three floors of living space above.

It is our understanding the project is in the early stages of the design, and the architectural plans are subject to substantial changes. As the project progresses, Jorgensen Geotechnical is available to consult with team members to increase design and construction efficiency based on our understanding of the subsurface conditions and the proposed design.

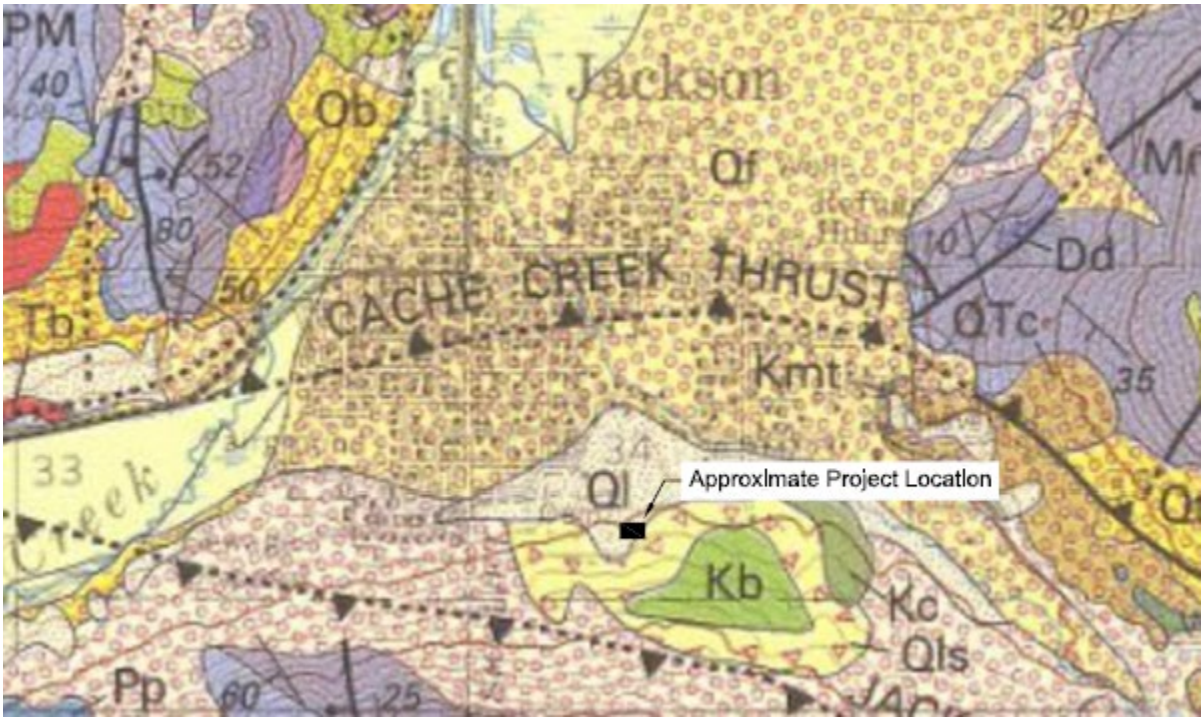


Figure 1: Site Location and Geologic Map

3.0 GEOTECHNICAL EXPLORATION

3.1 Description

JG developed the following description of the site based on field visits, meetings with the project team, our review of available historical aerial imagery, and observations made during the subsurface exploration.

Item	Description
Location and Parcel Information	• Lots 53 and 58 are located at the base of Snow King Resort and are accessed via Snow King Loop. The project area sits at a generalized latitude and longitude of 43.471263°N, -110.753274°W.
Existing Conditions	• The project location slopes from the north upwards to the south and ranges in elevation from approximately 6,400-ft Above Mean Sea Level (AMSL) on the northern boundary of Lot 53, to approximately 6,530-ft AMSL on the southern property boundary of Lot 58. The lots are bisected by a dirt road that provides access for employees at Snow King Resort. • Lot 53 is currently being used for storage by Snow King Resort. • A retaining wall approximately 20-ft tall is present on Lot 53 between the storage area and the access road. This Retaining wall comprises H-piles, lagging, and tie-backs and was built based on construction drawing dated August 13, 2007. • Slopes at the project site range from 10 to 35%.

	• Current utilities at the site include power, gas and water.
Geologic Setting	• The project location is found on the Geologic Map of Grand Teton National Park (Love et. al., 1992), in an area that contains three mapped geologic units including Loess (Ql), a fine-grained, windblown deposit, Landslide Debris (Qls), and the Bacon Ridge Sandstone (Kb). The soils observed from the subsurface exploration seem to be consistent with mapped geology. • The project location sits on a mapped multiple slump/multiple flow landslide, and is understood to be deep seated(WSGS, Wyoming Geologic Hazards Map Tool). A portion of the project site is capped with a wind-blown deposit known as loess which was likely deposited during or after the Pinedale Glaciation Period, or between approximately 30,000 to 10,000 years ago. The mapped loess stratigraphically overlies portions of the mapped landslide unit. • Numerous Quaternary faults (i.e., relatively young and potentially active) are mapped throughout the area. The Teton Fault is mapped approximately 8 miles northwest of the project, at the base of the eastern flank of the Teton Range (Zellman, 2019). Slip rates along the Teton fault is estimated to be between 0.2 and 1.0 mm/year. The Hoback Fault is located approximately 3 miles to the southwest of the project site but is considered old and inactive.

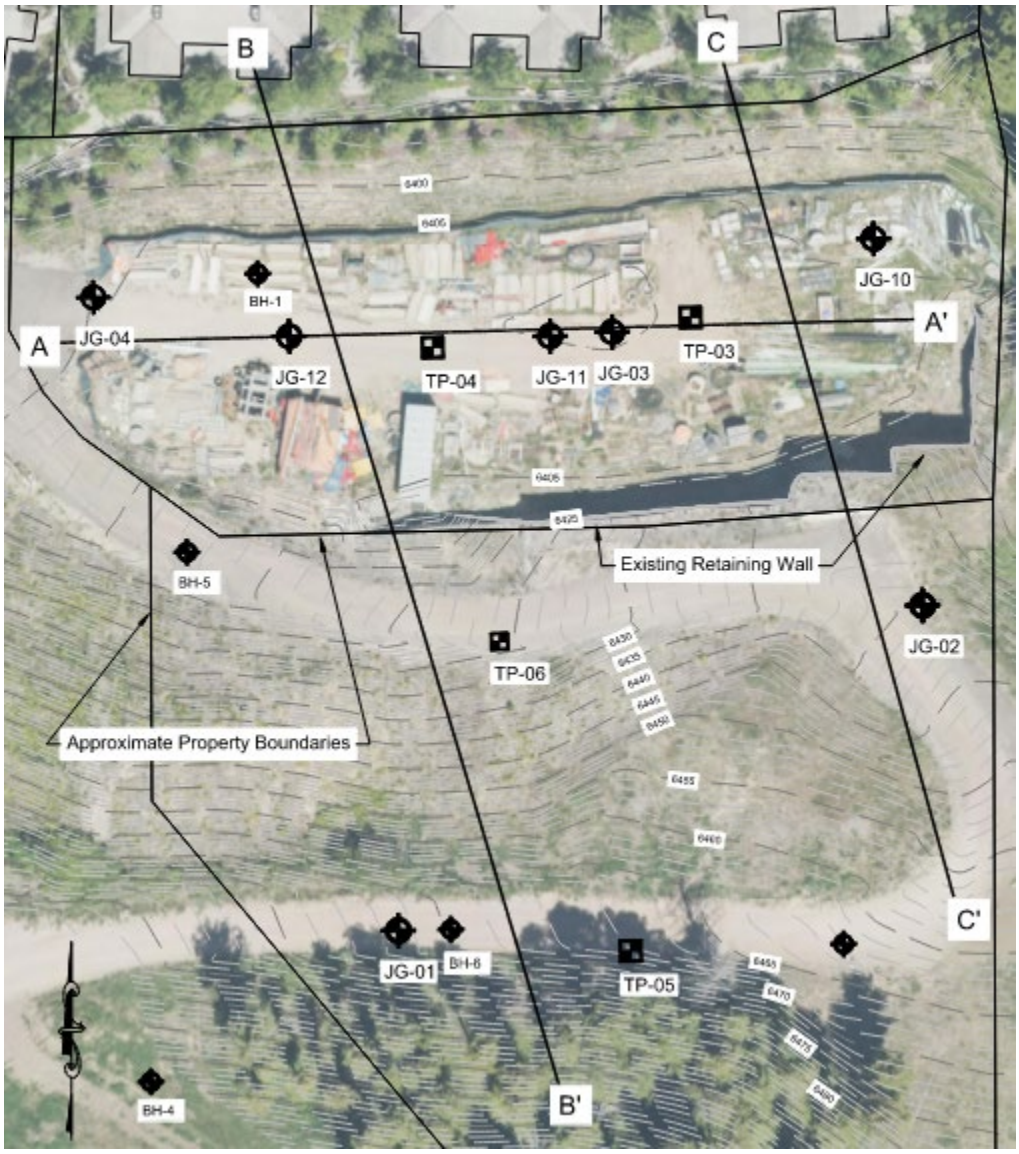


Figure 2: Borehole, Test Pit and Geologic Cross Section Location Map

3.2 Subsurface Soil Conditions

In general, three soil types were encountered during the subsurface exploration:

- **Landslide Debris** – consisting of clayey gravels (GC), lean clays (CL), and clayey sands (SC). The landslide debris soils are assumed to be derived from native colluvium soils prior to mobilization. These landslide debris soils exhibited chaotic deposition, which is also represented in the MASW plots provided by Atlas Geophysics. These results can be found attached to Appendix A.
- **Loess** – consisting of lean clay with sand (CL).
- **Weathered Bedrock** – consisting of soft weathered sandstone of the Bacon Ridge Formation (SC).

Below are three generalized geologic cross-sections spanning both north-south and east-west depicting the subsurface soil conditions and approximate foundation elevations for the buildings on Lots 53 and 58. Cross-section alignments can be found in Figure 2 and complete figures can be found in Appendix B.

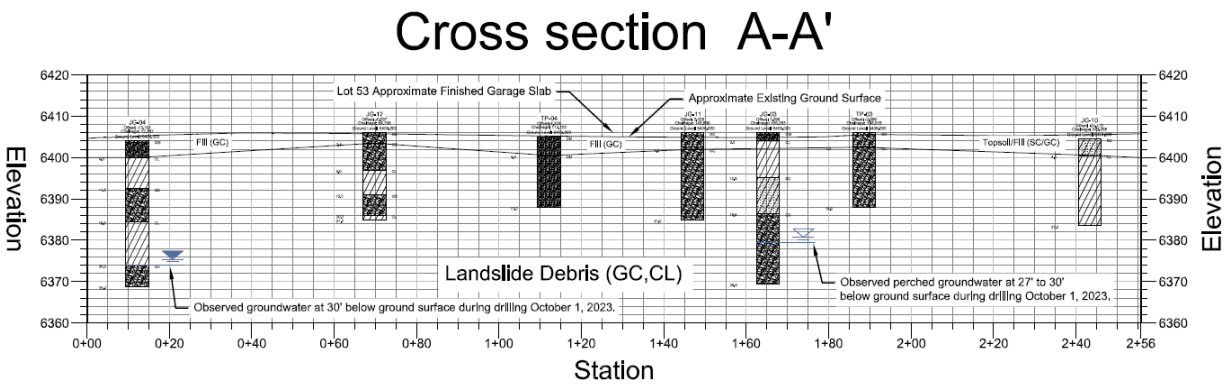


Figure 3: Geologic Cross Section A-A'

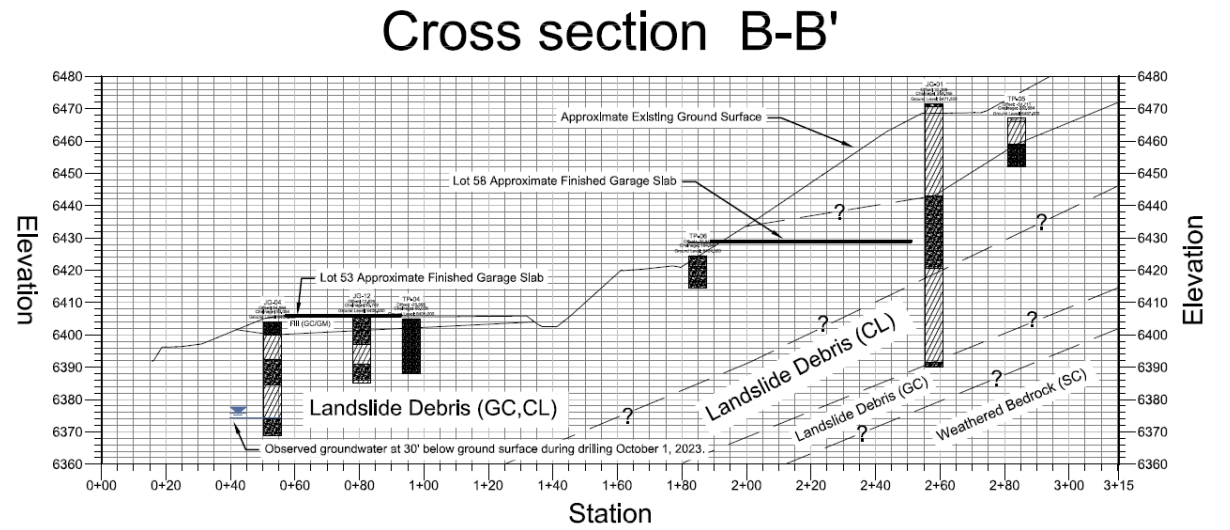


Figure 4: Geologic Cross Section B-B'

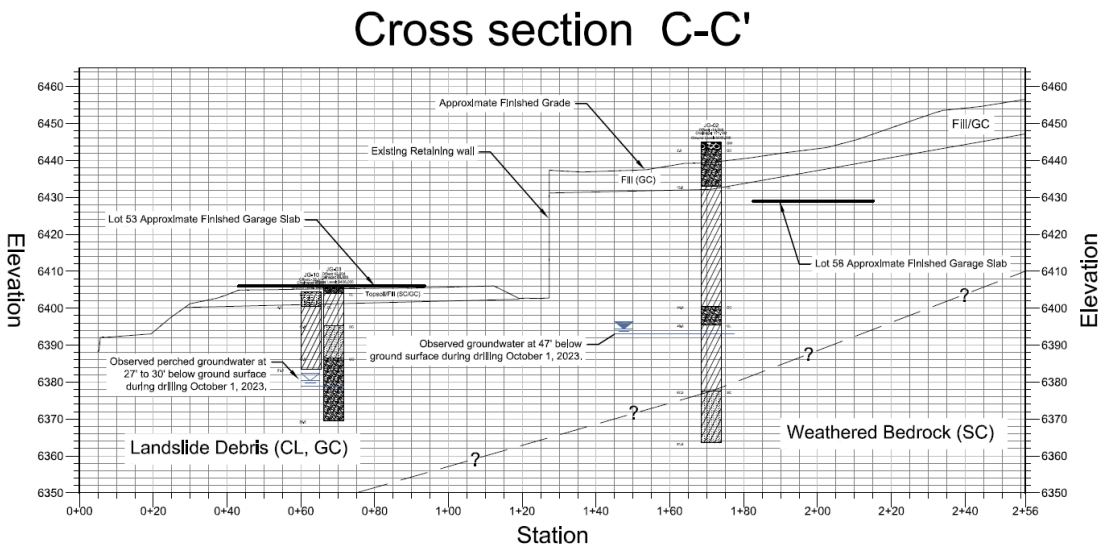


Figure 5: Geologic Cross Section C-C'

The table below describes each soil and rock layer, and detailed borehole logs are represented graphically in Appendix A. **It is important to note that** the borehole exploration techniques used either a 4-inch coring barrel or a 1.5-inch diameter split spoon sampler, limiting the soil that was collected during the drilling effort. It is likely that gravels larger and cobbles 3.0-inches are present but were unable to be logged due to the sampling method. Cobbles and boulders were encountered in the test pits.

Layer	Layer Name	Description	Geotechnical Considerations and Uses
1	**Topsoil/Fill (GC/GM/SC)**	• Observed in all boreholes and test pits • Depths ranging from 1- to 4.5-ft bgs • Classified as a Clayey **Gravel** with Sand, Silty **Gravel** with sand, or a Clayey **Sand** with Gravel. • Both the topsoil and fill are assumed to be derived from native soils • Brown to dark brown • Contains construction debris, including rebar, wood and concrete.	• Undocumented construction fill should be remove from beneath foundations • Non-structural applications
2	**Landslide Debris (GC/CL)**	• Observed in all boreholes and test pits	• Acceptable bearing layer with appropriate subgrade

		• Classified as Clayey **Gravel** with Sand, **Lean Clay**, **Lean Clay** with Sand, Sandy **Lean Clay** with Gravel, • Reddish brown to brownish gray • Coarse-grained soils are loose to very dense • Fine-grained soils are soft to very stiff • **Chaotic deposition, including charcoal fragments** • Observed 15-25% cobbles by volume • 10-55% gravel • 15-30% sand • 25-90% Clay/Silt	improvement methods • Settlement concerns • Structural applications • Non-structural applications
3	**Weathered Bedrock (SC)**	• Observed in BH-02 at 67.5-ft bgs • Classified as Clayey **Sand** • Grayish brown to reddish gray • Very dense • 55% sand • 45% fines	• Unlikely to be reached during construction

3.3 Groundwater

Groundwater was encountered in three boreholes during the subsurface exploration. Groundwater was observed in JG-02 at a depth of 47-ft bgs, JG-04 at a depth of 30-ft bgs, and a region of perched groundwater was encountered in JG-03 ranging from 27- to 30-ft bgs. These groundwater levels were incorporated into our slope stability analysis modeling and are discussed further in Appendix E.

The exploration occurred during a time of year that is considered to take place after peak groundwater levels have occurred, therefore the groundwater levels encountered during the drilling effort are *not* expected to represent peak groundwater levels. Groundwater levels fluctuate in response to seasonal snowmelt, runoff and flow levels in nearby rivers and streams, and is likely most heavily influenced by spring runoff and natural springs uphill. Soil moisture conditions on this site are most likely influenced by surface infiltration due to precipitation, snowmelt, and uphill natural springs. Two groundwater standpipes were installed on Lot 53 as part of the subsurface exploration. These standpipes were installed in JG-10 and JG-12, to total depths of 20 and 21-ft bgs, respectively.

Groundwater data was also presented in the previous Site Investigation Report published by Nelson Engineering, which was dated July, 2021. In this Report, they describe their encounters with perched groundwater to be in relatively thin (<1-ft in thickness) saturated zones. Groundwater measurements taken between 2005 and 2021 typically coincided with these saturated zones. We assume the measured groundwater levels at the site to be heavily influenced by spring runoff and natural springs uphill of the site.

3.4 Earthquakes and Ground Shaking

Jackson, Wyoming is located within the Intermountain Seismic Belt, a zone of seismicity that extends from southern Utah through eastern Idaho, western Montana, and Western Wyoming (Smith and Arabasz, 1991). The Teton fault, located along the eastern margin of the Teton Range, approximately 8-miles northeast of the site, is considered an important structural element of the Intermountain Seismic Belt. Predicted recurrence intervals for maximum credible earthquakes have passed for most of the fault systems capable of generating magnitude 7.5 earthquakes in western Wyoming (Case, 1997), implying the risk of major earthquakes is relatively high. In the event of a large magnitude earthquake (i.e., approximately 7.5), strong ground shaking, liquefaction, or slope movement could potentially cause damage to structures (Smith, et al., 1993).

Shear wave velocity calculated by Atlas Technical Consulting LLC, of Salt Lake City, Utah using ReMi geophysical exploration method for the project site is 1,200 ft/s. The IBC references ASCE 7-16 to determine the ground motion accelerations. Based on subsurface soils, and the results from the geophysical exploration, the site is classified as Site Class C ("Very dense soil and soft rock"). For your convenience, Seismic Design Maps (SEAOC, 2019) values are summarized in Table 3-1: U.S. Seismic Design Maps Summary.

Table 3-1: U.S. Seismic Design Maps Summary

Maximum Considered Earthquake (MCE) Spectral Response Acceleration Parameters			
	Short Period (S_s) =	1.024	
	1-Second Period (S_1) =	0.336	
Site Coefficients and Adjusted MCE Spectral Response Acceleration Parameters			
F_a =	1.2	S_{MS} =	1.229
*F_v =	1.5	*S_{M1} =	0.504
Design Spectral Response Parameters			
	S_{DS} =	0.819	
	*S_{D1} =	0.336	

*Note: Values for F_v, S_{M1}, and S_{D1} were determined in accordance with Section 11.4.4 of ASCE 7-16. Per Section 11.4.8 of ASCE 7-16, if the proposed structure foundation will include seismic isolators or damping systems, a site response analysis shall be performed in accordance with Section 21.1.

The project site is located in an area of moderate seismic activity. The current peak horizontal acceleration (PGA) with a probability of occurrence of 2% in 50 years is approximately 0.454g (USGS, 2014). The site amplification factor at PGA is 1.2, resulting in a site modified peak ground acceleration (PGA_M) of 0.545. This has been applied for the analysis of seismic lateral loading on retaining walls Section 4.3.

The provisions of the IBC are intended to provide uniform levels of performance for structures depending on their intended use and the risk inherent to their failure. The approach adopted in the IBC is intended to provide a uniform margin of safety against collapse at the design motion. The design earthquake ground motion is selected at a ground shaking level that is 2/3 of the maximum considered earthquake (MCE) ground motion, which has a likelihood of exceedance of 2% in 50 years (corresponding to a return period of 2,500 years). The IBC is not intended to prevent damage or loss of

function during a major earthquake; it is intended to reduce the risk of loss of life. Structural design should follow the level of risk tolerable by the Design team.

3.5 Geologic and Geotechnical Hazards

3.5.1 Potential Settlement/Compressible Clays

The primary geotechnical concern at the project site is differential settlement of foundation elements placed on unimproved landslide deposits. Based on the borehole logs, in-situ testing, lab testing, and geophysical exploration, the subgrade soils comprise a range of chaotic mixture of soils, from compressible clays to competent stony soils. The soft clays are expected to experience moderate to severe settlement, while the stony soils are *not* expected to experience substantial settlement. Calculated settlement values are discussed in Section 5.2 and calculation spreadsheets are shown in Appendix E.

3.5.2 Seismic and Fault Related Hazards

The owner should be aware that in the event of a large magnitude earthquake (i.e., approximately 7.5), strong ground shaking could potentially cause damage to structures (Smith et al, 1993). The owners may wish to consider the option of carrying earthquake insurance in addition to homeowner's insurance. Older faults mapped in the immediate vicinity of the property are believed to be old and inactive. Surface rupture due to faulting is very unlikely, and no slope failure is anticipated to occur.

3.5.3 Slope-Related Hazards

In the event of an earthquake or extreme precipitation event, rock fall, debris flows, or avalanches produced from the steep slopes to the south of the development area could potentially cause damage to structures, especially following wildfires. Risk assessment of the slope related hazards was beyond the scope of this Report, but we present slope stability analyses of several slopes captured in the cross section Lot 53 and 58. These are discussed in Section 4.1 and presented in Appendix F.

4.0 GEOTECHNICAL ENGINEERING ANALYSES

4.1 Slope Stability Analyses

The slope stability analyses were performed using SLOPE/W module of Geostudio. We analyzed two sets of geometry for global slope stability, taken from cross sections B-B’ and C-C’. Pre-construction and post-construction external geometry was determined using topographic data provided by Jorgensen Associates, as well as proposed design data provided by Jon Althschuld of Chinook Landscape Architecture, LLC.

Soil-strength parameters were determined using direct testing methods, as well as correlations based on index tests and SPT N-Values. A detailed discussion on soil-strength parameters can be found in Appendix D. The parameters used in the stability analysis are shown in Table 4-2 and Table 4-3. We incorporated a phreatic surface into model based on observed water conditions during the drilling effort. We included surcharge loads to account for future building loads and evaluated seismic conditions using a pseudo-static approach.

Table 4-2: Soil Parameters Used for Slope Stability Analysis B-B'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (CL)	115	100[1]	35
Landslide Debris (GC)	125	50[2]	40
Landslide Debris (GC/CL)	120	100[2]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

Table 4-3: Soil Parameters Used for Slope Stability Analysis C-C'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (GC/CL)	120	100[1]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

4.1.1 Results

Results of the stability analyses are summarized in Table 4-4. Appendix F shows the output of the stability model for Cross-Section B-B' and C-C'.

Table 4-4: Summary of Stability Analyses Results

Cross section	Analysis	FS	Change in FS[1]
B-B'	Pre-construction	1.646	-1.03%
	Post-construction	1.629	
	Post-Construction Seismic	1.173	N/A
C-C'	Pre-construction	2.281	+12.93%
	Post-construction	2.576	
	Post-Construction Seismic	1.753	N/A

1. Negative indicates a reduction in FS from pre-construction to post-construction, while positive indicates an increase in FS from pre-construction to post-construction.

Discussion regarding accepted FS can be found in Appendix F. Changes in Factors of Safety (FS) from pre-construction to post-construction conditions range from -1.03 to 12.93%, though all of the post-construction conditions indicate static FS's above the 1.5 threshold for residential construction ranging from 1.629 to 2.576. Post-construction seismic conditions indicate factors of safety from 1.173 to 1.753, both of which are above the 1.1 FS threshold for maximum allowable permanent seismic deformations of 2 inches (FHWA 2011).

Residual strength results from strain-softening behavior; i.e., soils become weaker with shearing (as in the case of slope movement) decreasing from peak strength to residual strength. Reduced shear strength usually occurs only in soils that have been previously sheared while undisturbed soils typically exist at peak strength. It is possible that sheared soils exist on this site or nearby and exhibit behavior

consistent with residual strength. In this case, seismic slope stability may result in factors of safety less than 1.0. **However, soil shearing was not observed during subsurface exploration at this site. If pockets or layers of soft, weak, or sheared soils are observed during construction, work shall cease, and Jorgensen Geotechnical be notified immediately to evaluate site conditions and review the stability model.**

4.2 Settlement

As described is Section 3.5.1, several different soil types were encountered at the site, all of which represent different levels of settlement potential, increasing the risk of differential settlement which is particularly damaging to structures. Settlement calculations were performed for the compressible clay, and the potentially compressible clayey sands. Because the stony soils contain varying amounts of matrix soils (i.e., clays and sands), estimated settlement is difficult. Though, it is important to note that in general, as the matrix content increases, the risk of settlement increases.

Item	Settlement Analyses – Slopewash	
	Scenario 1	**Scenario 2**
Bearing Layer	**Clay** – Foundation system is placed in direct contact with the clay soils	**Colluvium** - Foundation placed in direct contact with clayey sand soils
Foundation Assumptions	Comprises typical reinforced concrete spread footings	
	Bearing pressure of 3,000 pounds per square foot	
	Buried 3-feet below finished grade	
	Spread footings is 2-feet wide	
Calculated Settlement	3.38-inches	1.67 -inches

The risk of settlement can be reduced by several subgrade improvement methods, of which are discussed below in Section **Error! Reference source not found.**.

4.3 Lateral Earth Pressures

Lateral pressures were calculated using methods suggested by Bowles (1996) for at-rest, active, and passive conditions and are presented in Table 4-5. These values assume a combination of lean clay and clayey gravel landslide debris will be used as non-structural backfill. We have assumed an estimated internal friction angle of 36° and a unit weight of 130 pcf based on experience working with similar soil deposits and laboratory testing. Calculations assume level backfill against foundation walls or retaining walls.

Table 4-5: Lateral Pressure Parameters for Landslide Debris

Condition	Coefficient of Earth Pressures	γK (equivalent fluid pressure)
Static Conditions Level Backfill	K_o = 0.41 K_a = 0.26 K_p = 3.85	54 pcf 34 pcf 501 pcf
Earthquake Conditions	K_{ae} = 0.38	49 pcf

Level Backfill	K_{pe} = 3.46	449 pcf

Lateral earth pressure design will be estimated based on the concept of equivalent fluid pressures, in which the soil pressure-distribution is triangular against the foundation or retaining wall. The following sections summarize each design situation.

4.3.1 Active Pressures

Application	Retaining walls which are allowed to deflect and develop an active soil wedge
Resultant Force Calculation	½ $\gamma K_a H^2$; pounds per horizontal foot of wall
Resultant Force Location	one-third the wall height (1/3 H) above the base
Seismic Coefficient[1]	K_s = 0.338g (r·α·PGA) per the FHWA (2011)
Seismic Calculation Basis	Mononobe-Okabe equations (Bowles, 1996)
Seismic Resultant Force	½ (γK_{ae} - γK_a) H^2; pounds per horizontal foot of wall
Seismic Resultant Force Location[2]	Applied at 60% of the wall height above the base

1. Discussion and calculations for the Seismic Coefficient can be found in Appendix F.
2. Research has indicated that lateral pressures due to earthquakes are non-hydrostatic in distribution, and the resultant acts above the lower third-point of the wall (Bakeer, et al, 1990).

4.3.2 At-Rest Pressures

Application[1]	Walls which are restrained and not allowed to deflect
Resultant Force Calculation	½ $\gamma K_0 H^2$; pounds per horizontal foot of wall
Resultant Force Location	One-third the wall height (1/3 H) above the base

1. Design control of such walls shall be whichever generates the higher resultant force: at-rest pressures or active seismic pressures.

4.3.3 Passive Pressures

Application[1]	Toe of retaining walls where the wall is allowed to move into soil
Resultant Force Calculation	½ $\gamma K_p H^2$; pounds per horizontal foot of wall
Resultant Force Location	One-third the wall height (1/3 H) above the base
Design Control	k_s = 0.338g (r·α·PGA) per the FHWA (2011)
Seismic Calculation Basis	Mononobe-Okabe equations (Bowles, 1996)
Seismic Resultant Force Location	One-third the wall height (1/3 H) above the base

1. Passive pressure design should neglect loose fill and soil located within the frost zone.

5.0 GEOTECHNICAL RECOMMENDATIONS

5.1 Recommendations Overview

The fine-grained soils encountered at the site exhibit moderate settlement potential as described above in Section 4.2. Typical spread footings are likely to experience settlement greater than 1-inch if placed above the compressible soils. The risk of settlement can be reduced by **ground improvement techniques** such as geosynthetic reinforced fills, or engineered aggregate piers (EAPs). The risk of settlement can also be reduced by incorporating **deep foundation elements** such as driven piles or micropiles into the foundation design. Subgrade improvement methods to reduce the risk of future differential settlement are discussed in Section **Error! Reference source not found.**, below.

Due to the need for a construction shoring system, if mass excavation (i.e., over-ex and replace with geosynthetic reinforced fill) is selected, the shoring system will need to be extended at or below the over-excavation limit, increasing the overall height of the shoring system. Deep foundation elements and aggregate piers would negate the need for mass excavation below the shoring system.

It should be noted that different subgrade improvement methods correspond with different levels of risk reduction. Any subgrade improvement method that leaves problematic soil beneath foundation systems has a higher level of risk than those that do not. Similarly, deep foundation elements greatly reduce the risk of settlement by transferring the foundation load past the problematic soils and into the underlying competent soils. Typically, the cost of a foundation system correlates to the risk reduction (i.e., the more expensive foundation system the more risk reduction).

5.2 Reinforced Fills

Reinforced fill comprise imported soil compacted and interbedded with a pre-determined geosynthetic. The reinforced fill will better distribute the foundation load thereby reducing the load applied to the fine-grained, compressible and reducing the amount of future potential settlement. Exact thickness of a reinforced fill is currently unknown due to the limited design data available, though it can be expected to be four to six fee thick with a geosynthetic layer placed at every 1-ft increment.

5.3 Engineered Aggregate Piers

Engineered aggregate piers are a ground improvement technique that utilize compacted aggregate to reinforce potentially problematic soils. The piers are predrilled with an auger to the full design-depth (or to a refusal condition on competent rock/soil), a select aggregate is dumped into the predrilled hole from the surface, and the aggregate is then compacted with a down hole compactor attached to an excavator. The compaction effort not only compacts the imported aggregate, but also densifies the surrounding native soils. The increased density of the select aggregate as well as the surrounding native soils reduces the potential of future foundation settlement. One major benefit of EAPs compared to deep foundation elements, is the EAPs are a ground improvement technique, therefore the foundation footings do not need to be designed as grade beams as it would need to be for deep foundation elements, but typical spread footings.

Aggregate piers are typically designed and installed by a design-build contractor. Such as Keller, Geotech Foundation Company, and Montana Helical Piers. Jorgensen is available to provide design values and recommendations to the selected contractor for final design and price estimates.

5.4 Deep Foundation Elements

Foundations consisting of grade beams supported by deep foundation elements, such as driven piles or micropiles, typically allow very little vertical movement of structural elements. This option represents the lowest risk of future foundation settlement.

Both micropiles and driven piles are typically designed and installed by a design-build contractor. Jorgensen is available to provide design values and recommendations to the selected contractor for final design and price estimates.

5.5 Earthwork

5.5.1 Site Preparation

Prior to the placement of any fill, concrete slabs, or foundation elements, the site should be cleared and stripped of topsoil and all organic debris. No brush, roots, frozen material, or other deleterious or unsuitable materials shall be incorporated in the foundation subgrade or structural fill. All exposed subgrade surfaces should be free of mounds and depressions which could prevent uniform compaction. If unexpected fills or obstructions are encountered during site clearing or excavation, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

During the excavation, the equipment may disturb and loosen the surface of the subgrade soils. All disturbed areas should be compacted with a smooth-drum vibratory roller, in vibratory mode with a minimum of three passes, prior to the placement of structural fill and footing construction. The actual number of passes should be determined by observing whether the surface is yielding after each pass. If the surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed and approved by a representative of this office.

5.5.2 Excavation and Cut Slope Stability

OSHA regulations (29CFR1926) appear to classify the coarse-grained at the site as Type C soil. For planning and design purposes, simple cut slopes should be no steeper than 1.5H:1V. According to OSHA, any cut slope greater than 20 feet in height requires additional analysis. Shallow groundwater conditions at the site may impact shoring requirements. These recommendations are based on observations made at the time of the site exploration. The contractor shall be responsible for adherence to OSHA and other safety regulations by observing soil conditions at the time of construction.

The design of a temporary construction shoring system is beyond the scope of this report. Jorgensen Geotechnical is available to coordinate with shoring contractors to provide design parameters and local expertise to the project and deliver the most efficient shoring option.

5.5.3 Final Backfilling and Grading

Properly compacted backfill and site drainage are very important to protect subgrade soils and prevent water from flowing to undesirable locations (i.e., to the highway). All soils at the site are acceptable for use as backfill and general site grading. Compaction guidelines for both soil types can be found in Section 5.5.4.

5.5.4 Compaction

Based on our borehole logs, compaction of the on-site soils during construction can be measured by performing a Standard Proctor test per ASTM D698 and performing nuclear density gauge testing during the compaction process. Site soils should be moisture-conditioned and placed in lifts and compacted to a predetermined percentage (typically either 92% or 95%) of the maximum dry density as determined by Standard Proctor testing. Soil should be moisture conditioned to between -2% and +2% of the optimum moisture content (OMC). Fine-grained soils require a sheepsfoot or padfoot roller.

It is important to note, the on-site soils contain fine-grained soils which become difficult to compact if moisture contents become too high. Moisture management of the compacted soils will be paramount to reach adequate densities. Additionally, groundwater may impact the ability to compact the soils during construction.

If imported "pit-run" is used as structural fill or if soils at the site contain more oversized clasts (greater than 3-inches) compaction testing with a nuclear density gauge is usually problematic due to the presence of stones. Therefore, we recommend compacting stony soils using a **method specification**, for which Table 5-1 provides initial guidelines.

Table 5-1: Compaction Parameters for Stony Fill

Compactor Type	Lift Thickness	Maximum Particle Size	Minimum Number of Passes[1]
5-ton vibratory	12 inches	9-inch[2]	3
1.5-ton vibratory	9 inches	6-inch	5
Hand-held	4 inches	4-inch	5

1. The actual number of passes should be determined by observing whether the surface is yielding after each pass. If the surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed.
2. Occasional clasts to 12-inch are permitted, if encountered, but should not be nested.

The method specification may be established as follows:

- The contractor will place fill in loose lifts no greater than specified in the above table for whichever class of compactor is used.
- Fill will be compacted with the *minimum* number of passes specified above. The actual number of passes should be determined by observing compaction after each pass to determine if the surface is non-yielding. If the fill surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed.
- Once the number of passes is determined, this **method** (unique to the material type, compactor, lift thickness, and number of passes) may be continued for the rest of the project as long as fill material properties and subgrade soil conditions remain the same.

It is important to establish a method specification as early in the construction as possible and apply it consistently for the entirety of the project. JG should observe lift thickness, number of passes, and equipment used during compaction. Additional guidance on construction observations may be found in Section 5.5.6.

5.5.5 Compaction Requirements

We recommend the following requirements for engineered fill materials:

Material Type and Location	Minimum Compaction Requirement	Moisture
Stony soils[1]: All Locations (Structural and Non-Structural Applications)	Non-yielding Condition	Usually 6-8%[2]
Non-stony soils	92% or 95% maximum dry density	+2-2% OMC

1. Stony soil may be imported or site-derived
2. Clean, stony soils are typically moisture insensitive and field observations are usually adequate to estimate when soils achieve the proper moisture.

We recommend compaction of fills be observed and tested during construction. If stony fill is not observed to be in a non-yielding condition or non-stony fills do not achieve the recommended compaction requirements, the area represented by the test should be reworked and retested as required to meet the requirements.

5.5.6 Observation during Construction

Recommendations in this report are contingent upon our involvement. If any unexpected soils or conditions are revealed during construction, this office should be notified immediately to survey the conditions and make necessary modifications. All excavations and foundation subgrades should be observed by a representative of JG prior to fill or concrete placement, especially if questionable materials are exposed. Notice shall be provided at a minimum of 24 hours before the requested observation.
We are able to provide the most value observing site conditions at the following times:

1. Upon completion of site preparation to verify all organics and unsuitable material have been removed, and to verify stony alluvial soils have been reached and structural fills have been prepared in accordance with Sections 5.5.1 and 5.5.4.
2. we can observe placement and compaction of fill and aid in the development of a method specification, Section 5.5.4.
3. We can perform density testing by means of proof rolls and with the use of a Nuclear Density Gauge for structural and non-structural soils.

6.0 LIMITATIONS

This report has been prepared based on a limited amount of data. Actual site conditions may vary. These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty is made or implied.

This report is site-specific and has been prepared in support of the proposed project. The report is for the sole use of the current property owner and their design and construction team and shall be considered non-transferable to future property owners without the written consent of Jorgensen Geotechnical. Under no circumstances are the figures and text to be used separately.

7.0 REFERENCES

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JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX A

Site Exploration Procedures and Subsurface Exploration Logs

Field Exploration

Borehole Locations and Elevations

Borehole and test pit locations were determined by Jorgensen Geotechnical (JG) staff to bracket the approximate location of the proposed development. Approximate locations of the boreholes and test pits are presented in Figure 2. The approximate location of each borehole and test pit locations were estimated based on relative proximity to landmarks identifiable on aerial photography. Approximate GPS coordinates for each borehole were also collected in the field. Approximate elevations were based on topographic data from Jorgensen Associates.

Subsurface Exploration Procedure

JG conducted a site exploration at the proposed project site utilizing two different subsurface exploration techniques: geotechnical boreholes and open test pits. During the exploration effort, several disturbed samples from SPTs were collected during the drilling effort as well as bulk disturbed grab samples during the test pit excavation. Shelby tubes were used to collect relatively undisturbed samples of soft material for consolidation testing, shear testing, and index testing. The samples were tested at GCI in Salt Lake City, Utah, and the results are presented in Appendix B. Soil-engineering properties were based on visual classification, direct lab testing results, and accepted correlations based on index test results and SPT blow counts and are discussed further in Appendix D. The subsurface exploration techniques are described below.

Sonic Boreholes

On October 1 and 2, 2023, JG directed and oversaw the drilling of four sonic boreholes; two to 80-feet below the ground surface (bgs) and two to 35-feet bgs using a sonic drill rig operated by Cascade Drilling of West Jordan, Utah. Sonic drilling utilizes high frequency vibrations to advance a core barrel or casing into the subsurface soils while collecting one continuous disturbed sample. At predetermined intervals, standard penetration tests (SPT) were performed to generate blow count values and collect additional disturbed samples.

Hollow Stem Auger Boreholes

Three additional boreholes were completed each to 20-feet bgs on October 25, 2023 using a hollow stem auger (HSA) drilling technique with a Diedrich D120 drill rig operated by SK Geotechnical of Billing, Montana. The HSA drilling technique utilized a 4.25-inch inside diameter hollow auger with a solid stem rod in the center that is removed to perform standard penetration tests every 2.5-feet.

Open Test Pits

On October 31, 2023, JG directed and oversaw the excavation of four open test pits. The test pits were excavated using a Hitachi Zaxis 160 steel tracked excavator operated by FCExcvation. The test pits ranged in depth from 10 to 18-feet bgs. Disturbed bulk samples were collected from pertinent soil layers.

Borehole Logs

Field data were collected in the field digitally using the application pLog on a tablet. Draft logs were reviewed in the office, and final versions are presented below. Blow counts for SPT (field N-values) were adjusted to a standard hammer efficiency of 60% and overburden pressure of one atmosphere as suggested by Youd and Idriss (1997) and Fang (1991), to obtain the adjusted (N1)60 values in blows per foot. Soil type, thickness, consistency, and relative moisture content were observed and documented by Jorgensen Geotechnical staff.

Detailed borehole logs are attached. Site conditions may vary and actual soil conditions may differ from those presented in the borehole logs. The final logs represent JG's interpretation of the subsurface soil conditions. Actual soil conditions may differ from those observed in the boreholes.

In addition to borehole and test pit logs produced by Jorgensen Geotechnical, borehole logs presented in a report produced by Nelson Engineering dated July 28, 2021 were also reviewed to determined subsurface soil conditions and are presented below. Approximate borehole locations performed by Nelson Engineering are presented in Figure 2. Test pit logs presented in a report prepared by Womack and Associated dated June 4, 2012 for the water tank due south of the proposed project site were also reviewed.

Geophysical Exploration

Jorgensen Geotechnical contracted with Atlas Technical Consultants LLC of Salt Lake City to perform a geophysical evaluation at the project site. The primary purpose of the geophysical study was to develop subsurface shear-wave velocity profiles using Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Waves (MASW). The geophysical exploration was performed on October 23 and 24th 2024. One ReMi line and one MASW line were performed at the specific project site (Lots 53 and 58), while the other ReMi and MASW lines were performed on Lot 57.

The ReMi study extended to a maximum depth of 100-ft below the ground surface, allowing us to select a Site Class based on the results. Shear wave velocity for the ReMi line RL-2 performed at lots 53 and 58 produced a shear wave velocity of 1,201 ft/s, classifying the site as a Site Class C per ASCE 7-16

The MASW line ML-2 performed at the project site indicates the upper approximately 20-feet are softer (i.e., slower shear wave velocity), and the soils become denser at approximately 30-feet below the ground surface. Though the soils appear to become denser at 30-feet, the upper 20-feet appear to be chaotic and have portions that are dense, and portions that are soft, consistent with the observations made in the boreholes and test pits.

The full Report from Atlas is attached.



Photo 1: Typical sonic drilling setup/JG--01



Photo 2: Typical sonic drilling bulk sample/Landslide Debris (GC/CL)



Photo 3: Typical hollow stem auger drilling setup/JG-12



Photo 4: Typical SPT sample/JG-10 D3



Photo 5: Typical test pit excavation setup/TP-07



Photo 6: Landslide Debris (GC)/TP-03



Photo 7: Chaotic sorting in Landslide Debris (GC)/TP-03



Photo 8: Charcoal present within landslide debris/TP-03



Photo 9: Large angular cobbles ~'1 to 2' diameter/TP-04 spoils pile

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Telephone: 307.733.5150

Borehole ID: JG-01

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
0			D1				Gravel (GW): Slightly moist to moist, brown, medium dense, clast supported, sub-rounded clasts approximately 50% sand and 50% sub-rounded gravel [FILL]					
1												
2			D2				Gravelly LEAN CLAY with Sand (CL): slightly moist, brownish tan, stiff, 25-30% angular gravel, 15-20% sand, 55-65% fines, [LANDSLIDE DEBRIS]					
3												
4												
5			D3									
6												
7			D4									
8			D5									
9												
10												
11												
12												
13												
14			D6									
15												
16												
17			D7									
18			D8					12		31	16	15
19												
			D9									

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
□ Fines Content (%) 20 40 60 80

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Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
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Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) / MC (%) / PL & LL (%) / Fines Content (%)
21							Gravelly LEAN CLAY with Sand (CL): slightly moist, brownish tan, stiff, 25-30% angular gravel, 15-20% sand, 55-65% fines, [LANDSLIDE DEBRIS]						
22			D10										
23													
24													
25			D11										
26													
27													
28			D12	67	11-16-21 38			11		28	16	12	
29							CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, very dense, 50-55% angular gravel, 15-25% sand, 25-30% fines [LANDSLIDE DEBRIS]						
30			D13										
31			D14										
32													
33			D15										
34													
35			D16										
36													
37			D17	56	46-50/5" 94								
38			D18										
39			D19										

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Hammer Type: Automatic

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Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) / □ Fines Content (%) 20 40 60 80
41			D20				CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, very dense, 50-55% angular gravel, 15-25% sand, 25-30% fines [LANDSLIDE DEBRIS]						
42			D21										
43			D22										
44			D23										
45			D24										
46			D25										
47		⧗	D26	200	19-50/1" 84								
48													
49													
50													
51							LEAN CLAY, Sandy LEAN CLAY with Gravel, LEAN CLAY with Sand (CL): slightly moist, brownish tan, very stiff, 10-20% gravel, 20-30% sand, 50-90% fines, [LANDSLIDE DEBRIS]						
52													
53													
54													
55													
56			D27					13		33	15	18	●⊢
57													
58													
59			D28										

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Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
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Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
61							LEAN CLAY, Sandy LEAN CLAY with Gravel, LEAN CLAY with Sand (CL): slightly moist, brownish tan, very stiff, 10-20% gravel, 20-30% sand, 50-90% fines, [LANDSLIDE DEBRIS]						
62			D29										
63			D30										
64													
65			D31										
66													
67													
68			D32	115	19-31-50/4" 56			10		26	16	10	● ⊢
69			D33										
70			D34										
71			D35										
72													
73			D36					12		38	17	21	● ⊢
74													
75			D37										
76													
77													
78			D38										
79													

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Client: Bear Development, LLC
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Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
81			D39	100	9-23-35 35		CLAYEY GRAVEL with Sand (GC): slightly moist, brownish gray, dense, angular 55% gravel, 15% sand, 30% fines [LANDSLIDE DEBRIS]						▲
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
96													
97													
98													
99													

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Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) / MC (%) / PL & LL (%) / Fines Content (%)
1			D1				GRAVEL (GW): slightly moist to moist, brown, medium dense, clast supported, approximately 50% sand and 50% sub-rounded gravel [FILL]						
2													
3			D2				CLAYEY GRAVEL with Sand (GC): slightly moist, medium dense, brownish tan, 55% angular gravel, 15% sand, 30% fines [LANDSLIDE DEBRIS]						
4													
5			D3										
6													
7			D4							20	15	5	H
8													
9			D5										
10			D6										
11													
12			D7				LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel, (CL): Slightly moist, reddish brown, soft to medium stiff, homogeneous, 10-20% sub-angular to angular gravel , 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]						
13													
14													
15			D8					12		31	15	16	●⊣
16													
17													
18			D9	0	4-3-3 6								▲
19													

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Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
21			D10				LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel, (CL): Slightly moist, reddish brown, soft to medium stiff, homogeneous, 10-20% sub-angular to angular gravel , 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]						
22													
23			D11					13		29	15	14	● ⊢
24													
25													
26			D12										
27													
28			D13	100	7-12-13 24	2.50							▲
29			D14										
30													
31			D15										
32													
33			D16					15		21	16	5	●
34													
35													
36			D17										
37													
38			D18	93	16-12-15 24								▲
39			D19					16		29	17	12	● ⊢

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Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
▽ At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
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Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
41			D20				LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel, (CL): Slightly moist, reddish brown, soft to medium stiff, homogeneous, 10-20% sub-angular to angular gravel , 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]					
42												
43			D21									
44												
45			D22				CLAYEY GRAVEL with Sand (GC): moist to wet, reddish brown to grayish tan, dense, homogeneous, 40-50% angular gravel, 20-30% sand, 30-35% fines [LANDSLIDE DEBRIS]					
46												
47							▽					
48			D23	100	14-25-31 45							
49			D24									
50							LEAN CLAY, LEAN CLAY with Sand (CL): wet, tan to reddish tan, stiff to very stiff, homogeneous, 0-10% angular gravel, 5-35% sand, 60-95% fines [LANDSLIDE DEBRIS]					
51			D25									
52												
53			D26					12		26	14	12
54												
55												
56			D27									
57												
58			D28	100	14-26-36 45							
59			D29									

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
☐ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) 8 16 24 32 / MC (%) / PL & LL (%) 20 40 60 80 / Fines Content (%) 20 40 60 80
61			D30				LEAN CLAY, LEAN CLAY with Sand (CL): wet, tan to reddish tan, stiff to very stiff, homogeneous, 0-10% angular gravel, 5-35% sand, 60-95% fines [LANDSLIDE DEBRIS]	14		37	14	23	
62													
63			D31										
64													
65			D32					13		31	17	14	
66													
67		⧗	D33	400	50/4" 66								
68			D34				CLAYEY SAND (SC): wet, grayish brown to reddish gray, very dense, 55% sand, 45% fines, ironoxide staining, organic odor [WEATHERED ROCK]						
69													
70			D35							21	16	5	
71													
72			D36										
73													
74													
75			D37										
76			D38										
77													
78			D39										
79													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
▽ At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
81			D40	0	50/2" 59		CLAYEY SAND (SC): wet, grayish brown to reddish gray, very dense, 55% sand, 45% fines, ironoxide staining, organic odor [WEATHERED ROCK]						
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
96													
97													
98													
99													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-03

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471750 **Longitude:** -110.753041 **Elevation:** 6406.00
Notes: Perched groundwater encountered between 27 and 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1			D1				SILTY GRAVEL with Sand (GM): slightly moist, dark brown, medium dense, 45% sub-rounded to rounded gravel, 25% sand, 30% fines [FILL]					
2							GRAVELLY LEAN CLAY with Sand (CL): slightly moist, brownish tan, soft, approximately 15-25% angular cobbles by volume, matrix supported, 30-35% angular gravel, 15-20% sand, 50% fines [LANDSLIDE DEBRIS]					
3			D2									
4												
5			D3					10		33	14	19
6												
7			D4	93	4-3-4 7							
8												
9			D5									
10			D6									
11							CLAYEY SAND with Gravel (SC): slightly moist, very light brownish tan, dense, approximately 15-25% angular cobbles by volume, matrix supported, 25-30% angular gravel, 30-35% sand, 40-45% fines [LANDSLIDE DEBRIS]					
12												
13			D7									
14												
15			D8					8		30	15	15
16												
17			D9	100	10-17-20 33							
18							CLAYEY GRAVEL with Sand (GC): moist to wet, reddish brown, medium dense, homogenous, approximately 15-25% angular cobbles by volume, matrix supported, 30-55% angular gravel, 20-30% sand, 30-50% fines [LANDSLIDE DEBRIS]					
19			D10									

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-03

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471750 **Longitude:** -110.753041 **Elevation:** 6406.00
Notes: Perched groundwater encountered between 27 and 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D11				CLAYEY GRAVEL with Sand (GC): moist to wet, reddish brown, medium dense, homogenous, approximately 15-25% angular cobbles by volume, matrix supported, 30-55% angular gravel, 20-30% sand, 30-50% fines [LANDSLIDE DEBRIS]					
22												
23			D12					12		35	15	20
24												
25			D13									
26												
27			D14	87	10-11-14 22							
28												
29			D15									
30			D16									
31			D17					11		29	15	14
32												
33												
34			D18									
35			D19	80	20-25-10 17							
36												
37												
38												
39												

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-04

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 30.00 on Oct 02 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 35.2 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471774 **Longitude:** -110.753619 **Elevation:** 6404.00
Notes: Groundwater encountered at 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1			D1				SILTY GRAVEL with Sand (GM): slightly moist, dark brown, medium dense, 45% sub-rounded gravel, 25% sand, 30% fines [FILL]					
2												
3			D2									
4							LEAN CLAY with Gravel (CL): slightly moist, brownish tan, soft, approximately 15-25% angular cobbles by volume, matrix supported, 15-20% angular gravel, 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]					
5			D3									
6												
7			D4	93	2-2-7			12		34	16	18
8			D5		8							
9												
10			D6									
11												
12							CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, dense, approximately 15-25% angular cobbles by volume, matrix supported, 35-55% angular gravel, 15-30% sand, 30-35% fines [LANDSLIDE DEBRIS]					
13			D7									
14												
15			D8					7		19	14	5
16												
17			D9	53	18-27-30							
18					49		LEAN CLAY with Sand (CL): slightly moist, brownish tan, medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-5% angular gravel, 25-30% sand, 65-70% fines [LANDSLIDE DEBRIS]					
19			D10									

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-04

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
▽ At time of drilling 30.00 on Oct 02 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 35.2 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471774 **Longitude:** -110.753619 **Elevation:** 6404.00
Notes: Groundwater encountered at 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D11				LEAN CLAY with Sand (CL): slightly moist, brownish tan, medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-5% angular gravel, 25-30% sand, 65-70% fines [LANDSLIDE DEBRIS]	17				
22												
23			D12							31	17	14
24												
25												
26			D13									
27												
28			D14	87	25-32-12 21							
29			D15									
30			D16									
31			D17				CLAYEY GRAVEL with Sand (GC): wet, grayish brown to reddish gray, very dense, approximately 15-25% angular cobbles by volume, matrix supported, 40-45% angular gravel, 15-20% sand, 40-45% fines [WEATHERED ROCK/LANDSLIDE DEBRIS]	10		33	15	18
32												
33												
34			D18									
35			~~D19~~	400	50/1" 83							
36												
37												
38												
39												

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
□ Fines Content (%) 20 40 60 80

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1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-10

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471827 **Longitude:** -110.752751 **Elevation:** 6404.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-2 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1–4							CLAYEY SAND with Gravel (SC): slightly moist, very loose, brown, 20% angular gravel, 55% sand, 20% fines [TOPSOIL/FILL]					
3			D-1	40	1-1-4 4							
4–5							GRAVELLY LEAN CLAY with Sand. LEAN CLAY with Sand, LEAN CLAY (CL): dry, reddish tan, soft to medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-30% angular gravel, 10-20% sand, 50-90% fines, [LANDSLIDE DEBRIS]					
6			D-2	67	5-8-7 11							
8			D-3	60	5-5-6 9					25	16	9
10–11			D-4	67	9-17-12 18							
13			U-1					14		39	15	24
15–16			D-5	83	4-6-8 11			16		38	21	17
18			U-2					14		32	14	18
19												

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-10

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471827 **Longitude:** -110.752751 **Elevation:** 6404.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-2 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / ☐ Fines Content (%) 20 40 60 80
21			D-6	100	5-9-8 14		GRAVELLY LEAN CLAY with Sand. LEAN CLAY with Sand, LEAN CLAY (CL): dry, reddish tan, soft to medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-30% angular gravel, 10-20% sand, 50-90% fines, [LANDSLIDE DEBRIS]						▲
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-11

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471746 **Longitude:** -110.753110 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1–4			D-1	20	11-11-19 26		CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, medium dense, 55% sub-rounded gravel, 25% sand, 20% fines [FILL]					
5–7			D-2	79	5-11-50/5" 50		CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, medium dense to very dense, chaotic sorting, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 30-50% angular gravel, 15-30% sand, 35-40% fines, Charcoal present [LANDSLIDE DEBRIS					
8–9			D-3	90	8-12-14 20			7		22	15	7
10–12			D-4	83	4-9-12 16							
13–15			D-5	100	6-17-23 33							
16–17			D-6	73	10-18-20 31							
18			~~D-7~~	0	50/1" 79							
19			D-8	125	50/5" 77							

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-11

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471746 **Longitude:** -110.753110 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21							CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, medium dense to very dense, chaotic sorting, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 30-50% angular gravel, 15-30% sand, 35-40% fines, Charcoal present [LANDSLIDE DEBRIS					
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
☐ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-12

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471744 **Longitude:** -110.753401 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-3 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
0							CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, very loose, 55% rounded gravel, 25% sand, 20% fines [FILL]					
3			D-1	60	4-4-3 5		CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, loose to very dense, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 30-35% angular gravel, 25-30% sand, 40-45% fines [LANDSLIDE DEBRIS]					
5			D-2	93	9-19-50/5" 55			10		27	15	12
7			D-3	75	50/5" 78							
9							LEAN CLAY with Sand (CL): dry, tan, medium stiff, 10% angular gravel, 30-40% sand, 50-60% fines, [LANDSLIDE DEBRIS]					
10			D-4	100	6-6-14 15			13		27	17	10
13			D-5	93	4-6-15 17							
15			D-6	100	6-23-29 41		CLAYEY GRAVEL WITH SAND (GC): dry to slightly moist, brown, dense, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 50% angular gravel, 15% sand, 35% fines [LANDSLIDE DEBRIS]					
18			D-7	73	19-16-42 45							

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-12

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471744 **Longitude:** -110.753401 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-3 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D-8	100	6-9-15 20		SANDLY LEAN CLAY with Gravel (CL): dry to slightly moist, brown, medium stiff, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 20-30% angular gravel, 20-30% sand, 50% fines [LANDSLIDE DEBRIS]	11		26	14	12

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
□ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-03

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471762
Longitude: -110.752954
Elevation: 6406.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

Notes:
No groundwater encountered. Stopped at target depth and limits of excavtator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
0						CLAYEY GRAVEL with Sand(GC): dry to slightly moist, blackish brown, homogeneous, 45% sub-angular gravel, 30% sand, 25% fines, [FILL]						
4						CLAYEY GRAVEL with Sand(GC): dry to slightly moist, brown, clast supported, 25% sub-angular to angular cobbles by volume, remaining 50% angular gravel, 15% sand, 35% fines by mass, Large amounts of charcoal. Chaotic sorting. Layer of CL (-0.5") at 6.5' and 8' [LANDSLIDE DEBRIS]						

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-04

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471736
Longitude: -110.753241
Elevation: 6405.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160
Notes: No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
1						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, blackish brown, homogeneous, 45% sub-rounded gravel, 30% sand, 25% fines, Chunks of asphalt present, rebar [FILL]						
2												
3												
4												
5						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, clast supported, 15% sub-angular to angular cobbles by volume, remaining 50% angular gravel, 15% sand, 35% fines by mass, Large amounts of charcoal. Chaotic sorting. [LANDSLIDE DEBRIS]						
6												
7												
8												
9												
10												
11												
12			D-1									
13												
14												
15												
16												
17												
18												
19												

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-05

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471248
Longitude: -110.753015
Elevation: 6467.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Notes:
Contractor: FCE
Equipment: Hitachi Zaxis 160

No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
1						CLAYEY SAND (SC): dry, brown, loose, 15% gravel, 55% sand, 30% fines, [TOPSOIL]						
2						LEAN CLAY with Sand (CL): dry, light whitish tan, pinholed, 5% angular gravel, 15% sand, 80% fines, medium plasticity, Some gravels and cobbles present. Lime stringers present [LOESS]						
3												
4												
5												
6												
7			D-1									
8						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, clast supported, 35% angular cobbles by volume, remaining 50% angular gravel, 15% sand, 35% fines by mass, charcoal. Chaotic sorting. [LANDSLIDE DEBRIS]						
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

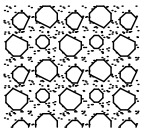
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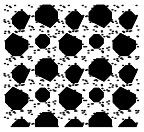
Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471498
Longitude: -110.753164
Elevation: 6424.50
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

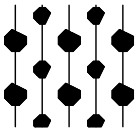
Notes:
No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

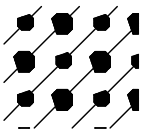
Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
0						CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, 40% angular cobbles by volume, remaining 55% angular gravel, 15% sand, 30% fines by mass, 2-4' cobbles and boulders [LANDSLIDE DEBRIS]						
4						CLAYEY GRAVEL with Sand (GC): slightly moist, dark reddish brown, dense, clast supported, 40% angular cobbles by volume, remaining 55% angular gravel, 15% sand, 30% fines by mass, 2-4' cobbles and boulders. Increased to very dense at bottom of pit. [LANDSLIDE DEBRIS]						
8						CLAYEY GRAVEL with Sand (GC): Dry, reddish brown, very dense, 80% angular cobbles by volume, remaining 55% angular gravel, 20% sand, 25% fines by mass, Appears to be layer of scree/ loose bedrock [LANDSLIDE DEBRIS/WEATHERED BEDROCK]						

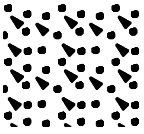
SOIL GRAPHICS

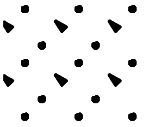
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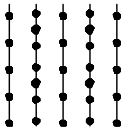
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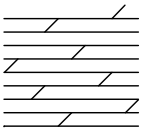
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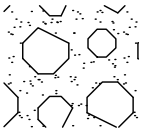
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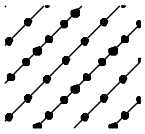
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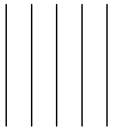
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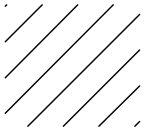
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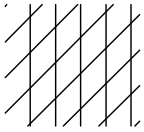
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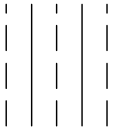
COBBLES/BOULDERS 

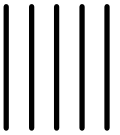
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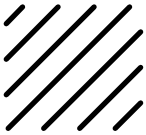
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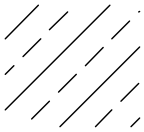
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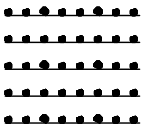
ML–CL 

OL 

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OH 

PT 

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

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

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**		**DRILL HOLE No. BH-1**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/11/05 10/12/05**		DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**		DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6408.5**		HOLE DIAMETER: **4"**	
		HAMMER TYPE: **140#**	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ALUVIAN GRAVEL, COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED ON EXCAVATED CUT SLOPE. SURFICIAL SOILS AT BORING SITE AND IN ADJACENT CUT SLOPES ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER (6' M.D.)*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-5' ARE ROCK CHIPS AND SILTY CLAY FINES*						
		4												
		5						*DRILLING THROUGH ROCK 4.8-6'*						
		6												
		7												
		8												
		9						*CUTTINGS 0-10.1' ARE ROCK CHIPS AND SILTY CLAY FINES*						
		10	X			BH1-1 2" SS	87	*DRY GREY GRAVEL, GP, FILGC, LIMESTONE FRAGMENTS IN MOIST BROWN SILTY SAND MATRIX*			>50			
		11	X											
		12												
		13												*10-20' DR REPORTS INTERVALS OF 1-4" SOFTER MATERIAL. PRIMARILY DRILLING THROUGH ROCK MATERIAL CUTTINGS ARE LIMESTONE FRAGMENTS IN SILTY SAND*
		14												
		15												
		16												
		17												
		18												
		19												
		20	X			BH1-2 2" SS	46	*MOIST BROWN GRAVEL W/ SILT AND SAND, GP-GM, GRAVELS ANGULAR, SILT STIFF. MULTICOLORED GRAVELS HIGHLY WEATHERED*			35			
		21	X											

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CLIENT: **SNOW KING MOUNTAIN RESORT**
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-1* PAGE: *2 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	22												DR MOD. TO EASY DRILLING IN 20–22' INTERVAL 8" ROCK 22.3–23'
		23												
		24												
		25				BH1-3 3"CS	25	MOIST BROWN CLAYEY SAND WITH GRAVEL, SC, PP=2.5 TSF, STIFF TO V. STIFF. FRAG. IN SHOE			8			
		26												DR 1–3" INTERVALS BETWEEN CLASTS
		27												
		28						SOME HIGHER PLASTICITY LEAN CLAYS IN CUTTINGS						
		29												
		30				BH1-4 2.5" SS	21	MOIST BROWN CLAYEY SAND WITH GRAVEL, SC, V. STIFF TO HARD, PP=4.0TSF	27	16	10		10	DR EASIER DRILLING FROM 29.5'± WITH LITTLE HAMMER ACTION
		31												
		32						HOLE CAVED TO 20' AFTER 30' SAMPLE						DR EASIER DRILLING FROM 29.5'± WITH LITTLE HAMMER ACTION FREQ. HAMMER PLUGGING 32–40'
		33												
		34												
		35												
		36												
		37												
		38												
		39												
		40						NO SLUFF IN HOLE @40' DIFFICULTY CLEANING HOLE TO REMOVE ROD INDICATES SOME CAVING IN 30–40' INTERVAL.						
		41				BH1-5 2" SS	70	MOIST BROWN CLAYEY SAND, SC, VERY STIFF TO HARD, FINE ANGULAR GRAVELS IN A SANDY CLAY MATRIX. UPPER 2" HIGHER MOISTURE CONTENT, MAY INDICATE SEEPAGE ZONE 40–41'	19	4	30		12	DR GRAVEL AND COBBLE ZONE 42–43' WATER LEVEL 11/3/05
		42												
		43												
		44												

S:\STANDARD\BORDERS\NE_BOREHOLE.DWG (BOREHOLE PG1) JUN 20 2002 08:53:53 AM PLOTTED BY: GREEN

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

CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-1* PAGE: *3 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44						*CUTTINGS ARE MOIST TO WET OLIVE GREEN CLAYEY SAND*						*DR CONT. HAMMER CLOGGING FROM 42'*
		45	X			*BH1-6 2" SS*	*83*	*MOIST OLIVE GREEN CLAYEY SAND, SC, MED. STIFF TO STIFF, SLIGHTLY SANDY LENS WITHIN. SOME CALCIUM CARBONATE STRINGERS.*	*30*	*6*	*16*		*20*	
		46	X											
		47	X											
		48												
		49												
		50												
		51												
		52	X											*AT 52' DR APPROX. 12' OF WATER IN HOLE OVERNIGHT*
		53	X			*BH1-7 2" SS*	*40*	*AS ABOVE BUT GREY BROWN, SOME COAL/ORGANICS, PP=3.5-4.0 TSF.*			*22*			
		54	X					*BOH =52.0'*						
		55						*SET PIEZO (1"PVC) BOTTOM AT 51.1 SLOTTED BOTTOM 10' FILLED ANNULUS WITH SAND TO 38' 1' STICKUP*						
		56												
		57												
		58												
		59												
		60												
		61												
		62												
		63												
		64												
		65												
		66												

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CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

S:\PROJECTS\06-12 GRAND VIEW LODGES\DRILLING\BHBORINGLOG.DWG (BH-1 (2)) FEB 13 2006 10:56:01 AM PLOTTED BY: GYR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-2**	PAGE: **1 OF 5**
DATE STARTED / FINISHED: **10/11/05 10/12/05**	DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6550.3**	HOLE DIAMETER: **4"**	
	HAMMER TYPE: **140#**	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	FREQ. GRAVEL, COBBLE. AND BOULDER SIZE CLASTS	1–6						*BORING LOCATED ON GRASSY AREA. SURFICIAL SOILS IN ADJACENT ROAD CUT ARE GENERALLY STIFF TO HARD GRAVEL AND SILT MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE. SEVERAL LARGE BOULDERS EXCAVATED FROM NEARBY WATER TANK EXCAVATION.*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		3–5						*CUTTINGS 0–5' ARE MOIST LT BROWN GRAVEL WITH WITH SILT, GP–GM*						*DR FREQ. COBBLES. HAMMER ACTION IS NEARLY CONTINUOUS*
		6												*DR NO GRAVEL/COBBLES FROM 6'±*
	WET TO SATURATED SOILS IN INTERVALS FROM 7'–18'	7–9						*DR VERY SOFT DRILLING 7–9.5' CUTTINGS ARE WET CLAY/SANDY CLAY. APPEARS TO BE A SATURATED ZONE*						
		10–11				BH2-1 2.5" CS	75	*FROM 9.5' SAND CONTENT OF CUTTINGS INCREASING MOIST GREY BROWN CLAY, CL, STIFF TO VERY STIFF, NONUNIFORM PLASTICITY IN SAMPLE.*			15			
		12–14												*DR GRAVELLY DRILLING 12'–13'*
		15–16				BH2-2 2" SS	75	*MOIST TO WET GREY CLAYEY SAND W/GRAVEL, SC, GRAVELS FINE TO MED. SANDS FINE. V. STIFF TO HARD, MEDIUM PLASTICITY*			16			
		17												
		18						*HAMMER PLUGGING FREQ. TO 17' CUTTINGS ARE MOIST CLAYS*						
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	19–21						*ROCKY DRILLING FROM 18' FREQ. HAMMER ACTION ON COBBLE AND GRAVELS. CUTTINGS SLIGHTLY MOIST*						

MATERIAL DESCRIPTION

NELSON ENGINEERING
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CLIENT: **SNOW KING MOUNTAIN RESORT**
JACKSON, WYOMING

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	22												*DR ROCKY DRILLING FROM 20'*
		23						*CUTTINGS TO 25' ARE GRAVEL/COBBLE FRAGMENTS IN SILT/SILTY CLAY WITH SAND MATRIX*						
		24												
		25	X			BH2-3 2.5"	25	*MOIST GREY SANDY SILT/SANDY CLAY, SC, V. STIFF*			18			
		26	X											*DR WET PLASTIC SOILS CONT. PLUG HAMMER. BORING ADVANCED WITH 1.875" ø NQ CORE FROM 30'*
		27	X											
		28												
		29												
		30						*CORING FROM 30' RETURN LOGGED AS IN"/IN"*						
		31		X				*30-30.8' WET SAT GREY CLAY, CL, WET FROM DRILLING FLUID. WITH 2 3" GRAVEL PARTICLES*						
		32		X			33/36	*30.8-33' MOIST GREY GREEN SANDY SILT, ML, V. STIFF TO HARD. GRADES TO SILTY SAND W RED COLORING SOME INTERVALS. TRACE CLAY. THROUGHOUT. 1 2" SEAM OF V.STIFF MED. PLASTICTY CH 31.0'*						
		33		X										
		34												
		35					2/60	*MOIST GREY SAND W/SILT, SP/SM, SANDS FINE, DENSE, WEAKLY CEMENTED*						
		36												
		37												
		38												
		39												
		40					35/60	*MOIST DENSE GRAY GREEN SAND W/SILT, SP-SM, DENSE, CONTAINS 1/4" THICK STRATA OF DK BROWN SILT W/SAND IN LOWER HALF*						
		41												
		42												
		43												
		44												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

S:\STANDARD\REFERENCE\BOREHOLE\BOREHOLE.PGU JUN 20 2002 09:53:53 AM PLOTTED BY: GREEN

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-2* PAGE: *3 OF 5*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44					43/60	*MOIST DENSE GRAY GREEN SILTY SAND, SM, SANDS FINE, SILT % INCREASING WITH DEPTH, LOWER 1.5' OF SAMPLE MAY BE SANDY SILT. 3–5 DARKER FINE GRAINED STRATA <1" THICKNESS IN INTERVAL*						
		45												
		46												
		47												
		48												
		49												*48–53 DR VARIABLE RATE OF ADVANCE IND. 6"± STRATA*
		50					60/60	*4" INTERVAL 48.2–48.6 SAT V. SOFT SILTY SAND (DRILLING FLUID). MOIST GRAY GREEN SILT, ML, V. STIFF, OCCASIONAL BLACK ANGULAR FINE GRAVELS.*						
		51						*SAND % INCREASING FROM 51' MOIST GREY GREEN SILTY SAND, SM, SANDS FINE, DENSE*						
		52												
		53												
		54					48/48	*MOIST GREY GREEN SILT, SILTY SAND, ML/SM, WEAKLY CEMENTED SILTSTONE UPPER 6"*						
		55												
		56												
		57					12/12	*AS ABOVE*						
		58												
		59												
		60					12/60	*DR COBBLE AND GRAVEL DRILLING AND LOSS OF DRILLING FLUID FROM APPROX. 58'. POOR RETURN, 2" MINUS SANDTONE GRAVELS AND SILTY SAND. APPEARS TO BE COBBLES IN SILTY SAND MATRIX.*						
		61												
		62												
		63												
		64												
		65					12/20	*BLOCKED OF AT 64.7 BY COBBLE. MED. COARSE GRAVEL SIZE FRAGMENTS QUARTZITE NO WATER RETURN 65.5–66'*						
		66												

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S:\STANDARD REFERENCE FILES\LOGGING GRIDDLE.PGU JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-2* PAGE: *4 OF 5*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		67					14/40	*AS ABOVE.* *CONT. LOSS OF FLUID TO FORMATION*						
		68												
		69					18/30	*GRAVEL SIZE LIMEYSANDSTONE FRAGMENTS, SOME SAND ADHEREING TO GRAVEL SURFACES*						
		70						*BLOCKED OFF BY COBBLE @70.5*						
		71					15/30	*DR HARDER COMPETENT ROCK WITH THIN (<2") SOFTER INTERVALS THROUGHOUT. CONT. WATER LOSS.* *MOIST GREEN SILT W/SAND, ML, HARD, TRACE CLAYS.*						
		72												
		73												
		74					54/60	*UPPER 1' IS SILT W SAND, ML, SAT. SOFT (DRILLING FLUID)* *REMAINDER IS MOIST GREEN SANDY SILT, ML, GRADES TO SILTY SAND IN SOME INTERVALS, SANDS FINE. VERY STIFF TO HARD*						
		75												
		76												
		77												
		78												
		79												
		80					44/60	*UPPER 10" MOIST GREEN SAND W/SILT, SP-SM,* *9" INTERVAL MOIST GREEN THEN BLACK CLAY, CH, MED. TO HIGH PLASTICITY, V. STIFF TO HARD* *16" SAND W SILT AS ABOVE* *GRADES TO MOIST GREEN CLAY, CH, HARD, BOTTOM 4"*						*DR REPORTS RED SEDIMENT IN RETURN FLOW 80-81 NO RED MATERIAL IN CORE*
		81												
		82												
		83												
		84					21/51	*14" MOIST GREEN TAN SILTY SAND/SANDY SILT, DENSE/HARD SANDS FINE* *2" MOIST GREEN CLAY, CH/CL, MED. HIGH PLASTICITY , WITH FINE SAND. V. STIFF TO HARD* *5" COBBLES LARGE GRAVELS IN SILT W SAND MATRIX*						*DR REPORTS LITTLE WATER LOSS 83-88*
		85												
		86												*BIT BLOCKED@87.25 NO RETURN FROM 87.5 DR COBBLE DRILLING*
		87												
		88					18/30							
		89												

S:\STANDARD\BORERS\NE_BOREHOLE.DWG (BOREHOLE PLG) JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-2* PAGE: *5 OF 5*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		90						*FRACTURED BLUE GREY LIMESTONE, 1" MD*						*DR COBBLES NO RETURN 89.8–93*
		91					14/38	*FRACTURED LIMESTONE AS ABOVE*						
		92												
		93												
		94												
		95					23/30	*LIMESTONE, 7" CONT. CORE, REMAINDER FRACTURED GRAVEL SIZE*						
		96					20/30	*BLACK TO GREY FRACTURED LIMESTONE, 1.5" M.D. SOME SANDY CALY MATRIX. APPEARS TO HAVE WEATHERED SURFACES*						*BLOCKED@96.5*
		97												
		98												*NO REUTRN 98–103 COBBLES WITH SMOOTH INTERVALS (CORING THROUGH LARGER COBBLE)*
		99												
		100					27/60	*CONT. FRACTURED LIMESTON, WITH SANDY CLAY INTERVALS. FRAGS UP TO 3" CORE LENGTH. WEATHERED SURFACES*						
		101												
		102												
		103												
		104												*NO REUTRN 103–108 CONT. COBBLE DRILLING*
		105					40/60	*AS ABOVE TO BOH*						
		106												
		107												
		108						*SET PIEZOMETER 1" ø PVC.* *BOTTOM AT 107.7* *SLOTTED 97.7–107.7* *NO WATER MEASURED ON 11/3/05*						
		109												
		110												
		111												
		112												

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S:\PROJECTS\2006\126-02 GRAND VIEW GEOTECH\DRAWINGS\LOGS\DWG GBH-2(5).DWG FEB 13 2006 11:06:21 AM PLOTTED BY: GYR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-3** PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/20/05 10/20/05**	DRILLER: **PIEDMONT**
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6445.8**	HOLE DIAMETER: **4"**
	HAMMER TYPE: **140#**

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED UNDISTURBED GROUND. SOILS EXPOSED IN WATERLINE TRENCH TO WEST TO DEPTH OF APPROX. 15' ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE (6' M.D.)*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-10' ARE ROCK CHIPS AND SILTY CLAYEY SAND*						
		4												*10-9.5' DR COBBLES AND GRAVELS WITH MATRIX INTERVALS OF 1" OR LESS THICKNESS*
		5												
		6												
		7												
		8												
		9												
		10	X			BH3-1 2" SS	46	*MOIST LT BROWN SILTY CLAYEY SAND W/GRAVEL, SC-SM, GRAVELS FINE ANGULAR, WITH CALCEROUS STRINGERS. SANDS FINE. GRADES TO SILTY CLAY WITH GRAVEL, STIFF*			34			
		11												
		12												*COBBLES LESS FREQ. FROM 9.5'*
		13												
		14						*DR ROCK, 14.1-16.8'*						
		15												
		16												
		17												
		18												
		19												
		20	X			2" SS	NS				30/0			*DR GRAVEL AND COBBLES FREQ. FROM 20.5'*
		21												

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S:\PROJ\2005\129-12 GRAND VIEW GEOTECH\ENGINEERING\DRIVE (ENGR)\ FEB 13 2006 11:46:48 AM PLOTTED BY: GYR

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-3* PAGE: *2 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		22						*CUTTINGS ARE GRAVEL FRAGS AND RED SAND FROM 20'*						
		23												
		24												*WATER LEVEL 11/3/05*
		25												
		26				BH3-2 2"SS	33	*MOIST LT BROWN SILTY CLAY W GRAVEL , CL-ML, FILGC, GRAVELS FINE TO MED. LIMESTONE. STIFF TO VERY STIFF. DRILLING INDICATES HIGHER ROCK % THAN SAMPLE CONTENTS.*			30			*DR FREQ. PLUGGING 25-30' GRAVELLY*
		27												
		28												
		29												
		30												
		31				BH3-3 2.5" SS	100	*MOIST GREY BROWN SILTY SAND W.GRAVEL, SM, SANDS FINE, VERY STIFF*			17			
		32												*DR FREQ. HAMMER PLUGGING 30-35' DUE TO WET SILTY CLAY.*
		33												
		34						*CUTTINGS 35-40' ARE SILTY CLAY, GRAVEL, SILT, AND SAND MIXTURE*						
		35												
		36												
		37												
		38												
		39				BH3-4 2.5" SS	50	*MOIST GREY CLAY, CL HARD. SUSPECT WATER ABOVE IMPERMEABLE CLAY LAYER.*			>50			
		40												
		41				BH3-5 2" SS	58	*MOIST BROWN TO YELLOWBROWN SILTY CLAY W/GRAVEL, CL-ML, SOME COAL, STIFF TO VERY STIFF.*			12			*DR GRAVEL AND COBBLE ZONE 42-43'*
		42				BH3-6 2" SS	100	*MOIST GREY SILT W GRAVEL, ML, FRAGS UP TO 2", V. STIFF TO HARD.*			>50			
		43												
		44												

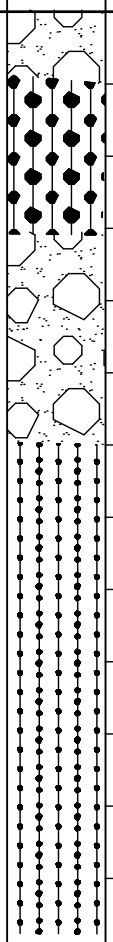
DRILLED BH3A TO 40' WITH DOWNHOLE HAMMER. SET PIEZO BOTTOM AT 33.25 SLOTTED TO 23.25. SAND 33.25-22.0' DRILLED BH3B APPROX. 7' EAST OF BH3A, 3B DRILLED WITH HAMMER TO 42' CASED 3.75"ø TRICONE WITH WATER FROM 42'

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S:\STANDARD\BORINGS\NE_BOREHOLE.PGU JUN 26 2002 09:35:3 AM PLOTTED BY: GREEN

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-3* PAGE: *3 OF 3*



DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
44						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 boring and at the time of the drilling. 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.						*DR SOFT EASY DRILLING FROM 44–45'*
45												
46												*DR COBBLES 3–6" WITH SOFT INTERVALS 46–49'*
47												
48												
49												*DR SMOOTH DRILLING FROM 49'–BOH*
50												
51	✕			*BH3-7 2" SS*	*100*	*MOIST GREY FINE SILTY SAND, SM, INCLUDES 4" OF CLAY WITH BLACK PEAT/COAL INCLUSIONS, V. STIFF*			*23*			
52	✕											
53												
54												
55												
56	✕			*BH3-8 2" SS*	*100*	*AS ABOVE. V. STIFF, DENSE.*			*20*			
57	✕					*BOH=–55.75'*						
58												
59												
60												
61												
62												
63												
64												
65												
66												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
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S:\STANDARDS\BOREHOLE\NE_BOREHOLES.DVG (BOREHOLE.PGL) JUN 28 2002 08:13:53 AM PLOTTED BY: GREEN

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-4**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/22/05 10/23/05**	DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6487.8**	HOLE DIAMETER: **4"**	
	HAMMER TYPE: **140#**	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED ON UNDISTURBED GROUND. SOILS EXPOSED 50' HIGH CUT SLOPE DOWNSLOPE TO THE NORTH ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE (6' M.D.) SEEPS ARE EVIDENT IN AREA OF CUT FACE DOWNSLOPE OF BORING.*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-6' ARE ROCK CHIPS AND MOIST SILTY CLAYEY SAND*						
		4												*CUTTINGS MOISTURE % INCREASING FROM 6' FEWER ROCKS AND FREQ. BIT PLUGGING.*
		5												
		6												
		7												
		8												
		9	X			BH4-1 2.5" SS	79	*MOIST LT TAN GREEN SILTY SAND, TRACE CLAY, TRACE COAL, HARD.*			35			
		10	X											
		11												
		12												
		13												
		14	X			BH4-2 2" SS	50	*MOIST TO WET RED SILTY CLAYEY GRAVEL W/SAND, MED. PLASTICITY, STIFF TO V. STIFF. MOIST. CHAOTIC, NOT STRATIFIED*			17			*DRILLING WITH 3.75" ø TRICONE AND WATER FROM 15'*
		15	X											
		16												
		17												
		18												
		19												
		20												*DR ROCK 19.5-20.2'*
		21												

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CLIENT: **SNOW KING MOUNTAIN RESORT**
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S:\PROJECTS\06-07\TRANSFER STATION GEOTECH\TRANSFER MAIN BUILDING BORING LOGS.DWG GINT-D MAR 14 2005 01:31:31 PM PLOTTED BY:

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-4* PAGE: *2 OF 3*

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		22												*DR SOFT 20.5–22 DR 50% ROCK WITH 4"–8" INTERVALS OF SOFTER MATERIAL BETWEEN 22–29'*
		23												
		24												
		25												
		26												
		27												
		28												
		29												
▼		30												*WATER LEVEL 11/3/05*
		31												
		32												
		33												
		34						*AT 34' ATTEMPTED SPLIT SPOON, BORING CAVED TO 29' DRILLING WITH CASED 3.75" TRICONE FROM 34' DR SMOOTHER DRILLING AT 35'*						
		35												
		36												
		37												
		38												
		39				BH4-3 2" SS	92	*MOIST TO WET SILT, ML, TAN, MED PLASTICITY. SEAMS .5–1" THICK MAY BE SATURATED. STIFF.*			8			
		40												
		41												*DR COBBLES FROM 39.5 LOSING WATER FROM 40.5*
		42												
		43												
		44												

S:\STANDARD\BORERS\NE_BOREHOLE.DWG (BOREHOLE PLT) JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

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CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-4* PAGE: *3 OF 3*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44						*DR CONT FRACTURED ROCKY DRILLING FROM 39' CUTTINGS ARE ANGULAR LIMETONE/SANDSTONE GRAVEL SIZE FRAGMENTS*						
		45												
		46												
		47												
		48												
		49												
		50												
		51												
		52												
		53						*DR CONT FRACTURED ROCKY DRILLING FROM 39' CUTTINGS ARE ANGULAR BLUE BLACK LIMESTONE/SANDSTONE GRAVEL SIZE FRAGMENTS*						
		54						*MAJORITY OF WATER LOST, 39'–BOH*						
		55						*BOH =55.75*						
		56						*SET PIEZO (¾"PVC) BOTTOM AT 36.1' SLOTTED BOTTOM 6' BENTONITE IN HOLE TO 36.1, SAND TO 20' FILLED ANNULUS WITH SAND TO 38'*						
		57												
		58												
		59												
		60												
		61												
		62												
		63												
		64												
		65												
		66												

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S:\PROJ\2002\130-12 GRAND VIEW GEOTECH\BH\BORINGLOGS.DWG (BH-4 (3)) FEB 13 2006 11:07:07 AM PLOTTED BY: GVR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**		**DRILL HOLE No.** BH-5	PAGE: 1 OF 4
DATE STARTED / FINISHED: 10/24/05 10/25/05		DRILLER: PIEDMONT	
LOGGED BY: GYR/ROLFE		DRILL TYPE: TRACK MOUNT B-50	
BOREHOLE LOCATION/ELEVATION: SEE LOCATION MAP/6409.9		HOLE DIAMETER: 4"	
		HAMMER TYPE: 140#	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1						*BORING LOCATED AT BASE OF 60' PLUS CUT SLOPE*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-10' ARE MOIST TO WET LT BROWN CLAY, SILTY CLAY WITH SOME GRAVEL FRAGMENTS.*						
		4						*DRILLING INDICATES OCCASIONAL COBBLES*						
		5						*MOIST TO WET PLASTIC SOIL CAUSING FREQ. PLUGGING FROM 4'*						
		6												
		7												
		8												
		9												
		10						*DR ROCK 9.5-11'*						
		11						*WET FROM 11' FREQ. HAMMER PLUGGING*						
		12												
		13												*NO WATER IN HOLE @13' AFTER 28 HOURS*
		14												
		15						*NQ CORING FROM 15' RETURN LOGGED AS IN"/IN"*						
		16					10/36	*MOIST LT BROWN CLAYEY SAND W. GRAVEL, COBBLE FRAG. IN SHOE. V. STIFF TO HARD PP> 3.0 TSF*						
		17												
		18												*18-23 LITTLE WATER LOSS SMOOTH DRILLING W/OCCASIONAL COBBLES*
		19					10/60	*AS ABOVE*						
		20												
		21												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *2 OF 4*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		22												*MINIMAL WATER LOSS 23–28'*
		23												
		24												
		25					19/60	*COBBLE IN BIT. MOIST BROWN CLAYEY SAND, SC, SANDS FINE, CLAY FRACTION MED. TO HIGH PLASTICITY, TRACE GRAVELS, HARD*	29	4				
		26												*SOME WATER LOSS @29' REGAINED BY 30'*
		27												
		28												
		29												*DRILLING IND. SAT. SOFT/LOOSE ZONE 30'±1 28–33 SMOOTH DRILLING W/SOME COBBLES LOWER PORTION*
		30					51/60	*AS ABOVE W/COBBLES TO 6", MOIST TAN BROWN SILTY CLAY W/GRAVELS*						
▼		31						*DRILLER REPORTS SAND LENSE "PUSHING IN ON HOLE" AT 30' HOLE CASED TO 33'*						
		32												
		33												
		34												
		35					18/36	*ALL GRAVEL AND COBBLE FRAGMENTS, LITTLE FINE GRAINED MATERIAL*						*MIN. WATER LOSS 33–40'*
		36						*36–38' MOIST TAN BROWN CLAYEY SAND, SC, TRACE GRAVEL, MED. PLASTIC*						
		37					13/24	*ABUNDANT GRAVEL MOIST TAN TO GREY CLAYEY SAND W/GRAVEL, SC, MED. PLASTICITY*						*DRILLING IND. HIGHER GRAVEL FRACTION THAN IN RETURN FROM 33'*
		38												
		39					15/17	*MOIST BROWN CLAYEY SAND, SC, SANDS FINE, FINES MED. PLASTIC, V.STIFF TO HARD, TRACE GRAVEL*	28	12				
		40												
		41					9/43	*MOIST GREY CLAYEY SAND, W/ GRAVEL AND COBBLES, SC, V. STIFF TO HARD*						
		42												
		43												
		44												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *3 OF 4*

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		44												
		45					21/60	*MOIST TAN SILTY TO SANDY CLAY W/GRAVEL, CL, MED. PLASTICITY, V. STIFF TO HARD*						*TAN BROWN RETURN*
		46												
		47												
		48												
		49					13/24	*AS ABOVE*						
		50												*GOOD RETURN*
		51												
		52					15/36	*MOIST TAN BROWN SILTY CLAYEY SAND W/GRAVEL, SC-SM COAL IN SHOE @53' V/ STIFF TO HARD*						
		53												
		54					30/30	*MOIST TAN BROWN SILTY CLAY W/GRAVEL, INTERBEDDED COAL STRATA, V. STIFF, SOME MOTTLEING*						
		55												
		56												
		57					27/30	*AS ABOVE*						
		58												
		59												
		60					14/60	*MOIST BROWN SANDY SILTY CLAY W/GRAVEL, CL-ML, VERY STIFF*						
		61												
		62												
		63												
		64						*63-68 SOME KNOCKING, SOME FAST DRILLING*						
		65						*ORGANICS AT 65'*						
		66												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *4 OF 4*

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		67					34/60	*AS ABOVE TO 65' <u>FIBROUS ORGANIC MATERIAL @65±</u> BELOW ORGANICS IS MOIST BLUE GREY SANDY CLAY/CLAYEY SAND, STIFF TO VERY STIFF, WITH GRAVEL. BOTTOM 1' IS MOIST SILTY SAND/SANDY SILT/HARD/V. DENSE*						
		68												
		69												
		70					37/60	*SILTY SAND AS ABOVE SMOOTH DRILLING OCCASION KNOCKING, MOD FAST DRILLING*						
		71												
		72												*GOOD RETURN BLUE/GREY TO WHITE GREY*
		73												
		74						*<u>ORGANIC DEBRIS</u> MOIST BLUE GREY CLAYEY SAND W/ GRAVEL AND OCCASIONAL LARGE FRAGS OF WHITE LIMESTONE, STIFF TO VERY STIFF, CHARCOAL AND ORGANIC DEBRIS*						
		75					44/48							
		76												
		77												
		78					9/12	*MOIST BLUE GREY SANDY SILT, ML, TRACE GRAVEL LOW PLASTICITY STIFF TO VERY STIFF, CHARCOAL*						
		79												
		80					24/33	*AS ABOVE CHARCOAL IN SHOE*						
		81						*BOH AT 80.75 3/4" PIEZO INSTALLED PULLED CASING, CAVED TO 50' WATER IN BORING ABOVE 50' AS SEEN ON CLOTH TAPE. BENTONITE TO 45.5' BOTTOM OF PIEZO AT 45.5' SLOTTED TO 35.5 SAND TO 35.0' CAVED ABOVE*						
		82												
		83												
		84												
		85												
		86												
		87												
		88					18/30							
		89												

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PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-6**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **6/24/2021 6/25/2021**	DRILLER: **IME**	
LOGGED BY: **PRUETT**	DRILL TYPE: **TRUCK-MOUNTED CME85**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6466.0'**	HOLE DIAMETER: **8" OD HOLLOW STEM AUGER (HSA)**	
	HAMMER TYPE: **140# AUTO**	

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DEPTH (FT)	SAMPLES DRIVE	SAMPLES UNDISTURBED	SAMPLES BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
1						*BORING LOCATED ON CENTERLINE OF MOUNTAIN ACCESS ROAD W/GRAVEL SURFACE. UPHILL ROAD CUTS EST. 3-7' HEIGHT. STEEP GRASSY SLOPES UPHILL AND DOWNHILL. SURFICIAL SOILS ON CUT SLOPES DRY SILTY/CLAYEY GRAVEL/GRAVELLY SILT/CLAY WITH COBBLES AND BOULDERS.*						*EASY DRILLING WITH INTERMITTENT BIT GRINDING FROM 1'-10'*
2												*2 MINUTES TO DRILL 0'-5'*
3												
4												
5	5			BH6-1 2" SS	83	*5.0'-6.5' MOIST, BROWN/LT BROWN GRAVELLY SILT/SILTY GRAVEL, HARD, ANGULAR LIMESTONE AND SANDSTONE GRAVELS, FILGC*			34			
6	7											*3 MINUTES TO DRILL 5'-10'*
7	11											*HARD DRILLING IN GRAVELS FROM 7'-8'*
8												
9												
10	6			BH6-2 2" SS	61	*10.0'-11.5' MOIST, LT BROWN/GRAY SILTY GRAVEL WITH SAND, DENSE, ANGULAR LIMESTONE GRAVEL FRAGMENTS, FILGC*			34			*MODERATE DRILLING WITH CONSTANT BIT GRINDING ON GRAVELS AND COBBLES FROM 10'-21'*
11	10											*4 MINUTES TO DRILL 10'-15'*
12	12											
13												
14												
15	12			BH6-3 2" SS	67	*15.0'-16.5' SAME AS ABOVE, TRACE SAND, LIMESTONE GRAVEL LODGED IN TIP OF SS*			47			
16	17											*5 MINUTES TO DRILL 15'-20'*
17	17											
18												
19												
20	17			BH6-4 2" SS	78	*20.0'-21.5' 0"-12" SAME AS ABOVE, DENSE, ANGULAR GRAY LIMESTONE AND MINOR YELLOW SANDSTONE GRAVELS, MEDIUM PLASTICITY SILT*			32			
21	15					*12"-14" MOIST, OLIVE GREEN SILTY CLAYEY GRAVEL WITH MINOR SAND*						
	11											

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DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
22	11											
	6			BH6-4B 3" DM	83	22.0'–23.0' MOIST, OLIVE GREEN LEAN CLAY CHAOTICALLY MIXED WITH MINOR GRAY SILTY CLAY, STIFF TO VERY STIFF, MINOR COAL FRAGMENTS, PP>4.0 TSF, ORANGE OXIDATION STAINING IN TIP OF SS	33	15	15	108	18	MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 21'–25'
23	13	X										
24												4 MINUTES TO DRILL 20'–25'
25	3											
	5			BH6-5 2" SS	83	25.0'–26.5' MOIST, GRAY GRAVELLY SILTY CLAY WITH SAND, STIFF, MEDIUM PLASTICITY SILTY CLAY, PP=1–2 TSF, ANGULAR LIMESTONE AND SANDSTONE CLASTS, SANDSTONE CLAST WITH SHELL FOSSIL, ABUNDANT ORANGE OXIDATION STAINING THROUGHOUT			13			SMOOTH EASY DRILLING FROM 25'–30'
26	6											
27												2 MINUTES TO DRILL 25'–30'
28												BIT GRINDING FROM 28'–29'
29	7			BH6-5B 3" DM	83	28.5'–29.5' MOIST, BROWN SILTY CLAYEY/CLAYEY GRAVEL WITH SAND, MEDIUM DENSE, FINE SAND, ANGULAR LIMESTONE FRAGMENTS, FILGC			16			
	14											
30	14			BH6-6 2" SS	67	30.0'–31.5' MOIST, BROWN SILTY GRAVEL WITH SAND, VERY DENSE, FINE SAND, ANGULAR LIMESTONE FRAGMENTS, FILGC, FROM 4"–8" GRAVEL WITH SILT AND SAND LENS, GRAVEL LODGED IN TIP OF SS			51			MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 30'–35'
31	23											5 MINUTES TO DRILL 30'–35'
	24											
32												
33	7											INCREASED BIT GRINDING FROM 33'–35'
	20	X		BH6-6B 3" DM	100	33.0'–34.0' MOIST, OLIVE GREEN CLAYEY GRAVEL WITH SAND, MEDIUM DENSE, ANGULAR LIMESTONE, DOLOMITE, AND SANDSTONE GRAVELS			19			
34												
35	11											HARD DRILLING WITH CONSTANT BIT GRINDING 35'–45'
	18			BH6-7 2" SS	83	35.0'–36.5' TOP HALF–MOIST, OLIVE GREEN CLAYEY GRAVEL WITH SAND BOTTOM HALF–MOIST BROWN SILTY GRAVEL WITH SAND, DENSE, ANGULAR LIMESTONE FRAGMENTS, FILGC			34			
36	16											GRINDING ON COBBLE/BOULDER FROM 39'–39.5' FOR 15 MIN W/ NO PROGRESS. MOVED BH 6' EAST (BH–6B) DRILLED TO 40.4 WHERE GRINDING ON BOULDER FOR 30 MINS W/ MINOR PROGRESS. MOVED BH 7' WEST (BH–6C/ MW) OF ORIGINAL BH
37												
38						MONITORING WELL DRY ON 6/28/2021						
39												
40	23											
	50			BH6-8C 3" DM	67	39.5'–40.5' 0"–3" PULVERIZED LIMESTONE GRAVEL/COBBLE 3"–8" MOIST, SILTY CLAYEY GRAVEL WITH COBBLES, VERY DENSE, FRACTURED GRAY SANDSTONE GRAVEL AT BOS			>50			
41												
42												
43												HARD DRILLING WITH CONSTANT BIT GRINDING 40'–45'
44												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-6* PAGE: *3 OF 3*

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		44												
		45	11			BH6-9 2" SS	117	*45.0'–46.5' 0"–4" MOIST, OLIVE GREEN SANDY LEAN CLAY WITH MINOR GRAVEL, PP>4.0 TSF*			34			*EASY TO MODERATE DRILLING WITH OCCASIONAL BIT GRINDING FROM 45'–47.5'*
		46	20					*4"–21" MOIST, BROWN/GRAY/OLIVE GREEN CHAOTICALLY MIXED GRAVELLY LEAN CLAY/SILTY CLAY/SILT WITH SAND, HARD, PP>4.0 TSF, MINOR ORANGE OXIDATION STAINING, VERTICAL CONTACTS IN BOTTOM 6"*						
			17											
		47												*STIFF SMOOTH DRILLING FROM 47.5'–50'*
		48												
		49												*9 MINUTES TO DRILL 45'–50'*
		50	6					*50.0'–51.5' SAME AS ABOVE, TRACE GRAVELS, VERY STIFF, COAL*						
			12			BH6-10 2" SS	122	*FRAGMENTS IN BOTTOM 6"*			26			
		51	18											*EASY TO MODERATE DRILLING WITH INCREASING BIT GRINDING FROM 50'–55'*
		52												
			15					*52.0'–53.0' SAME AS ABOVE WITH GRAVELS, HARD, COAL FRAGMENTS*						
			50	X		BH6-11 3" DM	67	*THROUGHOUT, TOP PORTION OF SAMPLE IS SATURATED DUE TO SURFACE WATER INFILTRATION FOR THUNDERSTORM INTO DRILL STRING*	25	11	>50	121	15	
		53												
		54												
		55												
			9					*55.0'–56.3' SAME AS ABOVE WITH COAL FRAGMENTS*						
			16			BH6-12 2" SS	94				>50			
		56	50/4"											*MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 55'–60'*
		57												
		58												*6 MINUTES TO DRILL 55'–60'*
		59												
		60	10					*60.0'–61.5' MOIST, GRAY SILTY SAND, DENSE, FINE SAND, FINE GRAVEL*						*INITIAL BORING CAVED TO 22' AFTER HSA REMOVAL*
			18			BH6-13 2" SS	89	*INTERVALS, COAL FRAGMENTS THROUGHOUT*			43			
		61	36											
		62												
			21			BH6-14 3" DM	55	*62.0'–62.9' SAME AS ABOVE, VERY DENSE*			>50			
			50/5"											
		63						*BOH = 62.9'*						
								MONITORING WELL CONSTRUCTION						
		64						*PIPE*						
								37.9 FEET OF 2" DIAMETER SCHEDULE 40 PVC CASING FROM 0.3'–18.2', 20–SLOT SCREEN FROM 18.2'–38.2'						
		65						*BACKFILL*						
								BENTONITE– 0.5'–1.5', SPOILS– 1.5'–16.5', BENTONITE– 16.5'–17.5', SILICA SAND– 17.5'–40', BENTONITE– 40'–49', SPOILS– 49'–62.9'						
		66												

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PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-7**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **6/25/2021**	DRILLER: **IME**	
LOGGED BY: **PRUETT**	DRILL TYPE: **TRUCK-MOUNTED CME85**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6459.0'**	HOLE DIAMETER: **8" OD HOLLOW STEM AUGER (HSA)**	
	HAMMER TYPE: **140# AUTO**	

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0						*BORING LOCATED ON UPHILL/SOUTH EDGE OF MOUNTAIN ACCESS ROAD. EXCAVATED CUT SLOPES ABOVE, MINOR FILLS DOWNSLOPE SIDE. GRAVEL WITH SAND ROADWAY G.S. STEEP GRASSY SLOPES BOTH UP AND DOWN SLOPES. EXPOSED SOILS IN CUTS ARE DRY SILTY/CLAYEY GRAVEL/GRAVELLY SILT/CLAY WITH COBBLES AND BOULDERS.*						*MODERATE TO HARD DRILLING WITH CONSTANT BIT GRINDING FROM 1'–9'*
4	6			BH7-1 2" SS	89	*4.0'–5.5' MOIST, BROWN AND DK BROWN CLAYEY GRAVEL WITH TRACE SAND, FRACTURED AND ANGULAR GRAVELS, FILGC, MEDIUM DENSE TO DENSE, 4" FRACTURED LIMESTONE COBBLE AT BOS. WATERLINE FILL OF NATIVE SOILS*			30			
5	5											*GRINDING ON COBBLE/BOULDER FROM 5.5'–6.5'*
	11											
9	4			BH7-2 2" SS	78	*9.0'–10.5' MOIST BROWN SILTY GRAVEL WITH TRACE SAND, FRACTURED AND ANGULAR LIMESTONE AND SANDSTONE GRAVELS, FILGC, MEDIUM DENSE, MINOR ORANGE OXIDATION STAINING THROUGHOUT, PULVERIZED LIMESTONE GRAVEL/COBBLE IN TOP 2"*			29			*15 MINUTES TO DRILL 4'–9'*
10	8											
	11											*EASY DRILLING WITH INTERMITTENT BIT GRINDING FROM 9'–19'*
14	5			BH7-3 2" SS	67	*14.0'–15.5' SAME AS ABOVE*			29			*3 MINUTES TO DRILL 9'–14'*
15	9											
	12											*3 MINUTES TO DRILL 14'–19'*
19	7			BH7-4 3" DM	100	*19.0'–20.5' CHAOTICALLY MIXED BROWN/DK BROWN SANDY LEAN CLAY AND GRAY SILTY CLAY WITH MINOR GRAVEL, VERY STIFF, ORANGE OXIDATION STAINING THROUGHOUT, PP>4.0 TSF*	25	14	18	117	14	
20	14	X										
21												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-7* PAGE: *2 OF 3*

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		22												*MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 19'–23'*
		23												*GRINDING ON COBBLE FROM 22'–23'*
		24	4											
			7			BH7-5 2" SS	117	*24.0'–25.5' MOIST, BROWN/DK BROWN LEAN CLAY WITH SAND, MINOR GRAVELS, VERY STIFF, MINOR WHITE CALCAREOUS STRINGERS THROUGHOUT, PP=2–3 TSF*			19			*10 MINUTES TO DRILL 19'–24'*
		25	9											
			10											*SMOOTH EASY DRILLING FROM 23'–28'*
		26	17	X		BH7-6 3" DM	100	*25.5'–26.5' MOIST BROWN LEAN CLAY WITH SAND, PP=3–4 TSF, COARSE GRAVEL FRAGMENTS COMPLETELY WEATHERED INTO SAND TO FINE GRAVEL SIZED FRAGMENTS*	35	17	21	101	22	
		27												
		28												
		29	19											*EASY TO MODERATE DRILLING WITH CONSTANT BIT GRINDING FROM 28'–44'*
			28			BH7-7 2" SS	67	*29.0'–30.5' MOIST, BROWN SILTY GRAVEL WITH TRACE SAND, ABUNDANT FRACTURED GRAY LIMESTONE AND SANDSTONE GRAVELS, FILGC, VERY DENSE, ORANGE OXIDATION STAINING IN BOTTOM 6", GRAVEL LODGED IN TIP OF SS*			59			
		30	26											*5 MINUTES TO DRILL 29'–34'*
		31												
		32												
		33												
		34	15											
			23			BH7-8 2" SS	89	*34.0'–35.5' SAME AS ABOVE, NO OXIDATION STAINING, GRAY SANDY SILT LENS FROM 5"–7", GRAVEL LODGED IN TIP OF SS*			63			
		35	39											*4 MINUTES TO DRILL 34'–39'*
		36												
		37												
		38												
		39	17											
			50/5"			BH7-9 2" SS	91	*39.0'–39.9' SAME AS ABOVE, GRAY SANDSTONE GRAVEL LODGED IN TIP OF SS*			>50			
		40												*6 MINUTES TO DRILL 39'–44'*
		41												
		42												
		43												
		44												

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

CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-7* PAGE: *3 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44	16					*44.0'–45.3' SAME AS ABOVE*						
		45	17			BH7-10 2" SS	69				>50			*HARD DRILLING WITH CONSTANT BIT GRINDING FROM 44'–56.5'*
			50/4"											
		46						*GROUNDWATER MEASURED AT 46.35' ON 6/28/2021*						
		47												*GRINDING ON COBBLE/BOULDER FROM 47'–48'*
		48												*20 MINUTES TO DRILL 44'–49'*
		49	17					*49.0'–50.3' SATURATED FROM 0"–4", MOIST FROM 4"–12", BROWN*						
			36			BH7-11 2" SS	75	*CLAYEY GRAVEL, VERY DENSE, PULVERIZED GRAY SANDSTONE COBBLE*			>50			
		50	50/4"					*FROM 5"–11", FILGC*						*GRINDING ON BOULDER FROM 50'–51.5'*
		51												*24 MINTUES TO DRILL 49'–54'*
		52												
		53												
		54	17					*54.0'–55.5' 0"–3" SATURATED SAND AND GRAVEL HEAVE*						
			36			BH7-12 2" SS	78	*3"–14" CHAOTICALLY MIXED MOIST, GRAY AND BROWN SILTY CLAYEY*			61			
		55	39					*GRAVEL, FRACTURED AND ANGULAR GRAVELS, VERY DENSE, FILGC, TIP OF SS IS SATURATED*						
		56												
		57												*MODERATE SMOOTH DRILLING FROM 56.5'–59'*
		58												
		59	11					*59.0'–60.0' SATURATED TO MOIST, GRAY/DK GRAY SANDY LEAN CLAY,*						
			30			BH7-13 3" DM	75	*VERY STIFF, MOIST CLAY PP>4.0 TSF, CHAOTIC BLACK COAL FRAGMENTS IN BOS*	29	15	21	114	18	
		60						*BOH = 60.0'*						
		61						*MONITORING WELL CONSTRUCTION*						
								PIPE						
		62						*59.4 FEET OF 2" DIAMETER SCHEDULE 40 PVC CASING FROM 0.3'–39.5', 20–SLOT SCREEN FROM 39.5'–59.5'*						
								BACKFILL						
		63						*BENTONITE– 0.5'–1.5', SPOILS– 1.5'–34.5', BENTONITE– 34.5'–37', SILICA SAND– 37'–59.5', BENTONITE– 59.5'–60'*						
		64												
		65												
		66												

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

CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

PROJECT: Town of Jackson, Snow King Water Tank

PIT LOCATION: Southwest of center of tank

TEST PIT: TP- 1

Approximate Pit Dimensions (feet): Length: 40 Width: 15 Depth: 31.5

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6740' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① Clayey GRAVEL and COBBLE: Slightly moist to moist, dark brown, loose to medium dense, ~40% sandy clay is moderately plastic, ~60% angular gravel and cobbles up to 6" diameter, some silt, grades into below over 10" [COLLUVIUM]

② Silty sandy GRAVEL with clay and cobbles: Slightly moist, yellow tan, very slightly plastic, medium dense, few clasts up to 12" diameter, limestone clasts angular to subangular, grades into below [COLLUVIUM]

③ GRAVEL and COBBLE: Dry to slightly moist, reddish gray, fractures/voids lined with calcium carbonate, abundant voids, very loose, limestone, follows topography, consistently overlies olive sandy layer below, calcium carbonate mineralization on clasts, abundant raveling, bottom contact ~35-45 degrees [TALUS]

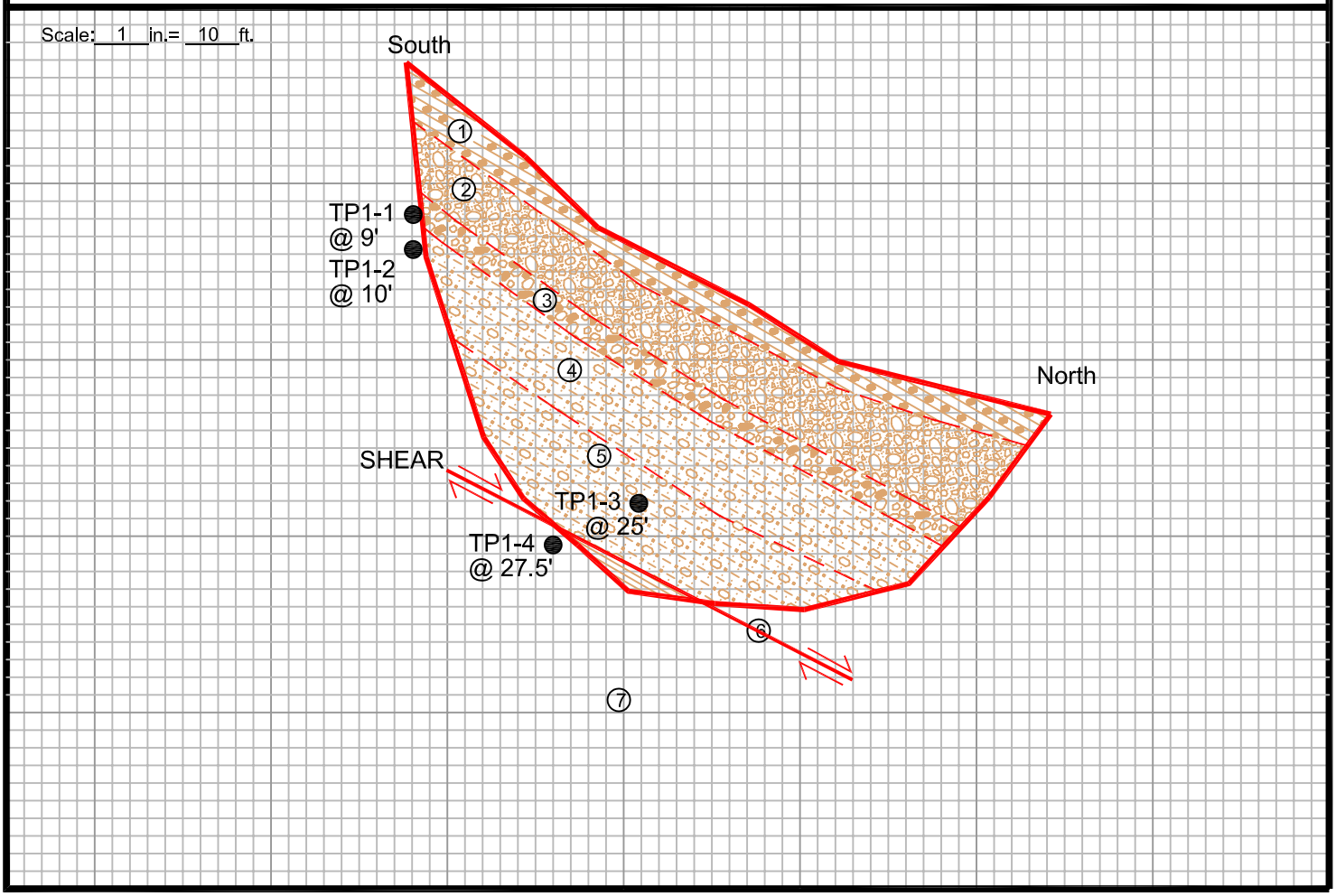
④ Sandy CLAY with gravel and cobble: Slightly moist, olive green, stiff to very stiff, moderately to highly plastic, abundant polished surfaces, irregularly follows silty sandy gravel, cobbles and boulders below contact with material below, varies, ~20% sand, ~15% gravel, ~15% cobble, ~50% sand [LANDSLIDE DEBRIS]

⑤ CLAY and sandy silty GRAVEL and COBBLE: Yellow tan to gray green, intervals of claye and sandy silty gravel and cobbles, few boulders, multiple irregular planar (~bedding) surfaces, angular to subangular boulders up to 2' diameter (mostly limestone), medium dense/very stiff, combination of the olive green sandy clay and the yellow tan silty sandy gravel with clay and cobbles, little consistency with shear orientations, abundant limestone fragments, very irregular contacts [LANDSLIDE DEBRIS]

⑥ CLAY: Pale blue gray, up to 1" thick, soft, moderately plastic, slickensided, dip 30° north [SHEAR ZONE]

⑦ CLAY with sand: Moist, gray, massive, heavily sheared, abundant polished surfaces, highly plastic, darker irregular beds throughout, wavy sheared zone, lots of slickensided surfaces, few coal beds, stiff [LANDSLIDE DEBRIS]

Note: No groundwater observed. Backfilled with spoils. Underlain by stony sandy clay.
Note: Soil Classifications (USCS) based on field descriptions



PROJECT: Town of Jackson, Snow King Water Tank

PIT LOCATION: ~20' northwest of northeast BH-3 (NE 2009)

TEST PIT: TP- 2

Approximate Pit Dimensions (feet): Length: 16 Width: 15 Depth: 12.6

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6711' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① 0.0-1.6ft Clayey sandy GRAVEL and COBBLES: Moist to very moist, medium to dark brown, abundant organics, moderately plastic, angular clasts up to 6" diameter, massive, medium dense [FILL]

② 1.6-2.6ft Sandy CLAY with gravel and cobble: Very moist, dark gray, medium stiff, massive, ~60% clay, ~40% gravel and cobbles up to 6" diameter [TOPSOIL]

③ 2.6-4.8ft Clayey sandy GRAVEL: Very moist, pale brown, medium dense, ~50% fine gravel [COLLUVIUM]

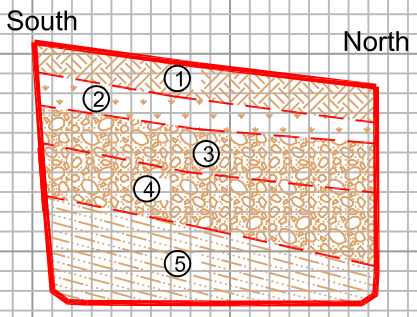
④ 4.8-7.0ft Clayey SAND and GRAVEL: Very moist, pale brown, medium dense, ~50% fine gravel [COLLUVIUM]

⑤ 7.0-12.6ft Sandy CLAY: Moist, green, slightly mottled yellow brown, very stiff, massive, abundant angular to subangular limestone clasts to 1' diameter (most up to 2" diameter) [LANDSLIDE DEBRIS]

Note: No groundwater observed. Backfilled hole with spoils.

Note: Soil Classifications (USCS) based on field descriptions

Scale: 1 in.= 10 ft.



PROJECT: Town of Jackson, Snow King Water Tank

TEST PIT: TP- 3

PIT LOCATION: ~25' east of northeast BH-1 (NE 2009)

Approximate Pit Dimensions (feet): Length: 15 Width: 15 Depth: 11.0

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6762' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① 0.0-1.2ft Silty CLAY with gravel: Moist to very moist, dark brown to blackish brown, abundant organics, highly plastic, soft [TOPSOIL]

② 1.2-3.5ft Gravelly silty CLAY: Buff yellow tan, stiff, ~25-35% gravel to 3" diameter [COLLUVIUM]

③ 3.5-5.0ft Silty CLAY: Moist, greenish brown with yellow mottling, very stiff [LANDSLIDE DEBRIS]

④ 5.0-6.0ft Gravelly silty CLAY: Moist, yellow tan (buff), stiff to very stiff [LANDSLIDE DEBRIS]

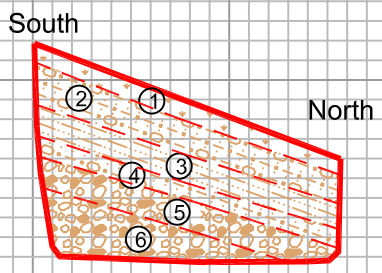
⑤ 6.0-7.5ft Rubble zone: Loose, white precipitates [TALUS]

⑥ 7.5-11.0ft Silty clayey GRAVEL and COBBLE: Yellow brown to red brown, dense, 50-60% clasts up to 8" diameter, oversize [TALUS]

Note: No groundwater observed. Hole standing OK. Backfilled hole with spoils.

Note: Soil Classifications (USCS) based on field descriptions

Scale: 1 in.= 10 ft.





GEOPHYSICAL EVALUATION

SNOW KING

Jackson, Wyoming

PREPARED FOR:

Colter Lane, P.E.
Jorgensen Geotechnical
1315 Highway 89 South, Suite 201
Jackson, Wyoming 83002

PREPARED BY:

Atlas Technical Consultants LLC
358 South 700 East, Suite B518
Salt Lake City, Utah 84102

January 2, 2024

358 South 700 East
Salt Lake City, UT 84102
(310) 951-1993 | OneAtlas.com

January 2, 2024

Atlas No. 11143

MR. COLTER LANE, P.E.
JORGENSEN GEOTECHNICAL
1315 HIGHWAY 89 SOUTH, SUITE 201
JACKSON, WYOMING 83002

Subject: Geophysical Evaluation
Snow King
Jackson, Wyoming

Dear Mr. Lane:

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to a portion of the Snow King project located in Jackson, Wyoming. The primary purpose of our study was to develop subsurface shear-wave velocity profiles and characterize subsurface geologic conditions at select locations of the project site. This was accomplished through the collection of Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Wave (MASW) data. Our services were conducted on October 23rd and 24th, 2023. This report presents our methodology, equipment used, analysis, and findings.

We appreciate the opportunity to be of service on this project. Should you have any questions, please contact the undersigned at (310) 951-1993.

Respectfully submitted,
Atlas Technical Consultants LLC

Stephan A. Callas
Project Geophysicist

Patrick F. Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

SAC:ERC:PFL:ds

Distribution: Mr. Colter Lane at CLane@JorgEng.com

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1. INTRODUCTION

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to a portion of the Snow King project located in Jackson, Wyoming (Figure 1). The primary purpose of our study was to develop subsurface shear-wave velocity profiles and characterize subsurface geologic conditions at select locations of the project site. This was accomplished through the collection of Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Wave (MASW) data. Our services were conducted on October 23rd and 24th, 2023. This report presents our methodology, equipment used, analysis, and findings.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two one-dimensional (1-D) ReMi profiles (RL-1 & RL-2).
- Performance of two 2-D MASW profiles (ML-1 & ML-2).
- Compilation and geophysical analysis of the collected data.
- Preparation of this illustrated report presenting our methodology and findings.

3. SITE AND PROJECT DESCRIPTION

The project site is generally located just southeast of the Snow King Mountain Resort in Jackson, Wyoming (Figure 1). Specifically, the study area is located on the south side of Snow King Loop Road. The locations of the seismic traverses were generally selected by a representative of your office and adjusted when necessary to account for surface conditions. The study area was composed of two graded lots with an access road separating the two lots. The seismic traverses were performed over relatively flat terrain on the east and west sides of the access road. The surface of the site was generally covered with soil, gravel and seasonal vegetation. Additionally, several surface obstructions including construction materials, a firewood pile, snow grooming equipment, vehicles, and temporary fencing were located within the study area boundaries. Figure 2 depicts the approximate locations of the seismic traverses while Figure 3 depicts the general site conditions.

4. STUDY METHODOLOGY

As previously indicated, our evaluation included the performance of two ReMi and two MASW transects. The following sections detail the methods and instrumentations used.

4.1 ReMi

The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a shear-wave velocity profile of the study area down to a depth, in this case, of approximately 100 feet. The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi

method are displayed as a one-dimensional profile which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with ReMi.

Our ReMi evaluation included the use of a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. Geophones were spaced 10 feet apart for a total line length of 230 feet for each line. A total of 22 records, each 32 seconds in duration, were recorded at each location, while 10 records utilized passive data collection of ambient ground vibration noise and 12 utilized an active source. The active source data gathers included generating a seismic signal at both ends of the seismic spread, approximately 10 or 30 feet off the ends of the geophone array. Six active source files were collected at each end of the line. The recorded data was then downloaded to a field computer for post-processing. The data was later processed using Surface Plus 9.1 - Advanced Surface Wave Processing Software (Geogiga Technology Corp., 2020), which uses the refraction microtremor method (Louie, 2001), and other surface wave analysis methods. The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool to determine the best fitting model. The result is a one-dimensional shear-wave velocity model of the site with roughly 85 to 95 percent accuracy (Louie, 2001). For situations in which the shear wave velocity values are close to the limit between site class boundary values, Geotechnical consultants should consider the site's subsurface geologic stratigraphy and structure, soil mechanics, and ReMi evaluation results when assessing seismic site classification. Figures 2 and 3 depict the general site conditions in the study area.

4.2 MASW

Surface waves (specifically Rayleigh waves) were recorded along lines ML-1 and ML-2 in order to provide S-wave velocity information for portions of the site (Figure 2). The surface waves were generated by a hammer and plate (shot) and recorded using a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. The geophones were coupled to the ground surface using a Geostuff Landstreamer with geophones stationed 4 feet apart and shots conducted off the end of the lines. Prior to the collection of surface wave data, near and far field effects were evaluated for several shot offset distances. The results indicated that an offset shot of 16 feet off the end of the line was optimal for our evaluation.

Three records, each one second long, were recorded at each shot location. After each shot location, the shot location and geophones were moved an integer multiple of the geophone spacing longitudinally along the profile direction and the line was reshot. The number of shots, spread length, and start and end stations are presented in Table 1.

Table 1: MASW Array Geometry

Line No.	No. of Shots	Total Spread Length (feet)	Profile Length/Start and End Stations (feet)
ML-1	21	252	160/(0-160)
ML-2	25	284	192/(0-192)

The recorded MASW data was processed using SurfSeis® (Kansas Geological Survey, 2019), a MASW software program. One dimensional (1-D) shear-wave (S-wave) velocity (Vs) profiles were generated for each shot location, which correspond to the middle of the geophone array. A two-dimensional color gradient model was then created from the 1-D models using the SurfSeis® interpolation scheme. It should be emphasized that the 2-D profile represents the area between the midpoint of the first shot location and the midpoint of the last shot location. The actual model section length and start and end stations for the sections are also listed in Table 1.

5. RESULTS AND CONCLUSIONS

As previously indicated, our evaluation consisted of performing two 1-D ReMi profiles (RL-1 & RL-2) and two 2-D MASW profiles (ML-1 & ML-2) at the project site. Figures 4a and 4b present the ReMi results for RL-1 and RL-2, respectively. Figures 5a and 5b present the MASW results for ML-1 and ML-2, respectively. The analysis of each is detailed below.

5.1 ReMi

The purpose of our ReMi evaluations were to develop shear-wave velocity profiles to be used for design and construction parameters at the project site. Table 2 and Figures 4a and 4b present the results from our ReMi evaluations. It should be noted that the ReMi results represent the average condition across the length of the line. When the 1-D ReMi surface wave velocity results (analogous to shear wave) show an IBC Vs100 velocity value that is close to the "border line" boundary between IBC Site Classes, the project geotechnical consultant of record should be consulted. The geotechnical consultant of record should also consider other existing available site information and whether obtaining additional new geotechnical evaluation data such as boreholes, surface to downhole seismic (ASTM D7400), crosshole seismic (ASTM D4428), and/or additional 1-D ReMi data collections would be needed concerning the site's subsurface geologic stratigraphy and structure, soil mechanics and soil modulus, along with the initial 1-D ReMi evaluation results when assessing the "borderline" IBC Vs100 Seismic Site Class.

Table 2: ReMi Results

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)	Average Shear Wave Velocity (Vs in feet/second)	Site Class (IBC, 2019)
RL-1 (NW-SE)	0-6	618	Vs100' = 1,320 ft/s	C
	6-14	1170		
	14-25	1494		
	25-35	1435		
	35-69	1152		
	69-100	2010		

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)	Average Shear Wave Velocity (Vs in feet/second)	Site Class (IBC, 2019)
RL-2 (W-E)	0-9	390	Vs100' = 1,201 ft/s	C
	9-14	799		
	14-25	1361		
	25-69	1446		
	69-100	2052		

5.2 MASW

Two MASW traverses were conducted as part of our study. Figures 5a and 5b present the S-wave velocity models generated from our analysis of lines ML-1 and ML-2, respectively. Based on the results, it appears that the project site is generally underlain by low-velocity materials in the near-surface and higher velocity materials at depth. Distinct vertical and lateral velocity variations are evident within the models. Specifically, ML-1 appears to contain pockets of low and high velocity materials in the near surface, possibly related to reported landslide deposits. At depth, ML-1 displays a high velocity contact that spans the length of the profile from northwest to southeast. This high velocity contact is generally contained towards the bottom of the profile; however, protrudes closer to the surface between 90 and 120 feet along the x-axis. This high velocity material may represent bedrock contacts. ML-2 displays slightly more homogenous material in the near surface compared to ML-1. At depth, ML-2 displays a moderately high velocity contact that spans the length of the profile from west to east. This moderately high velocity contact is generally contained within 20 and 50 feet below ground surface and may represent weathered bedrock contacts. It should be noted that there were several underground utilities present in the vicinity of ML-1, and possibly ML-2, which could be affecting the results from our evaluation. As a general rule of thumb, the S-wave velocity of a given material might be between approximately 0.4 to 0.6 of the P-wave velocity, depending on the soil/rock type and condition.

6. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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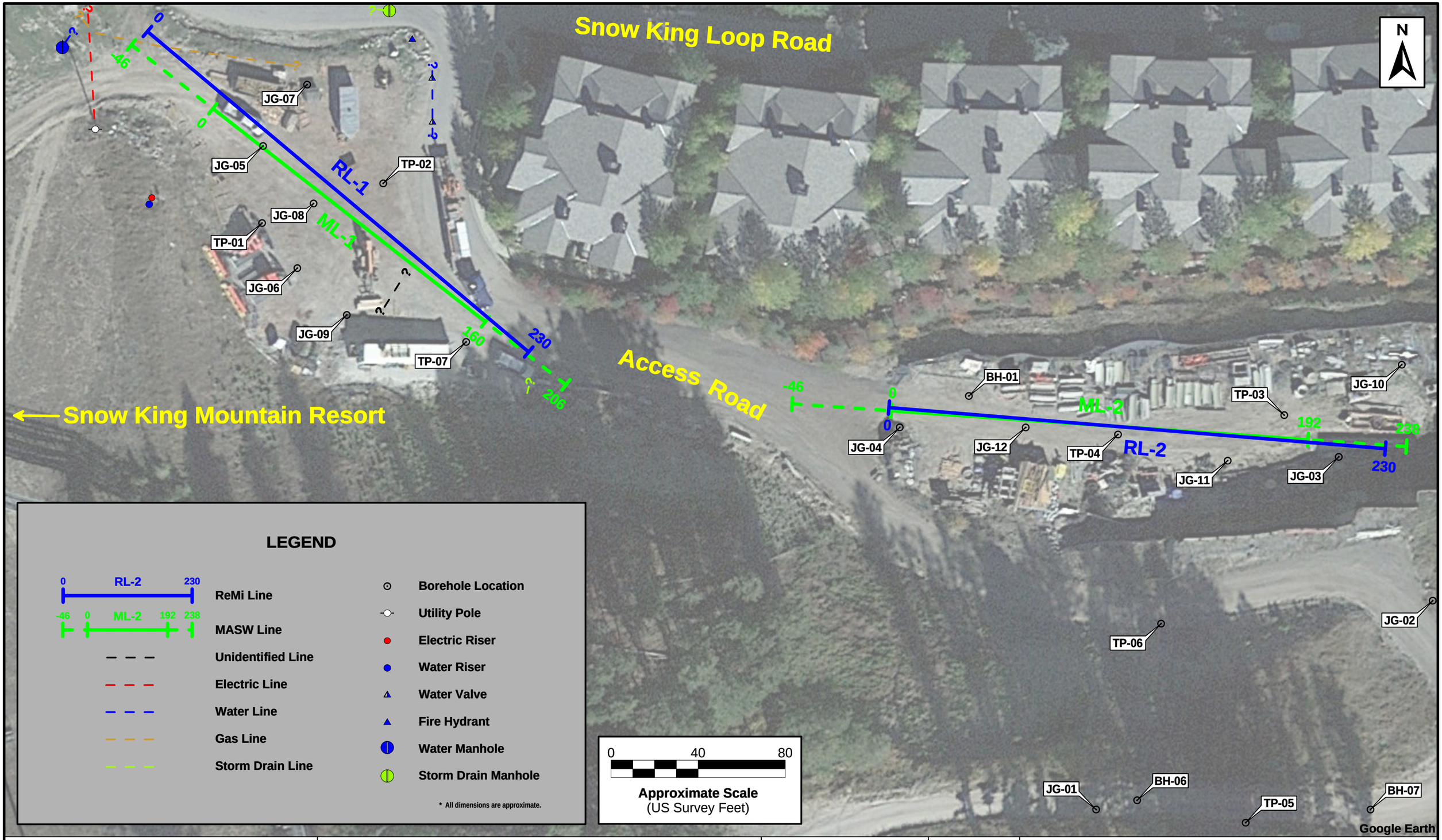
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ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 1	**SITE LOCATION MAP**



LEGEND

- RL-2 (0 – 230): ReMi Line
- ML-2 (-46, 0, 192, 238): MASW Line
- Unidentified Line
- Electric Line
- Water Line
- Gas Line
- Storm Drain Line
- Borehole Location
- Utility Pole
- Electric Riser
- Water Riser
- Water Valve
- Fire Hydrant
- Water Manhole
- Storm Drain Manhole

* All dimensions are approximate.

0 40 80

Approximate Scale
(US Survey Feet)

ATLAS

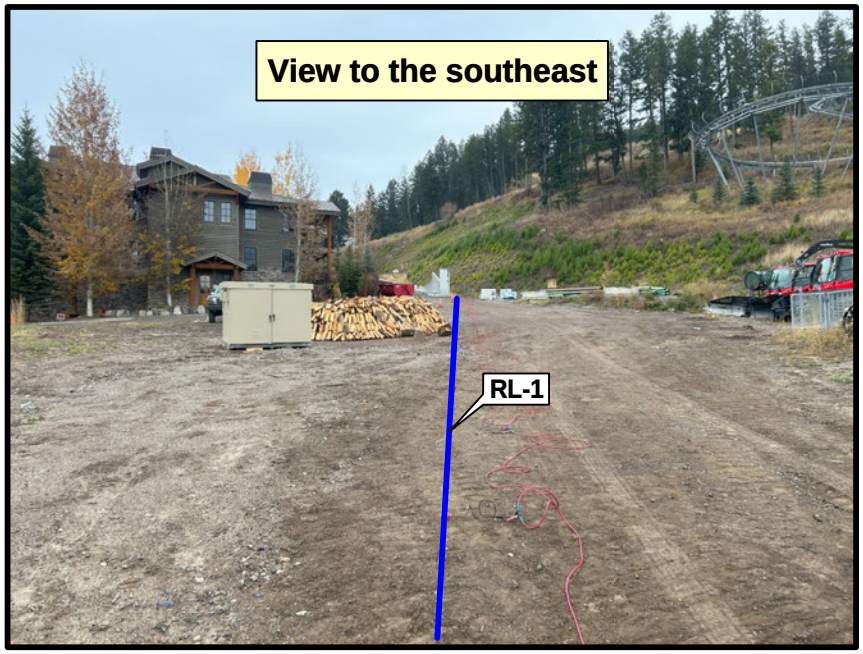
Snow King
Jackson, Wyoming

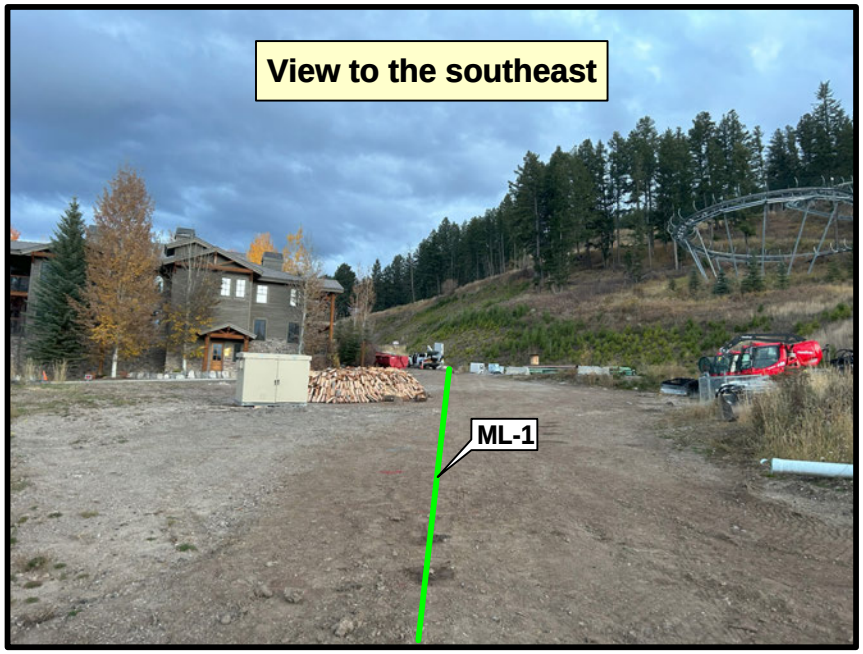
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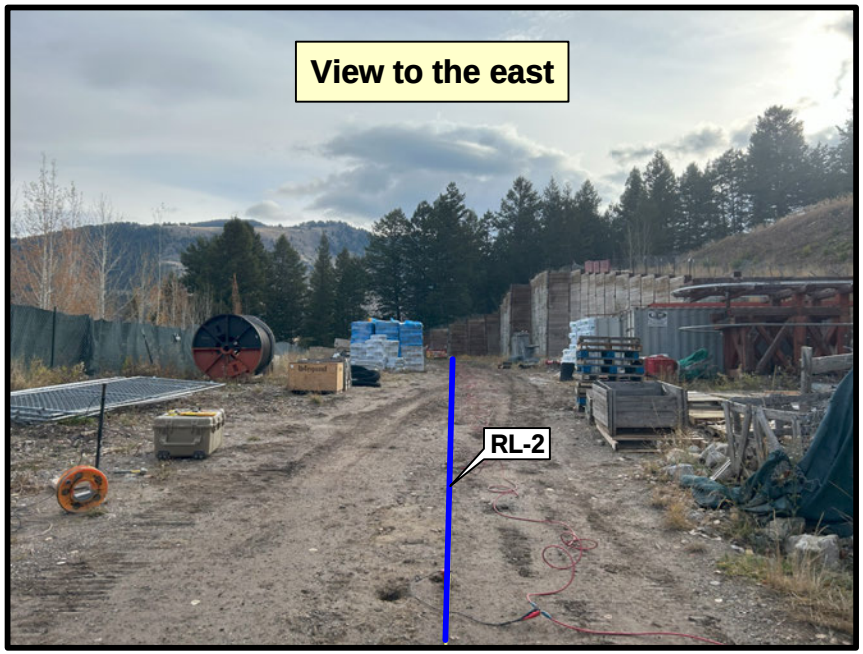
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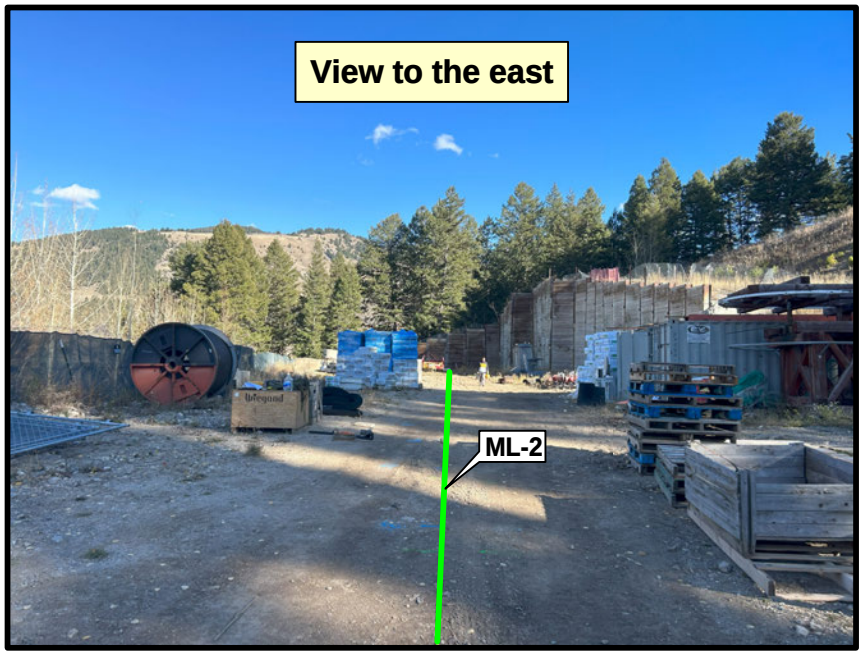
Figure 2

LINE LOCATION MAP



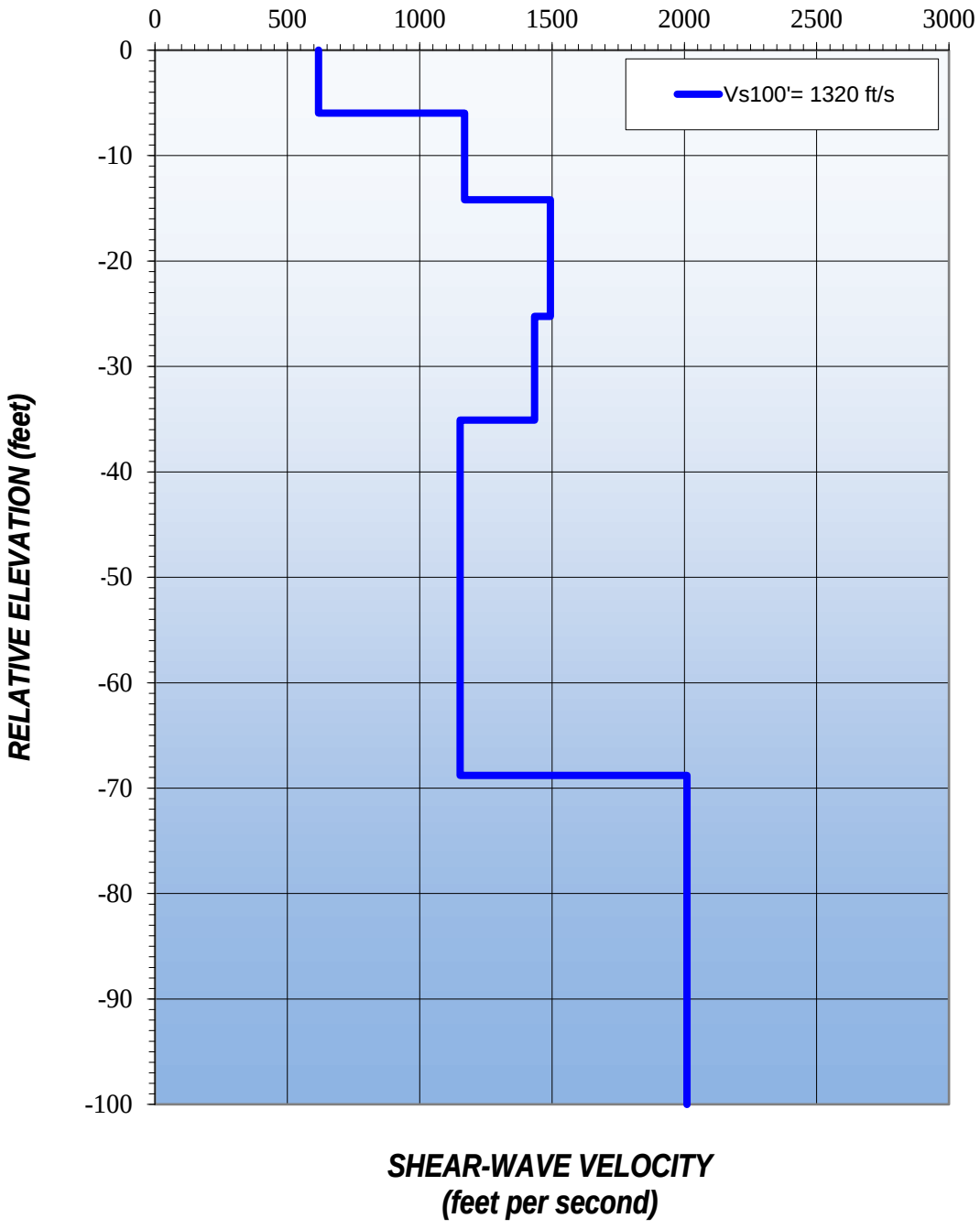




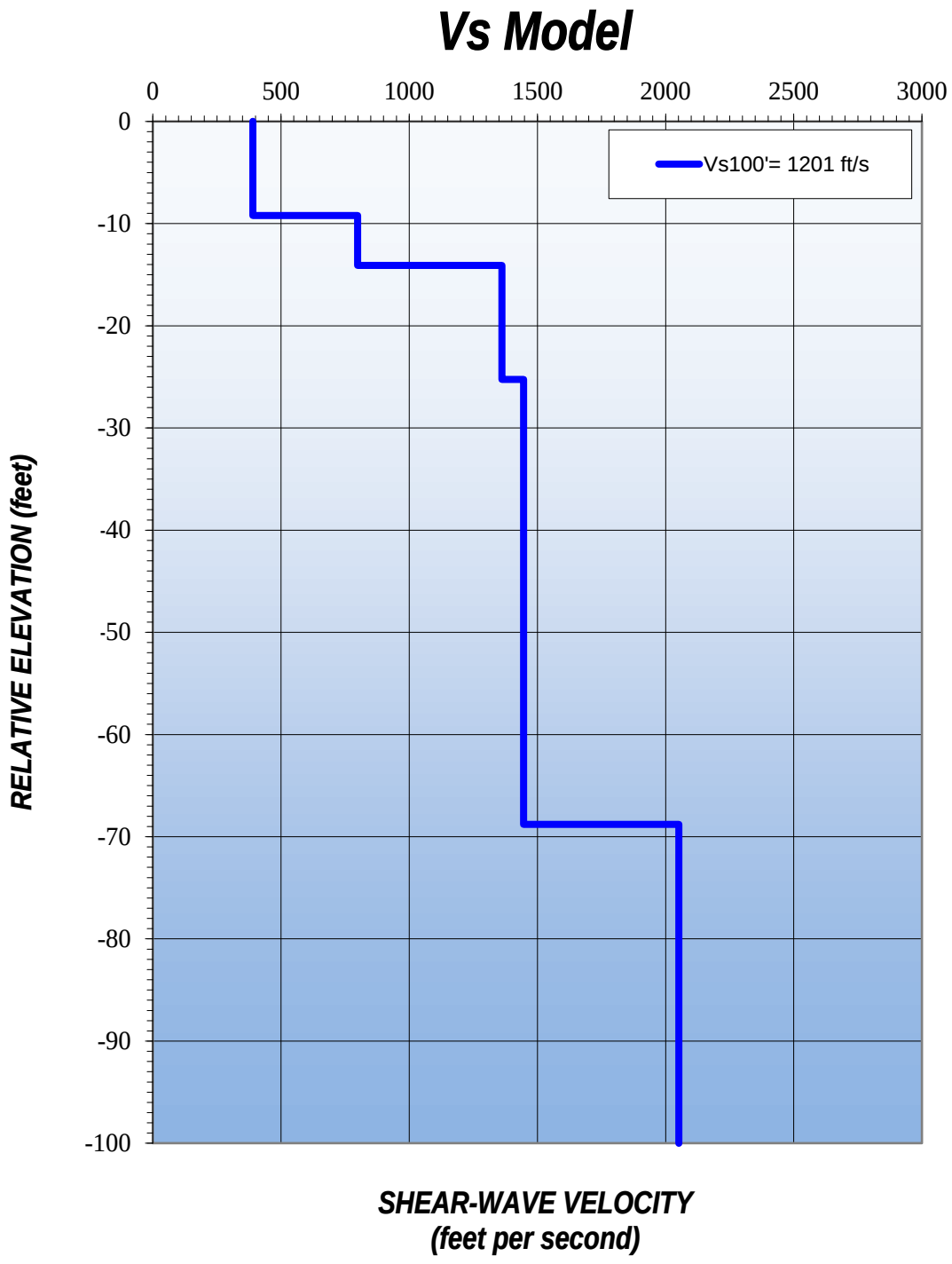


ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 3	**SITE PHOTOGRAPHS**

Vs Model



ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 4a	**ReMi RESULTS** **RL-1**



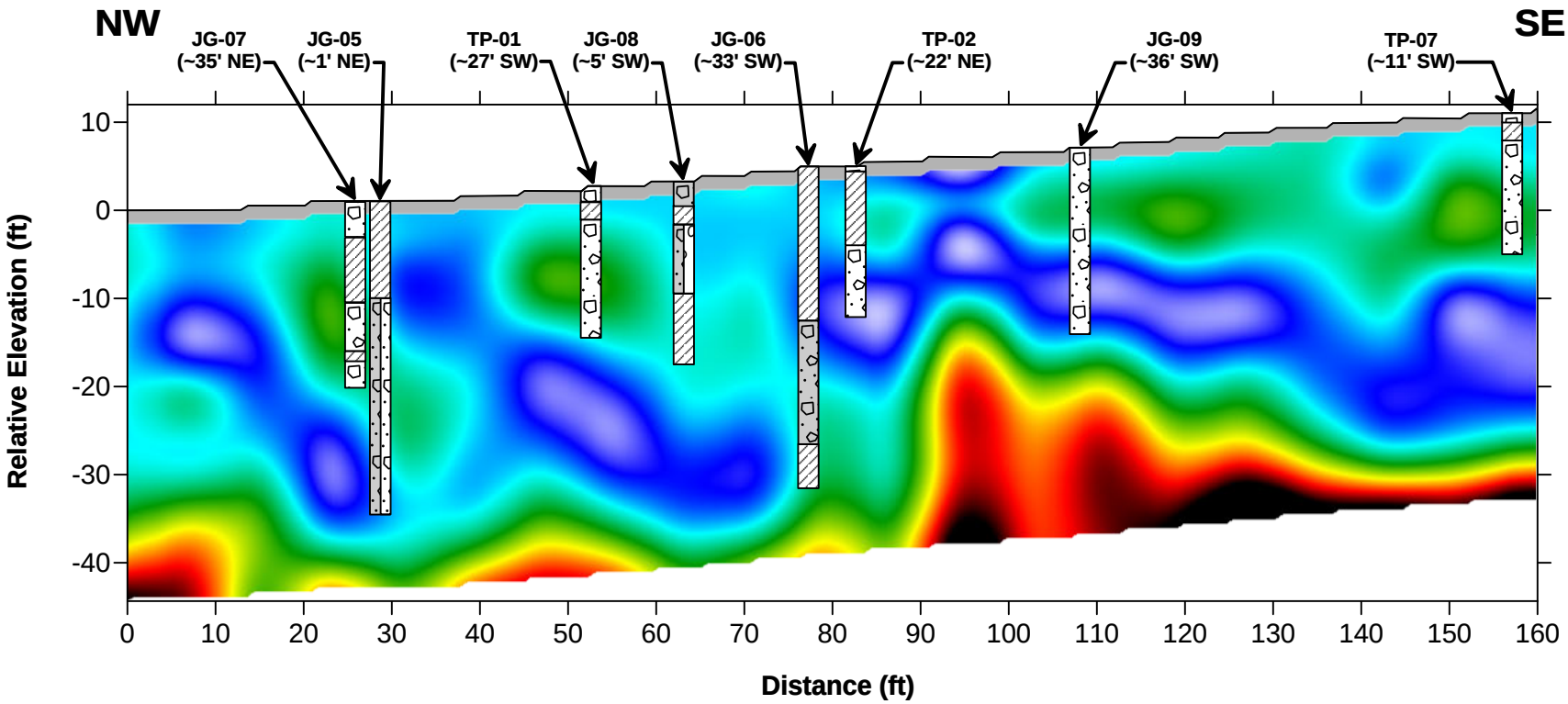
ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 4b	**ReMi RESULTS** **RL-2**

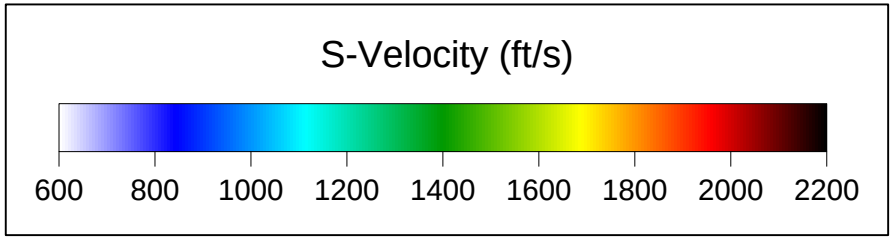
MASW PROFILE
ML-1

LEGEND

CL GM
GP GC

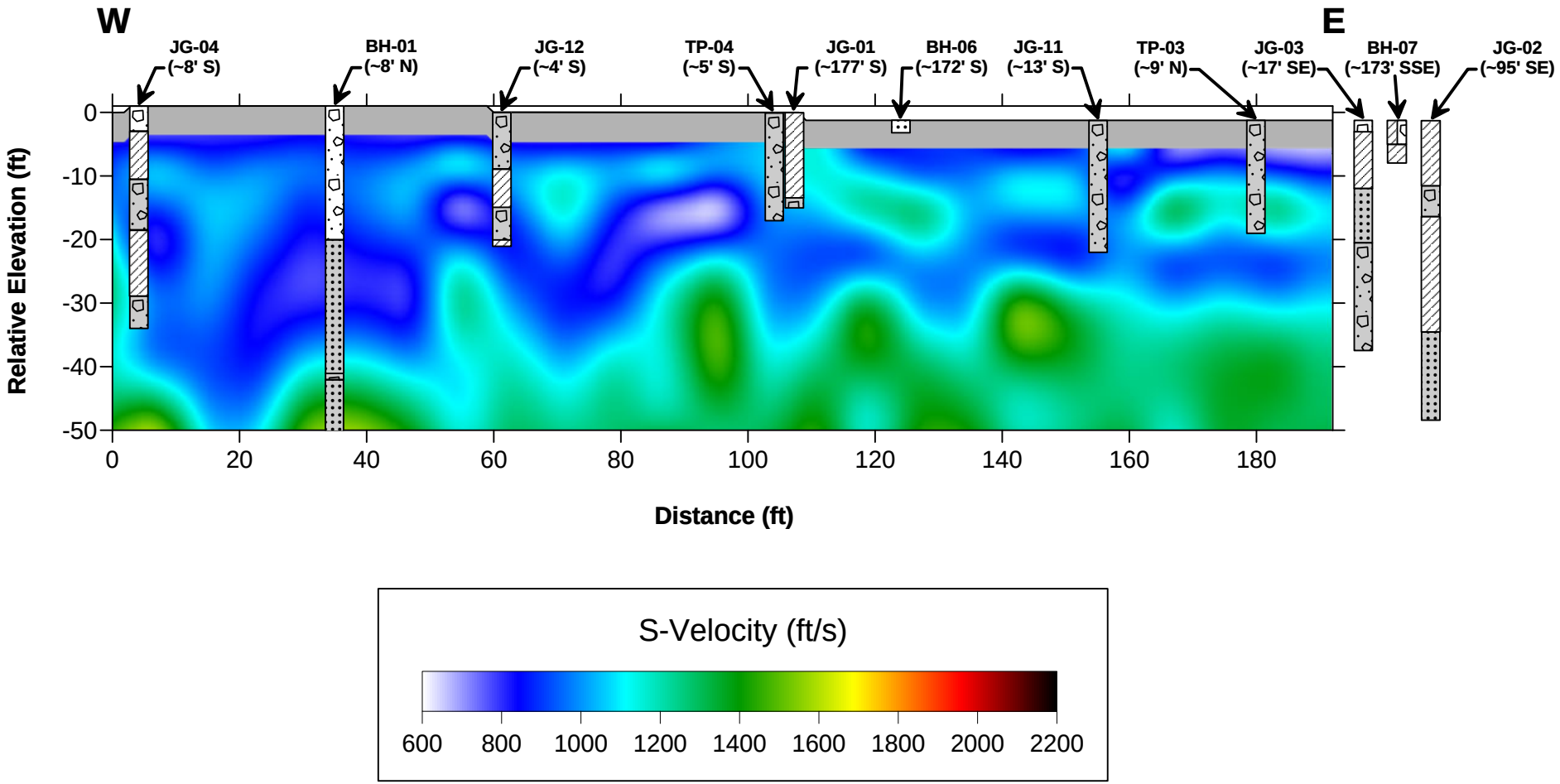
* All dimensions are approximate.
* Borehole data provided by Jorgensen.





ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 5a	**MASW PROFILE ML-1**

MASW PROFILE
ML-2



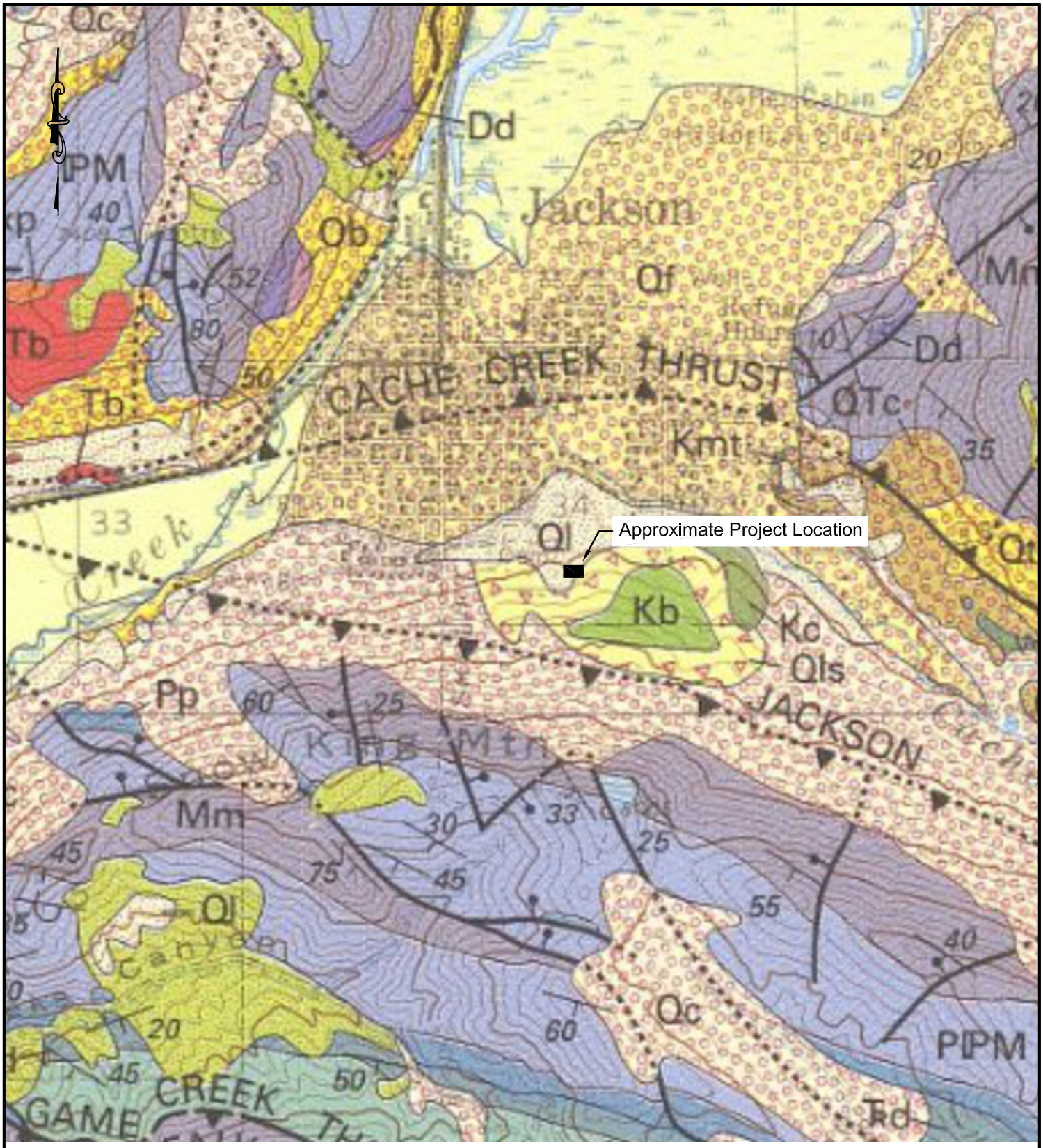
ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 5b	**MASW PROFILE** **ML-2**

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APPENDIX B

Figures



0 2000 4000

SCALE: 1 INCH = 2000 FEET

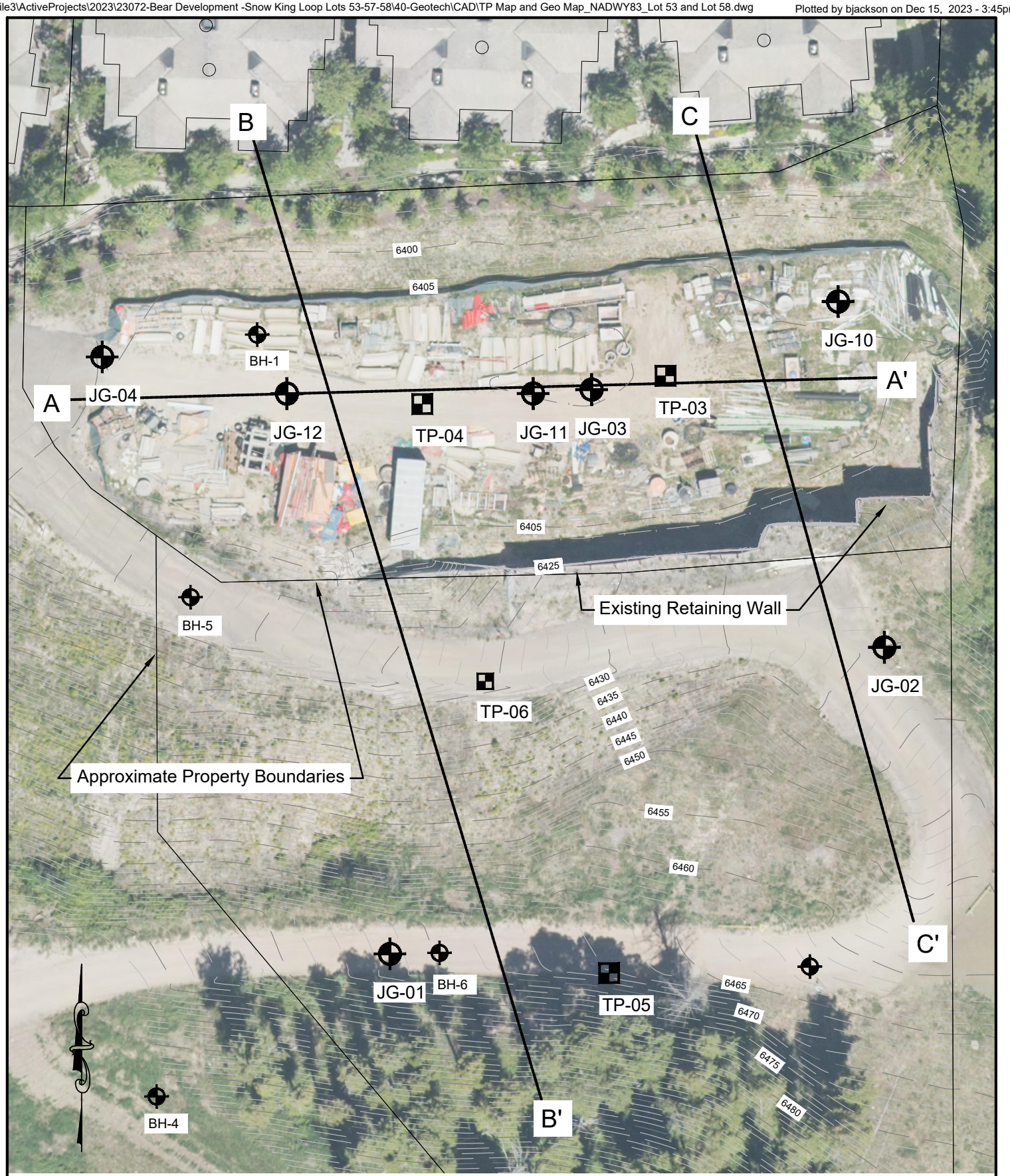
THIS SCALE VALID ONLY FOR 8.5x11 PRINTS

Map symbols:

Ql - Loess
Qls - Landslide Debris
Kb - Bacon Ridge Sandstone (Upper Cretaceous)

From Love et. al, Geologic Map of Grand Teton National Park, 1992

DRAFTED BY: JBJ REVIEWED BY: HC PROJECT NUMBER 23072	SHEET TITLE: Figure 1 Site Location and Geologic Map	PROJECT TITLE: Geotechincal-Engineering Report Bear Development - Lot 53 and Lot 58 Teton County, Wyoming	JORGENSEN GEOTECHNICAL, LLC PO Box 9550 | 1315 HWY 89 S., Ste. 201 Jackson, WY 83002 PH: 307.733.5150 www.jorgeng.com



0 40 80

SCALE: 1 INCH = 40 FEET
THIS SCALE VALID ONLY FOR 8.5x11 PRINTS

Borehole (JG-XX), Historic Nelson Engineering Borehole (BH-X), and test pit (TP-XX) locations are approximate and may be surveyed upon request. Existing ground surface topography provided by Jorgensen Associates, taken from topographiuc survey completed November 1, 2023. Aerial imagery provided by Teton County, 2019.

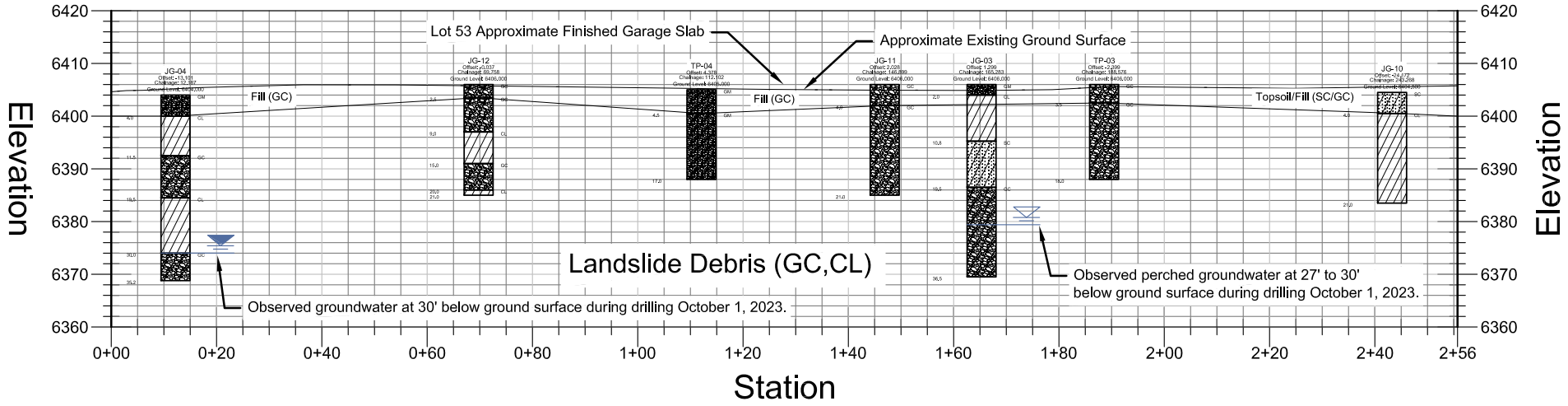
DRAFTED BY:	JBJ
REVIEWED BY:	HC
PROJECT NUMBER	23072

SHEET TITLE:
Figure 2
Borehole, Test Pit and Geologic Cross Section Location Map

PROJECT TITLE:
Geotechnical Engineering Report
Bear Development - Lot 53 and Lot 58
Teton County, Wyoming

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Cross section A-A'

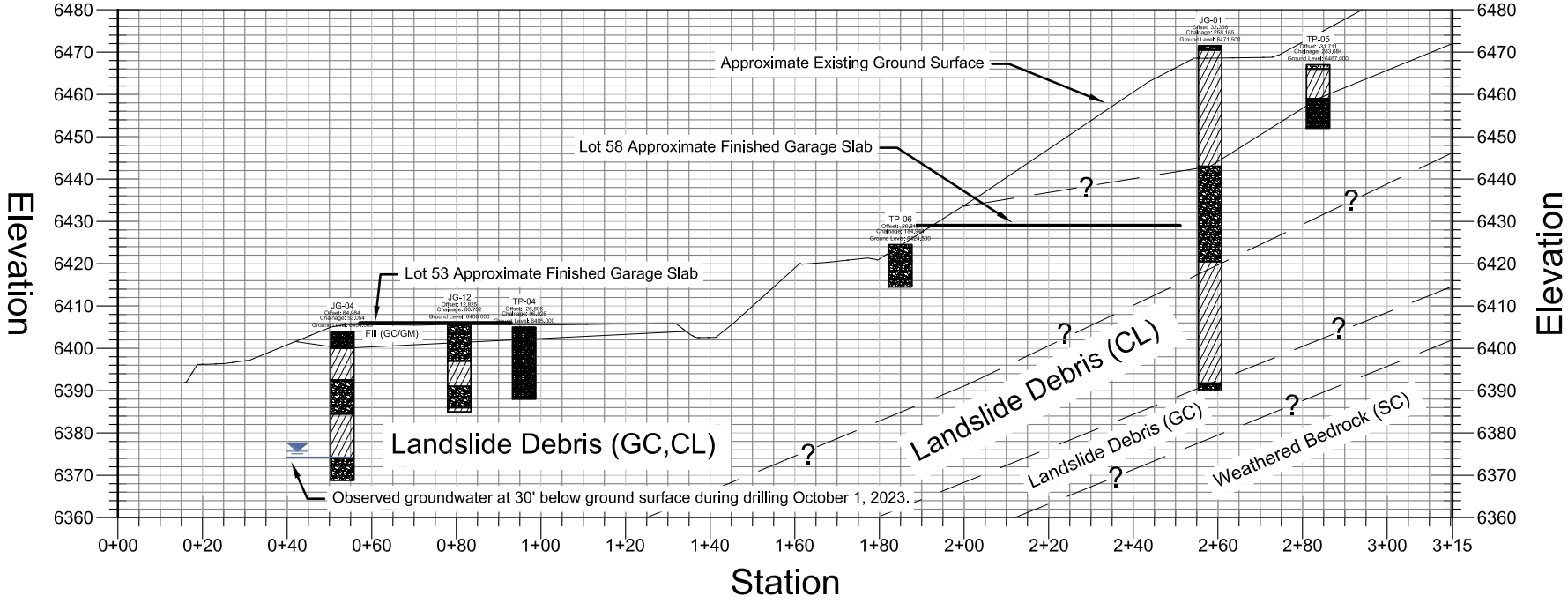


Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

DRAFTED BY: JBJ REVIEWED BY: HC/DB PROJECT NUMBER 23072	SHEET TITLE: Figure 3 Geologic Cross Section A-A'	PROJECT TITLE: Geotechnical-Engineering Report Bear Development - Lot 53 and Lot 58 Teton County, Wyoming	JORGENSEN GEOTECHNICAL, LLC PO Box 9550 | 1315 HWY 89 S., Ste. 201 Jackson, WY 83002 PH: 307.733.5150 www.jorgeng.com

Cross section B-B'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

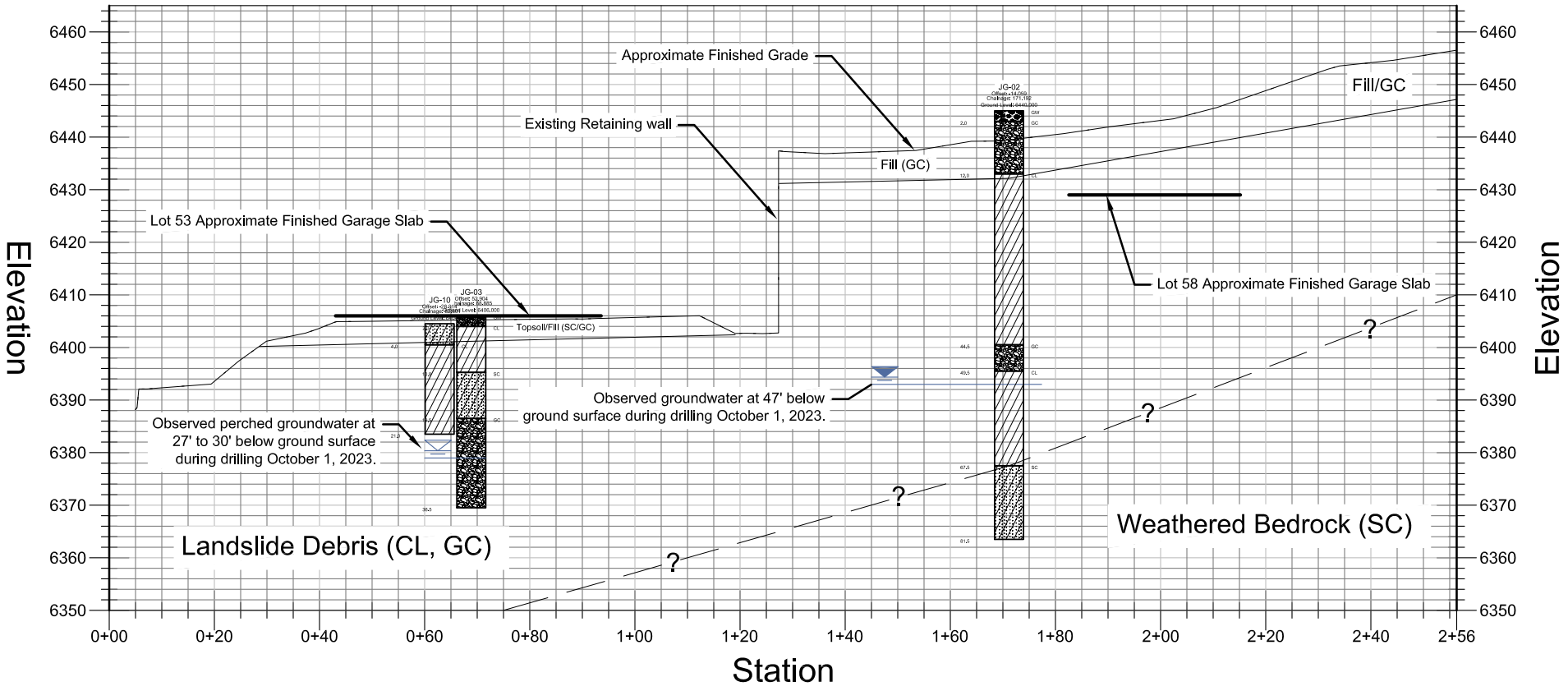
DRAFTED BY:	JBJ
REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 4
Geologic Cross Section B-B'

PROJECT TITLE:
Geotechnical-Engineering Report
Bear Development - Lot 53 and Lot 58
Teton County, Wyoming

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PH: 307.733.5150
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Cross section C-C'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

DRAFTED BY:	JBJ
REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 5
Geologic Cross Section C-C'

PROJECT TITLE:
Geotechnical-Engineering Report
Bear Development - Lot 53 and Lot 58
Teton County, Wyoming

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APPENDIX C

Soils Laboratory Procedures and Results

Laboratory Testing

Laboratory Testing Procedures

Lab samples were submitted for testing at GCI in Salt Lake City, Utah from boreholes JG-01, JG-02, JG-03, JG-04, JG-10, JG-11, and JG-12.

During the October 2023 site exploration for the Development at Lots 53 and 58, JG collected relatively undisturbed (i.e., thin-walled Shelby tubes) and disturbed samples (i.e., split spoon (SPT) samples and sonic drilling grab samples). Of the samples collected, 31 disturbed samples and two relatively undisturbed samples were selected for lab analysis. Laboratory testing included natural moisture content, unit weight, Atterberg limits, grain-size distribution, hydrometer, and consolidation testing.

The laboratory testing program consisted of:

- Twenty Seven (27) Moisture Contents (ASTM D2937/D2216)
- Thirty (30) Atterberg Limits (ASTM D4318)
- Twenty Seven (27) Grain Size Analysis (ASTM D422)
- Four (4) Hydrometer (ASTM D422a)
- Two (2) One Dimension Consolidation (ASTM D2435)

Results are shown on the following pages.

Laboratory Test Results: Detailed Summary

Laboratory testing included index testing for classification per USCS and indirect correlation with engineering parameters, and direct testing of strength. Classification tests – including Atterberg limits and grain-size analysis – have been summarized in table 4-1, with hydrometer tests and consolidation tests summarized in Tables 4-2 and 4-3, respectively. Full laboratory data sheets are attached.

The data herein are provided for informational purposes. Design-build contractors shall be responsible for providing their own analysis of the test results and for development of appropriate design parameters.

Table 4-1: Classification Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	Gravel (%)	Sand (%)	Fines (%)	Moisture Content (%)	Liquid Limit	Plasticity Index
JG-01	D8	18-19	CL	19.0	18.2	62.8	12.3	31	15
JG-01	D12	27-29	CL	27.7	17.1	55.2	11.0	28	12
JG-01	D17	37-38	GC	51.6	22.7	25.7	--	--	--
JG-01	D27	54.5-57	CL	11.9	20.2	67.9	12.6	33	18
JG-01	D32	67-69	CL	20.1	28.0	51.9	10.0	26	10
JG-01	D36	72.5-75	CL	4.5	10.0	85.5	20.7	38	21
JG-02	D4	7-10	GC	--	--	--	--	20	5
JG-02	D8	14.5-16	CL	12.4	20.8	66.8	11.9	31	16
JG-02	D11	22-25	CL	15.6	18.7	65.7	13.3	29	14
JG-02	D16	32-35	CL	13.2	18.2	68.6	14.5	21	5
JG-02	D18	38.5-40	CL	0.0	12.9	87.1	15.5	29	12
JG-02	D22	44.5-47	GC	41.6	27.3	31.1	--	--	--
JG-02	D26	52-55	CL	6.4	31.1	62.5	11.6	16	12
JG-02	D30	60-62	CL	0.2	5.3	94.5	13.7	37	14
JG-02	D32	64.5-67	CL	2.2	94.4	3.4	12.8	31	14
JG-02	D35	69.5-72	SC	--	--	--	--	21	5
JG-03	D3	4.5-7	CL	30.3	19.6	50.1	10.1	33	19
JG-03	D8	14.5-17	SC	28.2	31.4	40.4	8.4	30	15
JG-03	D12	22-25	GC	26.8	26.3	46.9	12.4	35	20
JG-03	D18	30-33	GC	32.7	22.1	45.2	10.8	29	14
JG-04	D4	7-10	CL	15.8	14.6	69.6	21.8	34	18
JG-04	D8	14.5-17	GC	37.4	30.1	32.5	6.8	19	5
JG-04	D12	22-25	CL	3.3	26.8	69.9	16.5	31	14
JG-04	D17	30-33	GC	43.1	15.3	41.6	10.1	33	18
JG-10	D3	7.5-9	CL	--	--	--	--	25	9
JG-10	U1	12.5-14	CL	27.6	21.7	50.7	13.7	39	24
JG-10	D5	15-17	CL	4.7	11.8	83.5	16.1	38	17
JG-10	U2	17.5-19	CL	13.9	19.4	66.7	13.8	32	18
JG-11	D3	7.5-9	GC	33.4	28.0	38.6	7.1	22	7
JG-12	D2	5-6.5	GC	33.9	25.3	40.8	10.2	27	12
JG-12	D4	10-11.5	CL	13.5	32.5	54.0	12.8	27	10
JG-12	D8	20-21.5	CL	23.9	25.5	50.6	10.6	26	12

Table 4-2: Hydrometer Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	Silt Fraction (%)	Clay Fraction (%)
JG-01	D17	37-38	GC	18	7
JG-02	D22	44.5-47	GC	23	8
JG-10	D5	15-17	CL	55	36
JG-11	D4	10-11.5	GC	33	17

Table 4-3: Consolidation Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	C_C
JG-10	U1	12.5-14	CL	0.171
JG-10	U2	17.5-19	CL	0.130

Supplemental Laboratory Data

Select laboratory results presented in a Site Investigation Report for Lots 53 and 58produced by Nelson Engineering dated July 28, 2021, and results presented in a Geotechnical Investigation Report for a project in close proximity to the site produced by Womack and Associates, Inc., dated June 4, 2010 are presented below.

GERHART COLE

PO Box 880
Midvale, Utah 84047
801.849.0055
gerhartcole.com

To:	Mr. Bruce Jackson Jorgensen Engineering 58 South Tyler, PO Box 1519 Pinedale, Wyoming 82941
Project:	Bear Development Snow King Lots 53 and 58
Gerhart Cole Project Number:	23-1725
Client Project Number	23072
Report Date:	November 30, 2023

Attached are the requested laboratory test results. These laboratory results are for the addressee and must be presented in their entirety without alteration, except with permission.

Gerhart Cole's Laboratory is accredited through the AASHTO Accreditation Program. The results provided were tested in general accordance with the referenced standards. Any test methods reported in this document outside the scope of this accreditation are marked with an asterisk in the header of the individual test report.

Gerhart Cole will dispose of samples two (2) weeks after the date above. Please contact us for storage pricing.

Approved By:_____
Zach Gibbs, PE (UT, MI) Laboratory Director

AASHTO ACCREDITED

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-01**	**JG-01**	**JG-01**	**JG-01**	**JG-01**	**JG-02**
	Depth:	**18-19 ft**	**27-29 ft**	**54.5-57 ft**	**67-69 ft**	**72.5-75 ft**	**14.5-16 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**14-Nov-23**	**14-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**
	Laboratory sample description:	**gy - bn clay**	**bn - gy clay**	**gy - dk gy clay**	**dk by - lt bn clay**	**gy - dk gy clay**	**bn - ol bn clay**
Moisture	Wet soil + tare (g)	806.82	1190.54	953.45	847.34	688.39	2264.09
	Dry soil + tare (g)	739.68	1074.24	869.05	788.12	590.77	2068.51
	Tare (g)	195.78	13.84	196.69	195.42	118.16	422.19
	Moisture content, w (%)	12.3	11.0	12.6	10.0	20.7	11.9
Comments							
QC/QA	Tested By:	AT	AT	CML	CML	CML	CML
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-02**	**JG-02**	**JG-02**	**JG-02**	**JG-02**	**JG-02**
	Depth:	**22-25 ft**	**32-35 ft**	**38.5-40 ft**	**52-55 ft**	**60-62 ft**	**64.5-67 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**
	Laboratory sample description:	**bn - ol bn clay**	**bn - dk yl bn clay**	**lt ol bn - ol bn clay**	**gy - ol bn clay**	**lt bn - bn clay**	**lt ol bn - ol bn clay**
Moisture	Wet soil + tare (g)	2104.69	2453.36	448.30	460.49	656.13	566.47
	Dry soil + tare (g)	1908.65	2210.32	405.33	433.20	600.68	516.43
	Tare (g)	438.53	539.41	127.25	197.51	195.80	126.68
	Moisture content, w (%)	13.3	14.5	15.5	11.6	13.7	12.8
Comments							
QC/QA	Tested By:	CML	CML	CML	CML	CML	CML
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	JG-03	JG-03	JG-03	JG-03	JG-04	JG-04
	Depth:	4.5-7 ft	14.5-17 ft	22-25 ft	30-33 ft	7-10 ft	14.5-17 ft
	Date Sampled:	-	-	-	-	-	-
	Date tested:	13-Nov-23	13-Nov-23	13-Nov-23	13-Nov-23	13-Nov-23	13-Nov-23
	Laboratory sample description:	lt bn - bn clay	pl ol bn - bn clay	lt ol bn - bn clay	bn - dk bn clay	lt ol bn - bn clay	pl ol bn - lt bn silt
Moisture	Wet soil + tare (g)	1630.20	872.07	1046.88	943.07	653.16	601.88
	Dry soil + tare (g)	1521.39	813.63	947.50	865.02	571.20	571.25
	Tare (g)	440.15	119.03	144.65	144.19	195.92	118.32
	Moisture content, w (%)	10.1	8.4	12.4	10.8	21.8	6.8
Comments							
QC/QA	Tested By:	JCC	JCC	JCC	JCC	JCC	JCC
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-04**	**JG-04**	**JG-10**	**JG-10**	**JG-10**	**JG-11**
	Depth:	**22-25 ft**	**30-33 ft**	**12.5-14 ft**	**15-17 ft**	**17.5-19 ft**	**7.5-9 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**
	Laboratory sample description:	**ol bn - bn silt**	**lt bn - bn clay**	**ol bn - lt bn clay**	**ol bn - y bn clay**	**ol bn - lt bn clay**	**bn - dk bn clay**
Moisture	Wet soil + tare (g)	555.20	1543.36	1129.47	377.19	860.87	758.29
	Dry soil + tare (g)	493.76	1440.63	1044.36	352.11	758.40	721.07
	Tare (g)	120.66	421.65	422.15	196.80	13.83	194.35
	Moisture content, w (%)	16.5	10.1	13.7	16.1	13.8	7.1
Comments							
QC/QA	Tested By:	JCC	JCC	AT	JCC	AT	JCC
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

X:\PROJECTS\23-1725 Bear Development\Reviewed\[2023-11-10_Lot53,58_MC.xlsx]5

Sample Info.	Sample:	**JG-12**	**JG-12**	**JG-12**			
	Depth:	**5-7 ft**	**10-12 ft**	**20-21 ft**			
	Date Sampled:	**-**	**-**	**-**			
	Date tested:	**14-Nov-23**	**14-Nov-23**	**14-Nov-23**			
	Laboratory sample description:	**lt ol bn - lt bn clay**	**lt ol bn - lt bn silt**	**lt ol bn - lt bn clay**			
Moisture	Wet soil + tare (g)	902.19	566.12	742.99			
	Dry soil + tare (g)	836.69	514.93	683.22			
	Tare (g)	193.61	116.09	117.11			
	Moisture content, w (%)	10.2	12.8	10.6			
Comments							
QC/QA	Tested By:	AT	AT	AT			
	Reduced By:	CML	CML	CML			
	Reviewed By:	AT	AT	AT			

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 18-19 ft

Tested by: JC Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - bn clay
As-received water content(%):	12.3	Approximate maximum particle size:	1.5"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

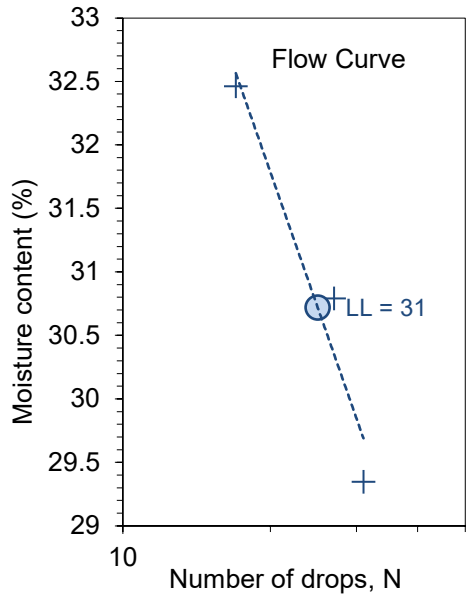
Determination No:	1	2
Wet Soil + Tare (g):	20.94	20.87
Dry Soil + Tare (g):	19.90	19.81
Moisture Loss (g):	1.04	1.06
Tare (g):	13.53	13.42
Dry Soil (g):	6.37	6.39
Moisture Content, w (%):	16.33	16.59

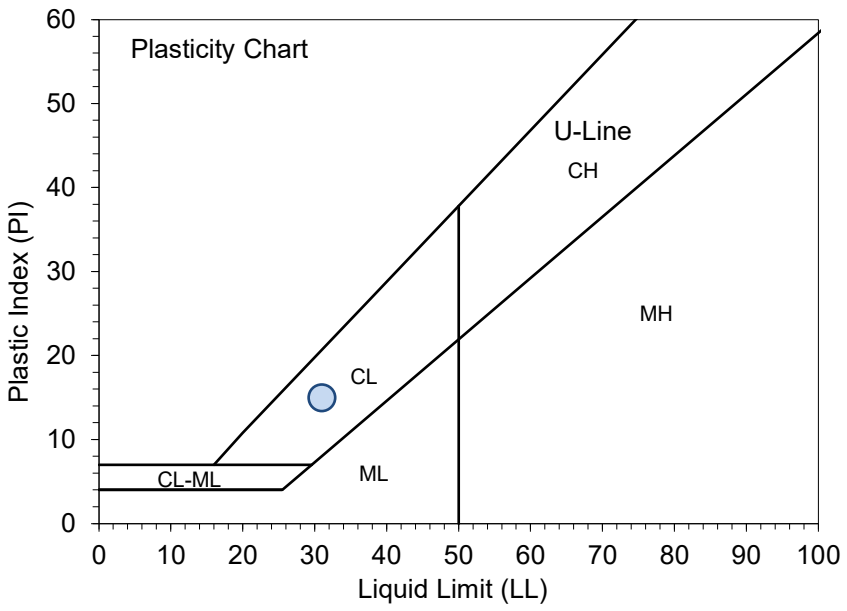
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	27	17
Wet Soil + Tare (g):	23.85	25.34	24.74
Dry Soil + Tare (g):	21.37	22.51	21.75
Moisture Loss (g):	2.48	2.83	2.99
Tare (g):	12.92	13.32	12.54
Dry Soil (g):	8.45	9.19	9.21
Moisture Content, w (%):	29.35	30.79	32.46
One-Point LL:		31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	16
Plasticity Index, PI:	15





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 27-29 ft

Tested by: JC Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - gy clay
As-received water content(%):	11.0	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

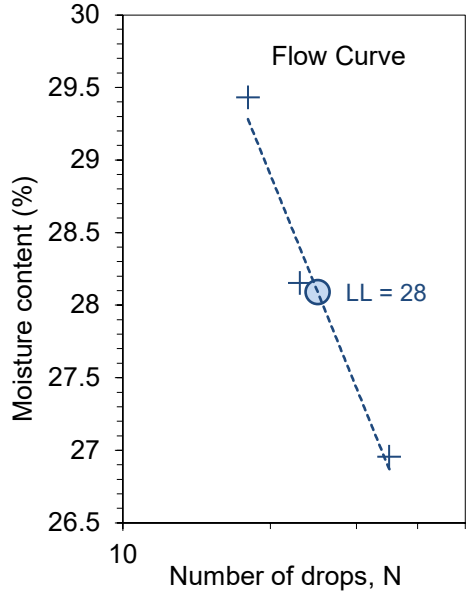
Determination No:	1	2
Wet Soil + Tare (g):	20.76	21.17
Dry Soil + Tare (g):	19.72	20.13
Moisture Loss (g):	1.04	1.04
Tare (g):	13.35	13.69
Dry Soil (g):	6.37	6.44
Moisture Content, w (%):	16.33	16.15

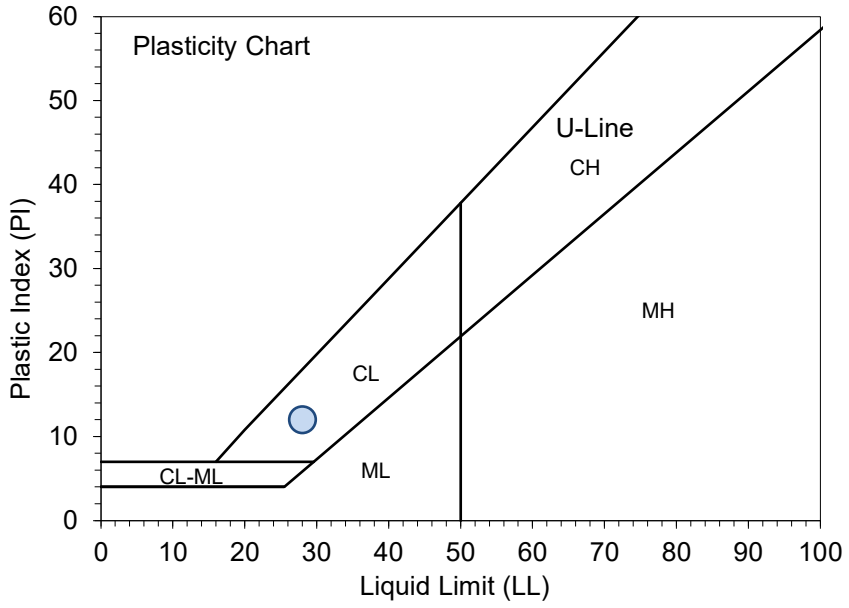
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	23	18
Wet Soil + Tare (g):	25.98	24.87	27.33
Dry Soil + Tare (g):	23.33	22.17	24.16
Moisture Loss (g):	2.65	2.70	3.17
Tare (g):	13.50	12.58	13.39
Dry Soil (g):	9.83	9.59	10.77
Moisture Content, w (%):	26.96	28.15	29.43
One-Point LL:		28	

Results

Liquid Limit, LL:	28
Plastic Limit, PL:	16
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 54.5-57 ft

Tested by: JC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - dk gy clay
As-received water content(%):	12.5	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

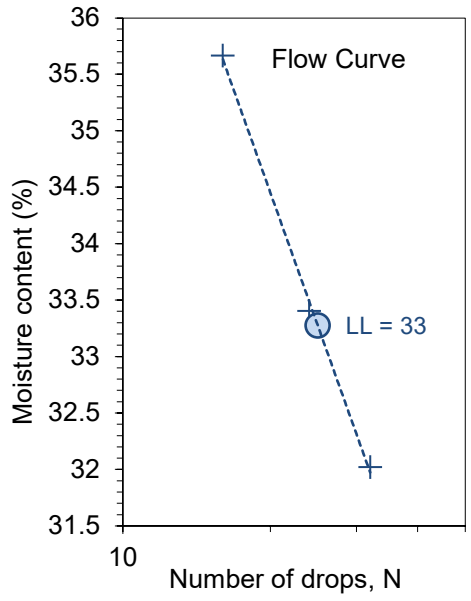
Determination No:	1	2
Wet Soil + Tare (g):	20.65	21.09
Dry Soil + Tare (g):	19.68	20.10
Moisture Loss (g):	0.97	0.99
Tare (g):	13.25	13.55
Dry Soil (g):	6.43	6.55
Moisture Content, w (%):	15.09	15.11

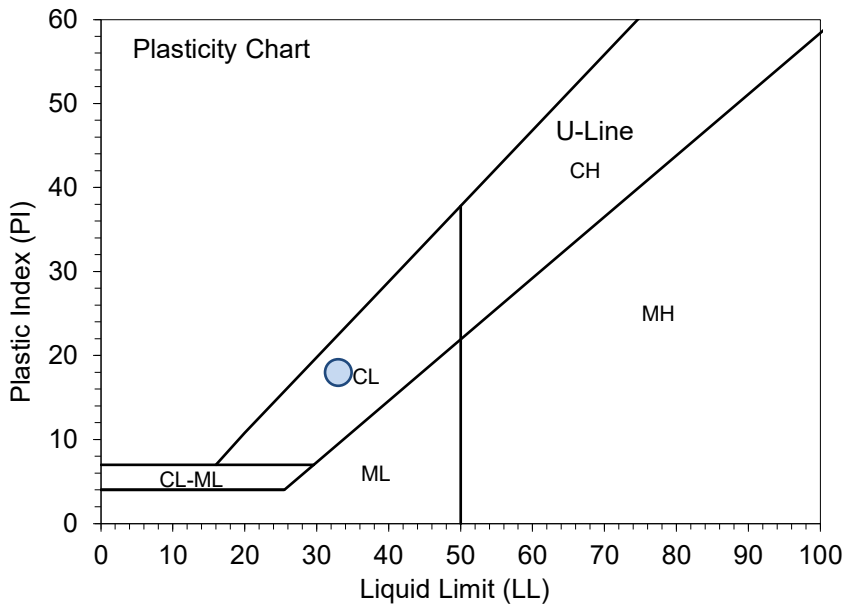
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	32	24	16
Wet Soil + Tare (g):	24.69	24.36	24.92
Dry Soil + Tare (g):	22.00	21.31	21.61
Moisture Loss (g):	2.69	3.05	3.31
Tare (g):	13.60	12.18	12.33
Dry Soil (g):	8.40	9.13	9.28
Moisture Content, w (%):	32.02	33.41	35.67
One-Point LL:		33	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	15
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 67-69 ft

Tested by: JC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	dk gy - lt bn clay
As-received water content(%):	10.0	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

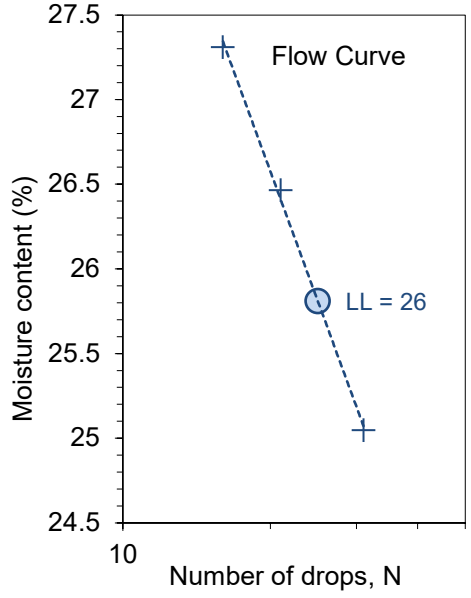
Determination No:	1	2
Wet Soil + Tare (g):	21.01	20.67
Dry Soil + Tare (g):	19.96	19.64
Moisture Loss (g):	1.05	1.03
Tare (g):	13.49	13.07
Dry Soil (g):	6.47	6.57
Moisture Content, w (%):	16.23	15.68

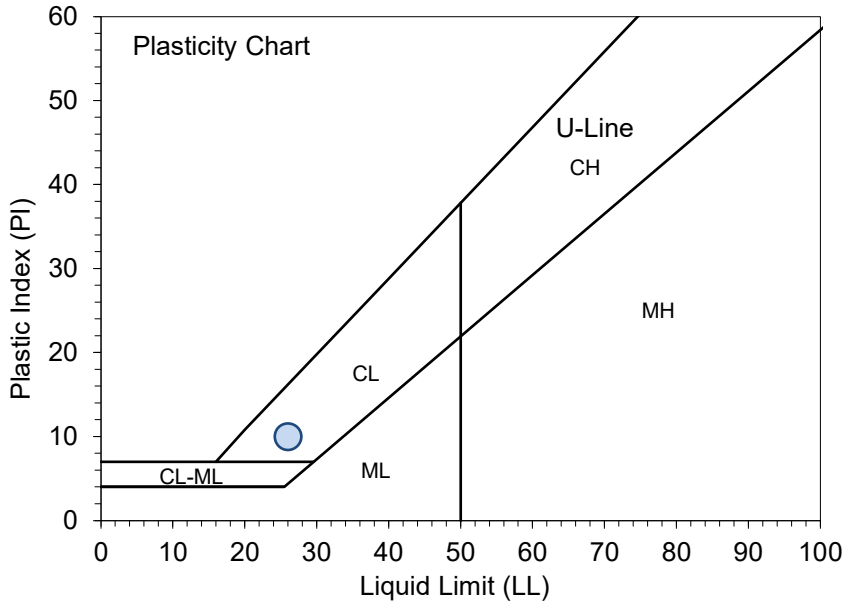
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	21	16
Wet Soil + Tare (g):	26.26	25.37	25.82
Dry Soil + Tare (g):	23.73	22.89	23.22
Moisture Loss (g):	2.53	2.48	2.60
Tare (g):	13.63	13.52	13.70
Dry Soil (g):	10.10	9.37	9.52
Moisture Content, w (%):	25.05	26.47	27.31
One-Point LL:		26	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	16
Plasticity Index, PI:	10





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 72.5-75 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - dk by clay
As-received water content(%):	20.7	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

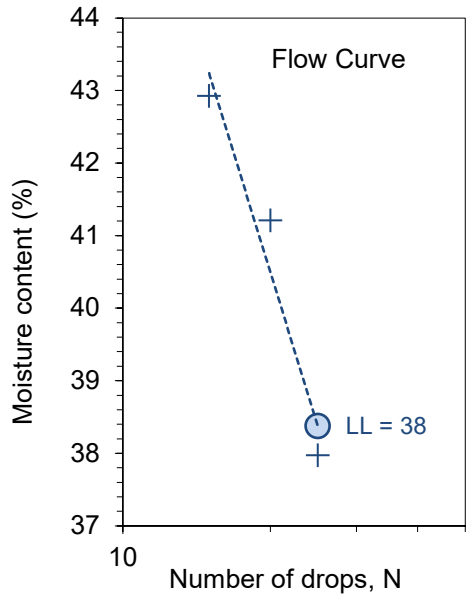
Determination No:	1	2
Wet Soil + Tare (g):	21.19	21.02
Dry Soil + Tare (g):	20.06	19.89
Moisture Loss (g):	1.13	1.13
Tare (g):	13.47	13.48
Dry Soil (g):	6.59	6.41
Moisture Content, w (%):	17.15	17.63

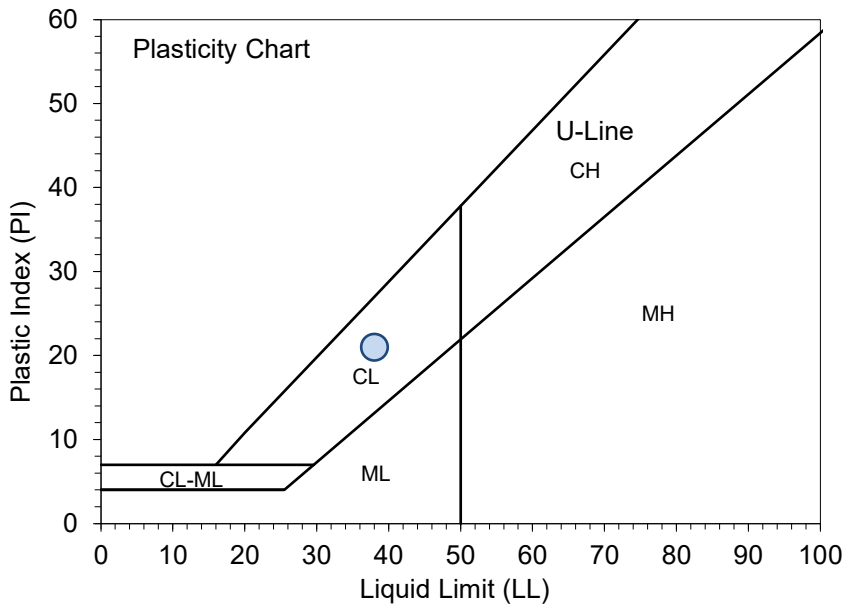
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	25	20	15
Wet Soil + Tare (g):	22.90	24.32	25.41
Dry Soil + Tare (g):	20.31	21.13	21.89
Moisture Loss (g):	2.59	3.19	3.52
Tare (g):	13.49	13.39	13.69
Dry Soil (g):	6.82	7.74	8.20
Moisture Content, w (%):	37.98	41.21	42.93
One-Point LL:	38	40	

Results

Liquid Limit, LL:	38
Plastic Limit, PL:	17
Plasticity Index, PI:	21





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 7-10 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn gravel
As-received water content(%):	Not Requested	Approximate maximum particle size:	1.5"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

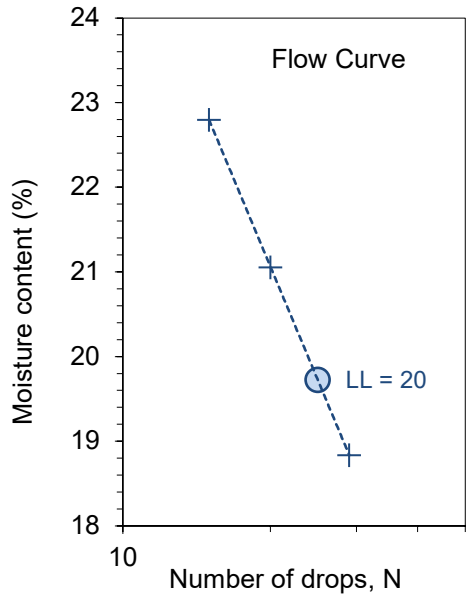
Determination No:	1	2
Wet Soil + Tare (g):	20.22	21.14
Dry Soil + Tare (g):	19.22	20.11
Moisture Loss (g):	1.00	1.03
Tare (g):	12.57	13.32
Dry Soil (g):	6.65	6.79
Moisture Content, w (%):	15.04	15.17

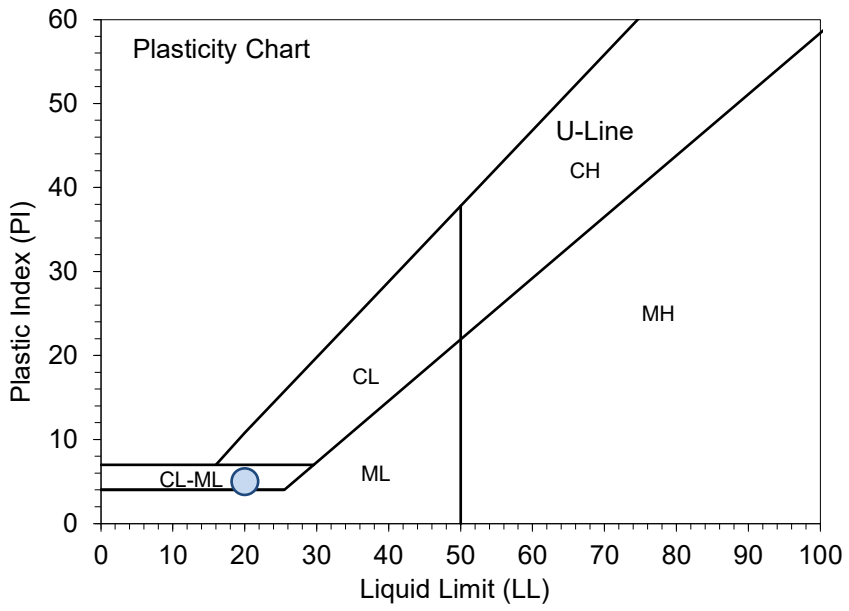
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	20	15
Wet Soil + Tare (g):	26.87	25.20	24.44
Dry Soil + Tare (g):	24.76	23.17	22.29
Moisture Loss (g):	2.11	2.03	2.15
Tare (g):	13.56	13.53	12.86
Dry Soil (g):	11.20	9.64	9.43
Moisture Content, w (%):	18.84	21.06	22.80
One-Point LL:	19	20	

Results

Liquid Limit, LL:	20
Plastic Limit, PL:	15
Plasticity Index, PI:	5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 14.5-16 ft

Tested by: JC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - ol bn clay
As-received water content(%):	11.9	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

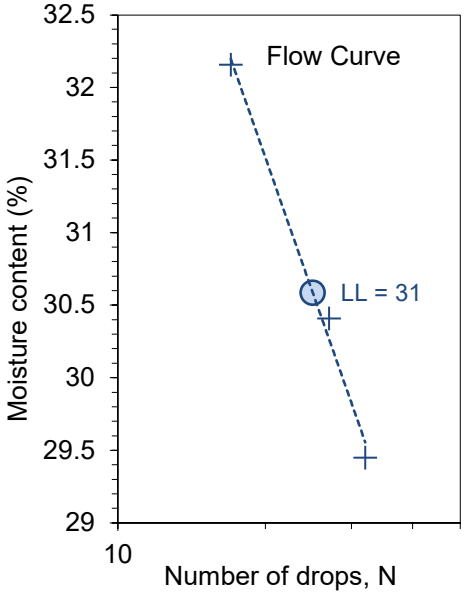
Determination No:	1	2
Wet Soil + Tare (g):	20.91	19.95
Dry Soil + Tare (g):	19.95	19.00
Moisture Loss (g):	0.96	0.95
Tare (g):	13.46	12.46
Dry Soil (g):	6.49	6.54
Moisture Content, w (%):	14.79	14.53

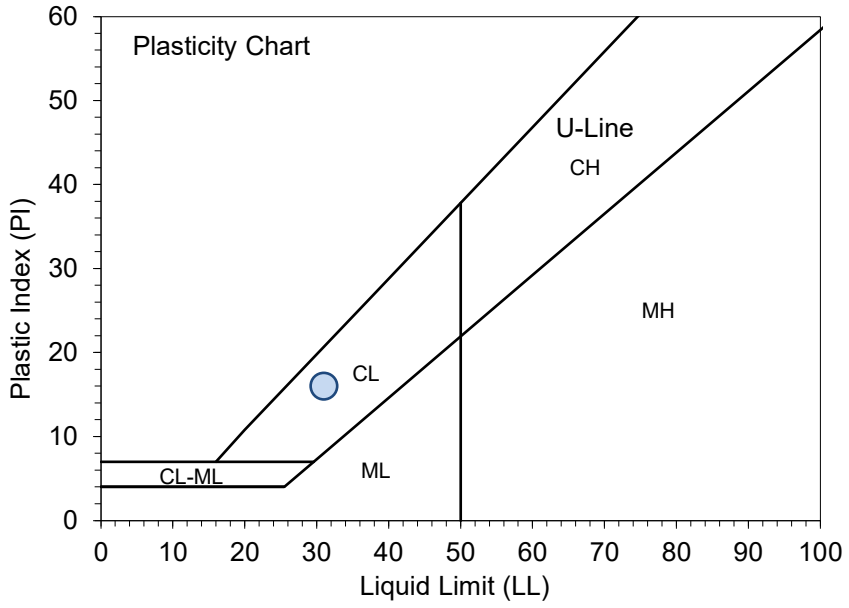
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	32	27	17
Wet Soil + Tare (g):	27.13	25.25	23.71
Dry Soil + Tare (g):	24.02	22.51	20.88
Moisture Loss (g):	3.11	2.74	2.83
Tare (g):	13.46	13.50	12.08
Dry Soil (g):	10.56	9.01	8.80
Moisture Content, w (%):	29.45	30.41	32.16
One-Point LL:		31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	15
Plasticity Index, PI:	16





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - ol bn clay
As-received water content(%):	13.3	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

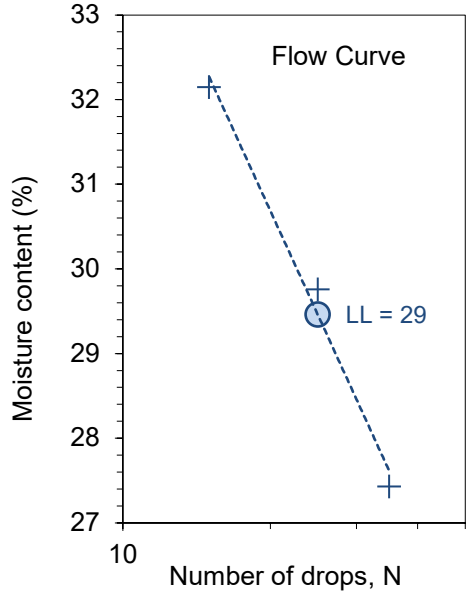
Determination No:	1	2
Wet Soil + Tare (g):	21.43	19.87
Dry Soil + Tare (g):	20.39	18.85
Moisture Loss (g):	1.04	1.02
Tare (g):	13.57	12.08
Dry Soil (g):	6.82	6.77
Moisture Content, w (%):	15.25	15.07

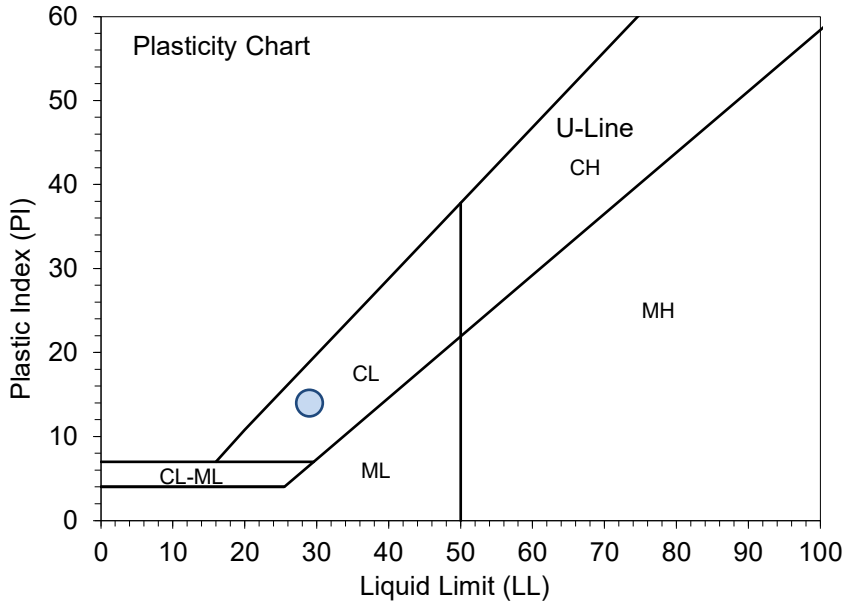
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	25	15
Wet Soil + Tare (g):	22.22	20.57	25.21
Dry Soil + Tare (g):	20.36	18.71	22.22
Moisture Loss (g):	1.86	1.86	2.99
Tare (g):	13.58	12.46	12.92
Dry Soil (g):	6.78	6.25	9.30
Moisture Content, w (%):	27.43	29.76	32.15
One-Point LL:		30	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	15
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 32-35 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk yl bn clay
As-received water content(%):	14.5	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

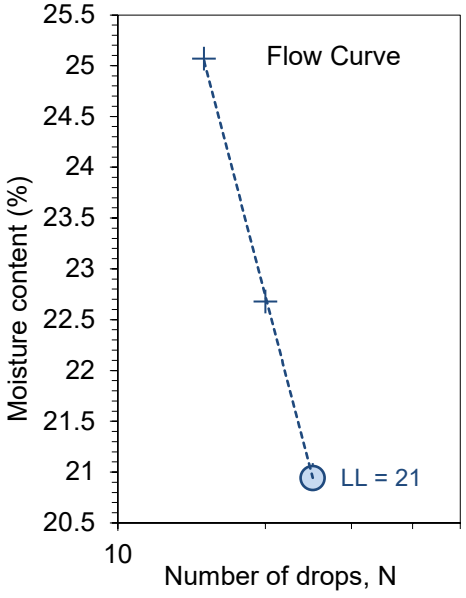
Determination No:	1	2
Wet Soil + Tare (g):	21.05	21.32
Dry Soil + Tare (g):	19.97	20.22
Moisture Loss (g):	1.08	1.10
Tare (g):	13.42	13.54
Dry Soil (g):	6.55	6.68
Moisture Content, w (%):	16.49	16.47

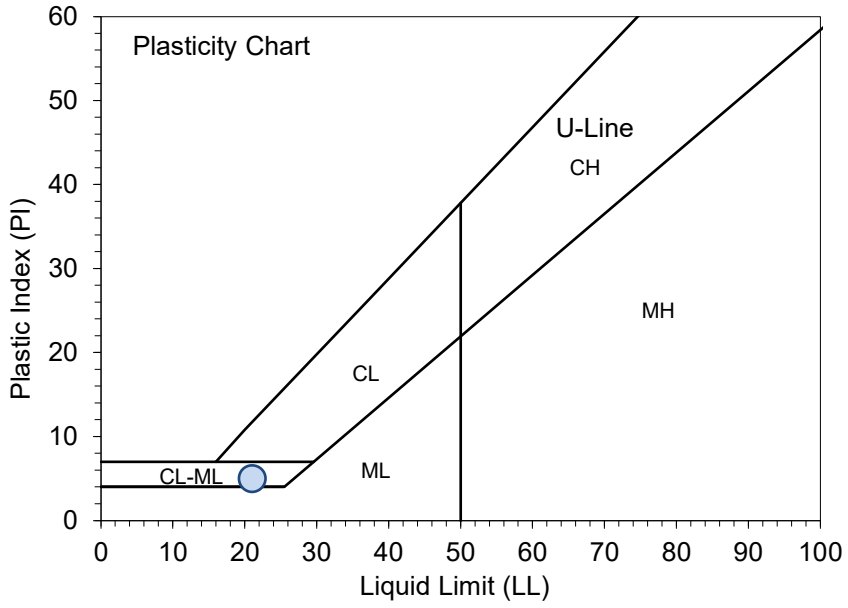
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	25	20	15
Wet Soil + Tare (g):	25.91	24.58	25.44
Dry Soil + Tare (g):	23.76	22.50	22.86
Moisture Loss (g):	2.15	2.08	2.58
Tare (g):	13.51	13.33	12.57
Dry Soil (g):	10.25	9.17	10.29
Moisture Content, w (%):	20.98	22.68	25.07
One-Point LL:	21	22	

Results

Liquid Limit, LL:	21
Plastic Limit, PL:	16
Plasticity Index, PI:	5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 38.5-40 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - ol bn clay
As-received water content(%):	15.5	Approximate maximum particle size:	No. 10
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

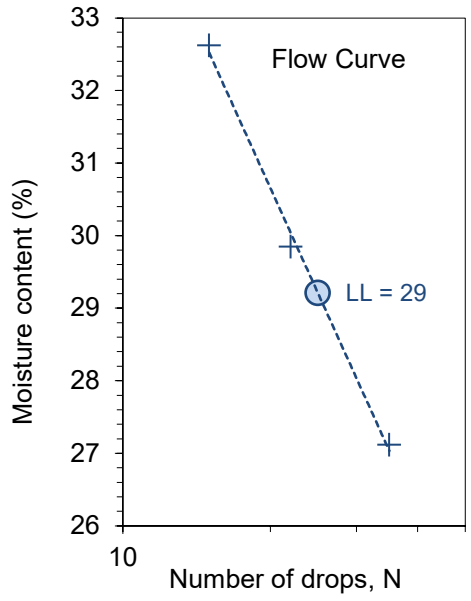
Determination No:	1	2
Wet Soil + Tare (g):	20.84	21.16
Dry Soil + Tare (g):	19.75	20.04
Moisture Loss (g):	1.09	1.12
Tare (g):	13.53	13.60
Dry Soil (g):	6.22	6.44
Moisture Content, w (%):	17.52	17.39

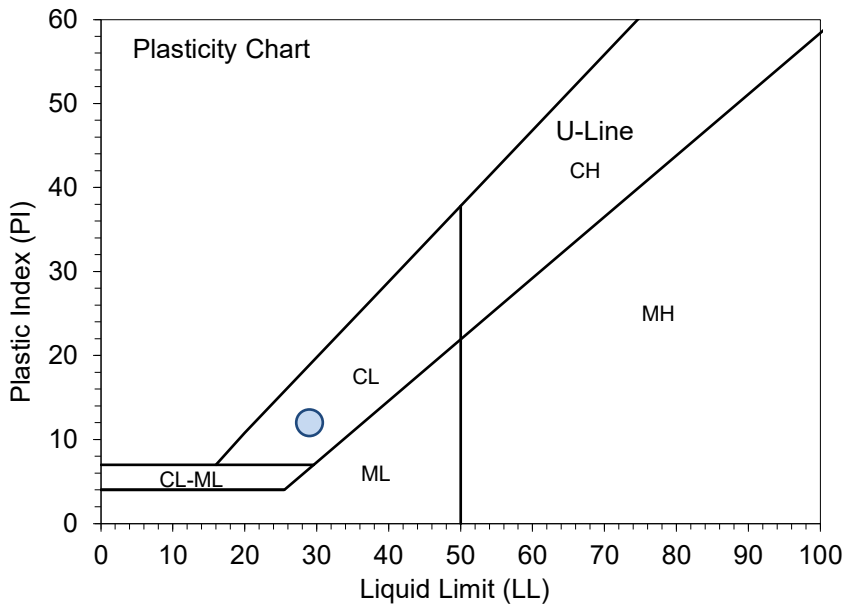
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	22	15
Wet Soil + Tare (g):	24.37	21.89	23.34
Dry Soil + Tare (g):	22.04	19.69	20.88
Moisture Loss (g):	2.33	2.20	2.46
Tare (g):	13.45	12.32	13.34
Dry Soil (g):	8.59	7.37	7.54
Moisture Content, w (%):	27.12	29.85	32.63
One-Point LL:		29	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	17
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 52-55 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - ol bn clay
As-received water content(%):	11.6	Approximate maximum particle size:	No. 10
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

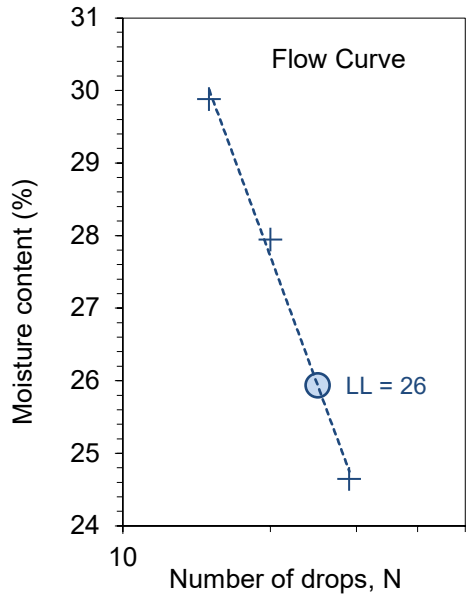
Determination No:	1	2
Wet Soil + Tare (g):	20.78	20.39
Dry Soil + Tare (g):	19.86	19.48
Moisture Loss (g):	0.92	0.91
Tare (g):	13.07	12.86
Dry Soil (g):	6.79	6.62
Moisture Content, w (%):	13.55	13.75

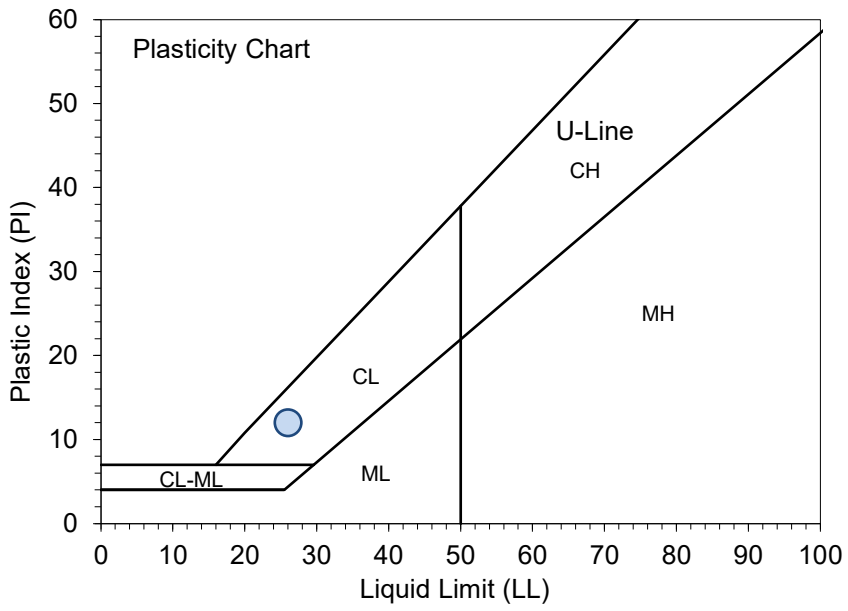
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	20	15
Wet Soil + Tare (g):	26.18	26.47	25.64
Dry Soil + Tare (g):	23.71	23.51	22.84
Moisture Loss (g):	2.47	2.96	2.80
Tare (g):	13.69	12.92	13.47
Dry Soil (g):	10.02	10.59	9.37
Moisture Content, w (%):	24.65	27.95	29.88
One-Point LL:	25	27	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	14
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 60-62 ft

Tested by: PJF Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	13.7	Approximate maximum particle size:	No. 10
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

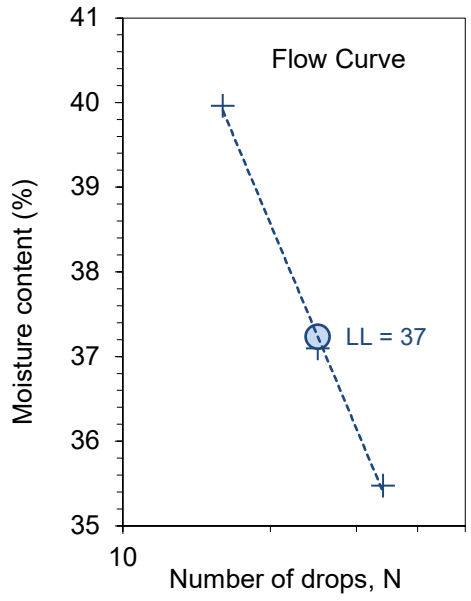
Determination No:	1	2
Wet Soil + Tare (g):	19.85	20.09
Dry Soil + Tare (g):	19.04	19.23
Moisture Loss (g):	0.81	0.86
Tare (g):	13.24	13.20
Dry Soil (g):	5.80	6.03
Moisture Content, w (%):	13.97	14.26

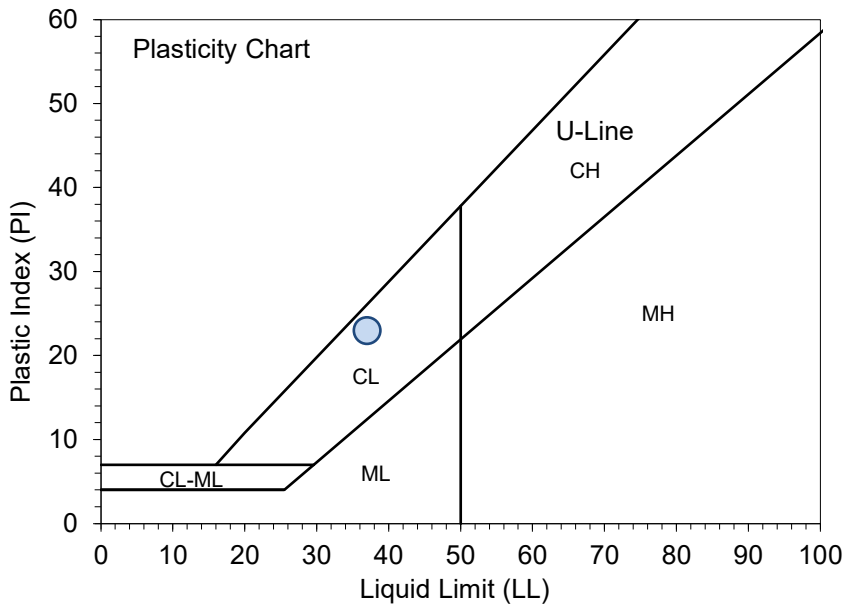
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	34	25	16
Wet Soil + Tare (g):	25.78	25.64	28.95
Dry Soil + Tare (g):	22.31	22.39	24.57
Moisture Loss (g):	3.47	3.25	4.38
Tare (g):	12.53	13.63	13.61
Dry Soil (g):	9.78	8.76	10.96
Moisture Content, w (%):	35.48	37.10	39.96
One-Point LL:		37	

Results

Liquid Limit, LL:	37
Plastic Limit, PL:	14
Plasticity Index, PI:	23





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 64.5-67 ft

Tested by: PJF Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - ol bn clay
As-received water content(%):	12.8	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

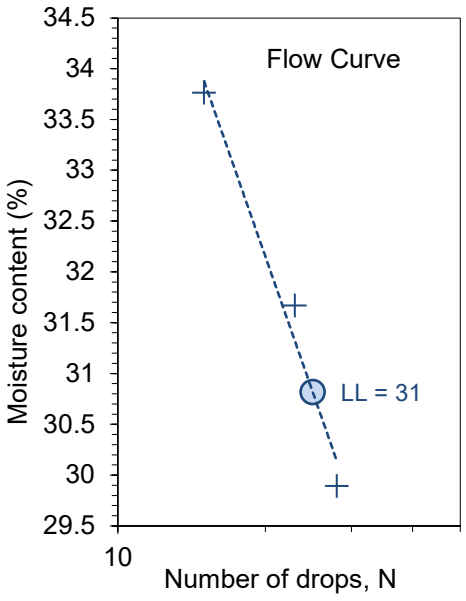
Determination No:	1	2
Wet Soil + Tare (g):	19.92	19.13
Dry Soil + Tare (g):	18.91	18.09
Moisture Loss (g):	1.01	1.04
Tare (g):	12.97	12.20
Dry Soil (g):	5.94	5.89
Moisture Content, w (%):	17.00	17.66

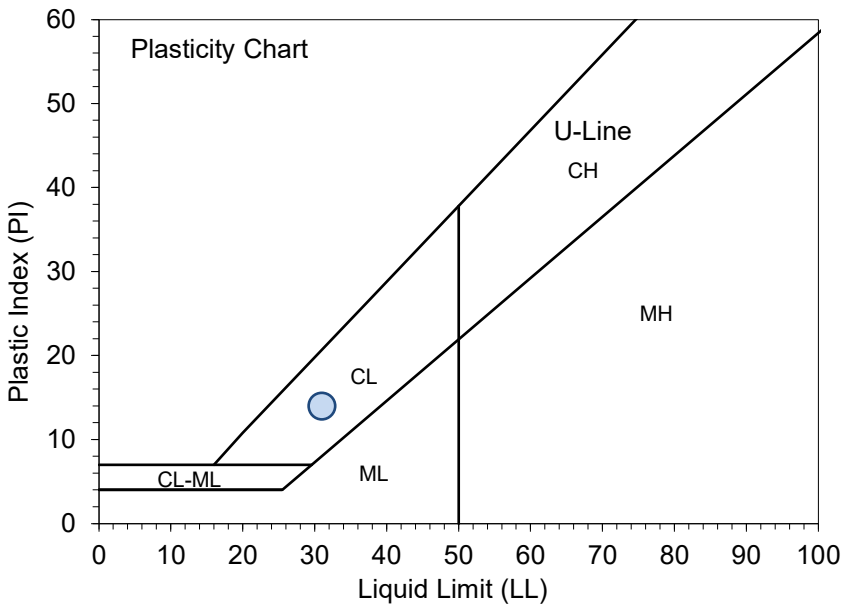
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	28	23	15
Wet Soil + Tare (g):	26.11	26.31	25.75
Dry Soil + Tare (g):	23.21	23.13	22.62
Moisture Loss (g):	2.90	3.18	3.13
Tare (g):	13.51	13.09	13.35
Dry Soil (g):	9.70	10.04	9.27
Moisture Content, w (%):	29.90	31.67	33.76
One-Point LL:	30	31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	17
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 69.5-72 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn gravel
As-received water content(%):	Not Requested	Approximate maximum particle size:	2"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	75
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

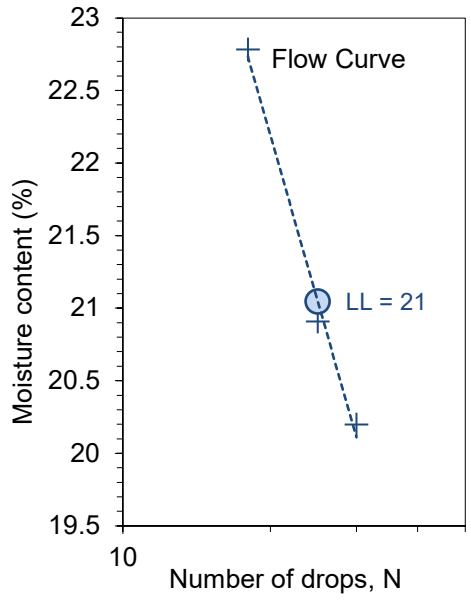
Determination No:	1	2
Wet Soil + Tare (g):	20.46	21.09
Dry Soil + Tare (g):	19.45	20.08
Moisture Loss (g):	1.01	1.01
Tare (g):	12.96	13.57
Dry Soil (g):	6.49	6.51
Moisture Content, w (%):	15.56	15.51

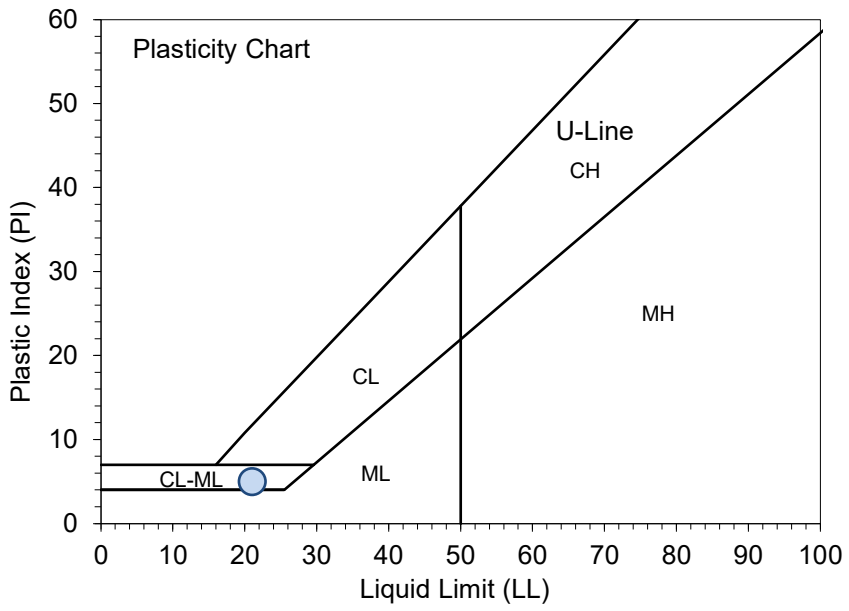
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	25	18
Wet Soil + Tare (g):	24.18	25.29	22.55
Dry Soil + Tare (g):	22.36	23.27	20.75
Moisture Loss (g):	1.82	2.02	1.80
Tare (g):	13.35	13.61	12.85
Dry Soil (g):	9.01	9.66	7.90
Moisture Content, w (%):	20.20	20.91	22.78
One-Point LL:	21	21	

Results

Liquid Limit, LL:	21
Plastic Limit, PL:	16
Plasticity Index, PI:	5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 4.5-7 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	10.1	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

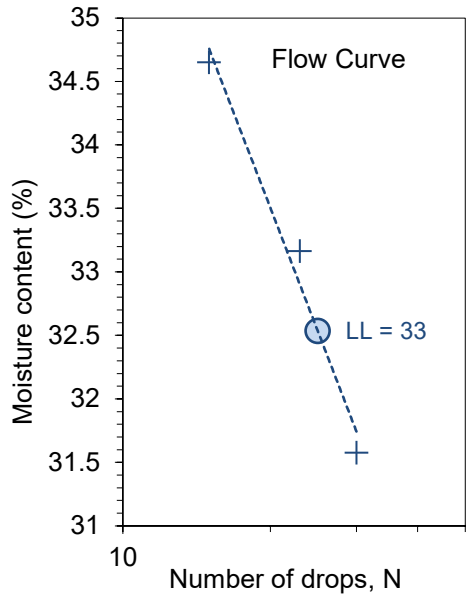
Determination No:	1	2
Wet Soil + Tare (g):	20.63	19.09
Dry Soil + Tare (g):	19.78	18.29
Moisture Loss (g):	0.85	0.80
Tare (g):	13.55	12.54
Dry Soil (g):	6.23	5.75
Moisture Content, w (%):	13.64	13.91

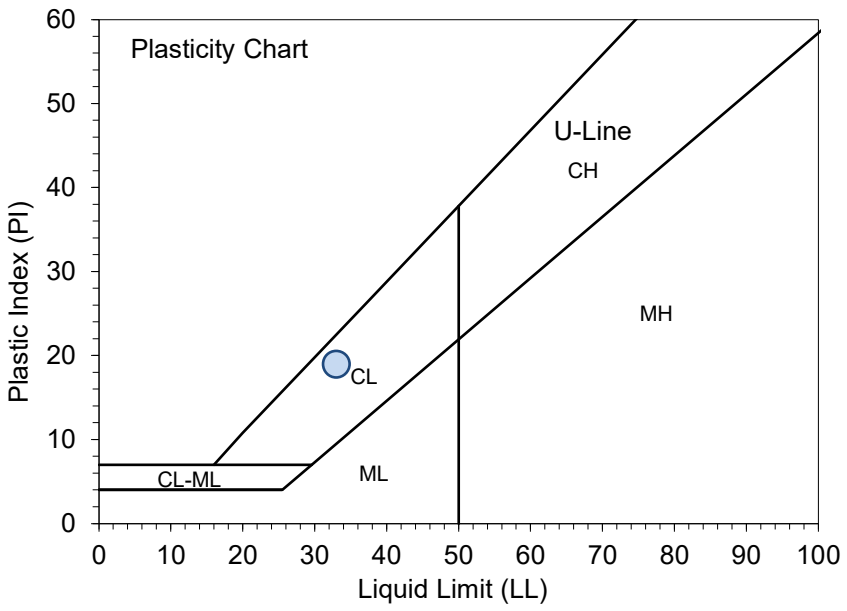
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	23	15
Wet Soil + Tare (g):	27.01	26.81	27.14
Dry Soil + Tare (g):	23.77	23.50	23.64
Moisture Loss (g):	3.24	3.31	3.50
Tare (g):	13.51	13.52	13.54
Dry Soil (g):	10.26	9.98	10.10
Moisture Content, w (%):	31.58	33.17	34.65
One-Point LL:	32	33	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	14
Plasticity Index, PI:	19





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Tested by: MGS Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	pl ol bn - bn clay
As-received water content(%):	8.4	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

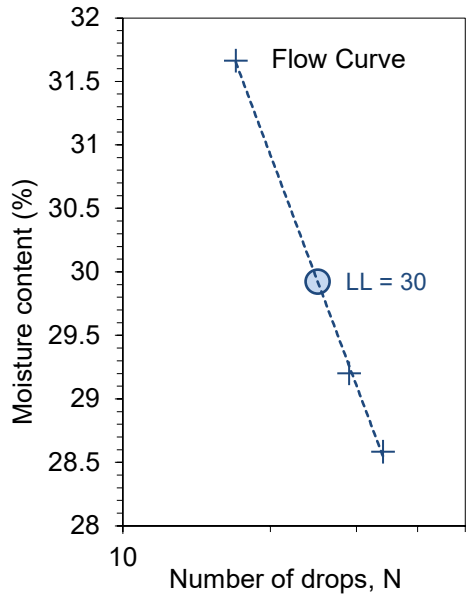
Determination No:	1	2
Wet Soil + Tare (g):	20.68	20.84
Dry Soil + Tare (g):	19.73	19.88
Moisture Loss (g):	0.95	0.96
Tare (g):	13.45	13.56
Dry Soil (g):	6.28	6.32
Moisture Content, w (%):	15.13	15.19

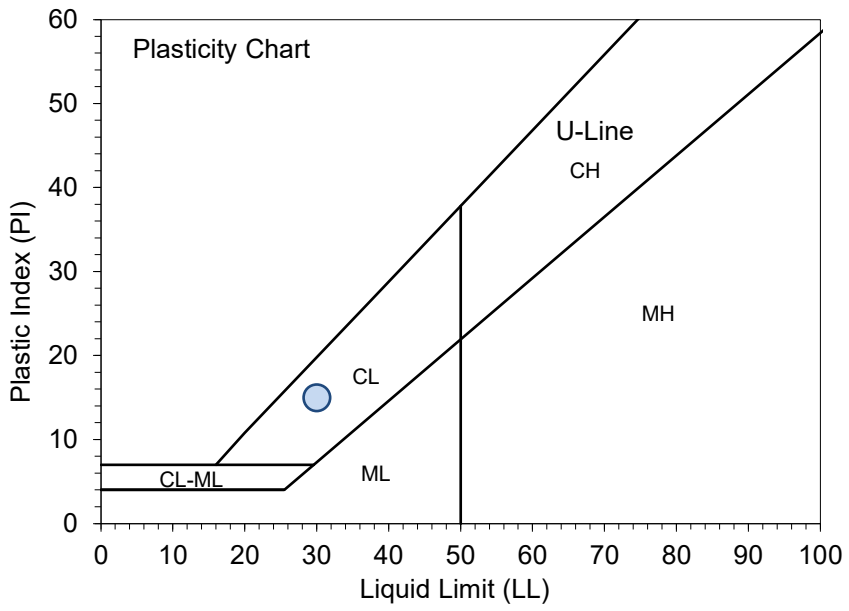
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	34	29	17
Wet Soil + Tare (g):	25.21	28.96	24.78
Dry Soil + Tare (g):	22.32	25.47	22.06
Moisture Loss (g):	2.89	3.49	2.72
Tare (g):	12.21	13.52	13.47
Dry Soil (g):	10.11	11.95	8.59
Moisture Content, w (%):	28.59	29.21	31.66
One-Point LL:		30	

Results

Liquid Limit, LL:	30
Plastic Limit, PL:	15
Plasticity Index, PI:	15





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - bn clay
As-received water content(%):	12.4	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	20
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

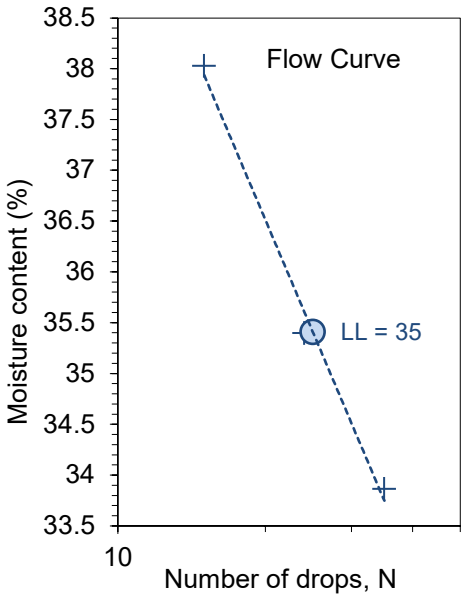
Determination No:	1	2
Wet Soil + Tare (g):	19.21	19.75
Dry Soil + Tare (g):	18.30	18.89
Moisture Loss (g):	0.91	0.86
Tare (g):	12.28	13.22
Dry Soil (g):	6.02	5.67
Moisture Content, w (%):	15.12	15.17

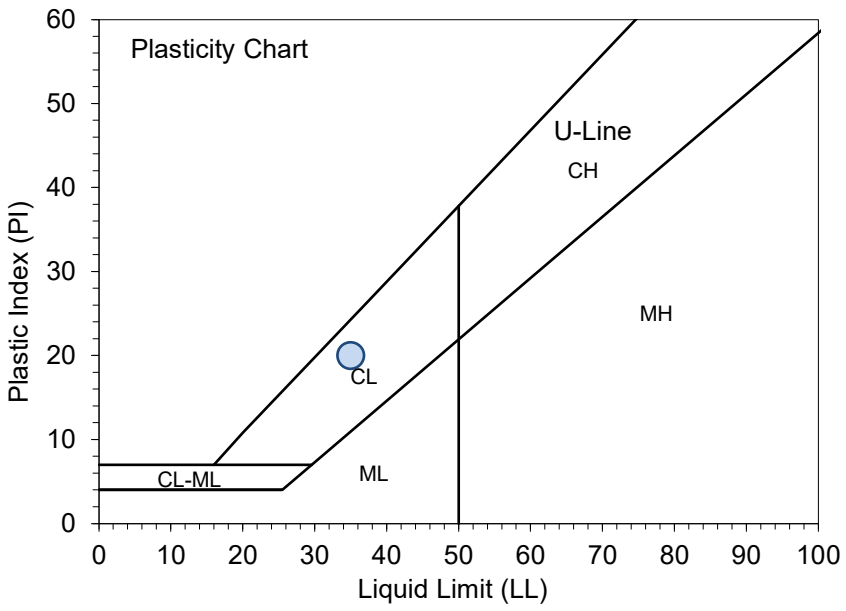
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	24	15
Wet Soil + Tare (g):	26.18	26.09	25.03
Dry Soil + Tare (g):	23.01	22.78	21.90
Moisture Loss (g):	3.17	3.31	3.13
Tare (g):	13.65	13.43	13.67
Dry Soil (g):	9.36	9.35	8.23
Moisture Content, w (%):	33.87	35.40	38.03
One-Point LL:		35	

Results

Liquid Limit, LL:	35
Plastic Limit, PL:	15
Plasticity Index, PI:	20





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 30-33 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn clay
As-received water content(%):	10.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

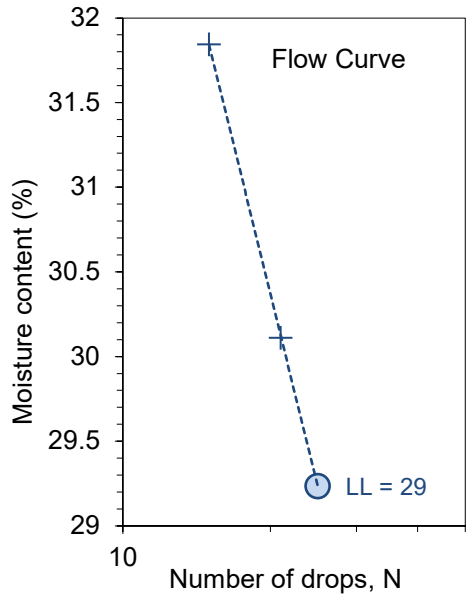
Determination No:	1	2
Wet Soil + Tare (g):	20.40	20.23
Dry Soil + Tare (g):	19.46	19.37
Moisture Loss (g):	0.94	0.86
Tare (g):	13.35	13.51
Dry Soil (g):	6.11	5.86
Moisture Content, w (%):	15.38	14.68

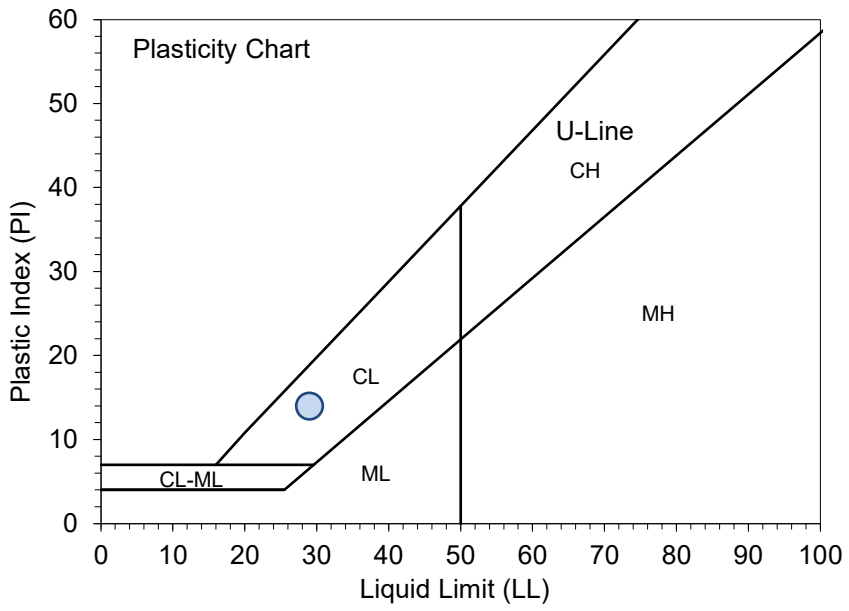
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	25	21	15
Wet Soil + Tare (g):	25.41	25.35	28.60
Dry Soil + Tare (g):	22.55	22.42	24.96
Moisture Loss (g):	2.86	2.93	3.64
Tare (g):	12.77	12.69	13.53
Dry Soil (g):	9.78	9.73	11.43
Moisture Content, w (%):	29.24	30.11	31.85
One-Point LL:	29	29	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	15
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 7-10 ft

Tested by: MGS Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	It ol bn - bn clay
As-received water content(%):	21.8	Approximate maximum particle size:	No. 4
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

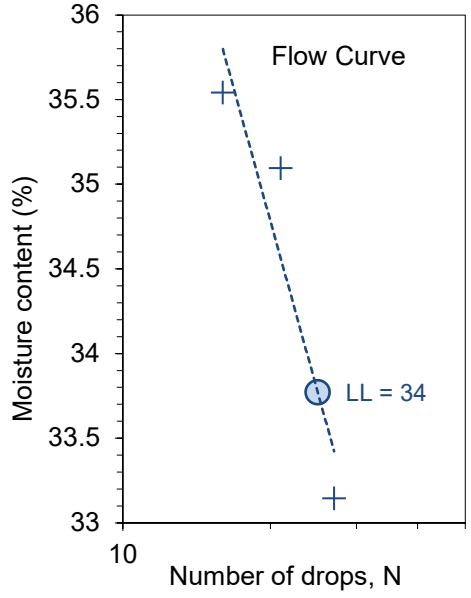
Determination No:	1	2
Wet Soil + Tare (g):	20.44	20.46
Dry Soil + Tare (g):	19.50	19.48
Moisture Loss (g):	0.94	0.98
Tare (g):	13.42	13.24
Dry Soil (g):	6.08	6.24
Moisture Content, w (%):	15.46	15.71

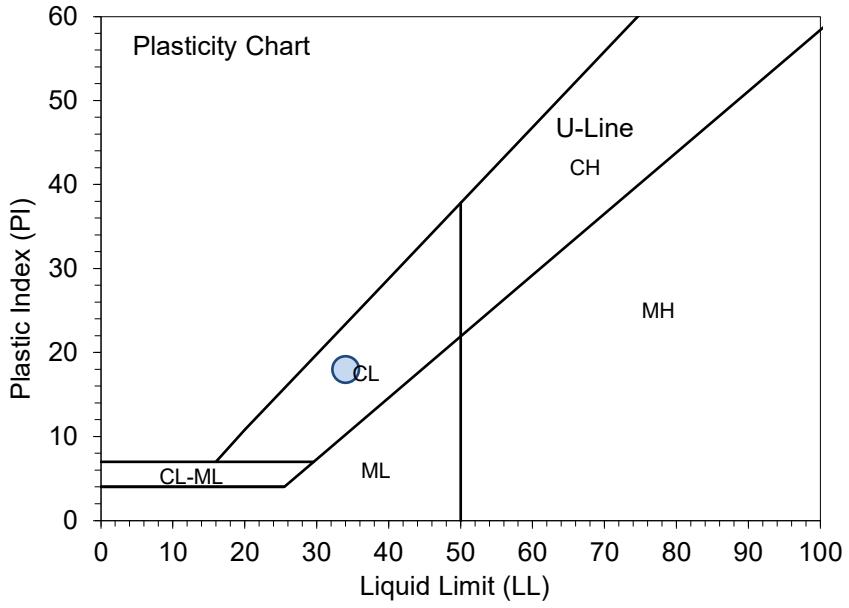
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	27	21	16
Wet Soil + Tare (g):	24.27	26.14	25.99
Dry Soil + Tare (g):	21.30	22.49	22.72
Moisture Loss (g):	2.97	3.65	3.27
Tare (g):	12.34	12.09	13.52
Dry Soil (g):	8.96	10.40	9.20
Moisture Content, w (%):	33.15	35.10	35.54
One-Point LL:	33	34	

Results

Liquid Limit, LL:	34
Plastic Limit, PL:	16
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Tested by: CML Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	pl ol bn - lt bn silt
As-received water content(%):	6.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

Determination No:	1	2
Wet Soil + Tare (g):	21.13	20.64
Dry Soil + Tare (g):	20.21	19.72
Moisture Loss (g):	0.92	0.92
Tare (g):	13.54	12.92
Dry Soil (g):	6.67	6.80
Moisture Content, w (%):	13.79	13.53

Liquid Limit

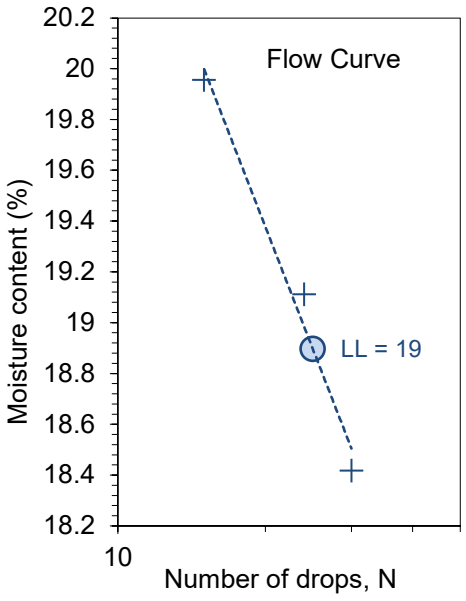
Determination No:	1	2	3
Number of Drops, N:	30	24	15
Wet Soil + Tare (g):	24.37	26.22	24.48
Dry Soil + Tare (g):	22.53	24.15	22.61
Moisture Loss (g):	1.84	2.07	1.87
Tare (g):	12.54	13.32	13.24
Dry Soil (g):	9.99	10.83	9.37
Moisture Content, w (%):	18.42	19.11	19.96
One-Point LL:	19	19	

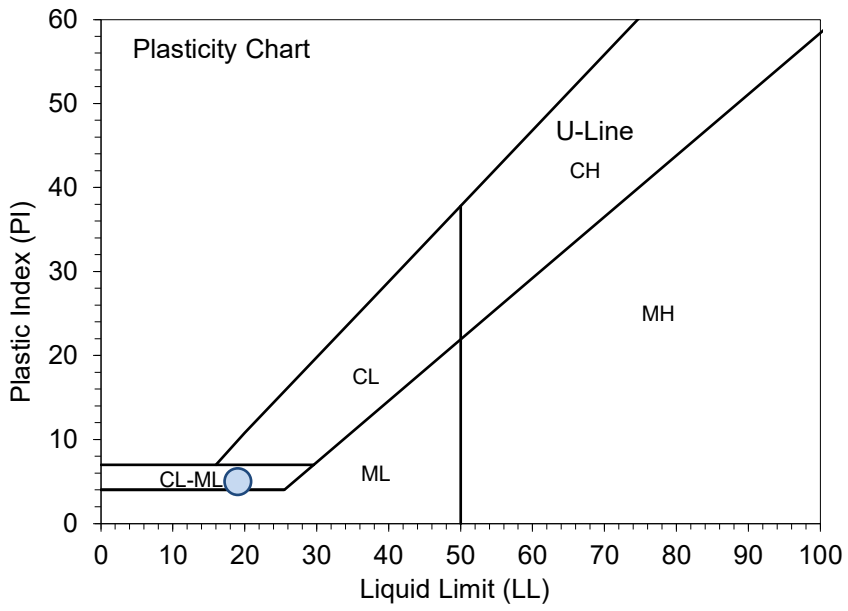
Results

Liquid Limit, LL: 19

Plastic Limit, PL: 14

Plasticity Index, PI: 5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - bn silt
As-received water content(%):	16.5	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

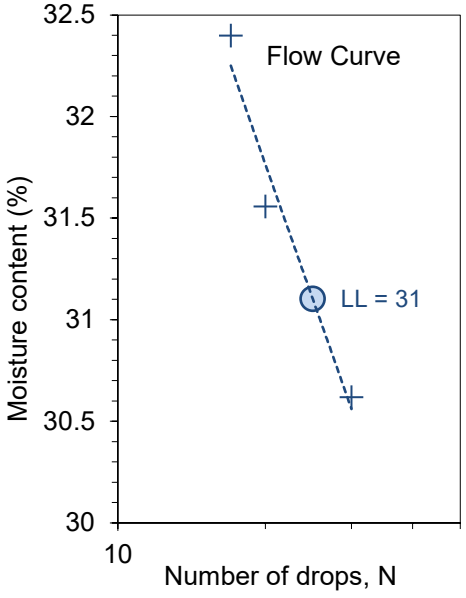
Determination No:	1	2
Wet Soil + Tare (g):	20.25	19.87
Dry Soil + Tare (g):	19.28	18.88
Moisture Loss (g):	0.97	0.99
Tare (g):	13.52	12.94
Dry Soil (g):	5.76	5.94
Moisture Content, w (%):	16.84	16.67

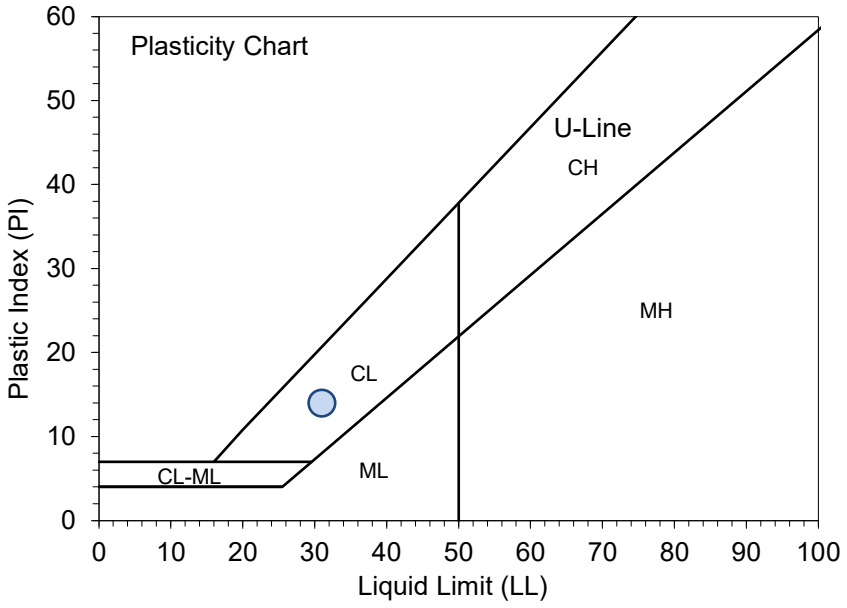
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	20	17
Wet Soil + Tare (g):	26.21	26.45	25.37
Dry Soil + Tare (g):	23.20	23.31	22.48
Moisture Loss (g):	3.01	3.14	2.89
Tare (g):	13.37	13.36	13.56
Dry Soil (g):	9.83	9.95	8.92
Moisture Content, w (%):	30.62	31.56	32.40
One-Point LL:	31	31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	17
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 30-33 ft

Tested by: CML Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	10.1	Approximate maximum particle size:	2"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	25
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

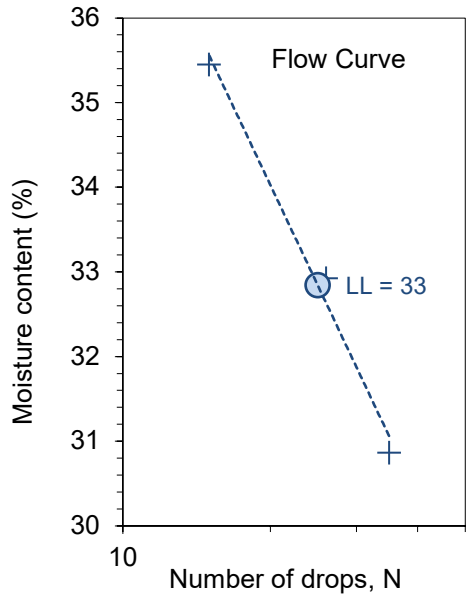
Determination No:	1	2
Wet Soil + Tare (g):	20.99	21.04
Dry Soil + Tare (g):	19.96	20.03
Moisture Loss (g):	1.03	1.01
Tare (g):	13.34	13.41
Dry Soil (g):	6.62	6.62
Moisture Content, w (%):	15.56	15.26

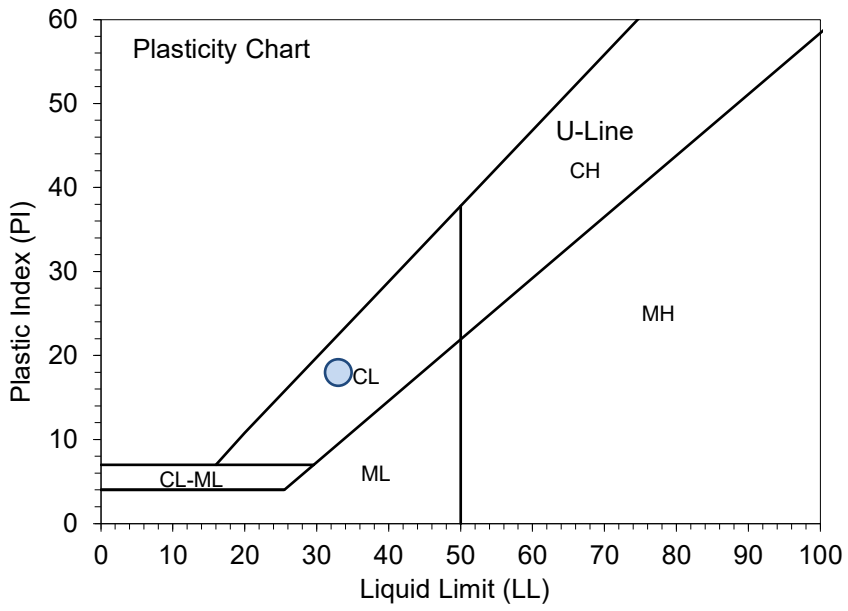
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	26	15
Wet Soil + Tare (g):	25.03	25.76	27.92
Dry Soil + Tare (g):	22.36	22.52	24.13
Moisture Loss (g):	2.67	3.24	3.79
Tare (g):	13.71	12.68	13.44
Dry Soil (g):	8.65	9.84	10.69
Moisture Content, w (%):	30.87	32.93	35.45
One-Point LL:		33	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	15
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn gravel
As-received water content(%):	Not Requested	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	20
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

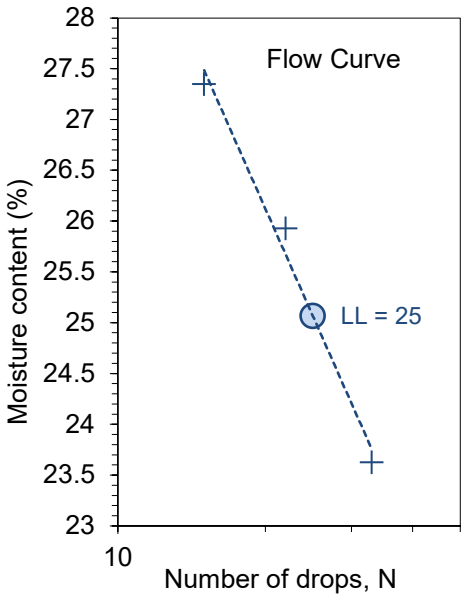
Determination No:	1	2
Wet Soil + Tare (g):	21.15	20.86
Dry Soil + Tare (g):	20.10	19.82
Moisture Loss (g):	1.05	1.04
Tare (g):	13.54	13.35
Dry Soil (g):	6.56	6.47
Moisture Content, w (%):	16.01	16.07

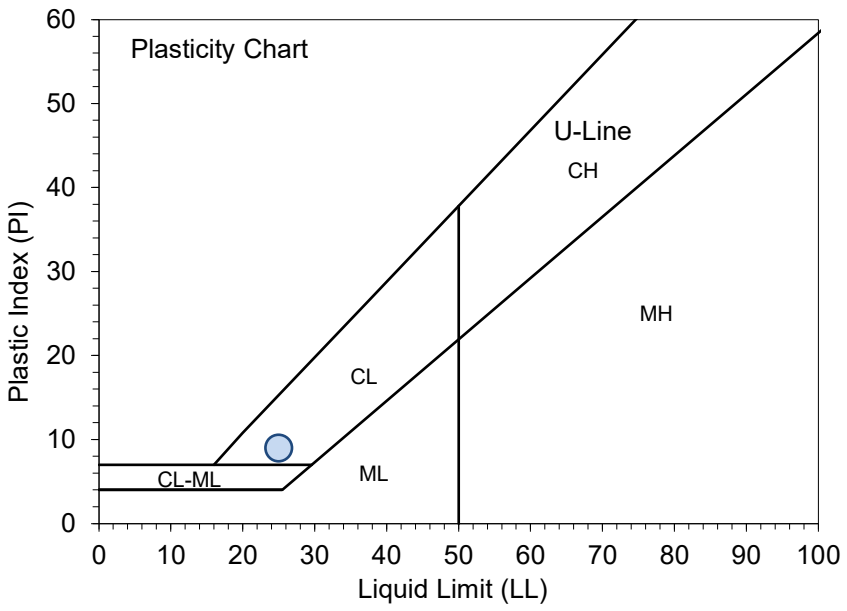
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	33	22	15
Wet Soil + Tare (g):	25.36	27.77	26.44
Dry Soil + Tare (g):	23.03	24.92	23.62
Moisture Loss (g):	2.33	2.85	2.82
Tare (g):	13.17	13.93	13.31
Dry Soil (g):	9.86	10.99	10.31
Moisture Content, w (%):	23.63	25.93	27.35
One-Point LL:		26	

Results

Liquid Limit, LL:	25
Plastic Limit, PL:	16
Plasticity Index, PI:	9





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Tested by: AT Date: 14-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Oven Dry	Laboratory sample description:	ol bn - lt bn clay
As-received water content(%):	13.7	Approximate maximum particle size:	1.5"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

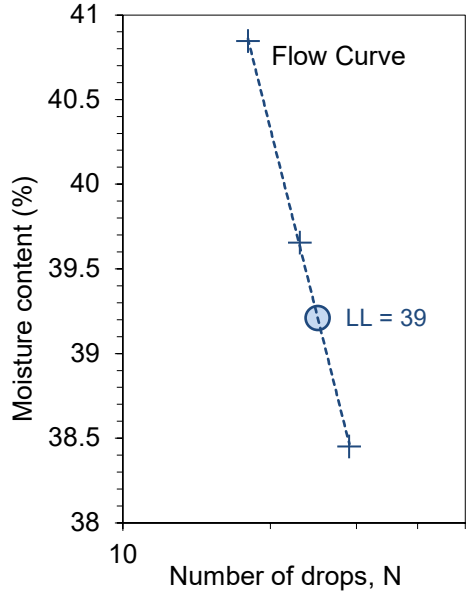
Determination No:	1	2
Wet Soil + Tare (g):	20.12	19.90
Dry Soil + Tare (g):	19.24	19.05
Moisture Loss (g):	0.88	0.85
Tare (g):	13.41	13.55
Dry Soil (g):	5.83	5.50
Moisture Content, w (%):	15.09	15.45

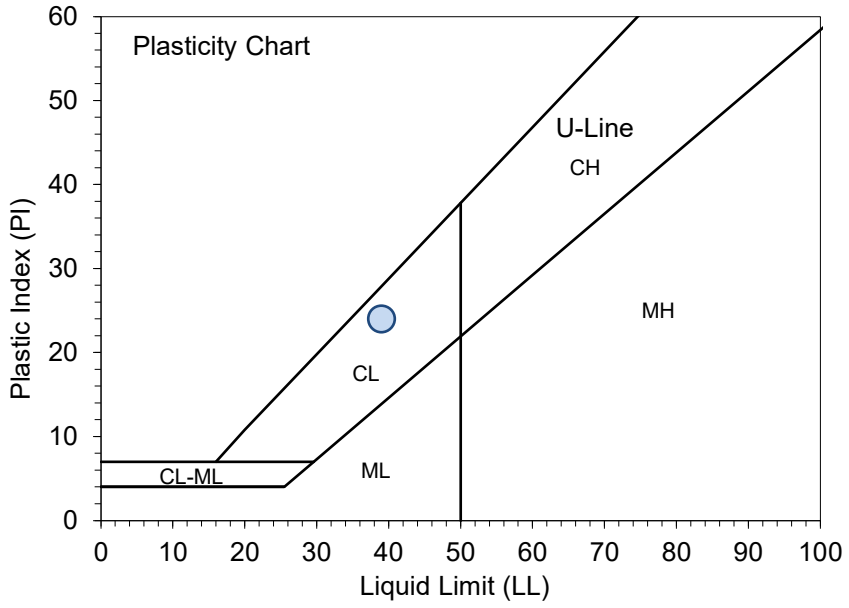
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	23	18
Wet Soil + Tare (g):	25.53	23.25	24.89
Dry Soil + Tare (g):	22.20	20.47	21.61
Moisture Loss (g):	3.33	2.78	3.28
Tare (g):	13.54	13.46	13.58
Dry Soil (g):	8.66	7.01	8.03
Moisture Content, w (%):	38.45	39.66	40.85
One-Point LL:	39	39	

Results

Liquid Limit, LL:	39
Plastic Limit, PL:	15
Plasticity Index, PI:	24





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 15-17 ft

Tested by: AT Date: 13-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - yl bn clay
As-received water content(%):	16.1	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

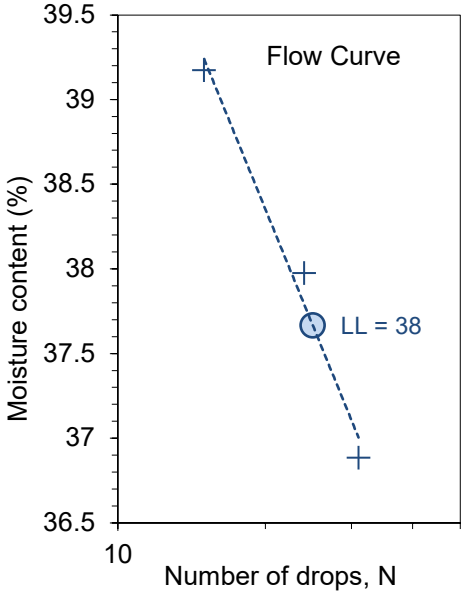
Determination No:	1	2
Wet Soil + Tare (g):	19.43	20.15
Dry Soil + Tare (g):	18.38	18.97
Moisture Loss (g):	1.05	1.18
Tare (g):	13.17	13.33
Dry Soil (g):	5.21	5.64
Moisture Content, w (%):	20.15	20.92

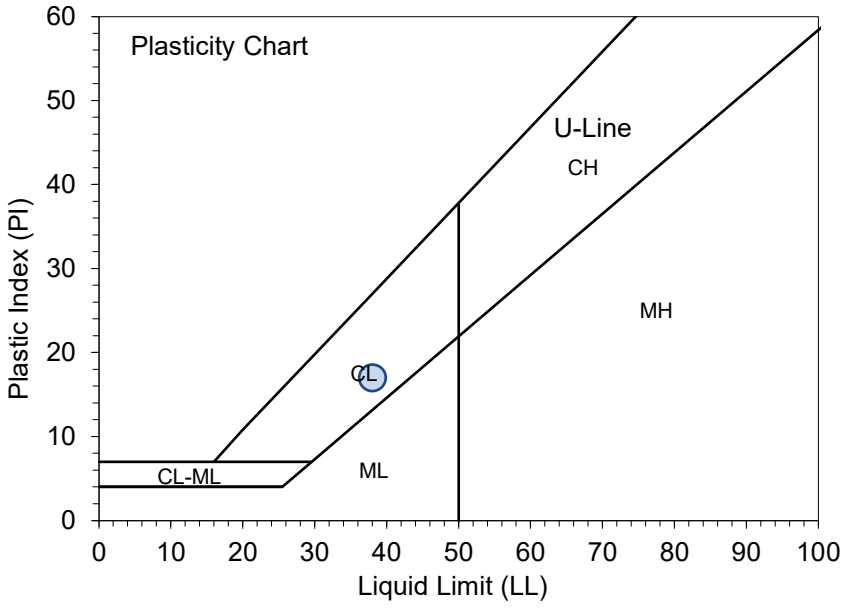
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	24	15
Wet Soil + Tare (g):	24.39	24.09	24.32
Dry Soil + Tare (g):	21.38	21.20	21.28
Moisture Loss (g):	3.01	2.89	3.04
Tare (g):	13.22	13.59	13.52
Dry Soil (g):	8.16	7.61	7.76
Moisture Content, w (%):	36.89	37.98	39.18
One-Point LL:		38	

Results

Liquid Limit, LL:	38
Plastic Limit, PL:	21
Plasticity Index, PI:	17





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 17.5-19 ft

Tested by: AT Date: 14-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - lt bn clay
As-received water content(%):	13.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

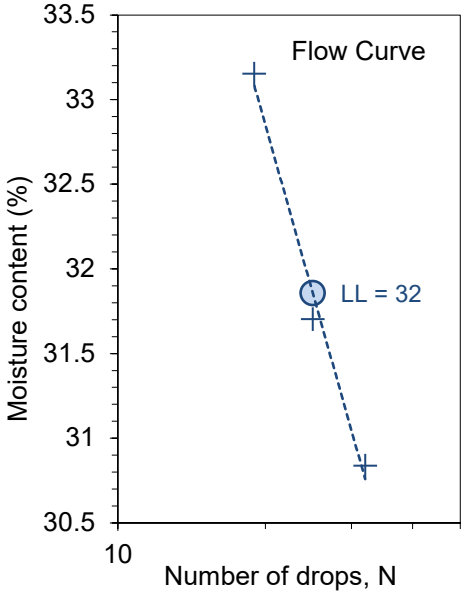
Determination No:	1	2
Wet Soil + Tare (g):	19.95	20.16
Dry Soil + Tare (g):	19.14	19.35
Moisture Loss (g):	0.81	0.81
Tare (g):	13.37	13.72
Dry Soil (g):	5.77	5.63
Moisture Content, w (%):	14.04	14.39

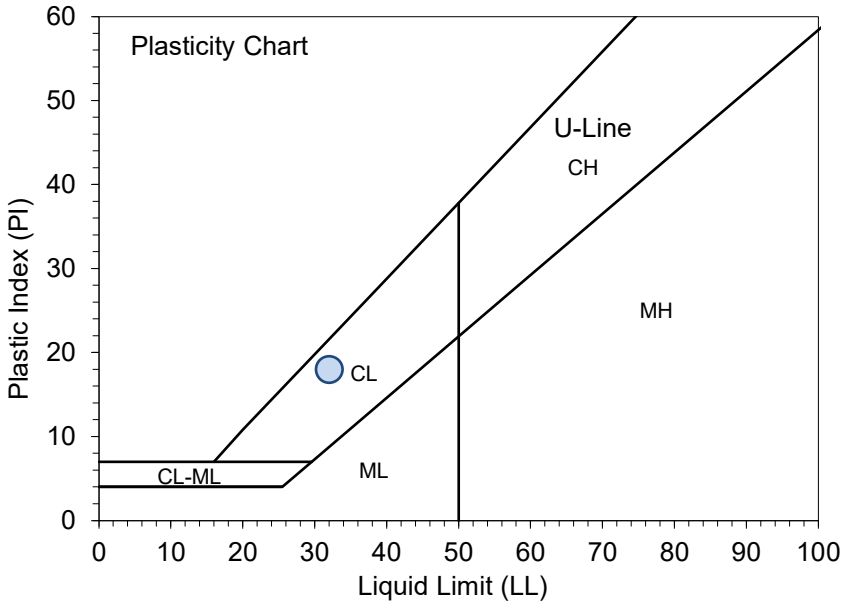
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	32	25	19
Wet Soil + Tare (g):	24.78	24.96	26.04
Dry Soil + Tare (g):	22.10	22.17	22.95
Moisture Loss (g):	2.68	2.79	3.09
Tare (g):	13.41	13.37	13.63
Dry Soil (g):	8.69	8.80	9.32
Moisture Content, w (%):	30.84	31.70	33.15
One-Point LL:		32	

Results

Liquid Limit, LL:	32
Plastic Limit, PL:	14
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-11

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Tested by: CML Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn clay
As-received water content(%):	7.1	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	30
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

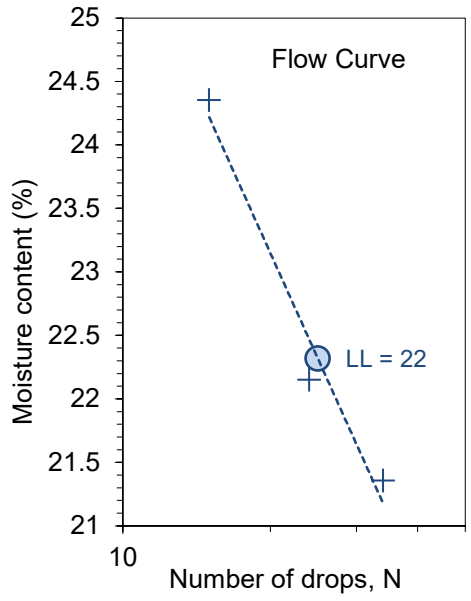
Determination No:	1	2
Wet Soil + Tare (g):	21.19	21.07
Dry Soil + Tare (g):	20.16	20.08
Moisture Loss (g):	1.03	0.99
Tare (g):	13.51	13.52
Dry Soil (g):	6.65	6.56
Moisture Content, w (%):	15.49	15.09

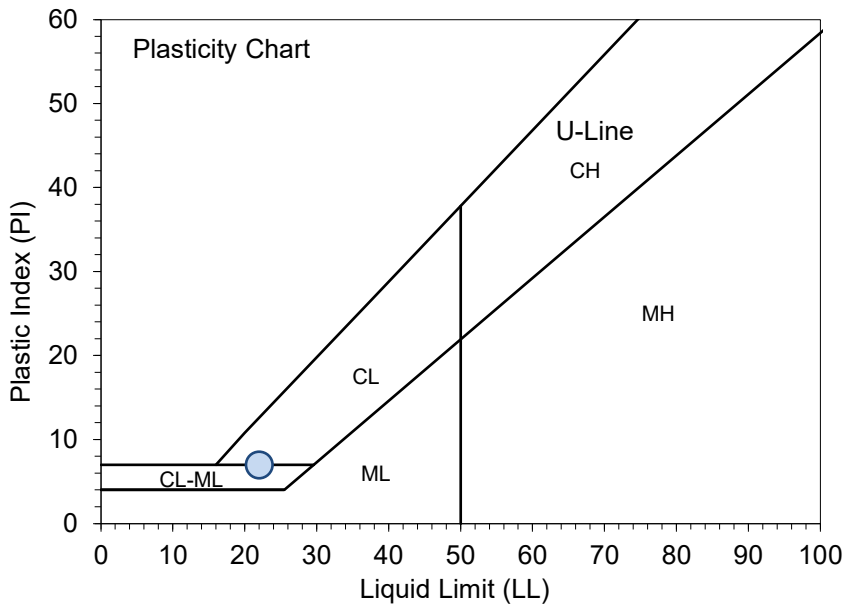
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	34	24	15
Wet Soil + Tare (g):	26.21	23.44	27.01
Dry Soil + Tare (g):	23.95	21.63	24.37
Moisture Loss (g):	2.26	1.81	2.64
Tare (g):	13.37	13.46	13.53
Dry Soil (g):	10.58	8.17	10.84
Moisture Content, w (%):	21.36	22.15	24.35
One-Point LL:		22	

Results

Liquid Limit, LL:	22
Plastic Limit, PL:	15
Plasticity Index, PI:	7





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 5-7 ft

Tested by: AT Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn clay
As-received water content(%):	10.2	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

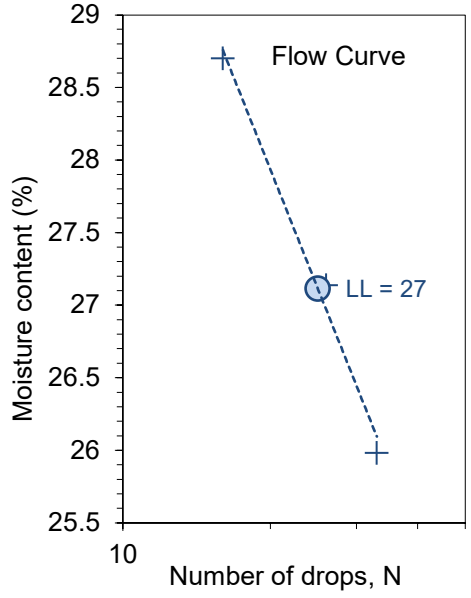
Determination No:	1	2
Wet Soil + Tare (g):	21.43	19.90
Dry Soil + Tare (g):	20.42	18.89
Moisture Loss (g):	1.01	1.01
Tare (g):	13.70	12.28
Dry Soil (g):	6.72	6.61
Moisture Content, w (%):	15.03	15.28

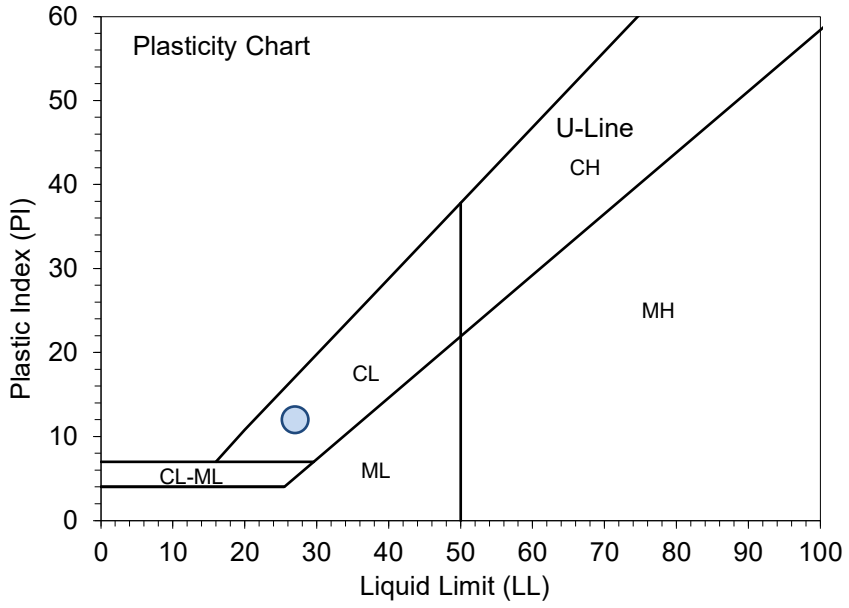
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	33	26	16
Wet Soil + Tare (g):	27.08	27.26	26.22
Dry Soil + Tare (g):	24.24	24.31	23.41
Moisture Loss (g):	2.84	2.95	2.81
Tare (g):	13.31	13.44	13.62
Dry Soil (g):	10.93	10.87	9.79
Moisture Content, w (%):	25.98	27.14	28.70
One-Point LL:		27	

Results

Liquid Limit, LL:	27
Plastic Limit, PL:	15
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 10-12 ft

Tested by: CML Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn silt
As-received water content(%):	12.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

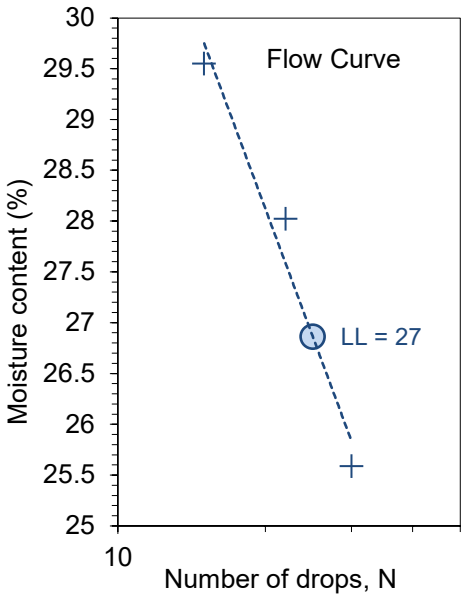
Determination No:	1	2
Wet Soil + Tare (g):	21.25	21.25
Dry Soil + Tare (g):	20.12	20.16
Moisture Loss (g):	1.13	1.09
Tare (g):	13.48	13.69
Dry Soil (g):	6.64	6.47
Moisture Content, w (%):	17.02	16.85

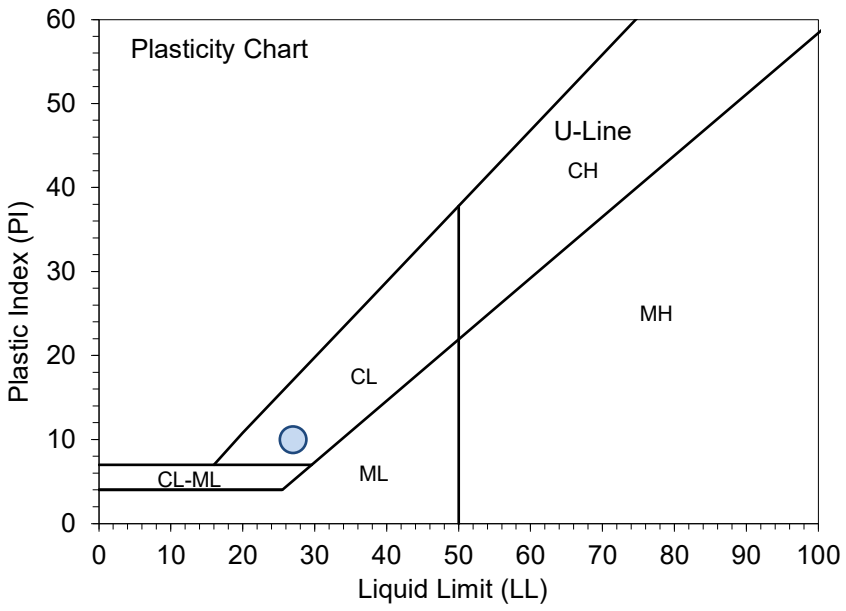
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	22	15
Wet Soil + Tare (g):	26.06	25.37	26.24
Dry Soil + Tare (g):	23.47	22.80	23.27
Moisture Loss (g):	2.59	2.57	2.97
Tare (g):	13.35	13.63	13.22
Dry Soil (g):	10.12	9.17	10.05
Moisture Content, w (%):	25.59	28.03	29.55
One-Point LL:	26	28	

Results

Liquid Limit, LL:	27
Plastic Limit, PL:	17
Plasticity Index, PI:	10





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 20-21 ft

Tested by: PJF Date: 14-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn clay
As-received water content(%):	10.6	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

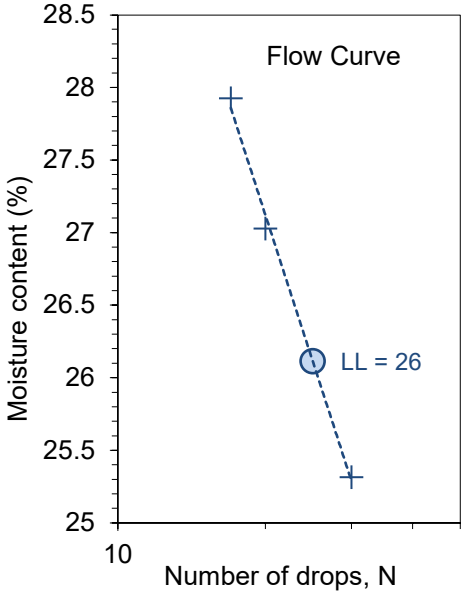
Determination No:	1	2
Wet Soil + Tare (g):	20.36	20.51
Dry Soil + Tare (g):	19.50	19.65
Moisture Loss (g):	0.86	0.86
Tare (g):	13.51	13.56
Dry Soil (g):	5.99	6.09
Moisture Content, w (%):	14.36	14.12

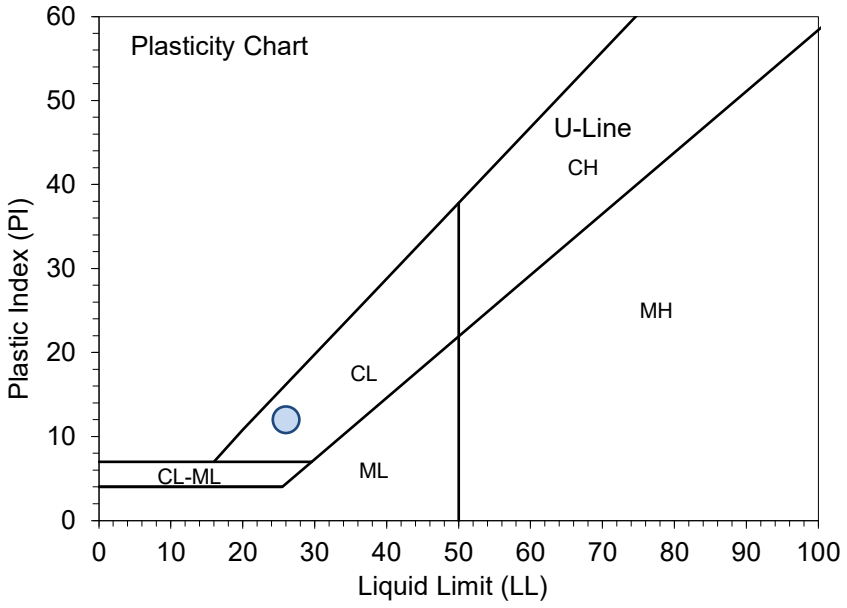
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	20	17
Wet Soil + Tare (g):	27.36	25.95	26.13
Dry Soil + Tare (g):	24.56	23.02	23.34
Moisture Loss (g):	2.80	2.93	2.79
Tare (g):	13.50	12.18	13.35
Dry Soil (g):	11.06	10.84	9.99
Moisture Content, w (%):	25.32	27.03	27.93
One-Point LL:	26	26	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	14
Plasticity Index, PI:	12





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Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 18-19 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: gy - bn clay

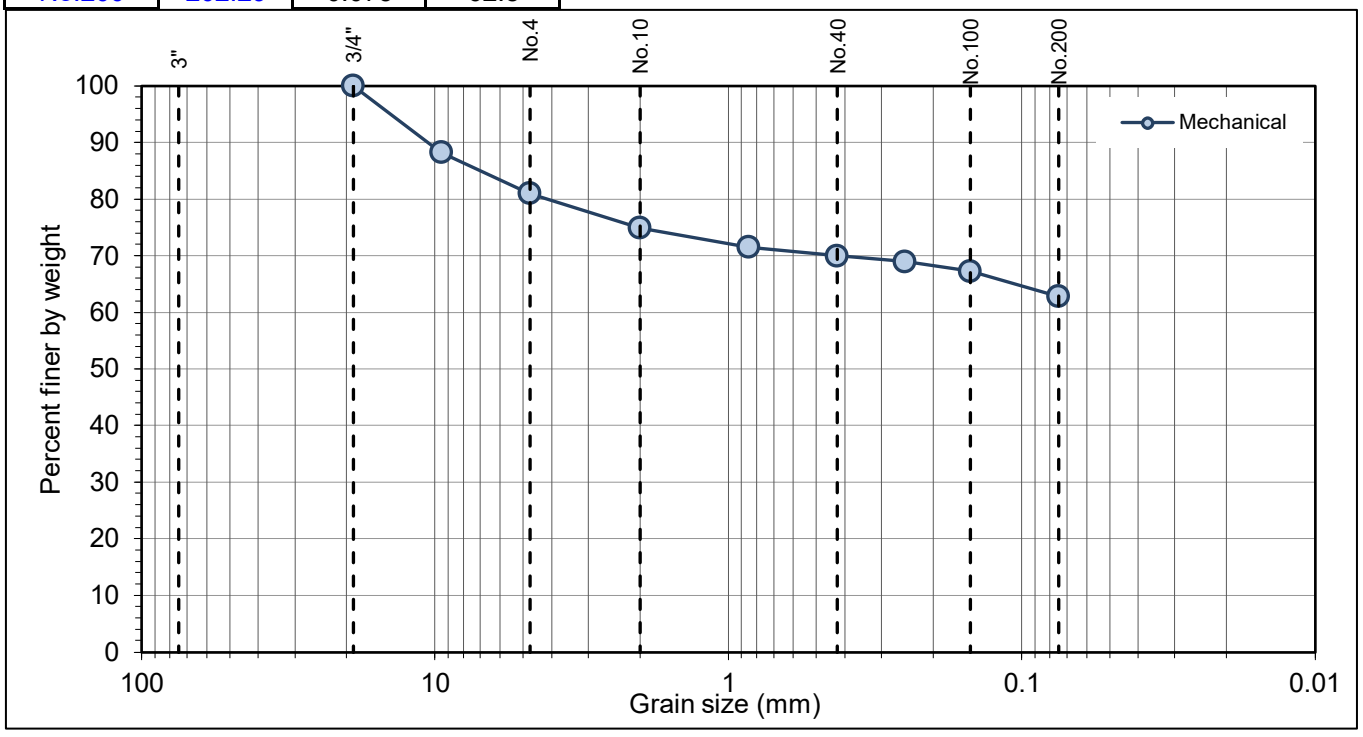
Reduced by: AT Comments: 1.5" rock not included in curve (274.56 g).

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	611.04	543.90
	-	
	611.04	543.90
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	806.82
Dry soil + tare (g):	-	739.68
Tare (g):	-	195.78
Moisture content (%):	0.0	12.3

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	63.83	9.5	88.3
No.4	103.44	4.75	81.0
No.10	136.66	2	74.9
No.20	154.83	0.85	71.5
No.40	163.20	0.425	70.0
No.60	168.87	0.25	69.0
No.100	177.88	0.15	67.3
No.200	202.29	0.075	62.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 27-29 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: bn - gy clay

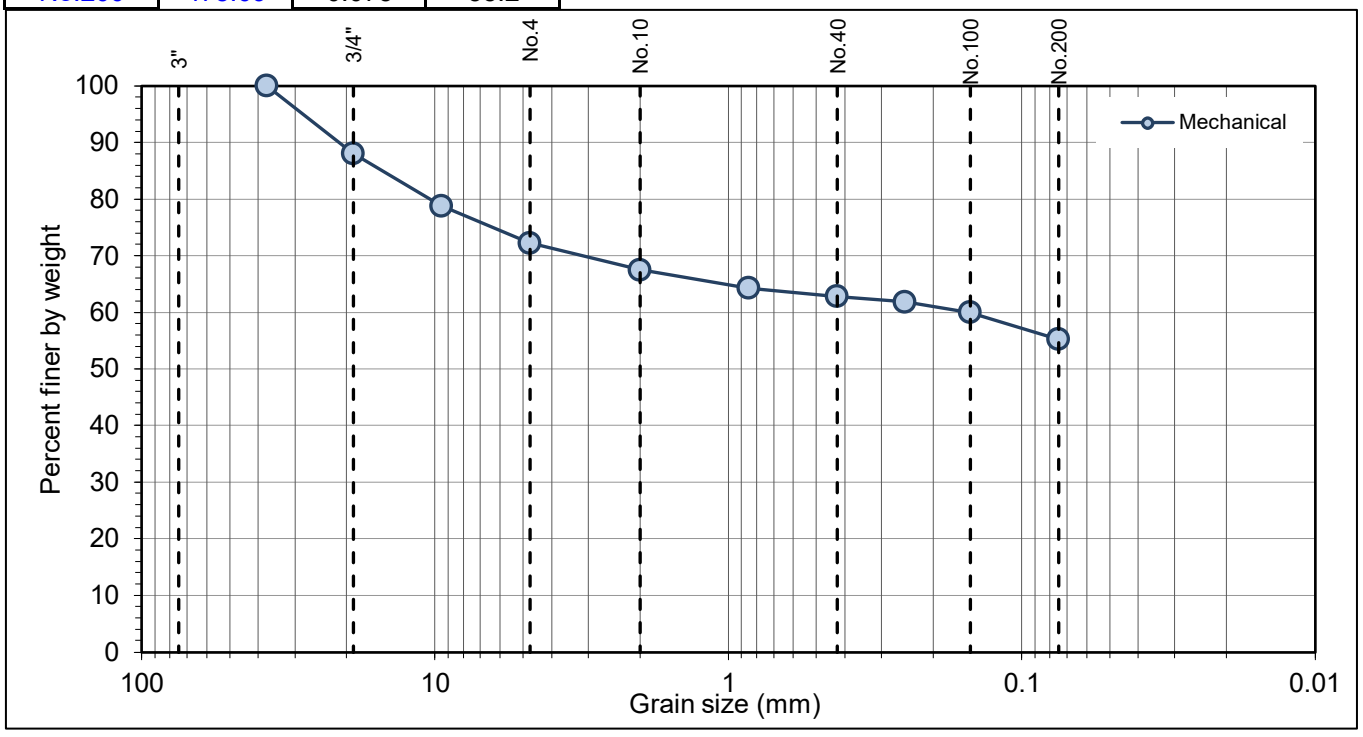
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1176.70	1060.40
	-	
	1176.70	1060.40
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1190.54
Dry soil + tare (g):	-	1074.24
Tare (g):	-	13.84
Moisture content (%):	0.0	11.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	126.52	19	88.1
3/8"	224.74	9.5	78.8
No.4	294.18	4.75	72.3
No.10	344.98	2	67.5
No.20	378.88	0.85	64.3
No.40	394.65	0.425	62.8
No.60	404.46	0.25	61.9
No.100	424.49	0.15	60.0
No.200	475.09	0.075	55.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 54.5-57 ft

Date: 16-Nov-23 Location: -

Tested by: DBW Lab soil description: gy - dk gy clay

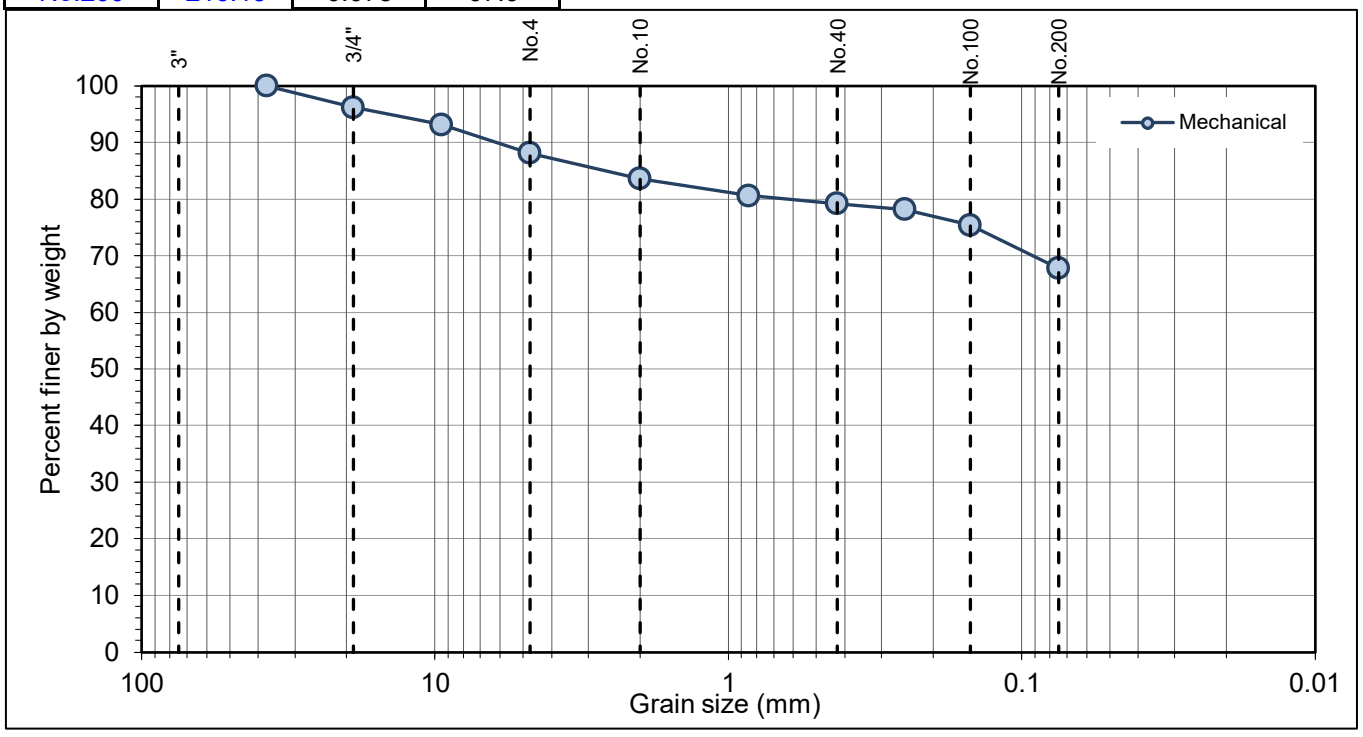
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	756.76	672.36
	-	
	756.76	672.36
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	953.45
Dry soil + tare (g):	-	869.05
Tare (g):	-	196.69
Moisture content (%):	0.0	12.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	25.43	19	96.2
3/8"	45.79	9.5	93.2
No.4	79.85	4.75	88.1
No.10	110.12	2	83.6
No.20	130.27	0.85	80.6
No.40	139.92	0.425	79.2
No.60	146.52	0.25	78.2
No.100	165.51	0.15	75.4
No.200	216.13	0.075	67.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 67-69 ft

Date: 16-Nov-23 Location: -

Tested by: DBW Lab soil description: dk gy - lt bn clay

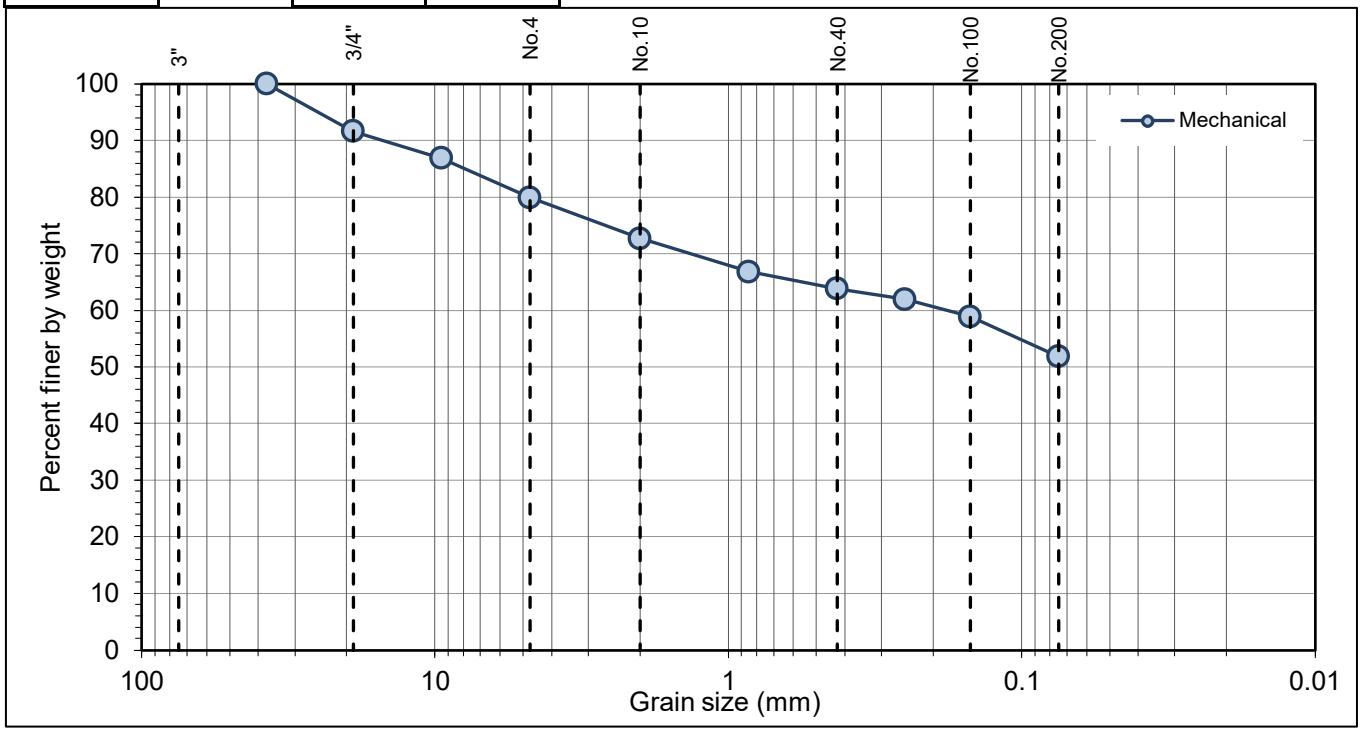
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	651.92	592.70
	-	
	651.92	592.70
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	847.34
Dry soil + tare (g):	-	788.12
Tare (g):	-	195.42
Moisture content (%):	0.0	10.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	49.64	19	91.6
3/8"	77.83	9.5	86.9
No.4	119.04	4.75	79.9
No.10	161.80	2	72.7
No.20	196.75	0.85	66.8
No.40	214.54	0.425	63.8
No.60	225.55	0.25	61.9
No.100	243.72	0.15	58.9
No.200	285.30	0.075	51.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 72.5-75 ft

Date: 16-Nov-23 Location: -

Tested by: DBW Lab soil description: gy - dk gy clay

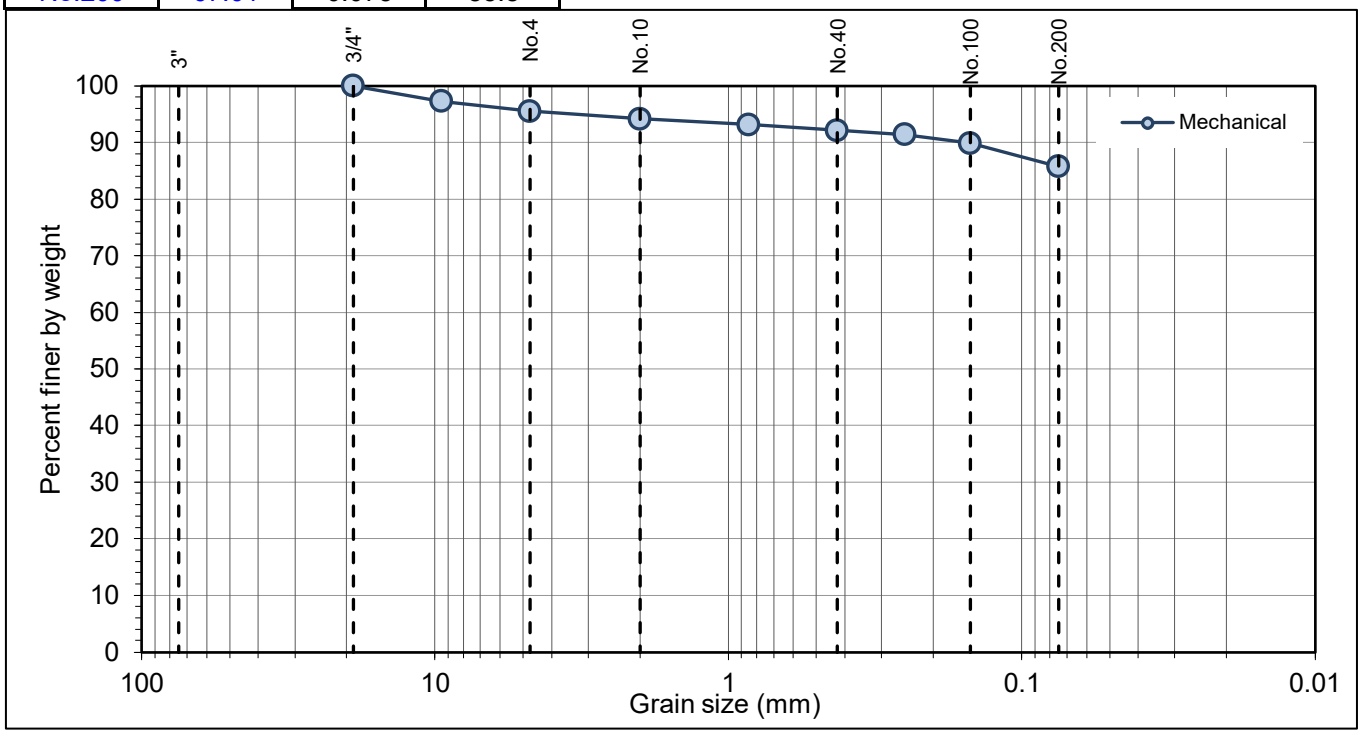
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	570.23	472.61
	-	
	570.23	472.61
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	688.39
Dry soil + tare (g):	-	590.77
Tare (g):	-	118.16
Moisture content (%):	0.0	20.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	12.74	9.5	97.3
No.4	21.18	4.75	95.5
No.10	27.46	2	94.2
No.20	32.38	0.85	93.1
No.40	36.99	0.425	92.2
No.60	40.67	0.25	91.4
No.100	47.81	0.15	89.9
No.200	67.01	0.075	85.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 14.5-16 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: bn - ol bn clay

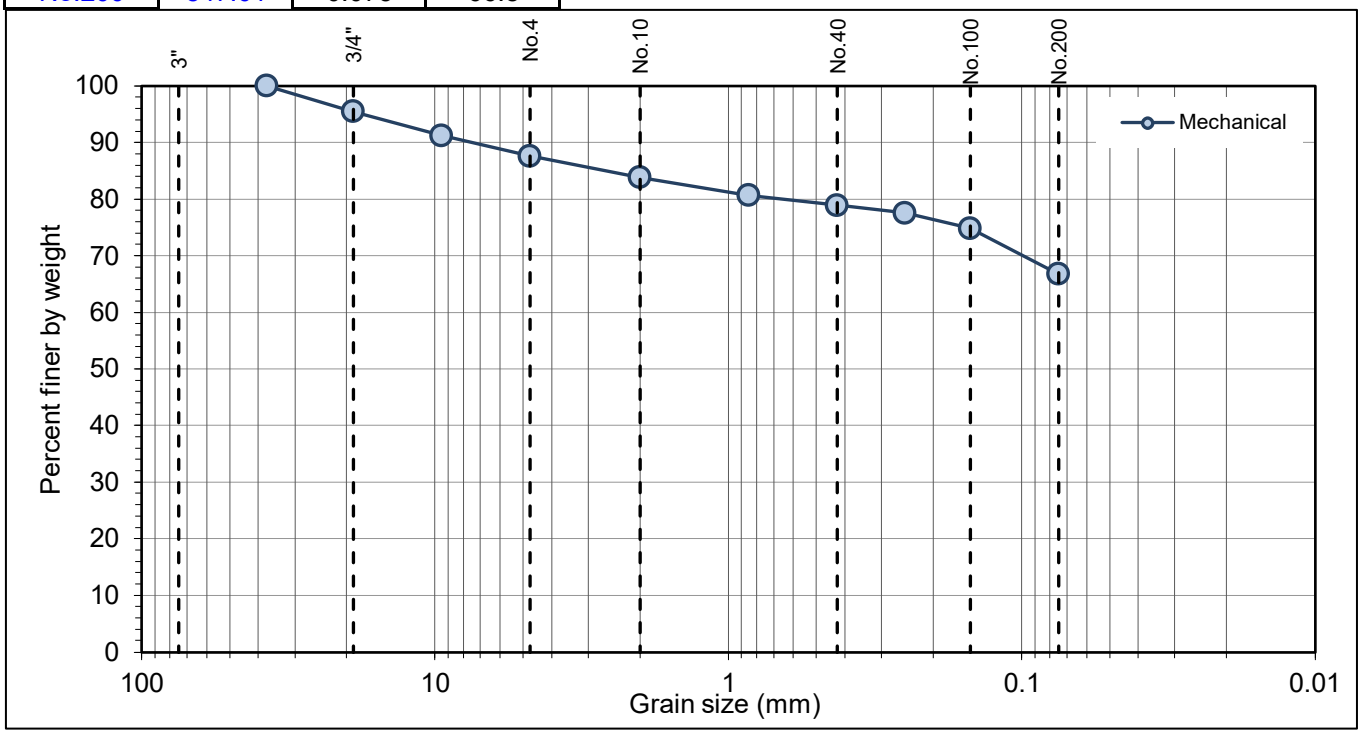
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1841.90	1646.32
	-	
	1841.90	1646.32
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	2264.09
Dry soil + tare (g):	-	2068.51
Tare (g):	-	422.19
Moisture content (%):	0.0	11.9

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	74.19	19	95.5
3/8"	144.60	9.5	91.2
No.4	203.84	4.75	87.6
No.10	266.51	2	83.8
No.20	318.13	0.85	80.7
No.40	347.49	0.425	78.9
No.60	369.50	0.25	77.6
No.100	413.96	0.15	74.9
No.200	547.01	0.075	66.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: bn - ol bn clay

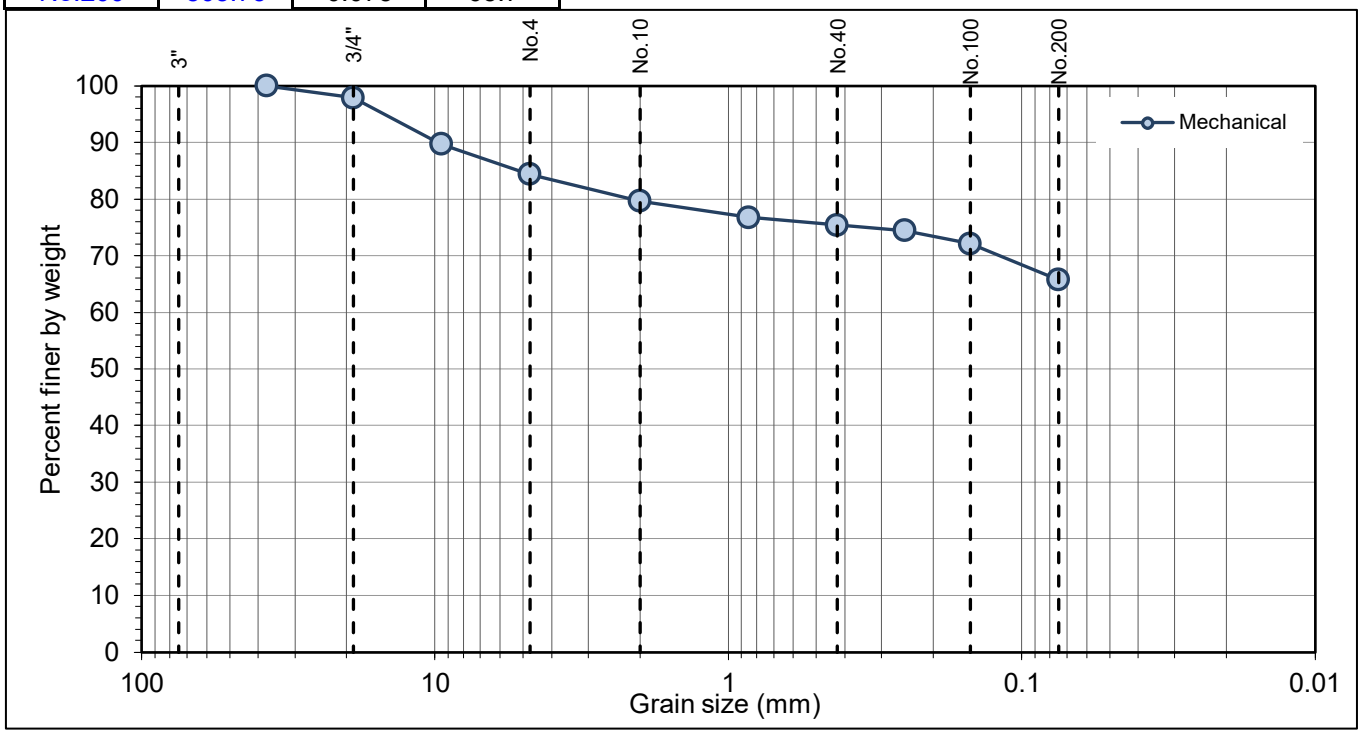
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1666.16	1470.26
	-	
	1666.16	1470.26
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	2104.69
Dry soil + tare (g):	-	1908.79
Tare (g):	-	438.53
Moisture content (%):	0.0	13.3

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	30.28	19	97.9
3/8"	150.96	9.5	89.7
No.4	229.44	4.75	84.4
No.10	298.96	2	79.7
No.20	341.90	0.85	76.7
No.40	361.85	0.425	75.4
No.60	375.86	0.25	74.4
No.100	409.90	0.15	72.1
No.200	503.73	0.075	65.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 32-35 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: bn - dk yl bn clay

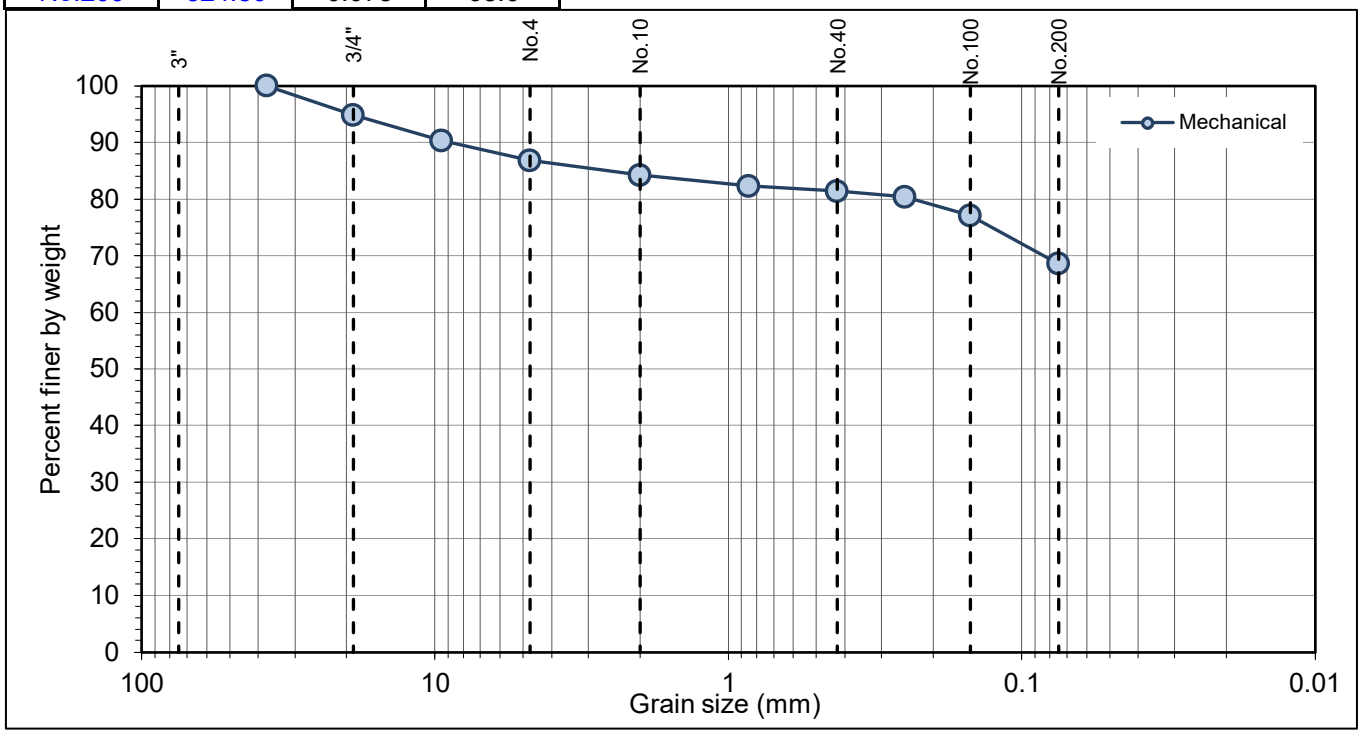
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1913.95	1670.91
	-	
	1913.95	1670.91
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	2453.36
Dry soil + tare (g):	-	2210.32
Tare (g):	-	539.41
Moisture content (%):	0.0	14.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	85.48	19	94.9
3/8"	161.21	9.5	90.4
No.4	219.81	4.75	86.8
No.10	263.64	2	84.2
No.20	295.15	0.85	82.3
No.40	311.17	0.425	81.4
No.60	327.50	0.25	80.4
No.100	382.33	0.15	77.1
No.200	524.86	0.075	68.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 38.5-40 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: lt ol bn - ol bn clay

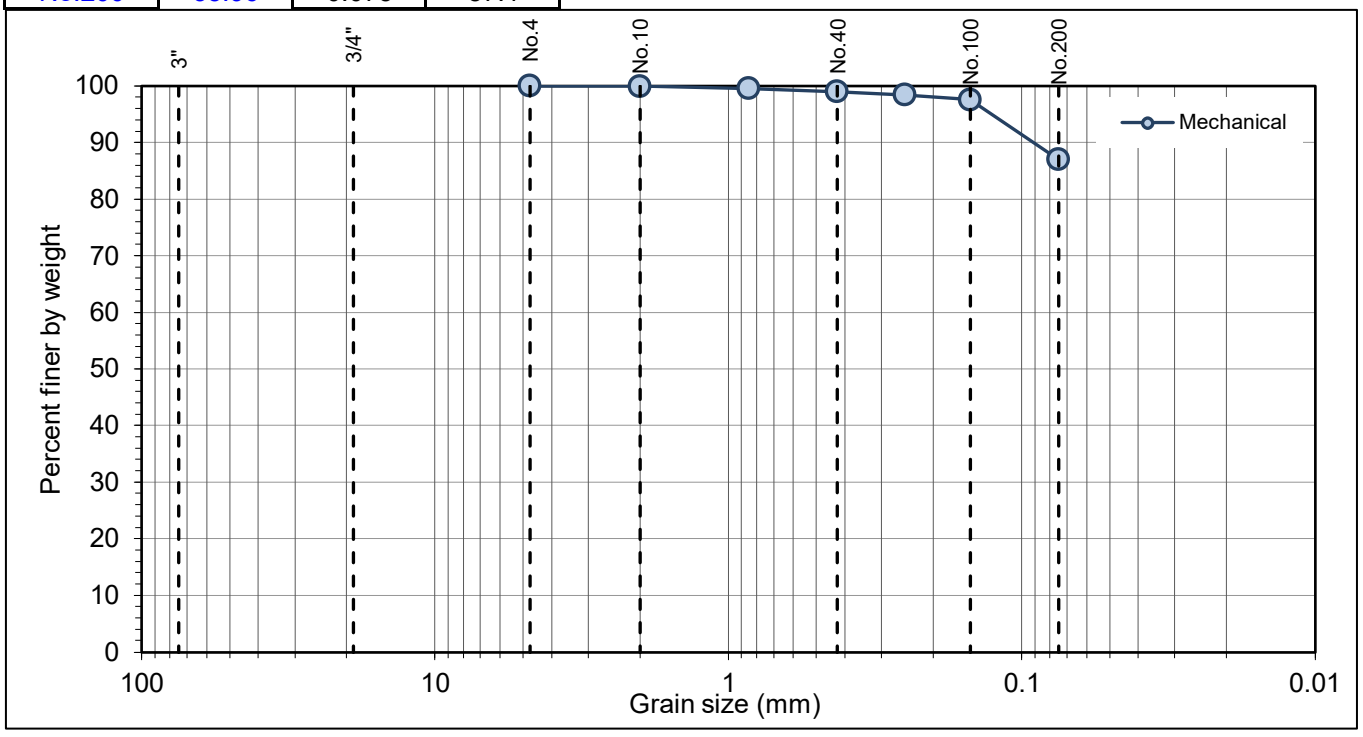
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	321.05	278.08
	-	
	321.05	278.08
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	448.30
Dry soil + tare (g):	-	405.33
Tare (g):	-	127.25
Moisture content (%):	0.0	15.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	-
No.4	-	4.75	100.0
No.10	0.15	2	99.9
No.20	1.17	0.85	99.6
No.40	2.85	0.425	99.0
No.60	4.46	0.25	98.4
No.100	6.75	0.15	97.6
No.200	35.96	0.075	87.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 52-55 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: gy - ol bn clay

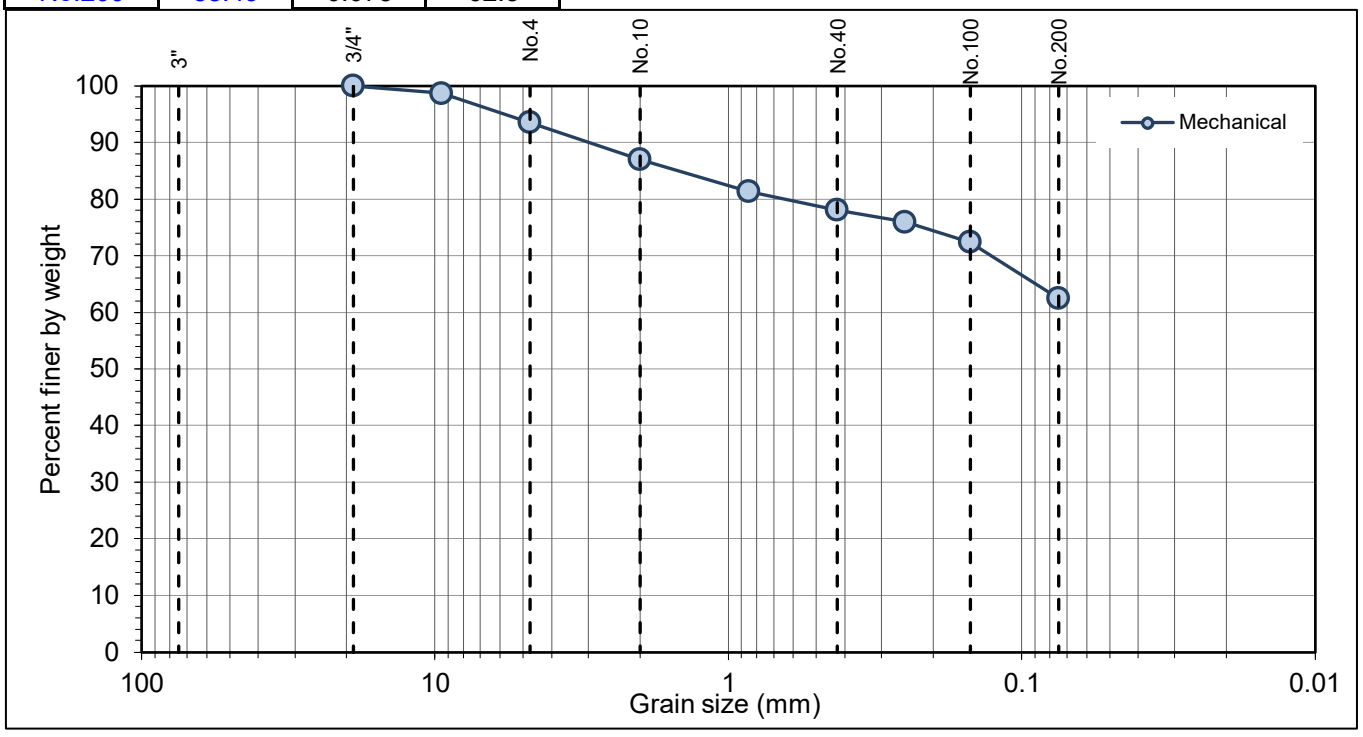
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	262.98	235.69
	-	
	262.98	235.69
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	460.49
Dry soil + tare (g):	-	433.20
Tare (g):	-	197.51
Moisture content (%):	0.0	11.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	3.09	9.5	98.7
No.4	15.18	4.75	93.6
No.10	30.60	2	87.0
No.20	44.01	0.85	81.3
No.40	51.69	0.425	78.1
No.60	56.57	0.25	76.0
No.100	65.04	0.15	72.4
No.200	88.49	0.075	62.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 60-62 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: lt bn - bn clay

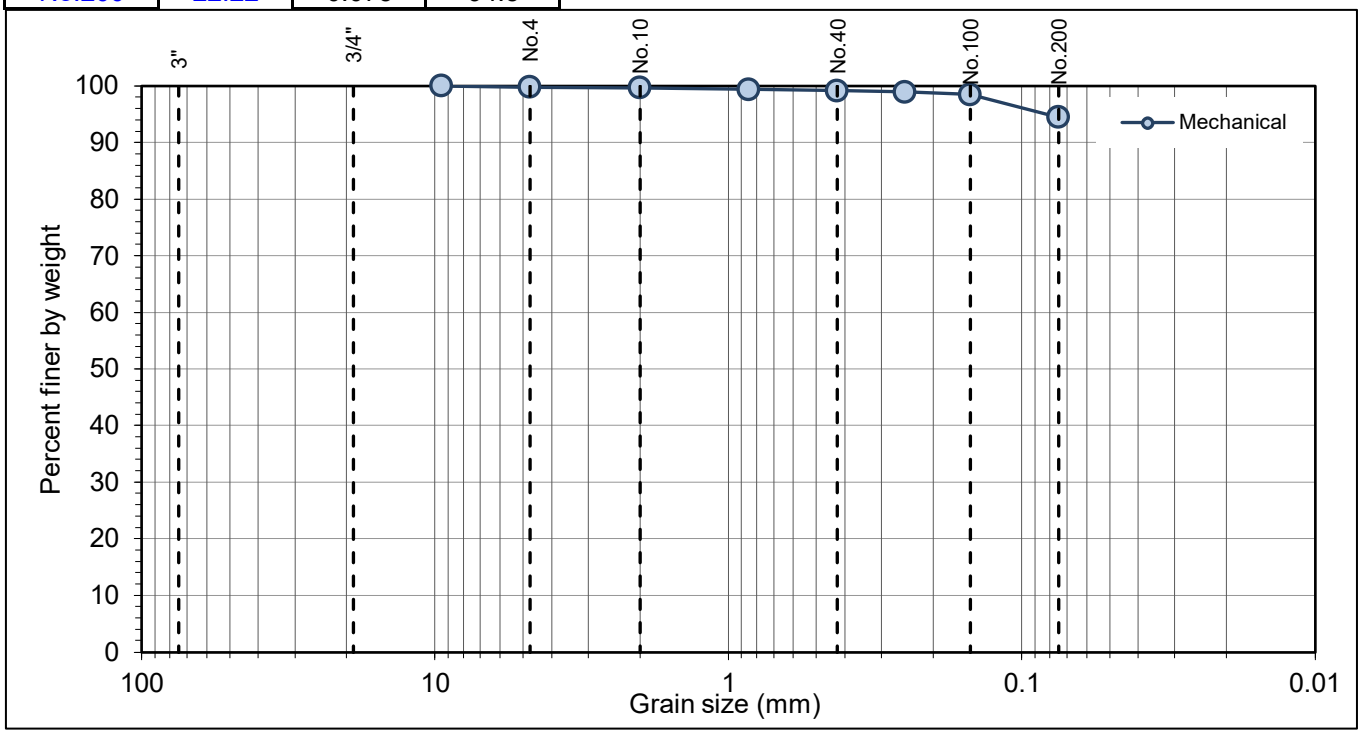
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	460.33	404.88
	-	
	460.33	404.88
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	656.13
Dry soil + tare (g):	-	600.68
Tare (g):	-	195.80
Moisture content (%):	0.0	13.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	100.0
No.4	0.93	4.75	99.8
No.10	1.29	2	99.7
No.20	2.54	0.85	99.4
No.40	3.42	0.425	99.2
No.60	4.29	0.25	98.9
No.100	6.05	0.15	98.5
No.200	22.22	0.075	94.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 64.5-67 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: lt ol bn - ol bn clay

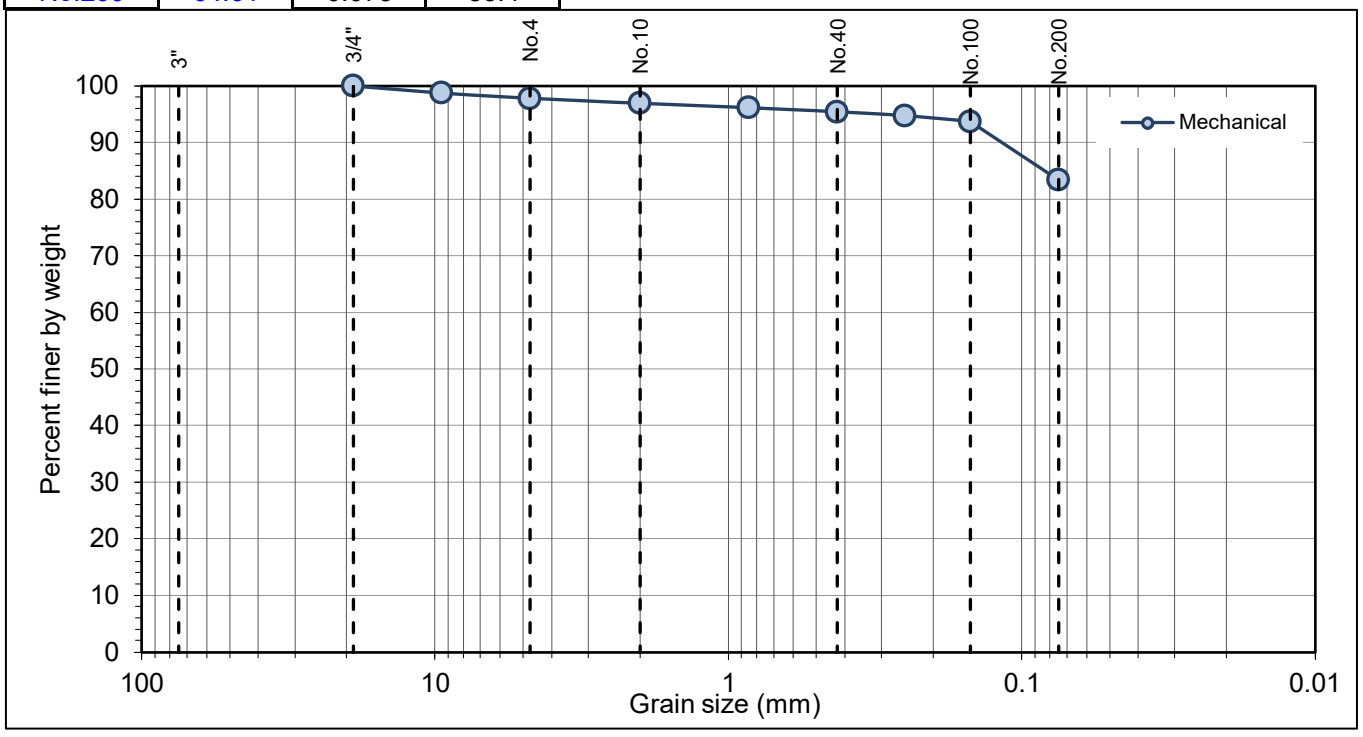
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	439.79	389.75
	-	
	439.79	389.75
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	566.47
Dry soil + tare (g):	-	516.43
Tare (g):	-	126.68
Moisture content (%):	0.0	12.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	4.88	9.5	98.7
No.4	8.54	4.75	97.8
No.10	11.97	2	96.9
No.20	14.92	0.85	96.2
No.40	17.72	0.425	95.5
No.60	20.42	0.25	94.8
No.100	24.38	0.15	93.7
No.200	64.61	0.075	83.4



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 4.5-7 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: lt bn - bn clay

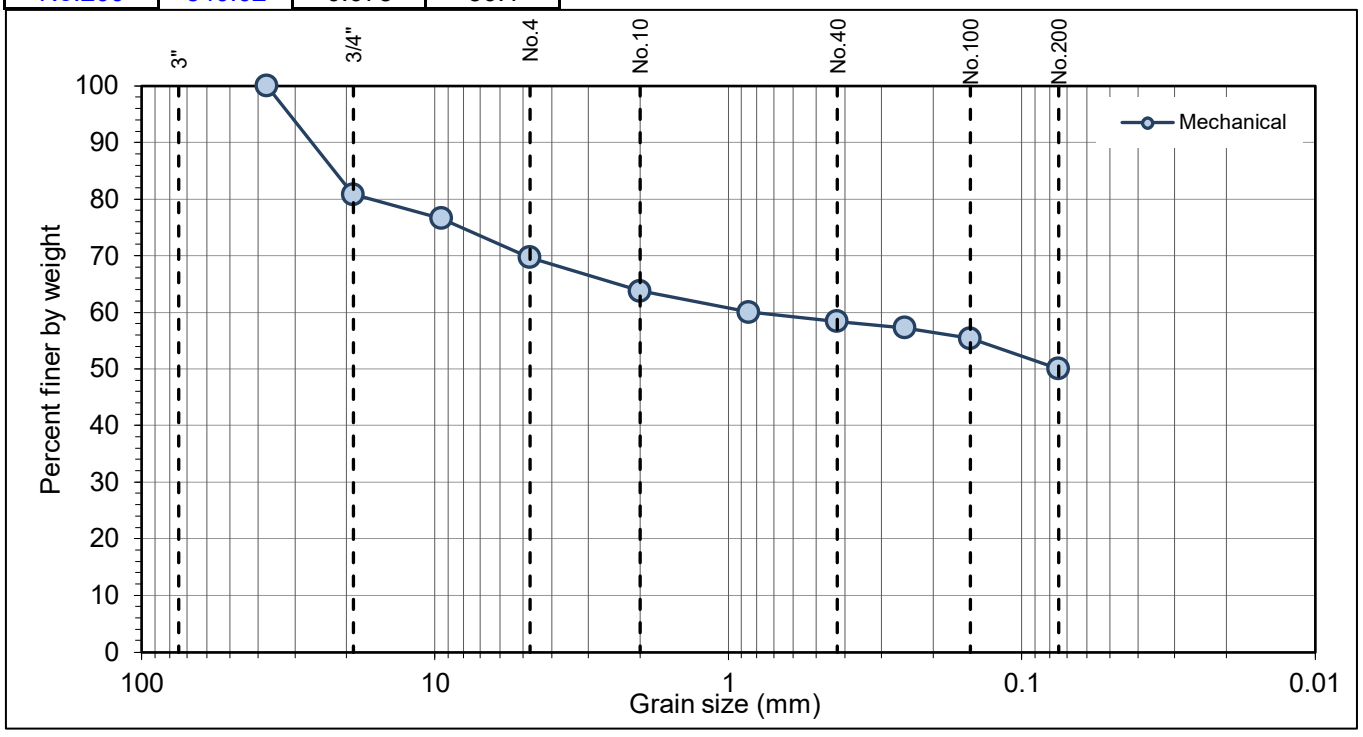
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1190.05	1081.24
	-	
	1190.05	1081.24
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1630.20
Dry soil + tare (g):	-	1521.39
Tare (g):	-	440.15
Moisture content (%):	0.0	10.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	207.44	19	80.8
3/8"	253.12	9.5	76.6
No.4	327.87	4.75	69.7
No.10	391.94	2	63.8
No.20	432.35	0.85	60.0
No.40	450.20	0.425	58.4
No.60	461.91	0.25	57.3
No.100	482.07	0.15	55.4
No.200	540.02	0.075	50.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: pl ol bn - bn clay

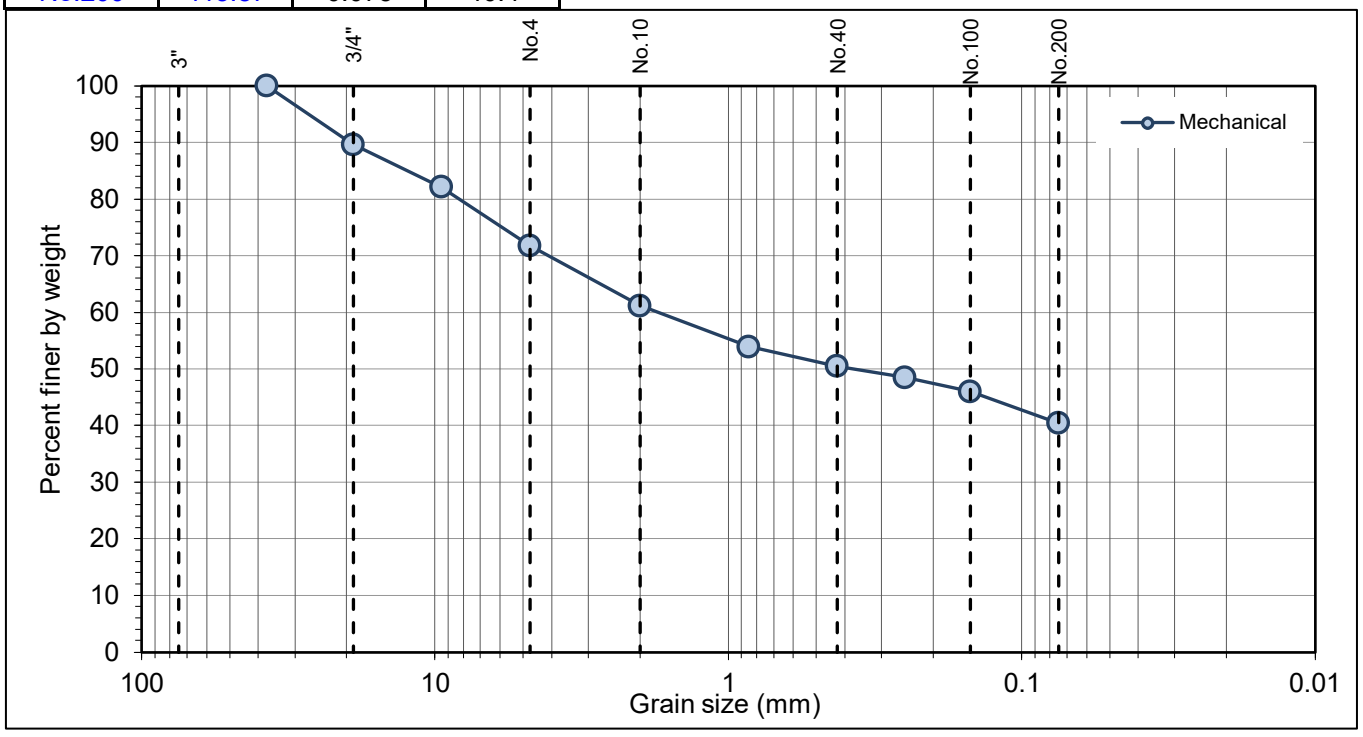
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	753.04	694.60
	-	
	753.04	694.60
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	872.07
Dry soil + tare (g):	-	813.63
Tare (g):	-	119.03
Moisture content (%):	0.0	8.4

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	71.73	19	89.7
3/8"	124.07	9.5	82.1
No.4	195.76	4.75	71.8
No.10	269.78	2	61.2
No.20	320.16	0.85	53.9
No.40	343.81	0.425	50.5
No.60	357.58	0.25	48.5
No.100	374.88	0.15	46.0
No.200	413.87	0.075	40.4



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - bn clay

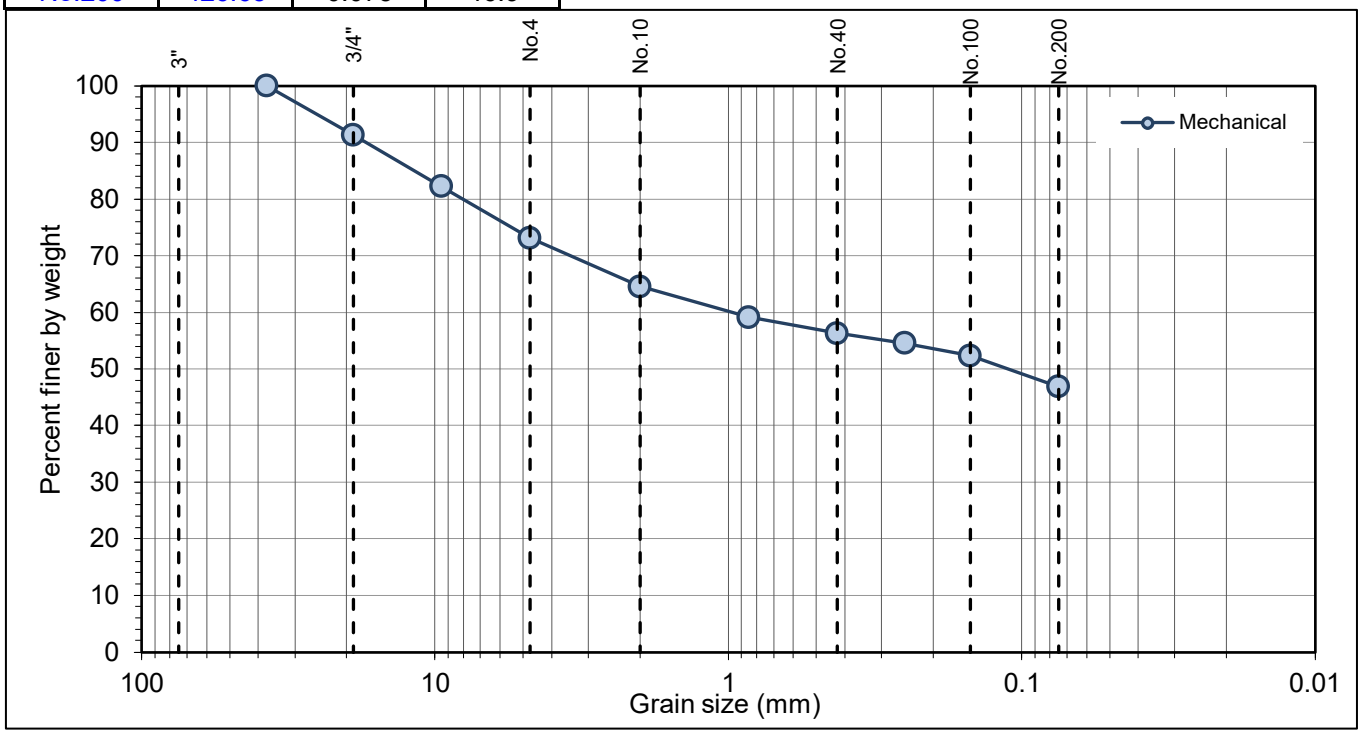
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	902.23	802.85
	-	
	902.23	802.85
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1046.88
Dry soil + tare (g):	-	947.50
Tare (g):	-	144.65
Moisture content (%):	0.0	12.4

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	69.23	19	91.4
3/8"	142.35	9.5	82.3
No.4	215.38	4.75	73.2
No.10	284.76	2	64.5
No.20	328.36	0.85	59.1
No.40	350.76	0.425	56.3
No.60	364.76	0.25	54.6
No.100	382.68	0.15	52.3
No.200	426.63	0.075	46.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 30-33 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: bn - dk bn clay

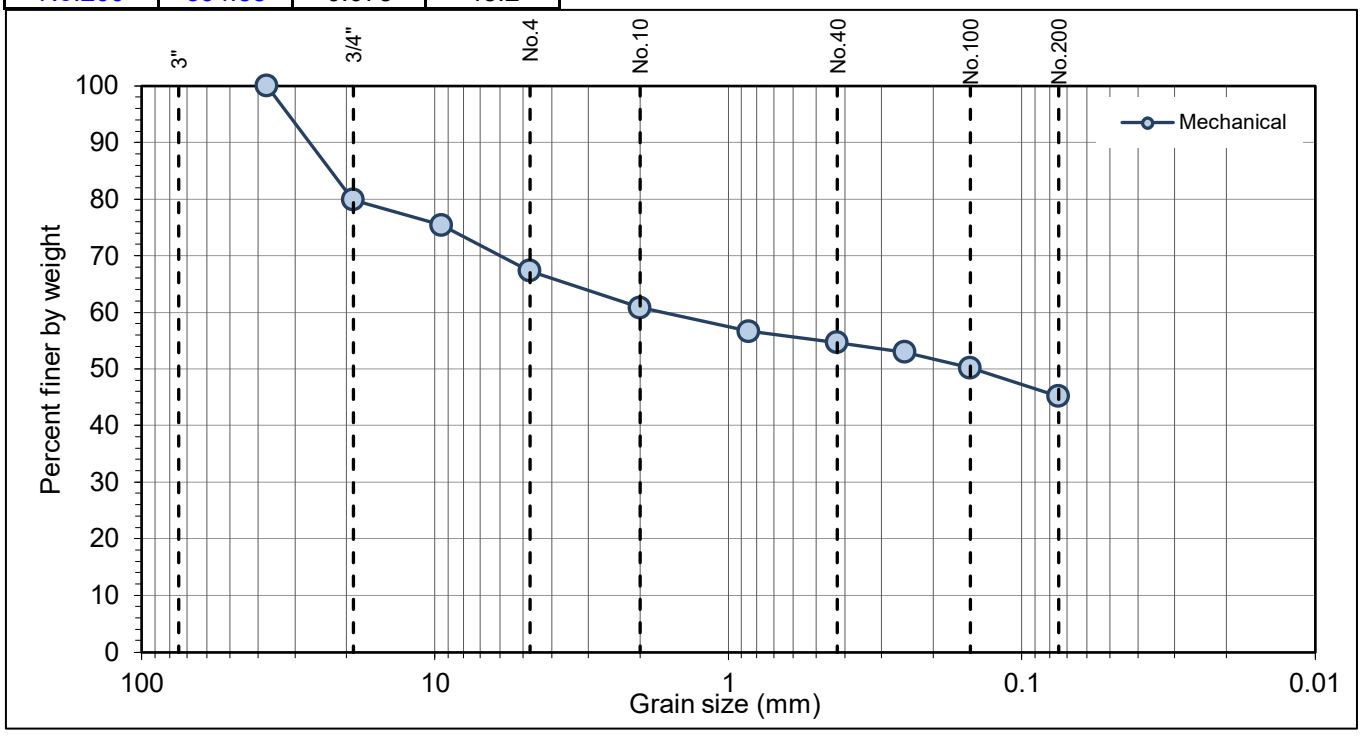
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	798.88	720.83
	-	-
	798.88	720.83
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	943.07
Dry soil + tare (g):	-	865.02
Tare (g):	-	144.19
Moisture content (%):	0.0	10.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	144.91	19	79.9
3/8"	177.22	9.5	75.4
No.4	235.48	4.75	67.3
No.10	282.48	2	60.8
No.20	312.47	0.85	56.7
No.40	326.73	0.425	54.7
No.60	339.06	0.25	53.0
No.100	359.09	0.15	50.2
No.200	394.88	0.075	45.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 7-10 ft

Date: 13-Nov-23 Location: -

Tested by: MGS Lab soil description: lt ol bn - bn clay

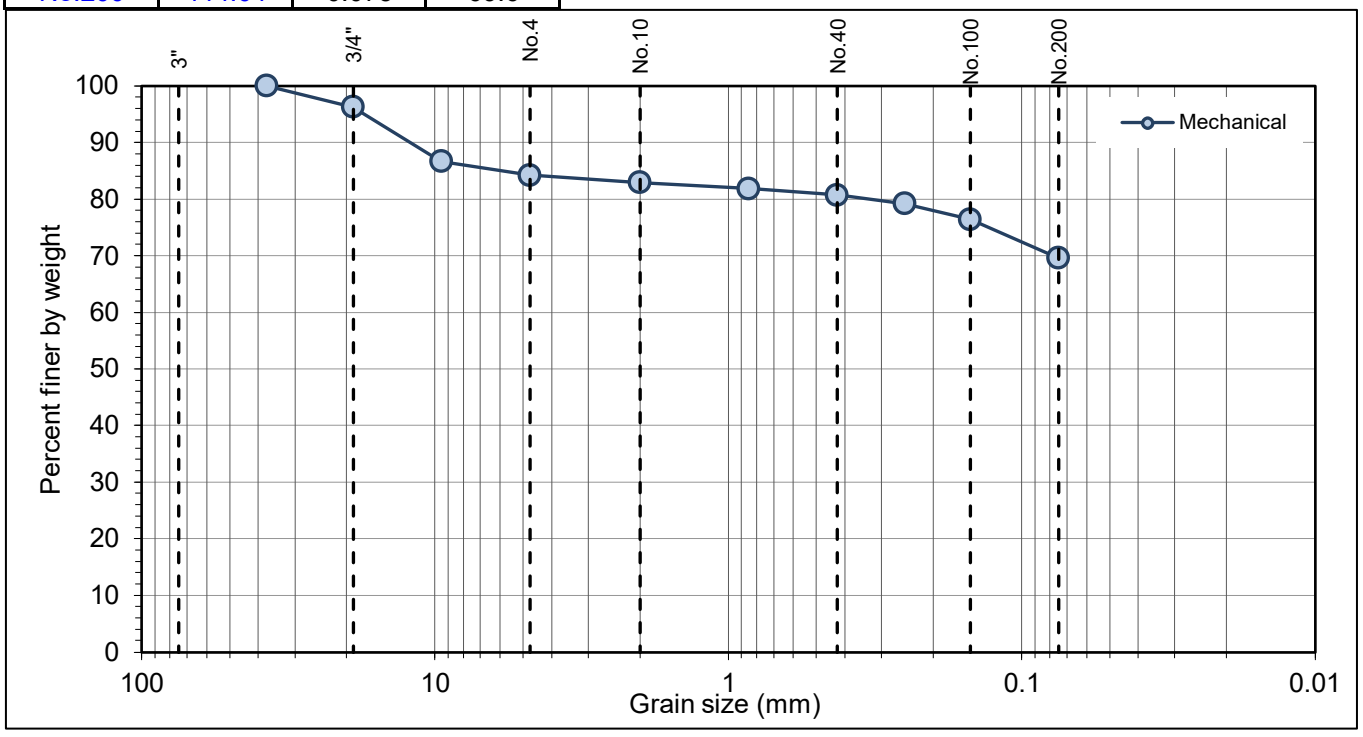
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	457.24	375.28
	-	
	457.24	375.28
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	653.16
Dry soil + tare (g):	-	571.20
Tare (g):	-	195.92
Moisture content (%):	0.0	21.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	13.96	19	96.3
3/8"	50.13	9.5	86.6
No.4	59.19	4.75	84.2
No.10	64.15	2	82.9
No.20	68.10	0.85	81.9
No.40	72.24	0.425	80.8
No.60	78.10	0.25	79.2
No.100	88.55	0.15	76.4
No.200	114.04	0.075	69.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: pl ol bn - lt bn silt

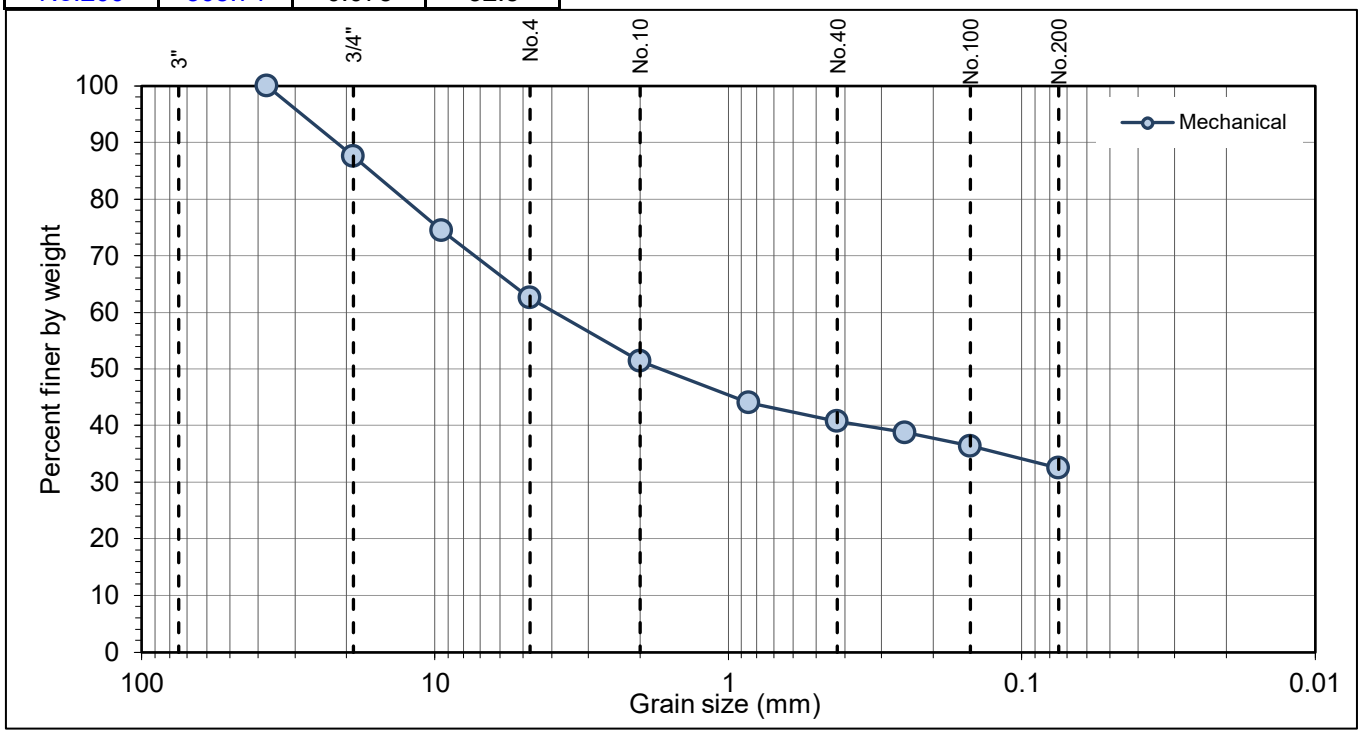
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	483.56	452.93
	-	
	483.56	452.93
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	601.88
Dry soil + tare (g):	-	571.25
Tare (g):	-	118.32
Moisture content (%):	0.0	6.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	56.10	19	87.6
3/8"	115.44	9.5	74.5
No.4	169.54	4.75	62.6
No.10	220.10	2	51.4
No.20	253.53	0.85	44.0
No.40	268.38	0.425	40.7
No.60	277.44	0.25	38.7
No.100	288.21	0.15	36.4
No.200	305.71	0.075	32.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: ol bn - bn silt

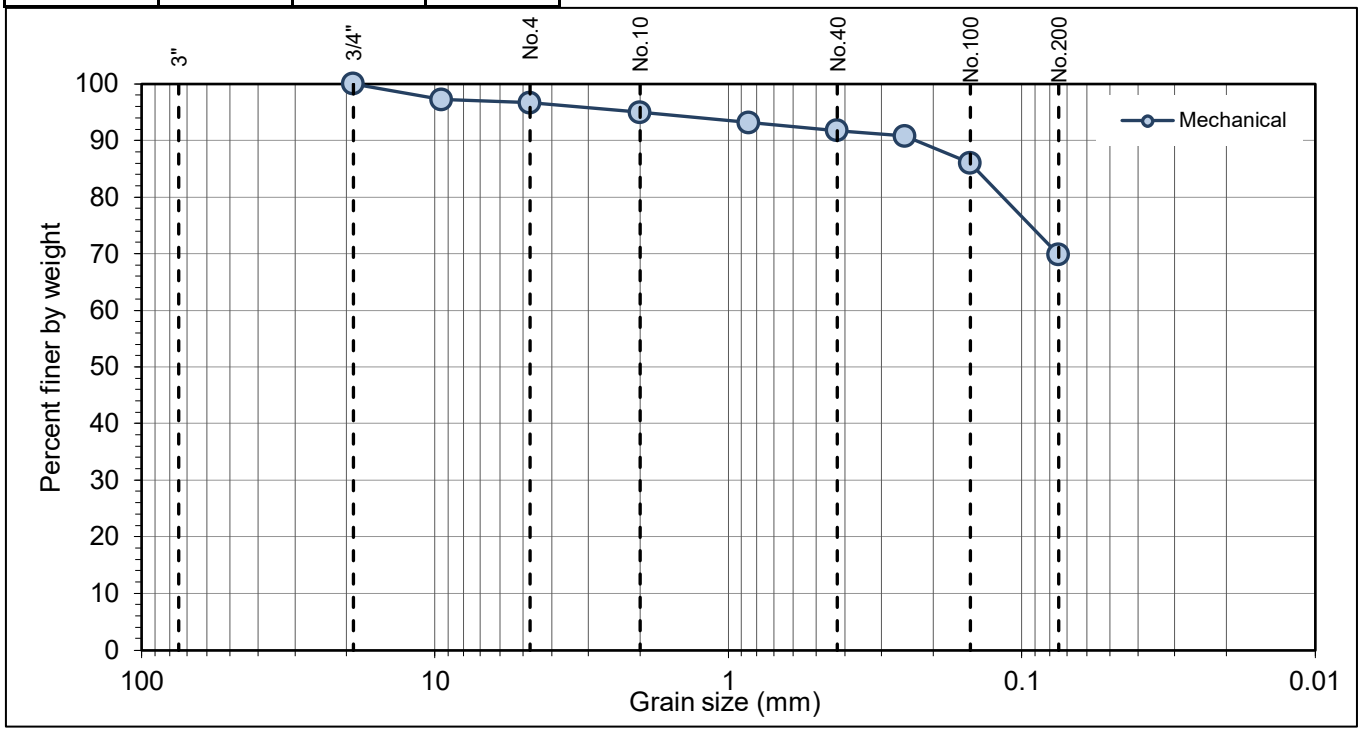
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	434.54	373.10
		-
	434.54	373.10
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	555.20
Dry soil + tare (g):	-	493.76
Tare (g):	-	120.66
Moisture content (%):	0.0	16.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	10.30	9.5	97.2
No.4	12.34	4.75	96.7
No.10	18.72	2	95.0
No.20	25.54	0.85	93.2
No.40	30.76	0.425	91.8
No.60	34.37	0.25	90.8
No.100	52.13	0.15	86.0
No.200	112.39	0.075	69.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 30-33 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: lt bn - bn clay

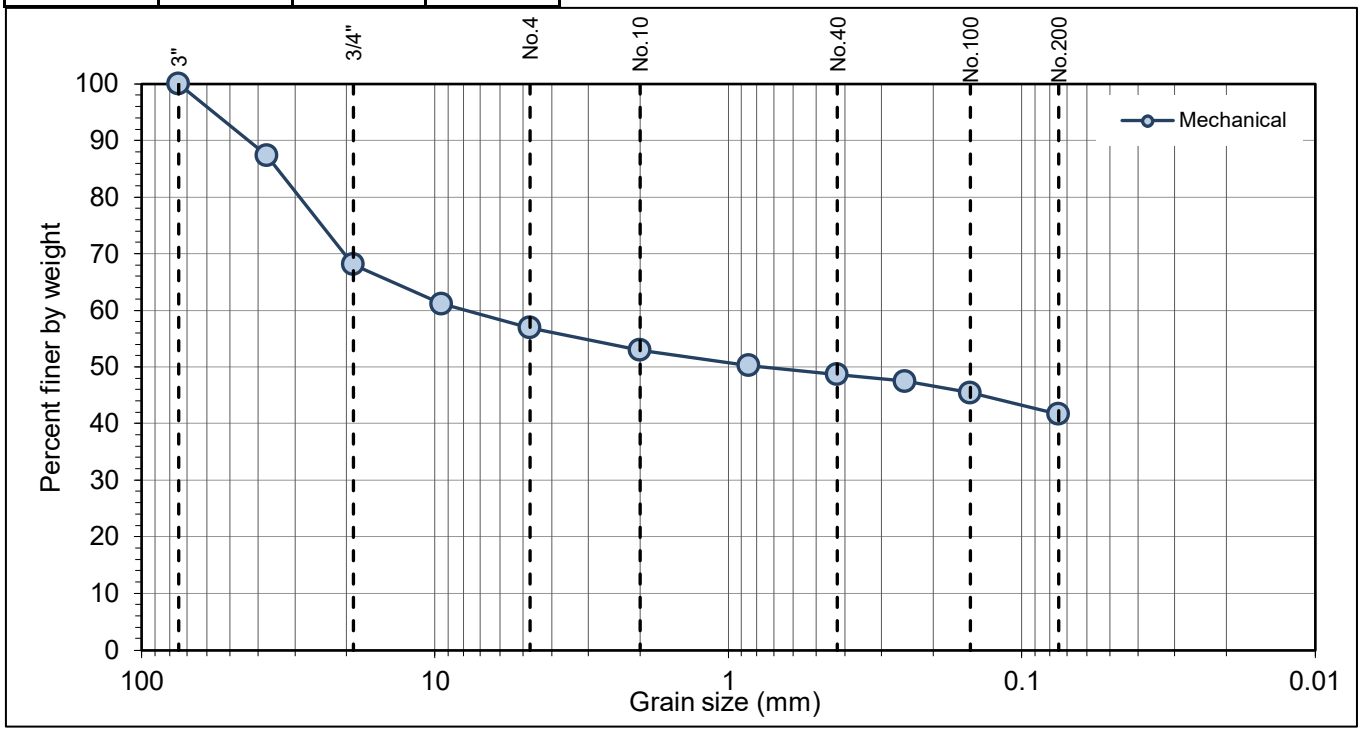
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1120.71	1018.98
	-	
	1120.71	1018.98
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1542.36
Dry soil + tare (g):	-	1440.63
Tare (g):	-	421.65
Moisture content (%):	0.0	10.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	100.0
1.5"	128.32	37.5	87.4
3/4"	325.14	19	68.1
3/8"	396.01	9.5	61.1
No.4	438.75	4.75	56.9
No.10	479.25	2	53.0
No.20	507.10	0.85	50.2
No.40	523.12	0.425	48.7
No.60	535.09	0.25	47.5
No.100	555.98	0.15	45.4
No.200	594.76	0.075	41.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Date: 14-Nov-23 Location: -

Tested by: MGS Lab soil description: ol bn - lt bn clay

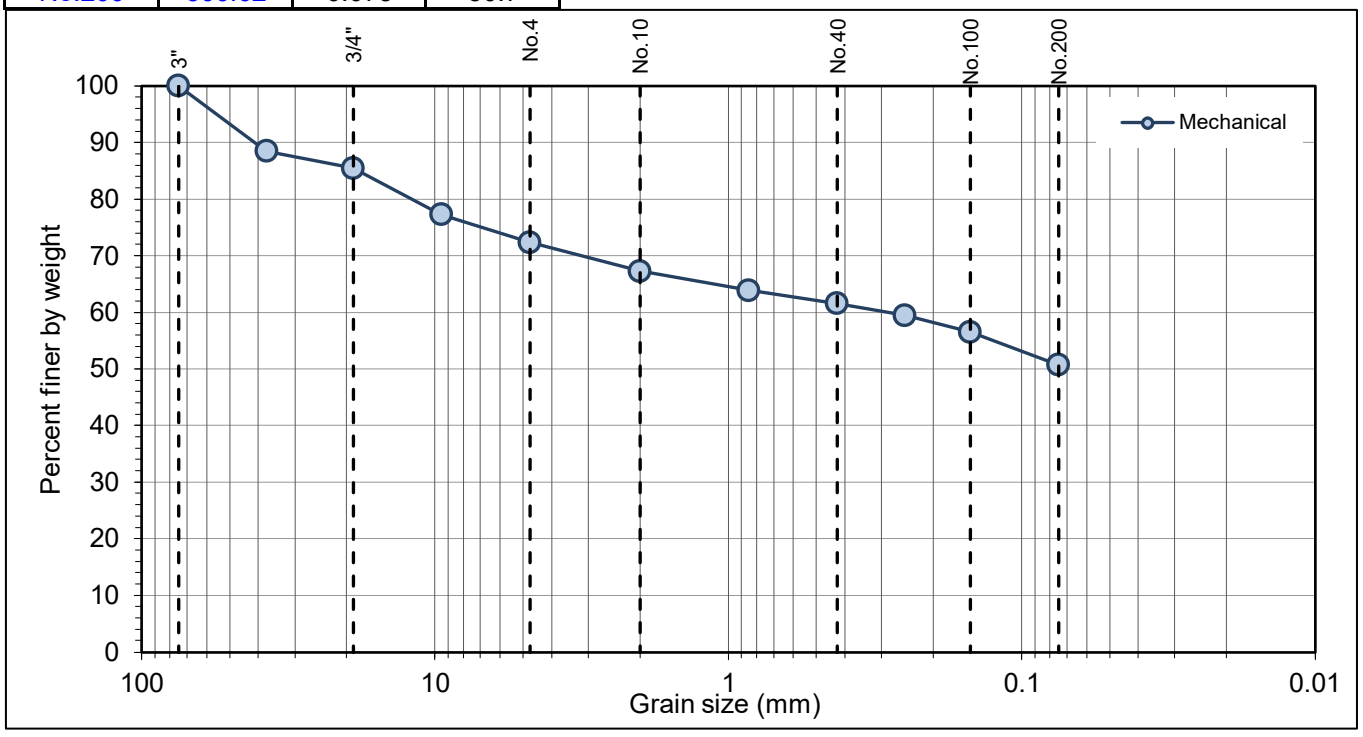
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	707.32	622.21
	-	
	707.32	622.21
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1129.47
Dry soil + tare (g):	-	1044.36
Tare (g):	-	422.15
Moisture content (%):	0.0	13.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	100.0
1.5"	71.56	37.5	88.5
3/4"	90.43	19	85.5
3/8"	141.32	9.5	77.3
No.4	172.00	4.75	72.4
No.10	203.64	2	67.3
No.20	224.65	0.85	63.9
No.40	239.11	0.425	61.6
No.60	252.04	0.25	59.5
No.100	270.48	0.15	56.5
No.200	306.62	0.075	50.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 15-17 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: ol bn - yl bn clay

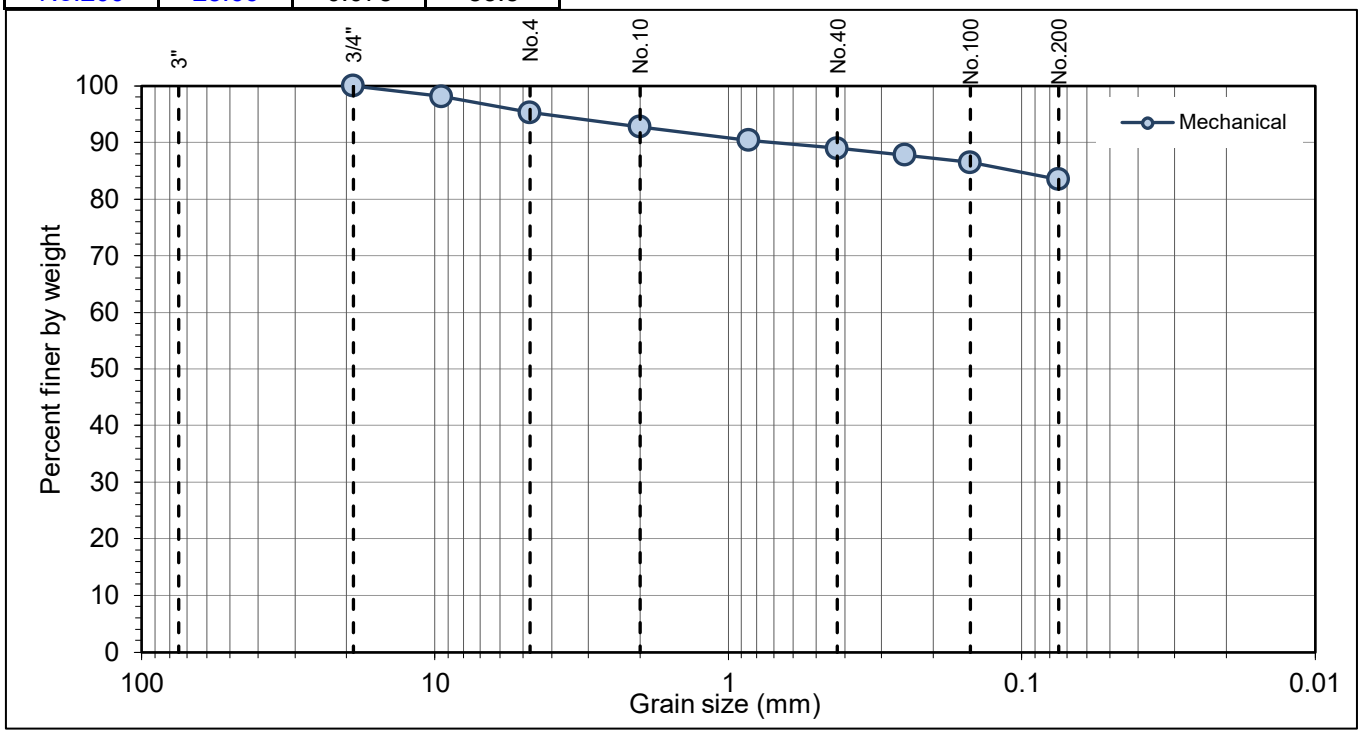
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	180.39	155.31
	-	
	180.39	155.31
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	377.19
Dry soil + tare (g):	-	352.11
Tare (g):	-	196.80
Moisture content (%):	0.0	16.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	2.89	9.5	98.1
No.4	7.30	4.75	95.3
No.10	11.23	2	92.8
No.20	14.96	0.85	90.4
No.40	17.13	0.425	89.0
No.60	18.94	0.25	87.8
No.100	20.99	0.15	86.5
No.200	25.66	0.075	83.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 17.5-19 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: ol bn - lt bn clay

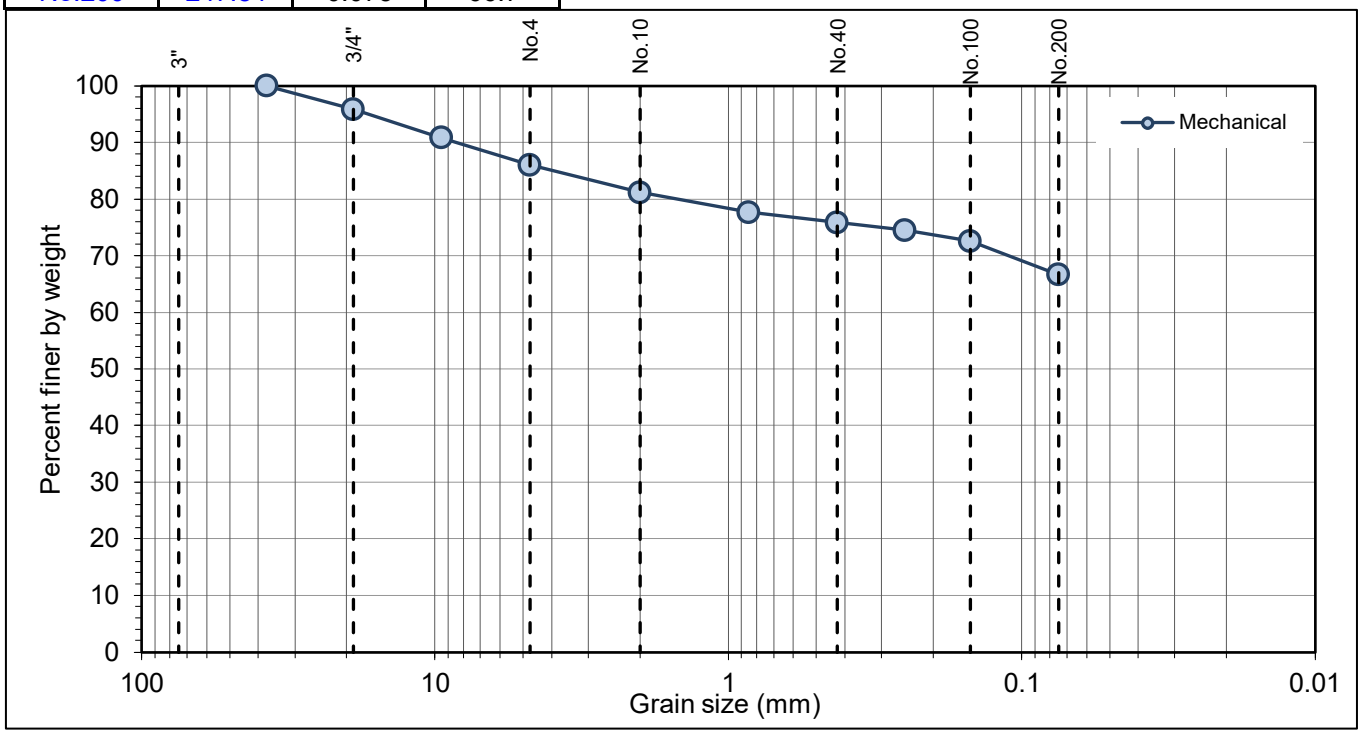
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	847.04	744.57
	-	
	847.04	744.57
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	860.87
Dry soil + tare (g):	-	758.40
Tare (g):	-	13.83
Moisture content (%):	0.0	13.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	30.57	19	95.9
3/8"	68.26	9.5	90.8
No.4	103.76	4.75	86.1
No.10	140.26	2	81.2
No.20	166.43	0.85	77.6
No.40	179.81	0.425	75.9
No.60	189.87	0.25	74.5
No.100	204.29	0.15	72.6
No.200	247.84	0.075	66.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-11

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: bn - dk bn clay

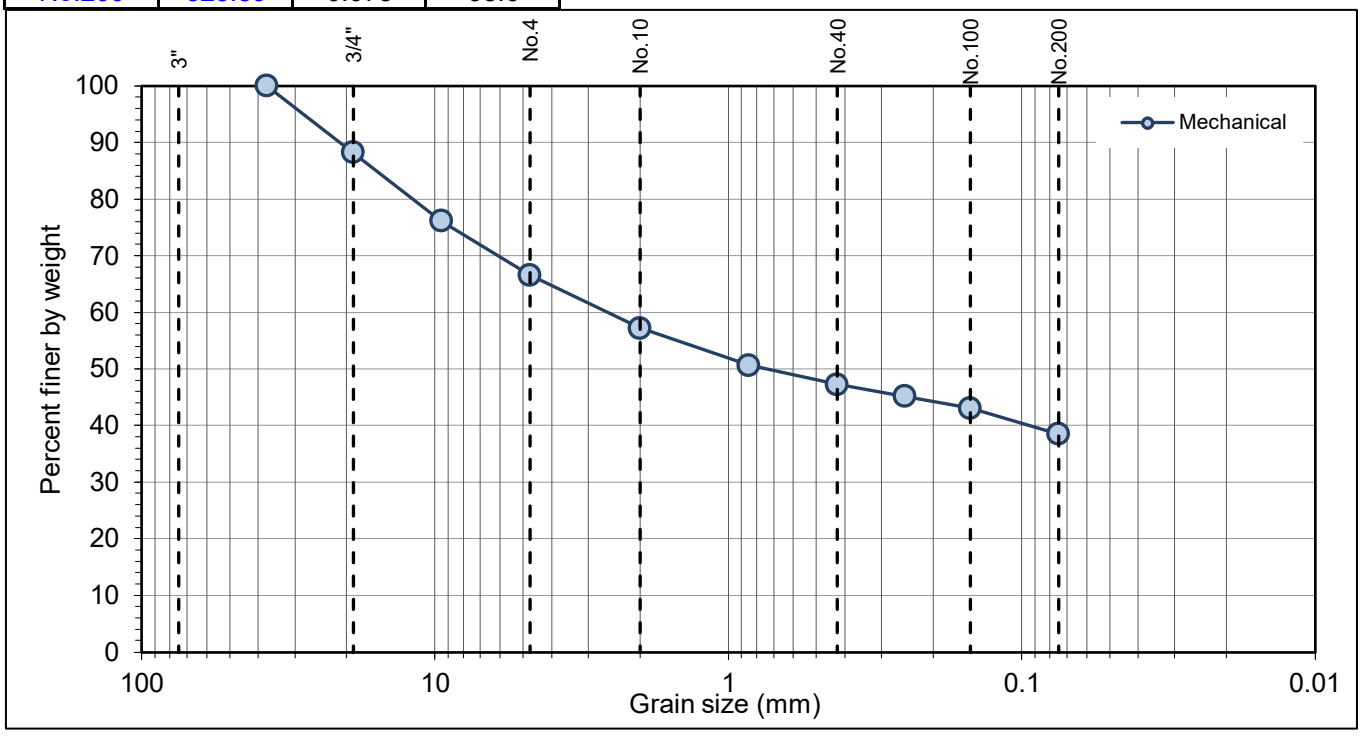
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	563.94	526.72
	-	
	563.94	526.72
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	758.29
Dry soil + tare (g):	-	721.07
Tare (g):	-	194.35
Moisture content (%):	0.0	7.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	61.88	19	88.3
3/8"	125.78	9.5	76.1
No.4	175.93	4.75	66.6
No.10	225.46	2	57.2
No.20	259.93	0.85	50.7
No.40	277.80	0.425	47.3
No.60	288.84	0.25	45.2
No.100	299.98	0.15	43.0
No.200	323.59	0.075	38.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 5-7 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - lt bn clay

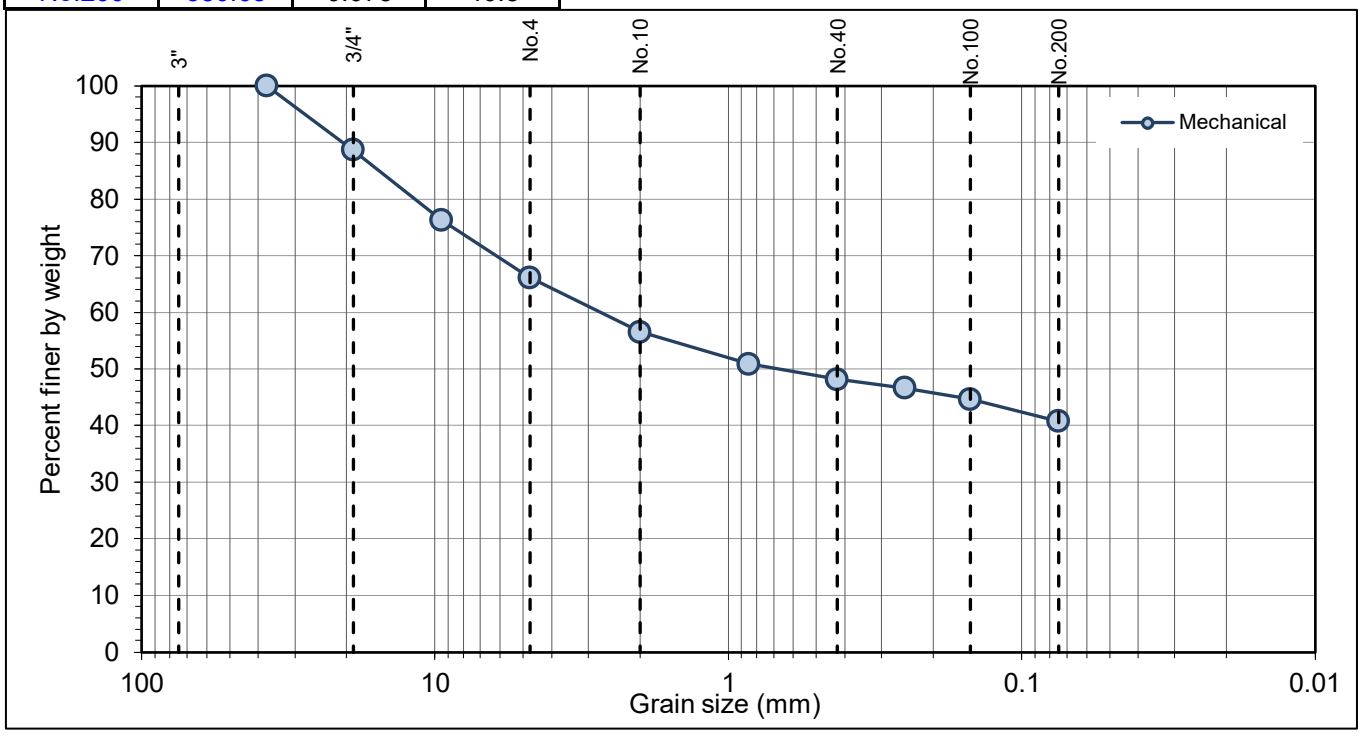
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	708.58	643.08
	-	
	708.58	643.08
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	902.19
Dry soil + tare (g):	-	836.69
Tare (g):	-	193.61
Moisture content (%):	0.0	10.2

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	72.52	19	88.7
3/8"	152.37	9.5	76.3
No.4	217.84	4.75	66.1
No.10	279.58	2	56.5
No.20	316.07	0.85	50.9
No.40	333.42	0.425	48.2
No.60	343.28	0.25	46.6
No.100	355.83	0.15	44.7
No.200	380.65	0.075	40.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 10-12 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - lt bn silt

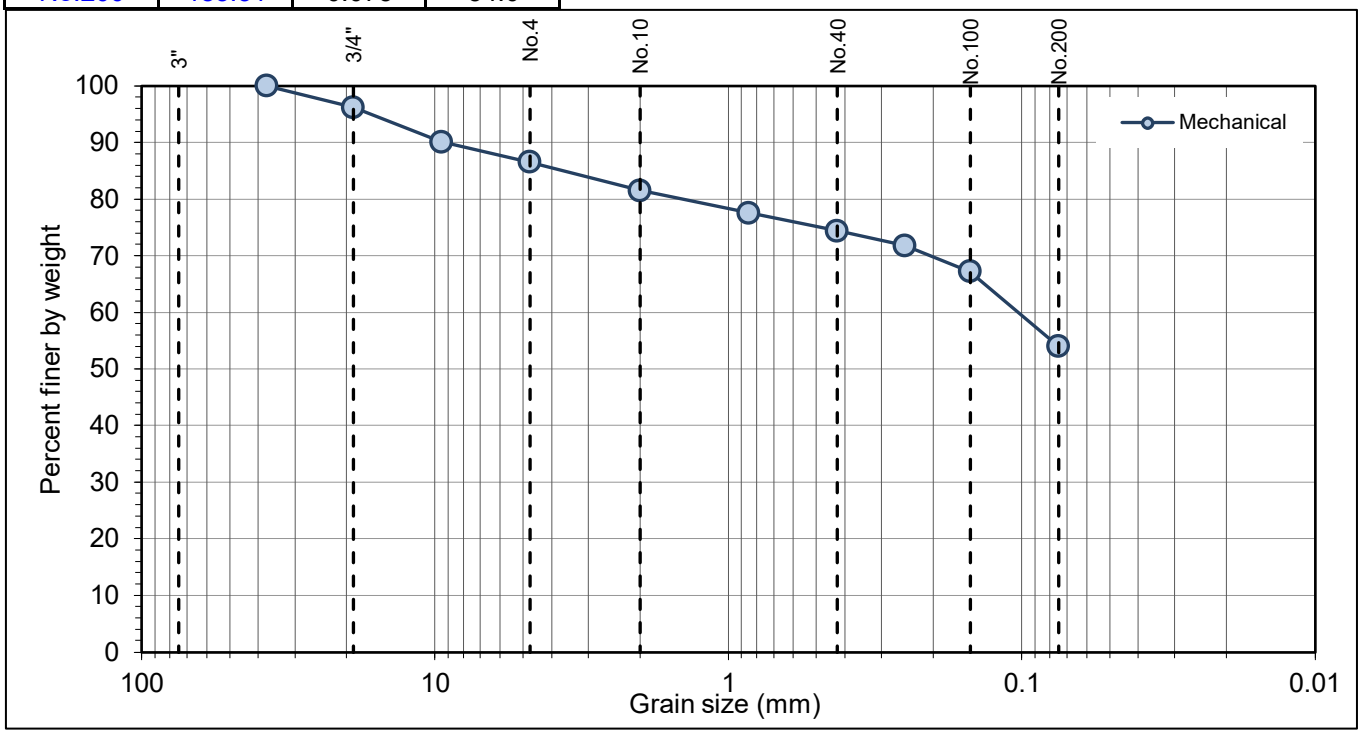
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	450.03	398.84
	-	
	450.03	398.84
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	566.12
Dry soil + tare (g):	-	514.93
Tare (g):	-	116.09
Moisture content (%):	0.0	12.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	15.06	19	96.2
3/8"	39.46	9.5	90.1
No.4	53.76	4.75	86.5
No.10	73.83	2	81.5
No.20	89.44	0.85	77.6
No.40	102.08	0.425	74.4
No.60	112.55	0.25	71.8
No.100	130.86	0.15	67.2
No.200	183.31	0.075	54.0



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 20-21 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - lt bn clay

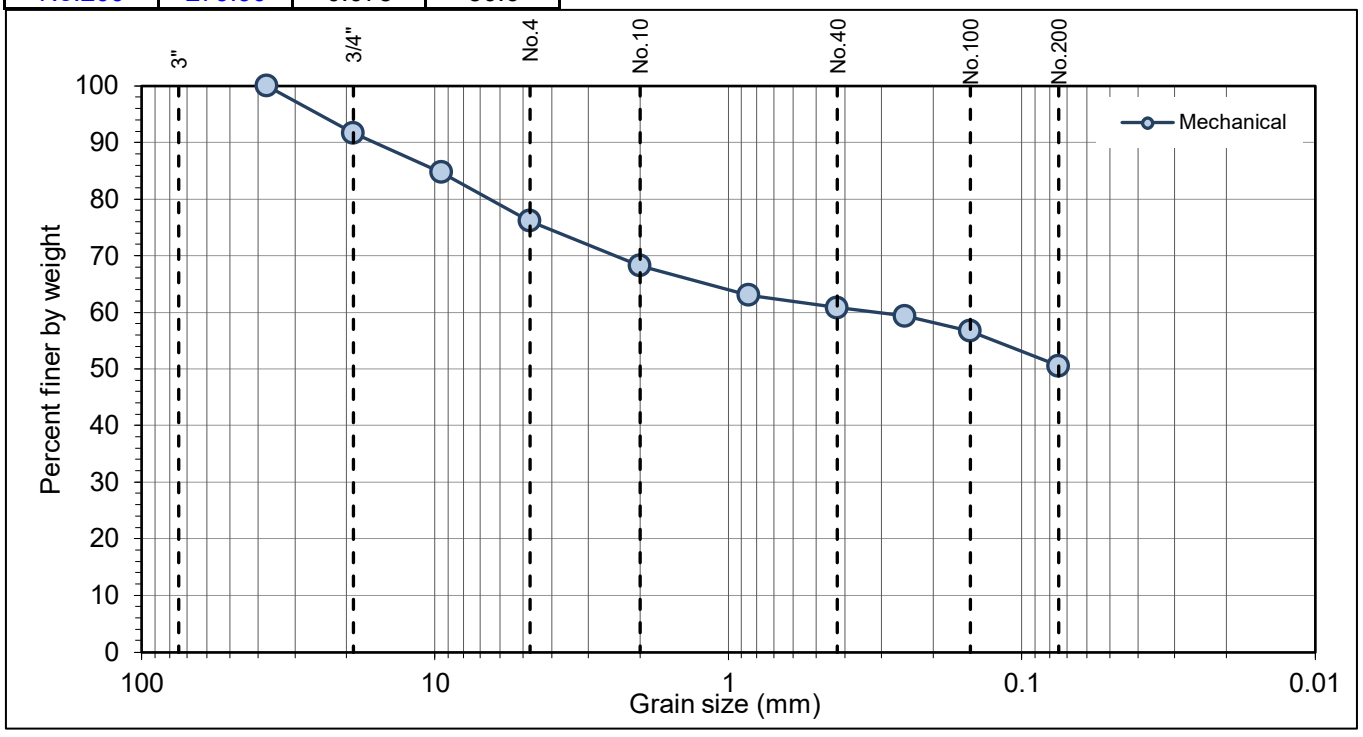
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	625.88	566.11
	-	
	625.88	566.11
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	742.99
Dry soil + tare (g):	-	683.22
Tare (g):	-	117.11
Moisture content (%):	0.0	10.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	47.10	19	91.7
3/8"	86.55	9.5	84.7
No.4	135.05	4.75	76.1
No.10	179.77	2	68.2
No.20	209.38	0.85	63.0
No.40	221.94	0.425	60.8
No.60	230.21	0.25	59.3
No.100	245.14	0.15	56.7
No.200	279.90	0.075	50.6



Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 37-39 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: gy - lt gy gravel

Reduced by: AT Comments:

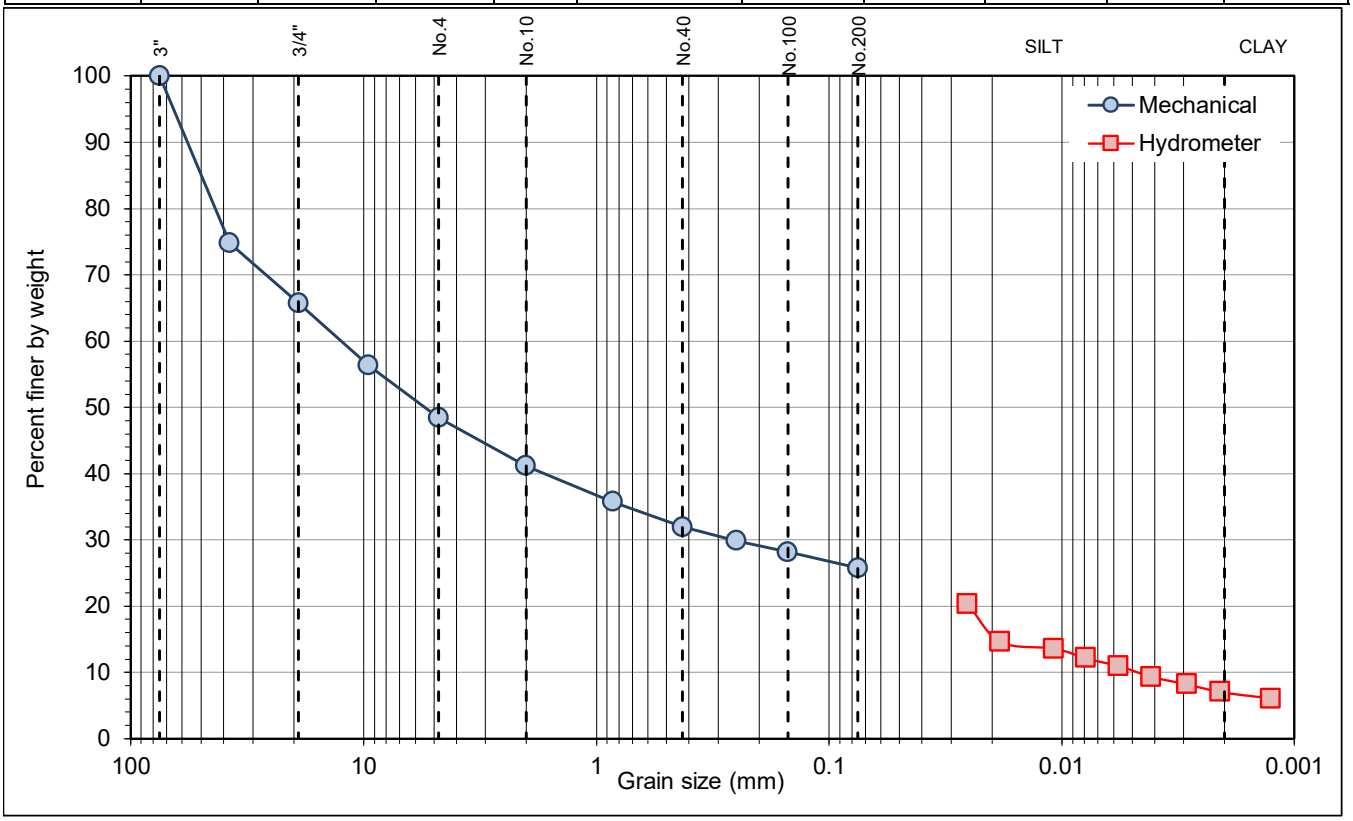
Reviewed by: JC

Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	1237.63	1179.38
+3" Coarse fraction (g):		
-3" Split fraction (g):	1237.63	1179.38
Hydrometer fraction (g):	100.02	99.95
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	1382.61	224.79
Dry soil + tare (g):	-	1324.36	224.77
Tare (g):	-	144.98	196.59
Moisture content (%):	0.00	4.94	0.07

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	41.14
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer		Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
12"	300	-	-		2	21.0	55	5.2	0.02534	20.28
8"	200	-	-		5	21.0	41	5.2	0.01838	14.58
6"	150	-	-		15	21.0	38.5	5.2	0.01084	13.57
4"	100	-	-		30	20.9	35	5.2	0.00789	12.13
3"	75	-	100.0	<=Split	60	21.0	32	5.2	0.00570	10.92
1.5"	37.5	298.03	74.7		120	21.2	28	5.1	0.00414	9.32
3/4"	19	404.72	65.7		250	22.0	25	4.9	0.00290	8.19
3/8"	9.5	515.59	56.3		500	22.5	22	4.7	0.00208	7.02
No.4	4.75	608.62	48.4		1440	20.9	20	5.2	0.00126	6.02
No.10	2	694.22	41.1	<=Split hyd.						
No.20	0.85	13.07	35.8							
No.40	0.425	22.42	31.9							
No.60	0.25	27.41	29.9							
No.100	0.15	31.53	28.2							
No.200	0.075	37.39	25.7							



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Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 44.5-47 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: lt bn - bn gravel

Reduced by: AT Comments:

Reviewed by: JC

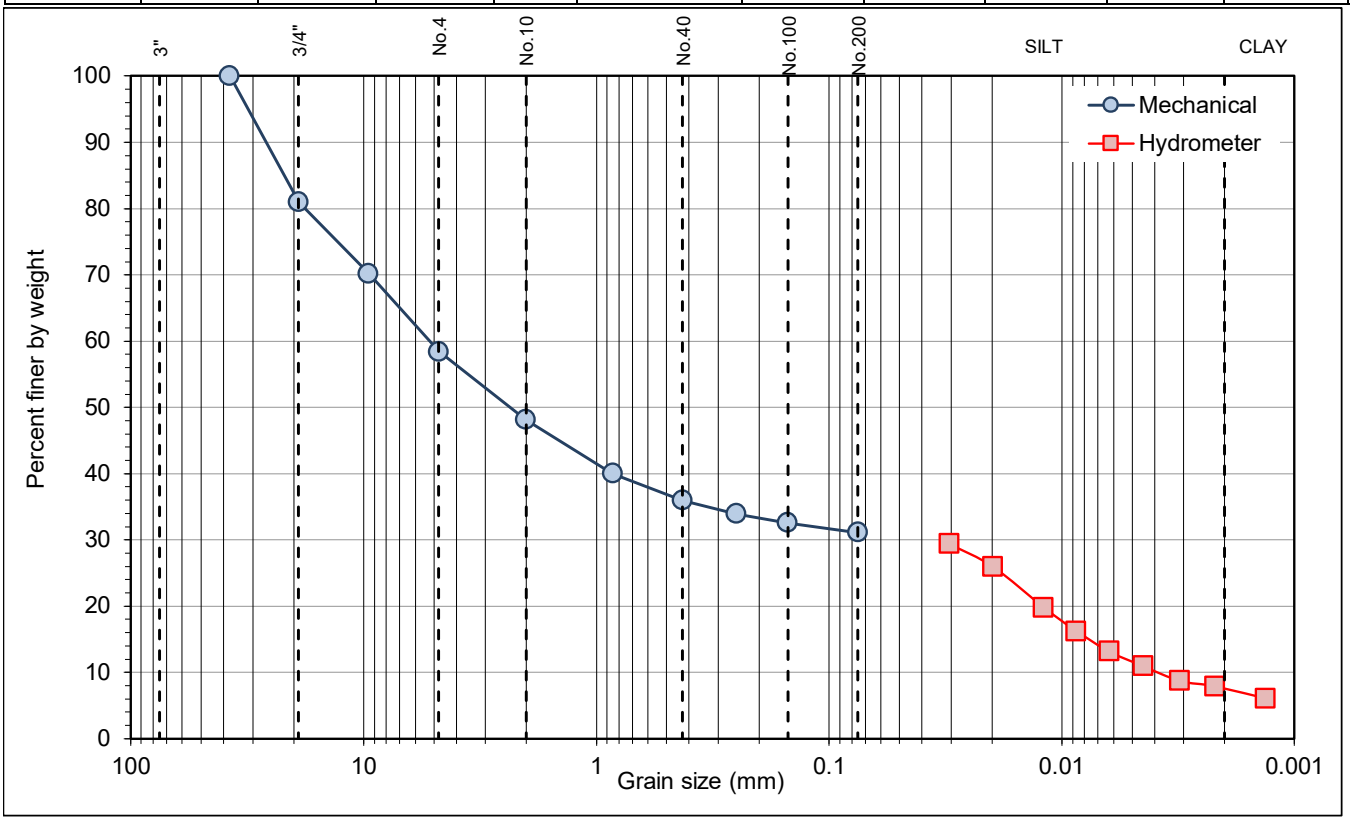
Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	446.03	423.48
+3" Coarse fraction (g):		
-3" Split fraction (g):	446.03	423.48
Hydrometer fraction (g):	50.04	50.01
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	572.96	229.12
Dry soil + tare (g):	-	550.41	229.10
Tare (g):	-	126.93	195.70
Moisture content (%):	0.00	5.32	0.06

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	48.08
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer
12"	300	-	-
8"	200	-	-
6"	150	-	-
4"	100	-	-
3"	75	-	-
1.5"	37.5	-	100.0
3/4"	19	80.60	81.0
3/8"	9.5	126.26	70.2
No.4	4.75	176.21	58.4
No.10	2	219.86	48.1
No.20	0.85	8.39	40.0
No.40	0.425	12.64	35.9
No.60	0.25	14.77	33.9
No.100	0.15	16.16	32.5
No.200	0.075	17.67	31.1

	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
	2	20.8	36.1	5.2	0.03034	29.35
	5	20.8	32.5	5.2	0.01973	25.93
	15	20.8	26	5.2	0.01193	19.75
	30	20.8	22.25	5.2	0.00865	16.19
<=Split	60	20.9	19	5.2	0.00623	13.12
	120	21.4	16.5	5.1	0.00445	10.88
	250	22.1	14	4.9	0.00310	8.69
	500	22.6	13	4.7	0.00219	7.88
	1448	20.9	11.5	5.2	0.00133	5.99
<=Split hyd.						



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Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 15-17 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: ol bn - yl bn clay

Reduced by: AT Comments:

Reviewed by: JC

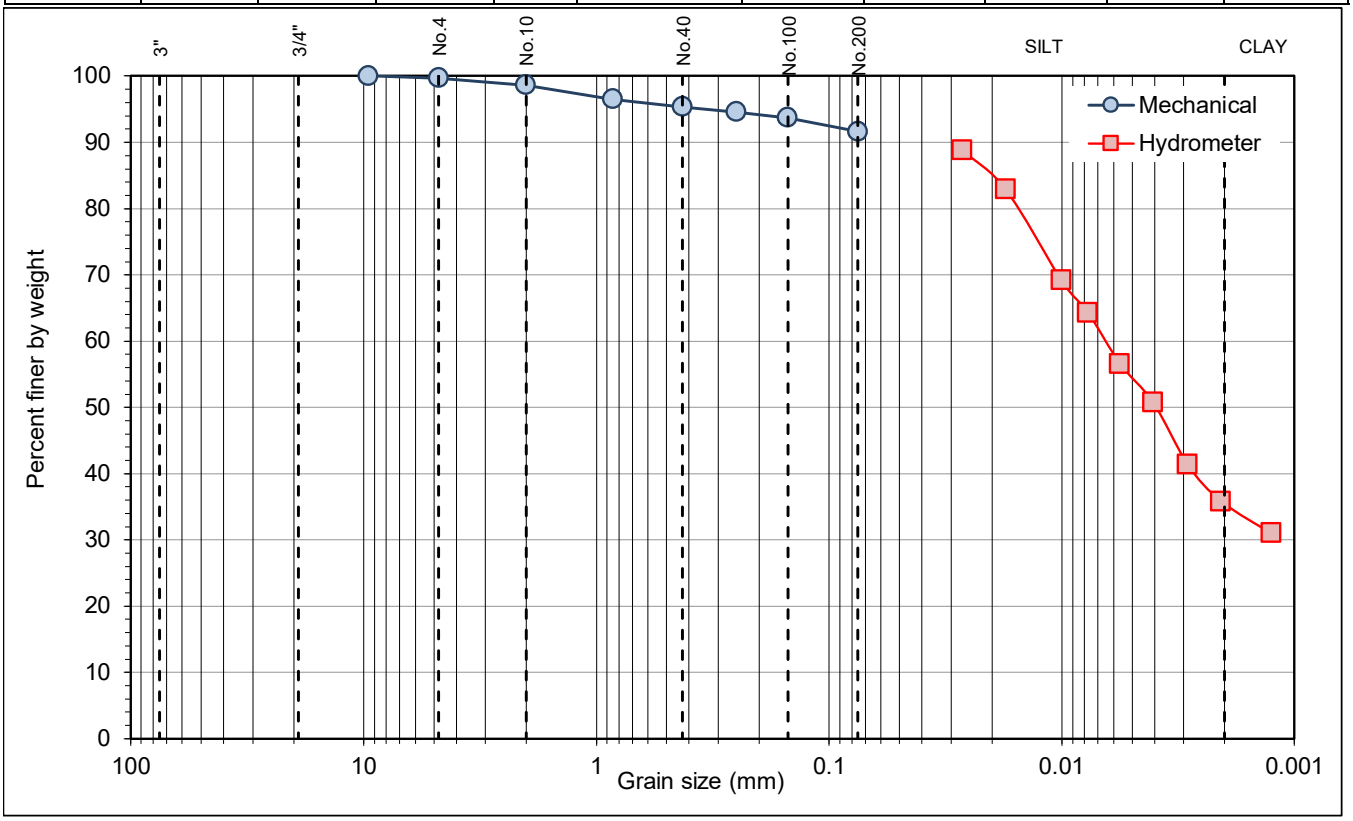
Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	133.83	114.98
+3" Coarse fraction (g):		
-3" Split fraction (g):	133.83	114.98
Hydrometer fraction (g):	50.01	49.74
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	250.79	239.17
Dry soil + tare (g):	-	231.94	238.94
Tare (g):	-	116.96	196.69
Moisture content (%):	0.00	16.39	0.54

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	98.62
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer
12"	300	-	-
8"	200	-	-
6"	150	-	-
4"	100	-	-
3"	75	-	-
1.5"	37.5	-	-
3/4"	19	-	-
3/8"	9.5	-	100.0
No.4	4.75	0.38	99.7
No.10	2	1.59	98.6
No.20	0.85	1.06	96.5
No.40	0.425	1.66	95.3
No.60	0.25	2.04	94.6
No.100	0.15	2.49	93.7
No.200	0.075	3.54	91.6

	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
	2	20.8	50.5	5.2	0.02667	88.77
	5	20.8	47.5	5.2	0.01737	82.88
	17	20.8	40.5	5.2	0.01004	69.16
	30	20.8	38	5.2	0.00772	64.26
<=Split	60	21.0	34	5.2	0.00562	56.53
	120	21.2	31	5.1	0.00405	50.76
	250	22.0	26	4.9	0.00288	41.40
	500	22.5	23	4.7	0.00206	35.79
	1444	20.9	21	5.2	0.00125	30.98
<=Split hyd.						



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Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-11

No: 23072 (23-1725) **Depth:** 10-12 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: lt ol bn - ol bn clay

Reduced by: AT Comments:

Reviewed by: JC

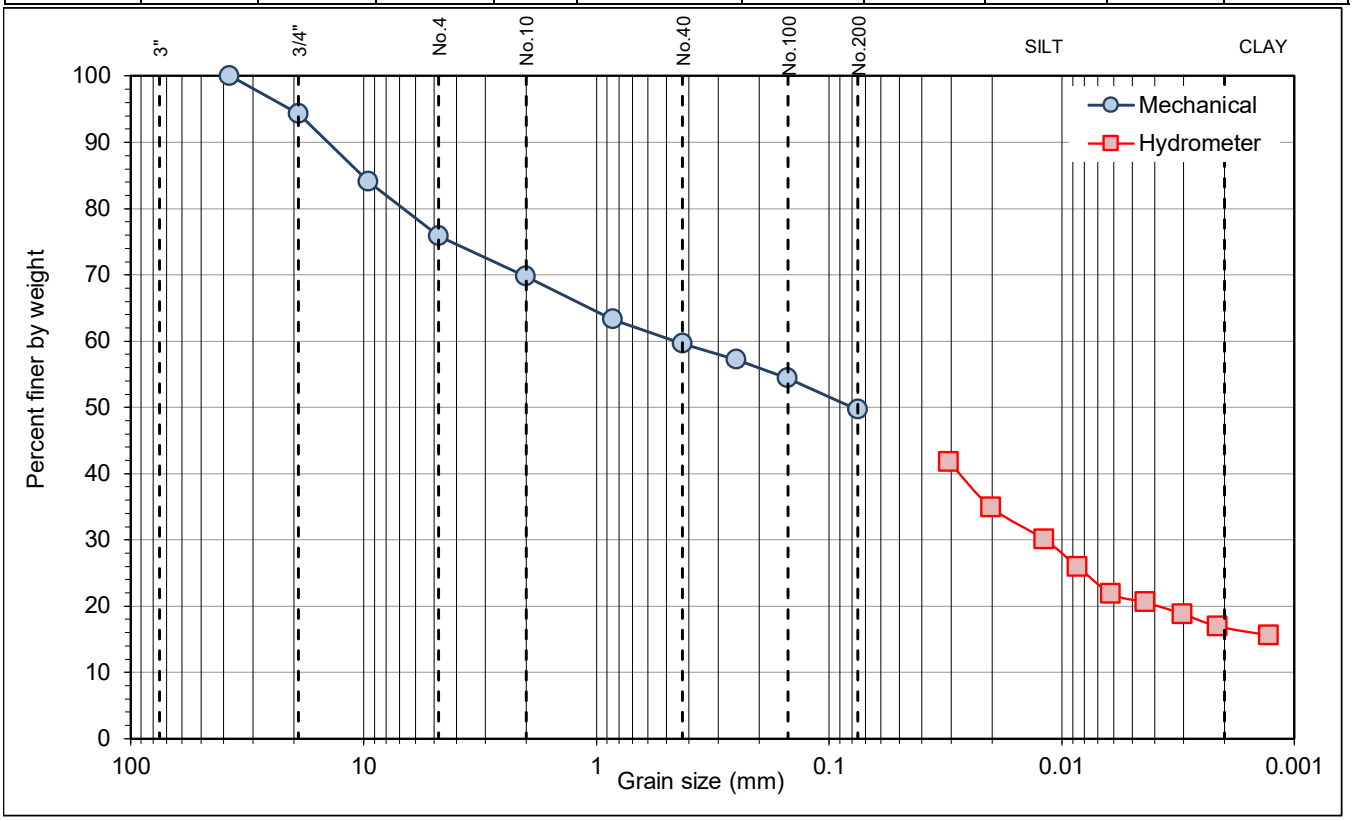
Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	621.27	566.27
+3" Coarse fraction (g):		
-3" Split fraction (g):	621.27	566.27
Hydrometer fraction (g):	50.09	50.00
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	766.77	150.52
Dry soil + tare (g):	-	711.77	150.46
Tare (g):	-	145.50	117.79
Moisture content (%):	0.00	9.71	0.18

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	69.77
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer
12"	300	-	-
8"	200	-	-
6"	150	-	-
4"	100	-	-
3"	75	-	-
1.5"	37.5	-	100.0
3/4"	19	32.39	94.3
3/8"	9.5	90.42	84.0
No.4	4.75	136.85	75.8
No.10	2	171.18	69.8
No.20	0.85	4.67	63.3
No.40	0.425	7.27	59.6
No.60	0.25	9.04	57.2
No.100	0.15	11.05	54.4
No.200	0.075	14.44	49.6

	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
	2	20.7	35.5	5.3	0.03051	41.74
	5	20.7	30.5	5.3	0.02004	34.84
	15	20.7	27	5.3	0.01186	30.01
	30	20.8	24	5.2	0.00855	25.91
<=Split	60	21.0	21	5.2	0.00615	21.85
	120	21.2	20	5.1	0.00436	20.54
	250	22.0	18.5	4.9	0.00302	18.79
	500	22.6	17	4.7	0.00214	16.95
	1446	20.9	16.5	5.2	0.00129	15.60
<=Split hyd.						



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One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project:	**Bear Development Snow King Lot 53 and 58**	**TH/TP/Sample:**	**JG-10**
No:	**23072 (23-1725)**	**Depth:**	**12.5-14 ft**
Location:	-	Laboratory sample description:	ol bn - lt bn clay
Date:	14-Nov-23	USCS classification:	not requested
Tested by:	AT	Sample type:	Rel. undisturbed, Shelby Tube
Reduced by:	AT	Inundation stress (psf):	100, completion
Checked by:	JC	Swell pressure (psf):	408
Comments:	Gravel up to 1.5" in sample.	Test method:	B
		Preparation procedure:	trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.995	-
	90°	1.002	-
	180°	0.999	-
	270°	1.003	-
Avg Height, Havg (in)		1.000	0.887
Height, H (cm)		2.539	2.253
Dia., D (in)	0°	2.494	-
	90°	2.495	-
Avg Dia., Davg (in)		2.495	2.495
Dia., D (cm)		6.336	6.336
Wt. rings + wet soil (g)		373.54	369.19
Wt. rings (g)		216.21	216.21
Wet soil + tare (g)		1129.47	350.66
Dry soil + tare (g)		1044.36	324.68
Tare (g)		422.15	198.47
Moisture cont., w (%)		13.7	20.6
Gs, assumed		2.70	2.70
Mass total (g)		157.3	153.0
Mass of solids (g)		138.4	138.4
Volume (cm^3)		80.1	71.0
Vol. of water (cm^3)		18.9	14.6
Vol. of solids (cm^3)		51.3	51.3
Vol. of voids (cm^3)		28.8	19.8
Vol. of air (cm^3)		9.9	5.2
Area, A (cm^2)		31.5	31.5
Ht. solids, Hs (cm)		1.626	1.626
Void ratio, e		0.562	0.386
Porosity, n		0.360	0.278
Vol.moisture, T		0.236	0.205
Saturation, S (%)		66	74
Dry density (gm/cm^3)		1.729	1.949
Wet unit wt., gm (pcf)		122.7	146.7
Dry unit wt., gd (pcf)		107.9	121.6

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9998	0.0000	0.5620	0
408	0.0000	0.9997	0.0000	0.5620	120
800	0.0034	0.9964	0.0034	0.5568	131
1,600	0.0108	0.9890	0.0108	0.5452	207
3,200	0.0278	0.9719	0.0278	0.5185	480
6,400	0.0528	0.9470	0.0528	0.4796	369
12,800	0.0843	0.9154	0.0843	0.4303	269
25,600	0.1173	0.8825	0.1173	0.3787	334
51,200	0.1513	0.8484	0.1514	0.3255	480
25,600	0.1474	0.8523	0.1475	0.3316	120
6,400	0.1325	0.8672	0.1326	0.3550	240
1,600	0.1129	0.8869	0.1129	0.3856	343

C'c

(0.1514-0.0528)/[Log(51200)-Log(6400)]

0.0986/(4.71-3.81)

C'c= 0.1096

C'c = Cc/(1+e0)

0.1096 = Cc/(1+0.562)

Cc = 0.171

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

To be determined by the Geotechnical Engineer

Notes:

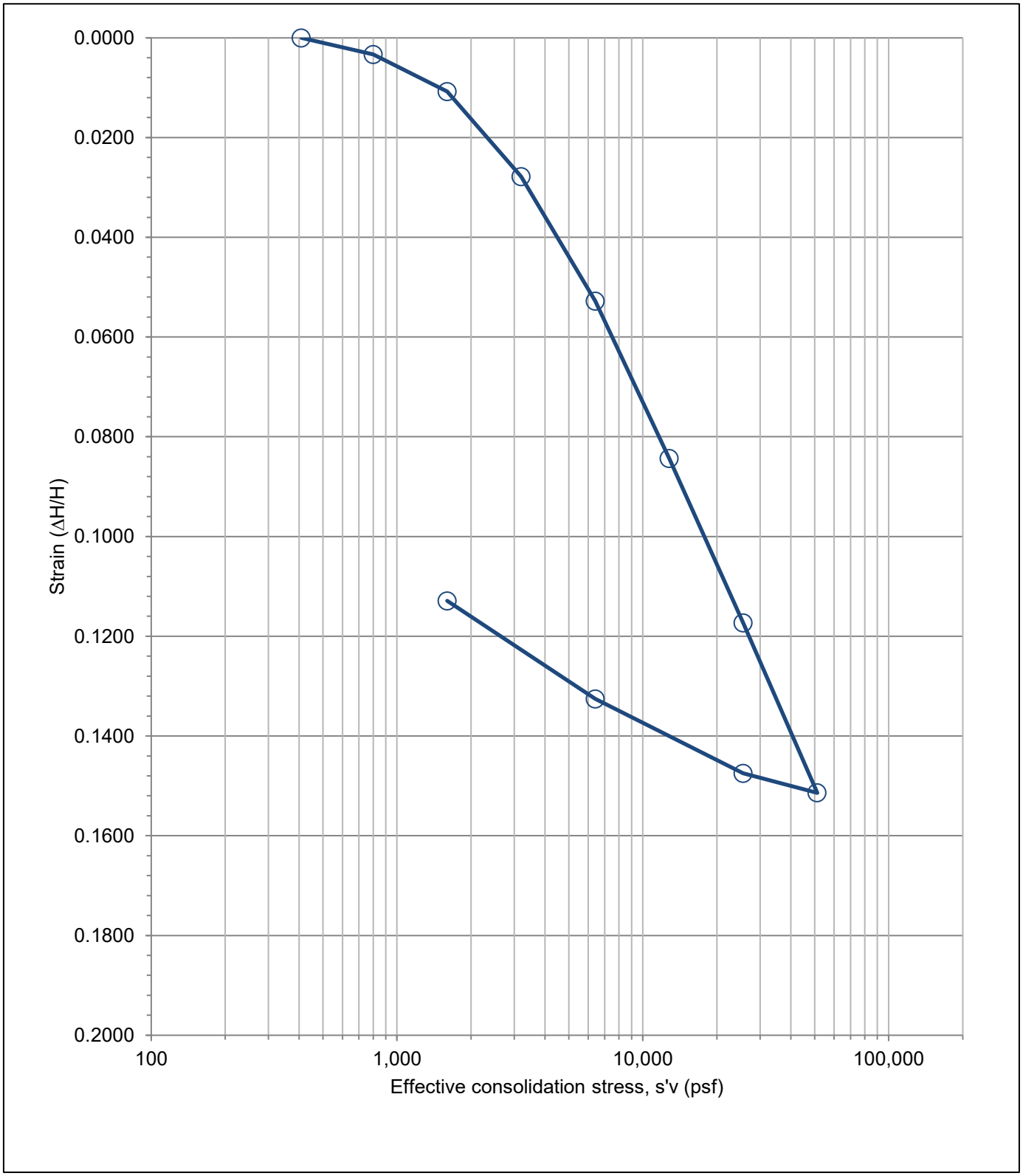
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation

[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10
No: 23072 (23-1725) **Depth:** 12.5-14 ft



One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 | **TH/TP/Sample:** JG-10
No: 23072 (23-1725) | **Depth:** 17.5-19 ft
Location: - | Laboratory sample description: ol bn - lt bn clay
Date: 14-Nov-23 | USCS classification: not requested

Tested by: AT | Sample type: Rel. undisturbed, Shelby Tube
Reduced by: AT | Inundation stress (psf): 100, completion
Checked by: JC | Swell pressure (psf): <100
Comments: | Test method: B
Preparation procedure: trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.985	-
	90°	0.987	-
	180°	0.988	-
	270°	0.989	-
Avg Height, Havg (in)		0.987	0.884
Height, H (cm)		2.508	2.245
Dia., D (in)	0°	2.487	-
	90°	2.496	-
Avg Dia., Davg (in)		2.492	2.492
Dia., D (cm)		6.328	6.328
Wt. rings + wet soil (g)		384.09	380.81
Wt. rings (g)		214.28	214.28
Wet soil + tare (g)		860.87	285.37
Dry soil + tare (g)		758.40	266.49
Tare (g)		13.83	119.06
Moisture cont., w (%)		13.8	12.8
Gs, assumed		2.70	2.70
Mass total (g)		169.8	166.5
Mass of solids (g)		149.3	149.3
Volume (cm^3)		78.9	70.6
Vol. of water (cm^3)		20.5	17.3
Vol. of solids (cm^3)		55.3	55.3
Vol. of voids (cm^3)		23.6	15.3
Vol. of air (cm^3)		3.0	-1.9
Area, A (cm^2)		31.5	31.5
Ht. solids, Hs (cm)		1.758	1.758
Void ratio, e		0.427	0.278
Porosity, n		0.299	0.217
Vol.moisture, T		0.260	0.244
Saturation, S (%)		87	113
Dry density (gm/cm^3)		1.892	2.113
Wet unit wt., gm (pcf)		134.4	148.8
Dry unit wt., gd (pcf)		118.1	131.9

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9873	0.0000	0.4267	0
100	0.0000	0.9872	0.0000	0.4267	108
200	0.0029	0.9844	0.0029	0.4225	123
400	0.0060	0.9813	0.0061	0.4181	210
800	0.0111	0.9761	0.0113	0.4106	96
1,600	0.0185	0.9687	0.0188	0.3999	176
3,200	0.0296	0.9576	0.0300	0.3839	480
6,400	0.0512	0.9360	0.0519	0.3527	89
12,800	0.0722	0.9150	0.0732	0.3223	123
25,600	0.0998	0.8875	0.1010	0.2826	155
51,200	0.1267	0.8605	0.1284	0.2436	315
25,600	0.1236	0.8637	0.1251	0.2482	120
6,400	0.1163	0.8709	0.1178	0.2586	210
1,600	0.1032	0.8840	0.1046	0.2775	980

C'c

(0.1284-0.0732)/[Log(51200)-Log(12800)]

0.0552/(4.71-4.1072)

C'c= 0.091

C'c = Cc/(1+e0)

0.091 = Cc/(1+0.427)

Cc = 0.13

Check:

Cc=(change in void ratio)/(Log change in pressure)

Cc=(0.2436-0.3223)/[Log(51200)-Log(12800)]

Cc=-0.0787/0.6028

Cc=-0.13

~~WHY DOES IT CALCULATE A NEGATIVE VALUE?~~

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

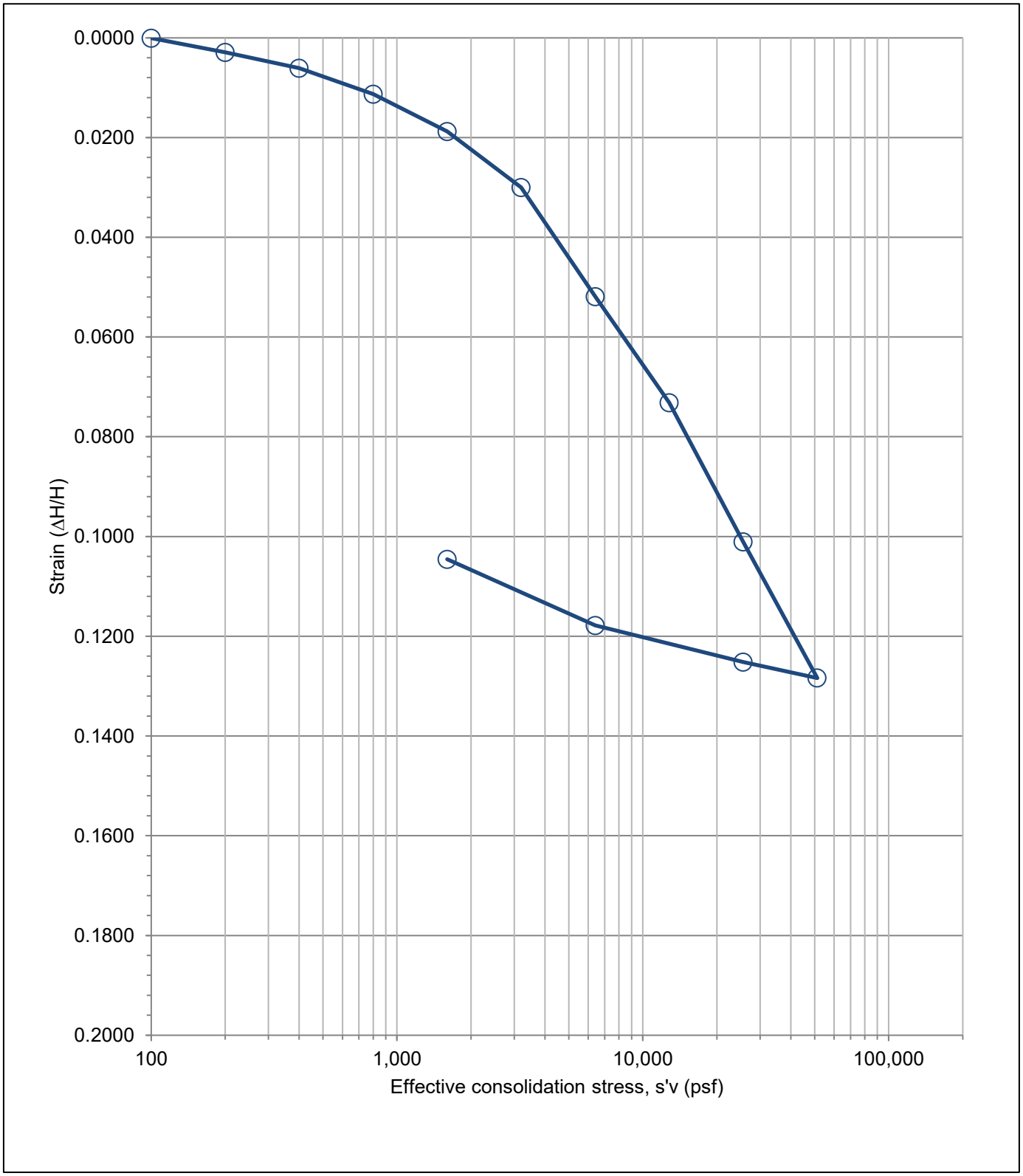
To be determined by the Geotechnical Engineer

Notes:
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation
[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10
No: 23072 (23-1725) **Depth:** 17.5-19 ft



Direct Shear of Soils Under Consolidated Drained Conditions, ASTM D3080

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson # 21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

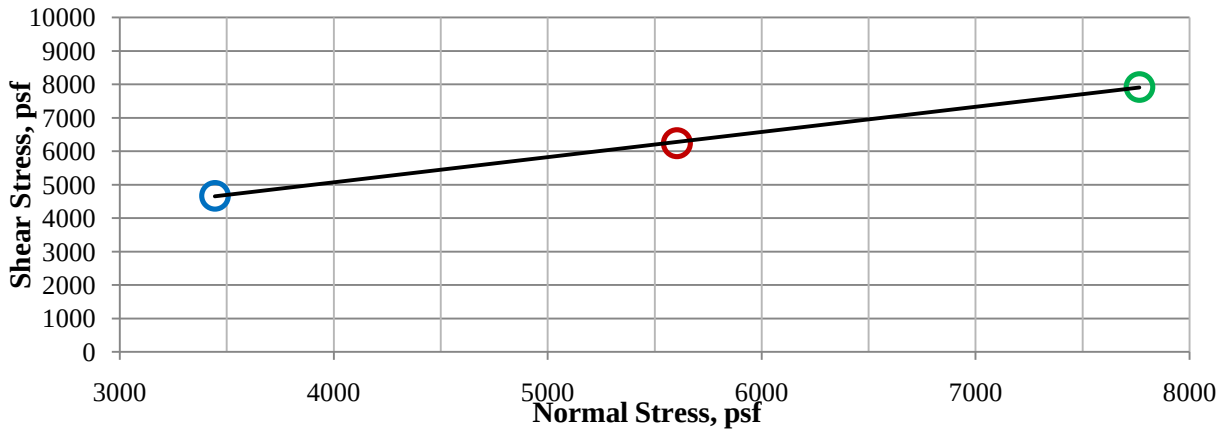
Sample Data:

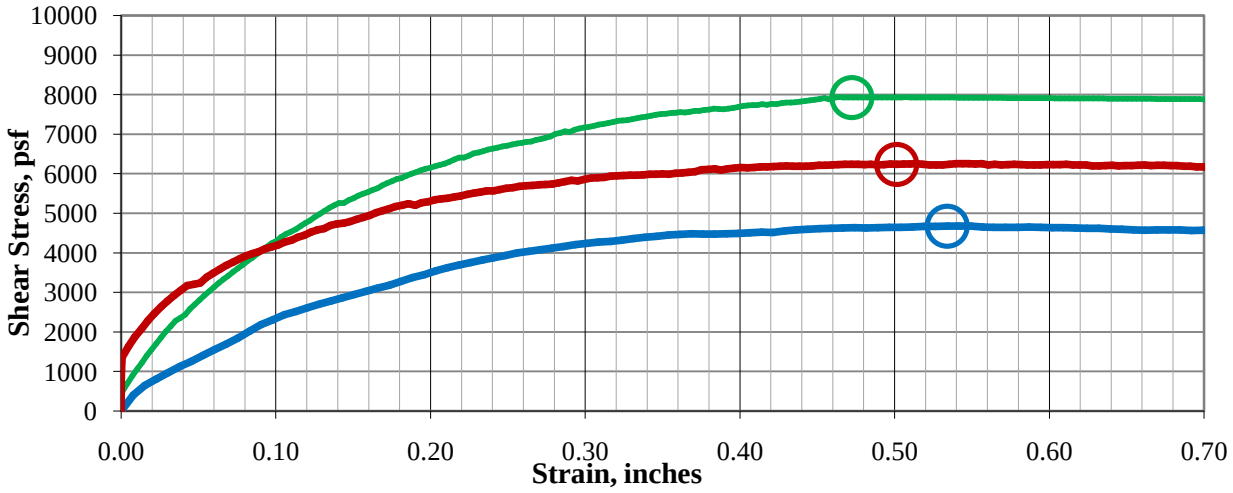
Boring: BH6-11 **Depth:** 52.5'-53' **Density:** 137.7 pcf moist

Description: Sandy Lean Clay, CL

Normal Stress, psf	Initial Moisture,%	Final Moisture,%	Consol + Collapse,%	Final Wet Density, pcf	Final Dry Density, pcf	Max Shear Stress, psf	Failure Strain,%
3444	14.4	16.2	2.2	143.1	123.1	**4673**	**22.1**
5604	14.4	15.6	3.0	143.5	124.1	**6234**	**20.7**
7764	14.4	14.7	3.8	143.6	125.2	**7924**	**19.5**

Peak Angle, ϕ° **37.0** Peak Cohesion, C, psf **2059** Strain rate, %/hour **4.1**





Remarks: Friction angle and cohesion in practice are sensitive to several other material properties, and conditions, in the field and lab. No individual lab property of a material can substitute for overall best practices in geotechnical design, construction, and field testing by qualified professionals.

Direct Shear of Soils Under Consolidated Drained Conditions, ASTM D3080

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson # 21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

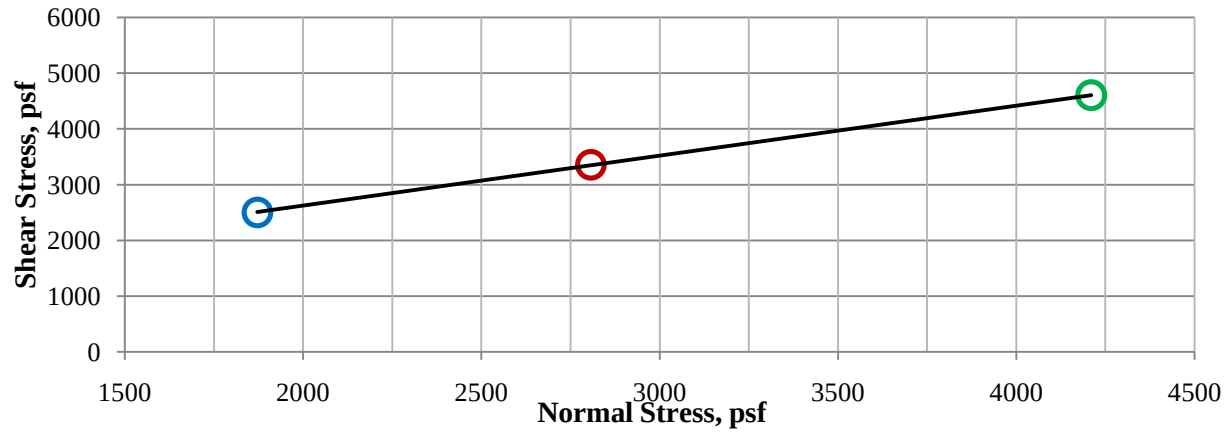
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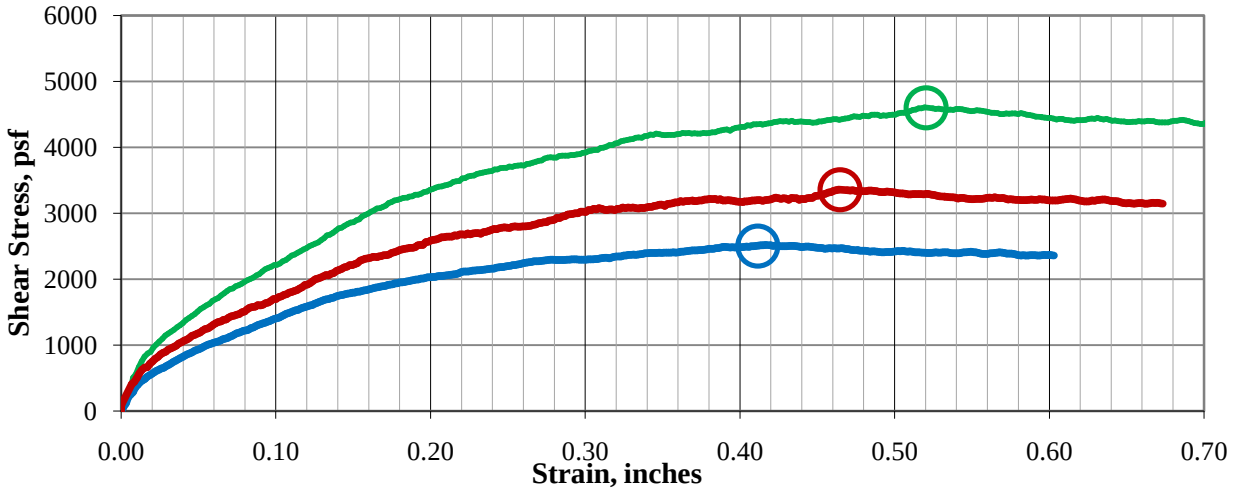
Boring: BH7-4 **Depth:** 19.5'-20' **Density:** 135.1 pcf moist

Description: Sandy Lean Clay, CL

Normal Stress, psf	Initial Moisture,%	Final Moisture,%	Consol + Collapse,%	Final Wet Density, pcf	Final Dry Density, pcf	Max Shear Stress, psf	Failure Strain,%
1871	15.5	19.5	1.5	141.9	118.7	**2505**	**17.0**
2806	15.5	17.6	2.6	141.2	120.1	**3358**	**19.2**
4210	15.5	15.8	3.6	140.5	121.3	**4602**	**21.5**

Peak Angle, ϕ° **41.9** Peak Cohesion, C, psf **835** Strain rate, %/hour **4.1**





Remarks: Friction angle and cohesion in practice are sensitive to several other material properties, and conditions, in the field and lab. No individual lab property of a material can substitute for overall best practices in geotechnical design, construction, and field testing by qualified professionals.

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

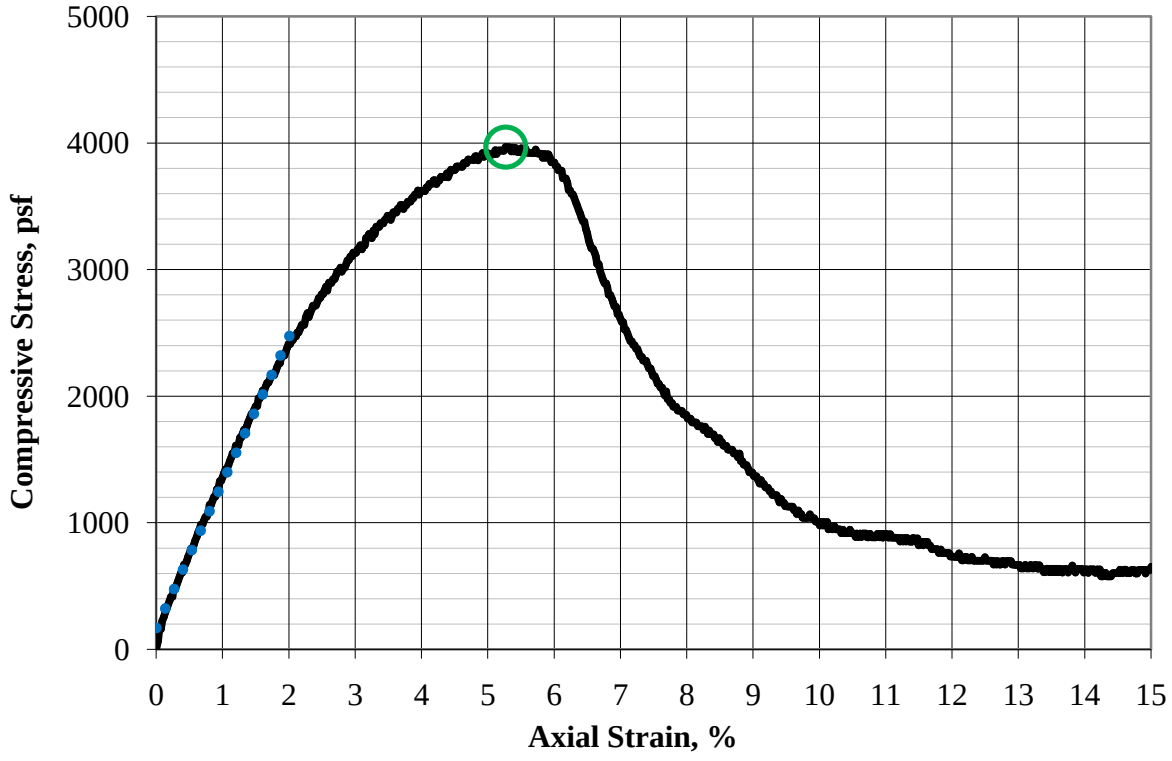
Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

Sample Data:

Boring: BH6-4B
Depth: 22.5' - 23'
Description: Lean Clay, CL

Specimen Properties:	
Average Diameter, in.	2.395
Average Height, in.	5.186
Height/Diameter (L/D)	2.17
Moisture, %	18.6
Wet density, pcf	128.5
Dry density, pcf	108.3

Undrained Unconfined Strength Properties:	
Compressive strength, psf	3968
Shear strength, psf	1984
Axial elastic modulus, psi	798
Failure strain, %	5.3
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

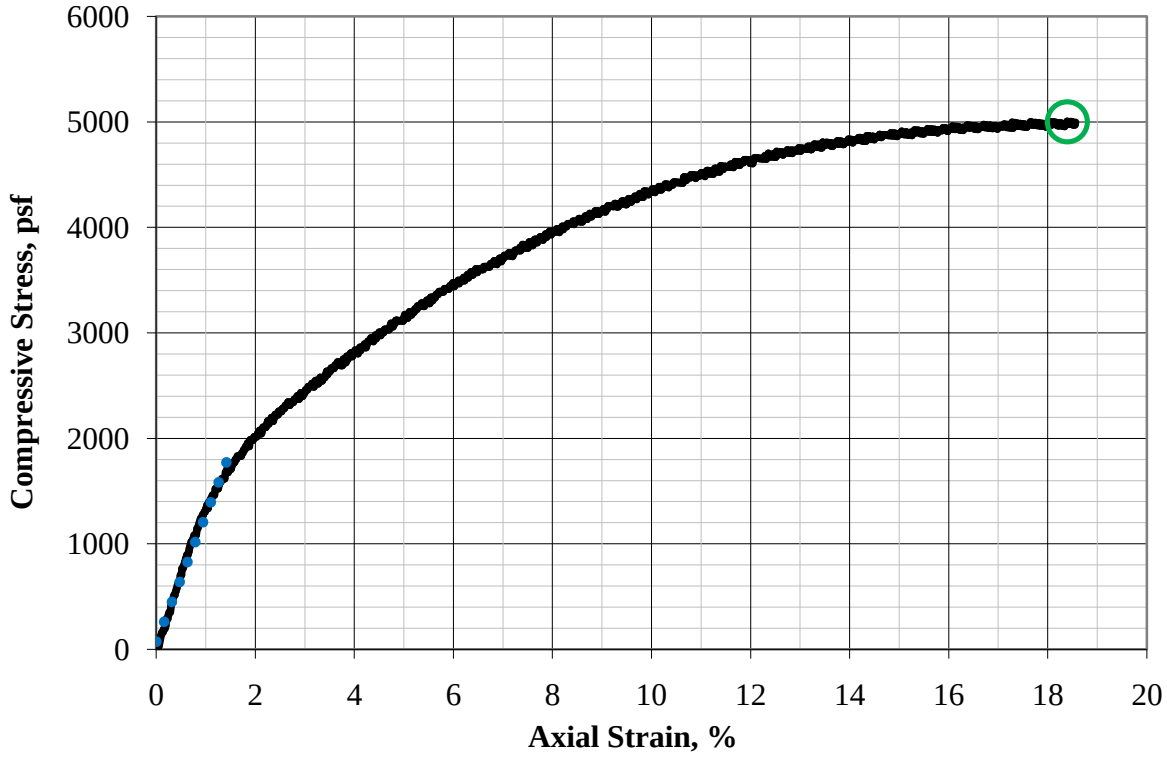
Sample Data:

Boring: BH7-6 Depth: 26' - 26.5'

Description: Lean Clay w/Sand, CL

Specimen Properties:	
Average Diameter, in.	2.389
Average Height, in.	6.044
Height/Diameter (L/D)	2.53
Moisture, %	25.6
Wet density, pcf	126.6
Dry density, pcf	100.8

Undrained Unconfined Strength Properties:	
Compressive strength, psf	5002
Shear strength, psf	2501
Axial elastic modulus, psi	834
Failure strain, %	18.4
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

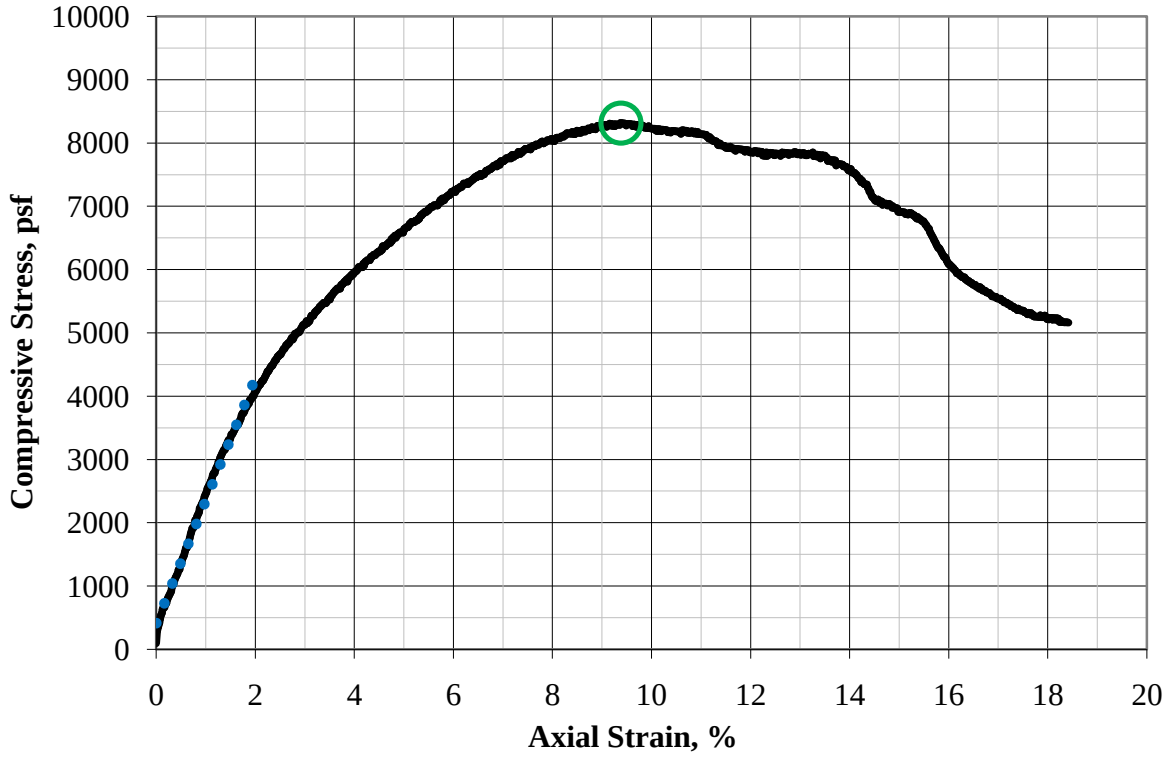
Sample Data:

Boring: BH7-13 Depth: 59.5' - 60'

Description: Sandy Lean Clay, CL

Specimen Properties:	
Average Diameter, in.	2.407
Average Height, in.	5.987
Height/Diameter (L/D)	2.49
Moisture, %	17.1
Wet density, pcf	133.3
Dry density, pcf	113.8

Undrained Unconfined Strength Properties:	
Compressive strength, psf	8315
Shear strength, psf	4158
Axial elastic modulus, psi	1346
Failure strain, %	9.4
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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USCS CLASSIFICATION

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Sample ID: BH1-4 Depth (ft): 29.75'-31.75'

Unified Soils Classification
SC (Clayey Sand with Gravel)

Gravel	22%
Sand	56%
Fines	23%

Liquid Limit:	27
Plastic Limit:	12
Plasticity Index:	15

In-Situ Moisture Content	10.2%

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	115.1	115.1	0.0	0%	100%
1"	25	115.1	115.1	0.0	0%	100%
3/4"	18.75	115.1	143.7	28.6	7%	93%
#4	4.75	115.1	174.2	59.1	22%	78%
#10	2.00	115.1	130.4	15.3	25%	75%
#40	0.425	115.1	131.8	16.7	29%	71%
#200	0.075	115.1	310.1	195.0	77%	23%
Pan	0	115.1	208.2	93.1	100%	0%
		Total Weight of Sample (g)		407.8		

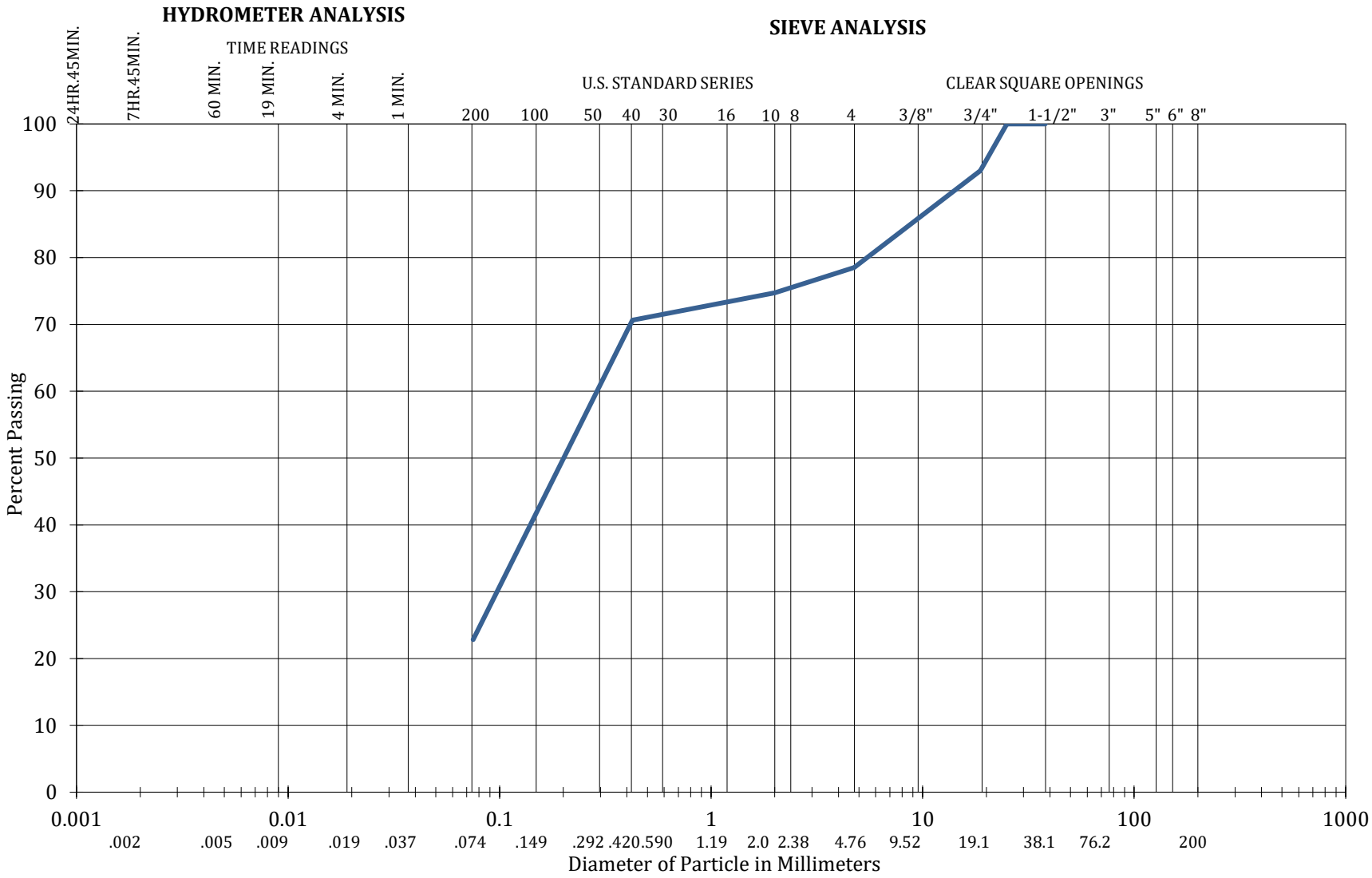
Moisture Content	
Wet Wt + Tare (g)	563.0
Dry Wt. + Tare (g)	521.6
Wt of Water (g)	41.4
Tare Wt. (g)	113.8
Dry Wt. (g)	407.8
Moisture Content	10.2%
Wash	
Wet Wt. + Tare (g)	563.0
Pre Wash Dry (g)	407.8
Post Wash Dry (g)	314.7
Tare Wt. (g)	113.8
Wt.Of Minus #200 =	93.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Brown Clayey Sand w/Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	12/7/2005

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USCS CLASSIFICATION SIEVE CHART



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

BH1-4

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH1-5 Depth (ft): 40'-42'

Unified Soils Classification
SC (Clayey Sand)

Gravel	14%
Sand	57%
Fines	28%

Liquid Limit:	19
Plastic Limit:	4
Plasticity Index:	15

In-Situ Moisture Content	11.6%

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	115.1	115.1	0.0	0%	100%
1"	25	115.1	115.1	0.0	0%	100%
3/4"	18.75	115.1	127.5	12.4	2%	98%
#4	4.75	115.1	186.5	71.4	14%	86%
#10	2.00	115.1	144.7	29.6	19%	81%
#40	0.425	115.1	127.2	12.1	21%	79%
#200	0.075	115.1	411.2	296.1	72%	28%
Pan	0	115.1	282.0	166.9	100%	0%
		Total Weight of Sample (g)		588.5		

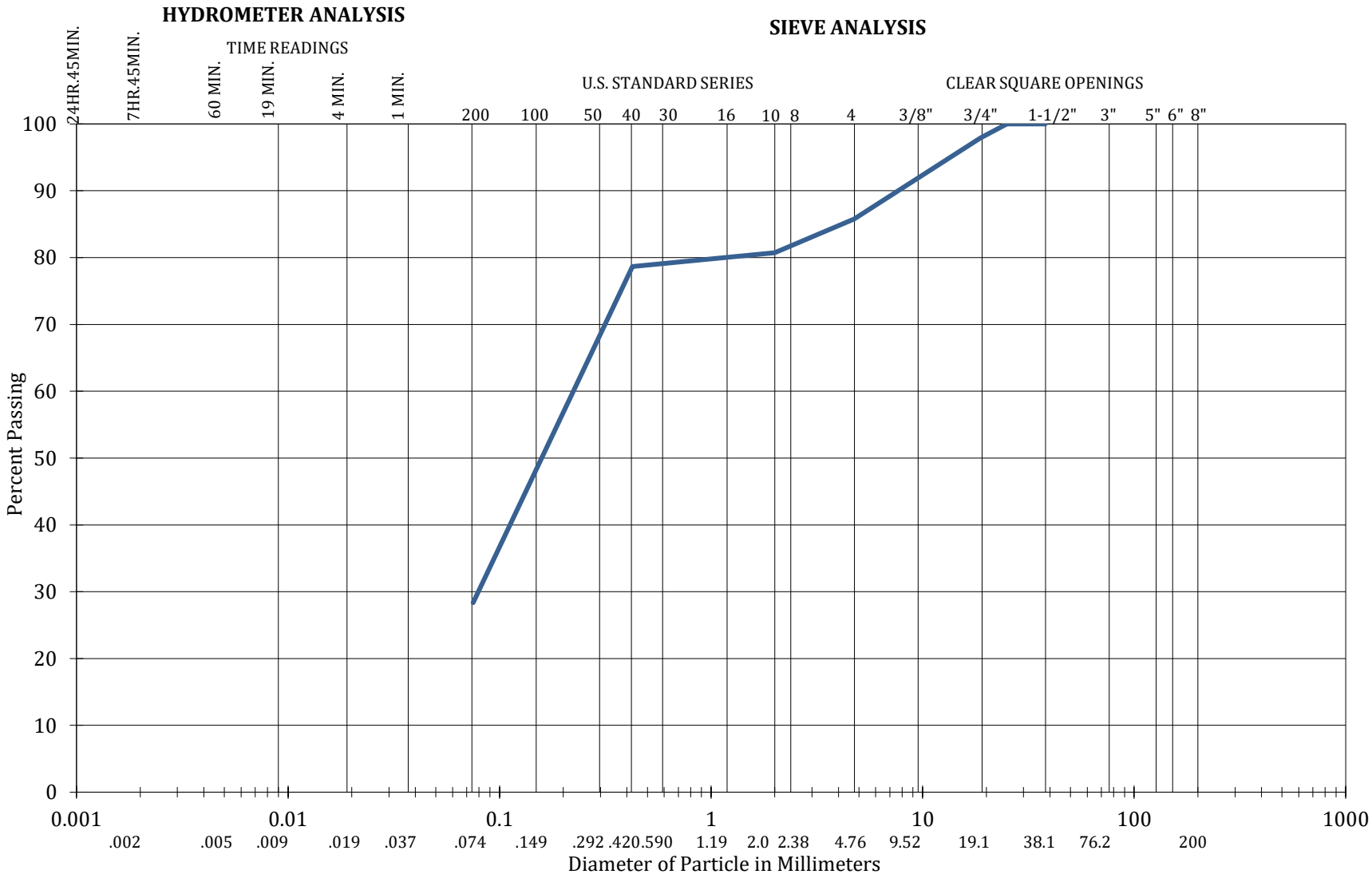
Moisture Content	
Wet Wt + Tare (g)	770.5
Dry Wt. + Tare (g)	702.3
Wt of Water (g)	68.2
Tare Wt. (g)	113.8
Dry Wt. (g)	588.5
Moisture Content	11.6%
Wash	
Wet Wt. + Tare (g)	770.5
Pre Wash Dry (g)	588.5
Post Wash Dry (g)	421.6
Tare Wt. (g)	113.8
Wt.Of Minus #200 =	166.9

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Brown Sandy Clay

Sampled By:	PG
Date:	
Tested By:	AP
Date:	12/7/2005

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USCS CLASSIFICATION SIEVE CHART



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

BH1-5

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH1-6 Depth (ft): 45'-47'

Unified Soils Classification
SC (Clayey Sand)

Gravel	0%
Sand	66%
Fines	34%

Liquid Limit:	30
Plastic Limit:	6
Plasticity Index:	24

In-Situ Moisture Content	19.3%

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.7	110.7	0.0	0%	100%
1"	25	110.7	110.7	0.0	0%	100%
3/4"	18.75	110.7	110.7	0.0	0%	100%
#4	4.75	110.7	110.7	0.0	0%	100%
#10	2.00	110.7	110.7	0.0	0%	100%
#40	0.425	110.7	129.9	19.2	2%	98%
#200	0.075	110.7	622.1	511.4	66%	34%
Pan	0	110.7	382.8	272.1	100%	0%
		Total Weight of Sample (g)		802.7		

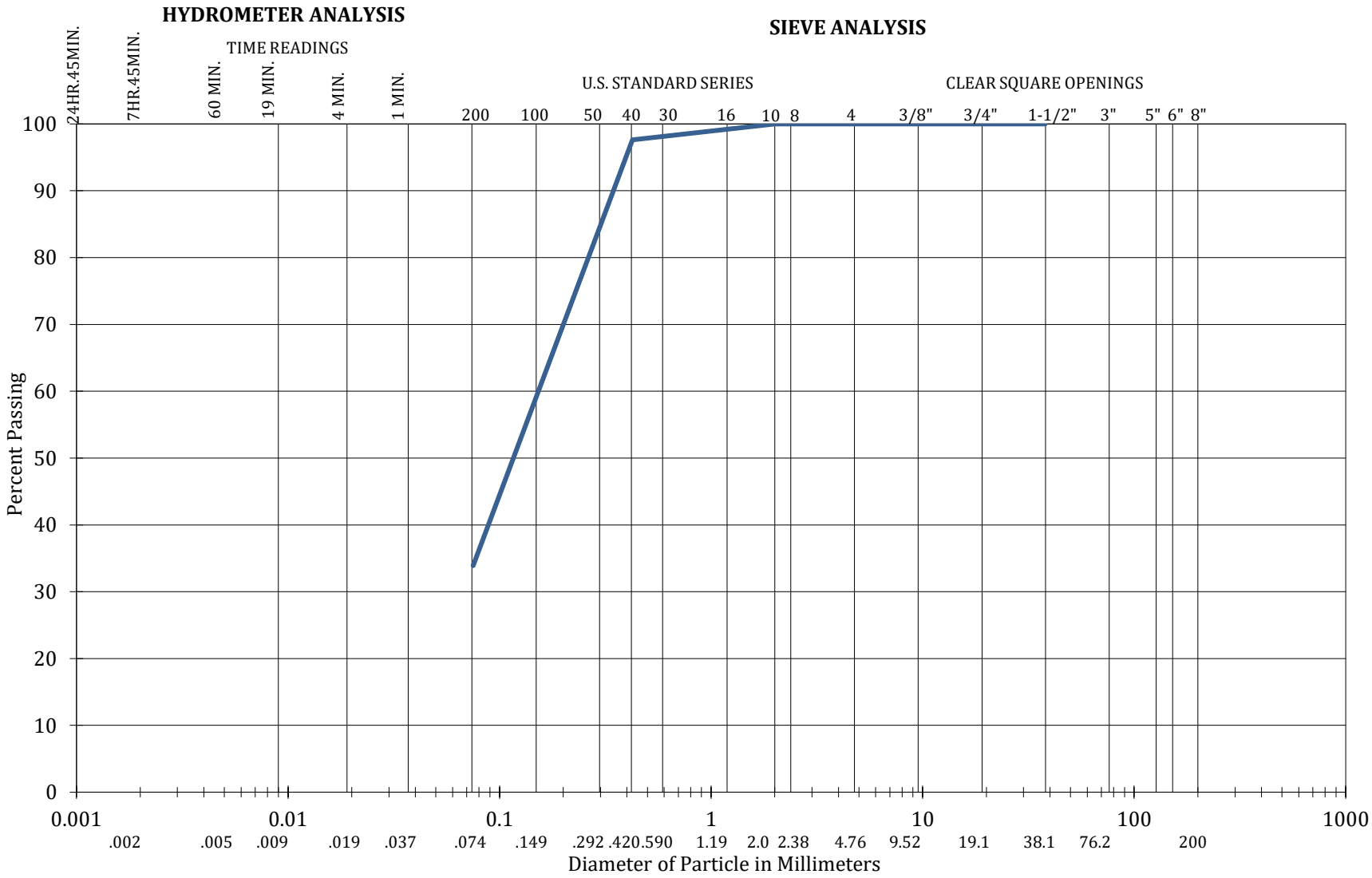
Moisture Content	
Wet Wt + Tare (g)	1067.4
Dry Wt. + Tare (g)	912.6
Wt of Water (g)	154.8
Tare Wt. (g)	109.9
Dry Wt. (g)	802.7
Moisture Content	19.3%
Wash	
Wet Wt. + Tare (g)	1067.4
Pre Wash Dry (g)	802.7
Post Wash Dry (g)	530.6
Tare Wt. (g)	109.9
Wt.Of Minus #200 =	272.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Brown Clayey Sand

Sampled By:	PG
Date:	
Tested By:	AP
Date:	12/7/2005

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USCS CLASSIFICATION SIEVE CHART



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

BH1-6

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH5 @ 23'-28' Depth (ft): 23'-28'

Unified Soils Classification
SC (Clayey Sand)

Gravel	7%
Sand	55%
Fines	38%

Liquid Limit:	29
Plastic Limit:	4
Plasticity Index:	25

In-Situ Moisture Content	N/A

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.1	110.1	0.0	0%	100%
1"	25	110.1	110.1	0.0	0%	100%
3/4"	18.75	110.1	110.1	0.0	0%	100%
#4	4.75	110.1	147.1	37.0	7%	93%
#10	2.00	110.1	134.6	24.5	11%	89%
#40	0.425	110.1	145.4	35.3	18%	82%
#200	0.075	110.1	343.2	233.1	62%	38%
Pan	0	110.1	316.3	206.2	100%	0%
		Total Weight of Sample (g)		536.1		

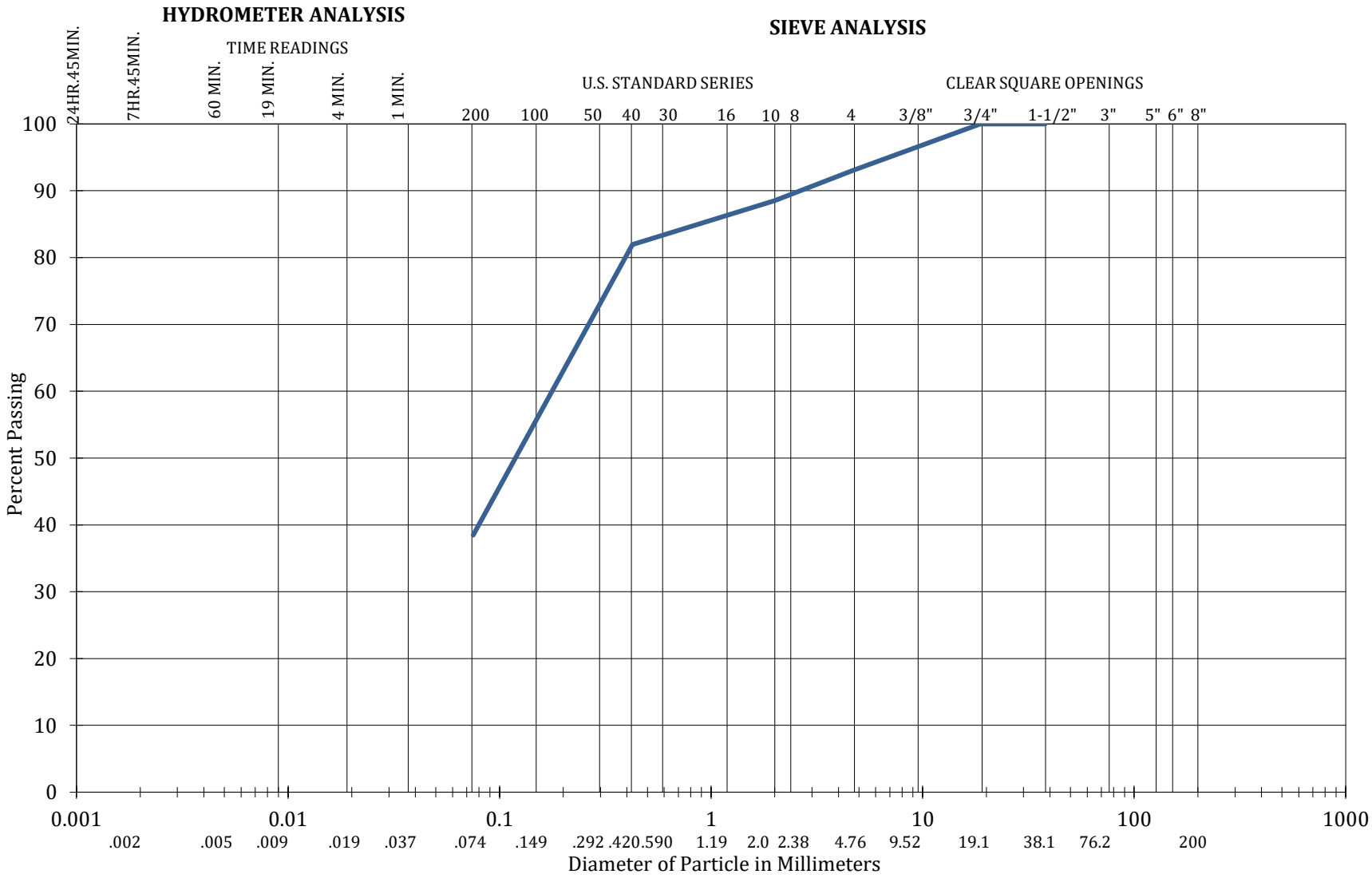
Moisture Content	
Wet Wt + Tare (g)	-
Dry Wt. + Tare (g)	-
Wt of Water (g)	-
Tare Wt. (g)	-
Dry Wt. (g)	-
Moisture Content	-
Wash	
Wet Wt. + Tare (g)	
Pre Wash Dry (g)	536.1
Post Wash Dry (g)	329.9
Tare Wt. (g)	109.9
Wt.Of Minus #200 =	206.2

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Tan Clayey Sand with Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	1/8/2005

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

BH5 @ 23'-28'

Lot 58 Grand View Lodges

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Sample ID: BH5 @ 37'-41' Depth (ft): 37'-41'

Unified Soils Classification
SC (Clayey Sand)

Gravel	7%
Sand	68%
Fines	25%

Liquid Limit:	28
Plastic Limit:	12
Plasticity Index:	16

In-Situ Moisture Content	N/A

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.1	110.1	0.0	0%	100%
1"	25	110.1	110.1	0.0	0%	100%
3/4"	18.75	110.1	110.1	0.0	0%	100%
#4	4.75	110.1	163.8	53.7	7%	93%
#10	2.00	110.1	139.7	29.6	11%	89%
#40	0.425	110.1	196.8	86.7	23%	77%
#200	0.075	110.1	502.4	392.3	75%	25%
Pan	0	110.1	298.2	188.1	100%	0%
		Total Weight of Sample (g)		750.4		

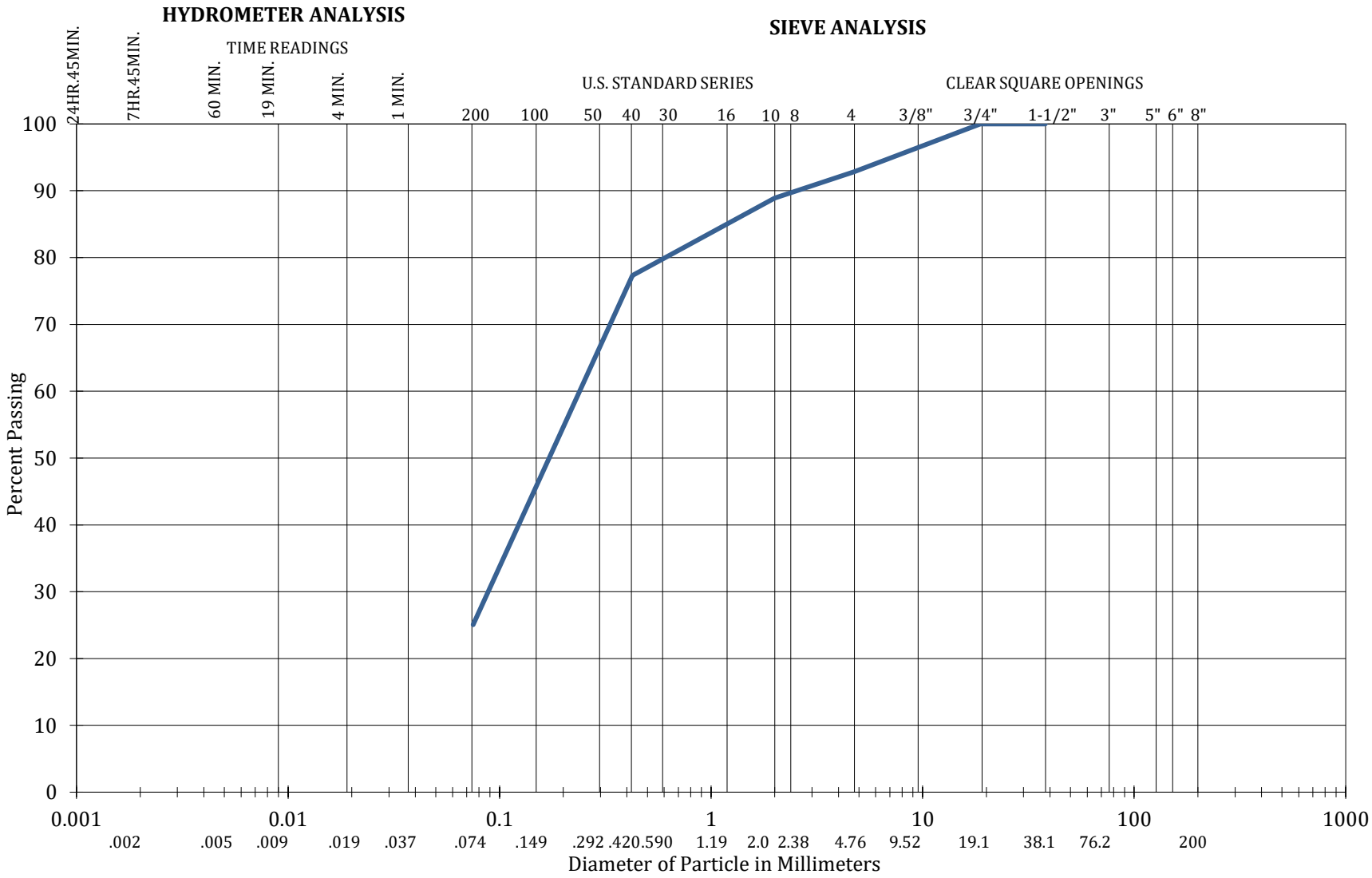
Moisture Content	
Wet Wt + Tare (g)	-
Dry Wt. + Tare (g)	-
Wt of Water (g)	-
Tare Wt. (g)	-
Dry Wt. (g)	-
Moisture Content	-
Wash	
Wet Wt. + Tare (g)	
Pre Wash Dry (g)	750.4
Post Wash Dry (g)	562.3
Tare Wt. (g)	114.3
Wt.Of Minus #200 =	188.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Gray Clayey Sand with Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	1/8/2005

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

BH5 @ 37'-41'

Lot 58 Grand View Lodges

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Sample ID: BH6-4B Depth (ft): 22'-23'

Unified Soils Classification
Lean Clay, CL

Gravel	**0%**
Sand	**12%**
Fines	**87%**

Liquid Limit:	**33**
Plastic Limit:	**15**
Plasticity Index:	**18**

In-Situ Moisture Content	**17.5%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.2	292.2	0.0	0%	100%
1"	25	292.2	292.2	0.0	0%	100%
3/4"	18.75	292.2	292.2	0.0	0%	100%
3/8"	9.5	292.2	292.2	0.0	0%	100%
#4	4.75	292.2	293.3	1.0	0%	100%
#10	2.00	292.2	293.3	1.1	1%	99%
#40	0.425	292.2	304.0	11.8	5%	95%
#100	0.15	292.2	301.3	9.1	9%	91%
#200	0.075	292.2	303.4	11.2	13%	87%
Pan	0	292.2	527.4	235.2	100%	0%
		Total Weight of Sample (g)		**269.3**		

Moisture Content	
Wet Wt + Tare (g)	940.7
Dry Wt. + Tare (g)	825.9
Wt of Water (g)	114.8
Tare Wt. (g)	170.9
Dry Wt. (g)	654.9
Moisture Content	17.5%
Wash	
Wet Wt. + Tare (g)	940.7
Pre Wash Dry (g)	269.3
Post Wash Dry (g)	34.2
Tare Wt. (g)	292.2
Wt.Of Minus #200 =	235.2

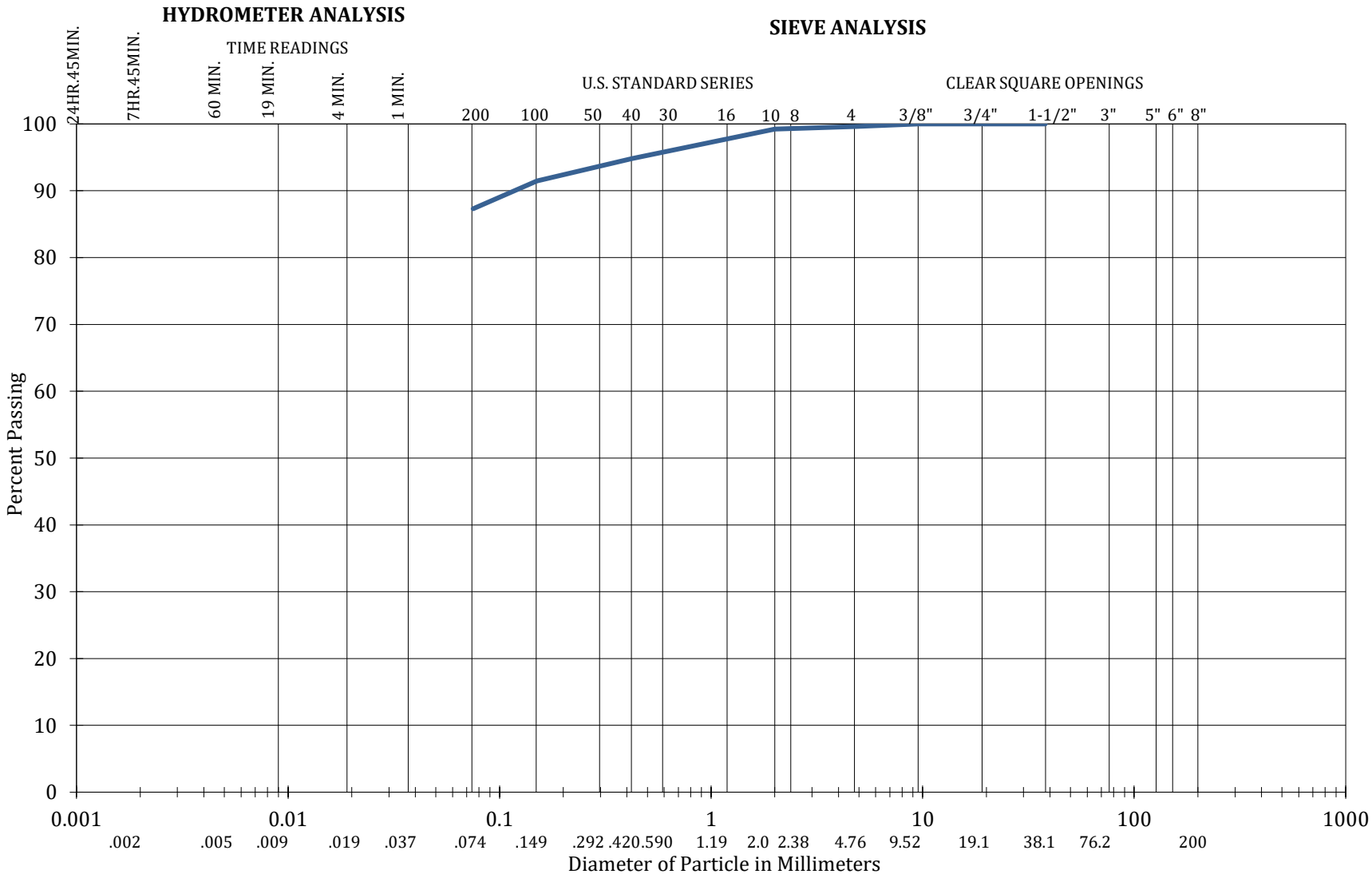
Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Olive Green Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/2/2021

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	FINE	MEDIUM	COARSE	FINE	COARSE	

BH6-4B

Lot 58 Grand View Lodges

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Sample ID: BH6-11 Depth (ft): 52'-53'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**9%**
Sand	**25%**
Fines	**66%**

Liquid Limit:	**25**
Plastic Limit:	**11**
Plasticity Index:	**14**

In-Situ Moisture Content	**16.5%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	171.0	171.0	0.0	0%	100%
1"	25	171.0	171.0	0.0	0%	100%
3/4"	18.75	171.0	171.0	0.0	0%	100%
3/8"	9.5	171.0	205.5	34.5	5%	95%
#4	4.75	171.0	206.3	35.3	9%	91%
#10	2.00	171.0	231.4	60.4	17%	83%
#40	0.425	171.0	226.7	55.7	25%	75%
#100	0.15	171.0	200.2	29.2	29%	71%
#200	0.075	171.0	213.6	42.7	34%	66%
Pan	0	171.0	661.8	490.9	100%	0%
		Total Weight of Sample (g)		**748.7**		

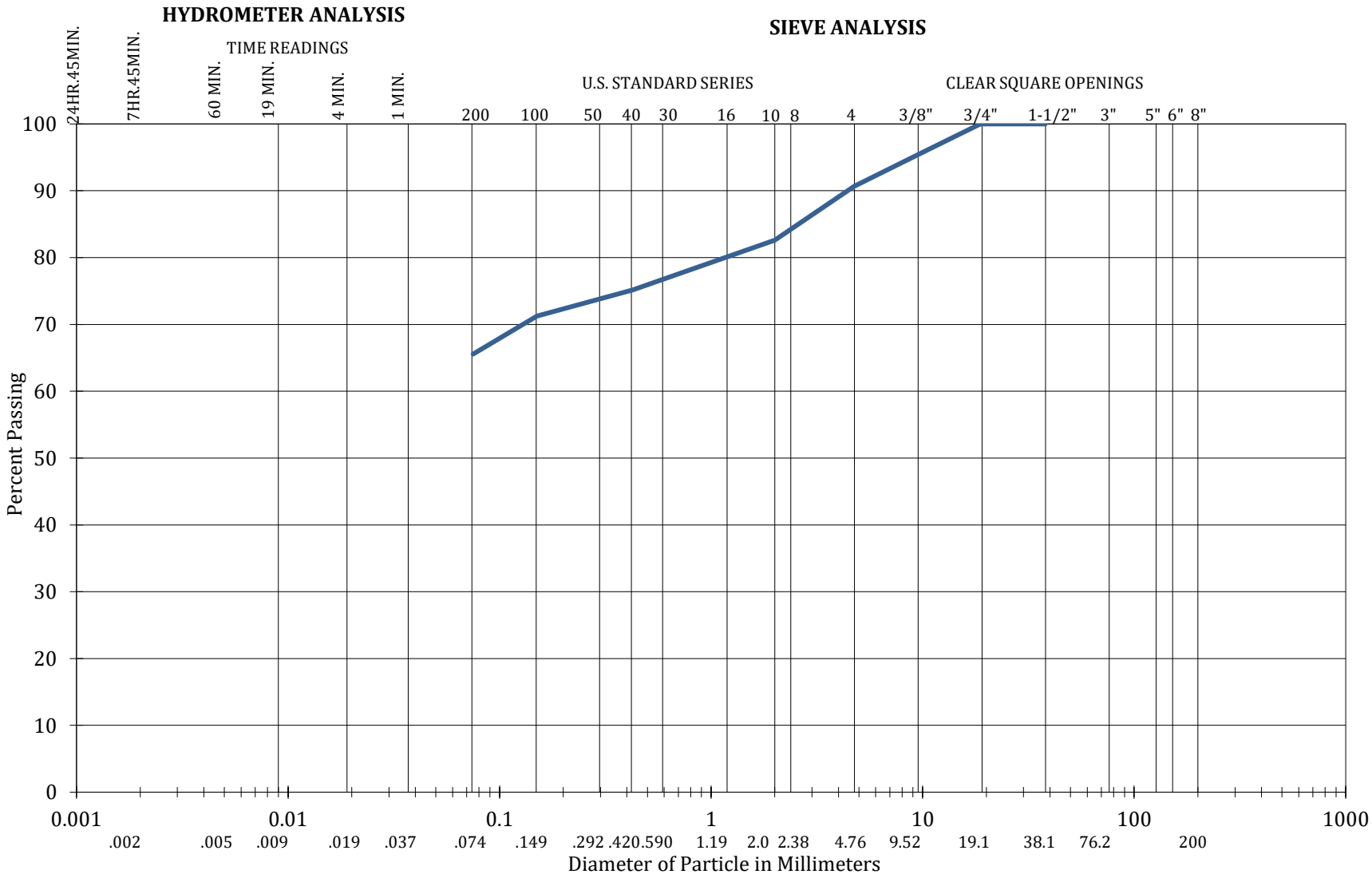
Moisture Content	
Wet Wt + Tare (g)	851.2
Dry Wt. + Tare (g)	754.8
Wt of Water (g)	96.4
Tare Wt. (g)	170.8
Dry Wt. (g)	584.0
Moisture Content	16.5%
Wash	
Wet Wt. + Tare (g)	851.2
Pre Wash Dry (g)	748.7
Post Wash Dry (g)	257.8
Tare Wt. (g)	170.4
Wt.Of Minus #200 =	490.9

Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Sandy Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/7/2021

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

BH6-11

Lot 58 Grand View Lodges

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Sample ID: BH7-4 Depth (ft): 19'-20'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**9%**
Sand	**27%**
Fines	**64%**

Liquid Limit:	**25**
Plastic Limit:	**14**
Plasticity Index:	**11**

In-Situ Moisture Content	**13.2%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.3	292.3	0.0	0%	100%
1"	25	292.3	292.3	0.0	0%	100%
3/4"	18.75	292.3	292.3	0.0	0%	100%
3/8"	9.5	292.3	301.7	9.5	3%	97%
#4	4.75	292.3	307.6	15.4	9%	91%
#10	2.00	292.3	310.8	18.5	16%	84%
#40	0.425	292.3	311.2	18.9	23%	77%
#100	0.15	292.3	306.4	14.1	28%	72%
#200	0.075	292.3	313.4	21.1	36%	64%
Pan	0	292.3	467.0	174.8	100%	0%
		Total Weight of Sample (g)		**272.2**		

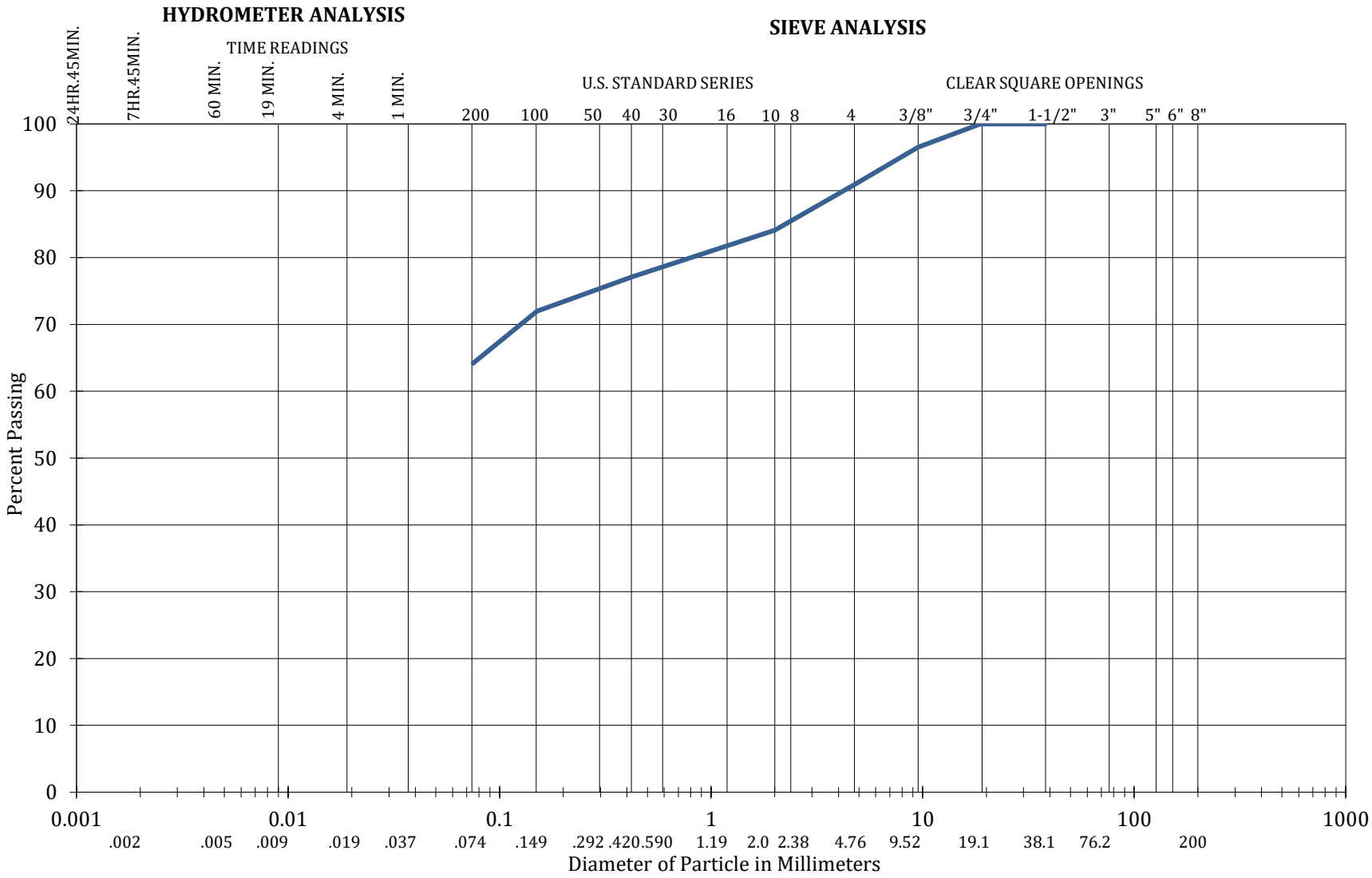
Moisture Content	
Wet Wt + Tare (g)	1193.5
Dry Wt. + Tare (g)	1074.5
Wt of Water (g)	118.9
Tare Wt. (g)	170.9
Dry Wt. (g)	903.7
Moisture Content	13.2%
Wash	
Wet Wt. + Tare (g)	1193.5
Pre Wash Dry (g)	272.2
Post Wash Dry (g)	97.5
Tare Wt. (g)	292.3
Wt.Of Minus #200 =	174.8

Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Sandy Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/2/2021

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

BH7-4

Lot 58 Grand View Lodges

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Sample ID: BH7-6 Depth (ft): 25.5'-26.5'

Unified Soils Classification

Lean Clay with Sand, CL

Gravel	**4%**
Sand	**15%**
Fines	**81%**

Liquid Limit:	**35**
Plastic Limit:	**17**
Plasticity Index:	**18**

In-Situ Moisture Content	**20.6%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.3	292.3	0.0	0%	100%
1"	25	292.3	292.3	0.0	0%	100%
3/4"	18.75	292.3	292.3	0.0	0%	100%
3/8"	9.5	292.3	298.7	6.4	2%	98%
#4	4.75	292.3	297.1	4.8	4%	96%
#10	2.00	292.3	296.7	4.4	5%	95%
#40	0.425	292.3	300.0	7.7	8%	92%
#100	0.15	292.3	302.7	10.4	12%	88%
#200	0.075	292.3	312.9	20.6	19%	81%
Pan	0	292.3	531.7	239.4	100%	0%
		Total Weight of Sample (g)		**293.8**		

Moisture Content	
Wet Wt + Tare (g)	1304.2
Dry Wt. + Tare (g)	1110.3
Wt of Water (g)	193.9
Tare Wt. (g)	170.6
Dry Wt. (g)	939.7
Moisture Content	20.6%
Wash	
Wet Wt. + Tare (g)	1304.2
Pre Wash Dry (g)	293.8
Post Wash Dry (g)	54.4
Tare Wt. (g)	292.3
Wt.Of Minus #200 =	239.4

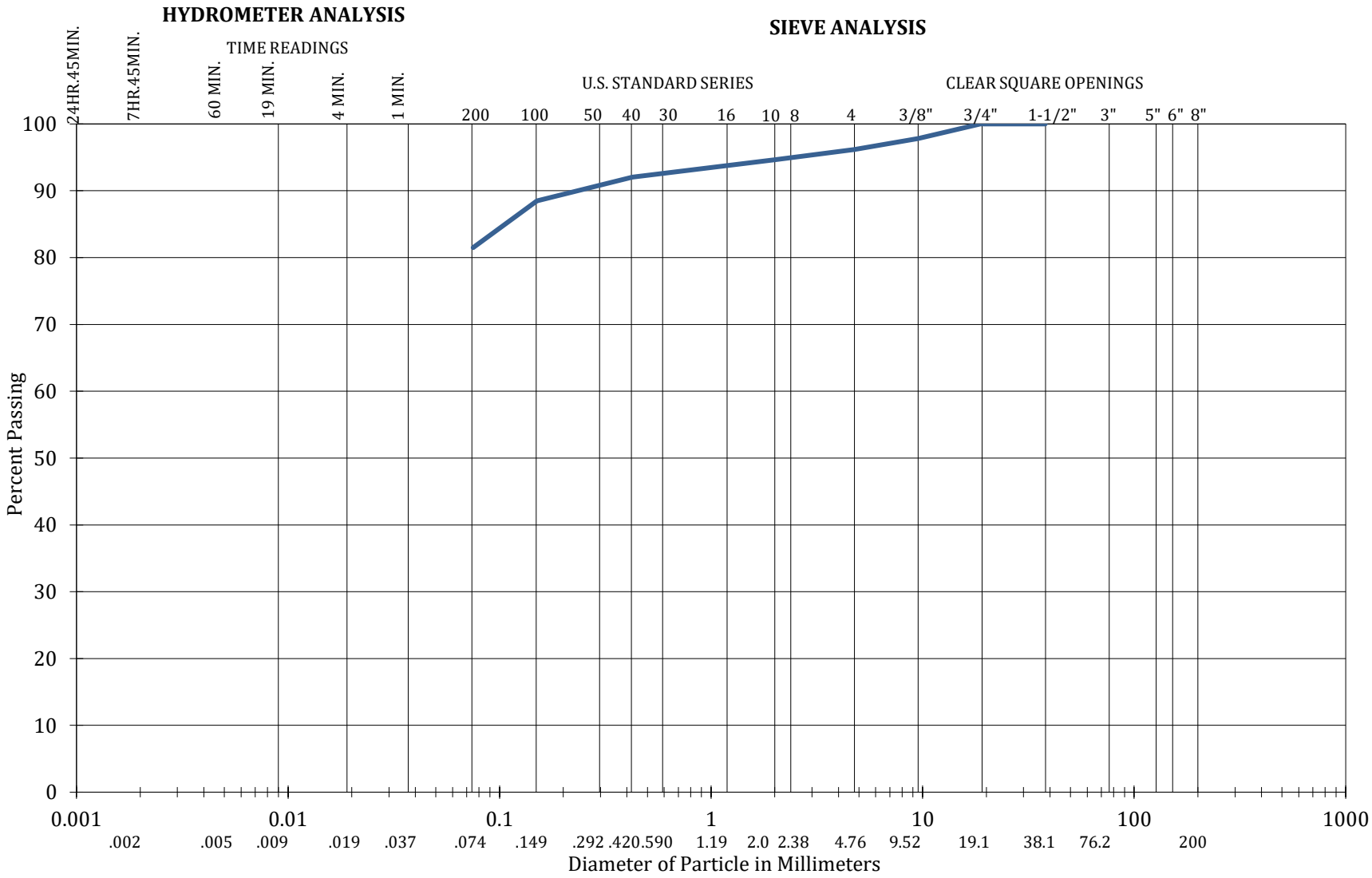
Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/1/2021

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

BH7-6

Lot 58 Grand View Lodges

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Sample ID: BH7-13 Depth (ft): 59'-60'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**11%**
Sand	**22%**
Fines	**67%**

Liquid Limit:	**29**
Plastic Limit:	**15**
Plasticity Index:	**14**

In-Situ Moisture Content	**17.9%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.2	292.2	0.0	0%	100%
1"	25	292.2	332.0	39.8	6%	94%
3/4"	18.75	292.2	292.2	0.0	6%	94%
3/8"	9.5	292.2	306.5	14.2	8%	92%
#4	4.75	292.2	311.7	19.4	11%	89%
#10	2.00	292.2	325.3	33.1	16%	84%
#40	0.425	292.2	327.0	34.8	21%	79%
#100	0.15	292.2	319.8	27.6	25%	75%
#200	0.075	292.2	344.3	52.0	33%	67%
Pan	0	292.2	748.9	456.6	100%	0%
		Total Weight of Sample (g)		**677.5**		

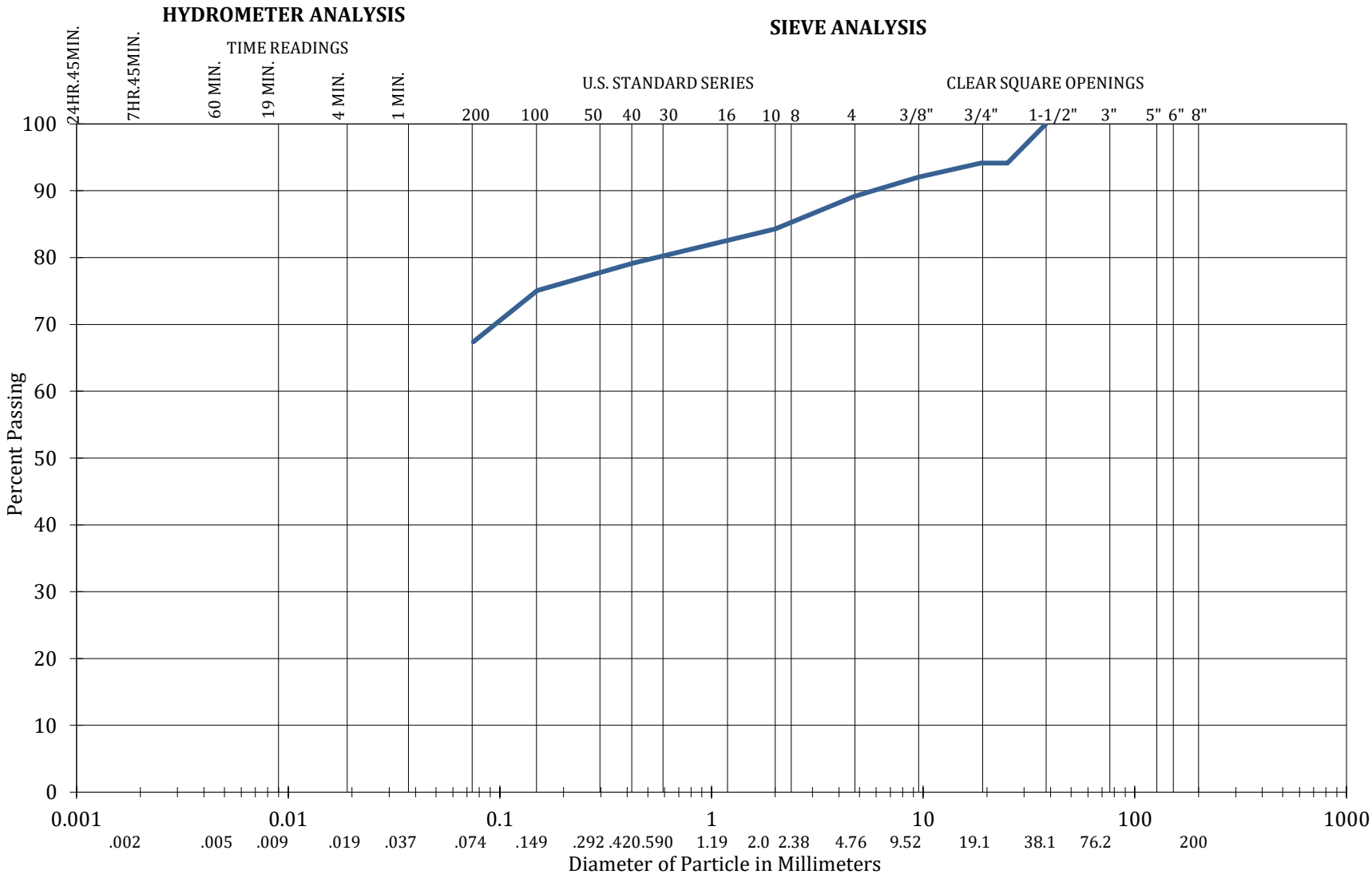
Moisture Content	
Wet Wt + Tare (g)	1000.2
Dry Wt. + Tare (g)	873.8
Wt of Water (g)	126.4
Tare Wt. (g)	169.7
Dry Wt. (g)	704.2
Moisture Content	17.9%
Wash	
Wet Wt. + Tare (g)	1000.2
Pre Wash Dry (g)	677.5
Post Wash Dry (g)	220.9
Tare Wt. (g)	169.7
Wt.Of Minus #200 =	456.6

Project:	Lot 58 Gand View Lodges
Job Number	21-222-02
Visual ID:	Gray Lean Clay with Sand

Sampled By:	AP
Date:	6/25/2021
Tested By:	AE
Date:	7/1/2021

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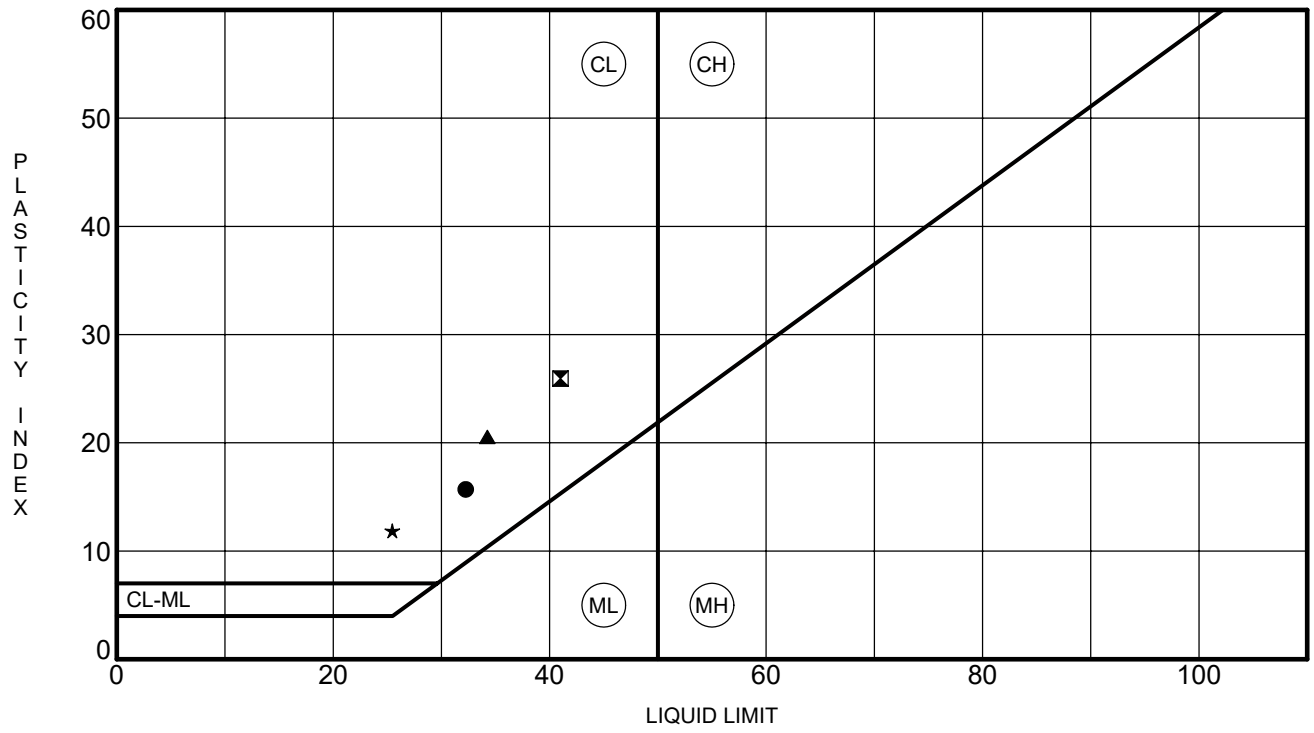
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CLAY (plastic) TO SILT (non-plastic)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

BH7-13

Lot 58 Grand View Lodges



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**TP-1**	**9.0**	**32**	**17**	**15**		
⊠	**TP-1**	**10.0**	**41**	**15**	**26**		
▲	**TP-1**	**25.0**	**34**	**14**	**20**		
★	**TP-1**	**27.5**	**25**	**14**	**11**		

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Telephone: (307)733-7209
Fax:

ATTERBERG LIMITS' RESULTS

Project: TOJ - Snow King Water Tank

Location: Jackson, Wyoming

Number:

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX D

Soil-Engineering Parameters

Engineering parameters for site soils were evaluated based on a variety of methods, including:

- direct laboratory testing (shear strength and consolidation),
- correlations with index tests,
- empirical relationships between SPT N-values and shear strength, and
- visual classification and empirical estimates.

Due to the chaotic and random nature of the soils (i.e., mixture of fine-grained and coarse-grained soils), collecting relatively undisturbed shelby tube samples of fine-grained soil layers during the drilling effort to perform shear tests and consolidation tests on was difficult. Therefore, very limited soil parameters for soil unit weight, consolidation values, and shear strength values were directly determined from their respective tests. Most of the samples that underwent lab testing were disturbed samples collected during SPT sampling and sonic drilling, of which their results were used to estimate the soil parameters based on correlations. Jorgensen Geotechnical (JG) was able to submit two relatively undisturbed Shelby tube samples to undergo consolidation testing, while the 2021 Nelson Engineering Report presented shear testing results from five relatively undisturbed Shelby tube samples, which were reviewed.

A discussion regarding the selection of soils parameters is found below.

Soil Unit Weight

Two consolidation tests were performed which produced dry unit weights, while five shear test results presented in the Nelson Engineering report produced dry unit weights. These direct unit weight measurements, SPT blow counts, and observations made in the open test pits were used to estimate the in-situ unit weight of the soils. Estimated unit weights are presented below in Table D-1.

Table D-1: Estimated Soil Unit Weight Values

Soil Layer	Unit Weight (Pounds per cubic foot)
CL – Lean Clay	115
SC – Clayey Sand	120
GC – Clayey Gravel	125
SC – Weathered Bedrock	140

Consolidation Parameters

Two consolidation tests were performed on samples collected during the drilling effort performed by JG. No consolidation tests were presented in the Nelson Engineering or Womack and Associates, reports. Coefficients of consolidation, C_c, were calculated based on the direct consolidated test results, as well as methods recommended by Skempton (1944), Nagaraj and Murthy (1985), Wroth and Wood (1978), and Kulhawy and Mayne (1990). These calculation methods use index properties such as the Liquid Limit and the Plasticity Index to estimate the coefficients of consolidation. The results presented below are the average of all C_c, values calculated from the direct results and correlation calculations.

Table D-2: Estimated Coefficients of Consolidation

Soil Layer	Coefficient of Consolidation
CL – Clay	0.20
SC – Clayey Sand	0.18
GC – Clayey Gravel	0.16

Strength Parameters

Internal Friction Angle (phi)

Strength parameters used in the slope stability model were selected by examining direct shear results, calculations based on SPT blow count values, as recommended by Hatanaka and Uchida (1996) and Schmertmann (1975), and calculated based on index properties as recommended by Duncan (1989). Minimum, maximum, and average internal friction angles (phi) are summarized in the table below.

Table D-3: Estimated Internal Friction Values (Degrees)

	Minimum	Maximum	Average	Standard Deviation	Selected phi[1]
CL – Clay	30.0	56.3	37.3	7.2	35
SC – Clayey Sand	27.5	54.2	37.9	9.4	37
GC – Clayey Gravel	29.0	63.3	47.5	9.7	40
SC – Weathered Bedrock	--	--	--	--	60

1. Dashes indicate a refusal condition was met during SPT samples, therefore phi value was estimated

As summarized in the table above, the minimum and maximum calculated internal friction angles for a single soil layer sometimes varied by over 20-degrees. Therefore, internal friction angles were selected by reviewing all calculated values, as well as reviewing suggested values in Chapter 9 of the Pit Slope Manual (1982).

Soils that have undergone movement are assumed to be in a residual strength state; i.e., weaker than the strength of the soils prior to the movement. Though the published geologic maps and our observations in the field classified the origin of the soils as landslide debris, no direct shear zones were observed and no signs of previous shearing (i.e., slickensides) were observed. Additionally, loess, typically formed from windblown glacial silt, was observed overlying the landslide deposit, therefore it is assumed the landslide occurred prior to or during the Pinedale Glaciation approximately 10 to 30 thousand years ago. If the soils observed in the boreholes and test pits were once in a residual state following failure, it is assumed since their mobilization in the failure event, they have been naturally consolidating and therefore regaining strength. Therefore, residual shear strengths were not used for the slope stability model and peak shear strengths were used.

Cohesion

Cohesion was added to the material models in the slope stability model to avoid selecting slip surfaces representing the “infinite slope” solution. Cohesion values used in the slope stability models can be found in Appendix F.

Compression Index (C_c) Calculation Spreadsheet

							Skempton	*Nagaraj*	*Wroth*	*Kulhawy*				
Project	**BH**	**Depth**	**LL**	**PL**	**PI**	**Consol Results**	**Compression Index (Cc)**				**Average**	**Median**	**Std Dev**	**Classification**
Bear Development - Snow King Loop Lots 53 and 58	JG-10	12.5-14.0	39	15	24	0.17	*0.26*	*0.24*	*0.32*	*0.32*	0.29	0.29	0.04	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-10	17.5-19.0	32	14	18	0.13	*0.20*	*0.20*	*0.24*	*0.24*	0.22	0.22	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	18-19	31	16	15		*0.19*	*0.19*	*0.20*	*0.20*	0.20	0.20	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	27-29	28	16	12		*0.16*	*0.18*	*0.16*	*0.16*	0.17	0.16	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	54.5-57	33	15	18		*0.21*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	67-69	26	16	10		*0.14*	*0.16*	*0.14*	*0.14*	0.14	0.14	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	72.5-75	38	17	21		*0.25*	*0.24*	*0.28*	*0.28*	0.26	0.27	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	7-8.5	20	15	5		*0.09*	*0.13*	*0.07*	*0.07*	0.09	0.08	0.03	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-02	14.5-16	31	15	16		*0.19*	*0.19*	*0.22*	*0.22*	0.20	0.21	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	22-25	29	15	14		*0.17*	*0.18*	*0.19*	*0.19*	0.18	0.19	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	32-35	21	16	5		*0.10*	*0.13*	*0.07*	*0.07*	0.09	0.08	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	38.5-40	29	17	12		*0.17*	*0.18*	*0.16*	*0.16*	0.17	0.17	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	52-55	16	4	12		*0.05*	*0.10*	*0.16*	*0.16*	0.12	0.13	0.05	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	60-62	37	23	14		*0.24*	*0.23*	*0.19*	*0.19*	0.21	0.21	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	64.5-67	31	17	14		*0.19*	*0.19*	*0.19*	*0.19*	0.19	0.19	0.00	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	69.5-72	21	16	5		*0.10*	*0.13*	*0.07*	*0.07*	0.09	0.08	0.03	SC
Bear Development - Snow King Loop Lots 53 and 58	JG-03	4.5-7	33	14	19		*0.21*	*0.21*	*0.26*	*0.26*	0.23	0.23	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-03	14.5-17	30	15	15		*0.18*	*0.19*	*0.20*	*0.20*	0.19	0.20	0.01	SC
Bear Development - Snow King Loop Lots 53 and 58	JG-03	22-25	35	15	20		*0.23*	*0.22*	*0.27*	*0.27*	0.25	0.25	0.03	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-03	30-33	29	15	14		*0.17*	*0.18*	*0.19*	*0.19*	0.18	0.19	0.01	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-04	7-8.5	34	16	18		*0.22*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-04	14.5-17	19	14	5		*0.08*	*0.12*	*0.07*	*0.07*	0.08	0.07	0.02	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-04	22-25	31	17	14		*0.19*	*0.19*	*0.19*	*0.19*	0.19	0.19	0.00	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-04	30-33	33	15	18		*0.21*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-10	7.5-9	25	16	9		*0.14*	*0.16*	*0.12*	*0.12*	0.13	0.13	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-10	15-17	38	21	17		*0.25*	*0.24*	*0.23*	*0.23*	0.24	0.23	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-11	7.5-9	22	15	7		*0.11*	*0.14*	*0.09*	*0.09*	0.11	0.10	0.02	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-12	5-6.5	27	15	12		*0.15*	*0.17*	*0.16*	*0.16*	0.16	0.16	0.01	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-12	10-11.5	27	17	10		*0.15*	*0.17*	*0.14*	*0.14*	0.15	0.14	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-12	20-21.5	26	14	12		*0.14*	*0.16*	*0.16*	*0.16*	0.16	0.16	0.01	SC
Nelson 53&58	BH1	29.75	27	12	15		*0.15*	*0.17*	*0.20*	*0.20*	0.18	0.19	0.02	SC
Nelson 53&58	BH1	40	19	4	15		*0.08*	*0.12*	*0.20*	*0.20*	0.15	0.16	0.06	SC
Nelson 53&58	BH1	45	30	6	24		*0.18*	*0.19*	*0.32*	*0.32*	0.25	0.26	0.08	SC
Nelson 53&58	BH5	23	29	4	25		*0.17*	*0.18*	*0.34*	*0.34*	0.26	0.26	0.09	SC
Nelson 53&58	BH5	37	18	2	16		*0.07*	*0.11*	*0.22*	*0.22*	0.15	0.16	0.07	SC
Nelson 53&58	BH6	22	33	15	18		*0.21*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	CL
Nelson 53&58	BH6	52	25	11	14		*0.14*	*0.16*	*0.19*	*0.19*	0.17	0.17	0.03	CL
Nelson 53&58	BH7	19	25	14	11		*0.14*	*0.16*	*0.15*	*0.15*	0.15	0.15	0.01	CL
Nelson 53&58	BH7	25.5	35	17	18		*0.23*	*0.22*	*0.24*	*0.24*	0.23	0.23	0.01	CL
Nelson 53&58	BH7	59	29	15	14		*0.17*	*0.18*	*0.19*	*0.19*	0.18	0.19	0.01	CL
Womack Water Tank	TP-1	9	32	17	15		*0.20*	*0.20*	*0.20*	*0.20*	0.20	0.20	0.00	CL
Womack Water Tank	TP-1	10	41	15	26		*0.28*	*0.26*	*0.35*	*0.35*	0.31	0.32	0.05	CL
Womack Water Tank	TP-1	25	34	14	20		*0.22*	*0.21*	*0.27*	*0.27*	0.24	0.24	0.03	CL
Womack Water Tank	TP-1	27.5	25	14	11		*0.14*	*0.16*	*0.15*	*0.15*	0.15	0.15	0.01	CL

Phi Calculation Spreadsheet

Shear Strength Correlation Summary - Peak Friction Angle

					Hatanaka and Uchida (1996)	*Schmertmann (1975)*							Duncan, 1989							
Project	**BH**	**Sample**	**Depth (ft)**	**(N1)60**	**Peak Phi (N160)**	**Peak Phi (N160)**	**Phi (Direct Shear)**	**LL**	**PI**	**Overburden**	**% Clay**	**Peak Phi**	**Classification**	**Unit Weight (pcf)**	**Cohesion**	**Min**	**Max**	**Average**	**Std Dev**
Bear Dev - 53&58	JG-01	D-8	18	--	--	--		31	15			34	CL	115	0	24.0	26.0	25.0	1.4
Bear Dev - 53&58	JG-01	D-12	27	38	47	53		28	12			35	CL	115	0				
Bear Dev - 53&58	JG-01	D-17	37	94	63	60				4300	7		GC	120	0	31.0	32.0	31.5	0.7
Bear Dev - 53&58	JG-01	D-26	47	84	61	59							GC	120	0				
Bear Dev - 53&58	JG-01	D-27	54.5	--	-	-		33	18			32	CL	115	0				
Bear Dev - 53&58	JG-01	D-31	67	56	53	54							CL	115	0	21.0	27.0	23.7	3.1
Bear Dev - 53&58	JG-01	D-32	67	--	-	-		26	10			36	CL	115	0				
Bear Dev - 53&58	JG-01	D-36	72.5	--	-	-		38	21			31	CL	115	0				
Bear Dev - 53&58	JG-01	D-39	80	35	47	48							GC	120	0				
Bear Dev - 53&58	JG-02	D4	7	-	-	-		20	5			37	GC	120	0	31.0	31.0	31.0	
Bear Dev - 53&58	JG-02	D8	14.5	-	-	-		31	16			32	CL	115	0				
Bear Dev - 53&58	JG-02	D9	17	6	31	31							CL	110	0				
Bear Dev - 53&58	JG-02	D11	22	-	-	-		29	14			30	CL	110	0	23.0	31.0	26.0	3.6
Bear Dev - 53&58	JG-02	D13	27	24	42	47							CL	110	0				
Bear Dev - 53&58	JG-02	D16	32	-	-	-		21	5			37	CL	110	0				
Bear Dev - 53&58	JG-02	D18	37	24	42	46		29	12			35	CL	110	0				
Bear Dev - 53&58	JG-02	D22	44.5	-	-	-				5500	8		GC	125	0	31.0	32.0	31.5	0.7
Bear Dev - 53&58	JG-02	D23	47	45	50	52							GC	125	0				
Bear Dev - 53&58	JG-02	D26	52	-	-	-		16	12			35	CL	110	0				
Bear Dev - 53&58	JG-02	D28	57	45	50	52							CL	125	0				
Bear Dev - 53&58	JG-02	D30	60	-	-	-		37	14			30	CL	125	0	23.0	26.0	24.0	1.7
Bear Dev - 53&58	JG-02	D32	64.5	-	-	-		31	14			30	CL	125	0				
Bear Dev - 53&58	JG-02	D33	67	66	56	56							CL	125	0				
Bear Dev - 53&58	JG-02	D35	69.5	-	-	-		21	5			37	SC	125	0	31.0	31.0	31.0	
Bear Dev - 53&58	JG-02	D40	80	59	54	54							SC	125	0				
Bear Dev - 53&58	JG-03	D3	4.5	-	-	-		33	19				CL	110	0	21.0	21.0	21.0	
Bear Dev - 53&58	JG-03	D4	7	7	31	33							CL	110	0				
Bear Dev - 53&58	JG-03	D8	14.5	-	-	-		30	15			34	SC	120	0	24.0	24.0	24.0	
Bear Dev - 53&58	JG-03	D9	17	33	46	51							SC	120	0				
Bear Dev - 53&58	JG-03	D12	22	-	-	-		35	20			31	GC	120	0				
Bear Dev - 53&58	JG-03	D14	27	22	41	45							GC	120	0	23.0	21.0	22.0	1.4
Bear Dev - 53&58	JG-03	D19	35	17	38	40		29	14			30	GC	120	0				
Bear Dev - 53&58	JG-04	D4	7	8	33	35		34	18			32	CL	110	0	23.0	23.0	23.0	
Bear Dev - 53&58	JG-04	D8	14.5	-	-	-		19	5			37	GC	125	0	31.0	31.0	31.0	
Bear Dev - 53&58	JG-04	D9	17	49	51	55							GC	125	0				
Bear Dev - 53&58	JG-04	D12	2	-	-	-		31	14			30	CL	115	0	23.0	23.0	23.0	
Bear Dev - 53&58	JG-04	D14	27	21	40	44							CL	115	0				
Bear Dev - 53&58	JG-04	D17	30	-	-	-		33	18			32	GC	125	0	23.0	23.0	23.0	
Bear Dev - 53&58	JG-04	D19	35	83	61	59							GC	125	0				
Bear Dev - 53&58	JG-10	D-1	2.5	4	29	28		25	9			36	SC	110	0	26.0	26.0	26.0	
Bear Dev - 53&58	JG-10	D-2	5	11	35	38							CL	110	0				
Bear Dev - 53&58	JG-10	D-3	7.5	9	33	34							CL	110	0				
Bear Dev - 53&58	JG-10	D-4	10	18	39	43							CL	115	0				
Bear Dev - 53&58	JG-10	U1	12.5	-	-	-		39	24			31	CL	110	0	18.0	24.5	21.8	2.4
Bear Dev - 53&58	JG-10	D-5	15	11	35	37		38	17	4200	36	33	CL	110	0				
Bear Dev - 53&58	JG-10	U2	17.5	-	-	-		32	18			32	CL	110	0				
Bear Dev - 53&58	JG-10	D-6	20	14	37	38							CL	110	0				
Bear Dev - 53&58	JG-11	D-1	2.5	16	43	49							GC	115	0				
Bear Dev - 53&58	JG-11	D-2	5	50	52	56							GC	125	0				
Bear Dev - 53&58	JG-11	D-3	7.5	20	40	45		22	7			37	GC	115	0				
Bear Dev - 53&58	JG-11	D-4	10	16	38	41				3600	17		GC	115	0	31.0	27.0	29.7	2.3
Bear Dev - 53&58	JG-11	D-5	12.5	33	46	50							GC	125	0				
Bear Dev - 53&58	JG-11	D-6	15	31	45	49							GC	120	0				
Bear Dev - 53&58	JG-11	D-7	17.5	79	60	59							GC	125	0				
Bear Dev - 53&58	JG-11	D-8	19	77	59	59							GC	125	0				
Bear Dev - 53&58	JG-12	D-1	2.5	5	30	29							GC	110	0				
Bear Dev - 53&58	JG-12	D-2	5	55	53	57		27	12			35	GC	125	0	26.0	26.0	26.0	
Bear Dev - 53&58	JG-12	D-3	7.5	78	59	59							GC	125	0				
Bear Dev - 53&58	JG-12	D-4	10	15	37	40		27	10			36	CL	115	0	27.0	27.0	27.0	
Bear Dev - 53&58	JG-12	D-5	12.5	17	39	42							CL	115	0				
Bear Dev - 53&58	JG-12	D-6	15	41	49	53							GC	120	0	26.0	26.0	26.0	
Bear Dev - 53&58	JG-12	D-7	17.5	45	50	53							GC	120	0				
Bear Dev - 53&58	JG-12	D-8	20	20	40	43		26	12			35	GC	120	0				
Nelson 53&58	BH1	4	29.75	10	32			27	15			34	SC	115					
Nelson 53&58	BH1	5	40	30	38			19	15			34	SC	125					
Nelson 53&58	BH1	6	45	16	33			30	24			31	SC	120		20	32	26.8333	
Nelson 53&58	BH5	-	23	-	-			29	25			30	SC	120					
Nelson 53&58	BH5	-	37	-	-			18	16			32	SC	120		20	32	26.5	
Nelson 53&58	BH6	4	22	15	32			33	18			32	CL	108.3					
Nelson 53&58	BH6	11	52	-	-		37	25	14			30	CL	115		22	30	26.5	
Nelson 53&58	BH7	4	19	-	-		41.9	25	11			36	CL	100					
Nelson 53&58	BH7	6	25.5	21	35			35	18			32	CL	100.8					
Nelson 53&58	BH7	13	59	21	35			29	14			30	CL	113.8		23	31	27.3333	
Womack Water Tank	TP-1		9					32	15			34	CL	110					
Womack Water Tank	TP-1		10					41	26			30	CL	110					
Womack Water Tank	TP-1		25					34	20			31	CL	110					
Womack Water Tank	TP-1		27.5					25	11			36	CL	110		20	30	25.625	

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX E

Calculations

Settlement Methodology

The settlement calculations assume the soil layer of concern comprises 100% compressible soil by volume. Though, some soils at the site only partially comprise the fine-grained soils by mass, as described in the borehole logs. Based on lab testing and visual classification, the clayey sand soils contain a maximum of 45% fines by mass. To convert the assumed mass to volume, we have used a scaling factor of 1.25, resulting in an assumed percent fines by volume of 55%.

Because the settlement is anticipated to only occur in the potentially compressible, fine-grained soils, the total settlement calculation was reduced by 55%.

Lateral Pressures Methodology

Seismic coefficients were calculated based on recommendation from NCHRP Report 611 “Seismic Analysis and Desing of Retaining Walls, Buried Structures, Slopes and Embankments” and FHWA NHI Course No 130094 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, as described below and illustrated in the equations. For our calculations, we used an average wall height of 30’ to account for the retaining wall at the site, and since the retaining wall is considered a brittle system with negligible allowable displacement, we used an r value of 1 (FHWA, 2011). In summary, the seismic coefficient (ks) is determined by applying a scaling factor (α) to the modified peak ground acceleration (PGAm).

Settlement Calculation Spreadsheet

Project: Bear Development
Project Number: 23072
Engineer: HC
Soil Sample: Average Cc value CL
Scenario: Direclty on poor soil

Settlement analysis of in-situ soil (only analyzing a maximum of 2B worth of soil below footing)

Key:

Manual Input
Calculation

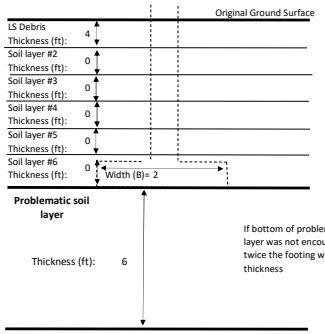
Step 1:

In-Situ Soil Properties of Problematic Soil			
	Soil Description: Lean Clay AF		
	Source of Soil Properties: SK Lab tests		
	Dry unit Weight:	15	pcf
	Moisture Content:	10.0%	
	Moist unit weight:	16.5	pcf
(Avergae 0.4 to 0.7)	Initial Void Ratio (e_0):	0.427	Vv/Vs
(Average 0.2 to 0.5)	Coefficient of Consol. (C_c):	0.2	

Step 2:

Original Overburden Pressure on Soil Element Identified in Step #1			
Soil Layer #1	Unit Weight	135	**PCF**
LS Debris	Thickness	4	**Ft.**
Soil Layer #2	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #3	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #4	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #5	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #6	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Problematic Soil Layer	Unit Weight	125	**PCF**
Below Footing	Thickess (H_0)	6	**Ft.**
Total Original Overburdern Pressure on Soil Element:		915	**PSF**

Pre-construction status. Footing is superimposed.



If bottom of problematic soil layer was not encountered, use twice the footing width for thickness

Step 3:

Foundation Characteristics		
Footing load:	3,000	psf
Estimated Footing Width (B):	2	ft
Footing Depth (D_f):	3	ft
Applied footing load applied to soil element (assuming 2V:1H)	1200	PSF

Step 4:

Backfill Soil Properties		
Dry Unit Weight:	120	pcf
Moisture Content:	12.0%	
Moist Unit Weight:	134.4	pcf
Backfill Depth:	3	ft

Step 5:

Settlement Calculation at Soil Element Identified in Step #2		
Thickness of Problematic Soil Layer (H_0):	6	ft
Depth to soil element below **OG**:	7	ft
Depth to soil element below footing:	3	ft
Original Overburden (σv_0):	915.0	psf
Applied foundation load at soil element :	1200.0	psf
Post Construction pressure at soil element (σv):	1978.2	
Change in presure at soils element:	1063	psf
$(\sigma v_f)/(\sigma v_0)$	2.162	
$Log[(\sigma v_f)/(\sigma v_0)]$	0.335	
$1+e_0$	1.427	
$H_0/(1+e_0)$	4.205	
Inches per foot:	12	
Settlement:	3.38	inches

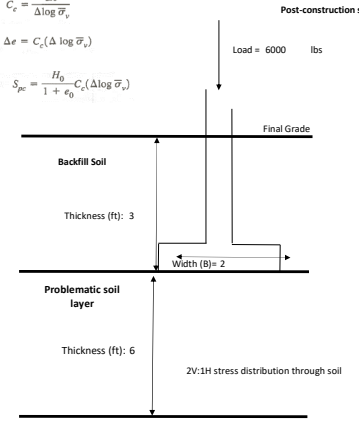
Settlement: $\text{Settlement} = S_{pc} = H_0\left(\frac{\Delta e}{1+e_0}\right)$

Compression Index: $C_c = \frac{\Delta e}{\Delta \log \overline{\sigma}_v}$

Rearranging gives: $\Delta e = C_c(\Delta \log \overline{\sigma}_v)$

Subistituting in gives: $S_{pc} = \frac{H_0}{1+e_0} C_c(\Delta \log \overline{\sigma}_v)$

Post-construction status



This formula is only valid for footings PLACED DIRECTLY ON PROBLEMATIC SOIL LAYER

$$S_{pc} = \frac{H_0}{1+e_0} C_c(\log \overline{\sigma}_{v_f} - \log \overline{\sigma}_{v_o}) = \frac{H_0}{1+e_0}(C_c)\log(\overline{\sigma}_{v_f}/\overline{\sigma}_{v_o})$$

Settlement Calculation Spreadsheet

Project: Bear Development
Project Number: 23072
Engineer: HC
Soil Sample: Average Cc value SC
Scenario: Direclty on poor soil

Settlement analysis of in-situ soil (only analyzing a maximum of 2B worth of soil below footing)

Key:

Manual Input
Calculation

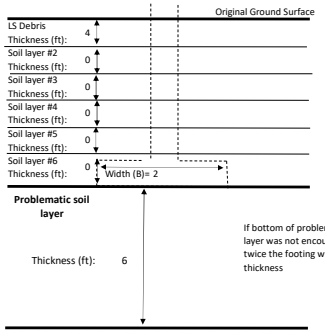
Step 1:

In-Situ Soil Properties of Problematic Soil			
	Soil Description: Lean Clay AF		
	Source of Soil Properties: SK Lab tests		
	Dry unit Weight:	15	pcf
	Moisture Content:	10.0%	
	Moist unit weight:	16.5	pcf
(Avergae 0.4 to 0.7)	Initial Void Ratio (e_0):	0.427	Vv/Vs
(Average 0.2 to 0.5)	Coefficient of Consol. (C_c):	0.18	

Step 2:

Original Overburden Pressure on Soil Element Identified in Step #1			
Soil Layer #1	Unit Weight	135	**PCF**
LS Debris	Thickness	4	**Ft.**
Soil Layer #2	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #3	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #4	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #5	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #6	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Problematic Soil Layer	Unit Weight	125	**PCF**
Below Footing	Thickess (H_0)	6	**Ft.**
Total Original Overburdern Pressure on Soil Element:		915	**PSF**

Pre-construction status. Footing is superimposed.



If bottom of problematic soil layer was not encountered, use twice the footing width for thickness

Step 3:

Foundation Characteristics		
Footing load:	3,000	psf
Estimated Footing Width (B):	2	ft
Footing Depth (D_f):	3	ft
Applied footing load applied to soil element (assuming 2V:1H)	1200	PSF

Step 4:

Backfill Soil Properties		
Dry Unit Weight:	120	pcf
Moisture Content:	12.0%	
Moist Unit Weight:	134.4	pcf
Backfill Depth:	3	ft

Step 5:

Settlement Calculation at Soil Element Identified in Step #2		
Thickness of Problematic Soil Layer (H_0):	6	ft
Depth to soil element below **OG**:	7	ft
Depth to soil element below footing:	3	ft
Original Overburden (σv_0):	915.0	psf
Applied foundation load at soil element :	1200.0	psf
Post Construction pressure at soil element (σv):	1978.2	
Change in presure at soils element:	1063	psf
$(\sigma v_f)/(\sigma v_0)$	2.162	
$Log[(\sigma v_f)/(\sigma v_0)]$	0.335	
$1+e_0$	1.427	
$H_0/(1+e_0)$	4.205	
Inches per foot:	12	
Settlement:	3.04	inches

Note: Maximum % fines by mass 45%. Scaling factor of 1.25 used to assume volume of fines, resulting in 55%.

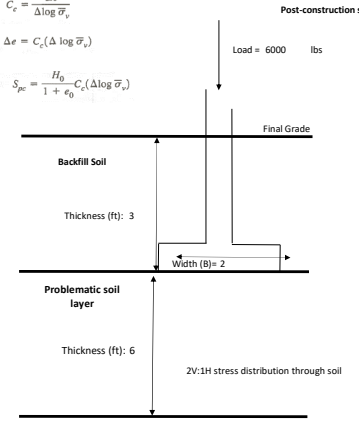
Settlement: $\text{Settlement} = S_{pc} = H_0\left(\frac{\Delta e}{1+e_0}\right)$

Compression Index: $C_c = \frac{\Delta e}{\Delta \log \bar{\sigma}_v}$

Rearranging gives: $\Delta e = C_c(\Delta \log \bar{\sigma}_v)$

Subistituting in gives: $S_{pc} = \frac{H_0}{1+e_0} C_c(\Delta \log \bar{\sigma}_v)$

Post-construction status



This formula is only valid for footings PLACED DIRECTLY ON PROBLEMATIC SOIL LAYER

$$S_{pc} = \frac{H_0}{1+e_0} C_c(\log \bar{\sigma}_{v_f} - \log \bar{\sigma}_{v_o}) = \frac{H_0}{1+e_0}(C_c)\log\left(\bar{\sigma}_{v_f}/\bar{\sigma}_{v_o}\right)$$

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Project Bear Dev | Project No. 23072
Calculated By JBJ | Date 12/20/2023
Sheet 1 of 1

Known:
$F_v = 1.5$
$S_1 = 0.336$
$k_{max} = 0.545$
$H = 30'$
$PGA = 0.454$
$r = 1.0$
$f_a = 1.2$

$\beta = (F_v S_1) / k_{max}$

$\alpha = 1 + 0.01 H [(0.5\beta) - 1]$

$k_s = r PGA \alpha$

$\beta = (1.5)(0.336) / 0.545$

$\boxed{\beta = 0.92}$

$\alpha = 1 + 0.01(30)[(0.5)(0.92) - 1]$

$\boxed{\alpha = 0.838}$

$k_s = (1.0)(0.454)(0.838)$

$k_s = 0.38$

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX F

Slope-Stability Analysis

Slope-Stability Analysis

Methodology

1. **Analyses:** Slope stability analyses were performed using the SLOPE/W stability module of GeoStudio 2023.1.2 version 23.1.2.11, produced by Bentley Systems. The Morgenstern-Price limit equilibrium method, which takes into consideration moment and force equilibrium, was used to analyze slope stability.

   Based on the existing and proposed geometry of the project and the mapped geology, we determined the project area may be subject to potential failure. Therefore, we evaluated each cross-section for existing conditions, proposed conditions, and seismic proposed conditions scenarios.

2. **Geometry:** Two cross-sections for the project were analyzed: Cross sections B-B' and C-C' (Figure 4 and Figure 5). Cross section locations are shown in Figure 2. The Cross Section B-B' Proposed Conditions model includes foundation loads for each housing unit because the applied loads from the buildings foundation elements and the change in geometry were identified as potential items that can affect the factor of safety (FS). The Cross Section C-C' Proposed Conditions also includes foundation loads for each housing unit, as well as the existing retaining wall on Lot 53. We based the external existing geometry on topographic data collected by Jorgensen Associates, Inc., proposed finished grade elevations were taken for the preliminary design documents provided by Hoyt Architects, and we based the internal geometry (material boundaries within the slope) on the results of the subsurface exploration (i.e., borehole and test pit logs), statistical correlations based on published literature, geologic conditions, and our experience with similar soils in the area.

   Subsurface conditions at the site were dominated by chaotically deposited landslide debris consisting of fine-grained Lean Clay (CL) and coarse-grained Clayey Gravels (GC) and Clayey Sands (SC). Often, soil layers identified in the SPT samples didn't correspond to similar soil layers at similar depths in the other boreholes indicating the soil layers were not continuous. To create a subsurface soil model with continuous soil layers, the discrete soil samples were interpolated and often combined between boreholes. Where discrete soil samples of different soil types were combined, an average phi value of the combined samples was applied to the entire soil layer.

3. **Materials:** We estimated the shear strength parameters used in the analyses based on correlation to index tests and direct shear testing from the previous Geotechnical Investigation Report from July 2021, provided by Nelson Engineering. See the discussion in Appendix D regarding development of the soil-engineering parameters. Final parameters used in the stability analysis are summarized below in Table F-1.

   Where two separate soil classifications were combined to one layer (i.e., GC/CL), a unit weight and phi angle were selected using a "weighted average" approach; the boreholes shown on figures 4 and 5 were reviewed and depending on the soil shown in each borehole, a weighted average value was selected.

   We used a Mohr-Coulomb strength model to define the soil parameters. Two parameters are used to describe this strength model: cohesion (c) and friction angle (φ). Cohesion is the soil's shear strength at zero overburden stress, and the friction angle expresses the relationship between overburden stress and shear stress. Mathematically, the shear strength is defined by the equation: $\tau = c + \sigma_n \tan(\varphi)$, where τ is the shear strength and σ_n represents the overburden stress. We used effective stress parameters as the soils are anticipated to drain well.

Table F-1: Soil Parameters Used for Slope Stability Analysis B-B'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (CL)	115	100[1]	35
Landslide Debris (GC)	125	50[2]	40
Landslide Debris (GC/CL)	120	100[2]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

Table F-2: Soil Parameters Used for Slope Stability Analysis C-C'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (GC/CL)	120	100[1]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

4. **Phreatic Surface:** Groundwater was encountered during the subsurface exploration in borehole JG-02, JG-03, and JG-04 during the subsurface exploration and are summarized below in Table F-2. Groundwater conditions encountered in the field were used in the slope stability model. It is important to note, the subsurface exploration occurred during a time of year when peak groundwater conditions are assumed to have already occurred, implying potential peak groundwater conditions are *not* shown in the model and are unknown.

Table F-3: Groundwater Conditions

Borehole	Date	Depth BGS (ft)	Approximate Elevation (ft)
JG-02	October 1 and 2, 2023	47	6,393
JG-03	October 2, 2023	27 to 30	6379 to 6376
JG-04	October 2, 2023	30	6374

5. **Seismicity:** Each post-construction scenario was evaluated in a seismic condition. Based on the ReMi and MASW results provided by Atlas Geophysics and direct shear testing data in the previous Nelson Engineering Site Investigation Report, the site is categorized as Site Class C – Very Dense Soil and Soft Rock. Seismicity was incorporated into the model using a pseudo-static limit equilibrium analysis approach where inertial forces from seismic accelerations were applied statically to the model. Seismic loads have been applied to the critical slip surface determined by static analysis for each post construction cross section, as it is assumed to be the most stressed region within the slope (Abramson et al., 2002). A seismic coefficient (k_s) of 0.163 was applied to cross section B-B' and a seismic coefficient of 0.169 was applied to cross section C-C'.

Seismic coefficients were calculated based on recommendation from NCHRP Report 611 "Seismic Analysis and Desing of Retaining Walls, Buried Structures, Slopes and Embankments" and FHWA NHI Course No 130094 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, as described below and illustrated in the equations. In summary, the seismic coefficient (k_s) is determined by applying a scaling factor (α) to the modified peak ground acceleration (PGA_m). Additionally, a seismic FS of 1.1 was used because it is assumed the system is ductile and an allowable total permanent seismic deformation of 2.0-inches is acceptable.

$$\beta=F_v \cdot S_1/PGA_m$$

$$\alpha=1+0.01H[(0.5\beta)-1]$$

$$k_s = r^* PGA_m * \alpha$$

Where:

- β = 0.92
- F_v = 1.5
- S_1 = 0.336
- PGA_m = 0.545
- α is equal to 0.595 for the B-B' seismic model, and α is equal to 0.623 for the C-C' seismic model.
- *H* is equal to the height of the critical slip surface; we used conservative values of 75' for the B-B' seismic model, and 70' for the C-C' seismic model
- r = 0.5. A value of 0.5 is used in calculating k_s when dealing with ductile systems (i.e., soils with no rigid structures) with allowable permanent seismic deformation of up to 2-inches.
- PGA is equal to 0.454, taken from ASCE 7-16 seismic design tool.

Our calculations can be found attached to this Appendix.

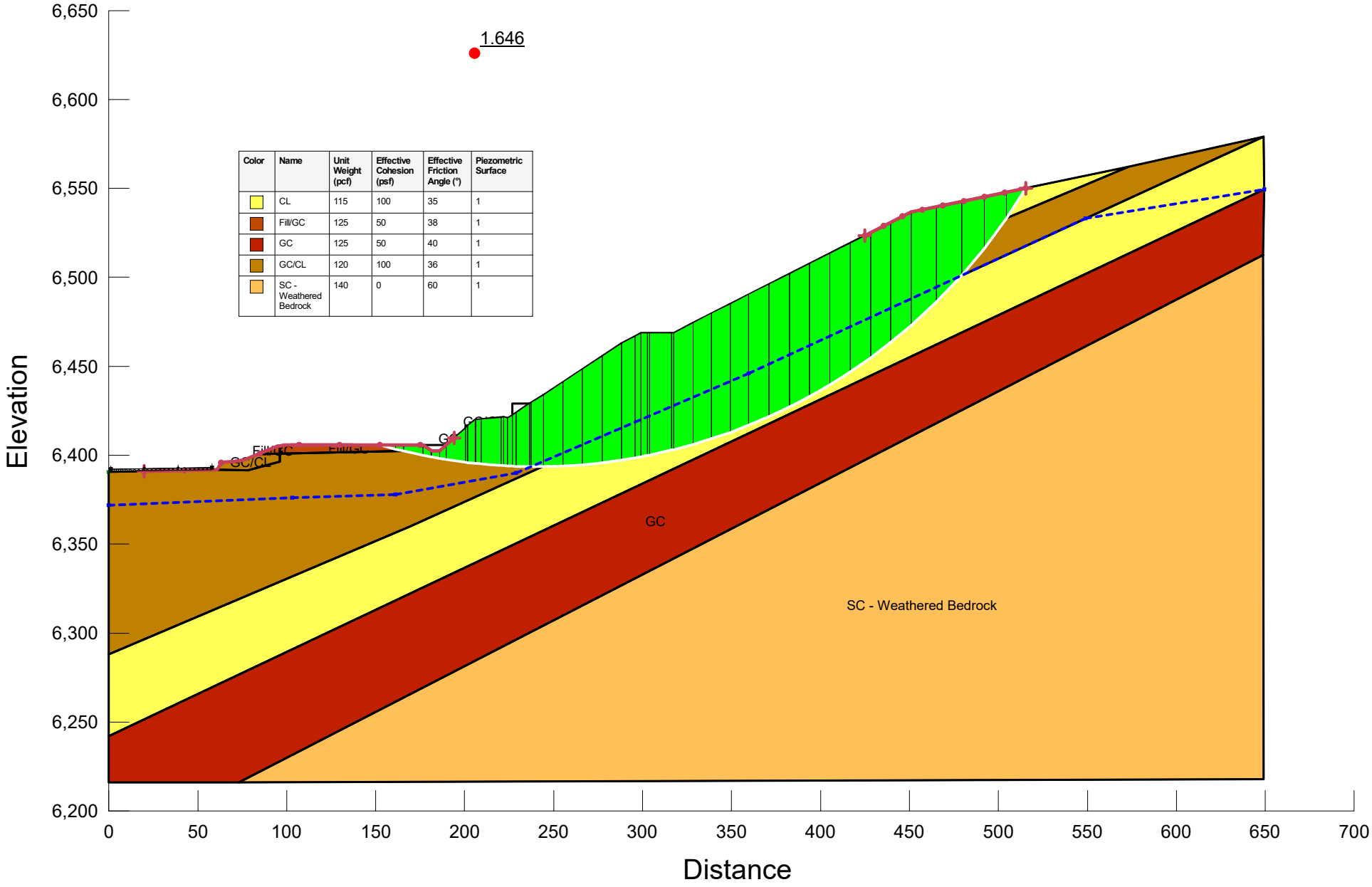
Surcharge Loads and Retaining Wall: Typical foundation loads were incorporated into the model, based on data in Section 1806 of the IBC, 2021. We use a distribution surcharge load of 2000 psf to account for the weight of any structures within the model.

The retaining wall on Lot 53 was also included in the geometry of the models. For the length of the soil nails, spacing and batter we used the Grand View, Building 53 Jackson, Wyoming Permanent Soldier Pile Wall and Temporary Soil Nail Wall Construction Drawings. Although the construction drawings show a slight variation in soil nail lengths, spacing and batter, we used the values applicable to the highest number of soil nails. In our model we used 48' soil nails, vertically spaced 9 feet, and battered -15 degrees.

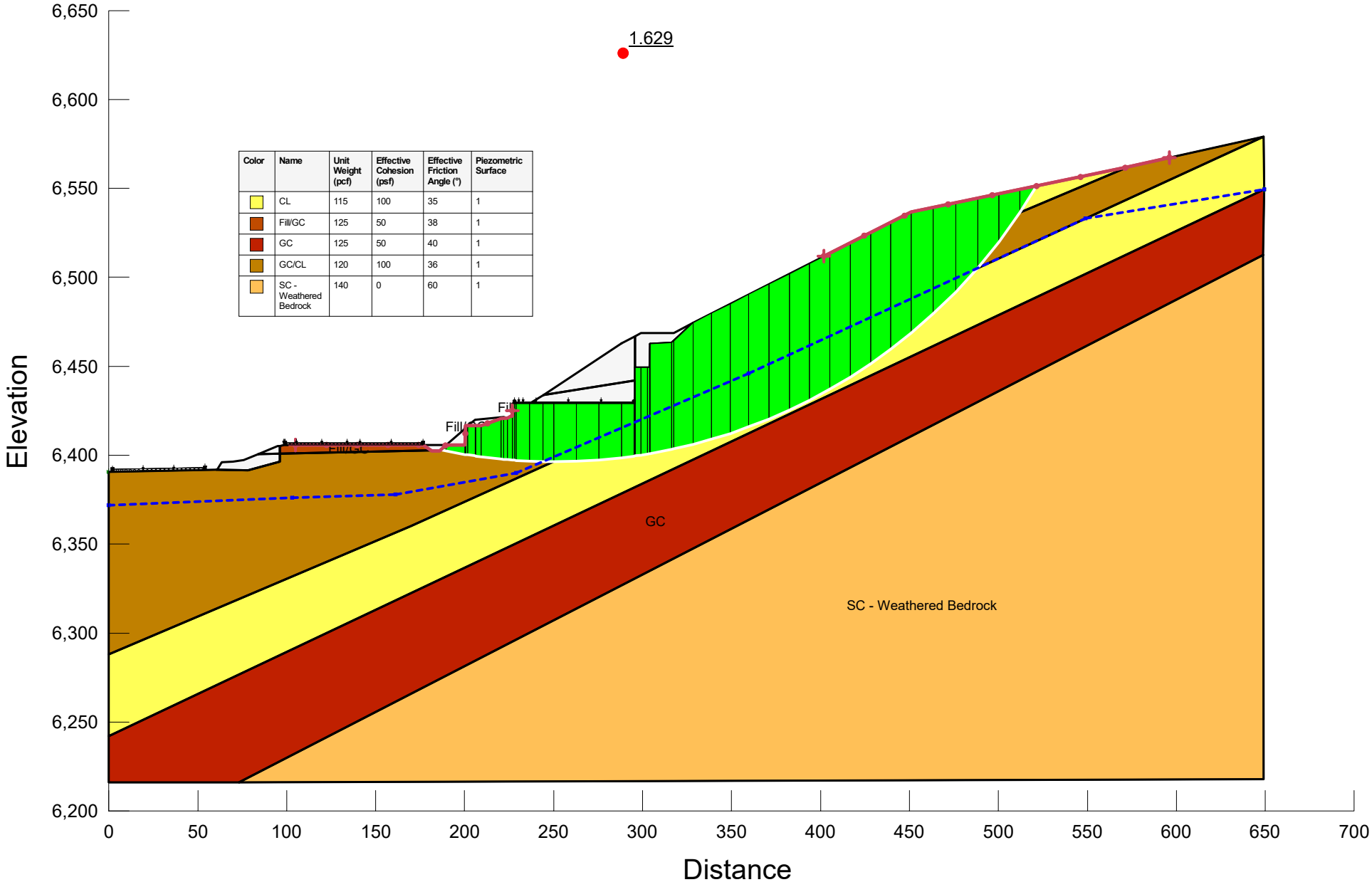
Results

We summarize factor of safety (FS) results for each cross section and analysis in Section 5.1.2 of the Report. The figures that follow are the output from each analysis. The critical slip surface and factor of safety are shown. Output files, reports, convergence data, or other data from Geostudio may be made available upon request.

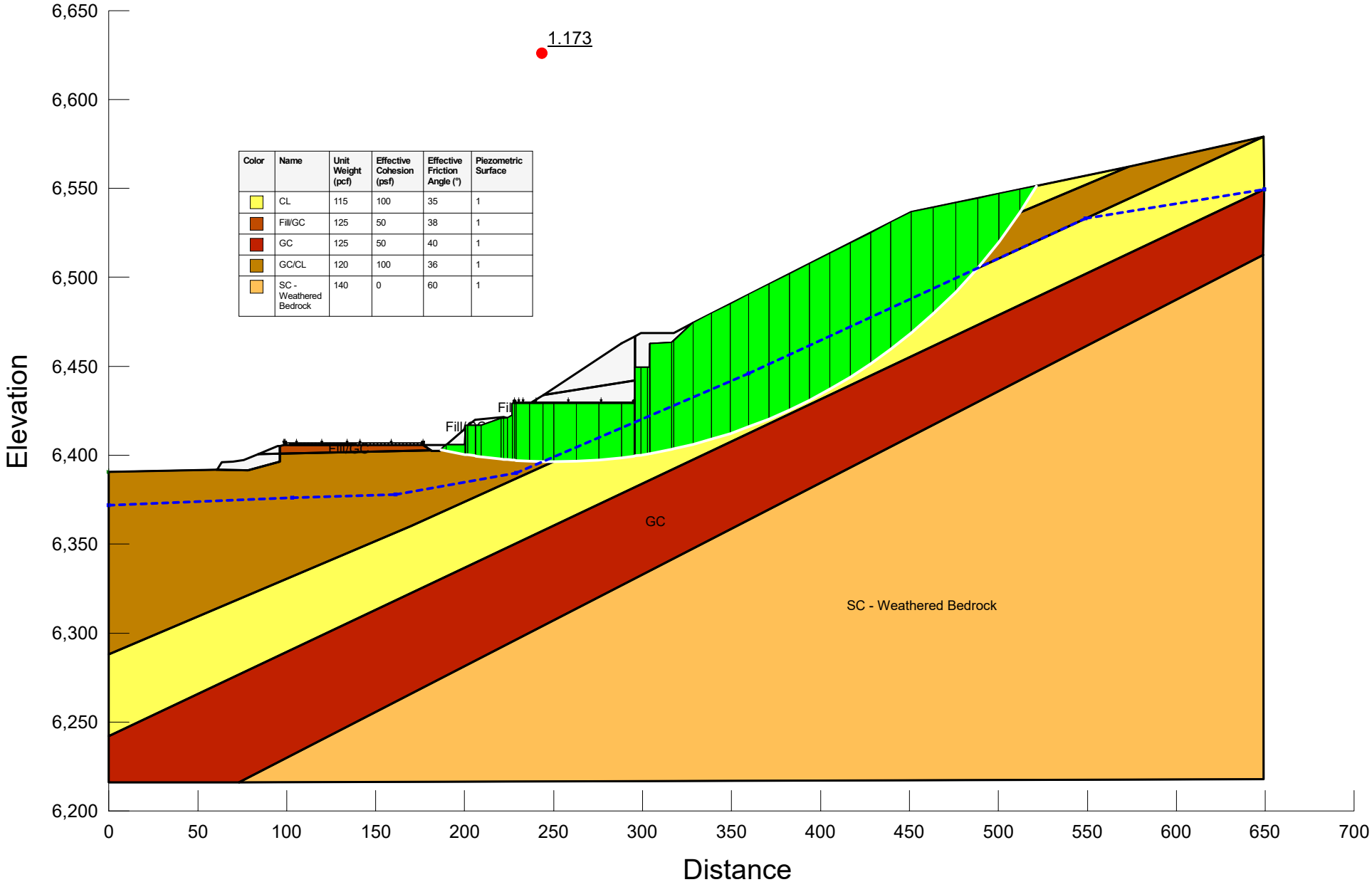
Lot 53 and 58 B-B' Existing Conditions



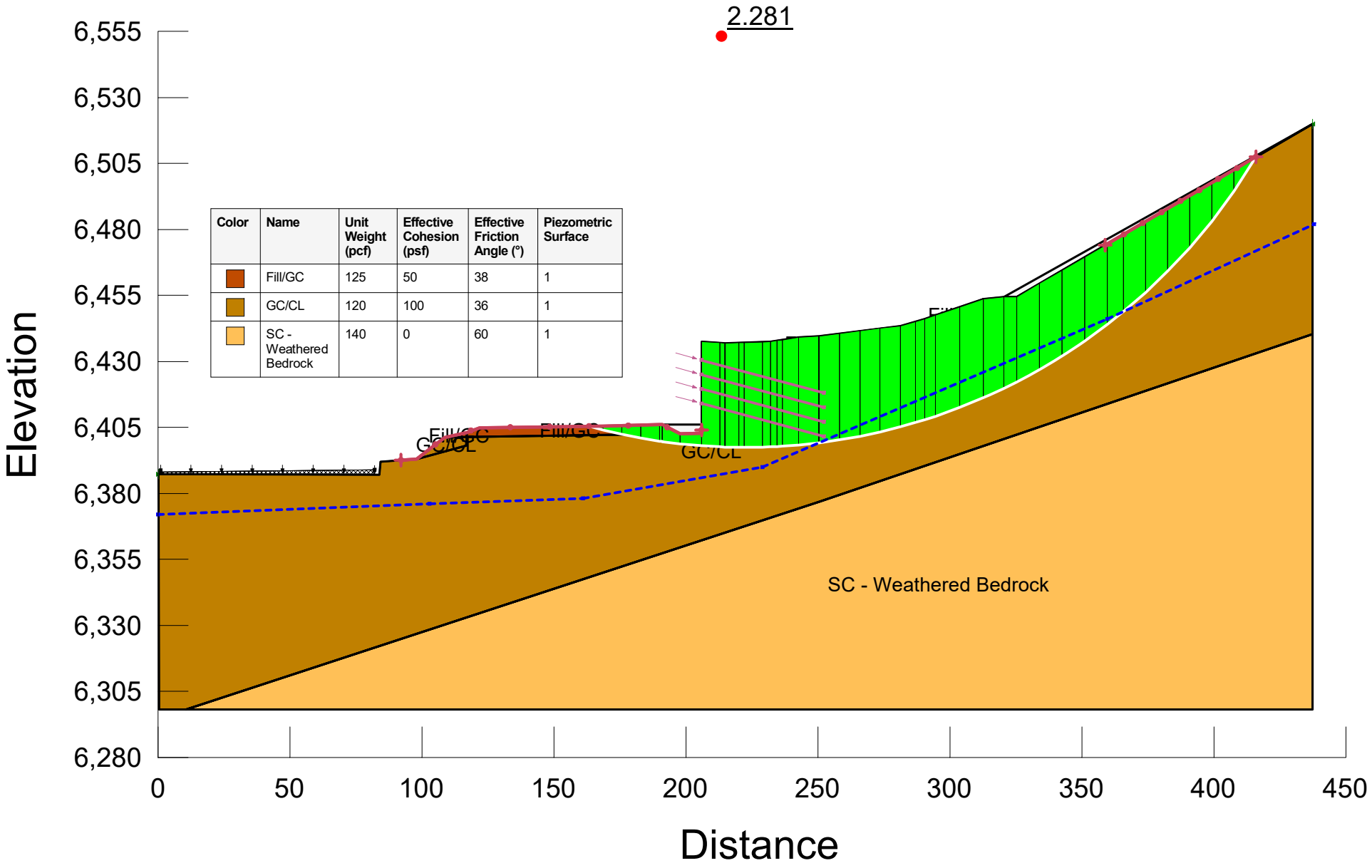
Lot 53 and 58 B-B' Proposed Conditions



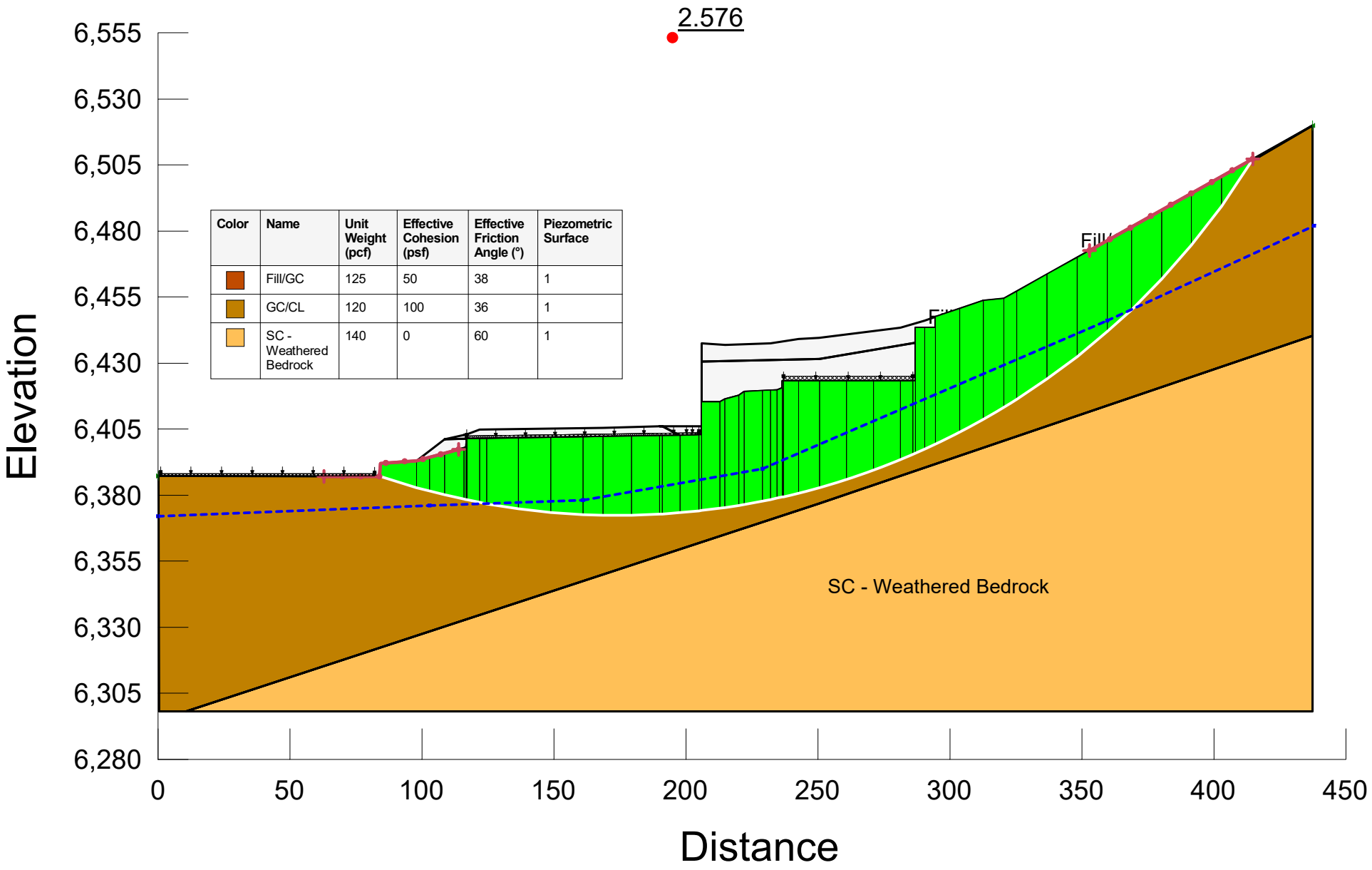
Lot 53 and 58 B-B' Proposed Conditions Siesmic



Lot 53 and 58 C-C' Existing Conditions

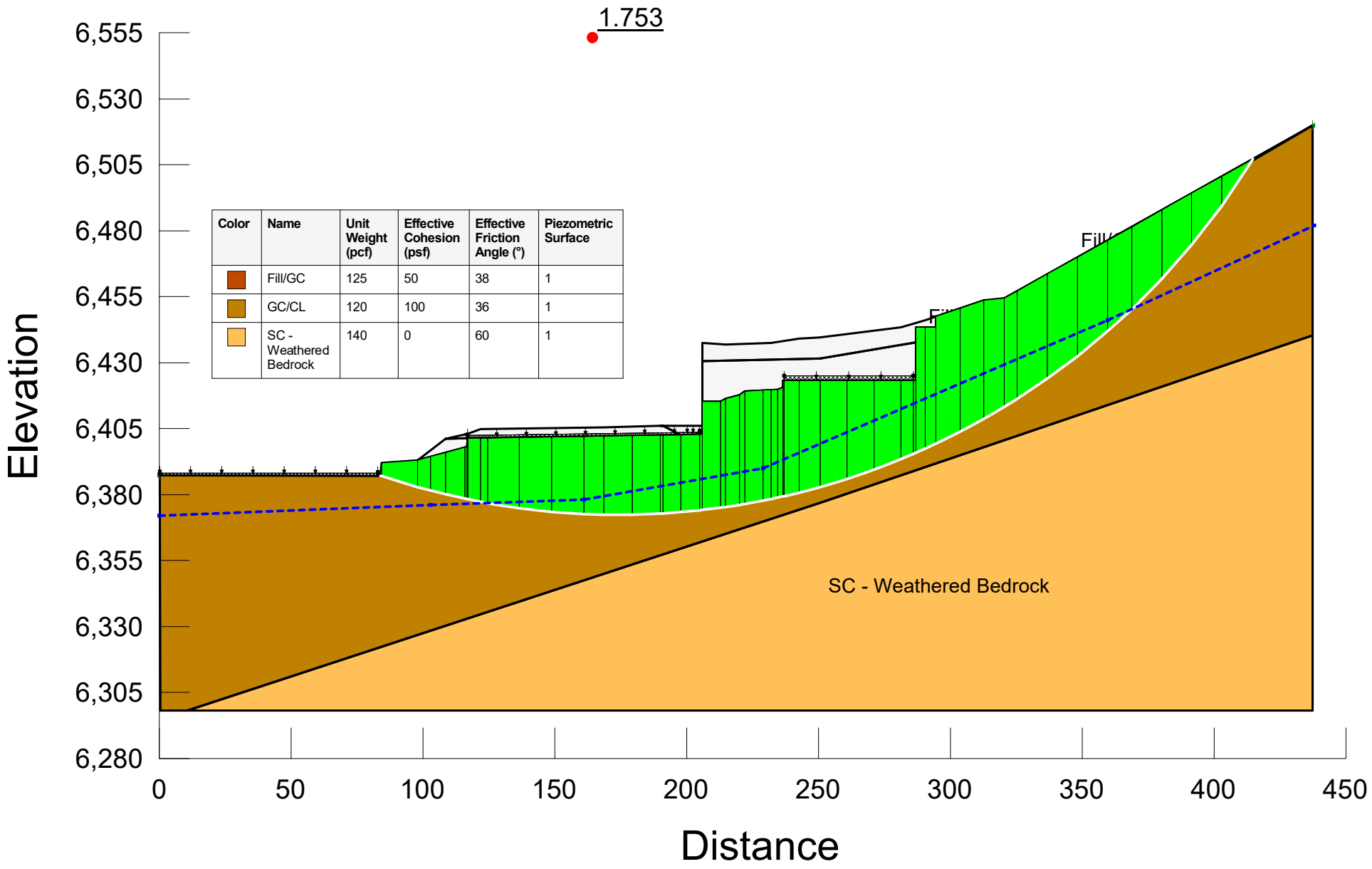


Lot 53 and 58 C-C' Proposed Conditions



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Piezometric Surface
	Fill/GC	125	50	38	1
	GC/CL	120	100	36	1
	SC - Weathered Bedrock	140	0	60	1

Lot 53 and 58 C-C' Proposed Conditions Siesmic

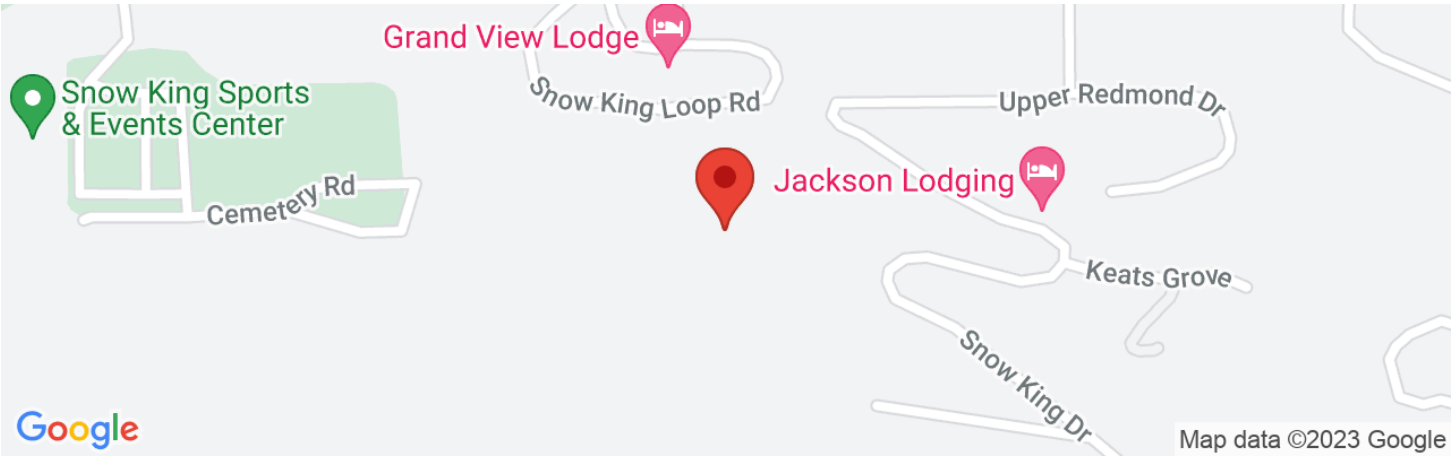


Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Piezometric Surface
	Fill/GC	125	50	38	1
	GC/CL	120	100	36	1
	SC - Weathered Bedrock	140	0	60	1

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

Latitude, Longitude: 43.47138391, -110.75322571



Date	20/12/2023, 15:51:56
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.024	MCE_R ground motion. (for 0.2 second period)
S_1	0.336	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.229	Site-modified spectral acceleration value
S_{M1}	0.505	Site-modified spectral acceleration value
S_{DS}	0.819	Numeric seismic design value at 0.2 second SA
S_{D1}	0.336	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.5	Site amplification factor at 1.0 second
PGA	0.454	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.545	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.024	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.145	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.894	Factored deterministic acceleration value. (0.2 second)
S1RT	0.336	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.374	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.721	Factored deterministic acceleration value. (1.0 second)
PGAd	0.66	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.454	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.895	Mapped value of the risk coefficient at short periods

Type	Value	Description
C_{R1}	0.9	Mapped value of the risk coefficient at a period of 1 s
C_V	1.105	Vertical coefficient

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Project BEAR Dev - Lots 53+56 Project No. 23272
Calculated By HC Date 12/20/2023
Sheet 1/2

K_s Determination

U.S. Seismic Design Maps - Structural Engineers Association of California Design Code Reference Document - ASCE 7-16

Risk Category II
Site Class C - Very Dense Soil & Soft Rock

FHWA (2011)

$$K_{MAX} = F_{PGA} \cdot PGA \qquad (6-1)$$

PGA = 0.454
F_{PGA} = 1.20

K_{MAX} or PGA_m = 1.2(0.454) = **0.545**

K_{AV} or MHA (Maximum Average Horizontal Acceleration) = $\alpha \cdot K_{MAX}$ (6-2)

Where $\alpha = 1 + 0.01(H)[(0.5B)-1]$ (6-3)

Where $B = f_v \cdot S_1 / K_{MAX}$ (6-4)

- B Cross Section B-B'

F_v = 1.5
S_1 = 0.336
K_{MAX} = 0.545

$B = 1.5(0.336)/0.545$ (6-4)

B = 0.924

- B Cross Section C-C'

F_v = 1.5
S_1 = 0.336
K_{MAX} = 0.545

$B = 1.5(0.336)/0.545$ (6-4)

B = 0.924

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Project BEAR DEN - LOTS 53+58 Project No. 23072
Calculated By HC Date 12/20/2023
Sheet 2/2

- α Cross Section B-B'

$\beta = 0.924$
$H = 75'$

$\alpha = 1 + 0.01(75)[0.5(0.924) - 1]$ (6-3)

$\alpha = 0.597$

- α Cross Section C-C'

$\beta = 0.924$
$H = 70'$

$\alpha = 1 + 0.01(70)[0.5(0.924) - 1]$ (6-3)

$\alpha = 0.623$

- k_{AV} Cross Section B-B'

$\alpha = 0.597$
$k_{MAX} = 0.545$

$k_{AV} = 0.597\ (0.545)$ (6-2)

$k_{AV} = 0.325$

- k_{AV} Cross Section C-C'

$\alpha = 0.623$
$k_{MAX} = 0.545$

$k_{AV} = 0.623\ (0.545)$ (6-2)

$k_{AV} = 0.339$

- k_S Cross Section B-B'

$k_S = r \cdot k_{AV}$ (6-5)

$r = 0.5$ ASSUMING 2-INCHES OF ALLOWABLE PERMANENT SEISMIC DEFORMATION

$k_S = 0.5\ (0.325)$

$k_S = 0.163$

- k_S Cross Section C-C'

$k_S = r \cdot k_{AV}$ (6-5)

$r = 0.5$ ASSUMING 2-INCHES OF ALLOWABLE PERMANENT SEISMIC DEFORMATION

$k_S = 0.5\ (0.339)$

$k_S = 0.169$

MINIMUM FACTOR OF SAFETY OF 1.1 USING r OF 0.5 AND ASSUMING 2-INCHES OF ALLOWABLE PERMANENT SEISMIC DEFORMATION

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

December 28, 2023

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosh, WI 53142

RE: GEOTECHNICAL-ENGINEERING REPORT, BEAR DEVELOPMENT – SNOW KING LOOP LOTS 53 AND 58, TETON COUNTY, WYOMING
PROJECT NO: 23072

Dear Nick,

We are pleased to present this Geotechnical-Engineering Report on our geotechnical site exploration for the proposed development at Lots 53 and 58 on Snow King Loop in Teton County, Wyoming. This report describes site conditions observed during the subsurface exploration, presents engineering analyses and recommendations to support the design and construction of foundation elements, and presents pre-construction and post-construction slope stability analyses.

Jorgensen Geotechnical explored subsurface conditions by drilling seven (7) boreholes and excavating four (4) exploratory test pits throughout Lots 53 and 58. A geophysical exploration was also performed comprising MASW and ReMi exploration techniques. In general, the site is underlain primarily by landslide debris, a chaotic mixture lean clay (CL), clayey gravel (GC), and clayey sands (SC). The site sits on a mapped landslide which likely mobilized prior to the Quaternary period. As such, we assume the soil at the site to be well consolidated. We also observed weathered sandstone bedrock during the subsurface exploration. The weathered bedrock was only observed in one borehole, BH-02, at 67.5-ft below ground surface (bgs), and is assumed to be part of the Cretaceous-age Bacon Ridge Formation (Kb).

Building locations and foundation elevations are based on preliminary design data provided by Hoyt Architecture, dated July 19, 2023. As the design progresses, we will be able to make site-specific recommendations.

If you have any questions about this report, or if we may provide other services to you, please contact us. As the project progresses, we will be available to answer questions for you.

Respectfully submitted,
JORGENSEN GEOTECHNICAL







Bruce Jackson G.I.T.
Geotechnical Design Engineer Technician

Harrison Carter, P.E.
Geotechnical Project Manager

Dominique Brough, P.G.
Geotechnical Project Manager

Geotechnical-Engineering Report

Bear Development – Snow King Loop Lots 53 and 58 | Teton County, Wyoming



43.471263°N, -110.753274°W

December 28, 2023

PREPARED FOR

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosh, WI 53142

PREPARED BY

Jorgensen Geotechnical, LLC
PO Box 9550
1315 HIGHWAY 89 S., Ste. 201
Jackson, WY 83002

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APPENDICES

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1.0 INTRODUCTION

Jorgensen Geotechnical, LLC was commissioned by Bear Development, LLC to perform a subsurface surface exploration and geotechnical engineering and analyses for the proposed development for Lots 53 and 58 accessed by Snow King Loop in Teton County, Wyoming. The purposes of the exploration were to provide information and geotechnical-engineering recommendations pertaining to:

- Subsurface soil conditions
- Site preparation and earthwork
- Geophysical exploration
- Seismic site classification per the International Building Code
- Evaluation of settlement and/or collapse potential
- General foundation design and construction recommendations
- Slabs-on-grade design and construction recommendations
- Lateral earth pressures for retaining structures
- Subgrade preparation
- Slope Stability Analyses
    - Existing Conditions
    - Proposed Conditions
    - Proposed Seismic Conditions

A detailed description of the subsurface exploration and graphical logs are shown in Appendix A, Figures in Appendix B, laboratory testing results are included as Appendix C, determination of soil engineering parameters in Appendix D, Calculations for settlement in Appendix E, and Slope Stability Analyses in Appendix F.

2.0 PROJECT DESCRIPTION

The project site is located in Jackson, Wyoming and is situated at the base of Snow King Resort. Preliminary plans were provided by Hoyt Architecture, dated July 19, 2023. The plans indicate the development for lots 53 and 58 will include two housing units: each with a first-floor parking garage area with three floors of living space above.

It is our understanding the project is in the early stages of the design, and the architectural plans are subject to substantial changes. As the project progresses, Jorgensen Geotechnical is available to consult with team members to increase design and construction efficiency based on our understanding of the subsurface conditions and the proposed design.

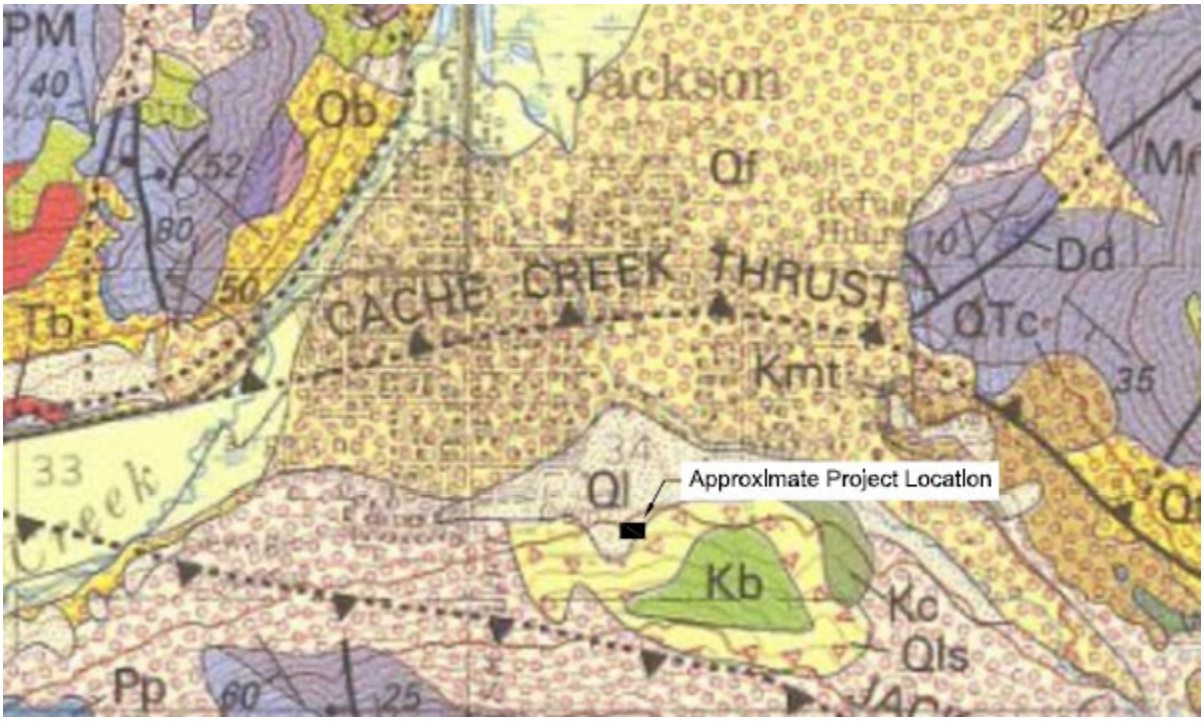


Figure 1: Site Location and Geologic Map

3.0 GEOTECHNICAL EXPLORATION

3.1 Description

JG developed the following description of the site based on field visits, meetings with the project team, our review of available historical aerial imagery, and observations made during the subsurface exploration.

Item	Description
Location and Parcel Information	• Lots 53 and 58 are located at the base of Snow King Resort and are accessed via Snow King Loop. The project area sits at a generalized latitude and longitude of 43.471263°N, -110.753274°W.
Existing Conditions	• The project location slopes from the north upwards to the south and ranges in elevation from approximately 6,400-ft Above Mean Sea Level (AMSL) on the northern boundary of Lot 53, to approximately 6,530-ft AMSL on the southern property boundary of Lot 58. The lots are bisected by a dirt road that provides access for employees at Snow King Resort. • Lot 53 is currently being used for storage by Snow King Resort. • A retaining wall approximately 20-ft tall is present on Lot 53 between the storage area and the access road. This Retaining wall comprises H-piles, lagging, and tie-backs and was built based on construction drawing dated August 13, 2007. • Slopes at the project site range from 10 to 35%.

	• Current utilities at the site include power, gas and water.
Geologic Setting	• The project location is found on the Geologic Map of Grand Teton National Park (Love et. al., 1992), in an area that contains three mapped geologic units including Loess (Ql), a fine-grained, windblown deposit, Landslide Debris (Qls), and the Bacon Ridge Sandstone (Kb). The soils observed from the subsurface exploration seem to be consistent with mapped geology. • The project location sits on a mapped multiple slump/multiple flow landslide, and is understood to be deep seated(WSGS, Wyoming Geologic Hazards Map Tool). A portion of the project site is capped with a wind-blown deposit known as loess which was likely deposited during or after the Pinedale Glaciation Period, or between approximately 30,000 to 10,000 years ago. The mapped loess stratigraphically overlies portions of the mapped landslide unit. • Numerous Quaternary faults (i.e., relatively young and potentially active) are mapped throughout the area. The Teton Fault is mapped approximately 8 miles northwest of the project, at the base of the eastern flank of the Teton Range (Zellman, 2019). Slip rates along the Teton fault is estimated to be between 0.2 and 1.0 mm/year. The Hoback Fault is located approximately 3 miles to the southwest of the project site but is considered old and inactive.

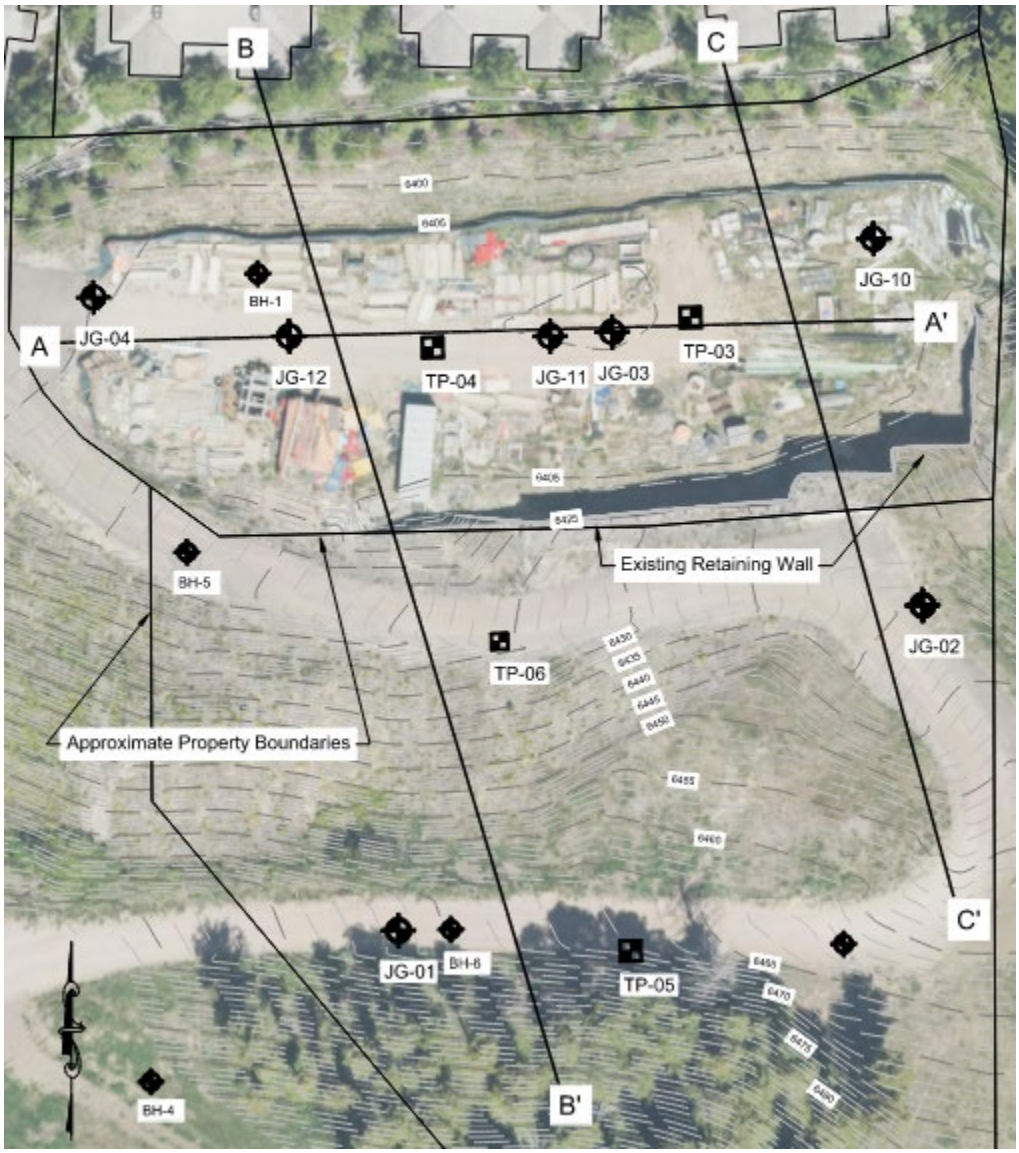


Figure 2: Borehole, Test Pit and Geologic Cross Section Location Map

3.2 Subsurface Soil Conditions

In general, three soil types were encountered during the subsurface exploration:

- **Landslide Debris** – consisting of clayey gravels (GC), lean clays (CL), and clayey sands (SC). The landslide debris soils are assumed to be derived from native colluvium soils prior to mobilization. These landslide debris soils exhibited chaotic deposition, which is also represented in the MASW plots provided by Atlas Geophysics. These results can be found attached to Appendix A.
- **Loess** – consisting of lean clay with sand (CL).
- **Weathered Bedrock** – consisting of soft weathered sandstone of the Bacon Ridge Formation (SC).

Below are three generalized geologic cross-sections spanning both north-south and east-west depicting the subsurface soil conditions and approximate foundation elevations for the buildings on Lots 53 and 58. Cross-section alignments can be found in Figure 2 and complete figures can be found in Appendix B.

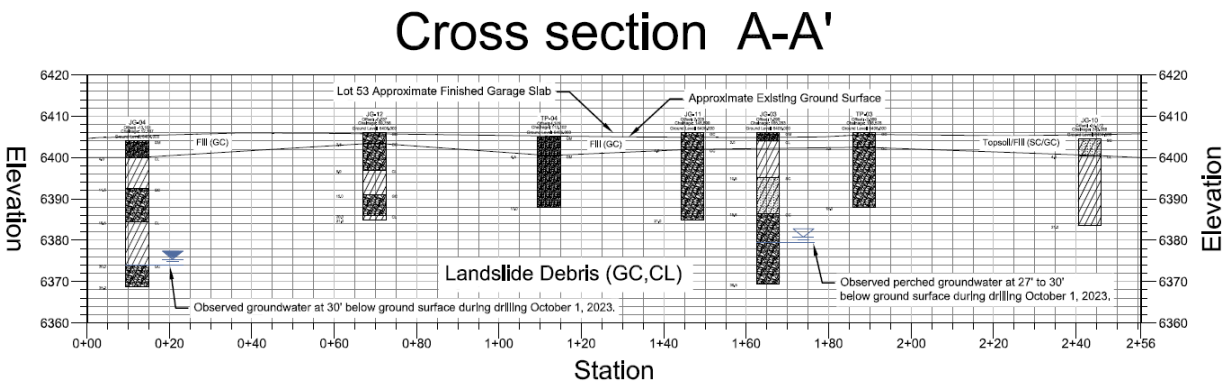


Figure 3: Geologic Cross Section A-A'

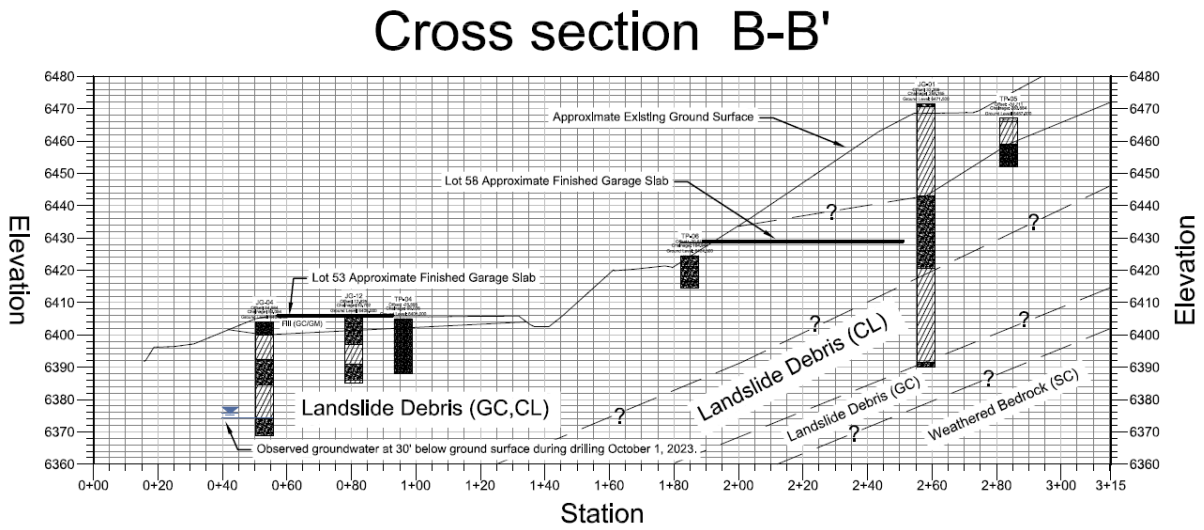


Figure 4: Geologic Cross Section B-B'

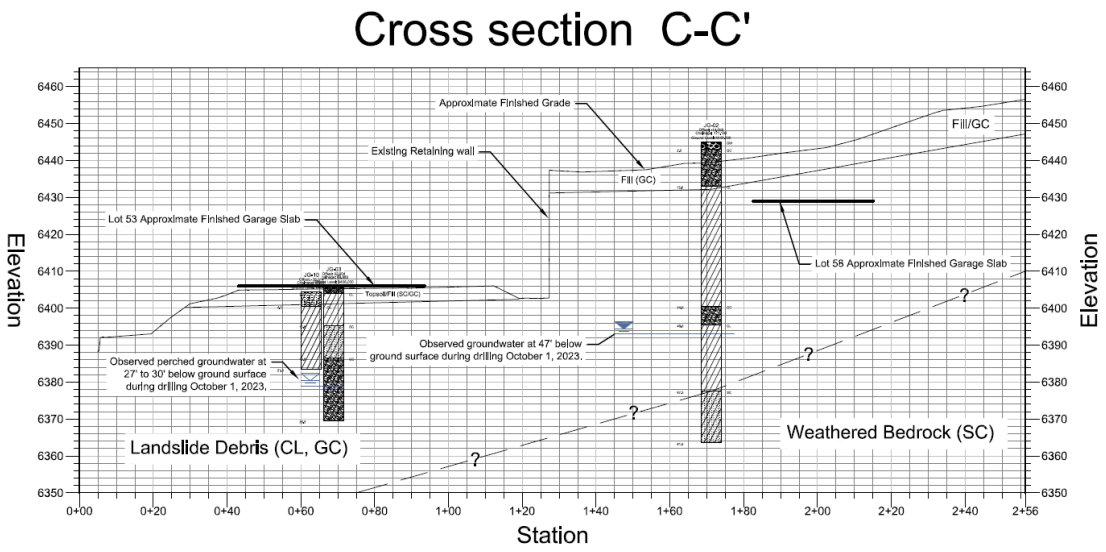


Figure 5: Geologic Cross Section C-C'

The table below describes each soil and rock layer, and detailed borehole logs are represented graphically in Appendix A. **It is important to note that** the borehole exploration techniques used either a 4-inch coring barrel or a 1.5-inch diameter split spoon sampler, limiting the soil that was collected during the drilling effort. It is likely that gravels larger and cobbles 3.0-inches are present but were unable to be logged due to the sampling method. Cobbles and boulders were encountered in the test pits.

Layer	Layer Name	Description	Geotechnical Considerations and Uses
1	**Topsoil/Fill (GC/GM/SC)**	• Observed in all boreholes and test pits • Depths ranging from 1- to 4.5-ft bgs • Classified as a Clayey **Gravel** with Sand, Silty **Gravel** with sand, or a Clayey **Sand** with Gravel. • Both the topsoil and fill are assumed to be derived from native soils • Brown to dark brown • Contains construction debris, including rebar, wood and concrete.	• Undocumented construction fill should be remove from beneath foundations • Non-structural applications
2	**Landslide Debris (GC/CL)**	• Observed in all boreholes and test pits	• Acceptable bearing layer with appropriate subgrade

		• Classified as Clayey **Gravel** with Sand, **Lean Clay**, **Lean Clay** with Sand, Sandy **Lean Clay** with Gravel, • Reddish brown to brownish gray • Coarse-grained soils are loose to very dense • Fine-grained soils are soft to very stiff • **Chaotic deposition, including charcoal fragments** • Observed 15-25% cobbles by volume • 10-55% gravel • 15-30% sand • 25-90% Clay/Silt	improvement methods • Settlement concerns • Structural applications • Non-structural applications
3	**Weathered Bedrock (SC)**	• Observed in BH-02 at 67.5-ft bgs • Classified as Clayey **Sand** • Grayish brown to reddish gray • Very dense • 55% sand • 45% fines	• Unlikely to be reached during construction

3.3 Groundwater

Groundwater was encountered in three boreholes during the subsurface exploration. Groundwater was observed in JG-02 at a depth of 47-ft bgs, JG-04 at a depth of 30-ft bgs, and a region of perched groundwater was encountered in JG-03 ranging from 27- to 30-ft bgs. These groundwater levels were incorporated into our slope stability analysis modeling and are discussed further in Appendix E.

The exploration occurred during a time of year that is considered to take place after peak groundwater levels have occurred, therefore the groundwater levels encountered during the drilling effort are *not* expected to represent peak groundwater levels. Groundwater levels fluctuate in response to seasonal snowmelt, runoff and flow levels in nearby rivers and streams, and is likely most heavily influenced by spring runoff and natural springs uphill. Soil moisture conditions on this site are most likely influenced by surface infiltration due to precipitation, snowmelt, and uphill natural springs. Two groundwater standpipes were installed on Lot 53 as part of the subsurface exploration. These standpipes were installed in JG-10 and JG-12, to total depths of 20 and 21-ft bgs, respectively.

Groundwater data was also presented in the previous Site Investigation Report published by Nelson Engineering, which was dated July, 2021. In this Report, they describe their encounters with perched groundwater to be in relatively thin (<1-ft in thickness) saturated zones. Groundwater measurements taken between 2005 and 2021 typically coincided with these saturated zones. We assume the measured groundwater levels at the site to be heavily influenced by spring runoff and natural springs uphill of the site.

3.4 Earthquakes and Ground Shaking

Jackson, Wyoming is located within the Intermountain Seismic Belt, a zone of seismicity that extends from southern Utah through eastern Idaho, western Montana, and Western Wyoming (Smith and Arabasz, 1991). The Teton fault, located along the eastern margin of the Teton Range, approximately 8-miles northeast of the site, is considered an important structural element of the Intermountain Seismic Belt. Predicted recurrence intervals for maximum credible earthquakes have passed for most of the fault systems capable of generating magnitude 7.5 earthquakes in western Wyoming (Case, 1997), implying the risk of major earthquakes is relatively high. In the event of a large magnitude earthquake (i.e., approximately 7.5), strong ground shaking, liquefaction, or slope movement could potentially cause damage to structures (Smith, et al., 1993).

Shear wave velocity calculated by Atlas Technical Consulting LLC, of Salt Lake City, Utah using ReMi geophysical exploration method for the project site is 1,200 ft/s. The IBC references ASCE 7-16 to determine the ground motion accelerations. Based on subsurface soils, and the results from the geophysical exploration, the site is classified as Site Class C ("Very dense soil and soft rock"). For your convenience, Seismic Design Maps (SEAOC, 2019) values are summarized in Table 3-1: U.S. Seismic Design Maps Summary.

Table 3-1: U.S. Seismic Design Maps Summary

Maximum Considered Earthquake (MCE) Spectral Response Acceleration Parameters			
	Short Period (S_s) =	1.024	
	1-Second Period (S_1) =	0.336	
Site Coefficients and Adjusted MCE Spectral Response Acceleration Parameters			
F_a =	1.2	S_{MS} =	1.229
*F_v =	1.5	*S_{M1} =	0.504
Design Spectral Response Parameters			
	S_{DS} =	0.819	
	*S_{D1} =	0.336	

*Note: Values for F_v, S_{M1}, and S_{D1} were determined in accordance with Section 11.4.4 of ASCE 7-16. Per Section 11.4.8 of ASCE 7-16, if the proposed structure foundation will include seismic isolators or damping systems, a site response analysis shall be performed in accordance with Section 21.1.

The project site is located in an area of moderate seismic activity. The current peak horizontal acceleration (PGA) with a probability of occurrence of 2% in 50 years is approximately 0.454g (USGS, 2014). The site amplification factor at PGA is 1.2, resulting in a site modified peak ground acceleration (PGA_M) of 0.545. This has been applied for the analysis of seismic lateral loading on retaining walls Section 4.3.

The provisions of the IBC are intended to provide uniform levels of performance for structures depending on their intended use and the risk inherent to their failure. The approach adopted in the IBC is intended to provide a uniform margin of safety against collapse at the design motion. The design earthquake ground motion is selected at a ground shaking level that is 2/3 of the maximum considered earthquake (MCE) ground motion, which has a likelihood of exceedance of 2% in 50 years (corresponding to a return period of 2,500 years). The IBC is not intended to prevent damage or loss of

function during a major earthquake; it is intended to reduce the risk of loss of life. Structural design should follow the level of risk tolerable by the Design team.

3.5 Geologic and Geotechnical Hazards

3.5.1 Potential Settlement/Compressible Clays

The primary geotechnical concern at the project site is differential settlement of foundation elements placed on unimproved landslide deposits. Based on the borehole logs, in-situ testing, lab testing, and geophysical exploration, the subgrade soils comprise a range of chaotic mixture of soils, from compressible clays to competent stony soils. The soft clays are expected to experience moderate to severe settlement, while the stony soils are *not* expected to experience substantial settlement. Calculated settlement values are discussed in Section 5.2 and calculation spreadsheets are shown in Appendix E.

3.5.2 Seismic and Fault Related Hazards

The owner should be aware that in the event of a large magnitude earthquake (i.e., approximately 7.5), strong ground shaking could potentially cause damage to structures (Smith et al, 1993). The owners may wish to consider the option of carrying earthquake insurance in addition to homeowner's insurance. Older faults mapped in the immediate vicinity of the property are believed to be old and inactive. Surface rupture due to faulting is very unlikely, and no slope failure is anticipated to occur.

3.5.3 Slope-Related Hazards

In the event of an earthquake or extreme precipitation event, rock fall, debris flows, or avalanches produced from the steep slopes to the south of the development area could potentially cause damage to structures, especially following wildfires. Risk assessment of the slope related hazards was beyond the scope of this Report, but we present slope stability analyses of several slopes captured in the cross section Lot 53 and 58. These are discussed in Section 4.1 and presented in Appendix F.

4.0 GEOTECHNICAL ENGINEERING ANALYSES

4.1 Slope Stability Analyses

The slope stability analyses were performed using SLOPE/W module of Geostudio. We analyzed two sets of geometry for global slope stability, taken from cross sections B-B’ and C-C’. Pre-construction and post-construction external geometry was determined using topographic data provided by Jorgensen Associates, as well as proposed design data provided by Jon Althschuld of Chinook Landscape Architecture, LLC.

Soil-strength parameters were determined using direct testing methods, as well as correlations based on index tests and SPT N-Values. A detailed discussion on soil-strength parameters can be found in Appendix D. The parameters used in the stability analysis are shown in Table 4-2 and Table 4-3. We incorporated a phreatic surface into model based on observed water conditions during the drilling effort. We included surcharge loads to account for future building loads and evaluated seismic conditions using a pseudo-static approach.

Table 4-2: Soil Parameters Used for Slope Stability Analysis B-B'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (CL)	115	100[1]	35
Landslide Debris (GC)	125	50[2]	40
Landslide Debris (GC/CL)	120	100[2]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

Table 4-3: Soil Parameters Used for Slope Stability Analysis C-C'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (GC/CL)	120	100[1]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

4.1.1 Results

Results of the stability analyses are summarized in Table 4-4. Appendix F shows the output of the stability model for Cross-Section B-B' and C-C'.

Table 4-4: Summary of Stability Analyses Results

Cross section	Analysis	FS	Change in FS[1]
B-B'	Pre-construction	1.646	-1.03%
	Post-construction	1.629	
	Post-Construction Seismic	1.173	N/A
C-C'	Pre-construction	2.281	+12.93%
	Post-construction	2.576	
	Post-Construction Seismic	1.753	N/A

1. Negative indicates a reduction in FS from pre-construction to post-construction, while positive indicates an increase in FS from pre-construction to post-construction.

Discussion regarding accepted FS can be found in Appendix F. Changes in Factors of Safety (FS) from pre-construction to post-construction conditions range from -1.03 to 12.93%, though all of the post-construction conditions indicate static FS's above the 1.5 threshold for residential construction ranging from 1.629 to 2.576. Post-construction seismic conditions indicate factors of safety from 1.173 to 1.753, both of which are above the 1.1 FS threshold for maximum allowable permanent seismic deformations of 2 inches (FHWA 2011).

Residual strength results from strain-softening behavior; i.e., soils become weaker with shearing (as in the case of slope movement) decreasing from peak strength to residual strength. Reduced shear strength usually occurs only in soils that have been previously sheared while undisturbed soils typically exist at peak strength. It is possible that sheared soils exist on this site or nearby and exhibit behavior

consistent with residual strength. In this case, seismic slope stability may result in factors of safety less than 1.0. **However, soil shearing was not observed during subsurface exploration at this site. If pockets or layers of soft, weak, or sheared soils are observed during construction, work shall cease, and Jorgensen Geotechnical be notified immediately to evaluate site conditions and review the stability model.**

4.2 Settlement

As described is Section 3.5.1, several different soil types were encountered at the site, all of which represent different levels of settlement potential, increasing the risk of differential settlement which is particularly damaging to structures. Settlement calculations were performed for the compressible clay, and the potentially compressible clayey sands. Because the stony soils contain varying amounts of matrix soils (i.e., clays and sands), estimated settlement is difficult. Though, it is important to note that in general, as the matrix content increases, the risk of settlement increases.

Item	Settlement Analyses – Slopewash	
	Scenario 1	**Scenario 2**
Bearing Layer	**Clay** – Foundation system is placed in direct contact with the clay soils	**Colluvium** - Foundation placed in direct contact with clayey sand soils
Foundation Assumptions	Comprises typical reinforced concrete spread footings	
	Bearing pressure of 3,000 pounds per square foot	
	Buried 3-feet below finished grade	
	Spread footings is 2-feet wide	
Calculated Settlement	3.38-inches	1.67 -inches

The risk of settlement can be reduced by several subgrade improvement methods, of which are discussed below in Section 5.0.

4.3 Lateral Earth Pressures

Lateral pressures were calculated using methods suggested by Bowles (1996) for at-rest, active, and passive conditions and are presented in Table 4-5. These values assume a combination of lean clay and clayey gravel landslide debris will be used as non-structural backfill. We have assumed an estimated internal friction angle of 36° and a unit weight of 130 pcf based on experience working with similar soil deposits and laboratory testing. Calculations assume level backfill against foundation walls or retaining walls.

Table 4-5: Lateral Pressure Parameters for Landslide Debris

Condition	Coefficient of Earth Pressures	γK (equivalent fluid pressure)
Static Conditions Level Backfill	K_o = 0.41 K_a = 0.26 K_p = 3.85	54 pcf 34 pcf 501 pcf
Earthquake Conditions	K_{ae} = 0.38	49 pcf

Level Backfill	K_{pe} = 3.46	449 pcf

Lateral earth pressure design will be estimated based on the concept of equivalent fluid pressures, in which the soil pressure-distribution is triangular against the foundation or retaining wall. The following sections summarize each design situation.

4.3.1 Active Pressures

Application	Retaining walls which are allowed to deflect and develop an active soil wedge
Resultant Force Calculation	½ $\gamma K_a H^2$; pounds per horizontal foot of wall
Resultant Force Location	one-third the wall height (1/3 H) above the base
Seismic Coefficient[1]	K_s = 0.338g (r·α·PGA) per the FHWA (2011)
Seismic Calculation Basis	Mononobe-Okabe equations (Bowles, 1996)
Seismic Resultant Force	½ (γK_{ae} - γK_a) H^2; pounds per horizontal foot of wall
Seismic Resultant Force Location[2]	Applied at 60% of the wall height above the base

1. Discussion and calculations for the Seismic Coefficient can be found in Appendix F.
2. Research has indicated that lateral pressures due to earthquakes are non-hydrostatic in distribution, and the resultant acts above the lower third-point of the wall (Bakeer, et al, 1990).

4.3.2 At-Rest Pressures

Application[1]	Walls which are restrained and not allowed to deflect
Resultant Force Calculation	½ $\gamma K_0 H^2$; pounds per horizontal foot of wall
Resultant Force Location	One-third the wall height (1/3 H) above the base

1. Design control of such walls shall be whichever generates the higher resultant force: at-rest pressures or active seismic pressures.

4.3.3 Passive Pressures

Application[1]	Toe of retaining walls where the wall is allowed to move into soil
Resultant Force Calculation	½ $\gamma K_p H^2$; pounds per horizontal foot of wall
Resultant Force Location	One-third the wall height (1/3 H) above the base
Design Control	k_s = 0.338g (r·α·PGA) per the FHWA (2011)
Seismic Calculation Basis	Mononobe-Okabe equations (Bowles, 1996)
Seismic Resultant Force Location	One-third the wall height (1/3 H) above the base

1. Passive pressure design should neglect loose fill and soil located within the frost zone.

5.0 GEOTECHNICAL RECOMMENDATIONS

5.1 Recommendations Overview

The fine-grained soils encountered at the site exhibit moderate settlement potential as described above in Section 4.2. Typical spread footings are likely to experience settlement greater than 1-inch if placed above the compressible soils. The risk of settlement can be reduced by **ground improvement techniques** such as geosynthetic reinforced fills, or engineered aggregate piers (EAPs). The risk of settlement can also be reduced by incorporating **deep foundation elements** such as driven piles or micropiles into the foundation design. Subgrade improvement methods to reduce the risk of future differential settlement are discussed in Sections 5.2, 5.3, and 5.4, below.

Due to the need for a construction shoring system, if mass excavation (i.e., over-ex and replace with geosynthetic reinforced fill) is selected, the shoring system will need to be extended at or below the over-excavation limit, increasing the overall height of the shoring system. Deep foundation elements and aggregate piers would negate the need for mass excavation below the shoring system.

It should be noted that different subgrade improvement methods correspond with different levels of risk reduction. Any subgrade improvement method that leaves problematic soil beneath foundation systems has a higher level of risk than those that do not. Similarly, deep foundation elements greatly reduce the risk of settlement by transferring the foundation load past the problematic soils and into the underlying competent soils. Typically, the cost of a foundation system correlates to the risk reduction (i.e., the more expensive foundation system the more risk reduction).

5.2 Reinforced Fills

Reinforced fill comprise imported soil compacted and interbedded with a pre-determined geosynthetic. The reinforced fill will better distribute the foundation load thereby reducing the load applied to the fine-grained, compressible and reducing the amount of future potential settlement. Exact thickness of a reinforced fill is currently unknown due to the limited design data available, though it can be expected to be four to six fee thick with a geosynthetic layer placed at every 1-ft increment.

5.3 Engineered Aggregate Piers

Engineered aggregate piers are a ground improvement technique that utilize compacted aggregate to reinforce potentially problematic soils. The piers are predrilled with an auger to the full design-depth (or to a refusal condition on competent rock/soil), a select aggregate is dumped into the predrilled hole from the surface, and the aggregate is then compacted with a down hole compactor attached to an excavator. The compaction effort not only compacts the imported aggregate, but also densifies the surrounding native soils. The increased density of the select aggregate as well as the surrounding native soils reduces the potential of future foundation settlement. One major benefit of EAPs compared to deep foundation elements, is the EAPs are a ground improvement technique, therefore the foundation footings do not need to be designed as grade beams as it would need to be for deep foundation elements, but typical spread footings.

Aggregate piers are typically designed and installed by a design-build contractor. Such as Keller, Geotech Foundation Company, and Montana Helical Piers. Jorgensen is available to provide design values and recommendations to the selected contractor for final design and price estimates.

5.4 Deep Foundation Elements

Foundations consisting of grade beams supported by deep foundation elements, such as driven piles or micropiles, typically allow very little vertical movement of structural elements. This option represents the lowest risk of future foundation settlement.

Both micropiles and driven piles are typically designed and installed by a design-build contractor. Jorgensen is available to provide design values and recommendations to the selected contractor for final design and price estimates.

5.5 Earthwork

5.5.1 Site Preparation

Prior to the placement of any fill, concrete slabs, or foundation elements, the site should be cleared and stripped of topsoil and all organic debris. No brush, roots, frozen material, or other deleterious or unsuitable materials shall be incorporated in the foundation subgrade or structural fill. All exposed subgrade surfaces should be free of mounds and depressions which could prevent uniform compaction. If unexpected fills or obstructions are encountered during site clearing or excavation, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

During the excavation, the equipment may disturb and loosen the surface of the subgrade soils. All disturbed areas should be compacted with a smooth-drum vibratory roller, in vibratory mode with a minimum of three passes, prior to the placement of structural fill and footing construction. The actual number of passes should be determined by observing whether the surface is yielding after each pass. If the surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed and approved by a representative of this office.

5.5.2 Excavation and Cut Slope Stability

OSHA regulations (29CFR1926) appear to classify the coarse-grained at the site as Type C soil. For planning and design purposes, simple cut slopes should be no steeper than 1.5H:1V. According to OSHA, any cut slope greater than 20 feet in height requires additional analysis. Shallow groundwater conditions at the site may impact shoring requirements. These recommendations are based on observations made at the time of the site exploration. The contractor shall be responsible for adherence to OSHA and other safety regulations by observing soil conditions at the time of construction.

The design of a temporary construction shoring system is beyond the scope of this report. Jorgensen Geotechnical is available to coordinate with shoring contractors to provide design parameters and local expertise to the project and deliver the most efficient shoring option.

5.5.3 Final Backfilling and Grading

Properly compacted backfill and site drainage are very important to protect subgrade soils and prevent water from flowing to undesirable locations (i.e., to the highway). All soils at the site are acceptable for use as backfill and general site grading. Compaction guidelines for both soil types can be found in Section 5.5.4.

5.5.4 Compaction

Based on our borehole logs, compaction of the on-site soils during construction can be measured by performing a Standard Proctor test per ASTM D698 and performing nuclear density gauge testing during the compaction process. Site soils should be moisture-conditioned and placed in lifts and compacted to a predetermined percentage (typically either 92% or 95%) of the maximum dry density as determined by Standard Proctor testing. Soil should be moisture conditioned to between -2% and +2% of the optimum moisture content (OMC). Fine-grained soils require a sheepsfoot or padfoot roller.

It is important to note, the on-site soils contain fine-grained soils which become difficult to compact if moisture contents become too high. Moisture management of the compacted soils will be paramount to reach adequate densities. Additionally, groundwater may impact the ability to compact the soils during construction.

If imported "pit-run" is used as structural fill or if soils at the site contain more oversized clasts (greater than 3-inches) compaction testing with a nuclear density gauge is usually problematic due to the presence of stones. Therefore, we recommend compacting stony soils using a **method specification**, for which Table 5-1 provides initial guidelines.

Table 5-1: Compaction Parameters for Stony Fill

Compactor Type	Lift Thickness	Maximum Particle Size	Minimum Number of Passes[1]
5-ton vibratory	12 inches	9-inch[2]	3
1.5-ton vibratory	9 inches	6-inch	5
Hand-held	4 inches	4-inch	5

1. The actual number of passes should be determined by observing whether the surface is yielding after each pass. If the surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed.
2. Occasional clasts to 12-inch are permitted, if encountered, but should not be nested.

The method specification may be established as follows:

- The contractor will place fill in loose lifts no greater than specified in the above table for whichever class of compactor is used.
- Fill will be compacted with the *minimum* number of passes specified above. The actual number of passes should be determined by observing compaction after each pass to determine if the surface is non-yielding. If the fill surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed.
- Once the number of passes is determined, this **method** (unique to the material type, compactor, lift thickness, and number of passes) may be continued for the rest of the project as long as fill material properties and subgrade soil conditions remain the same.

It is important to establish a method specification as early in the construction as possible and apply it consistently for the entirety of the project. JG should observe lift thickness, number of passes, and equipment used during compaction. Additional guidance on construction observations may be found in Section 5.5.6.

5.5.5 Compaction Requirements

We recommend the following requirements for engineered fill materials:

Material Type and Location	Minimum Compaction Requirement	Moisture
Stony soils[1]: All Locations (Structural and Non-Structural Applications)	Non-yielding Condition	Usually 6-8%[2]
Non-stony soils	92% or 95% maximum dry density	+2-2% OMC

1. Stony soil may be imported or site-derived
2. Clean, stony soils are typically moisture insensitive and field observations are usually adequate to estimate when soils achieve the proper moisture.

We recommend compaction of fills be observed and tested during construction. If stony fill is not observed to be in a non-yielding condition or non-stony fills do not achieve the recommended compaction requirements, the area represented by the test should be reworked and retested as required to meet the requirements.

5.5.6 Observation during Construction

Recommendations in this report are contingent upon our involvement. If any unexpected soils or conditions are revealed during construction, this office should be notified immediately to survey the conditions and make necessary modifications. All excavations and foundation subgrades should be observed by a representative of JG prior to fill or concrete placement, especially if questionable materials are exposed. Notice shall be provided at a minimum of 24 hours before the requested observation.
We are able to provide the most value observing site conditions at the following times:

1. Upon completion of site preparation to verify all organics and unsuitable material have been removed, and to verify stony alluvial soils have been reached and structural fills have been prepared in accordance with Sections 5.5.1 and 5.5.4.
2. we can observe placement and compaction of fill and aid in the development of a method specification, Section 5.5.4.
3. We can perform density testing by means of proof rolls and with the use of a Nuclear Density Gauge for structural and non-structural soils.

6.0 LIMITATIONS

This report has been prepared based on a limited amount of data. Actual site conditions may vary. These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty is made or implied.

This report is site-specific and has been prepared in support of the proposed project. The report is for the sole use of the current property owner and their design and construction team and shall be considered non-transferable to future property owners without the written consent of Jorgensen Geotechnical. Under no circumstances are the figures and text to be used separately.

7.0 REFERENCES

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JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX A

Site Exploration Procedures and Subsurface Exploration Logs

Field Exploration

Borehole Locations and Elevations

Borehole and test pit locations were determined by Jorgensen Geotechnical (JG) staff to bracket the approximate location of the proposed development. Approximate locations of the boreholes and test pits are presented in Figure 2. The approximate location of each borehole and test pit locations were estimated based on relative proximity to landmarks identifiable on aerial photography. Approximate GPS coordinates for each borehole were also collected in the field. Approximate elevations were based on topographic data from Jorgensen Associates.

Subsurface Exploration Procedure

JG conducted a site exploration at the proposed project site utilizing two different subsurface exploration techniques: geotechnical boreholes and open test pits. During the exploration effort, several disturbed samples from SPTs were collected during the drilling effort as well as bulk disturbed grab samples during the test pit excavation. Shelby tubes were used to collect relatively undisturbed samples of soft material for consolidation testing, shear testing, and index testing. The samples were tested at GCI in Salt Lake City, Utah, and the results are presented in Appendix B. Soil-engineering properties were based on visual classification, direct lab testing results, and accepted correlations based on index test results and SPT blow counts and are discussed further in Appendix D. The subsurface exploration techniques are described below.

Sonic Boreholes

On October 1 and 2, 2023, JG directed and oversaw the drilling of four sonic boreholes; two to 80-feet below the ground surface (bgs) and two to 35-feet bgs using a sonic drill rig operated by Cascade Drilling of West Jordan, Utah. Sonic drilling utilizes high frequency vibrations to advance a core barrel or casing into the subsurface soils while collecting one continuous disturbed sample. At predetermined intervals, standard penetration tests (SPT) were performed to generate blow count values and collect additional disturbed samples.

Hollow Stem Auger Boreholes

Three additional boreholes were completed each to 20-feet bgs on October 25, 2023 using a hollow stem auger (HSA) drilling technique with a Diedrich D120 drill rig operated by SK Geotechnical of Billing, Montana. The HSA drilling technique utilized a 4.25-inch inside diameter hollow auger with a solid stem rod in the center that is removed to perform standard penetration tests every 2.5-feet.

Open Test Pits

On October 31, 2023, JG directed and oversaw the excavation of four open test pits. The test pits were excavated using a Hitachi Zaxis 160 steel tracked excavator operated by FCExcvation. The test pits ranged in depth from 10 to 18-feet bgs. Disturbed bulk samples were collected from pertinent soil layers.

Borehole Logs

Field data were collected in the field digitally using the application pLog on a tablet. Draft logs were reviewed in the office, and final versions are presented below. Blow counts for SPT (field N-values) were adjusted to a standard hammer efficiency of 60% and overburden pressure of one atmosphere as suggested by Youd and Idriss (1997) and Fang (1991), to obtain the adjusted (N1)60 values in blows per foot. Soil type, thickness, consistency, and relative moisture content were observed and documented by Jorgensen Geotechnical staff.

Detailed borehole logs are attached. Site conditions may vary and actual soil conditions may differ from those presented in the borehole logs. The final logs represent JG's interpretation of the subsurface soil conditions. Actual soil conditions may differ from those observed in the boreholes.

In addition to borehole and test pit logs produced by Jorgensen Geotechnical, borehole logs presented in a report produced by Nelson Engineering dated July 28, 2021 were also reviewed to determined subsurface soil conditions and are presented below. Approximate borehole locations performed by Nelson Engineering are presented in Figure 2. Test pit logs presented in a report prepared by Womack and Associated dated June 4, 2012 for the water tank due south of the proposed project site were also reviewed.

Geophysical Exploration

Jorgensen Geotechnical contracted with Atlas Technical Consultants LLC of Salt Lake City to perform a geophysical evaluation at the project site. The primary purpose of the geophysical study was to develop subsurface shear-wave velocity profiles using Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Waves (MASW). The geophysical exploration was performed on October 23 and 24th 2024. One ReMi line and one MASW line were performed at the specific project site (Lots 53 and 58), while the other ReMi and MASW lines were performed on Lot 57.

The ReMi study extended to a maximum depth of 100-ft below the ground surface, allowing us to select a Site Class based on the results. Shear wave velocity for the ReMi line RL-2 performed at lots 53 and 58 produced a shear wave velocity of 1,201 ft/s, classifying the site as a Site Class C per ASCE 7-16

The MASW line ML-2 performed at the project site indicates the upper approximately 20-feet are softer (i.e., slower shear wave velocity), and the soils become denser at approximately 30-feet below the ground surface. Though the soils appear to become denser at 30-feet, the upper 20-feet appear to be chaotic and have portions that are dense, and portions that are soft, consistent with the observations made in the boreholes and test pits.

The full Report from Atlas is attached.



Photo 1: Typical sonic drilling setup/JG--01



Photo 2: Typical sonic drilling bulk sample/Landslide Debris (GC/CL)



Photo 3: Typical hollow stem auger drilling setup/JG-12



Photo 4: Typical SPT sample/JG-10 D3



Photo 5: Typical test pit excavation setup/TP-07



Photo 6: Landslide Debris (GC)/TP-03



Photo 7: Chaotic sorting in Landslide Debris (GC)/TP-03



Photo 8: Charcoal present within landslide debris/TP-03



Photo 9: Large angular cobbles ~'1 to 2' diameter/TP-04 spoils pile

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1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-01

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
0			D1				Gravel (GW): Slightly moist to moist, brown, medium dense, clast supported, sub-rounded clasts approximately 50% sand and 50% sub-rounded gravel [FILL]					
1												
2			D2				Gravelly LEAN CLAY with Sand (CL): slightly moist, brownish tan, stiff, 25-30% angular gravel, 15-20% sand, 55-65% fines, [LANDSLIDE DEBRIS]					
3												
4												
5			D3									
6												
7			D4									
8			D5									
9												
10												
11												
12												
13												
14			D6									
15												
16												
17			D7									
18			D8					12		31	16	15
19												
			D9									

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
□ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-01

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) / MC (%) / PL & LL (%) / Fines Content (%)
21							Gravelly LEAN CLAY with Sand (CL): slightly moist, brownish tan, stiff, 25-30% angular gravel, 15-20% sand, 55-65% fines, [LANDSLIDE DEBRIS]						
22			D10										
23													
24													
25			D11										
26													
27													
28			D12	67	11-16-21 38			11		28	16	12	
29							CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, very dense, 50-55% angular gravel, 15-25% sand, 25-30% fines [LANDSLIDE DEBRIS]						
30			D13										
31			D14										
32													
33			D15										
34													
35			D16										
36													
37			D17	56	46-50/5" 94								
38			D18										
39			D19										

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-01

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) / □ Fines Content (%) 20 40 60 80
41			D20				CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, very dense, 50-55% angular gravel, 15-25% sand, 25-30% fines [LANDSLIDE DEBRIS]						
42			D21										
43			D22										
44			D23										
45			D24										
46			D25										
47		⧗	D26	200	19-50/1" 84								
48													
49													
50													
51							LEAN CLAY, Sandy LEAN CLAY with Gravel, LEAN CLAY with Sand (CL): slightly moist, brownish tan, very stiff, 10-20% gravel, 20-30% sand, 50-90% fines, [LANDSLIDE DEBRIS]						
52													
53													
54													
55													
56			D27					13		33	15	18	●⊢
57													
58													
59			D28										

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1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-01

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
61							LEAN CLAY, Sandy LEAN CLAY with Gravel, LEAN CLAY with Sand (CL): slightly moist, brownish tan, very stiff, 10-20% gravel, 20-30% sand, 50-90% fines, [LANDSLIDE DEBRIS]						
62			D29										
63			D30										
64													
65			D31										
66													
67													
68			D32	115	19-31-50/4" 56			10		26	16	10	● ⊢
69			D33										
70			D34										
71			D35										
72													
73			D36					12		38	17	21	● ⊢
74													
75			D37										
76													
77													
78			D38										
79													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-01

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Diedrich D120
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471263 **Longitude:** -110.753274 **Elevation:** 6471.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
81			D39	100	9-23-35 35		CLAYEY GRAVEL with Sand (GC): slightly moist, brownish gray, dense, angular 55% gravel, 15% sand, 30% fines [LANDSLIDE DEBRIS]						▲
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
96													
97													
98													
99													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) / MC (%) / PL & LL (%) / Fines Content (%)
1			D1				GRAVEL (GW): slightly moist to moist, brown, medium dense, clast supported, approximately 50% sand and 50% sub-rounded gravel [FILL]						
2													
3			D2				CLAYEY GRAVEL with Sand (GC): slightly moist, medium dense, brownish tan, 55% angular gravel, 15% sand, 30% fines [LANDSLIDE DEBRIS]						
4													
5			D3										
6													
7			D4							20	15	5	H
8													
9			D5										
10			D6										
11													
12			D7				LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel, (CL): Slightly moist, reddish brown, soft to medium stiff, homogeneous, 10-20% sub-angular to angular gravel , 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]						
13													
14													
15			D8					12		31	15	16	●⊣
16													
17													
18			D9	0	4-3-3 6								▲
19													

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1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
21			D10				LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel, (CL): Slightly moist, reddish brown, soft to medium stiff, homogeneous, 10-20% sub-angular to angular gravel , 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]						
22													
23			D11					13		29	15	14	● ⊢
24													
25													
26			D12										
27													
28			D13	100	7-12-13 24	2.50							▲
29			D14										
30													
31			D15										
32													
33			D16					15		21	16	5	●
34													
35													
36			D17										
37													
38			D18	93	16-12-15 24								▲
39			D19					16		29	17	12	● ⊢

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Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
▽ At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
41			D20				LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel, (CL): Slightly moist, reddish brown, soft to medium stiff, homogeneous, 10-20% sub-angular to angular gravel , 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]					
42												
43			D21									
44												
45			D22				CLAYEY GRAVEL with Sand (GC): moist to wet, reddish brown to grayish tan, dense, homogeneous, 40-50% angular gravel, 20-30% sand, 30-35% fines [LANDSLIDE DEBRIS]					
46												
47							▽					
48			D23	100	14-25-31 45							
49			D24									
50							LEAN CLAY, LEAN CLAY with Sand (CL): wet, tan to reddish tan, stiff to very stiff, homogeneous, 0-10% angular gravel, 5-35% sand, 60-95% fines [LANDSLIDE DEBRIS]					
51			D25									
52												
53			D26					12		26	14	12
54												
55												
56			D27									
57												
58			D28	100	14-26-36 45							
59			D29									

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
☐ Fines Content (%) 20 40 60 80

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Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) 8 16 24 32 / MC (%) / PL & LL (%) 20 40 60 80 / Fines Content (%) 20 40 60 80
61			D30				LEAN CLAY, LEAN CLAY with Sand (CL): wet, tan to reddish tan, stiff to very stiff, homogeneous, 0-10% angular gravel, 5-35% sand, 60-95% fines [LANDSLIDE DEBRIS]	14		37	14	23	
62													
63			D31										
64													
65			D32					13		31	17	14	
66													
67		⧗	D33	400	50/4" 66								
68			D34				CLAYEY SAND (SC): wet, grayish brown to reddish gray, very dense, 55% sand, 45% fines, ironoxide staining, organic odor [WEATHERED ROCK]						
69													
70			D35							21	16	5	
71													
72			D36										
73													
74													
75			D37										
76			D38										
77													
78			D39										
79													

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Telephone: 307.733.5150

Borehole ID: JG-02

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 01 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
▽ At time of drilling 47.00 on Oct 01 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 81.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471530 **Longitude:** -110.752693 **Elevation:** 6440.00
Notes: Groundwater encountered at 47' bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
81			D40	0	50/2" 59		CLAYEY SAND (SC): wet, grayish brown to reddish gray, very dense, 55% sand, 45% fines, ironoxide staining, organic odor [WEATHERED ROCK]						
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
96													
97													
98													
99													

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Telephone: 307.733.5150

Borehole ID: JG-03

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471750 **Longitude:** -110.753041 **Elevation:** 6406.00
Notes: Perched groundwater encountered between 27 and 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1			D1				SILTY GRAVEL with Sand (GM): slightly moist, dark brown, medium dense, 45% sub-rounded to rounded gravel, 25% sand, 30% fines [FILL]					
2							GRAVELLY LEAN CLAY with Sand (CL): slightly moist, brownish tan, soft, approximately 15-25% angular cobbles by volume, matrix supported, 30-35% angular gravel, 15-20% sand, 50% fines [LANDSLIDE DEBRIS]					
3			D2									
4												
5			D3					10		33	14	19
6												
7			D4	93	4-3-4 7							
8												
9			D5									
10			D6									
11							CLAYEY SAND with Gravel (SC): slightly moist, very light brownish tan, dense, approximately 15-25% angular cobbles by volume, matrix supported, 25-30% angular gravel, 30-35% sand, 40-45% fines [LANDSLIDE DEBRIS]					
12												
13			D7									
14												
15			D8					8		30	15	15
16												
17			D9	100	10-17-20 33							
18							CLAYEY GRAVEL with Sand (GC): moist to wet, reddish brown, medium dense, homogenous, approximately 15-25% angular cobbles by volume, matrix supported, 30-55% angular gravel, 20-30% sand, 30-50% fines [LANDSLIDE DEBRIS]					
19			D10									

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-03

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471750 **Longitude:** -110.753041 **Elevation:** 6406.00
Notes: Perched groundwater encountered between 27 and 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D11				CLAYEY GRAVEL with Sand (GC): moist to wet, reddish brown, medium dense, homogenous, approximately 15-25% angular cobbles by volume, matrix supported, 30-55% angular gravel, 20-30% sand, 30-50% fines [LANDSLIDE DEBRIS]					
22												
23			D12					12		35	15	20
24												
25			D13									
26												
27			D14	87	10-11-14 22							
28												
29			D15									
30			D16									
31			D17					11		29	15	14
32												
33												
34			D18									
35			D19	80	20-25-10 17							
36												
37												
38												
39												

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

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Telephone: 307.733.5150

Borehole ID: JG-04

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
At time of drilling 30.00 on Oct 02 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 35.2 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471774 **Longitude:** -110.753619 **Elevation:** 6404.00
Notes: Groundwater encountered at 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1			D1				SILTY GRAVEL with Sand (GM): slightly moist, dark brown, medium dense, 45% sub-rounded gravel, 25% sand, 30% fines [FILL]					
2												
3			D2									
4							LEAN CLAY with Gravel (CL): slightly moist, brownish tan, soft, approximately 15-25% angular cobbles by volume, matrix supported, 15-20% angular gravel, 15-20% sand, 60-70% fines [LANDSLIDE DEBRIS]					
5			D3									
6												
7			D4	93	2-2-7			12		34	16	18
8			D5		8							
9												
10			D6									
11												
12							CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, dense, approximately 15-25% angular cobbles by volume, matrix supported, 35-55% angular gravel, 15-30% sand, 30-35% fines [LANDSLIDE DEBRIS]					
13			D7									
14												
15			D8					7		19	14	5
16												
17			D9	53	18-27-30							
18					49		LEAN CLAY with Sand (CL): slightly moist, brownish tan, medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-5% angular gravel, 25-30% sand, 65-70% fines [LANDSLIDE DEBRIS]					
19			D10									

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-04

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic
▽ At time of drilling 30.00 on Oct 02 2023

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 35.2 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471774 **Longitude:** -110.753619 **Elevation:** 6404.00
Notes: Groundwater encountered at 30-ft bgs. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D11				LEAN CLAY with Sand (CL): slightly moist, brownish tan, medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-5% angular gravel, 25-30% sand, 65-70% fines [LANDSLIDE DEBRIS]	17				
22												
23			D12							31	17	14
24												
25												
26			D13									
27												
28			D14	87	25-32-12 21							
29			D15									
30			D16									
31			D17				CLAYEY GRAVEL with Sand (GC): wet, grayish brown to reddish gray, very dense, approximately 15-25% angular cobbles by volume, matrix supported, 40-45% angular gravel, 15-20% sand, 40-45% fines [WEATHERED ROCK/LANDSLIDE DEBRIS]	10		33	15	18
32												
33												
34			D18									
35			~~D19~~	400	50/1" 83							
36												
37												
38												
39												

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
□ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-10

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471827 **Longitude:** -110.752751 **Elevation:** 6404.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-2 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1–4							CLAYEY SAND with Gravel (SC): slightly moist, very loose, brown, 20% angular gravel, 55% sand, 20% fines [TOPSOIL/FILL]					
3			D-1	40	1-1-4 4							
4–5							GRAVELLY LEAN CLAY with Sand. LEAN CLAY with Sand, LEAN CLAY (CL): dry, reddish tan, soft to medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-30% angular gravel, 10-20% sand, 50-90% fines, [LANDSLIDE DEBRIS]					
6			D-2	67	5-8-7 11							
8			D-3	60	5-5-6 9					25	16	9
10–11			D-4	67	9-17-12 18							
13			U-1					14		39	15	24
15–16			D-5	83	4-6-8 11			16		38	21	17
18			U-2					14		32	14	18
19												

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-10

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471827 **Longitude:** -110.752751 **Elevation:** 6404.50
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-2 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / ☐ Fines Content (%) 20 40 60 80
21			D-6	100	5-9-8 14		GRAVELLY LEAN CLAY with Sand. LEAN CLAY with Sand, LEAN CLAY (CL): dry, reddish tan, soft to medium stiff, approximately 15-25% angular cobbles by volume, matrix supported, 0-30% angular gravel, 10-20% sand, 50-90% fines, [LANDSLIDE DEBRIS]						▲
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-11

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471746 **Longitude:** -110.753110 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1–4			D-1	20	11-11-19 26		CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, medium dense, 55% sub-rounded gravel, 25% sand, 20% fines [FILL]					
5–7			D-2	79	5-11-50/5" 50		CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, medium dense to very dense, chaotic sorting, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 30-50% angular gravel, 15-30% sand, 35-40% fines, Charcoal present [LANDSLIDE DEBRIS					
8–9			D-3	90	8-12-14 20			7		22	15	7
10–12			D-4	83	4-9-12 16							
13–15			D-5	100	6-17-23 33							
16–17			D-6	73	10-18-20 31							
18			~~D-7~~	0	50/1" 79							
19			D-8	125	50/5" 77							

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

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1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-11

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471746 **Longitude:** -110.753110 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21							CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, medium dense to very dense, chaotic sorting, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 30-50% angular gravel, 15-30% sand, 35-40% fines, Charcoal present [LANDSLIDE DEBRIS					
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
☐ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-12

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471744 **Longitude:** -110.753401 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-3 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
0							CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, very loose, 55% rounded gravel, 25% sand, 20% fines [FILL]					
3			D-1	60	4-4-3 5		CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, loose to very dense, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 30-35% angular gravel, 25-30% sand, 40-45% fines [LANDSLIDE DEBRIS]					
5			D-2	93	9-19-50/5" 55			10		27	15	12
7			D-3	75	50/5" 78							
9							LEAN CLAY with Sand (CL): dry, tan, medium stiff, 10% angular gravel, 30-40% sand, 50-60% fines, [LANDSLIDE DEBRIS]					
10			D-4	100	6-6-14 15			13		27	17	10
13			D-5	93	4-6-15 17							
15			D-6	100	6-23-29 41		CLAYEY GRAVEL WITH SAND (GC): dry to slightly moist, brown, dense, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 50% angular gravel, 15% sand, 35% fines [LANDSLIDE DEBRIS]					
18			D-7	73	19-16-42 45							

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-12

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 25 2023 **Completed:** Oct 25 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Total Depth: 21.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471744 **Longitude:** -110.753401 **Elevation:** 6406.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-3 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D-8	100	6-9-15 20		SANDLY LEAN CLAY with Gravel (CL): dry to slightly moist, brown, medium stiff, homogeneous, approximately 15-25% angular cobbles by volume, matrix supported, 20-30% angular gravel, 20-30% sand, 50% fines [LANDSLIDE DEBRIS]	11		26	14	12

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
□ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-03

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471762
Longitude: -110.752954
Elevation: 6406.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

Notes:
No groundwater encountered. Stopped at target depth and limits of excavtator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
0						CLAYEY GRAVEL with Sand(GC): dry to slightly moist, blackish brown, homogeneous, 45% sub-angular gravel, 30% sand, 25% fines, [FILL]						
4						CLAYEY GRAVEL with Sand(GC): dry to slightly moist, brown, clast supported, 25% sub-angular to angular cobbles by volume, remaining 50% angular gravel, 15% sand, 35% fines by mass, Large amounts of charcoal. Chaotic sorting. Layer of CL (-0.5") at 6.5' and 8' [LANDSLIDE DEBRIS]						

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-04

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471736
Longitude: -110.753241
Elevation: 6405.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160
Notes: No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
1						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, blackish brown, homogeneous, 45% sub-rounded gravel, 30% sand, 25% fines, Chunks of asphalt present, rebar [FILL]						
2												
3												
4												
5						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, clast supported, 15% sub-angular to angular cobbles by volume, remaining 50% angular gravel, 15% sand, 35% fines by mass, Large amounts of charcoal. Chaotic sorting. [LANDSLIDE DEBRIS]						
6												
7												
8												
9												
10												
11												
12			D-1									
13												
14												
15												
16												
17												
18												
19												

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-05

Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471248
Longitude: -110.753015
Elevation: 6467.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Notes:
Contractor: FCE
Equipment: Hitachi Zaxis 160

No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
1						CLAYEY SAND (SC): dry, brown, loose, 15% gravel, 55% sand, 30% fines, [TOPSOIL]						
2						LEAN CLAY with Sand (CL): dry, light whitish tan, pinholed, 5% angular gravel, 15% sand, 80% fines, medium plasticity, Some gravels and cobbles present. Lime stringers present [LOESS]						
3												
4												
5												
6												
7			D-1									
8						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, clast supported, 35% angular cobbles by volume, remaining 50% angular gravel, 15% sand, 35% fines by mass, charcoal. Chaotic sorting. [LANDSLIDE DEBRIS]						
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

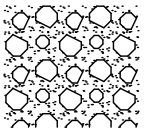
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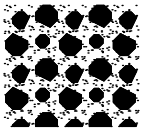
Project Name: Bear Development - Snow King Loop Lots 53 and 58
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
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Longitude: -110.753164
Elevation: 6424.50
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

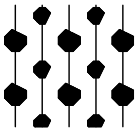
Notes:
No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

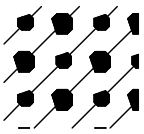
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0						CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, 40% angular cobbles by volume, remaining 55% angular gravel, 15% sand, 30% fines by mass, 2-4' cobbles and boulders [LANDSLIDE DEBRIS]						
4						CLAYEY GRAVEL with Sand (GC): slightly moist, dark reddish brown, dense, clast supported, 40% angular cobbles by volume, remaining 55% angular gravel, 15% sand, 30% fines by mass, 2-4' cobbles and boulders. Increased to very dense at bottom of pit. [LANDSLIDE DEBRIS]						
8						CLAYEY GRAVEL with Sand (GC): Dry, reddish brown, very dense, 80% angular cobbles by volume, remaining 55% angular gravel, 20% sand, 25% fines by mass, Appears to be layer of scree/ loose bedrock [LANDSLIDE DEBRIS/WEATHERED BEDROCK]						

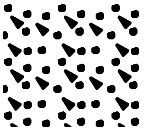
SOIL GRAPHICS

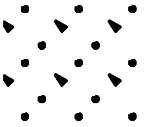
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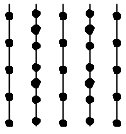
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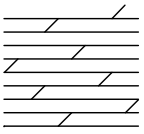
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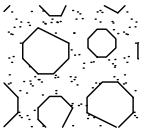
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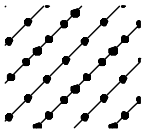
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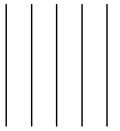
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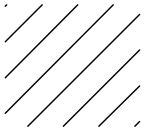
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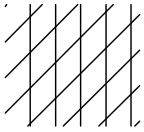
BEDROCK 

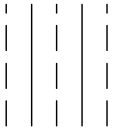
COBBLES/BOULDERS 

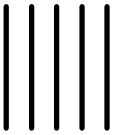
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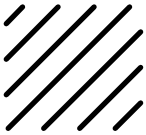
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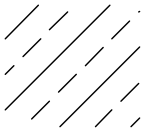
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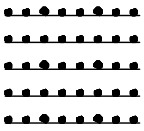
ML–CL 

OL 

MH 

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OH 

PT 

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

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

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**		**DRILL HOLE No. BH-1**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/11/05 10/12/05**		DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**		DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6408.5**		HOLE DIAMETER: **4"**	
		HAMMER TYPE: **140#**	

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ALUVIAN GRAVEL, COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED ON EXCAVATED CUT SLOPE. SURFICIAL SOILS AT BORING SITE AND IN ADJACENT CUT SLOPES ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER (6' M.D.)*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-5' ARE ROCK CHIPS AND SILTY CLAY FINES*						
		4												
		5						*DRILLING THROUGH ROCK 4.8-6'*						
		6												
		7												
		8												
		9						*CUTTINGS 0-10.1' ARE ROCK CHIPS AND SILTY CLAY FINES*						
		10	X			BH1-1 2" SS	87	*DRY GREY GRAVEL, GP, FILGC, LIMESTONE FRAGMENTS IN MOIST BROWN SILTY SAND MATRIX*			>50			
		11	X											
		12												
		13												*10-20' DR REPORTS INTERVALS OF 1-4" SOFTER MATERIAL. PRIMARILY DRILLING THROUGH ROCK MATERIAL CUTTINGS ARE LIMESTONE FRAGMENTS IN SILTY SAND*
		14												
		15												
		16												
		17												
		18												
		19												
		20	X			BH1-2 2" SS	46	*MOIST BROWN GRAVEL W/ SILT AND SAND, GP-GM, GRAVELS ANGULAR, SILT STIFF. MULTICOLORED GRAVELS HIGHLY WEATHERED*			35			
		21	X											

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

CLIENT: **SNOW KING MOUNTAIN RESORT**
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-1* PAGE: *2 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	22												DR MOD. TO EASY DRILLING IN 20–22' INTERVAL 8" ROCK 22.3–23'
		23												
		24												
		25				BH1-3 3"CS	25	MOIST BROWN CLAYEY SAND WITH GRAVEL, SC, PP=2.5 TSF, STIFF TO V. STIFF. FRAG. IN SHOE			8			
		26												DR 1–3" INTERVALS BETWEEN CLASTS
		27												
		28						SOME HIGHER PLASTICITY LEAN CLAYS IN CUTTINGS						
		29												
		30				BH1-4 2.5" SS	21	MOIST BROWN CLAYEY SAND WITH GRAVEL, SC, V. STIFF TO HARD, PP=4.0TSF	27	16	10		10	DR EASIER DRILLING FROM 29.5'± WITH LITTLE HAMMER ACTION
		31												
		32						HOLE CAVED TO 20' AFTER 30' SAMPLE						DR EASIER DRILLING FROM 29.5'± WITH LITTLE HAMMER ACTION FREQ. HAMMER PLUGGING 32–40'
		33												
		34												
		35												
		36												
		37												
		38												
		39												
		40						NO SLUFF IN HOLE @40' DIFFICULTY CLEANING HOLE TO REMOVE ROD INDICATES SOME CAVING IN 30–40' INTERVAL.						
		41				BH1-5 2" SS	70	MOIST BROWN CLAYEY SAND, SC, VERY STIFF TO HARD, FINE ANGULAR GRAVELS IN A SANDY CLAY MATRIX. UPPER 2" HIGHER MOISTURE CONTENT, MAY INDICATE SEEPAGE ZONE 40–41'	19	4	30		12	DR GRAVEL AND COBBLE ZONE 42–43' WATER LEVEL 11/3/05
		42												
		43												
		44												

S:\STANDARD\BORDERS\NE_BOREHOLE.DWG (BOREHOLE PG1) JUN 20 2002 08:53:53 AM PLOTTED BY: GREEN

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

CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-1* PAGE: *3 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44						*CUTTINGS ARE MOIST TO WET OLIVE GREEN CLAYEY SAND*						*DR CONT. HAMMER CLOGGING FROM 42'*
		45	X			*BH1-6 2" SS*	*83*	*MOIST OLIVE GREEN CLAYEY SAND, SC, MED. STIFF TO STIFF, SLIGHTLY SANDY LENS WITHIN. SOME CALCIUM CARBONATE STRINGERS.*	*30*	*6*	*16*		*20*	
		46	X											
		47	X											
		48												
		49												
		50												
		51												
		52	X											*AT 52' DR APPROX. 12' OF WATER IN HOLE OVERNIGHT*
		53	X			*BH1-7 2" SS*	*40*	*AS ABOVE BUT GREY BROWN, SOME COAL/ORGANICS, PP=3.5-4.0 TSF.*			*22*			
		54	X					*BOH =52.0'*						
		55						*SET PIEZO (1"PVC) BOTTOM AT 51.1 SLOTTED BOTTOM 10' FILLED ANNULUS WITH SAND TO 38' 1' STICKUP*						
		56												
		57												
		58												
		59												
		60												
		61												
		62												
		63												
		64												
		65												
		66												

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

CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

S:\PROJECTS\06-12 GRAND VIEW LODGES\DRILLING\BHBORINGLOG.DWG (BH-1 (2)) FEB 13 2006 10:56:01 AM PLOTTED BY: GYR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-2**	PAGE: **1 OF 5**
DATE STARTED / FINISHED: **10/11/05 10/12/05**	DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6550.3**	HOLE DIAMETER: **4"**	
	HAMMER TYPE: **140#**	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	FREQ. GRAVEL, COBBLE. AND BOULDER SIZE CLASTS	1–6						*BORING LOCATED ON GRASSY AREA. SURFICIAL SOILS IN ADJACENT ROAD CUT ARE GENERALLY STIFF TO HARD GRAVEL AND SILT MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE. SEVERAL LARGE BOULDERS EXCAVATED FROM NEARBY WATER TANK EXCAVATION.*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		3–5						*CUTTINGS 0–5' ARE MOIST LT BROWN GRAVEL WITH WITH SILT, GP–GM*						*DR FREQ. COBBLES. HAMMER ACTION IS NEARLY CONTINUOUS*
		6												*DR NO GRAVEL/COBBLES FROM 6'±*
	WET TO SATURATED SOILS IN INTERVALS FROM 7'–18'	7–9						*DR VERY SOFT DRILLING 7–9.5' CUTTINGS ARE WET CLAY/SANDY CLAY. APPEARS TO BE A SATURATED ZONE*						
		10–11				BH2-1 2.5" CS	75	*FROM 9.5' SAND CONTENT OF CUTTINGS INCREASING MOIST GREY BROWN CLAY, CL, STIFF TO VERY STIFF, NONUNIFORM PLASTICITY IN SAMPLE.*			15			
		12–14												*DR GRAVELLY DRILLING 12'–13'*
		15–16				BH2-2 2" SS	75	*MOIST TO WET GREY CLAYEY SAND W/GRAVEL, SC, GRAVELS FINE TO MED. SANDS FINE. V. STIFF TO HARD, MEDIUM PLASTICITY*			16			
		17												
		18						*HAMMER PLUGGING FREQ. TO 17' CUTTINGS ARE MOIST CLAYS*						
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	19–21						*ROCKY DRILLING FROM 18' FREQ. HAMMER ACTION ON COBBLE AND GRAVELS. CUTTINGS SLIGHTLY MOIST*						

MATERIAL DESCRIPTION

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	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	22												*DR ROCKY DRILLING FROM 20'*
		23						*CUTTINGS TO 25' ARE GRAVEL/COBBLE FRAGMENTS IN SILT/SILTY CLAY WITH SAND MATRIX*						
		24												
		25	X			BH2-3 2.5"	25	*MOIST GREY SANDY SILT/SANDY CLAY, SC, V. STIFF*			18			
		26	X											*DR WET PLASTIC SOILS CONT. PLUG HAMMER. BORING ADVANCED WITH 1.875" ø NQ CORE FROM 30'*
		27	X											
		28												
		29												
		30						*CORING FROM 30' RETURN LOGGED AS IN"/IN"*						
		31		X				*30-30.8' WET SAT GREY CLAY, CL, WET FROM DRILLING FLUID. WITH 2 3" GRAVEL PARTICLES*						
		32		X			33/36	*30.8-33' MOIST GREY GREEN SANDY SILT, ML, V. STIFF TO HARD. GRADES TO SILTY SAND W RED COLORING SOME INTERVALS. TRACE CLAY. THROUGHOUT. 1 2" SEAM OF V.STIFF MED. PLASTICTY CH 31.0'*						
		33		X										
		34												
		35					2/60	*MOIST GREY SAND W/SILT, SP/SM, SANDS FINE, DENSE, WEAKLY CEMENTED*						
		36												
		37												
		38												
		39												
		40					35/60	*MOIST DENSE GRAY GREEN SAND W/SILT, SP-SM, DENSE, CONTAINS 1/4" THICK STRATA OF DK BROWN SILT W/SAND IN LOWER HALF*						
		41												
		42												
		43												
		44												

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S:\STANDARD\REFERENCE\BOREHOLE\BOREHOLE.PGU JUN 20 2002 09:53:53 AM PLOTTED BY: GREEN

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-2* PAGE: *3 OF 5*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44					43/60	*MOIST DENSE GRAY GREEN SILTY SAND, SM, SANDS FINE, SILT % INCREASING WITH DEPTH, LOWER 1.5' OF SAMPLE MAY BE SANDY SILT. 3–5 DARKER FINE GRAINED STRATA <1" THICKNESS IN INTERVAL*						
		45												
		46												
		47												
		48												
		49												*48–53 DR VARIABLE RATE OF ADVANCE IND. 6"± STRATA*
		50					60/60	*4" INTERVAL 48.2–48.6 SAT V. SOFT SILTY SAND (DRILLING FLUID). MOIST GRAY GREEN SILT, ML, V. STIFF, OCCASIONAL BLACK ANGULAR FINE GRAVELS.*						
		51						*SAND % INCREASING FROM 51' MOIST GREY GREEN SILTY SAND, SM, SANDS FINE, DENSE*						
		52												
		53												
		54					48/48	*MOIST GREY GREEN SILT, SILTY SAND, ML/SM, WEAKLY CEMENTED SILTSTONE UPPER 6"*						
		55												
		56												
		57					12/12	*AS ABOVE*						
		58												
		59												
		60					12/60	*DR COBBLE AND GRAVEL DRILLING AND LOSS OF DRILLING FLUID FROM APPROX. 58'. POOR RETURN, 2" MINUS SANDTONE GRAVELS AND SILTY SAND. APPEARS TO BE COBBLES IN SILTY SAND MATRIX.*						
		61												
		62												
		63												
		64												
		65					12/20	*BLOCKED OF AT 64.7 BY COBBLE. MED. COARSE GRAVEL SIZE FRAGMENTS QUARTZITE NO WATER RETURN 65.5–66'*						
		66												

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S:\STANDARD REFERENCE FILES\LOGGING GRIDDLE.PGU JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-2* PAGE: *4 OF 5*

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		67					14/40	*AS ABOVE.* *CONT. LOSS OF FLUID TO FORMATION*						
		68												
		69					18/30	*GRAVEL SIZE LIMEYSANDSTONE FRAGMENTS, SOME SAND ADHEREING TO GRAVEL SURFACES*						
		70						*BLOCKED OFF BY COBBLE @70.5*						
		71					15/30	*DR HARDER COMPETENT ROCK WITH THIN (<2") SOFTER INTERVALS THROUGHOUT. CONT. WATER LOSS.* *MOIST GREEN SILT W/SAND, ML, HARD, TRACE CLAYS.*						
		72												
		73												
		74					54/60	*UPPER 1' IS SILT W SAND, ML, SAT. SOFT (DRILLING FLUID)* *REMAINDER IS MOIST GREEN SANDY SILT, ML, GRADES TO SILTY SAND IN SOME INTERVALS, SANDS FINE. VERY STIFF TO HARD*						
		75												
		76												
		77												
		78												
		79												
		80					44/60	*UPPER 10" MOIST GREEN SAND W/SILT, SP-SM,* *9" INTERVAL MOIST GREEN THEN BLACK CLAY, CH, MED. TO HIGH PLASTICITY, V. STIFF TO HARD* *16" SAND W SILT AS ABOVE* *GRADES TO MOIST GREEN CLAY, CH, HARD, BOTTOM 4"*						*DR REPORTS RED SEDIMENT IN RETURN FLOW 80-81 NO RED MATERIAL IN CORE*
		81												
		82												
		83												
		84					21/51	*14" MOIST GREEN TAN SILTY SAND/SANDY SILT, DENSE/HARD SANDS FINE* *2" MOIST GREEN CLAY, CH/CL, MED. HIGH PLASTICITY , WITH FINE SAND. V. STIFF TO HARD* *5" COBBLES LARGE GRAVELS IN SILT W SAND MATRIX*						*DR REPORTS LITTLE WATER LOSS 83-88*
		85												
		86												*BIT BLOCKED@87.25 NO RETURN FROM 87.5 DR COBBLE DRILLING*
		87												
		88					18/30							
		89												

S:\STANDARD\BORERS\NE_BOREHOLE.DWG (BOREHOLE PLG) JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-2* PAGE: *5 OF 5*

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 boring and at the time of the drilling. 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.

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		90						*FRACTURED BLUE GREY LIMESTONE, 1" MD*						*DR COBBLES NO RETURN 89.8–93*
		91					14/38	*FRACTURED LIMESTONE AS ABOVE*						
		92												
		93												
		94												
		95					23/30	*LIMESTONE, 7" CONT. CORE, REMAINDER FRACTURED GRAVEL SIZE*						
		96					20/30	*BLACK TO GREY FRACTURED LIMESTONE, 1.5" M.D. SOME SANDY CALY MATRIX. APPEARS TO HAVE WEATHERED SURFACES*						*BLOCKED@96.5*
		97												
		98												*NO REUTRN 98–103 COBBLES WITH SMOOTH INTERVALS (CORING THROUGH LARGER COBBLE)*
		99												
		100					27/60	*CONT. FRACTURED LIMESTON, WITH SANDY CLAY INTERVALS. FRAGS UP TO 3" CORE LENGTH. WEATHERED SURFACES*						
		101												
		102												
		103												
		104												*NO REUTRN 103–108 CONT. COBBLE DRILLING*
		105					40/60	*AS ABOVE TO BOH*						
		106												
		107												
		108						*SET PIEZOMETER 1" ø PVC.* *BOTTOM AT 107.7* *SLOTTED 97.7–107.7* *NO WATER MEASURED ON 11/3/05*						
		109												
		110												
		111												
		112												

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S:\PROJECTS\2006\126-02 GRAND VIEW GEOTECH\DRAWINGS\LOGS\DWG GBH-2(5).DWG FEB 13 2006 11:06:21 AM PLOTTED BY: GYR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-3** PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/20/05 10/20/05**	DRILLER: **PIEDMONT**
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6445.8**	HOLE DIAMETER: **4"**
	HAMMER TYPE: **140#**

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED UNDISTURBED GROUND. SOILS EXPOSED IN WATERLINE TRENCH TO WEST TO DEPTH OF APPROX. 15' ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE (6' M.D.)*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-10' ARE ROCK CHIPS AND SILTY CLAYEY SAND*						
		4												*10-9.5' DR COBBLES AND GRAVELS WITH MATRIX INTERVALS OF 1" OR LESS THICKNESS*
		5												
		6												
		7												
		8												
		9												
		10	X			BH3-1 2" SS	46	*MOIST LT BROWN SILTY CLAYEY SAND W/GRAVEL, SC-SM, GRAVELS FINE ANGULAR, WITH CALCEROUS STRINGERS. SANDS FINE. GRADES TO SILTY CLAY WITH GRAVEL, STIFF*			34			
		11												
		12												*COBBLES LESS FREQ. FROM 9.5'*
		13												
		14						*DR ROCK, 14.1-16.8'*						
		15												
		16												
		17												
		18												
		19												
		20	X			2" SS	NS				30/0			*DR GRAVEL AND COBBLES FREQ. FROM 20.5'*
		21												

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S:\PROJ\2005\129-12 GRAND VIEW GEOTECH\ENGINEERING\DRIVE (ENGR)\ FEB 13 2006 11:46:48 AM PLOTTED BY: GYR

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-3* PAGE: *2 OF 3*

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		22						*CUTTINGS ARE GRAVEL FRAGS AND RED SAND FROM 20'*						
		23												
		24												*WATER LEVEL 11/3/05*
		25												
		26				BH3-2 2"SS	33	*MOIST LT BROWN SILTY CLAY W GRAVEL , CL-ML, FILGC, GRAVELS FINE TO MED. LIMESTONE. STIFF TO VERY STIFF. DRILLING INDICATES HIGHER ROCK % THAN SAMPLE CONTENTS.*			30			*DR FREQ. PLUGGING 25-30' GRAVELLY*
		27												
		28												
		29												
		30												
		31				BH3-3 2.5" SS	100	*MOIST GREY BROWN SILTY SAND W.GRAVEL, SM, SANDS FINE, VERY STIFF*			17			
		32												*DR FREQ. HAMMER PLUGGING 30-35' DUE TO WET SILTY CLAY.*
		33												
		34						*CUTTINGS 35-40' ARE SILTY CLAY, GRAVEL, SILT, AND SAND MIXTURE*						
		35												
		36												
		37												
		38												
		39				BH3-4 2.5" SS	50	*MOIST GREY CLAY, CL HARD. SUSPECT WATER ABOVE IMPERMEABLE CLAY LAYER.*			>50			
		40												
		41				BH3-5 2" SS	58	*MOIST BROWN TO YELLOWBROWN SILTY CLAY W/GRAVEL, CL-ML, SOME COAL, STIFF TO VERY STIFF.*			12			*DR GRAVEL AND COBBLE ZONE 42-43'*
		42				BH3-6 2" SS	100	*MOIST GREY SILT W GRAVEL, ML, FRAGS UP TO 2", V. STIFF TO HARD.*			>50			
		43												
		44												

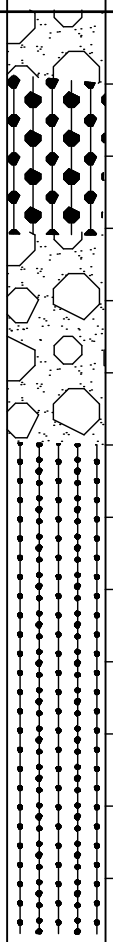
DRILLED BH3A TO 40' WITH DOWNHOLE HAMMER. SET PIEZO BOTTOM AT 33.25 SLOTTED TO 23.25. SAND 33.25-22.0' DRILLED BH3B APPROX. 7' EAST OF BH3A, 3B DRILLED WITH HAMMER TO 42' CASED 3.75"ø TRICONE WITH WATER FROM 42'

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S:\STANDARD\BORINGS\NE_BOREHOLE.PGU JUN 26 2002 09:35:3 AM PLOTTED BY: GREEN

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-3* PAGE: *3 OF 3*



DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
44						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 boring and at the time of the drilling. 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.						*DR SOFT EASY DRILLING FROM 44–45'*
45												
46												*DR COBBLES 3–6" WITH SOFT INTERVALS 46–49'*
47												
48												
49												*DR SMOOTH DRILLING FROM 49'–BOH*
50												
51	✕			*BH3-7 2" SS*	*100*	*MOIST GREY FINE SILTY SAND, SM, INCLUDES 4" OF CLAY WITH BLACK PEAT/COAL INCLUSIONS, V. STIFF*			*23*			
52	✕											
53												
54												
55												
56	✕			*BH3-8 2" SS*	*100*	*AS ABOVE. V. STIFF, DENSE.*			*20*			
57	✕					*BOH=–55.75'*						
58												
59												
60												
61												
62												
63												
64												
65												
66												

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S:\STANDARDS\BOREHOLE\NE_BOREHOLES.DVG (BOREHOLE.PGL) JUN 28 2002 08:13:53 AM PLOTTED BY: GREEN

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-4**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/22/05 10/23/05**	DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6487.8**	HOLE DIAMETER: **4"**	
	HAMMER TYPE: **140#**	

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	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED ON UNDISTURBED GROUND. SOILS EXPOSED 50' HIGH CUT SLOPE DOWNSLOPE TO THE NORTH ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE (6' M.D.) SEEPS ARE EVIDENT IN AREA OF CUT FACE DOWNSLOPE OF BORING.*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-6' ARE ROCK CHIPS AND MOIST SILTY CLAYEY SAND*						
		4												*CUTTINGS MOISTURE % INCREASING FROM 6' FEWER ROCKS AND FREQ. BIT PLUGGING.*
		5												
		6												
		7												
		8												
		9	X			BH4-1 2.5" SS	79	*MOIST LT TAN GREEN SILTY SAND, TRACE CLAY, TRACE COAL, HARD.*			35			
		10	X											
		11												
		12												
		13												
		14	X			BH4-2 2" SS	50	*MOIST TO WET RED SILTY CLAYEY GRAVEL W/SAND, MED. PLASTICITY, STIFF TO V. STIFF. MOIST. CHAOTIC, NOT STRATIFIED*			17			*DRILLING WITH 3.75" ø TRICONE AND WATER FROM 15'*
		15	X											
		16												
		17												
		18												
		19												
		20												*DR ROCK 19.5-20.2'*
		21												

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CLIENT: **SNOW KING MOUNTAIN RESORT**
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S:\PROJECTS\06-07\TRANSFER STATION GEOTECH\TRANSFER MAIN BUILDING BORING LOGS.DWG GINT-D MAR 14 2005 01:31:31 PM PLOTTED BY:

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-4* PAGE: *2 OF 3*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		22												*DR SOFT 20.5–22 DR 50% ROCK WITH 4"–8" INTERVALS OF SOFTER MATERIAL BETWEEN 22–29'*
		23												
		24												
		25												
		26												
		27												
		28												
		29												
▼		30												*WATER LEVEL 11/3/05*
		31												
		32												
		33												
		34						*AT 34' ATTEMPTED SPLIT SPOON, BORING CAVED TO 29' DRILLING WITH CASED 3.75" TRICONE FROM 34' DR SMOOTHER DRILLING AT 35'*						
		35												
		36												
		37												
		38												
		39				BH4-3 2" SS	92	*MOIST TO WET SILT, ML, TAN, MED PLASTICITY. SEAMS .5–1" THICK MAY BE SATURATED. STIFF.*			8			
		40												
		41												*DR COBBLES FROM 39.5 LOSING WATER FROM 40.5*
		42												
		43												
		44												

S:\STANDARD\BORERS\NE_BOREHOLE.DWG (BOREHOLE PLT) JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

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CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-4* PAGE: *3 OF 3*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44						*DR CONT FRACTURED ROCKY DRILLING FROM 39' CUTTINGS ARE ANGULAR LIMETONE/SANDSTONE GRAVEL SIZE FRAGMENTS*						
		45												
		46												
		47												
		48												
		49												
		50												
		51												
		52												
		53						*DR CONT FRACTURED ROCKY DRILLING FROM 39' CUTTINGS ARE ANGULAR BLUE BLACK LIMESTONE/SANDSTONE GRAVEL SIZE FRAGMENTS*						
		54						*MAJORITY OF WATER LOST, 39'–BOH*						
		55						*BOH =55.75*						
		56						*SET PIEZO (¾"PVC) BOTTOM AT 36.1' SLOTTED BOTTOM 6' BENTONITE IN HOLE TO 36.1, SAND TO 20' FILLED ANNULUS WITH SAND TO 38'*						
		57												
		58												
		59												
		60												
		61												
		62												
		63												
		64												
		65												
		66												

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S:\PROJ\2002\130-12 GRAND VIEW GEOTECH\BH\BORINGLOGS.DWG (BH-4 (3)) FEB 13 2006 11:07:07 AM PLOTTED BY: GVR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**		**DRILL HOLE No.** BH-5	PAGE: 1 OF 4
DATE STARTED / FINISHED: 10/24/05 10/25/05		DRILLER: PIEDMONT	
LOGGED BY: GYR/ROLFE		DRILL TYPE: TRACK MOUNT B-50	
BOREHOLE LOCATION/ELEVATION: SEE LOCATION MAP/6409.9		HOLE DIAMETER: 4"	
		HAMMER TYPE: 140#	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1						*BORING LOCATED AT BASE OF 60' PLUS CUT SLOPE*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-10' ARE MOIST TO WET LT BROWN CLAY, SILTY CLAY WITH SOME GRAVEL FRAGMENTS.*						
		4						*DRILLING INDICATES OCCASIONAL COBBLES*						
		5						*MOIST TO WET PLASTIC SOIL CAUSING FREQ. PLUGGING FROM 4'*						
		6												
		7												
		8												
		9												
		10						*DR ROCK 9.5-11'*						
		11						*WET FROM 11' FREQ. HAMMER PLUGGING*						
		12												
		13												*NO WATER IN HOLE @13' AFTER 28 HOURS*
		14												
		15						*NQ CORING FROM 15' RETURN LOGGED AS IN"/IN"*						
		16					10/36	*MOIST LT BROWN CLAYEY SAND W. GRAVEL, COBBLE FRAG. IN SHOE. V. STIFF TO HARD PP> 3.0 TSF*						
		17												
		18												*18-23 LITTLE WATER LOSS SMOOTH DRILLING W/OCCASIONAL COBBLES*
		19					10/60	*AS ABOVE*						
		20												
		21												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *2 OF 4*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		22												*MINIMAL WATER LOSS 23–28'*
		23												
		24												
		25					19/60	*COBBLE IN BIT. MOIST BROWN CLAYEY SAND, SC, SANDS FINE, CLAY FRACTION MED. TO HIGH PLASTICITY, TRACE GRAVELS, HARD*	29	4				
		26												*SOME WATER LOSS @29' REGAINED BY 30'*
		27												
		28												
		29												*DRILLING IND. SAT. SOFT/LOOSE ZONE 30'±1 28–33 SMOOTH DRILLING W/SOME COBBLES LOWER PORTION*
		30					51/60	*AS ABOVE W/COBBLES TO 6", MOIST TAN BROWN SILTY CLAY W/GRAVELS*						
▼		31						*DRILLER REPORTS SAND LENSE "PUSHING IN ON HOLE" AT 30' HOLE CASED TO 33'*						
		32												
		33												
		34												
		35					18/36	*ALL GRAVEL AND COBBLE FRAGMENTS, LITTLE FINE GRAINED MATERIAL*						*MIN. WATER LOSS 33–40'*
		36						*36–38' MOIST TAN BROWN CLAYEY SAND, SC, TRACE GRAVEL, MED. PLASTIC*						
		37					13/24	*ABUNDANT GRAVEL MOIST TAN TO GREY CLAYEY SAND W/GRAVEL, SC, MED. PLASTICITY*						*DRILLING IND. HIGHER GRAVEL FRACTION THAN IN RETURN FROM 33'*
		38												
		39					15/17	*MOIST BROWN CLAYEY SAND, SC, SANDS FINE, FINES MED. PLASTIC, V.STIFF TO HARD, TRACE GRAVEL*	28	12				
		40												
		41					9/43	*MOIST GREY CLAYEY SAND, W/ GRAVEL AND COBBLES, SC, V. STIFF TO HARD*						
		42												
		43												
		44												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *3 OF 4*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44												
		45					21/60	*MOIST TAN SILTY TO SANDY CLAY W/GRAVEL, CL, MED. PLASTICITY, V. STIFF TO HARD*						*TAN BROWN RETURN*
		46												
		47												
		48												
		49					13/24	*AS ABOVE*						
		50												*GOOD RETURN*
		51												
		52					15/36	*MOIST TAN BROWN SILTY CLAYEY SAND W/GRAVEL, SC-SM COAL IN SHOE @53' V/ STIFF TO HARD*						
		53												
		54					30/30	*MOIST TAN BROWN SILTY CLAY W/GRAVEL, INTERBEDDED COAL STRATA, V. STIFF, SOME MOTTLEING*						
		55												
		56												
		57					27/30	*AS ABOVE*						
		58												
		59												
		60					14/60	*MOIST BROWN SANDY SILTY CLAY W/GRAVEL, CL-ML, VERY STIFF*						
		61												
		62												
		63												
		64						*63-68 SOME KNOCKING, SOME FAST DRILLING*						
		65						*ORGANICS AT 65'*						
		66												

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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *4 OF 4*

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		67					34/60	*AS ABOVE TO 65' <u>FIBROUS ORGANIC MATERIAL @65±</u> BELOW ORGANICS IS MOIST BLUE GREY SANDY CLAY/CLAYEY SAND, STIFF TO VERY STIFF, WITH GRAVEL. BOTTOM 1' IS MOIST SILTY SAND/SANDY SILT/HARD/V. DENSE*						
		68												
		69												
		70					37/60	*SILTY SAND AS ABOVE SMOOTH DRILLING OCCASION KNOCKING, MOD FAST DRILLING*						
		71												
		72												*GOOD RETURN BLUE/GREY TO WHITE GREY*
		73												
		74						*<u>ORGANIC DEBRIS</u> MOIST BLUE GREY CLAYEY SAND W/ GRAVEL AND OCCASIONAL LARGE FRAGS OF WHITE LIMESTONE, STIFF TO VERY STIFF, CHARCOAL AND ORGANIC DEBRIS*						
		75					44/48							
		76												
		77												
		78					9/12	*MOIST BLUE GREY SANDY SILT, ML, TRACE GRAVEL LOW PLASTICITY STIFF TO VERY STIFF, CHARCOAL*						
		79												
		80					24/33	*AS ABOVE CHARCOAL IN SHOE*						
		81						*BOH AT 80.75 3/4" PIEZO INSTALLED PULLED CASING, CAVED TO 50' WATER IN BORING ABOVE 50' AS SEEN ON CLOTH TAPE. BENTONITE TO 45.5' BOTTOM OF PIEZO AT 45.5' SLOTTED TO 35.5 SAND TO 35.0' CAVED ABOVE*						
		82												
		83												
		84												
		85												
		86												
		87												
		88					18/30							
		89												

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PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-6**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **6/24/2021 6/25/2021**	DRILLER: **IME**	
LOGGED BY: **PRUETT**	DRILL TYPE: **TRUCK-MOUNTED CME85**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6466.0'**	HOLE DIAMETER: **8" OD HOLLOW STEM AUGER (HSA)**	
	HAMMER TYPE: **140# AUTO**	

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DEPTH (FT)	SAMPLES DRIVE	SAMPLES UNDISTURBED	SAMPLES BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
1						*BORING LOCATED ON CENTERLINE OF MOUNTAIN ACCESS ROAD W/GRAVEL SURFACE. UPHILL ROAD CUTS EST. 3-7' HEIGHT. STEEP GRASSY SLOPES UPHILL AND DOWNHILL. SURFICIAL SOILS ON CUT SLOPES DRY SILTY/CLAYEY GRAVEL/GRAVELLY SILT/CLAY WITH COBBLES AND BOULDERS.*						*EASY DRILLING WITH INTERMITTENT BIT GRINDING FROM 1'-10'*
2												*2 MINUTES TO DRILL 0'-5'*
3												
4												
5	5			BH6-1 2" SS	83	*5.0'-6.5' MOIST, BROWN/LT BROWN GRAVELLY SILT/SILTY GRAVEL, HARD, ANGULAR LIMESTONE AND SANDSTONE GRAVELS, FILGC*			34			
6	7											*3 MINUTES TO DRILL 5'-10'*
7	11											*HARD DRILLING IN GRAVELS FROM 7'-8'*
8												
9												
10	6			BH6-2 2" SS	61	*10.0'-11.5' MOIST, LT BROWN/GRAY SILTY GRAVEL WITH SAND, DENSE, ANGULAR LIMESTONE GRAVEL FRAGMENTS, FILGC*			34			*MODERATE DRILLING WITH CONSTANT BIT GRINDING ON GRAVELS AND COBBLES FROM 10'-21'*
11	10											*4 MINUTES TO DRILL 10'-15'*
12	12											
13												
14												
15	12			BH6-3 2" SS	67	*15.0'-16.5' SAME AS ABOVE, TRACE SAND, LIMESTONE GRAVEL LODGED IN TIP OF SS*			47			
16	17											*5 MINUTES TO DRILL 15'-20'*
17	17											
18												
19												
20	17			BH6-4 2" SS	78	*20.0'-21.5' 0"-12" SAME AS ABOVE, DENSE, ANGULAR GRAY LIMESTONE AND MINOR YELLOW SANDSTONE GRAVELS, MEDIUM PLASTICITY SILT*			32			
21	15					*12"-14" MOIST, OLIVE GREEN SILTY CLAYEY GRAVEL WITH MINOR SAND*						
	11											

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DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
22	11											
	6			BH6-4B 3" DM	83	22.0'–23.0' MOIST, OLIVE GREEN LEAN CLAY CHAOTICALLY MIXED WITH MINOR GRAY SILTY CLAY, STIFF TO VERY STIFF, MINOR COAL FRAGMENTS, PP>4.0 TSF, ORANGE OXIDATION STAINING IN TIP OF SS	33	15	15	108	18	MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 21'–25'
23	13	X										
24												4 MINUTES TO DRILL 20'–25'
25	3											
	5			BH6-5 2" SS	83	25.0'–26.5' MOIST, GRAY GRAVELLY SILTY CLAY WITH SAND, STIFF, MEDIUM PLASTICITY SILTY CLAY, PP=1–2 TSF, ANGULAR LIMESTONE AND SANDSTONE CLASTS, SANDSTONE CLAST WITH SHELL FOSSIL, ABUNDANT ORANGE OXIDATION STAINING THROUGHOUT			13			SMOOTH EASY DRILLING FROM 25'–30'
26	6											
27												2 MINUTES TO DRILL 25'–30'
28												BIT GRINDING FROM 28'–29'
29	7			BH6-5B 3" DM	83	28.5'–29.5' MOIST, BROWN SILTY CLAYEY/CLAYEY GRAVEL WITH SAND, MEDIUM DENSE, FINE SAND, ANGULAR LIMESTONE FRAGMENTS, FILGC			16			
	14											
30	14			BH6-6 2" SS	67	30.0'–31.5' MOIST, BROWN SILTY GRAVEL WITH SAND, VERY DENSE, FINE SAND, ANGULAR LIMESTONE FRAGMENTS, FILGC, FROM 4"–8" GRAVEL WITH SILT AND SAND LENS, GRAVEL LODGED IN TIP OF SS			51			MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 30'–35'
31	23											5 MINUTES TO DRILL 30'–35'
	24											
32												
33	7											INCREASED BIT GRINDING FROM 33'–35'
	20	X		BH6-6B 3" DM	100	33.0'–34.0' MOIST, OLIVE GREEN CLAYEY GRAVEL WITH SAND, MEDIUM DENSE, ANGULAR LIMESTONE, DOLOMITE, AND SANDSTONE GRAVELS			19			
34												
35	11											HARD DRILLING WITH CONSTANT BIT GRINDING 35'–45'
	18			BH6-7 2" SS	83	35.0'–36.5' TOP HALF–MOIST, OLIVE GREEN CLAYEY GRAVEL WITH SAND BOTTOM HALF–MOIST BROWN SILTY GRAVEL WITH SAND, DENSE, ANGULAR LIMESTONE FRAGMENTS, FILGC			34			
36	16											GRINDING ON COBBLE/BOULDER FROM 39'–39.5' FOR 15 MIN W/ NO PROGRESS. MOVED BH 6' EAST (BH–6B) DRILLED TO 40.4 WHERE GRINDING ON BOULDER FOR 30 MINS W/ MINOR PROGRESS. MOVED BH 7' WEST (BH–6C/ MW) OF ORIGINAL BH
37												
38						MONITORING WELL DRY ON 6/28/2021						
39												
40	23											
	50			BH6-8C 3" DM	67	39.5'–40.5' 0"–3" PULVERIZED LIMESTONE GRAVEL/COBBLE 3"–8" MOIST, SILTY CLAYEY GRAVEL WITH COBBLES, VERY DENSE, FRACTURED GRAY SANDSTONE GRAVEL AT BOS			>50			
41												
42												
43												HARD DRILLING WITH CONSTANT BIT GRINDING 40'–45'
44												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-6* PAGE: *3 OF 3*

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		44												
		45	11			BH6-9 2" SS	117	*45.0'–46.5' 0"–4" MOIST, OLIVE GREEN SANDY LEAN CLAY WITH MINOR GRAVEL, PP>4.0 TSF*			34			*EASY TO MODERATE DRILLING WITH OCCASIONAL BIT GRINDING FROM 45'–47.5'*
		46	20					*4"–21" MOIST, BROWN/GRAY/OLIVE GREEN CHAOTICALLY MIXED GRAVELLY LEAN CLAY/SILTY CLAY/SILT WITH SAND, HARD, PP>4.0 TSF, MINOR ORANGE OXIDATION STAINING, VERTICAL CONTACTS IN BOTTOM 6"*						
			17											
		47												*STIFF SMOOTH DRILLING FROM 47.5'–50'*
		48												
		49												*9 MINUTES TO DRILL 45'–50'*
		50	6					*50.0'–51.5' SAME AS ABOVE, TRACE GRAVELS, VERY STIFF, COAL*						
			12			BH6-10 2" SS	122	*FRAGMENTS IN BOTTOM 6"*			26			
		51	18											*EASY TO MODERATE DRILLING WITH INCREASING BIT GRINDING FROM 50'–55'*
		52												
			15					*52.0'–53.0' SAME AS ABOVE WITH GRAVELS, HARD, COAL FRAGMENTS*						
			50	X		BH6-11 3" DM	67	*THROUGHOUT, TOP PORTION OF SAMPLE IS SATURATED DUE TO SURFACE WATER INFILTRATION FOR THUNDERSTORM INTO DRILL STRING*	25	11	>50	121	15	
		53												
		54												
		55												
			9					*55.0'–56.3' SAME AS ABOVE WITH COAL FRAGMENTS*						
			16			BH6-12 2" SS	94				>50			
		56	50/4"											*MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 55'–60'*
		57												
		58												*6 MINUTES TO DRILL 55'–60'*
		59												
		60	10					*60.0'–61.5' MOIST, GRAY SILTY SAND, DENSE, FINE SAND, FINE GRAVEL*						*INITIAL BORING CAVED TO 22' AFTER HSA REMOVAL*
			18			BH6-13 2" SS	89	*INTERVALS, COAL FRAGMENTS THROUGHOUT*			43			
		61	36											
		62												
			21			BH6-14 3" DM	55	*62.0'–62.9' SAME AS ABOVE, VERY DENSE*			>50			
			50/5"											
		63						*BOH = 62.9'*						
								MONITORING WELL CONSTRUCTION						
		64						*PIPE*						
								37.9 FEET OF 2" DIAMETER SCHEDULE 40 PVC CASING FROM 0.3'–18.2', 20–SLOT SCREEN FROM 18.2'–38.2'						
		65						*BACKFILL*						
								BENTONITE– 0.5'–1.5', SPOILS– 1.5'–16.5', BENTONITE– 16.5'–17.5', SILICA SAND– 17.5'–40', BENTONITE– 40'–49', SPOILS– 49'–62.9'						
		66												

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PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-7**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **6/25/2021**	DRILLER: **IME**	
LOGGED BY: **PRUETT**	DRILL TYPE: **TRUCK-MOUNTED CME85**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6459.0'**	HOLE DIAMETER: **8" OD HOLLOW STEM AUGER (HSA)**	
	HAMMER TYPE: **140# AUTO**	

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DEPTH (FT)	SAMPLES DRIVE	SAMPLES UNDISTURBED	SAMPLES BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
0						*BORING LOCATED ON UPHILL/SOUTH EDGE OF MOUNTAIN ACCESS ROAD. EXCAVATED CUT SLOPES ABOVE, MINOR FILLS DOWNSLOPE SIDE. GRAVEL WITH SAND ROADWAY G.S. STEEP GRASSY SLOPES BOTH UP AND DOWN SLOPES. EXPOSED SOILS IN CUTS ARE DRY SILTY/CLAYEY GRAVEL/GRAVELLY SILT/CLAY WITH COBBLES AND BOULDERS.*						*MODERATE TO HARD DRILLING WITH CONSTANT BIT GRINDING FROM 1'–9'*
4	6			BH7-1 2" SS	89	*4.0'–5.5' MOIST, BROWN AND DK BROWN CLAYEY GRAVEL WITH TRACE SAND, FRACTURED AND ANGULAR GRAVELS, FILGC, MEDIUM DENSE TO DENSE, 4" FRACTURED LIMESTONE COBBLE AT BOS. WATERLINE FILL OF NATIVE SOILS*			30			
5	5											*GRINDING ON COBBLE/BOULDER FROM 5.5'–6.5'*
	11											
9	4			BH7-2 2" SS	78	*9.0'–10.5' MOIST BROWN SILTY GRAVEL WITH TRACE SAND, FRACTURED AND ANGULAR LIMESTONE AND SANDSTONE GRAVELS, FILGC, MEDIUM DENSE, MINOR ORANGE OXIDATION STAINING THROUGHOUT, PULVERIZED LIMESTONE GRAVEL/COBBLE IN TOP 2"*			29			*15 MINUTES TO DRILL 4'–9'*
10	8											
	11											*EASY DRILLING WITH INTERMITTENT BIT GRINDING FROM 9'–19'*
14	5			BH7-3 2" SS	67	*14.0'–15.5' SAME AS ABOVE*			29			*3 MINUTES TO DRILL 9'–14'*
15	9											
	12											*3 MINUTES TO DRILL 14'–19'*
19	7			BH7-4 3" DM	100	*19.0'–20.5' CHAOTICALLY MIXED BROWN/DK BROWN SANDY LEAN CLAY AND GRAY SILTY CLAY WITH MINOR GRAVEL, VERY STIFF, ORANGE OXIDATION STAINING THROUGHOUT, PP>4.0 TSF*	25	14	18	117	14	
20	14	X										
21												

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

CLIENT: **SNOW KING MOUNTAIN RESORT**
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-7* PAGE: *2 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		22												*MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 19'–23'*
		23												*GRINDING ON COBBLE FROM 22'–23'*
		24	4											
			7			BH7-5 2" SS	117	*24.0'–25.5' MOIST, BROWN/DK BROWN LEAN CLAY WITH SAND, MINOR GRAVELS, VERY STIFF, MINOR WHITE CALCAREOUS STRINGERS THROUGHOUT, PP=2–3 TSF*			19			*10 MINUTES TO DRILL 19'–24'*
		25	9											
			10											*SMOOTH EASY DRILLING FROM 23'–28'*
		26	17	X		BH7-6 3" DM	100	*25.5'–26.5' MOIST BROWN LEAN CLAY WITH SAND, PP=3–4 TSF, COARSE GRAVEL FRAGMENTS COMPLETELY WEATHERED INTO SAND TO FINE GRAVEL SIZED FRAGMENTS*	35	17	21	101	22	
		27												
		28												
		29	19											*EASY TO MODERATE DRILLING WITH CONSTANT BIT GRINDING FROM 28'–44'*
			28			BH7-7 2" SS	67	*29.0'–30.5' MOIST, BROWN SILTY GRAVEL WITH TRACE SAND, ABUNDANT FRACTURED GRAY LIMESTONE AND SANDSTONE GRAVELS, FILGC, VERY DENSE, ORANGE OXIDATION STAINING IN BOTTOM 6", GRAVEL LODGED IN TIP OF SS*			59			
		30	26											*5 MINUTES TO DRILL 29'–34'*
		31												
		32												
		33												
		34	15											
			23			BH7-8 2" SS	89	*34.0'–35.5' SAME AS ABOVE, NO OXIDATION STAINING, GRAY SANDY SILT LENS FROM 5"–7", GRAVEL LODGED IN TIP OF SS*			63			
		35	39											*4 MINUTES TO DRILL 34'–39'*
		36												
		37												
		38												
		39	17											
			50/5"			BH7-9 2" SS	91	*39.0'–39.9' SAME AS ABOVE, GRAY SANDSTONE GRAVEL LODGED IN TIP OF SS*			>50			
		40												*6 MINUTES TO DRILL 39'–44'*
		41												
		42												
		43												
		44												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-7* PAGE: *3 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44	16					*44.0'–45.3' SAME AS ABOVE*						
		45	17			BH7-10 2" SS	69				>50			*HARD DRILLING WITH CONSTANT BIT GRINDING FROM 44'–56.5'*
			50/4"											
		46						*GROUNDWATER MEASURED AT 46.35' ON 6/28/2021*						
		47												*GRINDING ON COBBLE/BOULDER FROM 47'–48'*
		48												*20 MINUTES TO DRILL 44'–49'*
		49	17					*49.0'–50.3' SATURATED FROM 0"–4", MOIST FROM 4"–12", BROWN*						
			36			BH7-11 2" SS	75	*CLAYEY GRAVEL, VERY DENSE, PULVERIZED GRAY SANDSTONE COBBLE*			>50			
		50	50/4"					*FROM 5"–11", FILGC*						*GRINDING ON BOULDER FROM 50'–51.5'*
		51												*24 MINTUES TO DRILL 49'–54'*
		52												
		53												
		54	17					*54.0'–55.5' 0"–3" SATURATED SAND AND GRAVEL HEAVE*						
			36			BH7-12 2" SS	78	*3"–14" CHAOTICALLY MIXED MOIST, GRAY AND BROWN SILTY CLAYEY*			61			
		55	39					*GRAVEL, FRACTURED AND ANGULAR GRAVELS, VERY DENSE, FILGC, TIP OF SS IS SATURATED*						
		56												
		57												*MODERATE SMOOTH DRILLING FROM 56.5'–59'*
		58												
		59	11					*59.0'–60.0' SATURATED TO MOIST, GRAY/DK GRAY SANDY LEAN CLAY,*						
			30			BH7-13 3" DM	75	*VERY STIFF, MOIST CLAY PP>4.0 TSF, CHAOTIC BLACK COAL FRAGMENTS IN BOS*	29	15	21	114	18	
		60						*BOH = 60.0'*						
		61						*MONITORING WELL CONSTRUCTION*						
								PIPE						
		62						*59.4 FEET OF 2" DIAMETER SCHEDULE 40 PVC CASING FROM 0.3'–39.5', 20–SLOT SCREEN FROM 39.5'–59.5'*						
								BACKFILL						
		63						*BENTONITE– 0.5'–1.5', SPOILS– 1.5'–34.5', BENTONITE– 34.5'–37', SILICA SAND– 37'–59.5', BENTONITE– 59.5'–60'*						
		64												
		65												
		66												

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CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

PROJECT: Town of Jackson, Snow King Water Tank

PIT LOCATION: Southwest of center of tank

TEST PIT: TP- 1

Approximate Pit Dimensions (feet): Length: 40 Width: 15 Depth: 31.5

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6740' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① Clayey GRAVEL and COBBLE: Slightly moist to moist, dark brown, loose to medium dense, ~40% sandy clay is moderately plastic, ~60% angular gravel and cobbles up to 6" diameter, some silt, grades into below over 10" [COLLUVIUM]

② Silty sandy GRAVEL with clay and cobbles: Slightly moist, yellow tan, very slightly plastic, medium dense, few clasts up to 12" diameter, limestone clasts angular to subangular, grades into below [COLLUVIUM]

③ GRAVEL and COBBLE: Dry to slightly moist, reddish gray, fractures/voids lined with calcium carbonate, abundant voids, very loose, limestone, follows topography, consistently overlies olive sandy layer below, calcium carbonate mineralization on clasts, abundant raveling, bottom contact ~35-45 degrees [TALUS]

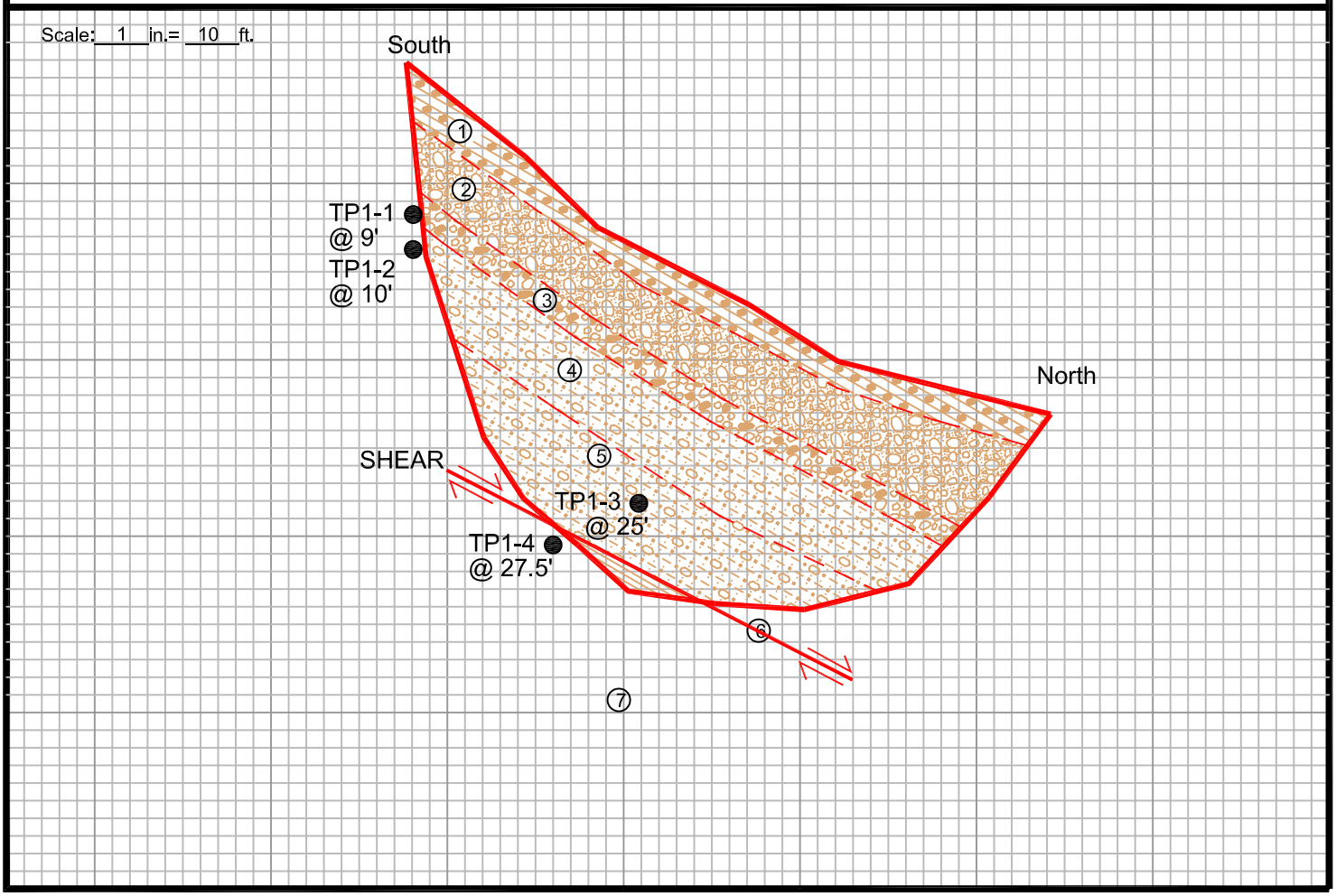
④ Sandy CLAY with gravel and cobble: Slightly moist, olive green, stiff to very stiff, moderately to highly plastic, abundant polished surfaces, irregularly follows silty sandy gravel, cobbles and boulders below contact with material below, varies, ~20% sand, ~15% gravel, ~15% cobble, ~50% sand [LANDSLIDE DEBRIS]

⑤ CLAY and sandy silty GRAVEL and COBBLE: Yellow tan to gray green, intervals of claye and sandy silty gravel and cobbles, few boulders, multiple irregular planar (~bedding) surfaces, angular to subangular boulders up to 2' diameter (mostly limestone), medium dense/very stiff, combination of the olive green sandy clay and the yellow tan silty sandy gravel with clay and cobbles, little consistency with shear orientations, abundant limestone fragments, very irregular contacts [LANDSLIDE DEBRIS]

⑥ CLAY: Pale blue gray, up to 1" thick, soft, moderately plastic, slickensided, dip 30° north [SHEAR ZONE]

⑦ CLAY with sand: Moist, gray, massive, heavily sheared, abundant polished surfaces, highly plastic, darker irregular beds throughout, wavy sheared zone, lots of slickensided surfaces, few coal beds, stiff [LANDSLIDE DEBRIS]

Note: No groundwater observed. Backfilled with spoils. Underlain by stony sandy clay.
Note: Soil Classifications (USCS) based on field descriptions



PROJECT: Town of Jackson, Snow King Water Tank

PIT LOCATION: ~20' northwest of northeast BH-3 (NE 2009)

TEST PIT: TP- 2

Approximate Pit Dimensions (feet): Length: 16 Width: 15 Depth: 12.6

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6711' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① 0.0-1.6ft Clayey sandy GRAVEL and COBBLES: Moist to very moist, medium to dark brown, abundant organics, moderately plastic, angular clasts up to 6" diameter, massive, medium dense [FILL]

② 1.6-2.6ft Sandy CLAY with gravel and cobble: Very moist, dark gray, medium stiff, massive, ~60% clay, ~40% gravel and cobbles up to 6" diameter [TOPSOIL]

③ 2.6-4.8ft Clayey sandy GRAVEL: Very moist, pale brown, medium dense, ~50% fine gravel [COLLUVIUM]

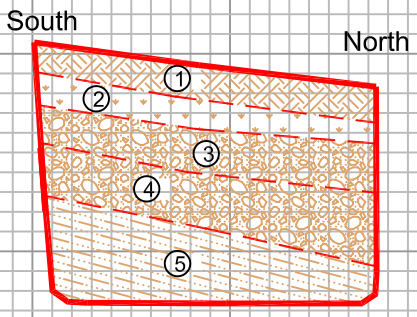
④ 4.8-7.0ft Clayey SAND and GRAVEL: Very moist, pale brown, medium dense, ~50% fine gravel [COLLUVIUM]

⑤ 7.0-12.6ft Sandy CLAY: Moist, green, slightly mottled yellow brown, very stiff, massive, abundant angular to subangular limestone clasts to 1' diameter (most up to 2" diameter) [LANDSLIDE DEBRIS]

Note: No groundwater observed. Backfilled hole with spoils.

Note: Soil Classifications (USCS) based on field descriptions

Scale: 1 in.= 10 ft.



PROJECT: Town of Jackson, Snow King Water Tank

TEST PIT: TP- 3

PIT LOCATION: ~25' east of northeast BH-1 (NE 2009)

Approximate Pit Dimensions (feet): Length: 15 Width: 15 Depth: 11.0

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6762' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① 0.0-1.2ft Silty CLAY with gravel: Moist to very moist, dark brown to blackish brown, abundant organics, highly plastic, soft [TOPSOIL]

② 1.2-3.5ft Gravelly silty CLAY: Buff yellow tan, stiff, ~25-35% gravel to 3" diameter [COLLUVIUM]

③ 3.5-5.0ft Silty CLAY: Moist, greenish brown with yellow mottling, very stiff [LANDSLIDE DEBRIS]

④ 5.0-6.0ft Gravelly silty CLAY: Moist, yellow tan (buff), stiff to very stiff [LANDSLIDE DEBRIS]

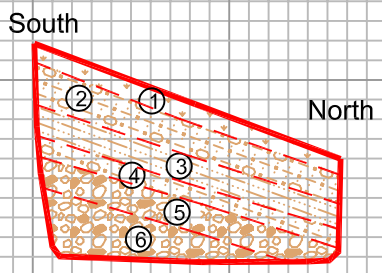
⑤ 6.0-7.5ft Rubble zone: Loose, white precipitates [TALUS]

⑥ 7.5-11.0ft Silty clayey GRAVEL and COBBLE: Yellow brown to red brown, dense, 50-60% clasts up to 8" diameter, oversize [TALUS]

Note: No groundwater observed. Hole standing OK. Backfilled hole with spoils.

Note: Soil Classifications (USCS) based on field descriptions

Scale: 1 in.= 10 ft.





GEOPHYSICAL EVALUATION

SNOW KING

Jackson, Wyoming

PREPARED FOR:

Colter Lane, P.E.
Jorgensen Geotechnical
1315 Highway 89 South, Suite 201
Jackson, Wyoming 83002

PREPARED BY:

Atlas Technical Consultants LLC
358 South 700 East, Suite B518
Salt Lake City, Utah 84102

January 2, 2024

358 South 700 East
Salt Lake City, UT 84102
(310) 951-1993 | OneAtlas.com

January 2, 2024

Atlas No. 11143

MR. COLTER LANE, P.E.
JORGENSEN GEOTECHNICAL
1315 HIGHWAY 89 SOUTH, SUITE 201
JACKSON, WYOMING 83002

Subject: Geophysical Evaluation
Snow King
Jackson, Wyoming

Dear Mr. Lane:

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to a portion of the Snow King project located in Jackson, Wyoming. The primary purpose of our study was to develop subsurface shear-wave velocity profiles and characterize subsurface geologic conditions at select locations of the project site. This was accomplished through the collection of Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Wave (MASW) data. Our services were conducted on October 23rd and 24th, 2023. This report presents our methodology, equipment used, analysis, and findings.

We appreciate the opportunity to be of service on this project. Should you have any questions, please contact the undersigned at (310) 951-1993.

Respectfully submitted,
Atlas Technical Consultants LLC

Stephan A. Callas
Project Geophysicist

Patrick F. Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

SAC:ERC:PFL:ds

Distribution: Mr. Colter Lane at CLane@JorgEng.com

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2. SCOPE OF SERVICES 1
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4. STUDY METHODOLOGY 1
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FIGURES

Figure 1 Site Location Map
Figure 2 Line Location Map
Figure 3 Site Photographs
Figure 4a ReMi Results (RL-1)
Figure 4b ReMi Results (RL-2)
Figure 5a MASW Profile (ML-1)
Figure 5b MASW Profile (ML-2)

1. INTRODUCTION

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to a portion of the Snow King project located in Jackson, Wyoming (Figure 1). The primary purpose of our study was to develop subsurface shear-wave velocity profiles and characterize subsurface geologic conditions at select locations of the project site. This was accomplished through the collection of Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Wave (MASW) data. Our services were conducted on October 23rd and 24th, 2023. This report presents our methodology, equipment used, analysis, and findings.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two one-dimensional (1-D) ReMi profiles (RL-1 & RL-2).
- Performance of two 2-D MASW profiles (ML-1 & ML-2).
- Compilation and geophysical analysis of the collected data.
- Preparation of this illustrated report presenting our methodology and findings.

3. SITE AND PROJECT DESCRIPTION

The project site is generally located just southeast of the Snow King Mountain Resort in Jackson, Wyoming (Figure 1). Specifically, the study area is located on the south side of Snow King Loop Road. The locations of the seismic traverses were generally selected by a representative of your office and adjusted when necessary to account for surface conditions. The study area was composed of two graded lots with an access road separating the two lots. The seismic traverses were performed over relatively flat terrain on the east and west sides of the access road. The surface of the site was generally covered with soil, gravel and seasonal vegetation. Additionally, several surface obstructions including construction materials, a firewood pile, snow grooming equipment, vehicles, and temporary fencing were located within the study area boundaries. Figure 2 depicts the approximate locations of the seismic traverses while Figure 3 depicts the general site conditions.

4. STUDY METHODOLOGY

As previously indicated, our evaluation included the performance of two ReMi and two MASW transects. The following sections detail the methods and instrumentations used.

4.1 ReMi

The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a shear-wave velocity profile of the study area down to a depth, in this case, of approximately 100 feet. The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi

method are displayed as a one-dimensional profile which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with ReMi.

Our ReMi evaluation included the use of a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. Geophones were spaced 10 feet apart for a total line length of 230 feet for each line. A total of 22 records, each 32 seconds in duration, were recorded at each location, while 10 records utilized passive data collection of ambient ground vibration noise and 12 utilized an active source. The active source data gathers included generating a seismic signal at both ends of the seismic spread, approximately 10 or 30 feet off the ends of the geophone array. Six active source files were collected at each end of the line. The recorded data was then downloaded to a field computer for post-processing. The data was later processed using Surface Plus 9.1 - Advanced Surface Wave Processing Software (Geogiga Technology Corp., 2020), which uses the refraction microtremor method (Louie, 2001), and other surface wave analysis methods. The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool to determine the best fitting model. The result is a one-dimensional shear-wave velocity model of the site with roughly 85 to 95 percent accuracy (Louie, 2001). For situations in which the shear wave velocity values are close to the limit between site class boundary values, Geotechnical consultants should consider the site's subsurface geologic stratigraphy and structure, soil mechanics, and ReMi evaluation results when assessing seismic site classification. Figures 2 and 3 depict the general site conditions in the study area.

4.2 MASW

Surface waves (specifically Rayleigh waves) were recorded along lines ML-1 and ML-2 in order to provide S-wave velocity information for portions of the site (Figure 2). The surface waves were generated by a hammer and plate (shot) and recorded using a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. The geophones were coupled to the ground surface using a Geostuff Landstreamer with geophones stationed 4 feet apart and shots conducted off the end of the lines. Prior to the collection of surface wave data, near and far field effects were evaluated for several shot offset distances. The results indicated that an offset shot of 16 feet off the end of the line was optimal for our evaluation.

Three records, each one second long, were recorded at each shot location. After each shot location, the shot location and geophones were moved an integer multiple of the geophone spacing longitudinally along the profile direction and the line was reshot. The number of shots, spread length, and start and end stations are presented in Table 1.

Table 1: MASW Array Geometry

Line No.	No. of Shots	Total Spread Length (feet)	Profile Length/Start and End Stations (feet)
ML-1	21	252	160/(0-160)
ML-2	25	284	192/(0-192)

The recorded MASW data was processed using SurfSeis® (Kansas Geological Survey, 2019), a MASW software program. One dimensional (1-D) shear-wave (S-wave) velocity (Vs) profiles were generated for each shot location, which correspond to the middle of the geophone array. A two-dimensional color gradient model was then created from the 1-D models using the SurfSeis® interpolation scheme. It should be emphasized that the 2-D profile represents the area between the midpoint of the first shot location and the midpoint of the last shot location. The actual model section length and start and end stations for the sections are also listed in Table 1.

5. RESULTS AND CONCLUSIONS

As previously indicated, our evaluation consisted of performing two 1-D ReMi profiles (RL-1 & RL-2) and two 2-D MASW profiles (ML-1 & ML-2) at the project site. Figures 4a and 4b present the ReMi results for RL-1 and RL-2, respectively. Figures 5a and 5b present the MASW results for ML-1 and ML-2, respectively. The analysis of each is detailed below.

5.1 ReMi

The purpose of our ReMi evaluations were to develop shear-wave velocity profiles to be used for design and construction parameters at the project site. Table 2 and Figures 4a and 4b present the results from our ReMi evaluations. It should be noted that the ReMi results represent the average condition across the length of the line. When the 1-D ReMi surface wave velocity results (analogous to shear wave) show an IBC Vs100 velocity value that is close to the "border line" boundary between IBC Site Classes, the project geotechnical consultant of record should be consulted. The geotechnical consultant of record should also consider other existing available site information and whether obtaining additional new geotechnical evaluation data such as boreholes, surface to downhole seismic (ASTM D7400), crosshole seismic (ASTM D4428), and/or additional 1-D ReMi data collections would be needed concerning the site's subsurface geologic stratigraphy and structure, soil mechanics and soil modulus, along with the initial 1-D ReMi evaluation results when assessing the "borderline" IBC Vs100 Seismic Site Class.

Table 2: ReMi Results

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)	Average Shear Wave Velocity (Vs in feet/second)	Site Class (IBC, 2019)
RL-1 (NW-SE)	0-6	618	Vs100' = 1,320 ft/s	C
	6-14	1170		
	14-25	1494		
	25-35	1435		
	35-69	1152		
	69-100	2010		

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)	Average Shear Wave Velocity (Vs in feet/second)	Site Class (IBC, 2019)
RL-2 (W-E)	0-9	390	Vs100' = 1,201 ft/s	C
	9-14	799		
	14-25	1361		
	25-69	1446		
	69-100	2052		

5.2 MASW

Two MASW traverses were conducted as part of our study. Figures 5a and 5b present the S-wave velocity models generated from our analysis of lines ML-1 and ML-2, respectively. Based on the results, it appears that the project site is generally underlain by low-velocity materials in the near-surface and higher velocity materials at depth. Distinct vertical and lateral velocity variations are evident within the models. Specifically, ML-1 appears to contain pockets of low and high velocity materials in the near surface, possibly related to reported landslide deposits. At depth, ML-1 displays a high velocity contact that spans the length of the profile from northwest to southeast. This high velocity contact is generally contained towards the bottom of the profile; however, protrudes closer to the surface between 90 and 120 feet along the x-axis. This high velocity material may represent bedrock contacts. ML-2 displays slightly more homogenous material in the near surface compared to ML-1. At depth, ML-2 displays a moderately high velocity contact that spans the length of the profile from west to east. This moderately high velocity contact is generally contained within 20 and 50 feet below ground surface and may represent weathered bedrock contacts. It should be noted that there were several underground utilities present in the vicinity of ML-1, and possibly ML-2, which could be affecting the results from our evaluation. As a general rule of thumb, the S-wave velocity of a given material might be between approximately 0.4 to 0.6 of the P-wave velocity, depending on the soil/rock type and condition.

6. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

7. SELECTED REFERENCES

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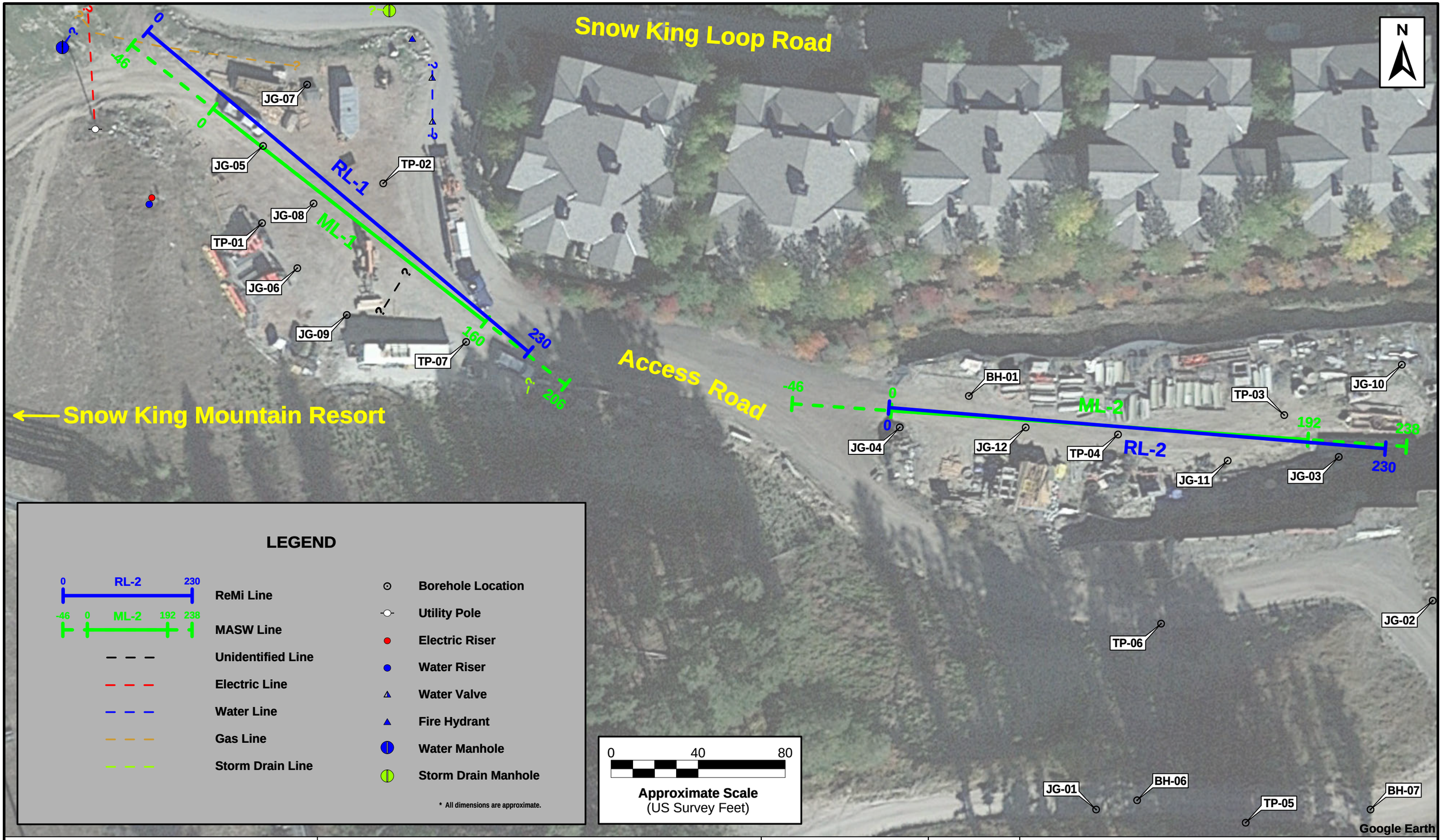
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ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 1	**SITE LOCATION MAP**



LEGEND

- RL-2 (0 – 230): ReMi Line
- ML-2 (-46, 0, 192, 238): MASW Line
- Unidentified Line
- Electric Line
- Water Line
- Gas Line
- Storm Drain Line
- Borehole Location
- Utility Pole
- Electric Riser
- Water Riser
- Water Valve
- Fire Hydrant
- Water Manhole
- Storm Drain Manhole

* All dimensions are approximate.

0 40 80

Approximate Scale
(US Survey Feet)

ATLAS

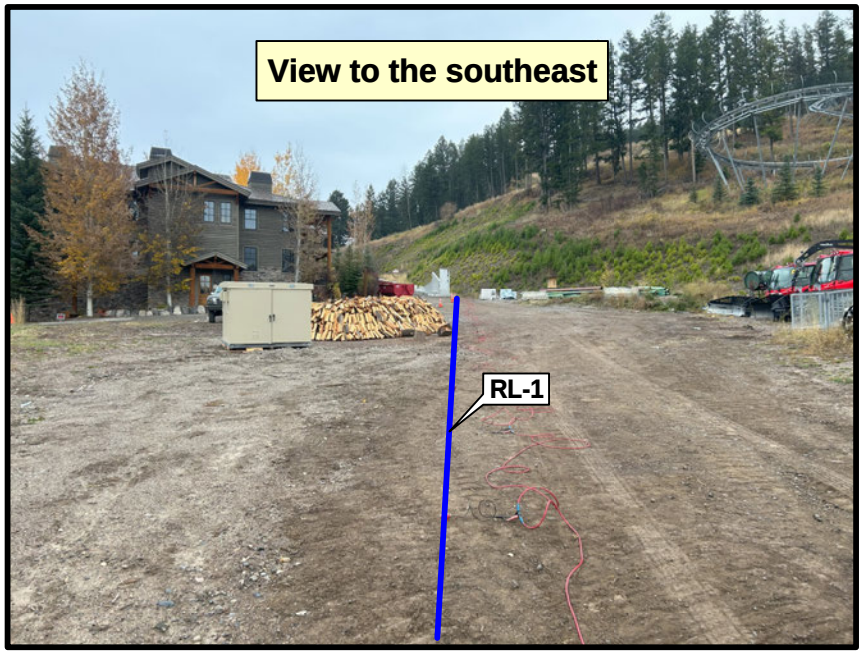
Snow King
Jackson, Wyoming

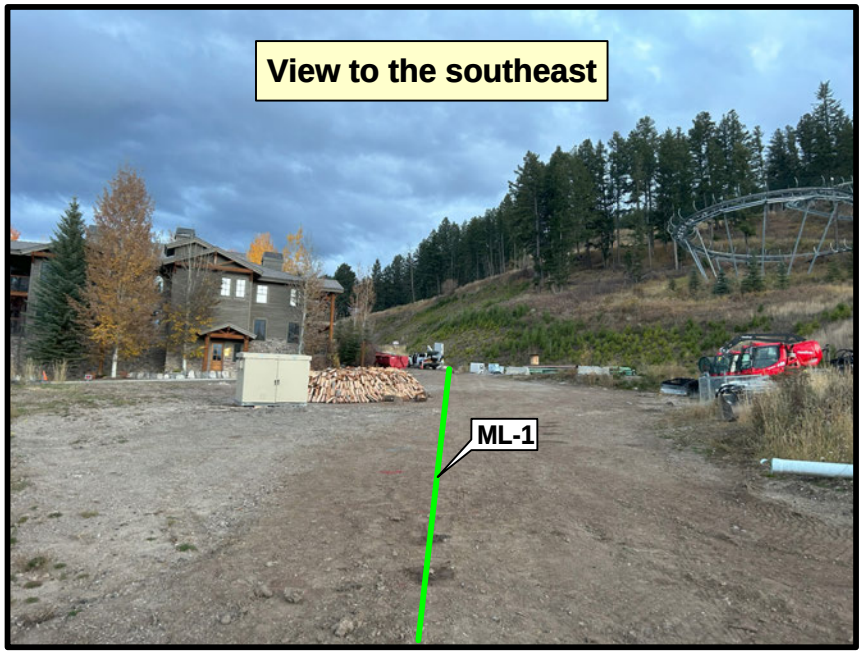
Project No.: 11143

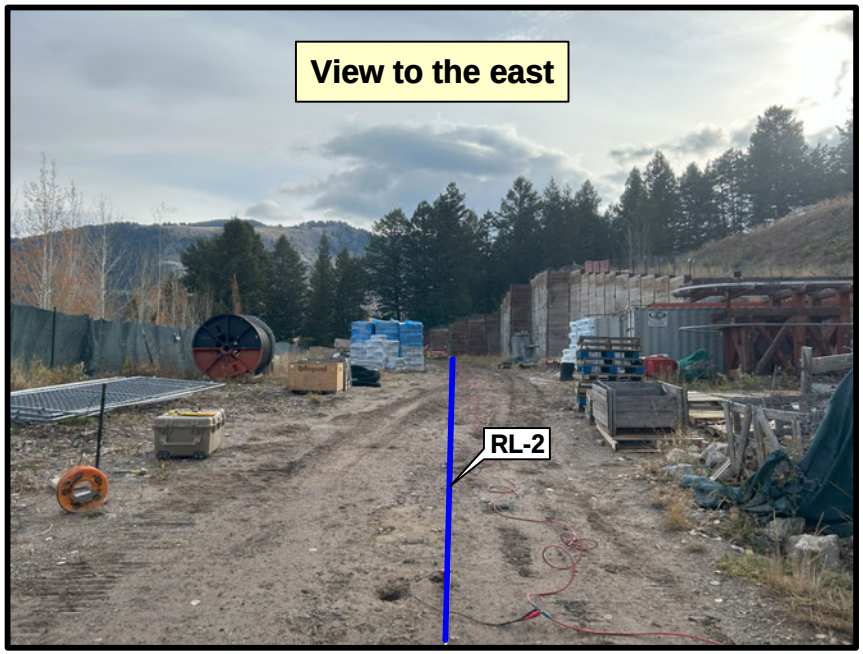
Date: 01/23

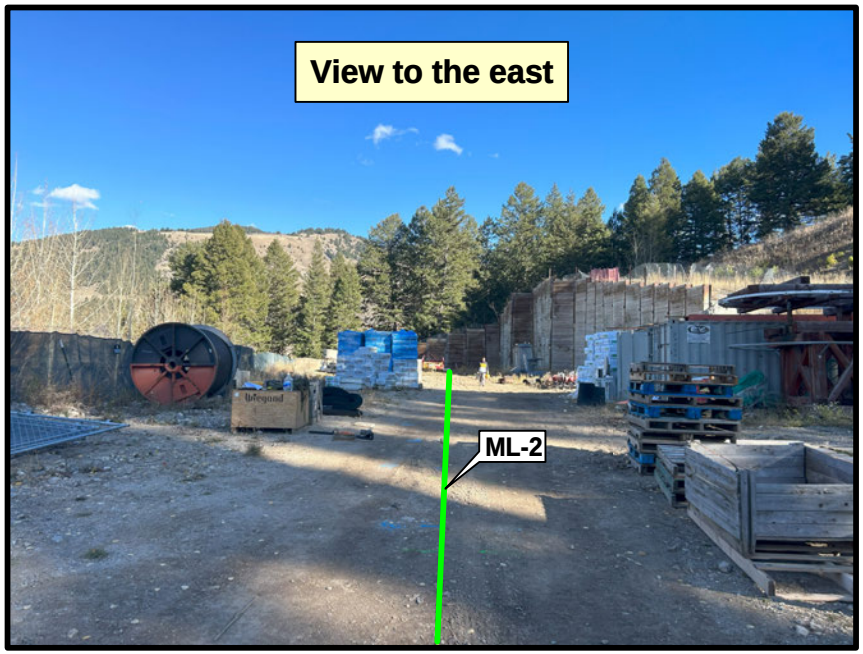
Figure 2

LINE LOCATION MAP



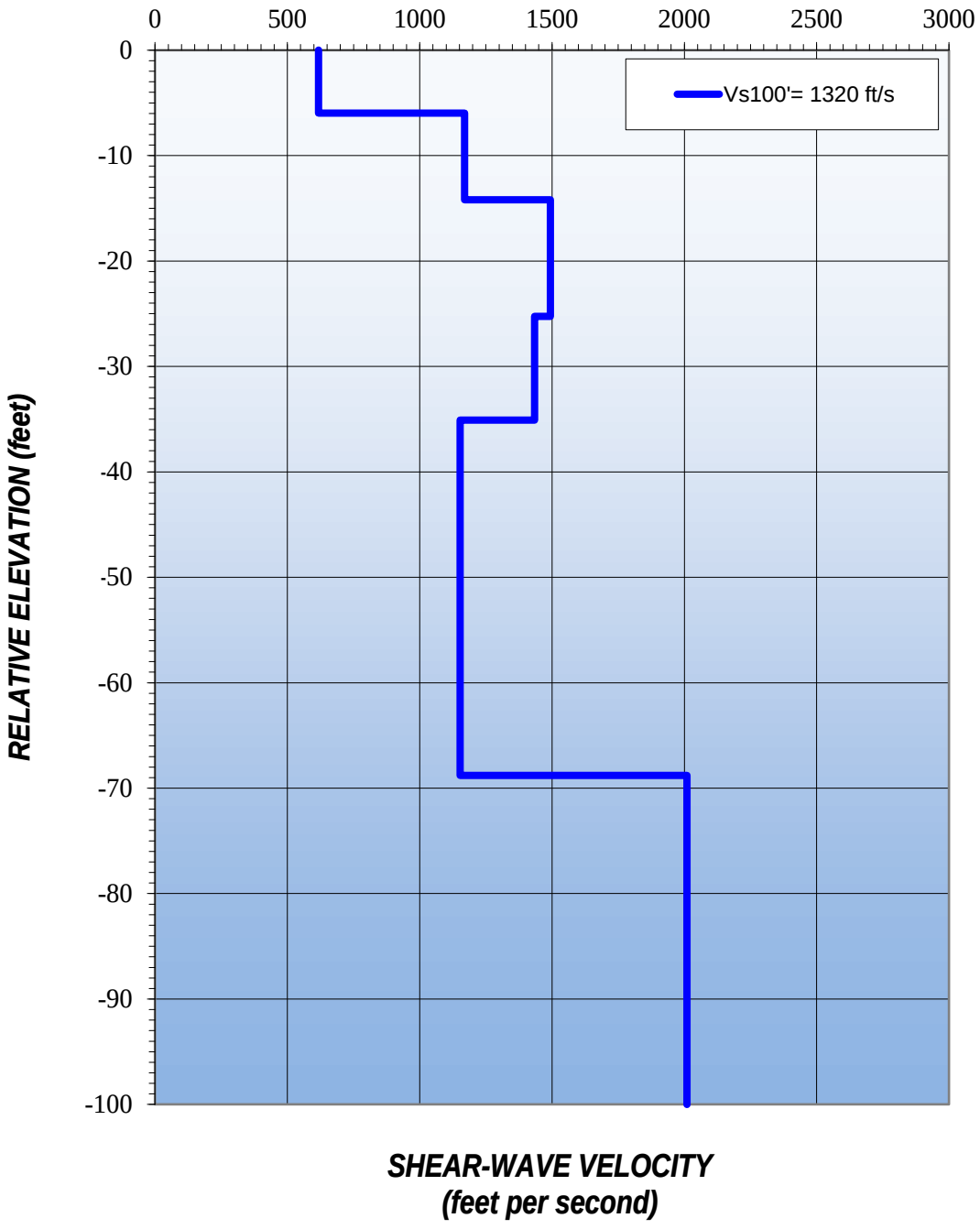




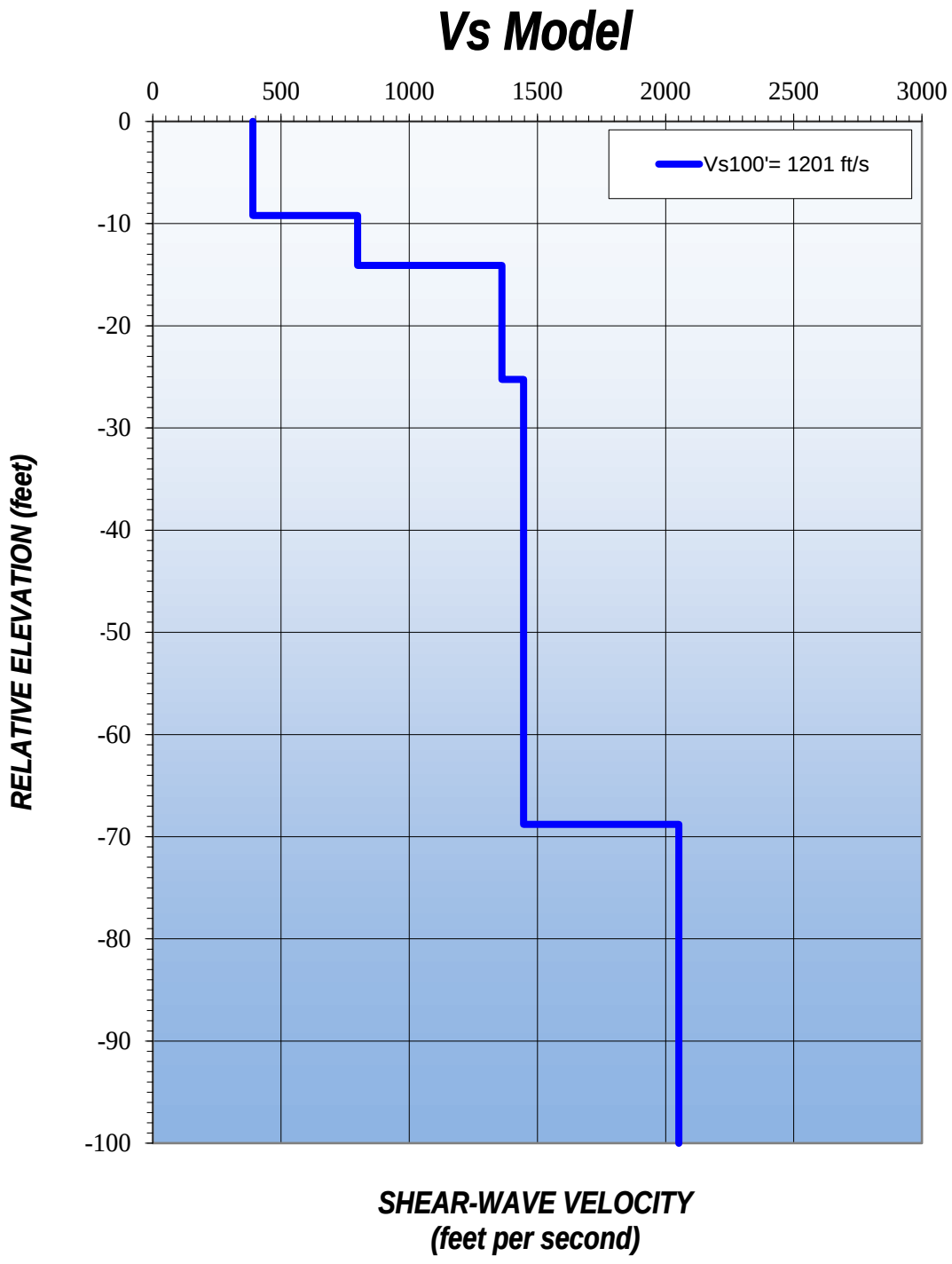


ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 3	**SITE PHOTOGRAPHS**

Vs Model



ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 4a	**ReMi RESULTS** **RL-1**



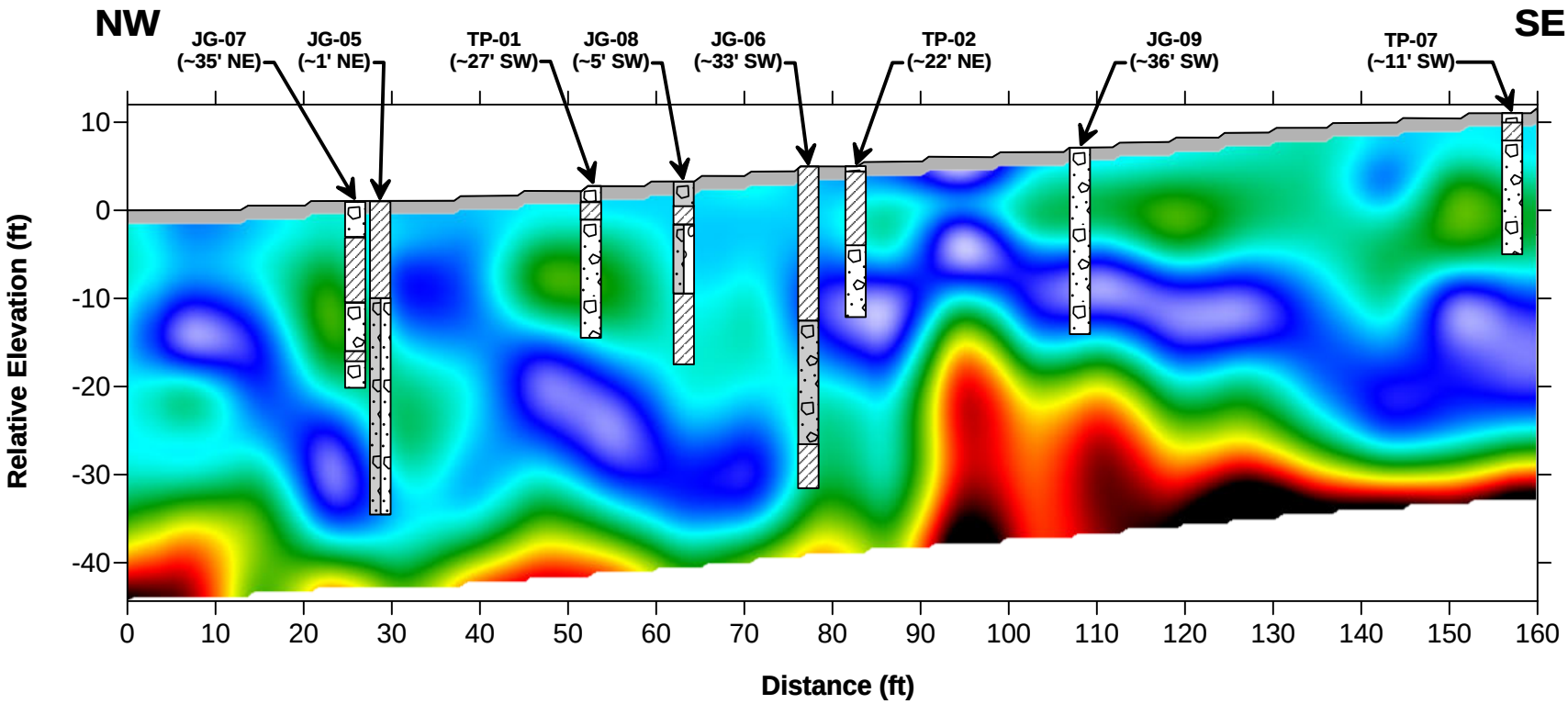
ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 4b	**ReMi RESULTS** **RL-2**

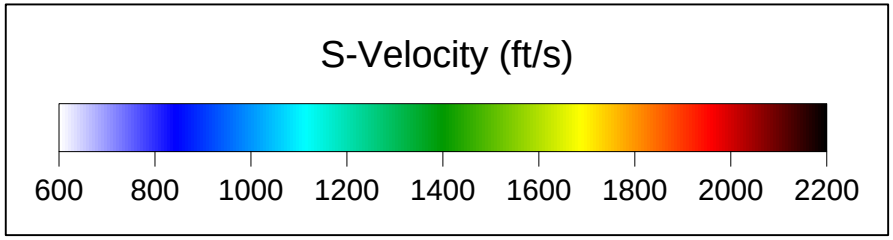
MASW PROFILE
ML-1

LEGEND

CL GM
GP GC

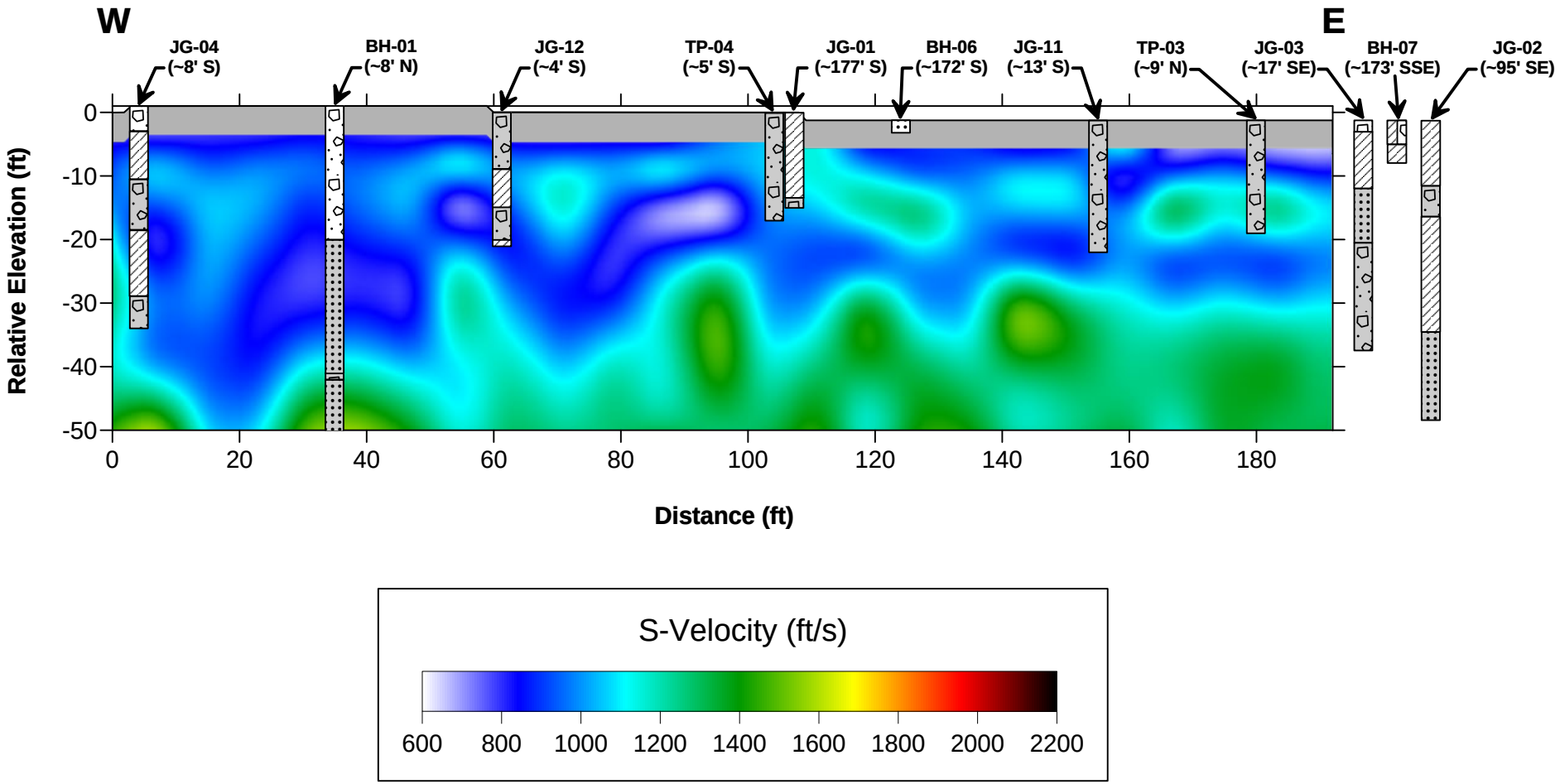
* All dimensions are approximate.
* Borehole data provided by Jorgensen.





ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 5a	**MASW PROFILE ML-1**

MASW PROFILE
ML-2



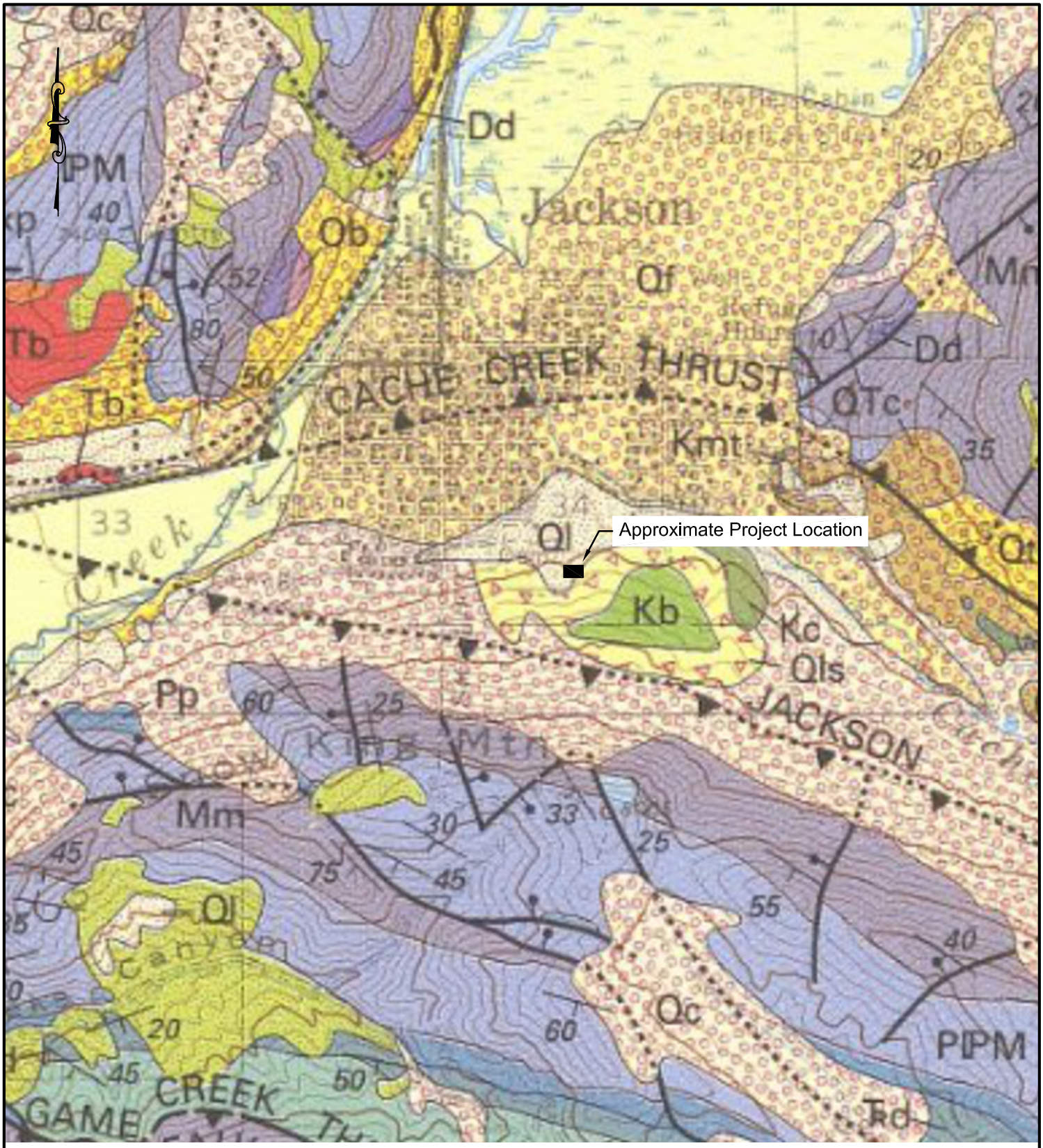
ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 5b	**MASW PROFILE** **ML-2**

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APPENDIX B

Figures



0 2000 4000

SCALE: 1 INCH = 2000 FEET

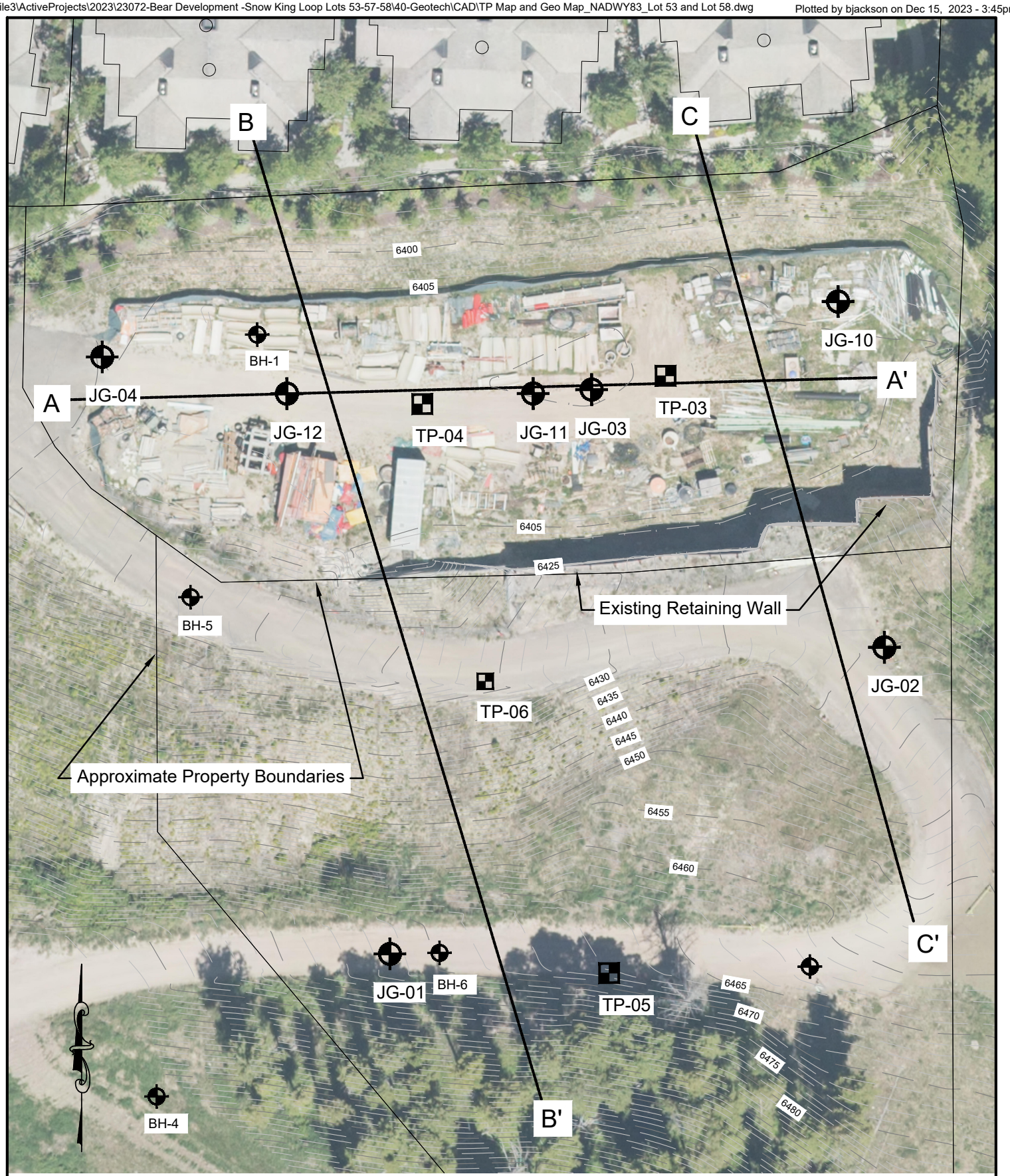
THIS SCALE VALID ONLY FOR 8.5x11 PRINTS

Map symbols:

Ql - Loess
Qls - Landslide Debris
Kb - Bacon Ridge Sandstone (Upper Cretaceous)

From Love et. al, Geologic Map of Grand Teton National Park, 1992

DRAFTED BY: JBJ REVIEWED BY: HC PROJECT NUMBER 23072	SHEET TITLE: Figure 1 Site Location and Geologic Map	PROJECT TITLE: Geotechincal-Engineering Report Bear Development - Lot 53 and Lot 58 Teton County, Wyoming	JORGENSEN GEOTECHNICAL, LLC PO Box 9550 | 1315 HWY 89 S., Ste. 201 Jackson, WY 83002 PH: 307.733.5150 www.jorgeng.com



0 40 80

SCALE: 1 INCH = 40 FEET
THIS SCALE VALID ONLY FOR 8.5x11 PRINTS

Borehole (JG-XX), Historic Nelson Engineering Borehole (BH-X), and test pit (TP-XX) locations are approximate and may be surveyed upon request. Existing ground surface topography provided by Jorgensen Associates, taken from topographiuc survey completed November 1, 2023. Aerial imagery provided by Teton County, 2019.

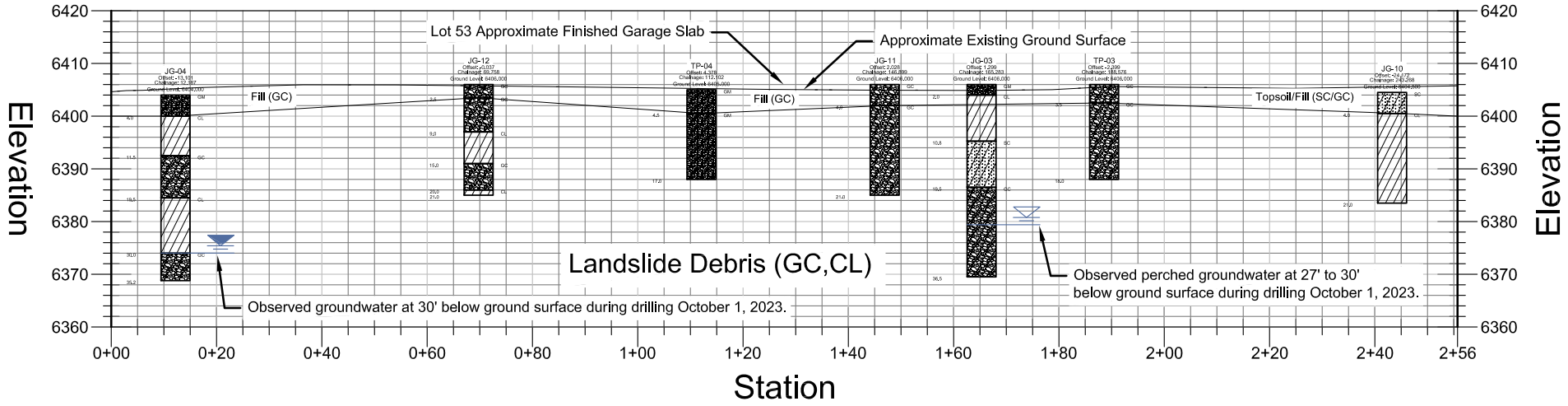
DRAFTED BY:	JBJ
REVIEWED BY:	HC
PROJECT NUMBER	23072

SHEET TITLE:
Figure 2
Borehole, Test Pit and Geologic Cross Section Location Map

PROJECT TITLE:
Geotechnical Engineering Report
Bear Development - Lot 53 and Lot 58
Teton County, Wyoming

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Cross section A-A'

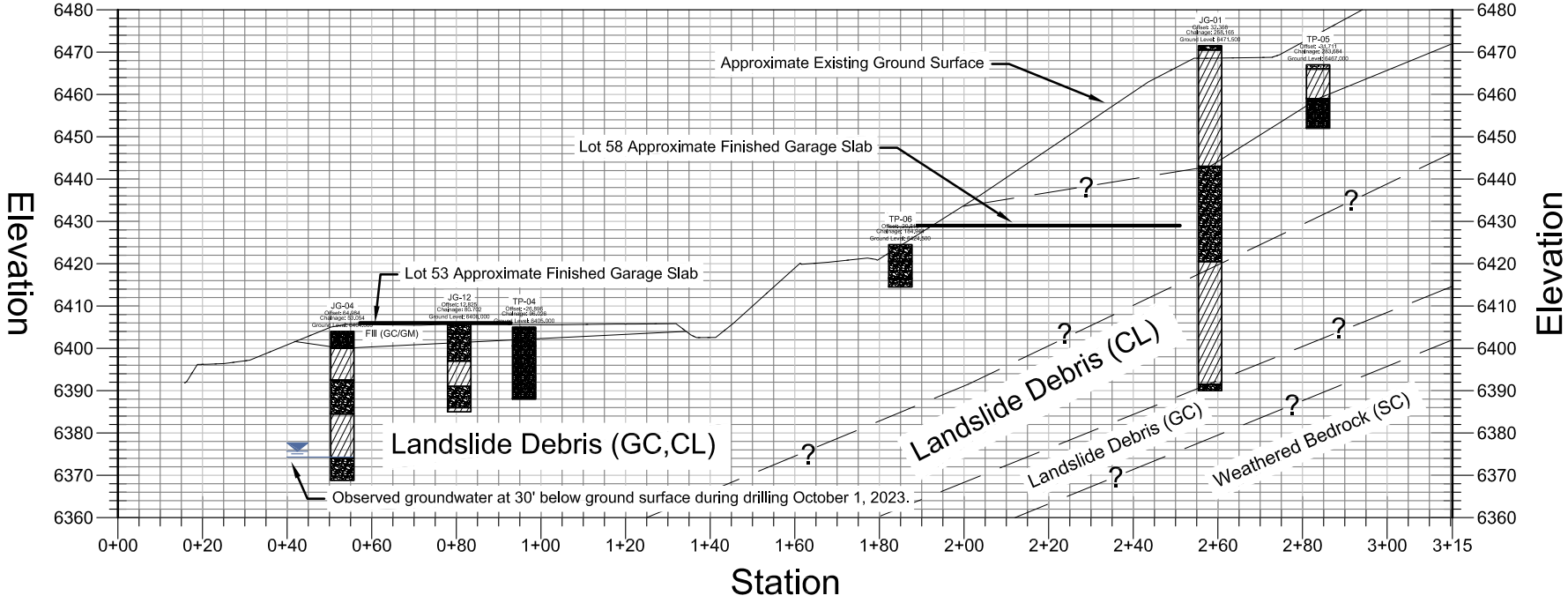


Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

DRAFTED BY: JBJ REVIEWED BY: HC/DB PROJECT NUMBER 23072	SHEET TITLE: Figure 3 Geologic Cross Section A-A'	PROJECT TITLE: Geotechnical-Engineering Report Bear Development - Lot 53 and Lot 58 Teton County, Wyoming	JORGENSEN GEOTECHNICAL, LLC PO Box 9550 | 1315 HWY 89 S., Ste. 201 Jackson, WY 83002 PH: 307.733.5150 www.jorgeng.com

Cross section B-B'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

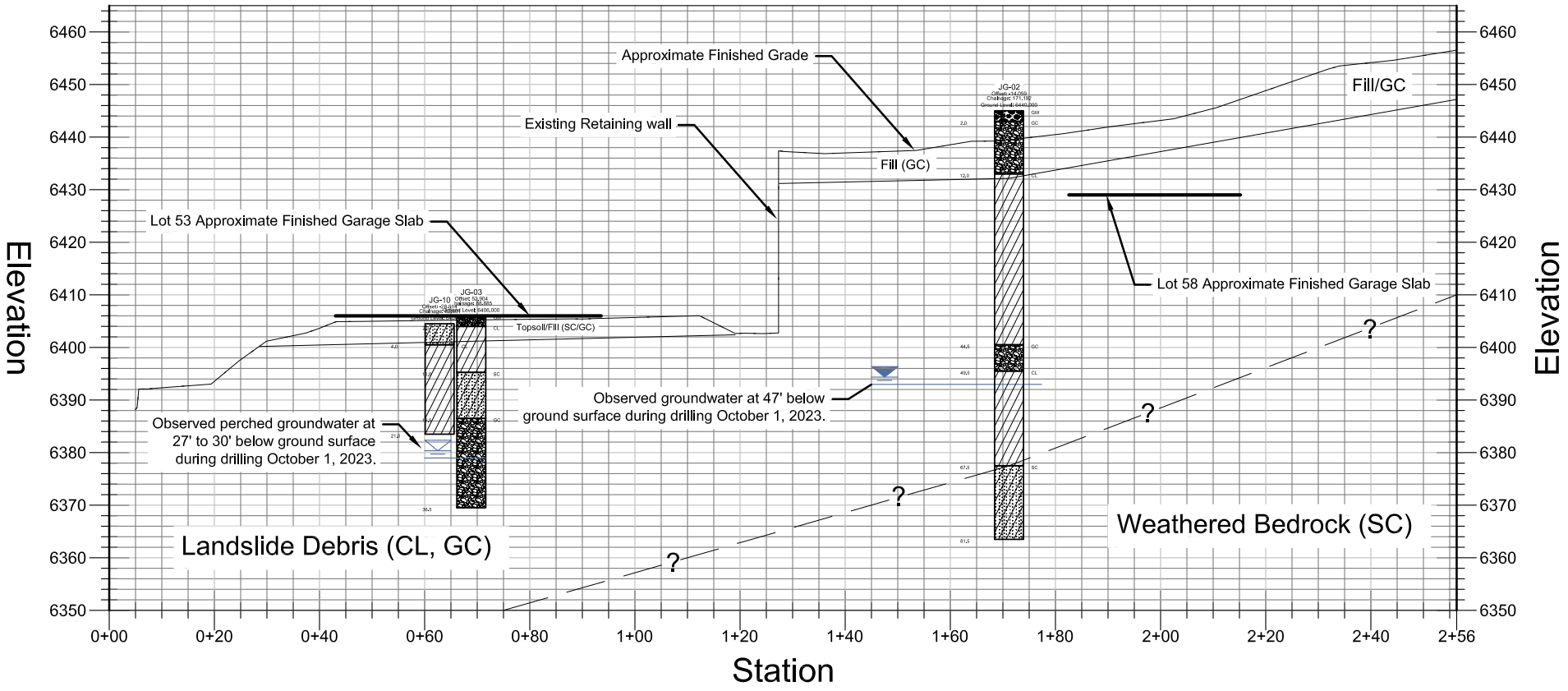
DRAFTED BY:	JBJ
REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 4
Geologic Cross Section B-B'

PROJECT TITLE:
Geotechnical-Engineering Report
Bear Development - Lot 53 and Lot 58
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Cross section C-C'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

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REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 5
Geologic Cross Section C-C'

PROJECT TITLE:
Geotechnical-Engineering Report
Bear Development - Lot 53 and Lot 58
Teton County, Wyoming

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APPENDIX C

Soils Laboratory Procedures and Results

Laboratory Testing

Laboratory Testing Procedures

Lab samples were submitted for testing at GCI in Salt Lake City, Utah from boreholes JG-01, JG-02, JG-03, JG-04, JG-10, JG-11, and JG-12.

During the October 2023 site exploration for the Development at Lots 53 and 58, JG collected relatively undisturbed (i.e., thin-walled Shelby tubes) and disturbed samples (i.e., split spoon (SPT) samples and sonic drilling grab samples). Of the samples collected, 31 disturbed samples and two relatively undisturbed samples were selected for lab analysis. Laboratory testing included natural moisture content, unit weight, Atterberg limits, grain-size distribution, hydrometer, and consolidation testing.

The laboratory testing program consisted of:

- Twenty Seven (27) Moisture Contents (ASTM D2937/D2216)
- Thirty (30) Atterberg Limits (ASTM D4318)
- Twenty Seven (27) Grain Size Analysis (ASTM D422)
- Four (4) Hydrometer (ASTM D422a)
- Two (2) One Dimension Consolidation (ASTM D2435)

Results are shown on the following pages.

Laboratory Test Results: Detailed Summary

Laboratory testing included index testing for classification per USCS and indirect correlation with engineering parameters, and direct testing of strength. Classification tests – including Atterberg limits and grain-size analysis – have been summarized in table 4-1, with hydrometer tests and consolidation tests summarized in Tables 4-2 and 4-3, respectively. Full laboratory data sheets are attached.

The data herein are provided for informational purposes. Design-build contractors shall be responsible for providing their own analysis of the test results and for development of appropriate design parameters.

Table 4-1: Classification Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	Gravel (%)	Sand (%)	Fines (%)	Moisture Content (%)	Liquid Limit	Plasticity Index
JG-01	D8	18-19	CL	19.0	18.2	62.8	12.3	31	15
JG-01	D12	27-29	CL	27.7	17.1	55.2	11.0	28	12
JG-01	D17	37-38	GC	51.6	22.7	25.7	--	--	--
JG-01	D27	54.5-57	CL	11.9	20.2	67.9	12.6	33	18
JG-01	D32	67-69	CL	20.1	28.0	51.9	10.0	26	10
JG-01	D36	72.5-75	CL	4.5	10.0	85.5	20.7	38	21
JG-02	D4	7-10	GC	--	--	--	--	20	5
JG-02	D8	14.5-16	CL	12.4	20.8	66.8	11.9	31	16
JG-02	D11	22-25	CL	15.6	18.7	65.7	13.3	29	14
JG-02	D16	32-35	CL	13.2	18.2	68.6	14.5	21	5
JG-02	D18	38.5-40	CL	0.0	12.9	87.1	15.5	29	12
JG-02	D22	44.5-47	GC	41.6	27.3	31.1	--	--	--
JG-02	D26	52-55	CL	6.4	31.1	62.5	11.6	16	12
JG-02	D30	60-62	CL	0.2	5.3	94.5	13.7	37	14
JG-02	D32	64.5-67	CL	2.2	94.4	3.4	12.8	31	14
JG-02	D35	69.5-72	SC	--	--	--	--	21	5
JG-03	D3	4.5-7	CL	30.3	19.6	50.1	10.1	33	19
JG-03	D8	14.5-17	SC	28.2	31.4	40.4	8.4	30	15
JG-03	D12	22-25	GC	26.8	26.3	46.9	12.4	35	20
JG-03	D18	30-33	GC	32.7	22.1	45.2	10.8	29	14
JG-04	D4	7-10	CL	15.8	14.6	69.6	21.8	34	18
JG-04	D8	14.5-17	GC	37.4	30.1	32.5	6.8	19	5
JG-04	D12	22-25	CL	3.3	26.8	69.9	16.5	31	14
JG-04	D17	30-33	GC	43.1	15.3	41.6	10.1	33	18
JG-10	D3	7.5-9	CL	--	--	--	--	25	9
JG-10	U1	12.5-14	CL	27.6	21.7	50.7	13.7	39	24
JG-10	D5	15-17	CL	4.7	11.8	83.5	16.1	38	17
JG-10	U2	17.5-19	CL	13.9	19.4	66.7	13.8	32	18
JG-11	D3	7.5-9	GC	33.4	28.0	38.6	7.1	22	7
JG-12	D2	5-6.5	GC	33.9	25.3	40.8	10.2	27	12
JG-12	D4	10-11.5	CL	13.5	32.5	54.0	12.8	27	10
JG-12	D8	20-21.5	CL	23.9	25.5	50.6	10.6	26	12

Table 4-2: Hydrometer Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	Silt Fraction (%)	Clay Fraction (%)
JG-01	D17	37-38	GC	18	7
JG-02	D22	44.5-47	GC	23	8
JG-10	D5	15-17	CL	55	36
JG-11	D4	10-11.5	GC	33	17

Table 4-3: Consolidation Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	C_C
JG-10	U1	12.5-14	CL	0.171
JG-10	U2	17.5-19	CL	0.130

Supplemental Laboratory Data

Select laboratory results presented in a Site Investigation Report for Lots 53 and 58produced by Nelson Engineering dated July 28, 2021, and results presented in a Geotechnical Investigation Report for a project in close proximity to the site produced by Womack and Associates, Inc., dated June 4, 2010 are presented below.

GERHART COLE

PO Box 880
Midvale, Utah 84047
801.849.0055
gerhartcole.com

To:	Mr. Bruce Jackson Jorgensen Engineering 58 South Tyler, PO Box 1519 Pinedale, Wyoming 82941
Project:	Bear Development Snow King Lots 53 and 58
Gerhart Cole Project Number:	23-1725
Client Project Number	23072
Report Date:	November 30, 2023

Attached are the requested laboratory test results. These laboratory results are for the addressee and must be presented in their entirety without alteration, except with permission.

Gerhart Cole's Laboratory is accredited through the AASHTO Accreditation Program. The results provided were tested in general accordance with the referenced standards. Any test methods reported in this document outside the scope of this accreditation are marked with an asterisk in the header of the individual test report.

Gerhart Cole will dispose of samples two (2) weeks after the date above. Please contact us for storage pricing.

Approved By:_____
Zach Gibbs, PE (UT, MI) Laboratory Director

AASHTO ACCREDITED

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

X:\PROJECTS\23-1725 Bear Development\Reviewed\[2023-11-10_Lot53,58_MC.xlsx]1

Sample Info.	Sample:	**JG-01**	**JG-01**	**JG-01**	**JG-01**	**JG-01**	**JG-02**
	Depth:	**18-19 ft**	**27-29 ft**	**54.5-57 ft**	**67-69 ft**	**72.5-75 ft**	**14.5-16 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**14-Nov-23**	**14-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**
	Laboratory sample description:	**gy - bn clay**	**bn - gy clay**	**gy - dk gy clay**	**dk by - lt bn clay**	**gy - dk gy clay**	**bn - ol bn clay**
Moisture	Wet soil + tare (g)	806.82	1190.54	953.45	847.34	688.39	2264.09
	Dry soil + tare (g)	739.68	1074.24	869.05	788.12	590.77	2068.51
	Tare (g)	195.78	13.84	196.69	195.42	118.16	422.19
	Moisture content, w (%)	12.3	11.0	12.6	10.0	20.7	11.9
Comments							
QC/QA	Tested By:	AT	AT	CML	CML	CML	CML
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

X:\PROJECTS\23-1725 Bear Development\Reviewed\[2023-11-10_Lot53,58_MC.xlsx]2

Sample Info.	Sample:	**JG-02**	**JG-02**	**JG-02**	**JG-02**	**JG-02**	**JG-02**
	Depth:	**22-25 ft**	**32-35 ft**	**38.5-40 ft**	**52-55 ft**	**60-62 ft**	**64.5-67 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**
	Laboratory sample description:	**bn - ol bn clay**	**bn - dk yl bn clay**	**lt ol bn - ol bn clay**	**gy - ol bn clay**	**lt bn - bn clay**	**lt ol bn - ol bn clay**
Moisture	Wet soil + tare (g)	2104.69	2453.36	448.30	460.49	656.13	566.47
	Dry soil + tare (g)	1908.65	2210.32	405.33	433.20	600.68	516.43
	Tare (g)	438.53	539.41	127.25	197.51	195.80	126.68
	Moisture content, w (%)	13.3	14.5	15.5	11.6	13.7	12.8
Comments							
QC/QA	Tested By:	CML	CML	CML	CML	CML	CML
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

X:\PROJECTS\23-1725 Bear Development\Reviewed\[2023-11-10_Lot53,58_MC.xlsx]3

Sample Info.	Sample:	JG-03	JG-03	JG-03	JG-03	JG-04	JG-04
	Depth:	4.5-7 ft	14.5-17 ft	22-25 ft	30-33 ft	7-10 ft	14.5-17 ft
	Date Sampled:	-	-	-	-	-	-
	Date tested:	13-Nov-23	13-Nov-23	13-Nov-23	13-Nov-23	13-Nov-23	13-Nov-23
	Laboratory sample description:	lt bn - bn clay	pl ol bn - bn clay	lt ol bn - bn clay	bn - dk bn clay	lt ol bn - bn clay	pl ol bn - lt bn silt
Moisture	Wet soil + tare (g)	1630.20	872.07	1046.88	943.07	653.16	601.88
	Dry soil + tare (g)	1521.39	813.63	947.50	865.02	571.20	571.25
	Tare (g)	440.15	119.03	144.65	144.19	195.92	118.32
	Moisture content, w (%)	10.1	8.4	12.4	10.8	21.8	6.8
Comments							
QC/QA	Tested By:	JCC	JCC	JCC	JCC	JCC	JCC
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-04**	**JG-04**	**JG-10**	**JG-10**	**JG-10**	**JG-11**
	Depth:	**22-25 ft**	**30-33 ft**	**12.5-14 ft**	**15-17 ft**	**17.5-19 ft**	**7.5-9 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**	**13-Nov-23**
	Laboratory sample description:	**ol bn - bn silt**	**lt bn - bn clay**	**ol bn - lt bn clay**	**ol bn - y bn clay**	**ol bn - lt bn clay**	**bn - dk bn clay**
Moisture	Wet soil + tare (g)	555.20	1543.36	1129.47	377.19	860.87	758.29
	Dry soil + tare (g)	493.76	1440.63	1044.36	352.11	758.40	721.07
	Tare (g)	120.66	421.65	422.15	196.80	13.83	194.35
	Moisture content, w (%)	16.5	10.1	13.7	16.1	13.8	7.1
Comments							
QC/QA	Tested By:	JCC	JCC	AT	JCC	AT	JCC
	Reduced By:	CML	CML	CML	CML	CML	CML
	Reviewed By:	AT	AT	AT	AT	AT	AT

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 53 and 58**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-12**	**JG-12**	**JG-12**			
	Depth:	**5-7 ft**	**10-12 ft**	**20-21 ft**			
	Date Sampled:	**-**	**-**	**-**			
	Date tested:	**14-Nov-23**	**14-Nov-23**	**14-Nov-23**			
	Laboratory sample description:	**lt ol bn - lt bn clay**	**lt ol bn - lt bn silt**	**lt ol bn - lt bn clay**			
Moisture	Wet soil + tare (g)	902.19	566.12	742.99			
	Dry soil + tare (g)	836.69	514.93	683.22			
	Tare (g)	193.61	116.09	117.11			
	Moisture content, w (%)	10.2	12.8	10.6			
Comments							
QC/QA	Tested By:	AT	AT	AT			
	Reduced By:	CML	CML	CML			
	Reviewed By:	AT	AT	AT			

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 18-19 ft

Tested by: JC Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - bn clay
As-received water content(%):	12.3	Approximate maximum particle size:	1.5"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

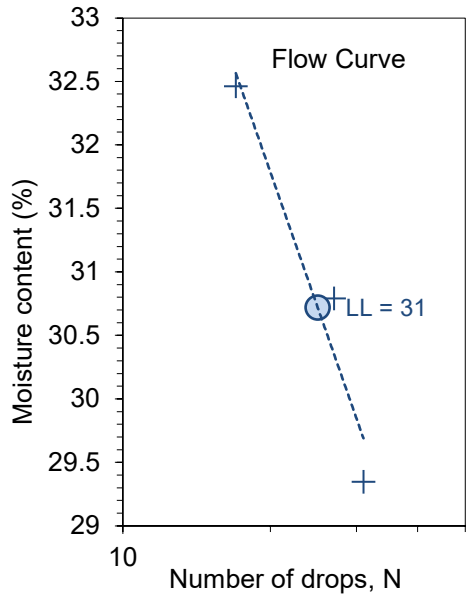
Determination No:	1	2
Wet Soil + Tare (g):	20.94	20.87
Dry Soil + Tare (g):	19.90	19.81
Moisture Loss (g):	1.04	1.06
Tare (g):	13.53	13.42
Dry Soil (g):	6.37	6.39
Moisture Content, w (%):	16.33	16.59

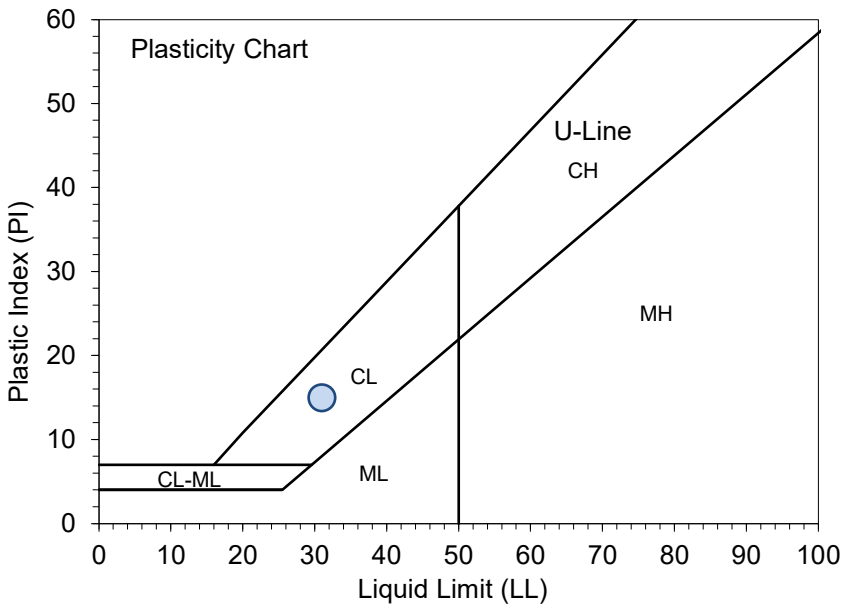
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	27	17
Wet Soil + Tare (g):	23.85	25.34	24.74
Dry Soil + Tare (g):	21.37	22.51	21.75
Moisture Loss (g):	2.48	2.83	2.99
Tare (g):	12.92	13.32	12.54
Dry Soil (g):	8.45	9.19	9.21
Moisture Content, w (%):	29.35	30.79	32.46
One-Point LL:		31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	16
Plasticity Index, PI:	15





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 27-29 ft

Tested by: JC Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - gy clay
As-received water content(%):	11.0	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

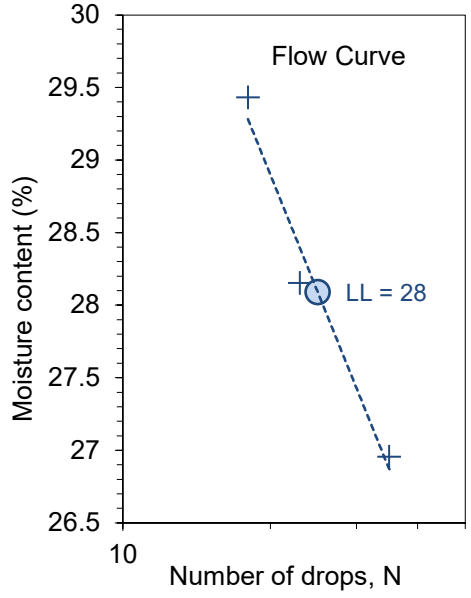
Determination No:	1	2
Wet Soil + Tare (g):	20.76	21.17
Dry Soil + Tare (g):	19.72	20.13
Moisture Loss (g):	1.04	1.04
Tare (g):	13.35	13.69
Dry Soil (g):	6.37	6.44
Moisture Content, w (%):	16.33	16.15

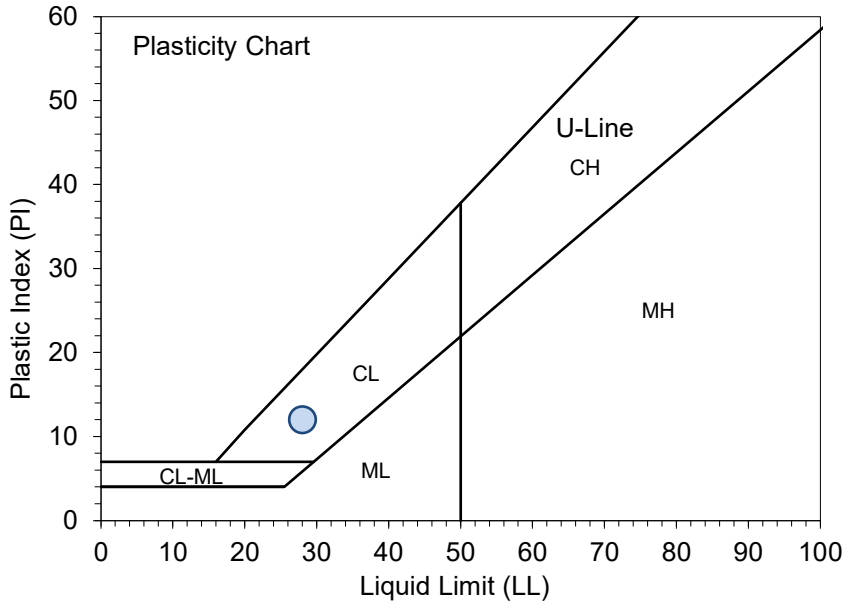
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	23	18
Wet Soil + Tare (g):	25.98	24.87	27.33
Dry Soil + Tare (g):	23.33	22.17	24.16
Moisture Loss (g):	2.65	2.70	3.17
Tare (g):	13.50	12.58	13.39
Dry Soil (g):	9.83	9.59	10.77
Moisture Content, w (%):	26.96	28.15	29.43
One-Point LL:		28	

Results

Liquid Limit, LL:	28
Plastic Limit, PL:	16
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 54.5-57 ft

Tested by: JC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - dk gy clay
As-received water content(%):	12.5	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

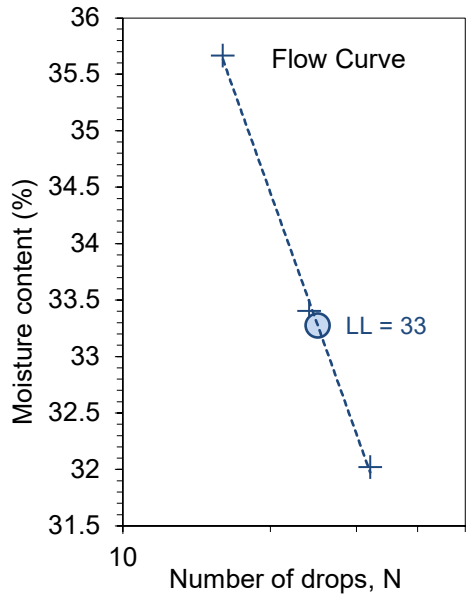
Determination No:	1	2
Wet Soil + Tare (g):	20.65	21.09
Dry Soil + Tare (g):	19.68	20.10
Moisture Loss (g):	0.97	0.99
Tare (g):	13.25	13.55
Dry Soil (g):	6.43	6.55
Moisture Content, w (%):	15.09	15.11

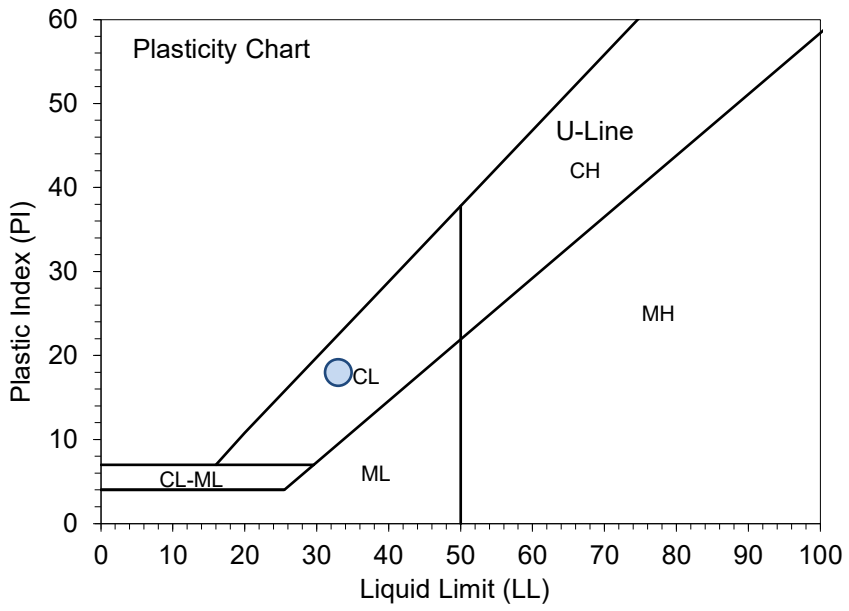
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	32	24	16
Wet Soil + Tare (g):	24.69	24.36	24.92
Dry Soil + Tare (g):	22.00	21.31	21.61
Moisture Loss (g):	2.69	3.05	3.31
Tare (g):	13.60	12.18	12.33
Dry Soil (g):	8.40	9.13	9.28
Moisture Content, w (%):	32.02	33.41	35.67
One-Point LL:		33	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	15
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 67-69 ft

Tested by: JC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	dk gy - lt bn clay
As-received water content(%):	10.0	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

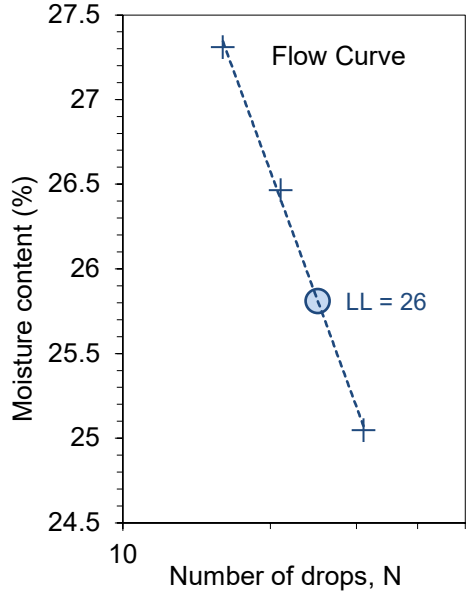
Determination No:	1	2
Wet Soil + Tare (g):	21.01	20.67
Dry Soil + Tare (g):	19.96	19.64
Moisture Loss (g):	1.05	1.03
Tare (g):	13.49	13.07
Dry Soil (g):	6.47	6.57
Moisture Content, w (%):	16.23	15.68

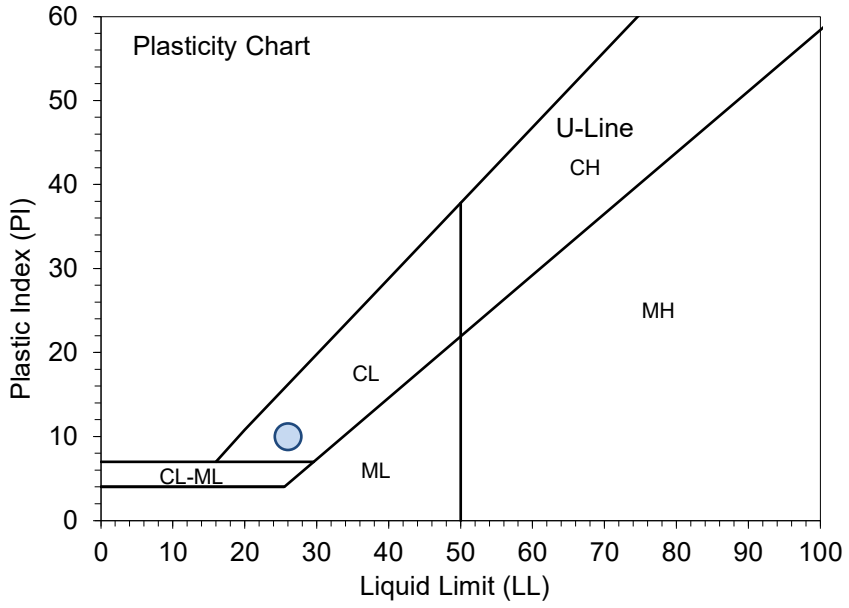
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	21	16
Wet Soil + Tare (g):	26.26	25.37	25.82
Dry Soil + Tare (g):	23.73	22.89	23.22
Moisture Loss (g):	2.53	2.48	2.60
Tare (g):	13.63	13.52	13.70
Dry Soil (g):	10.10	9.37	9.52
Moisture Content, w (%):	25.05	26.47	27.31
One-Point LL:		26	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	16
Plasticity Index, PI:	10





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 72.5-75 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - dk by clay
As-received water content(%):	20.7	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

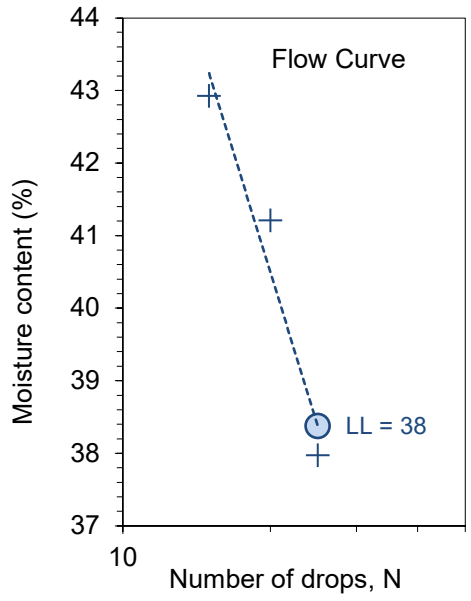
Determination No:	1	2
Wet Soil + Tare (g):	21.19	21.02
Dry Soil + Tare (g):	20.06	19.89
Moisture Loss (g):	1.13	1.13
Tare (g):	13.47	13.48
Dry Soil (g):	6.59	6.41
Moisture Content, w (%):	17.15	17.63

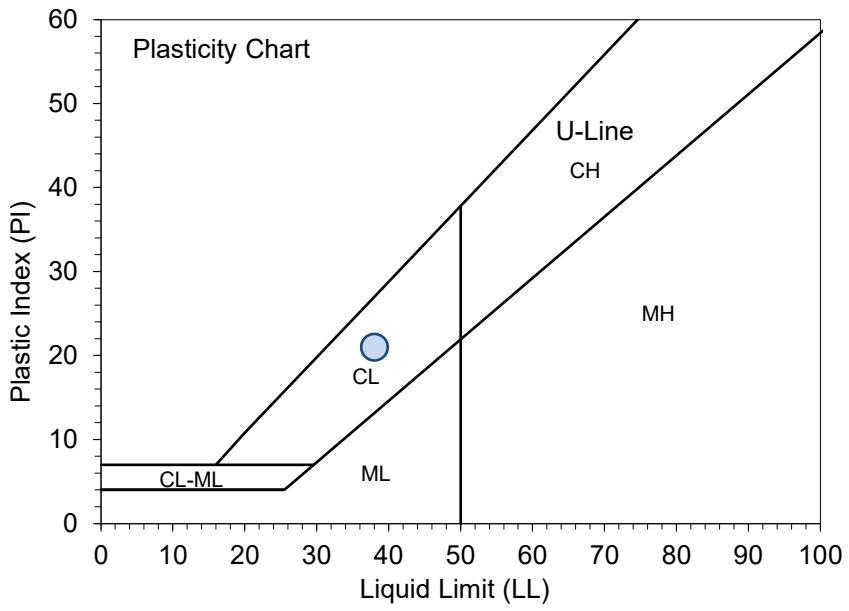
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	25	20	15
Wet Soil + Tare (g):	22.90	24.32	25.41
Dry Soil + Tare (g):	20.31	21.13	21.89
Moisture Loss (g):	2.59	3.19	3.52
Tare (g):	13.49	13.39	13.69
Dry Soil (g):	6.82	7.74	8.20
Moisture Content, w (%):	37.98	41.21	42.93
One-Point LL:	38	40	

Results

Liquid Limit, LL:	38
Plastic Limit, PL:	17
Plasticity Index, PI:	21





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 7-10 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn gravel
As-received water content(%):	Not Requested	Approximate maximum particle size:	1.5"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

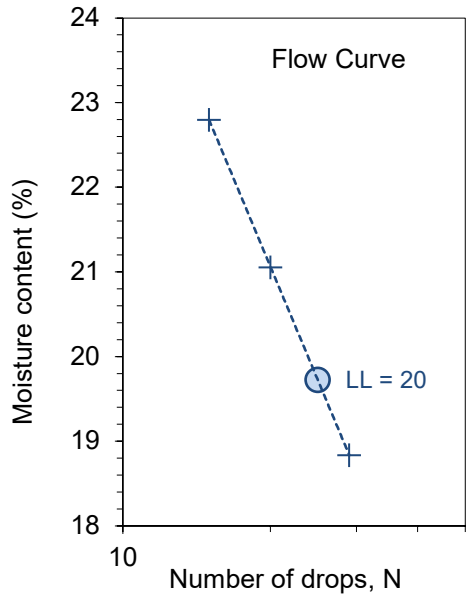
Determination No:	1	2
Wet Soil + Tare (g):	20.22	21.14
Dry Soil + Tare (g):	19.22	20.11
Moisture Loss (g):	1.00	1.03
Tare (g):	12.57	13.32
Dry Soil (g):	6.65	6.79
Moisture Content, w (%):	15.04	15.17

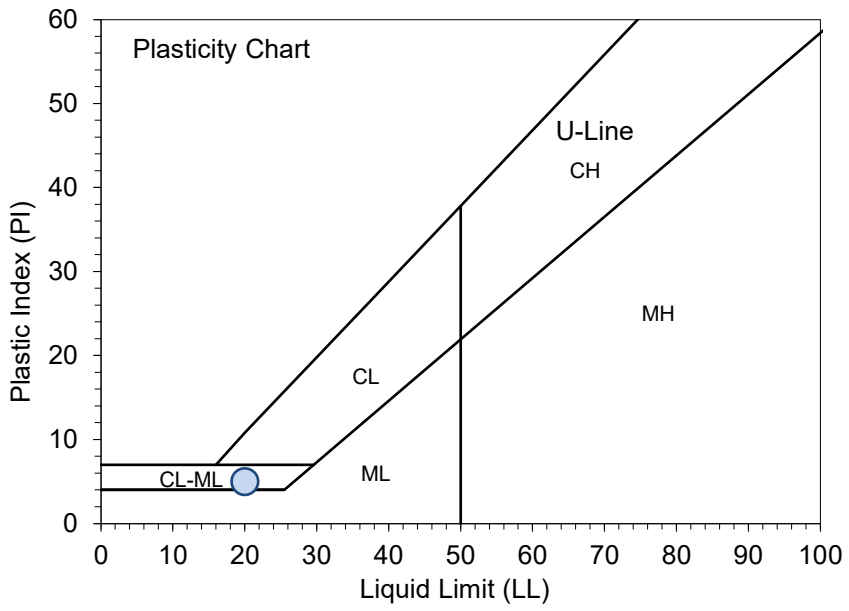
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	20	15
Wet Soil + Tare (g):	26.87	25.20	24.44
Dry Soil + Tare (g):	24.76	23.17	22.29
Moisture Loss (g):	2.11	2.03	2.15
Tare (g):	13.56	13.53	12.86
Dry Soil (g):	11.20	9.64	9.43
Moisture Content, w (%):	18.84	21.06	22.80
One-Point LL:	19	20	

Results

Liquid Limit, LL:	20
Plastic Limit, PL:	15
Plasticity Index, PI:	5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 14.5-16 ft

Tested by: JC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - ol bn clay
As-received water content(%):	11.9	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

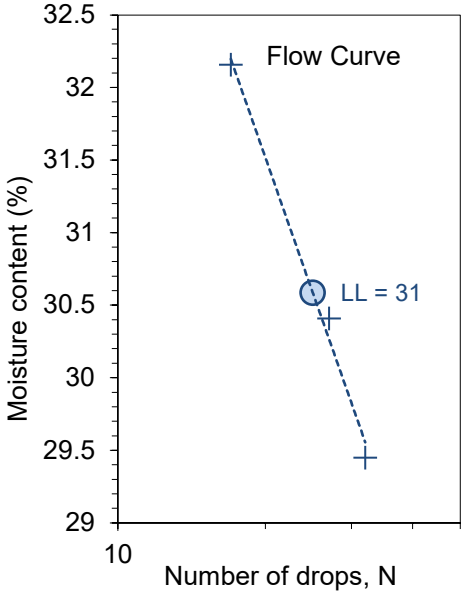
Determination No:	1	2
Wet Soil + Tare (g):	20.91	19.95
Dry Soil + Tare (g):	19.95	19.00
Moisture Loss (g):	0.96	0.95
Tare (g):	13.46	12.46
Dry Soil (g):	6.49	6.54
Moisture Content, w (%):	14.79	14.53

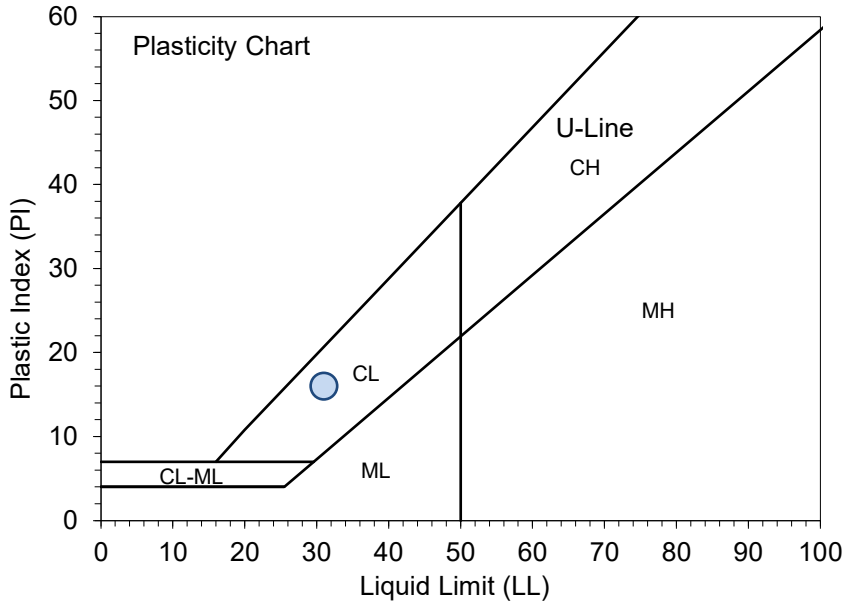
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	32	27	17
Wet Soil + Tare (g):	27.13	25.25	23.71
Dry Soil + Tare (g):	24.02	22.51	20.88
Moisture Loss (g):	3.11	2.74	2.83
Tare (g):	13.46	13.50	12.08
Dry Soil (g):	10.56	9.01	8.80
Moisture Content, w (%):	29.45	30.41	32.16
One-Point LL:		31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	15
Plasticity Index, PI:	16





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - ol bn clay
As-received water content(%):	13.3	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

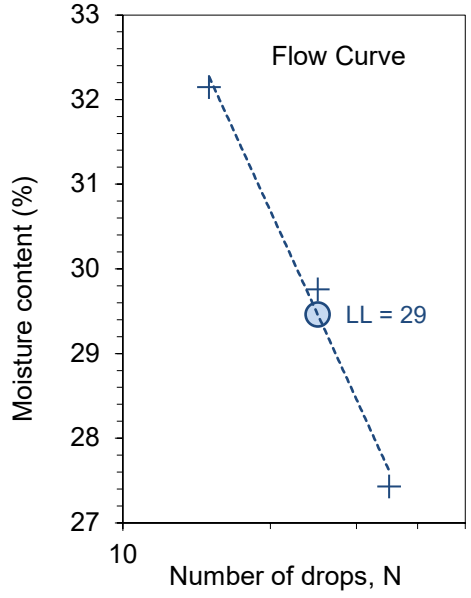
Determination No:	1	2
Wet Soil + Tare (g):	21.43	19.87
Dry Soil + Tare (g):	20.39	18.85
Moisture Loss (g):	1.04	1.02
Tare (g):	13.57	12.08
Dry Soil (g):	6.82	6.77
Moisture Content, w (%):	15.25	15.07

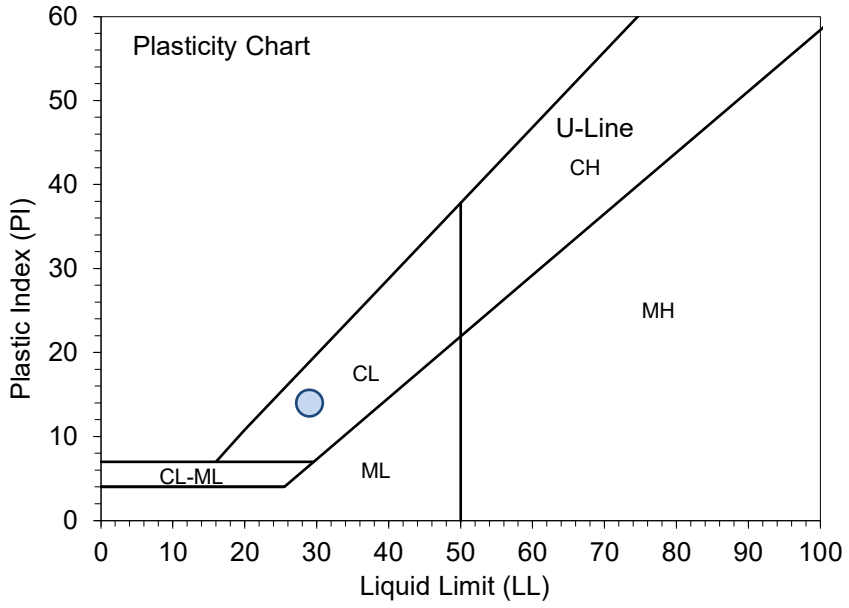
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	25	15
Wet Soil + Tare (g):	22.22	20.57	25.21
Dry Soil + Tare (g):	20.36	18.71	22.22
Moisture Loss (g):	1.86	1.86	2.99
Tare (g):	13.58	12.46	12.92
Dry Soil (g):	6.78	6.25	9.30
Moisture Content, w (%):	27.43	29.76	32.15
One-Point LL:		30	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	15
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 32-35 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk yl bn clay
As-received water content(%):	14.5	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

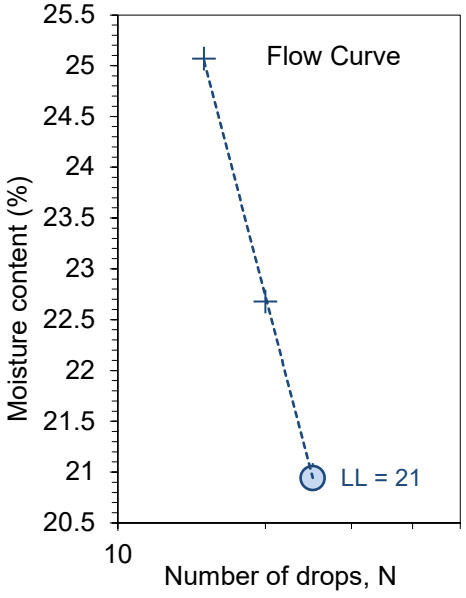
Determination No:	1	2
Wet Soil + Tare (g):	21.05	21.32
Dry Soil + Tare (g):	19.97	20.22
Moisture Loss (g):	1.08	1.10
Tare (g):	13.42	13.54
Dry Soil (g):	6.55	6.68
Moisture Content, w (%):	16.49	16.47

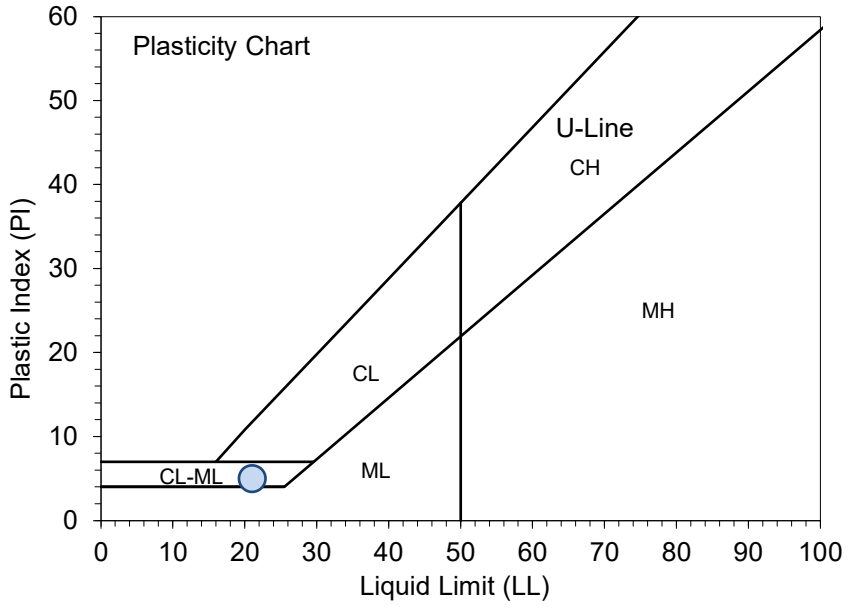
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	25	20	15
Wet Soil + Tare (g):	25.91	24.58	25.44
Dry Soil + Tare (g):	23.76	22.50	22.86
Moisture Loss (g):	2.15	2.08	2.58
Tare (g):	13.51	13.33	12.57
Dry Soil (g):	10.25	9.17	10.29
Moisture Content, w (%):	20.98	22.68	25.07
One-Point LL:	21	22	

Results

Liquid Limit, LL:	21
Plastic Limit, PL:	16
Plasticity Index, PI:	5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 38.5-40 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - ol bn clay
As-received water content(%):	15.5	Approximate maximum particle size:	No. 10
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

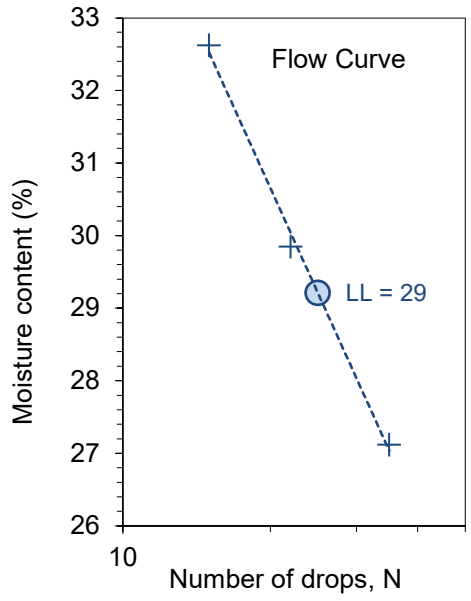
Determination No:	1	2
Wet Soil + Tare (g):	20.84	21.16
Dry Soil + Tare (g):	19.75	20.04
Moisture Loss (g):	1.09	1.12
Tare (g):	13.53	13.60
Dry Soil (g):	6.22	6.44
Moisture Content, w (%):	17.52	17.39

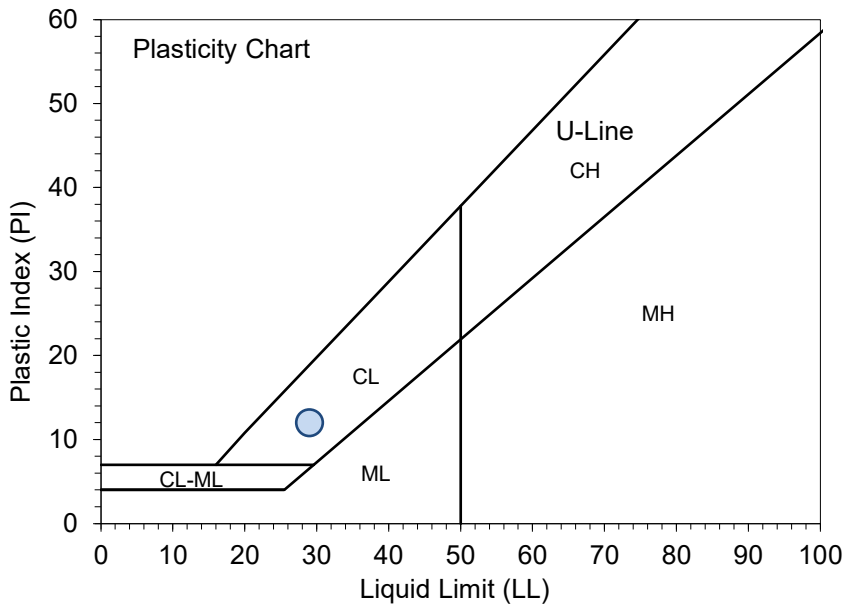
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	22	15
Wet Soil + Tare (g):	24.37	21.89	23.34
Dry Soil + Tare (g):	22.04	19.69	20.88
Moisture Loss (g):	2.33	2.20	2.46
Tare (g):	13.45	12.32	13.34
Dry Soil (g):	8.59	7.37	7.54
Moisture Content, w (%):	27.12	29.85	32.63
One-Point LL:		29	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	17
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 52-55 ft

Tested by: CML Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	gy - ol bn clay
As-received water content(%):	11.6	Approximate maximum particle size:	No. 10
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

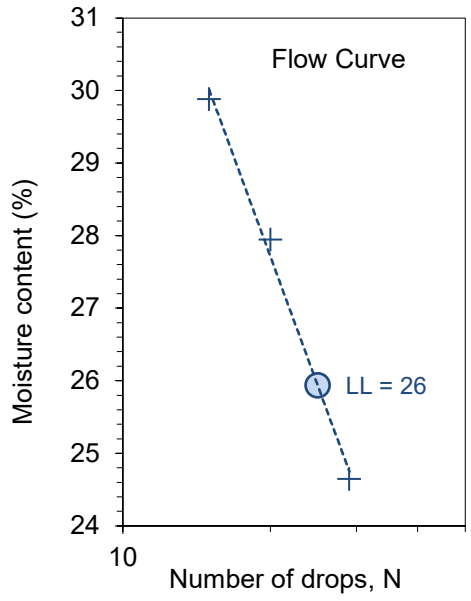
Determination No:	1	2
Wet Soil + Tare (g):	20.78	20.39
Dry Soil + Tare (g):	19.86	19.48
Moisture Loss (g):	0.92	0.91
Tare (g):	13.07	12.86
Dry Soil (g):	6.79	6.62
Moisture Content, w (%):	13.55	13.75

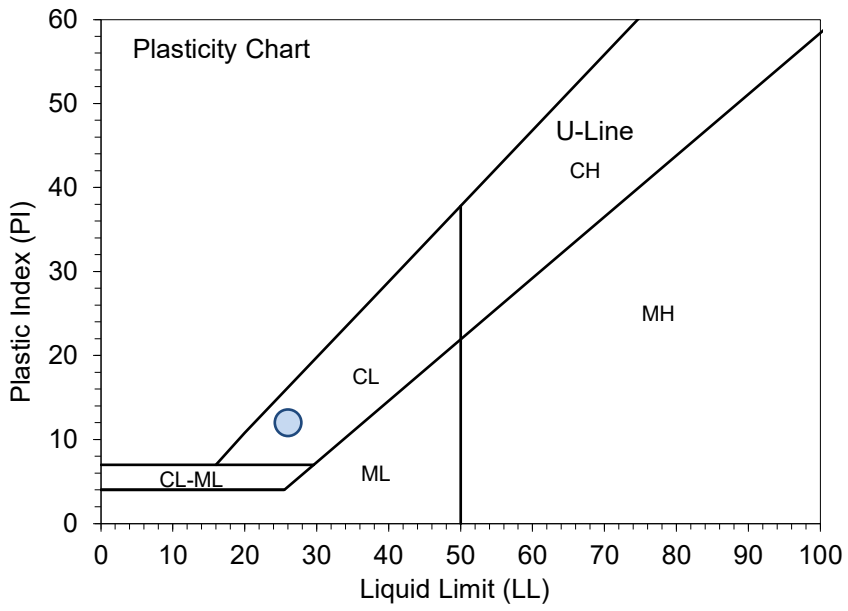
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	20	15
Wet Soil + Tare (g):	26.18	26.47	25.64
Dry Soil + Tare (g):	23.71	23.51	22.84
Moisture Loss (g):	2.47	2.96	2.80
Tare (g):	13.69	12.92	13.47
Dry Soil (g):	10.02	10.59	9.37
Moisture Content, w (%):	24.65	27.95	29.88
One-Point LL:	25	27	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	14
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 60-62 ft

Tested by: PJF Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	13.7	Approximate maximum particle size:	No. 10
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

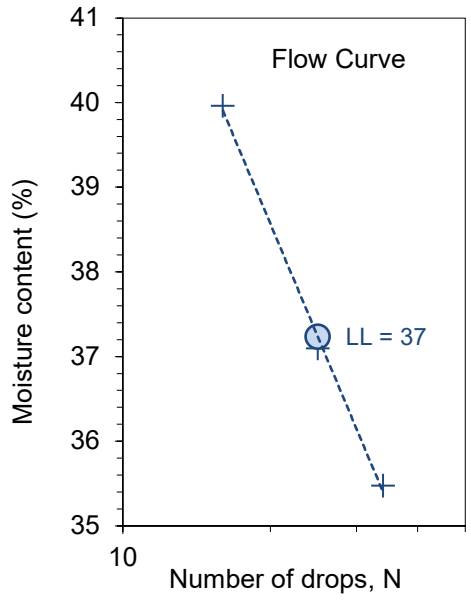
Determination No:	1	2
Wet Soil + Tare (g):	19.85	20.09
Dry Soil + Tare (g):	19.04	19.23
Moisture Loss (g):	0.81	0.86
Tare (g):	13.24	13.20
Dry Soil (g):	5.80	6.03
Moisture Content, w (%):	13.97	14.26

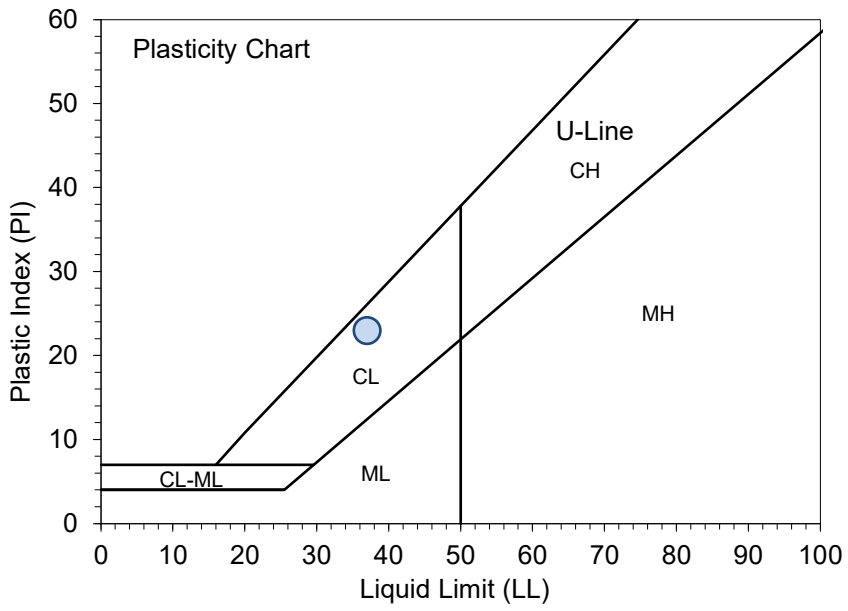
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	34	25	16
Wet Soil + Tare (g):	25.78	25.64	28.95
Dry Soil + Tare (g):	22.31	22.39	24.57
Moisture Loss (g):	3.47	3.25	4.38
Tare (g):	12.53	13.63	13.61
Dry Soil (g):	9.78	8.76	10.96
Moisture Content, w (%):	35.48	37.10	39.96
One-Point LL:		37	

Results

Liquid Limit, LL:	37
Plastic Limit, PL:	14
Plasticity Index, PI:	23





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 64.5-67 ft

Tested by: PJF Date: 16-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - ol bn clay
As-received water content(%):	12.8	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

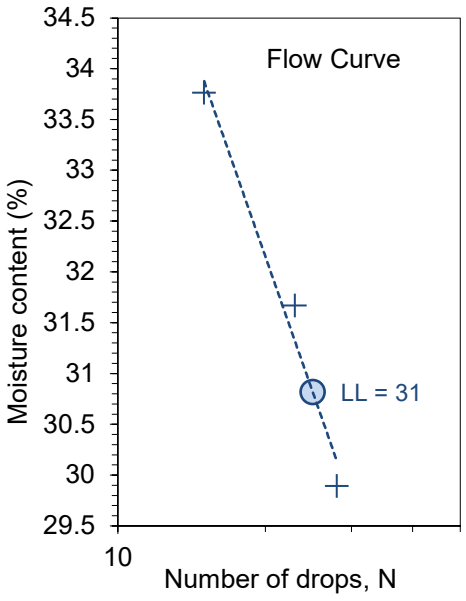
Determination No:	1	2
Wet Soil + Tare (g):	19.92	19.13
Dry Soil + Tare (g):	18.91	18.09
Moisture Loss (g):	1.01	1.04
Tare (g):	12.97	12.20
Dry Soil (g):	5.94	5.89
Moisture Content, w (%):	17.00	17.66

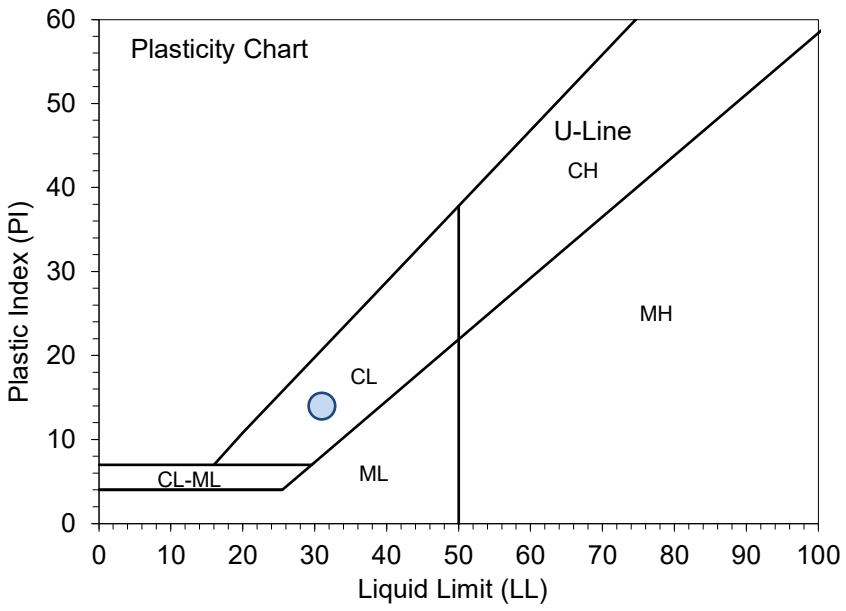
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	28	23	15
Wet Soil + Tare (g):	26.11	26.31	25.75
Dry Soil + Tare (g):	23.21	23.13	22.62
Moisture Loss (g):	2.90	3.18	3.13
Tare (g):	13.51	13.09	13.35
Dry Soil (g):	9.70	10.04	9.27
Moisture Content, w (%):	29.90	31.67	33.76
One-Point LL:	30	31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	17
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 69.5-72 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn gravel
As-received water content(%):	Not Requested	Approximate maximum particle size:	2"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	75
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

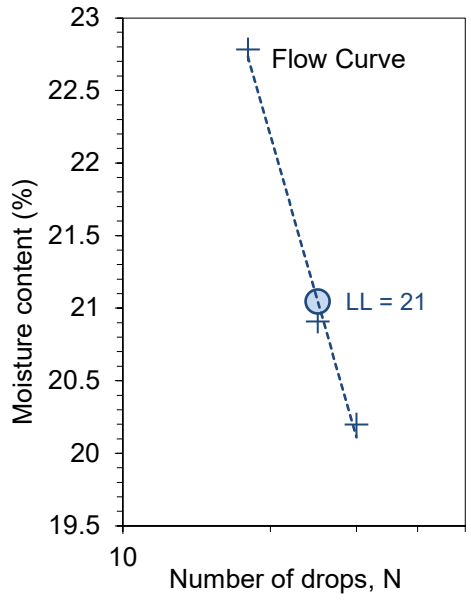
Determination No:	1	2
Wet Soil + Tare (g):	20.46	21.09
Dry Soil + Tare (g):	19.45	20.08
Moisture Loss (g):	1.01	1.01
Tare (g):	12.96	13.57
Dry Soil (g):	6.49	6.51
Moisture Content, w (%):	15.56	15.51

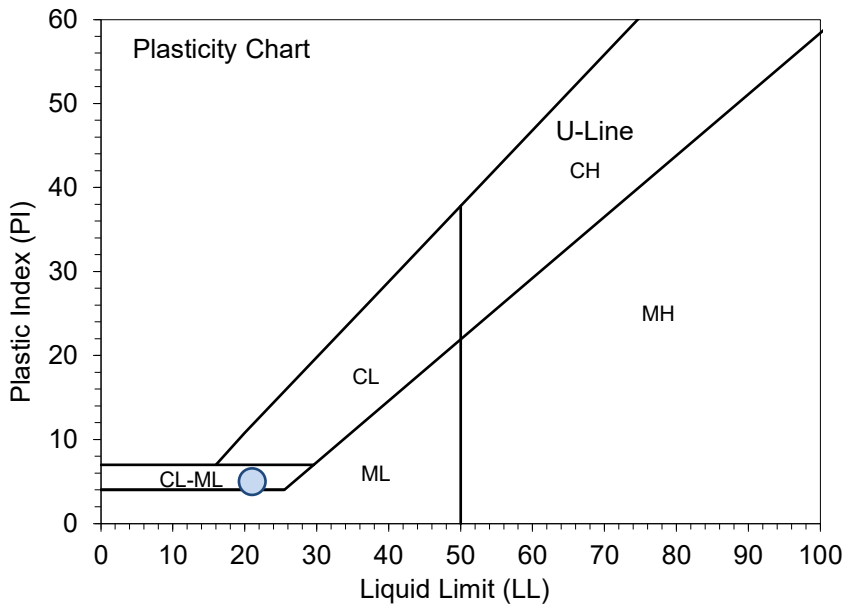
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	25	18
Wet Soil + Tare (g):	24.18	25.29	22.55
Dry Soil + Tare (g):	22.36	23.27	20.75
Moisture Loss (g):	1.82	2.02	1.80
Tare (g):	13.35	13.61	12.85
Dry Soil (g):	9.01	9.66	7.90
Moisture Content, w (%):	20.20	20.91	22.78
One-Point LL:	21	21	

Results

Liquid Limit, LL:	21
Plastic Limit, PL:	16
Plasticity Index, PI:	5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 4.5-7 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	10.1	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

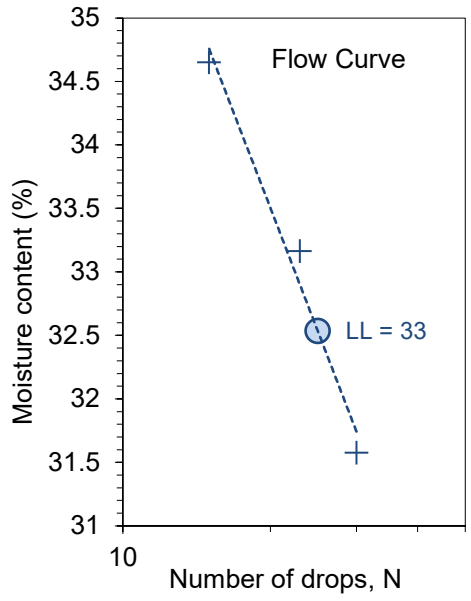
Determination No:	1	2
Wet Soil + Tare (g):	20.63	19.09
Dry Soil + Tare (g):	19.78	18.29
Moisture Loss (g):	0.85	0.80
Tare (g):	13.55	12.54
Dry Soil (g):	6.23	5.75
Moisture Content, w (%):	13.64	13.91

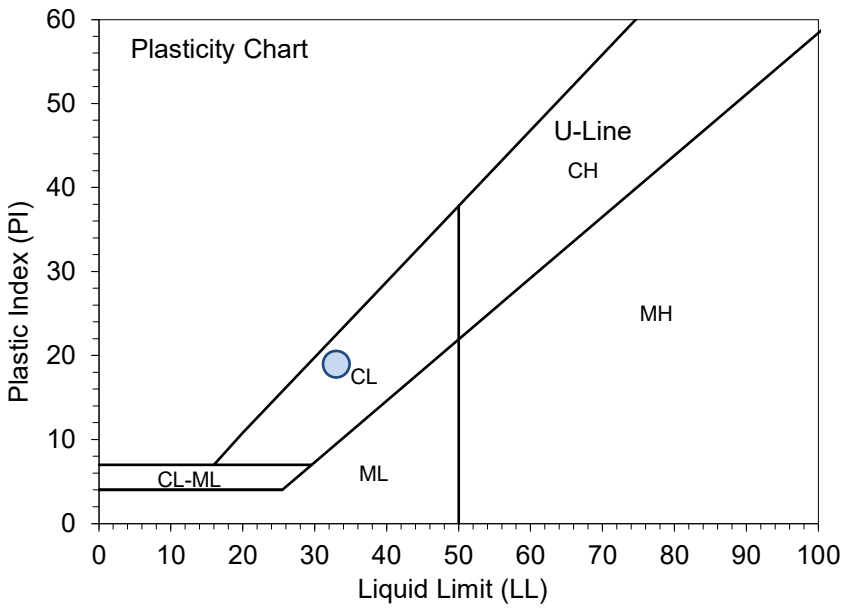
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	23	15
Wet Soil + Tare (g):	27.01	26.81	27.14
Dry Soil + Tare (g):	23.77	23.50	23.64
Moisture Loss (g):	3.24	3.31	3.50
Tare (g):	13.51	13.52	13.54
Dry Soil (g):	10.26	9.98	10.10
Moisture Content, w (%):	31.58	33.17	34.65
One-Point LL:	32	33	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	14
Plasticity Index, PI:	19





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Tested by: MGS Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	pl ol bn - bn clay
As-received water content(%):	8.4	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

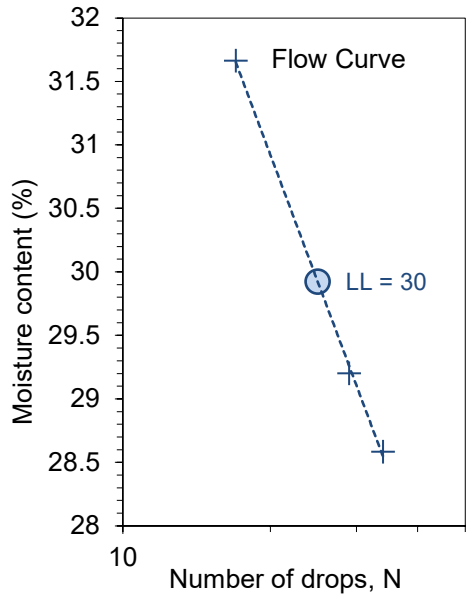
Determination No:	1	2
Wet Soil + Tare (g):	20.68	20.84
Dry Soil + Tare (g):	19.73	19.88
Moisture Loss (g):	0.95	0.96
Tare (g):	13.45	13.56
Dry Soil (g):	6.28	6.32
Moisture Content, w (%):	15.13	15.19

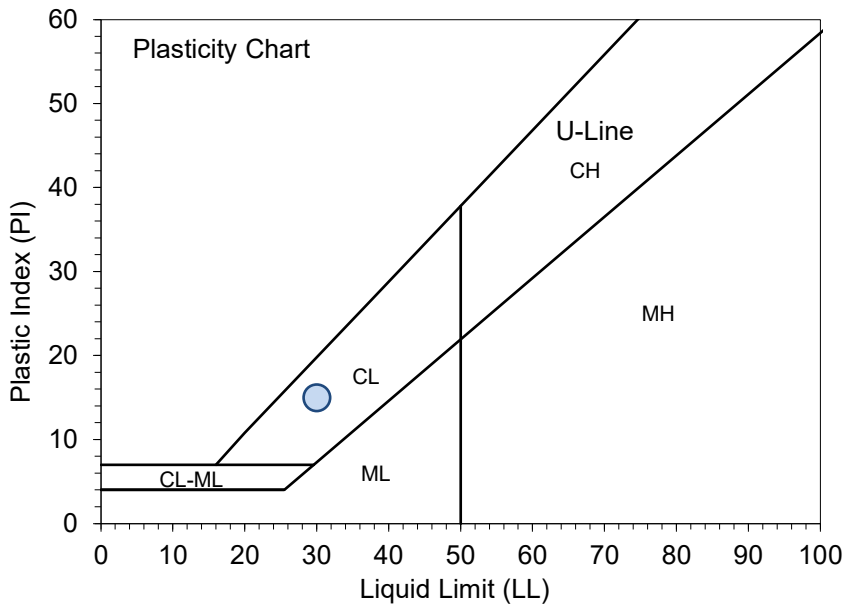
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	34	29	17
Wet Soil + Tare (g):	25.21	28.96	24.78
Dry Soil + Tare (g):	22.32	25.47	22.06
Moisture Loss (g):	2.89	3.49	2.72
Tare (g):	12.21	13.52	13.47
Dry Soil (g):	10.11	11.95	8.59
Moisture Content, w (%):	28.59	29.21	31.66
One-Point LL:		30	

Results

Liquid Limit, LL:	30
Plastic Limit, PL:	15
Plasticity Index, PI:	15





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - bn clay
As-received water content(%):	12.4	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	20
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

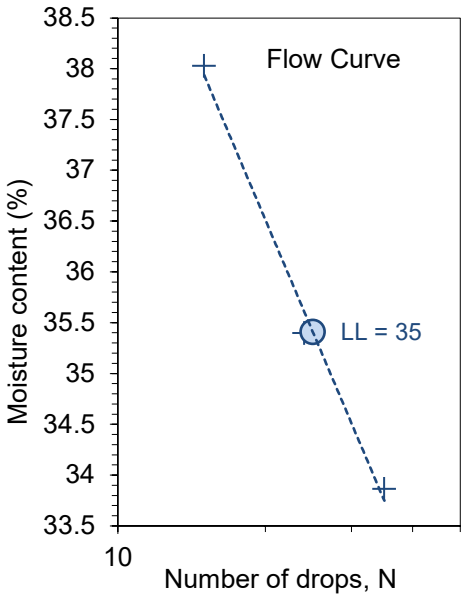
Determination No:	1	2
Wet Soil + Tare (g):	19.21	19.75
Dry Soil + Tare (g):	18.30	18.89
Moisture Loss (g):	0.91	0.86
Tare (g):	12.28	13.22
Dry Soil (g):	6.02	5.67
Moisture Content, w (%):	15.12	15.17

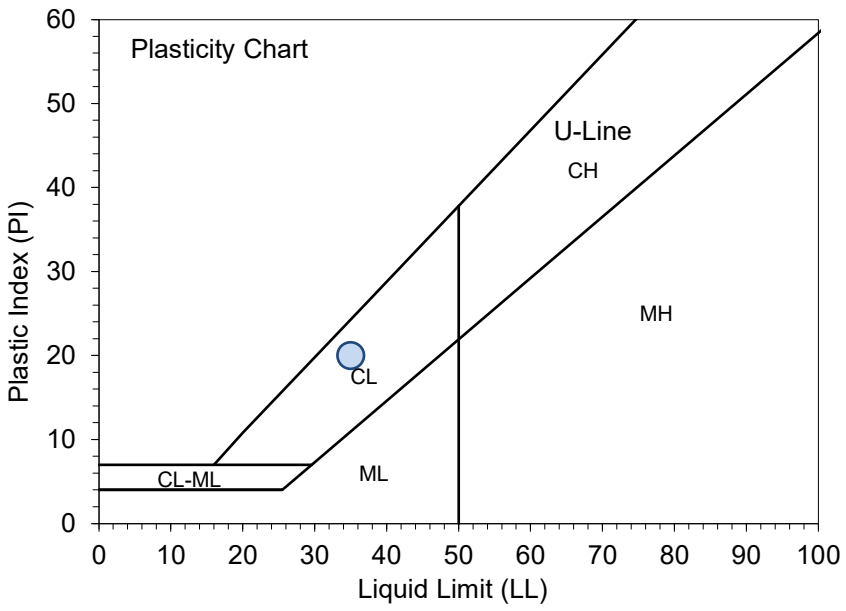
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	24	15
Wet Soil + Tare (g):	26.18	26.09	25.03
Dry Soil + Tare (g):	23.01	22.78	21.90
Moisture Loss (g):	3.17	3.31	3.13
Tare (g):	13.65	13.43	13.67
Dry Soil (g):	9.36	9.35	8.23
Moisture Content, w (%):	33.87	35.40	38.03
One-Point LL:		35	

Results

Liquid Limit, LL:	35
Plastic Limit, PL:	15
Plasticity Index, PI:	20





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 30-33 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn clay
As-received water content(%):	10.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

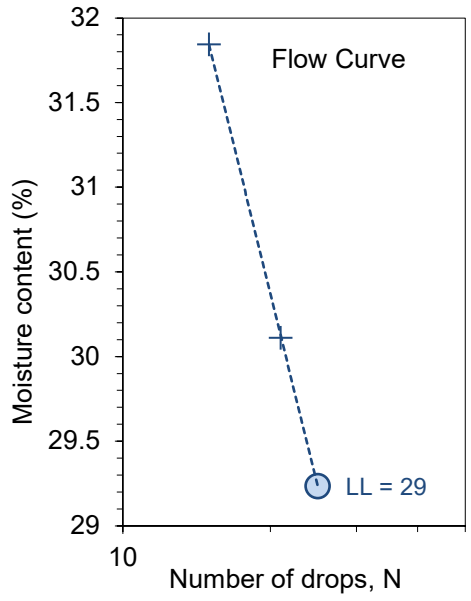
Determination No:	1	2
Wet Soil + Tare (g):	20.40	20.23
Dry Soil + Tare (g):	19.46	19.37
Moisture Loss (g):	0.94	0.86
Tare (g):	13.35	13.51
Dry Soil (g):	6.11	5.86
Moisture Content, w (%):	15.38	14.68

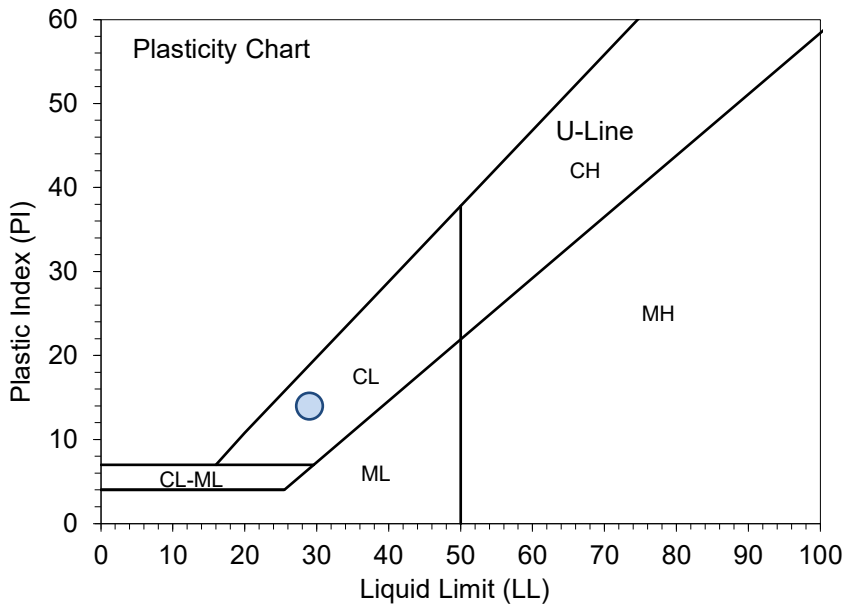
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	25	21	15
Wet Soil + Tare (g):	25.41	25.35	28.60
Dry Soil + Tare (g):	22.55	22.42	24.96
Moisture Loss (g):	2.86	2.93	3.64
Tare (g):	12.77	12.69	13.53
Dry Soil (g):	9.78	9.73	11.43
Moisture Content, w (%):	29.24	30.11	31.85
One-Point LL:	29	29	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	15
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 7-10 ft

Tested by: MGS Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	It ol bn - bn clay
As-received water content(%):	21.8	Approximate maximum particle size:	No. 4
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

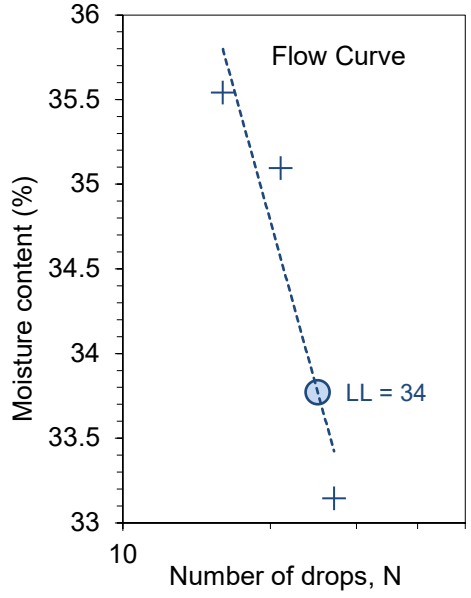
Determination No:	1	2
Wet Soil + Tare (g):	20.44	20.46
Dry Soil + Tare (g):	19.50	19.48
Moisture Loss (g):	0.94	0.98
Tare (g):	13.42	13.24
Dry Soil (g):	6.08	6.24
Moisture Content, w (%):	15.46	15.71

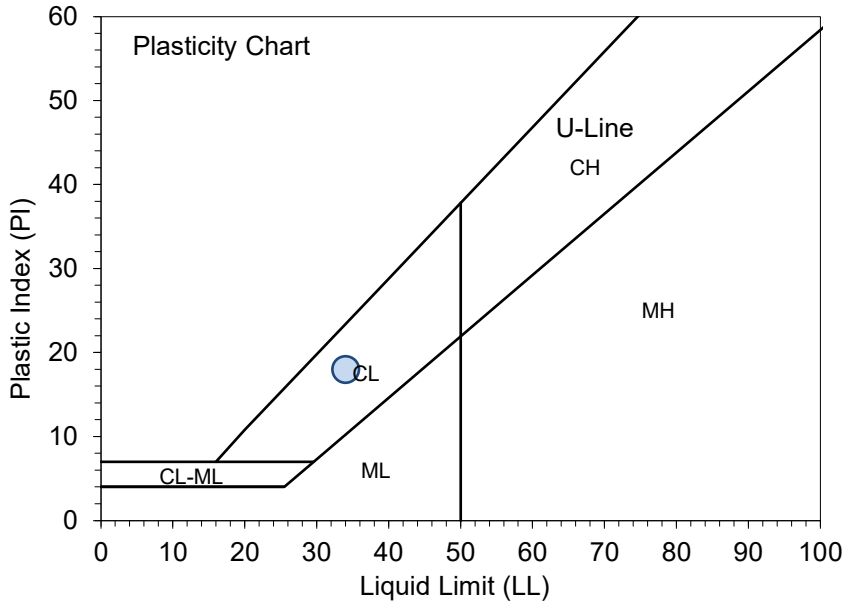
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	27	21	16
Wet Soil + Tare (g):	24.27	26.14	25.99
Dry Soil + Tare (g):	21.30	22.49	22.72
Moisture Loss (g):	2.97	3.65	3.27
Tare (g):	12.34	12.09	13.52
Dry Soil (g):	8.96	10.40	9.20
Moisture Content, w (%):	33.15	35.10	35.54
One-Point LL:	33	34	

Results

Liquid Limit, LL:	34
Plastic Limit, PL:	16
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Tested by: CML Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	pl ol bn - lt bn silt
As-received water content(%):	6.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

Determination No:	1	2
Wet Soil + Tare (g):	21.13	20.64
Dry Soil + Tare (g):	20.21	19.72
Moisture Loss (g):	0.92	0.92
Tare (g):	13.54	12.92
Dry Soil (g):	6.67	6.80
Moisture Content, w (%):	13.79	13.53

Liquid Limit

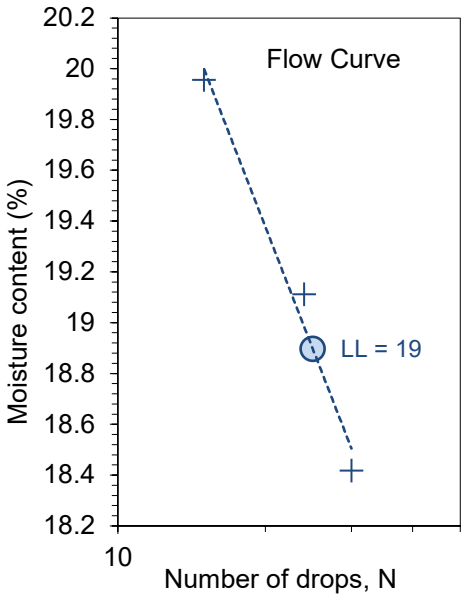
Determination No:	1	2	3
Number of Drops, N:	30	24	15
Wet Soil + Tare (g):	24.37	26.22	24.48
Dry Soil + Tare (g):	22.53	24.15	22.61
Moisture Loss (g):	1.84	2.07	1.87
Tare (g):	12.54	13.32	13.24
Dry Soil (g):	9.99	10.83	9.37
Moisture Content, w (%):	18.42	19.11	19.96
One-Point LL:	19	19	

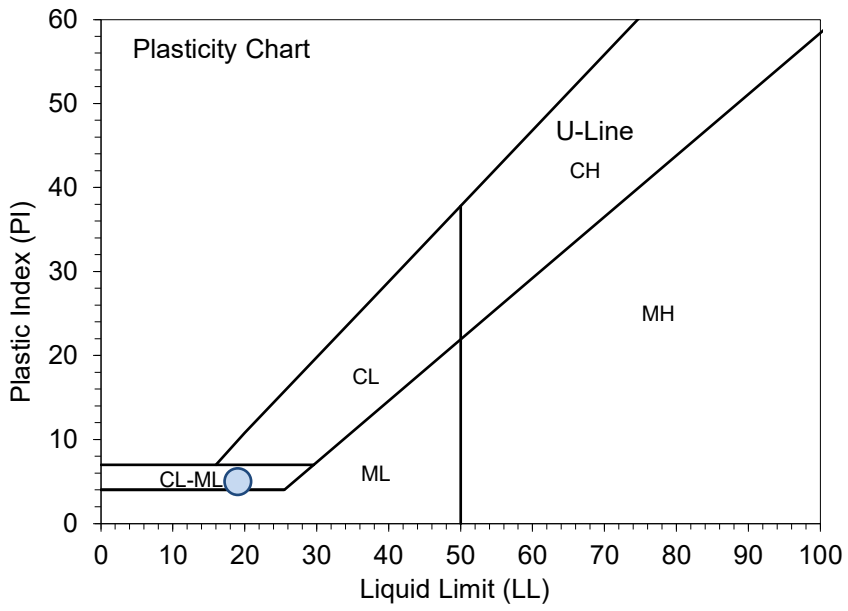
Results

Liquid Limit, LL: 19

Plastic Limit, PL: 14

Plasticity Index, PI: 5





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: PJF Date: 13-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - bn silt
As-received water content(%):	16.5	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

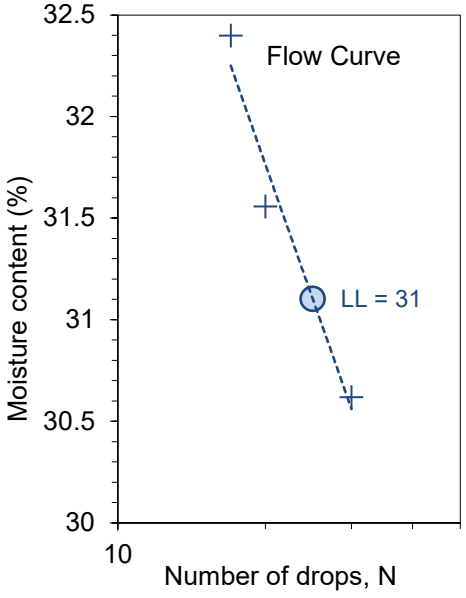
Determination No:	1	2
Wet Soil + Tare (g):	20.25	19.87
Dry Soil + Tare (g):	19.28	18.88
Moisture Loss (g):	0.97	0.99
Tare (g):	13.52	12.94
Dry Soil (g):	5.76	5.94
Moisture Content, w (%):	16.84	16.67

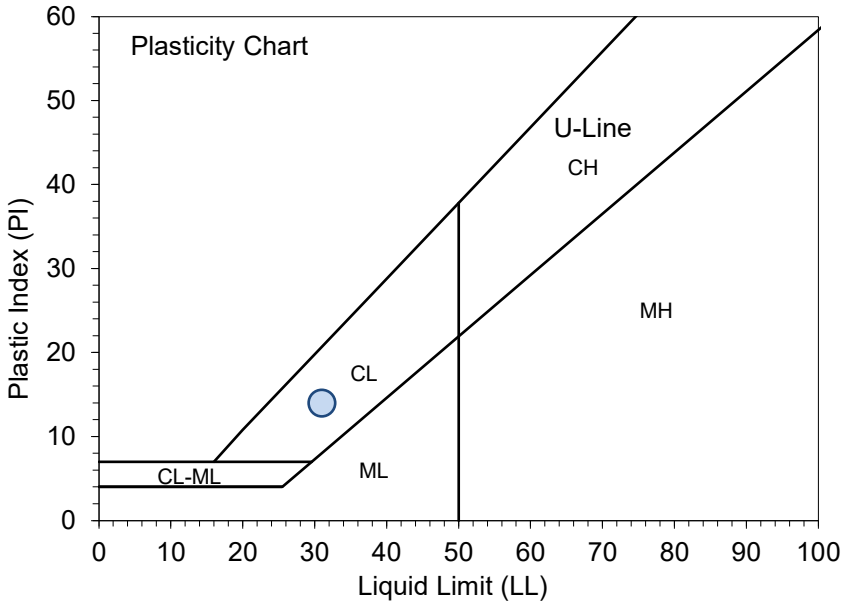
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	20	17
Wet Soil + Tare (g):	26.21	26.45	25.37
Dry Soil + Tare (g):	23.20	23.31	22.48
Moisture Loss (g):	3.01	3.14	2.89
Tare (g):	13.37	13.36	13.56
Dry Soil (g):	9.83	9.95	8.92
Moisture Content, w (%):	30.62	31.56	32.40
One-Point LL:	31	31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	17
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 30-33 ft

Tested by: CML Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	10.1	Approximate maximum particle size:	2"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	25
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

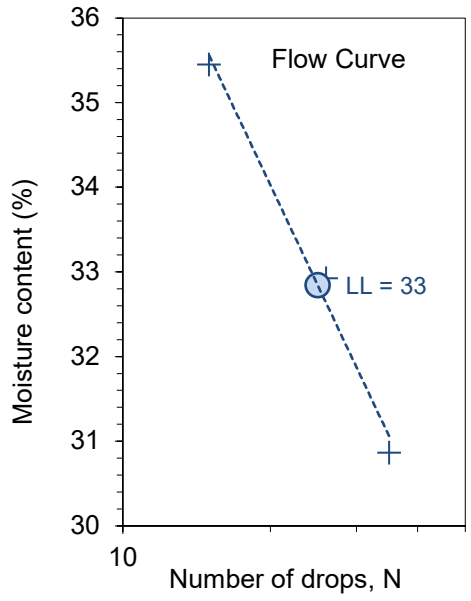
Determination No:	1	2
Wet Soil + Tare (g):	20.99	21.04
Dry Soil + Tare (g):	19.96	20.03
Moisture Loss (g):	1.03	1.01
Tare (g):	13.34	13.41
Dry Soil (g):	6.62	6.62
Moisture Content, w (%):	15.56	15.26

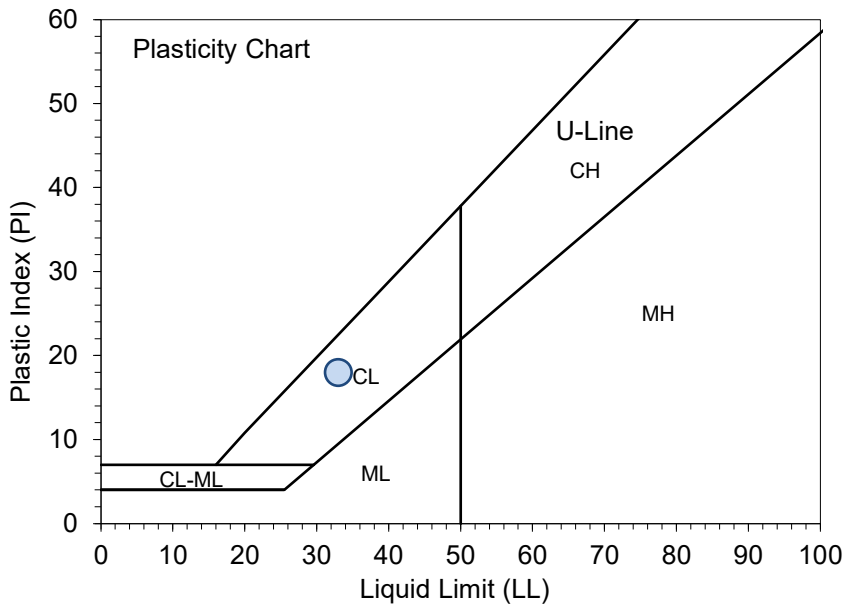
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	26	15
Wet Soil + Tare (g):	25.03	25.76	27.92
Dry Soil + Tare (g):	22.36	22.52	24.13
Moisture Loss (g):	2.67	3.24	3.79
Tare (g):	13.71	12.68	13.44
Dry Soil (g):	8.65	9.84	10.69
Moisture Content, w (%):	30.87	32.93	35.45
One-Point LL:		33	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	15
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn gravel
As-received water content(%):	Not Requested	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	20
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

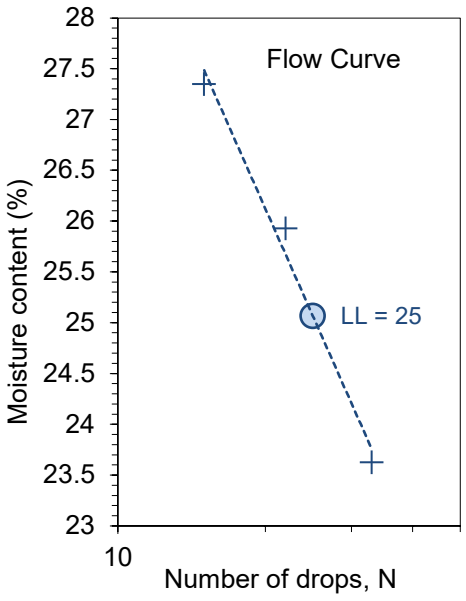
Determination No:	1	2
Wet Soil + Tare (g):	21.15	20.86
Dry Soil + Tare (g):	20.10	19.82
Moisture Loss (g):	1.05	1.04
Tare (g):	13.54	13.35
Dry Soil (g):	6.56	6.47
Moisture Content, w (%):	16.01	16.07

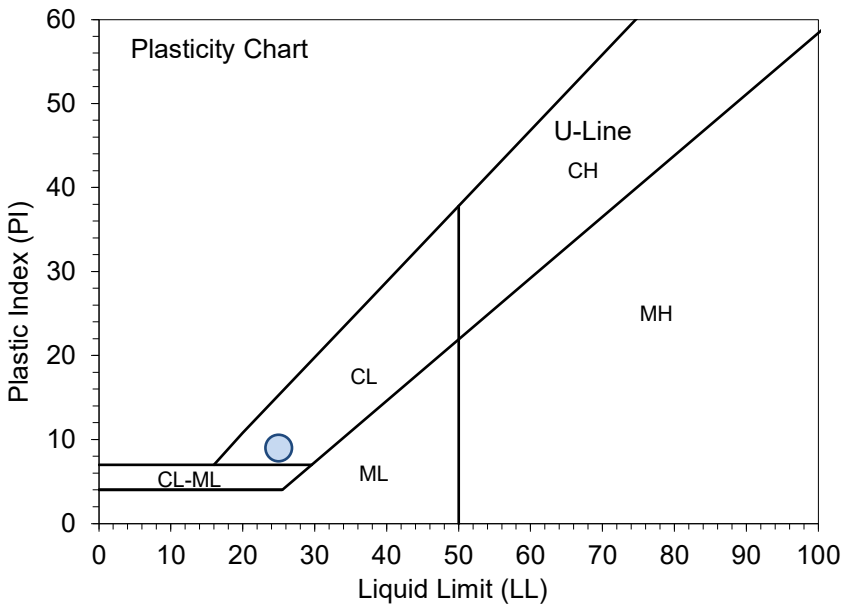
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	33	22	15
Wet Soil + Tare (g):	25.36	27.77	26.44
Dry Soil + Tare (g):	23.03	24.92	23.62
Moisture Loss (g):	2.33	2.85	2.82
Tare (g):	13.17	13.93	13.31
Dry Soil (g):	9.86	10.99	10.31
Moisture Content, w (%):	23.63	25.93	27.35
One-Point LL:		26	

Results

Liquid Limit, LL:	25
Plastic Limit, PL:	16
Plasticity Index, PI:	9





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Tested by: AT Date: 14-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Oven Dry	Laboratory sample description:	ol bn - lt bn clay
As-received water content(%):	13.7	Approximate maximum particle size:	1.5"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

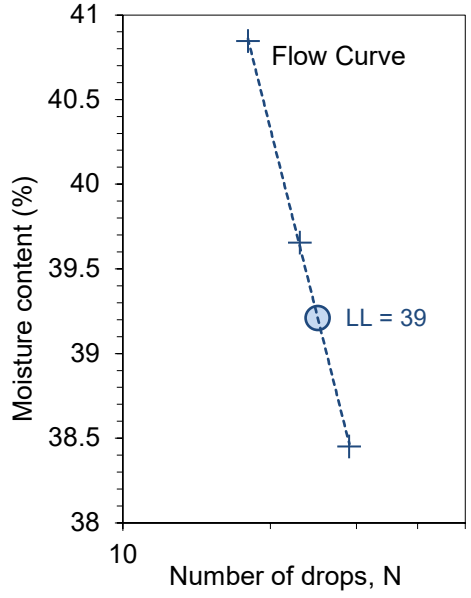
Determination No:	1	2
Wet Soil + Tare (g):	20.12	19.90
Dry Soil + Tare (g):	19.24	19.05
Moisture Loss (g):	0.88	0.85
Tare (g):	13.41	13.55
Dry Soil (g):	5.83	5.50
Moisture Content, w (%):	15.09	15.45

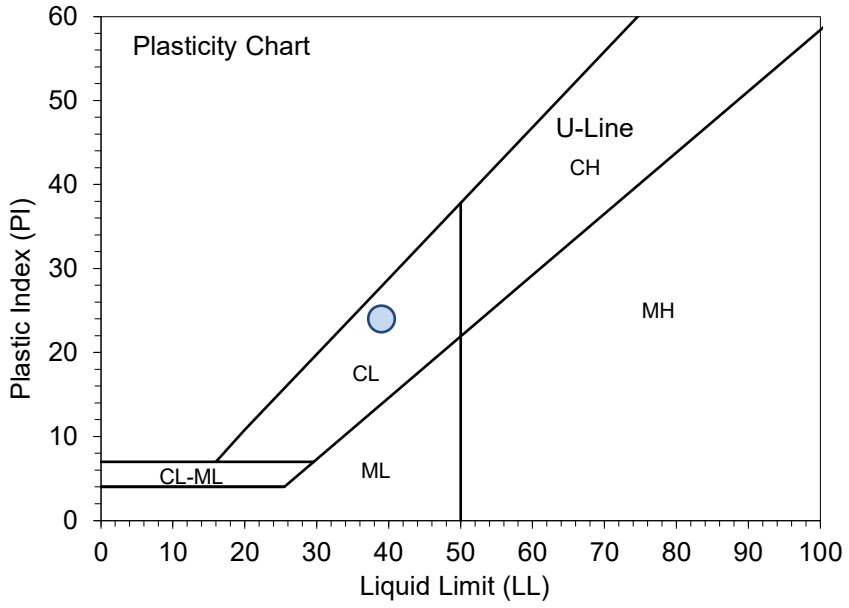
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	23	18
Wet Soil + Tare (g):	25.53	23.25	24.89
Dry Soil + Tare (g):	22.20	20.47	21.61
Moisture Loss (g):	3.33	2.78	3.28
Tare (g):	13.54	13.46	13.58
Dry Soil (g):	8.66	7.01	8.03
Moisture Content, w (%):	38.45	39.66	40.85
One-Point LL:	39	39	

Results

Liquid Limit, LL:	39
Plastic Limit, PL:	15
Plasticity Index, PI:	24





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 15-17 ft

Tested by: AT Date: 13-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - yl bn clay
As-received water content(%):	16.1	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

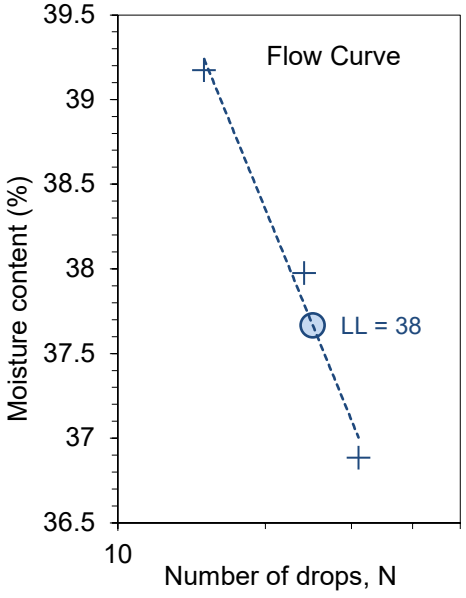
Determination No:	1	2
Wet Soil + Tare (g):	19.43	20.15
Dry Soil + Tare (g):	18.38	18.97
Moisture Loss (g):	1.05	1.18
Tare (g):	13.17	13.33
Dry Soil (g):	5.21	5.64
Moisture Content, w (%):	20.15	20.92

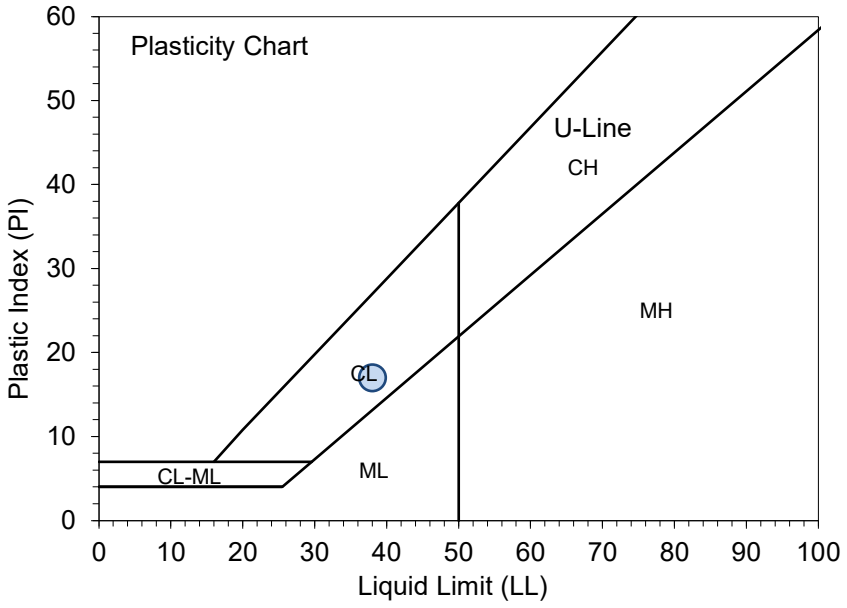
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	24	15
Wet Soil + Tare (g):	24.39	24.09	24.32
Dry Soil + Tare (g):	21.38	21.20	21.28
Moisture Loss (g):	3.01	2.89	3.04
Tare (g):	13.22	13.59	13.52
Dry Soil (g):	8.16	7.61	7.76
Moisture Content, w (%):	36.89	37.98	39.18
One-Point LL:		38	

Results

Liquid Limit, LL:	38
Plastic Limit, PL:	21
Plasticity Index, PI:	17





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 17.5-19 ft

Tested by: AT Date: 14-Nov-23

Reduced by: AT Location: -

Reviewed by: CML

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - lt bn clay
As-received water content(%):	13.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

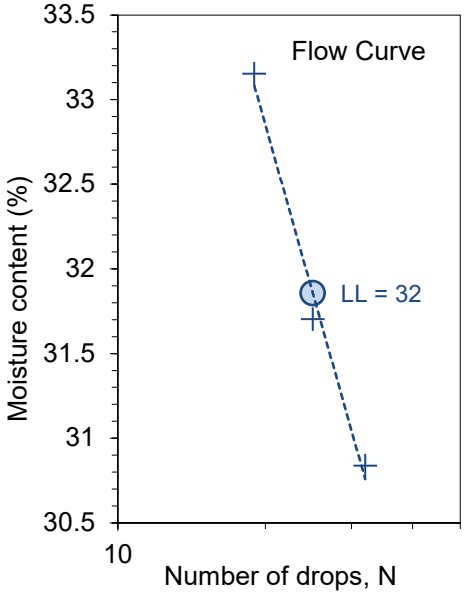
Determination No:	1	2
Wet Soil + Tare (g):	19.95	20.16
Dry Soil + Tare (g):	19.14	19.35
Moisture Loss (g):	0.81	0.81
Tare (g):	13.37	13.72
Dry Soil (g):	5.77	5.63
Moisture Content, w (%):	14.04	14.39

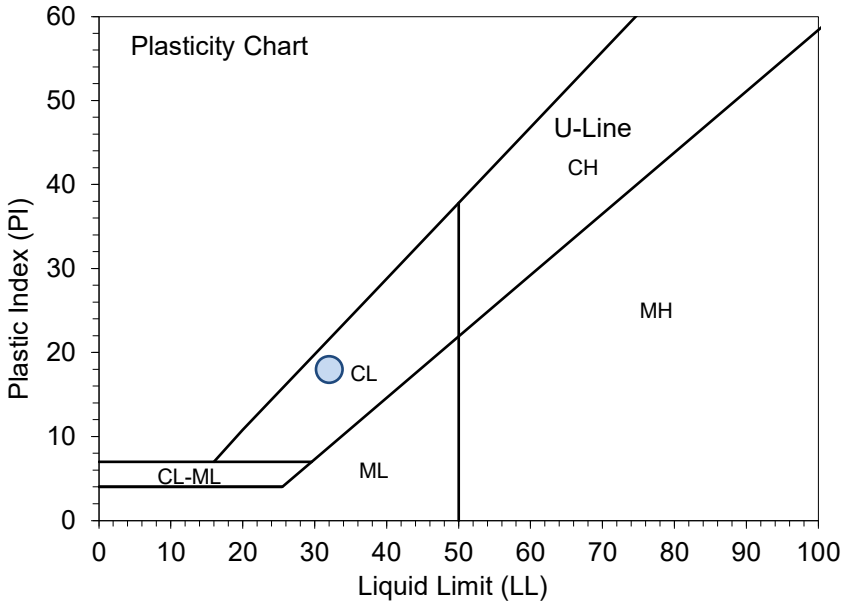
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	32	25	19
Wet Soil + Tare (g):	24.78	24.96	26.04
Dry Soil + Tare (g):	22.10	22.17	22.95
Moisture Loss (g):	2.68	2.79	3.09
Tare (g):	13.41	13.37	13.63
Dry Soil (g):	8.69	8.80	9.32
Moisture Content, w (%):	30.84	31.70	33.15
One-Point LL:		32	

Results

Liquid Limit, LL:	32
Plastic Limit, PL:	14
Plasticity Index, PI:	18





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-11

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Tested by: CML Date: 13-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn clay
As-received water content(%):	7.1	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	30
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

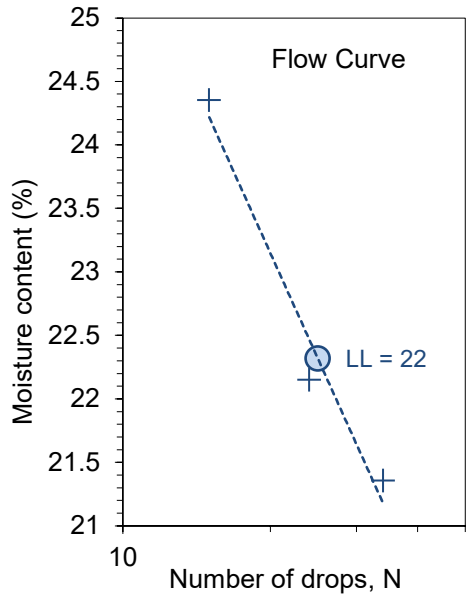
Determination No:	1	2
Wet Soil + Tare (g):	21.19	21.07
Dry Soil + Tare (g):	20.16	20.08
Moisture Loss (g):	1.03	0.99
Tare (g):	13.51	13.52
Dry Soil (g):	6.65	6.56
Moisture Content, w (%):	15.49	15.09

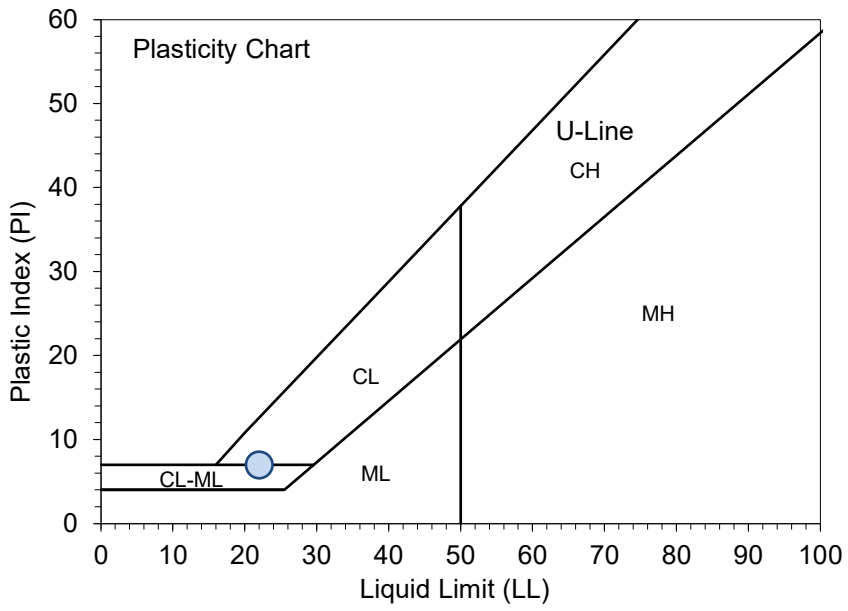
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	34	24	15
Wet Soil + Tare (g):	26.21	23.44	27.01
Dry Soil + Tare (g):	23.95	21.63	24.37
Moisture Loss (g):	2.26	1.81	2.64
Tare (g):	13.37	13.46	13.53
Dry Soil (g):	10.58	8.17	10.84
Moisture Content, w (%):	21.36	22.15	24.35
One-Point LL:		22	

Results

Liquid Limit, LL:	22
Plastic Limit, PL:	15
Plasticity Index, PI:	7





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 5-7 ft

Tested by: AT Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn clay
As-received water content(%):	10.2	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	15
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

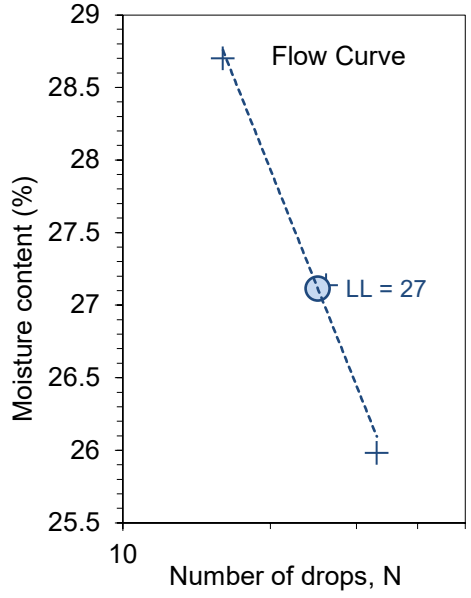
Determination No:	1	2
Wet Soil + Tare (g):	21.43	19.90
Dry Soil + Tare (g):	20.42	18.89
Moisture Loss (g):	1.01	1.01
Tare (g):	13.70	12.28
Dry Soil (g):	6.72	6.61
Moisture Content, w (%):	15.03	15.28

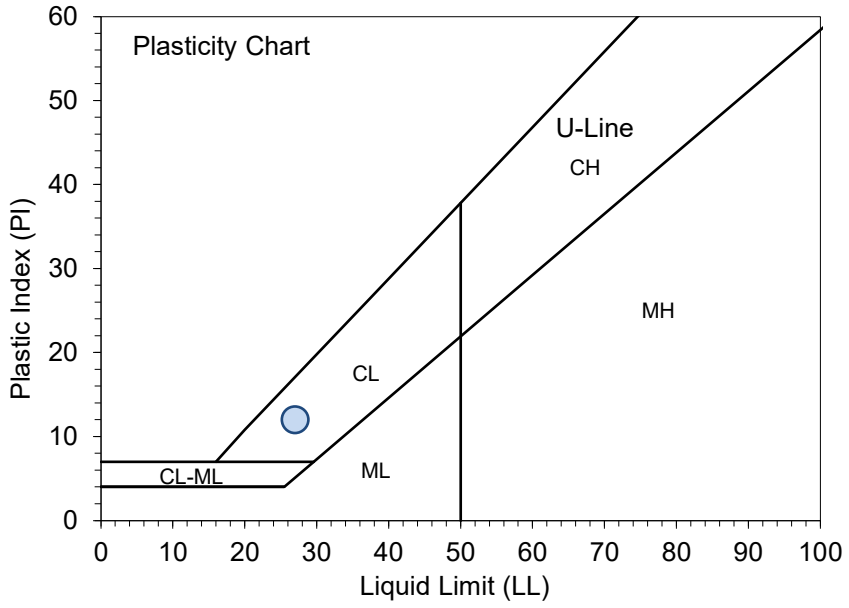
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	33	26	16
Wet Soil + Tare (g):	27.08	27.26	26.22
Dry Soil + Tare (g):	24.24	24.31	23.41
Moisture Loss (g):	2.84	2.95	2.81
Tare (g):	13.31	13.44	13.62
Dry Soil (g):	10.93	10.87	9.79
Moisture Content, w (%):	25.98	27.14	28.70
One-Point LL:		27	

Results

Liquid Limit, LL:	27
Plastic Limit, PL:	15
Plasticity Index, PI:	12





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 10-12 ft

Tested by: CML Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn silt
As-received water content(%):	12.8	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

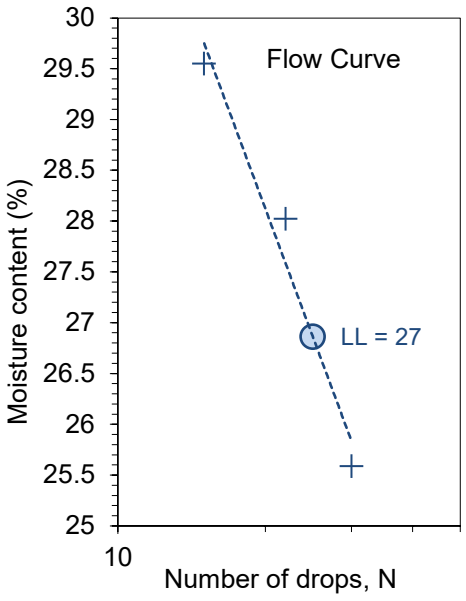
Determination No:	1	2
Wet Soil + Tare (g):	21.25	21.25
Dry Soil + Tare (g):	20.12	20.16
Moisture Loss (g):	1.13	1.09
Tare (g):	13.48	13.69
Dry Soil (g):	6.64	6.47
Moisture Content, w (%):	17.02	16.85

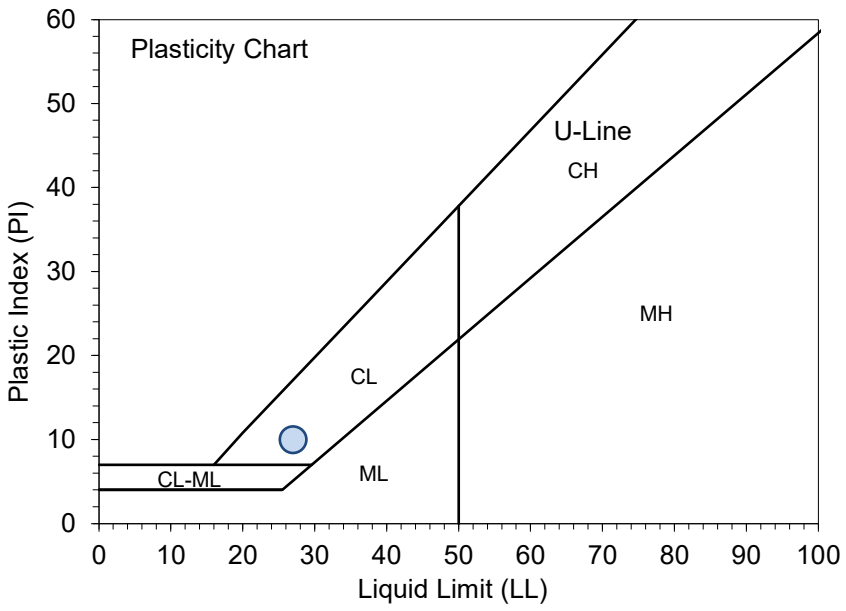
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	22	15
Wet Soil + Tare (g):	26.06	25.37	26.24
Dry Soil + Tare (g):	23.47	22.80	23.27
Moisture Loss (g):	2.59	2.57	2.97
Tare (g):	13.35	13.63	13.22
Dry Soil (g):	10.12	9.17	10.05
Moisture Content, w (%):	25.59	28.03	29.55
One-Point LL:	26	28	

Results

Liquid Limit, LL:	27
Plastic Limit, PL:	17
Plasticity Index, PI:	10





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 20-21 ft

Tested by: PJF Date: 14-Nov-23

Reduced by: DBW Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt ol bn - lt bn clay
As-received water content(%):	10.6	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

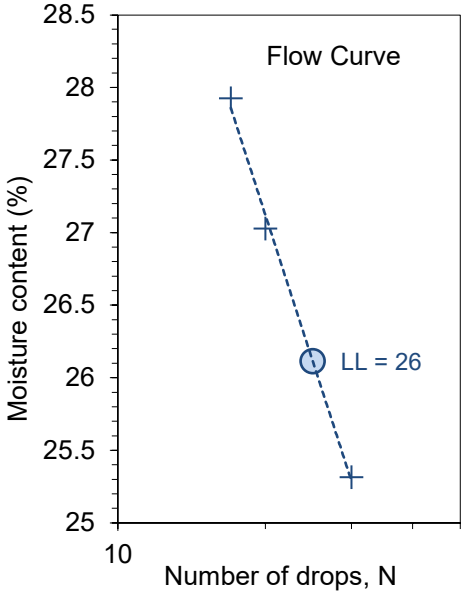
Determination No:	1	2
Wet Soil + Tare (g):	20.36	20.51
Dry Soil + Tare (g):	19.50	19.65
Moisture Loss (g):	0.86	0.86
Tare (g):	13.51	13.56
Dry Soil (g):	5.99	6.09
Moisture Content, w (%):	14.36	14.12

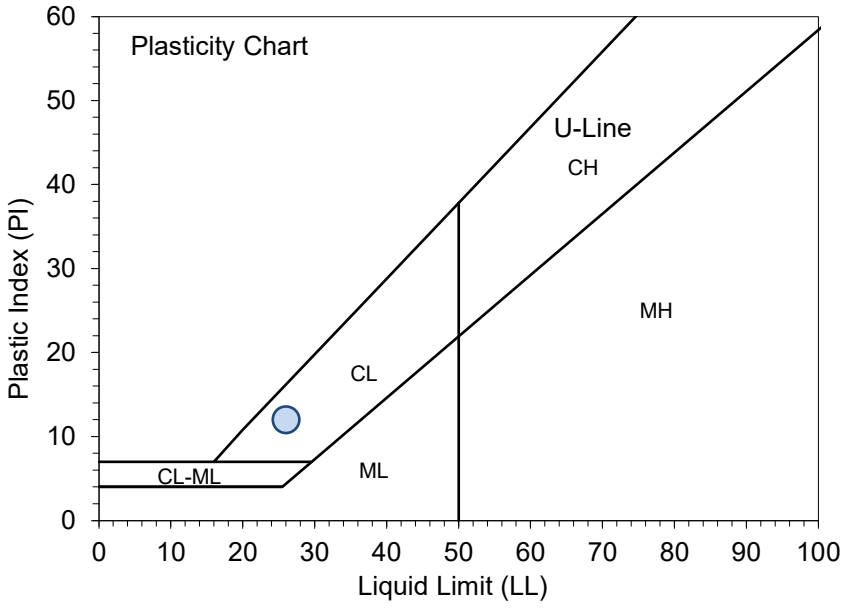
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	30	20	17
Wet Soil + Tare (g):	27.36	25.95	26.13
Dry Soil + Tare (g):	24.56	23.02	23.34
Moisture Loss (g):	2.80	2.93	2.79
Tare (g):	13.50	12.18	13.35
Dry Soil (g):	11.06	10.84	9.99
Moisture Content, w (%):	25.32	27.03	27.93
One-Point LL:	26	26	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	14
Plasticity Index, PI:	12





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Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 18-19 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: gy - bn clay

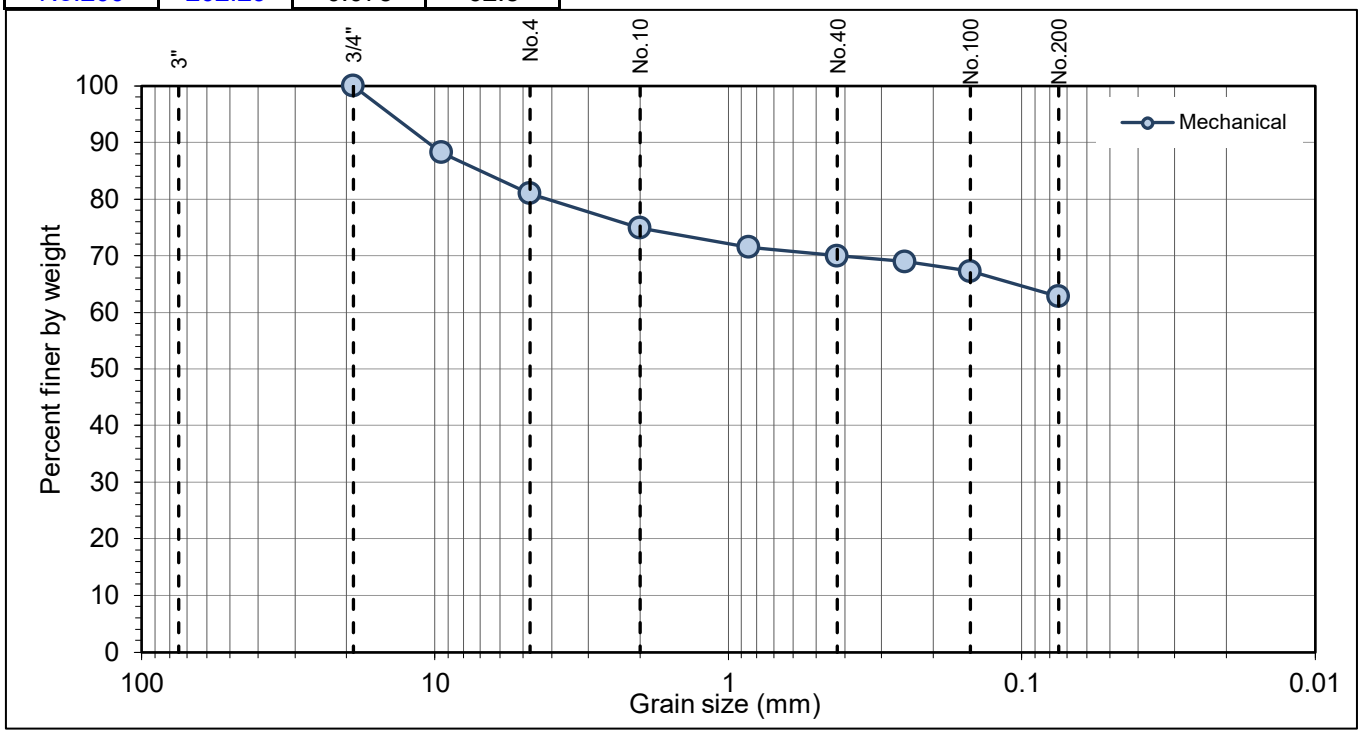
Reduced by: AT Comments: 1.5" rock not included in curve (274.56 g).

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	611.04	543.90
	-	
	611.04	543.90
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	806.82
Dry soil + tare (g):	-	739.68
Tare (g):	-	195.78
Moisture content (%):	0.0	12.3

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	63.83	9.5	88.3
No.4	103.44	4.75	81.0
No.10	136.66	2	74.9
No.20	154.83	0.85	71.5
No.40	163.20	0.425	70.0
No.60	168.87	0.25	69.0
No.100	177.88	0.15	67.3
No.200	202.29	0.075	62.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 27-29 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: bn - gy clay

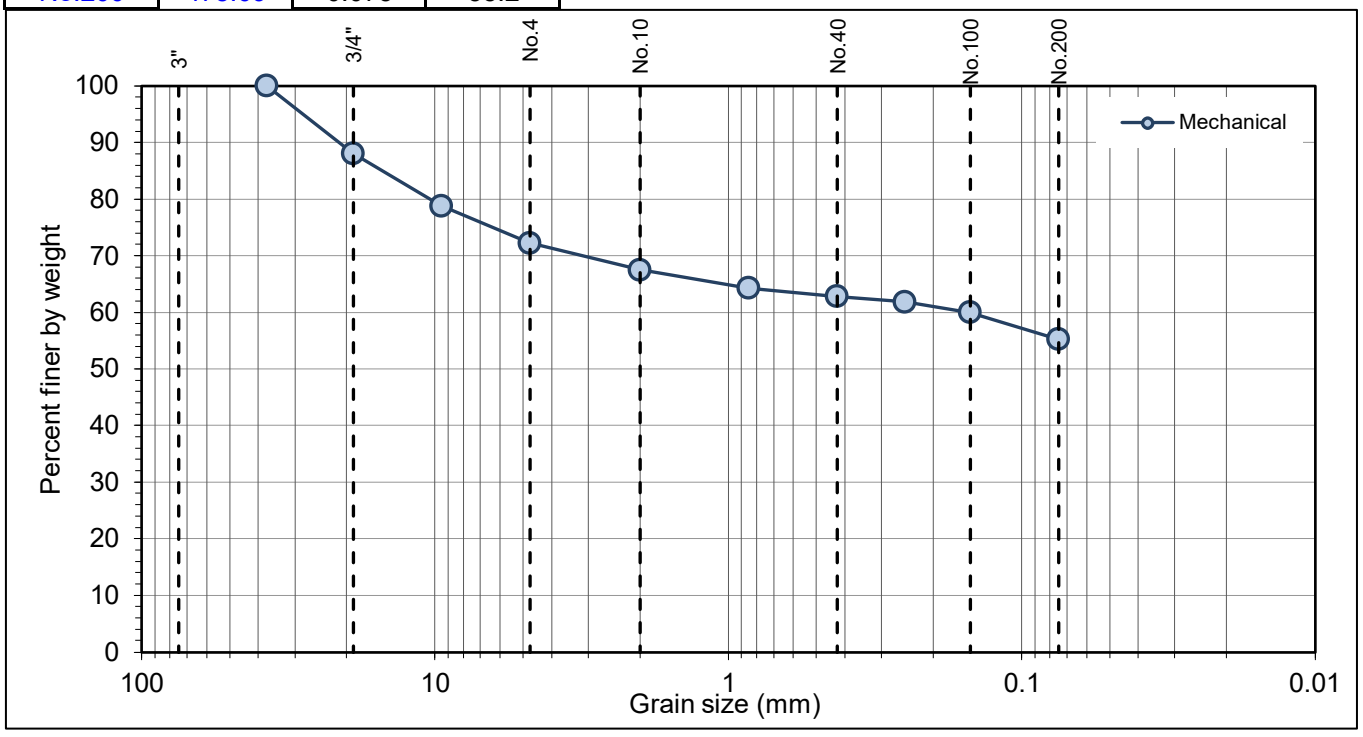
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1176.70	1060.40
	-	
	1176.70	1060.40
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1190.54
Dry soil + tare (g):	-	1074.24
Tare (g):	-	13.84
Moisture content (%):	0.0	11.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	126.52	19	88.1
3/8"	224.74	9.5	78.8
No.4	294.18	4.75	72.3
No.10	344.98	2	67.5
No.20	378.88	0.85	64.3
No.40	394.65	0.425	62.8
No.60	404.46	0.25	61.9
No.100	424.49	0.15	60.0
No.200	475.09	0.075	55.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 54.5-57 ft

Date: 16-Nov-23 Location: -

Tested by: DBW Lab soil description: gy - dk gy clay

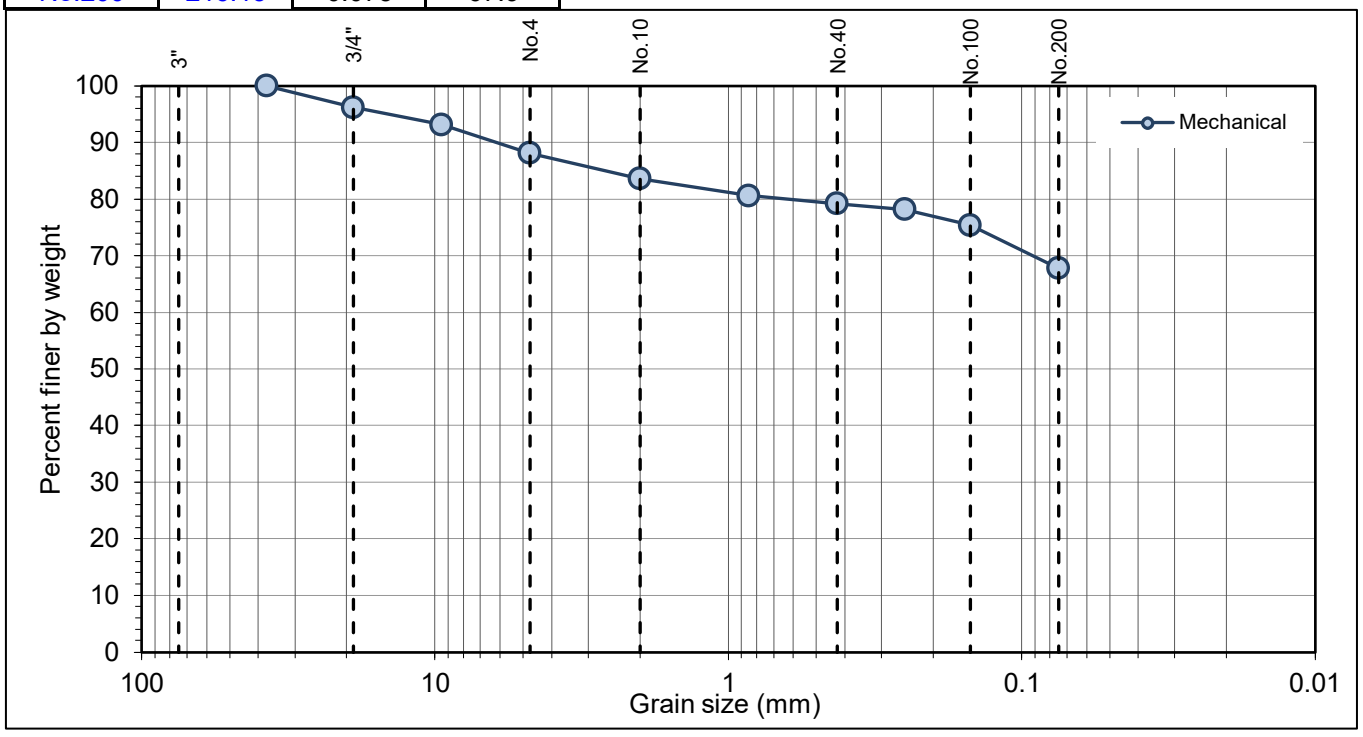
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	756.76	672.36
	-	
	756.76	672.36
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	953.45
Dry soil + tare (g):	-	869.05
Tare (g):	-	196.69
Moisture content (%):	0.0	12.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	25.43	19	96.2
3/8"	45.79	9.5	93.2
No.4	79.85	4.75	88.1
No.10	110.12	2	83.6
No.20	130.27	0.85	80.6
No.40	139.92	0.425	79.2
No.60	146.52	0.25	78.2
No.100	165.51	0.15	75.4
No.200	216.13	0.075	67.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 67-69 ft

Date: 16-Nov-23 Location: -

Tested by: DBW Lab soil description: dk gy - lt bn clay

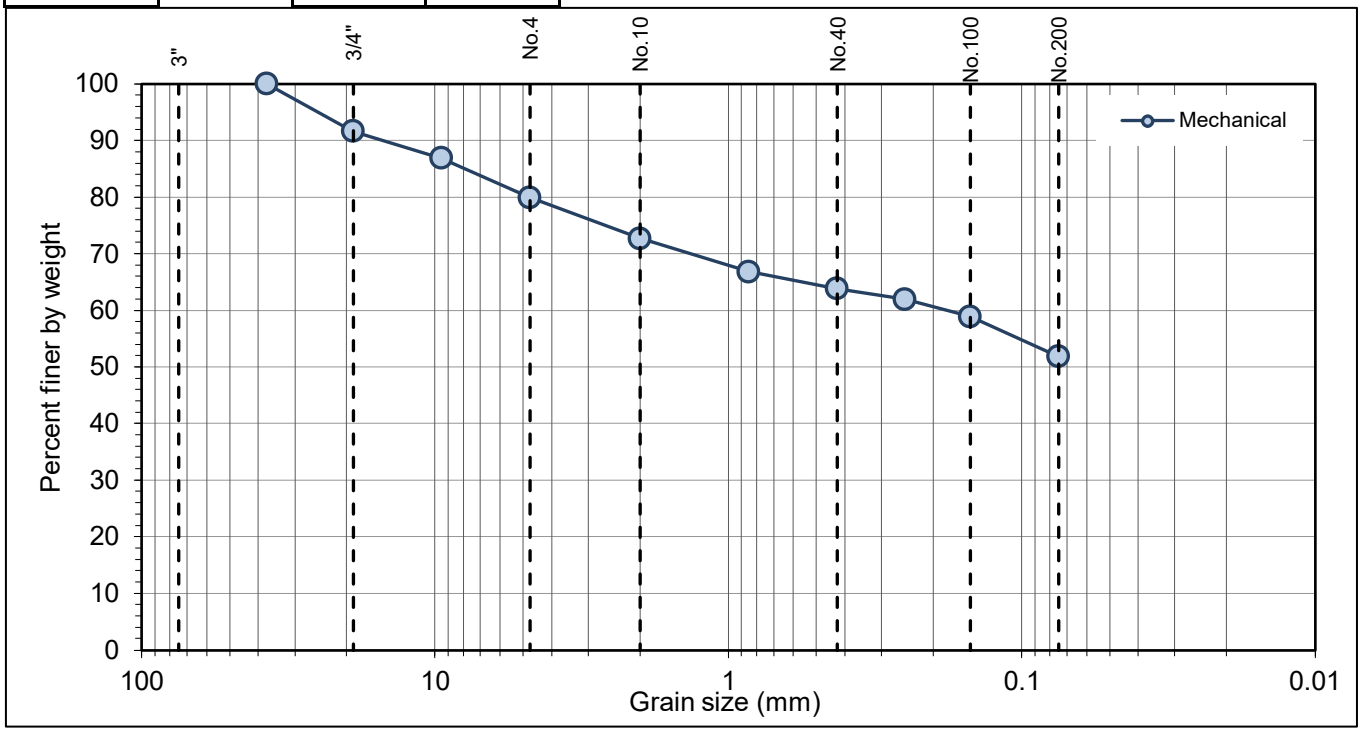
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	651.92	592.70
	-	
	651.92	592.70
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	847.34
Dry soil + tare (g):	-	788.12
Tare (g):	-	195.42
Moisture content (%):	0.0	10.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	49.64	19	91.6
3/8"	77.83	9.5	86.9
No.4	119.04	4.75	79.9
No.10	161.80	2	72.7
No.20	196.75	0.85	66.8
No.40	214.54	0.425	63.8
No.60	225.55	0.25	61.9
No.100	243.72	0.15	58.9
No.200	285.30	0.075	51.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 72.5-75 ft

Date: 16-Nov-23 Location: -

Tested by: DBW Lab soil description: gy - dk gy clay

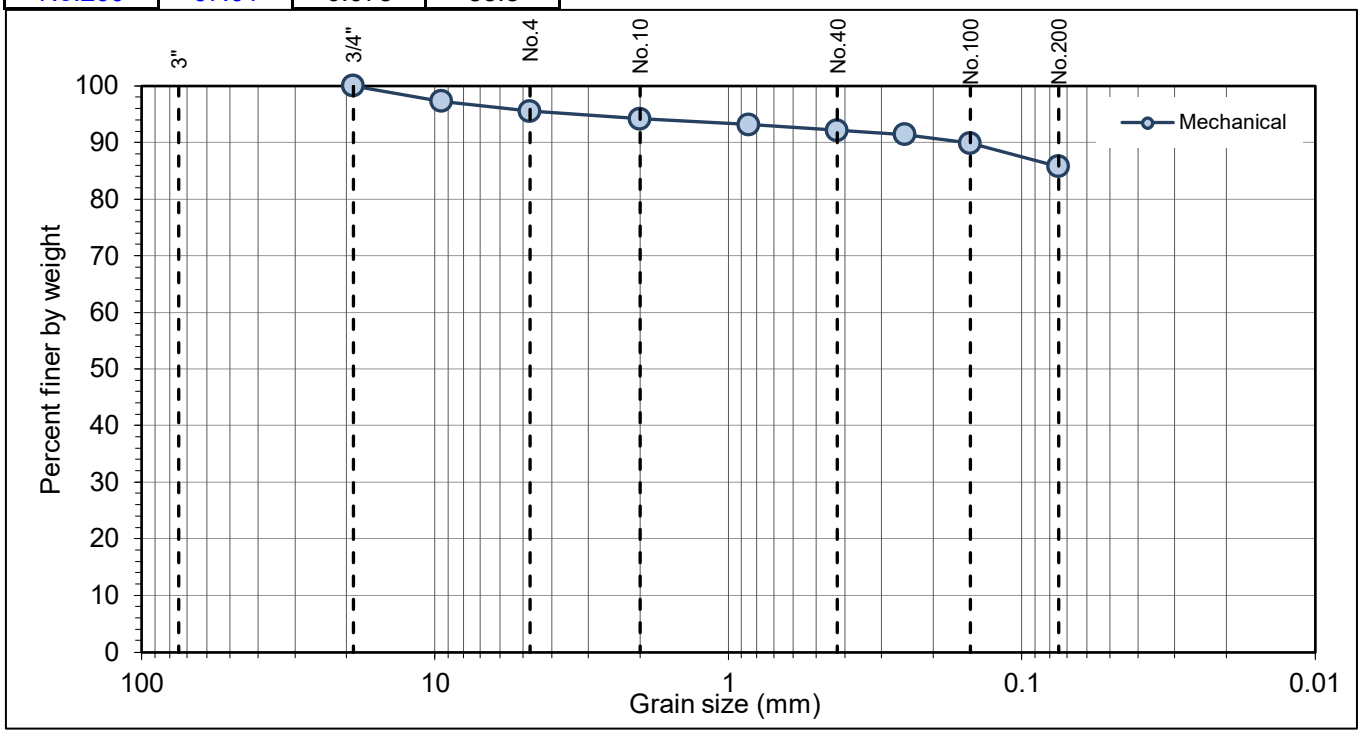
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	570.23	472.61
	-	
	570.23	472.61
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	688.39
Dry soil + tare (g):	-	590.77
Tare (g):	-	118.16
Moisture content (%):	0.0	20.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	12.74	9.5	97.3
No.4	21.18	4.75	95.5
No.10	27.46	2	94.2
No.20	32.38	0.85	93.1
No.40	36.99	0.425	92.2
No.60	40.67	0.25	91.4
No.100	47.81	0.15	89.9
No.200	67.01	0.075	85.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 14.5-16 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: bn - ol bn clay

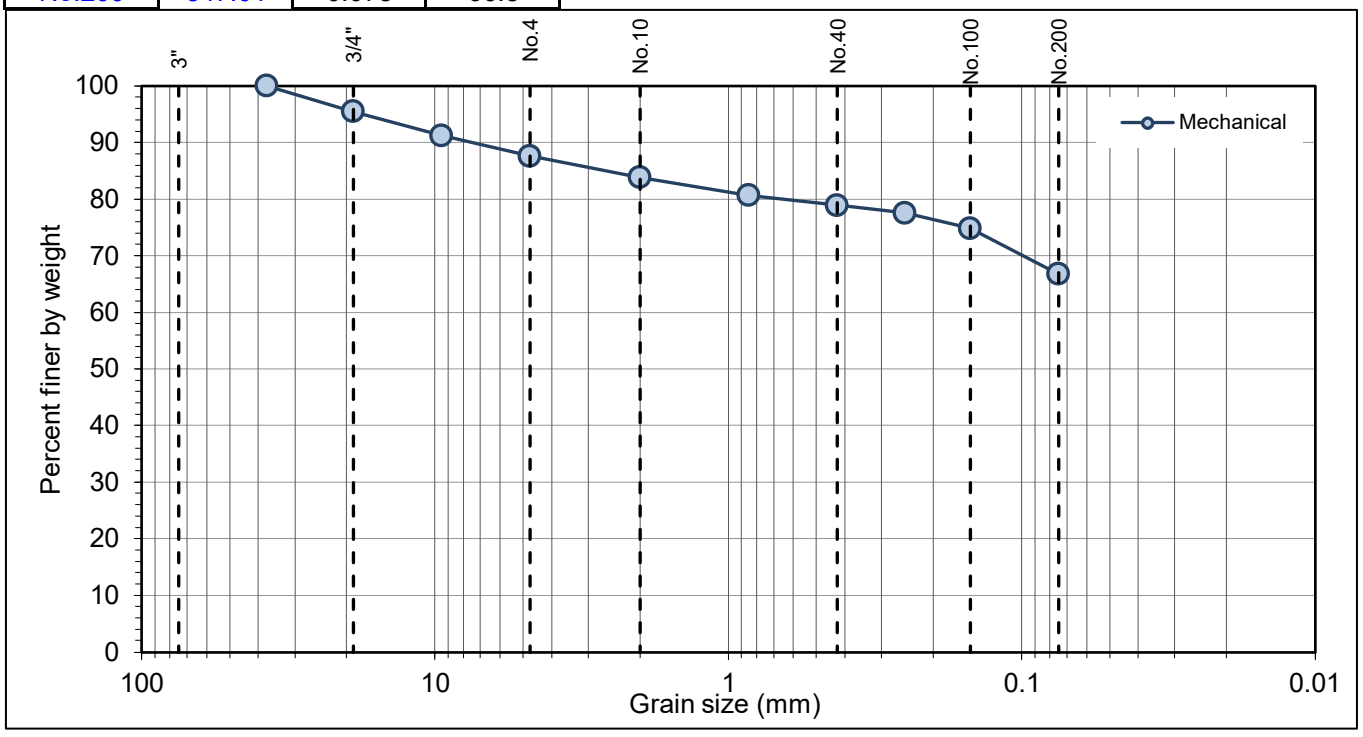
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1841.90	1646.32
	-	
	1841.90	1646.32
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	2264.09
Dry soil + tare (g):	-	2068.51
Tare (g):	-	422.19
Moisture content (%):	0.0	11.9

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	74.19	19	95.5
3/8"	144.60	9.5	91.2
No.4	203.84	4.75	87.6
No.10	266.51	2	83.8
No.20	318.13	0.85	80.7
No.40	347.49	0.425	78.9
No.60	369.50	0.25	77.6
No.100	413.96	0.15	74.9
No.200	547.01	0.075	66.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: bn - ol bn clay

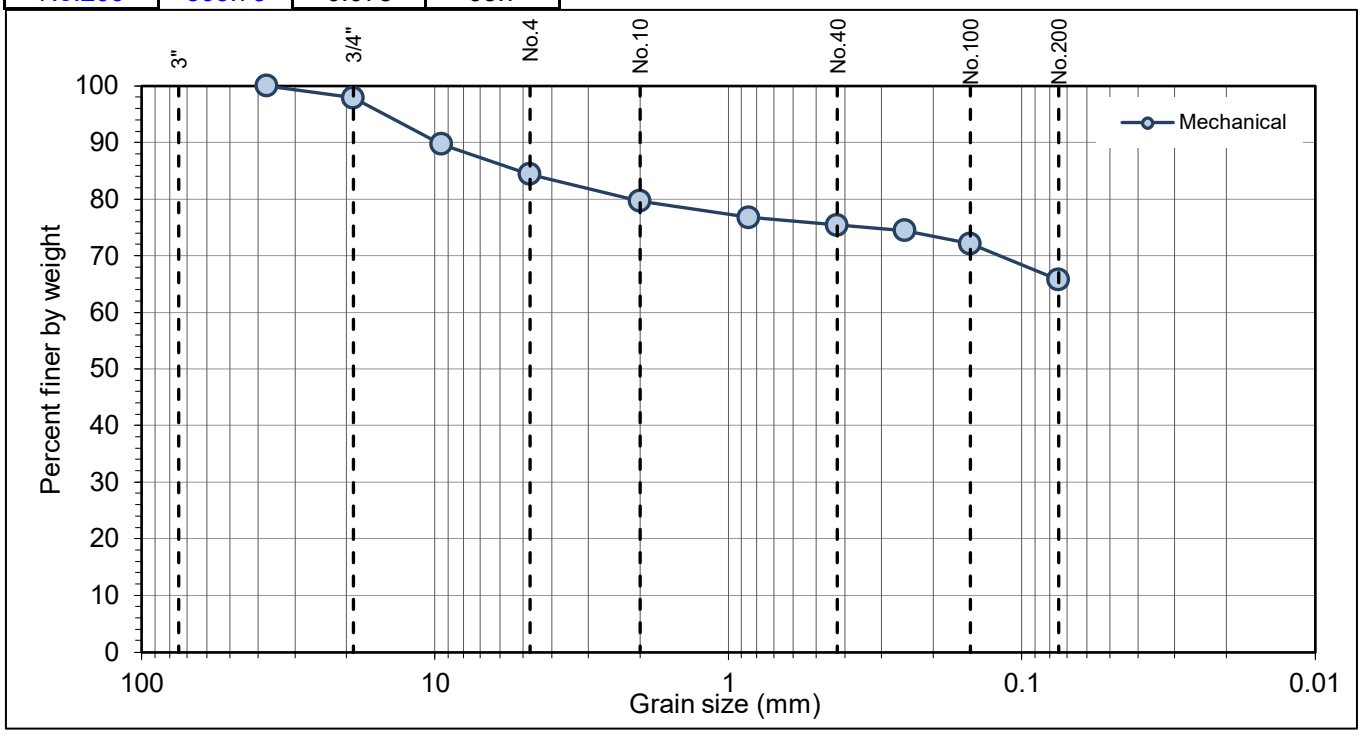
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1666.16	1470.26
	-	
	1666.16	1470.26
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	2104.69
Dry soil + tare (g):	-	1908.79
Tare (g):	-	438.53
Moisture content (%):	0.0	13.3

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	30.28	19	97.9
3/8"	150.96	9.5	89.7
No.4	229.44	4.75	84.4
No.10	298.96	2	79.7
No.20	341.90	0.85	76.7
No.40	361.85	0.425	75.4
No.60	375.86	0.25	74.4
No.100	409.90	0.15	72.1
No.200	503.73	0.075	65.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 32-35 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: bn - dk yl bn clay

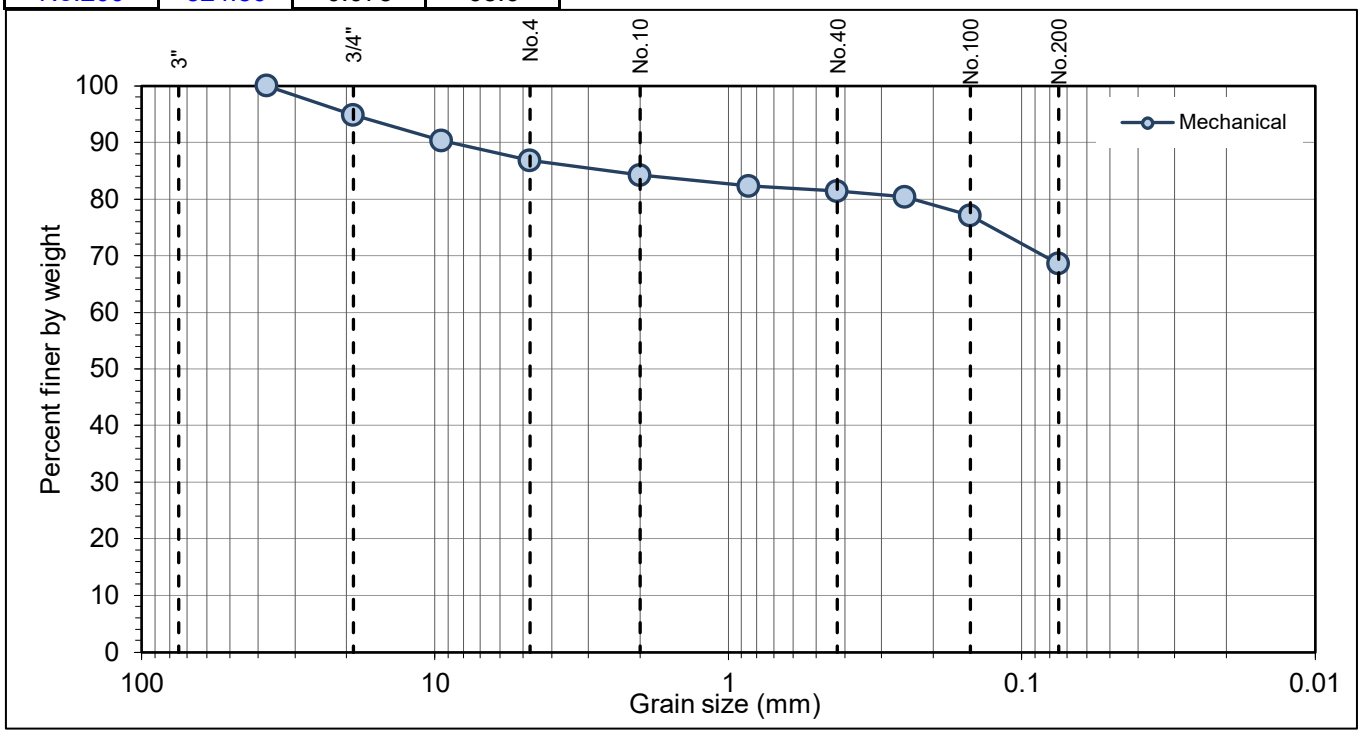
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1913.95	1670.91
	-	
	1913.95	1670.91
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	2453.36
Dry soil + tare (g):	-	2210.32
Tare (g):	-	539.41
Moisture content (%):	0.0	14.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	85.48	19	94.9
3/8"	161.21	9.5	90.4
No.4	219.81	4.75	86.8
No.10	263.64	2	84.2
No.20	295.15	0.85	82.3
No.40	311.17	0.425	81.4
No.60	327.50	0.25	80.4
No.100	382.33	0.15	77.1
No.200	524.86	0.075	68.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 38.5-40 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: lt ol bn - ol bn clay

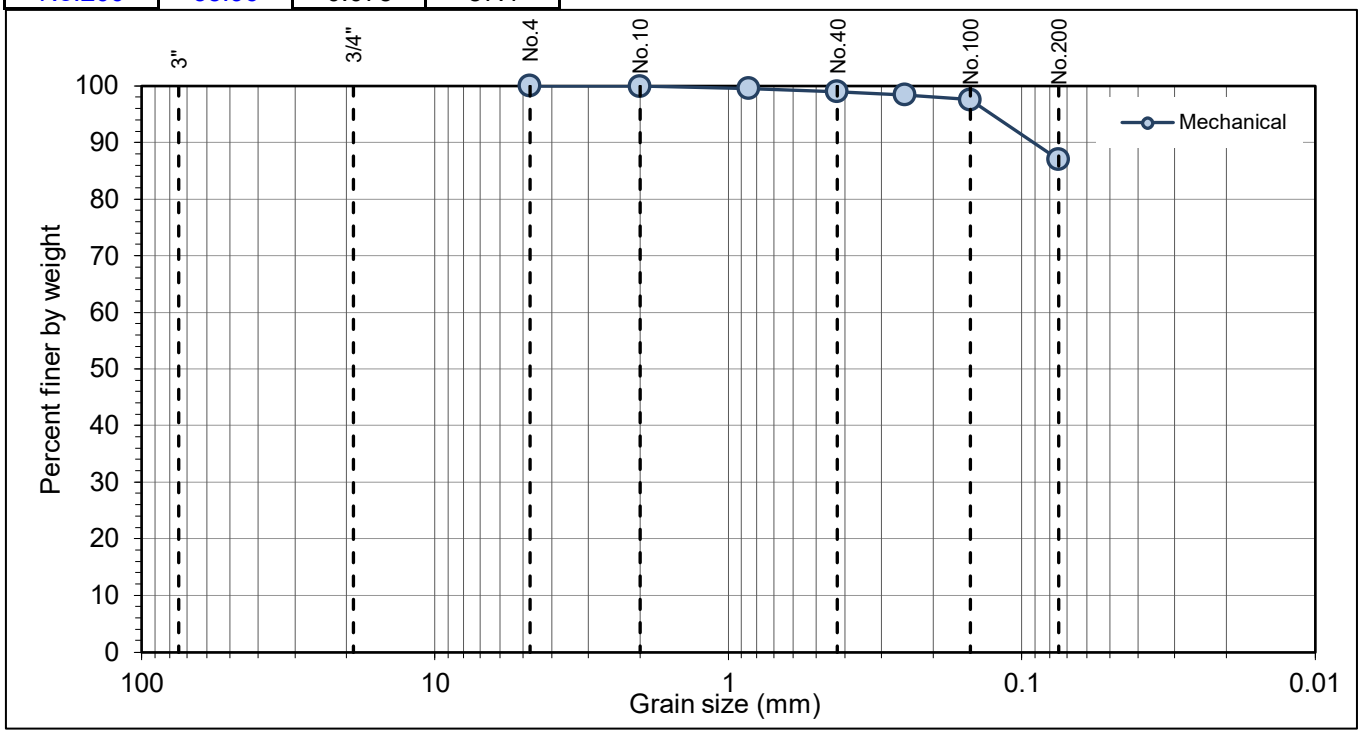
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	321.05	278.08
	-	
	321.05	278.08
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	448.30
Dry soil + tare (g):	-	405.33
Tare (g):	-	127.25
Moisture content (%):	0.0	15.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	-
No.4	-	4.75	100.0
No.10	0.15	2	99.9
No.20	1.17	0.85	99.6
No.40	2.85	0.425	99.0
No.60	4.46	0.25	98.4
No.100	6.75	0.15	97.6
No.200	35.96	0.075	87.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 52-55 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: gy - ol bn clay

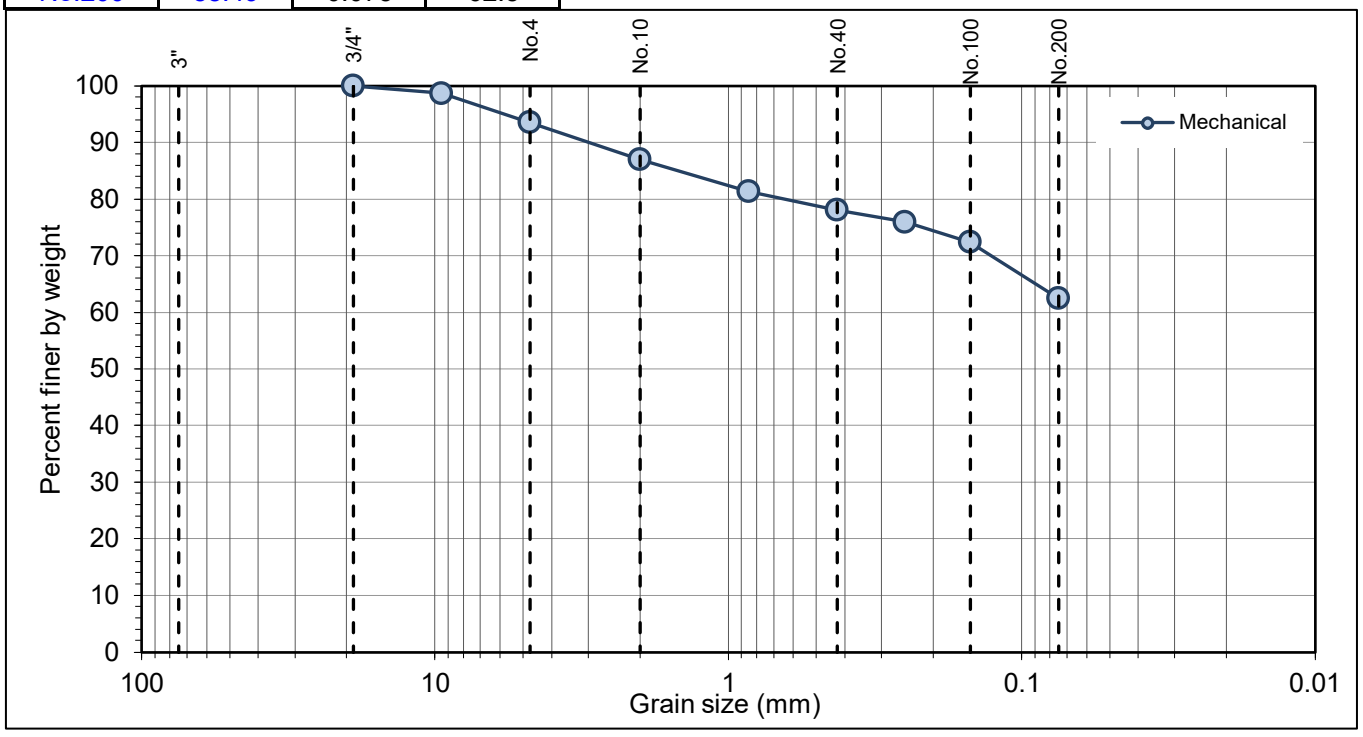
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	262.98	235.69
	-	
	262.98	235.69
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	460.49
Dry soil + tare (g):	-	433.20
Tare (g):	-	197.51
Moisture content (%):	0.0	11.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	3.09	9.5	98.7
No.4	15.18	4.75	93.6
No.10	30.60	2	87.0
No.20	44.01	0.85	81.3
No.40	51.69	0.425	78.1
No.60	56.57	0.25	76.0
No.100	65.04	0.15	72.4
No.200	88.49	0.075	62.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 60-62 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: lt bn - bn clay

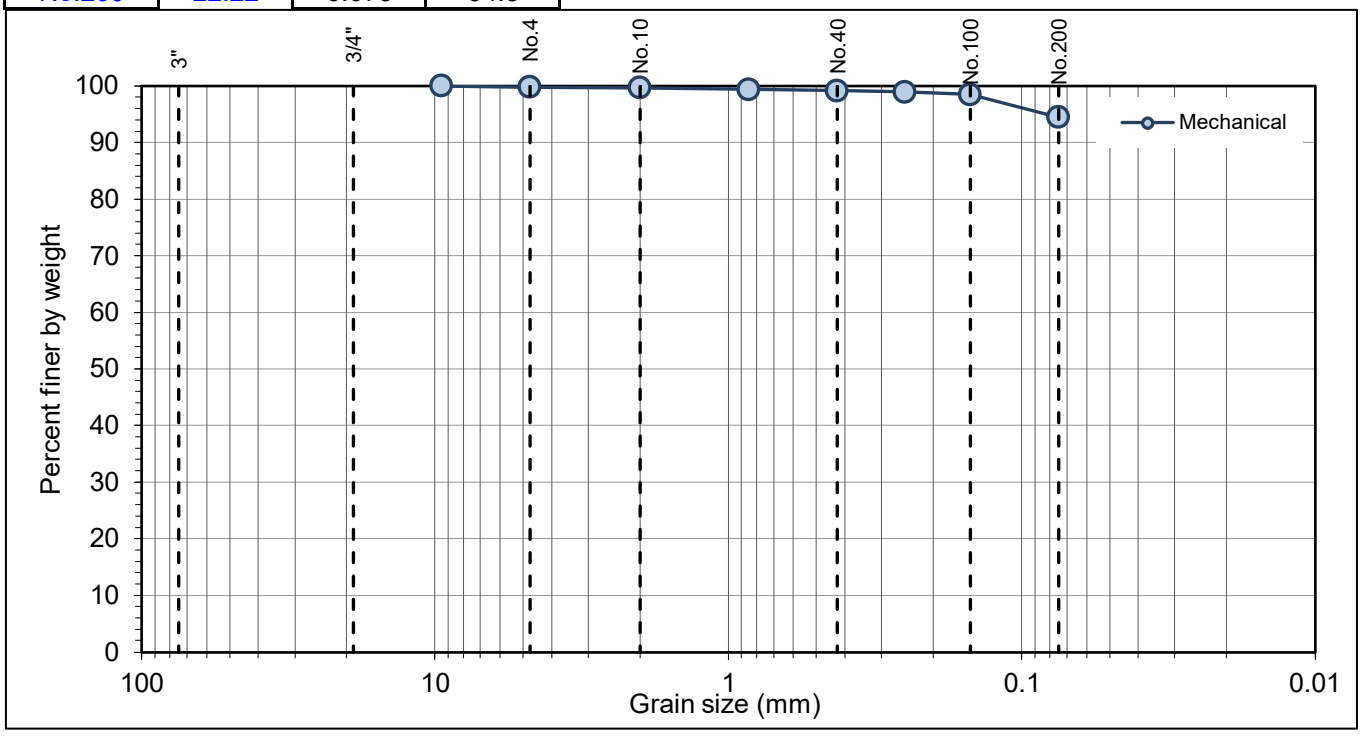
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	460.33	404.88
	-	
	460.33	404.88
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	656.13
Dry soil + tare (g):	-	600.68
Tare (g):	-	195.80
Moisture content (%):	0.0	13.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	100.0
No.4	0.93	4.75	99.8
No.10	1.29	2	99.7
No.20	2.54	0.85	99.4
No.40	3.42	0.425	99.2
No.60	4.29	0.25	98.9
No.100	6.05	0.15	98.5
No.200	22.22	0.075	94.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 64.5-67 ft

Date: 16-Nov-23 Location: -

Tested by: MGS Lab soil description: lt ol bn - ol bn clay

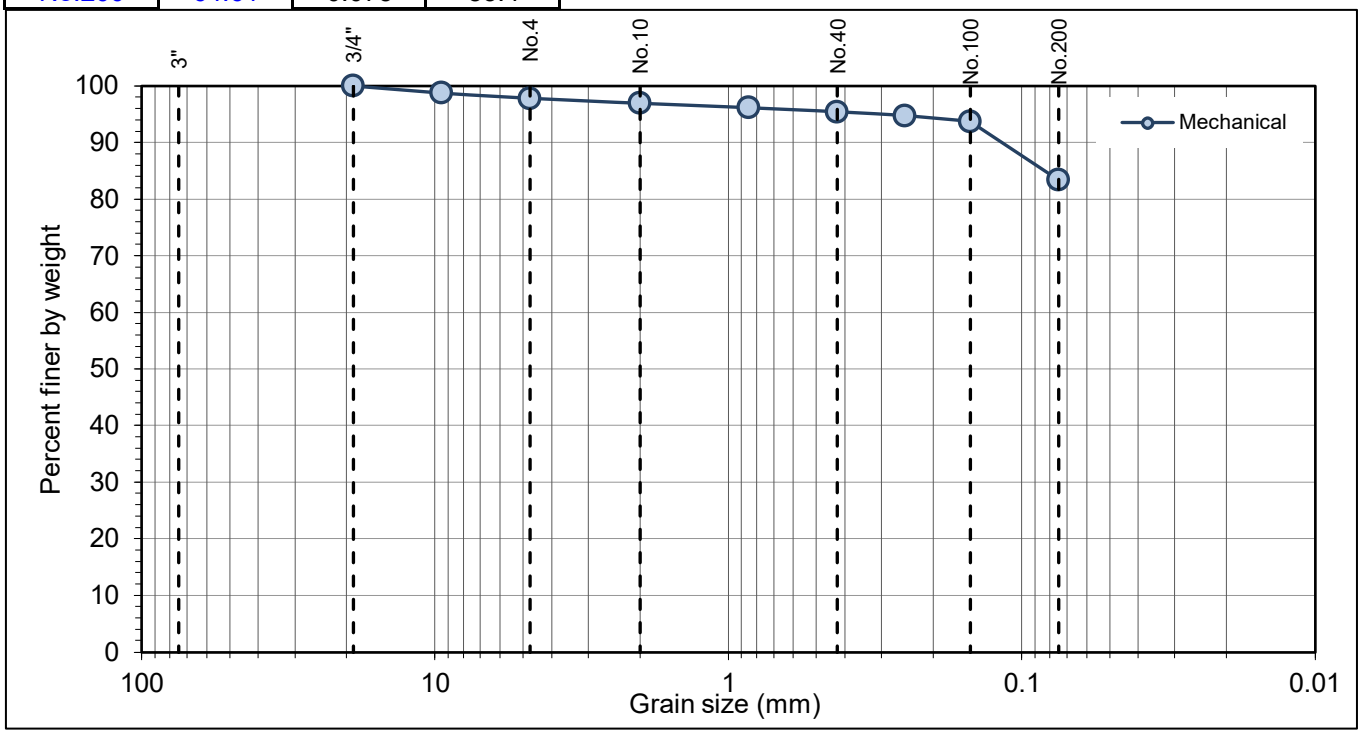
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	439.79	389.75
	-	
	439.79	389.75
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	566.47
Dry soil + tare (g):	-	516.43
Tare (g):	-	126.68
Moisture content (%):	0.0	12.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	4.88	9.5	98.7
No.4	8.54	4.75	97.8
No.10	11.97	2	96.9
No.20	14.92	0.85	96.2
No.40	17.72	0.425	95.5
No.60	20.42	0.25	94.8
No.100	24.38	0.15	93.7
No.200	64.61	0.075	83.4



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 4.5-7 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: lt bn - bn clay

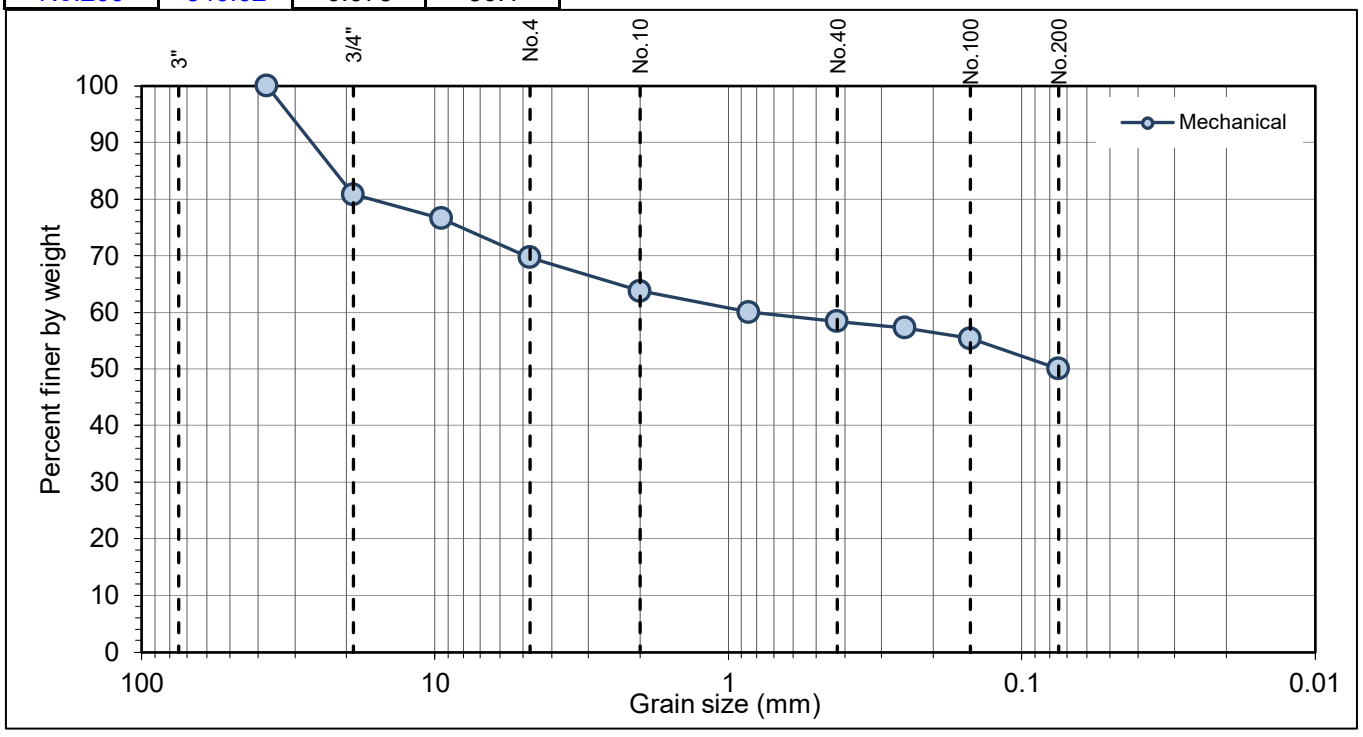
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1190.05	1081.24
	-	
	1190.05	1081.24
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1630.20
Dry soil + tare (g):	-	1521.39
Tare (g):	-	440.15
Moisture content (%):	0.0	10.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	207.44	19	80.8
3/8"	253.12	9.5	76.6
No.4	327.87	4.75	69.7
No.10	391.94	2	63.8
No.20	432.35	0.85	60.0
No.40	450.20	0.425	58.4
No.60	461.91	0.25	57.3
No.100	482.07	0.15	55.4
No.200	540.02	0.075	50.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: pl ol bn - bn clay

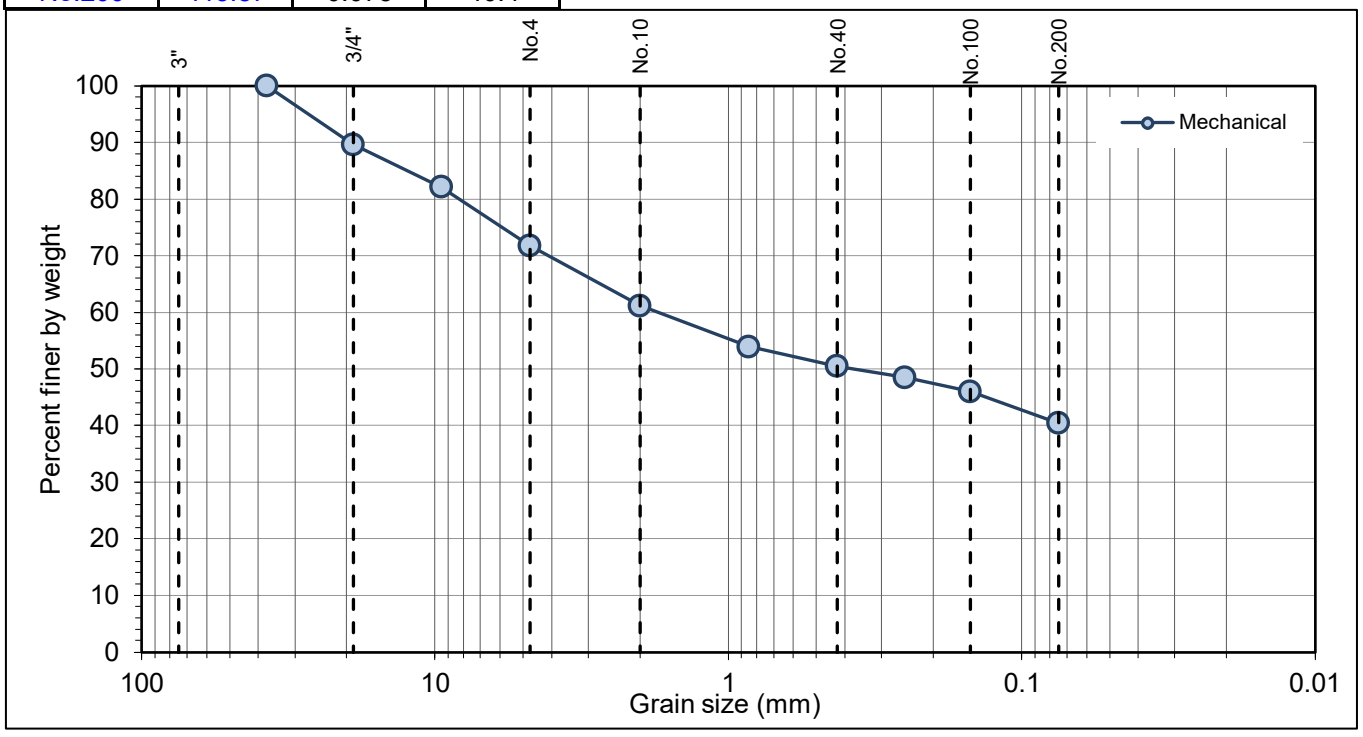
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	753.04	694.60
	-	
	753.04	694.60
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	872.07
Dry soil + tare (g):	-	813.63
Tare (g):	-	119.03
Moisture content (%):	0.0	8.4

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	71.73	19	89.7
3/8"	124.07	9.5	82.1
No.4	195.76	4.75	71.8
No.10	269.78	2	61.2
No.20	320.16	0.85	53.9
No.40	343.81	0.425	50.5
No.60	357.58	0.25	48.5
No.100	374.88	0.15	46.0
No.200	413.87	0.075	40.4



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - bn clay

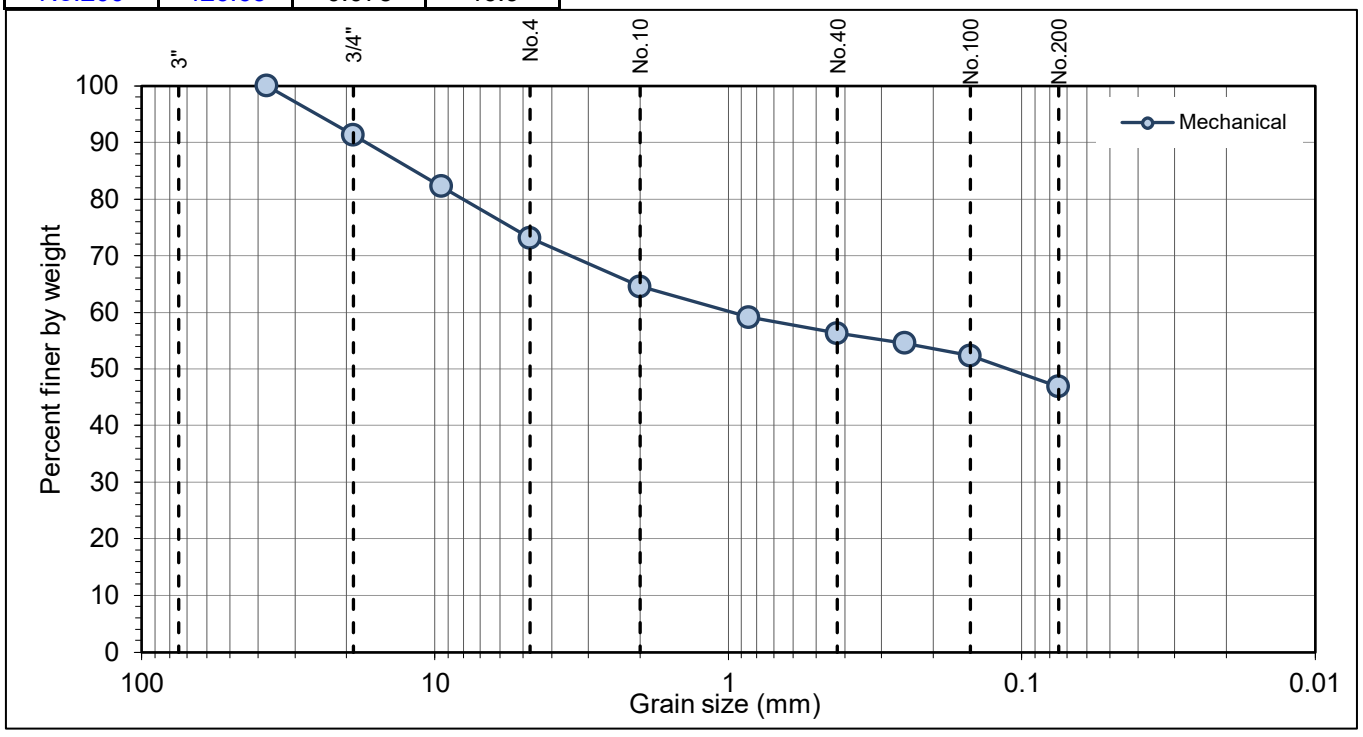
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	902.23	802.85
	-	
	902.23	802.85
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1046.88
Dry soil + tare (g):	-	947.50
Tare (g):	-	144.65
Moisture content (%):	0.0	12.4

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	69.23	19	91.4
3/8"	142.35	9.5	82.3
No.4	215.38	4.75	73.2
No.10	284.76	2	64.5
No.20	328.36	0.85	59.1
No.40	350.76	0.425	56.3
No.60	364.76	0.25	54.6
No.100	382.68	0.15	52.3
No.200	426.63	0.075	46.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-03

No: 23072 (23-1725) **Depth:** 30-33 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: bn - dk bn clay

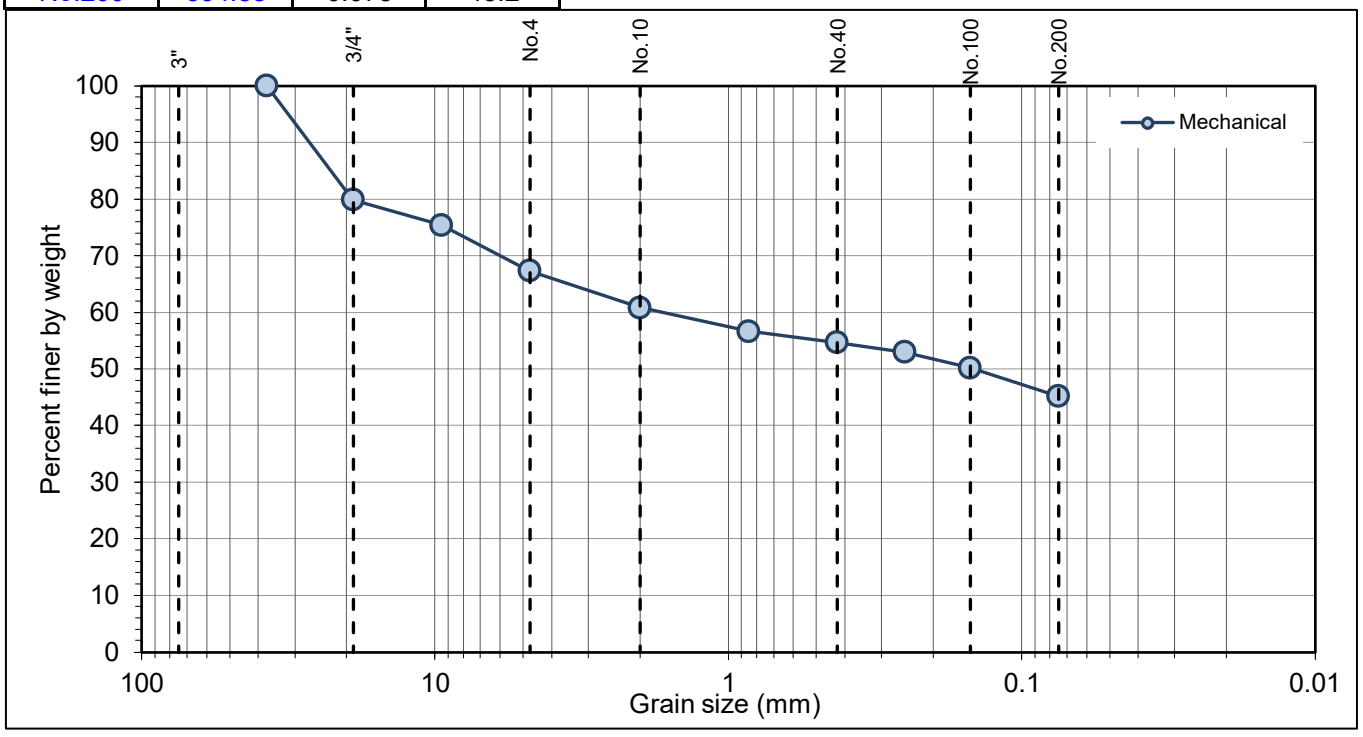
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	798.88	720.83
	-	-
	798.88	720.83
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	943.07
Dry soil + tare (g):	-	865.02
Tare (g):	-	144.19
Moisture content (%):	0.0	10.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	144.91	19	79.9
3/8"	177.22	9.5	75.4
No.4	235.48	4.75	67.3
No.10	282.48	2	60.8
No.20	312.47	0.85	56.7
No.40	326.73	0.425	54.7
No.60	339.06	0.25	53.0
No.100	359.09	0.15	50.2
No.200	394.88	0.075	45.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 7-10 ft

Date: 13-Nov-23 Location: -

Tested by: MGS Lab soil description: lt ol bn - bn clay

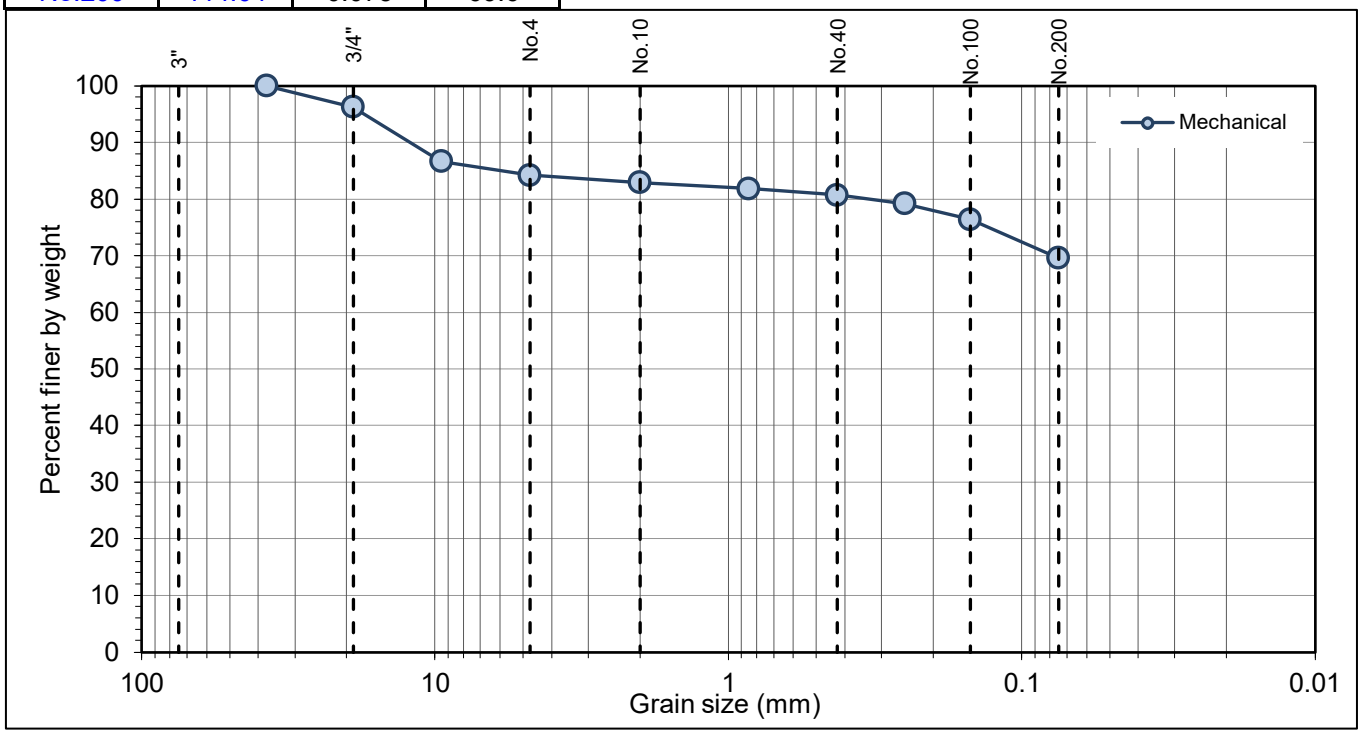
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	457.24	375.28
	-	
	457.24	375.28
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	653.16
Dry soil + tare (g):	-	571.20
Tare (g):	-	195.92
Moisture content (%):	0.0	21.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	13.96	19	96.3
3/8"	50.13	9.5	86.6
No.4	59.19	4.75	84.2
No.10	64.15	2	82.9
No.20	68.10	0.85	81.9
No.40	72.24	0.425	80.8
No.60	78.10	0.25	79.2
No.100	88.55	0.15	76.4
No.200	114.04	0.075	69.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 14.5-17 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: pl ol bn - lt bn silt

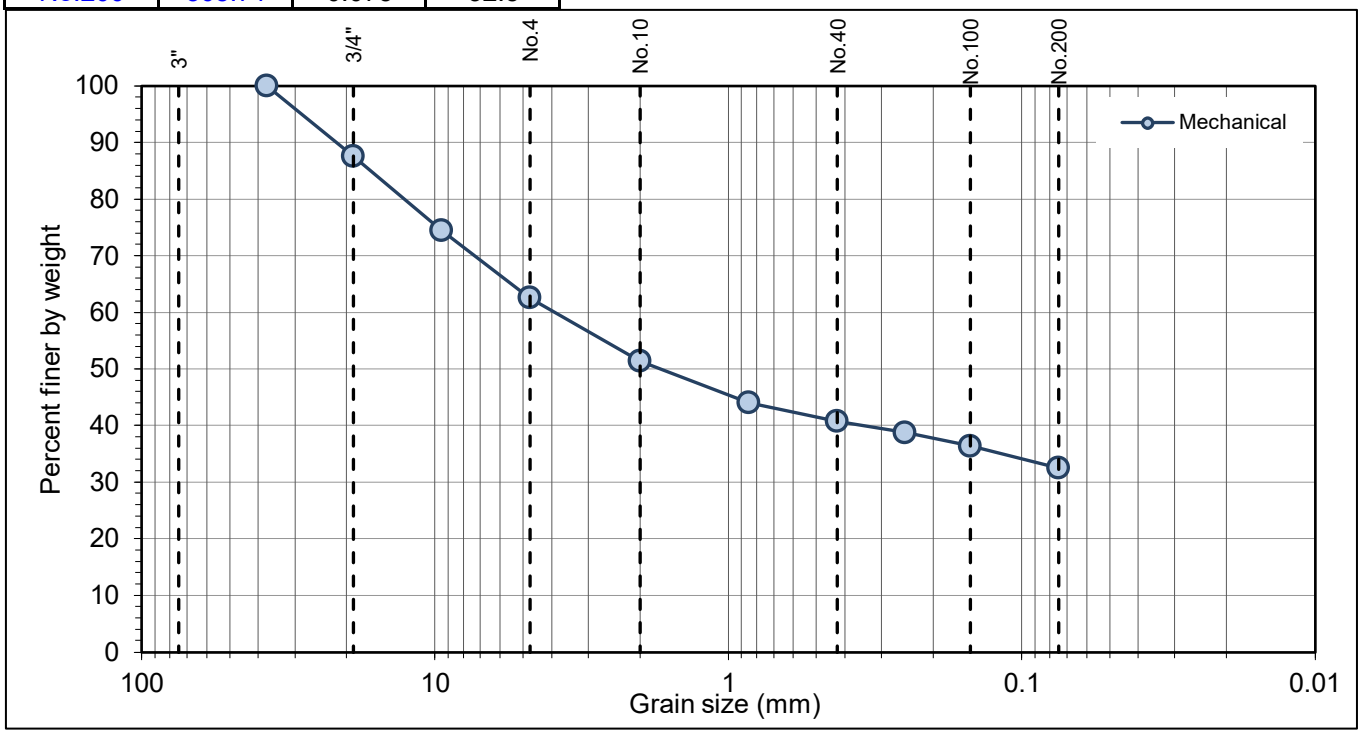
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	483.56	452.93
	-	
	483.56	452.93
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	601.88
Dry soil + tare (g):	-	571.25
Tare (g):	-	118.32
Moisture content (%):	0.0	6.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	56.10	19	87.6
3/8"	115.44	9.5	74.5
No.4	169.54	4.75	62.6
No.10	220.10	2	51.4
No.20	253.53	0.85	44.0
No.40	268.38	0.425	40.7
No.60	277.44	0.25	38.7
No.100	288.21	0.15	36.4
No.200	305.71	0.075	32.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: ol bn - bn silt

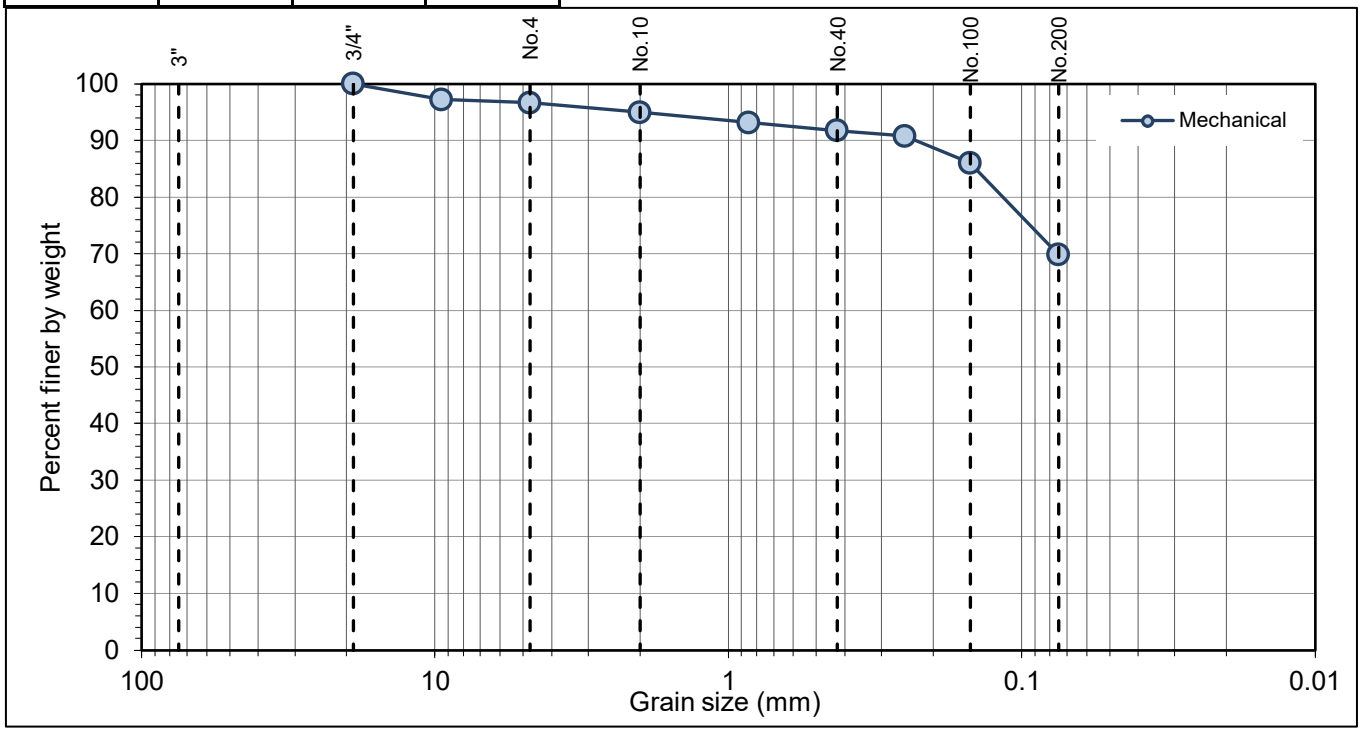
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	434.54	373.10
		-
	434.54	373.10
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	555.20
Dry soil + tare (g):	-	493.76
Tare (g):	-	120.66
Moisture content (%):	0.0	16.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	10.30	9.5	97.2
No.4	12.34	4.75	96.7
No.10	18.72	2	95.0
No.20	25.54	0.85	93.2
No.40	30.76	0.425	91.8
No.60	34.37	0.25	90.8
No.100	52.13	0.15	86.0
No.200	112.39	0.075	69.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-04

No: 23072 (23-1725) **Depth:** 30-33 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: lt bn - bn clay

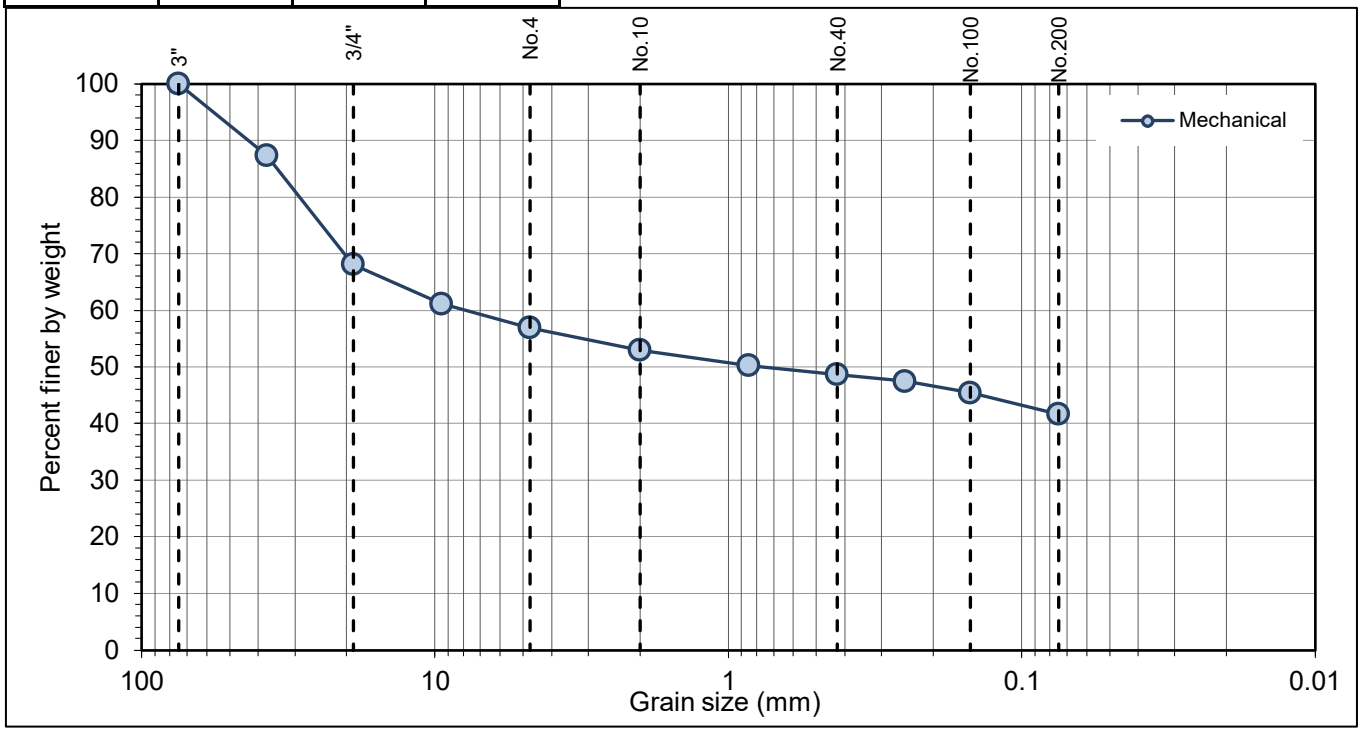
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1120.71	1018.98
	-	
	1120.71	1018.98
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1542.36
Dry soil + tare (g):	-	1440.63
Tare (g):	-	421.65
Moisture content (%):	0.0	10.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	100.0
1.5"	128.32	37.5	87.4
3/4"	325.14	19	68.1
3/8"	396.01	9.5	61.1
No.4	438.75	4.75	56.9
No.10	479.25	2	53.0
No.20	507.10	0.85	50.2
No.40	523.12	0.425	48.7
No.60	535.09	0.25	47.5
No.100	555.98	0.15	45.4
No.200	594.76	0.075	41.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Date: 14-Nov-23 Location: -

Tested by: MGS Lab soil description: ol bn - lt bn clay

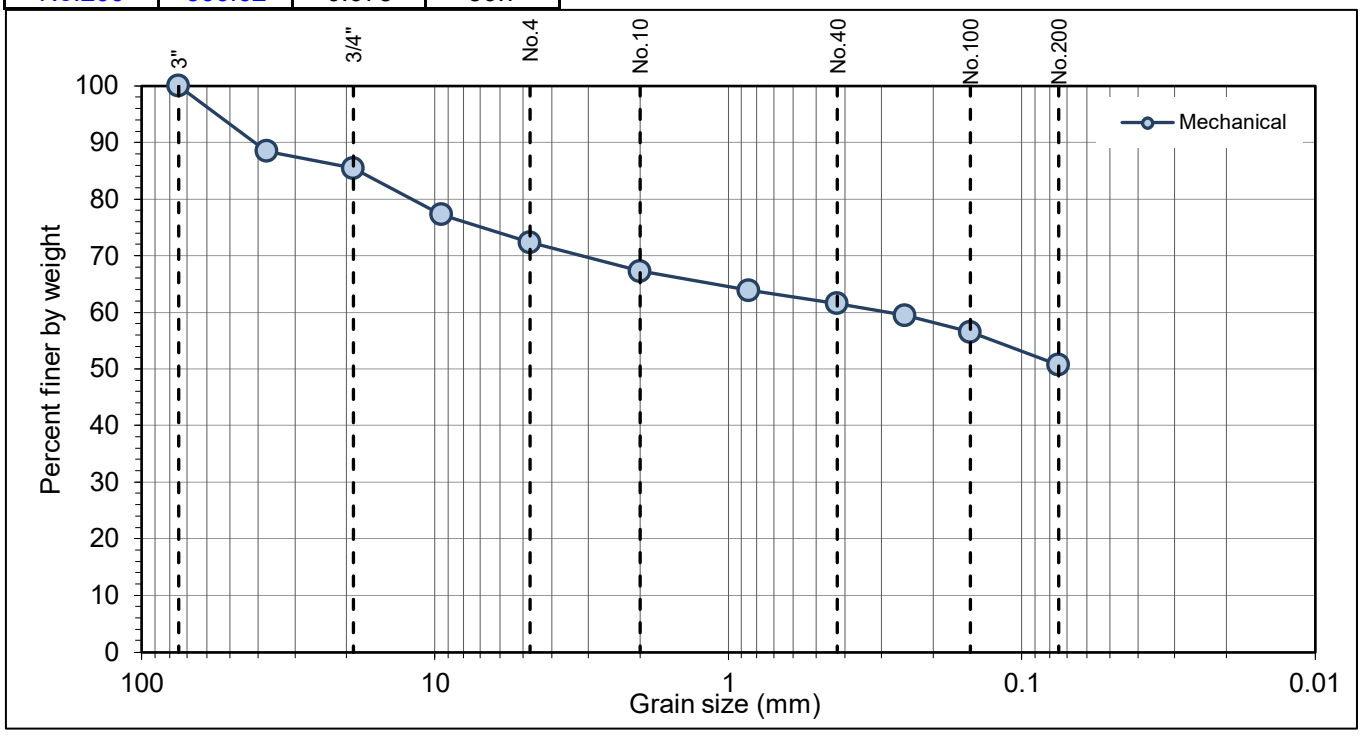
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	707.32	622.21
	-	
	707.32	622.21
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1129.47
Dry soil + tare (g):	-	1044.36
Tare (g):	-	422.15
Moisture content (%):	0.0	13.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	100.0
1.5"	71.56	37.5	88.5
3/4"	90.43	19	85.5
3/8"	141.32	9.5	77.3
No.4	172.00	4.75	72.4
No.10	203.64	2	67.3
No.20	224.65	0.85	63.9
No.40	239.11	0.425	61.6
No.60	252.04	0.25	59.5
No.100	270.48	0.15	56.5
No.200	306.62	0.075	50.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 15-17 ft

Date: 13-Nov-23 Location: -

Tested by: JCC Lab soil description: ol bn - yl bn clay

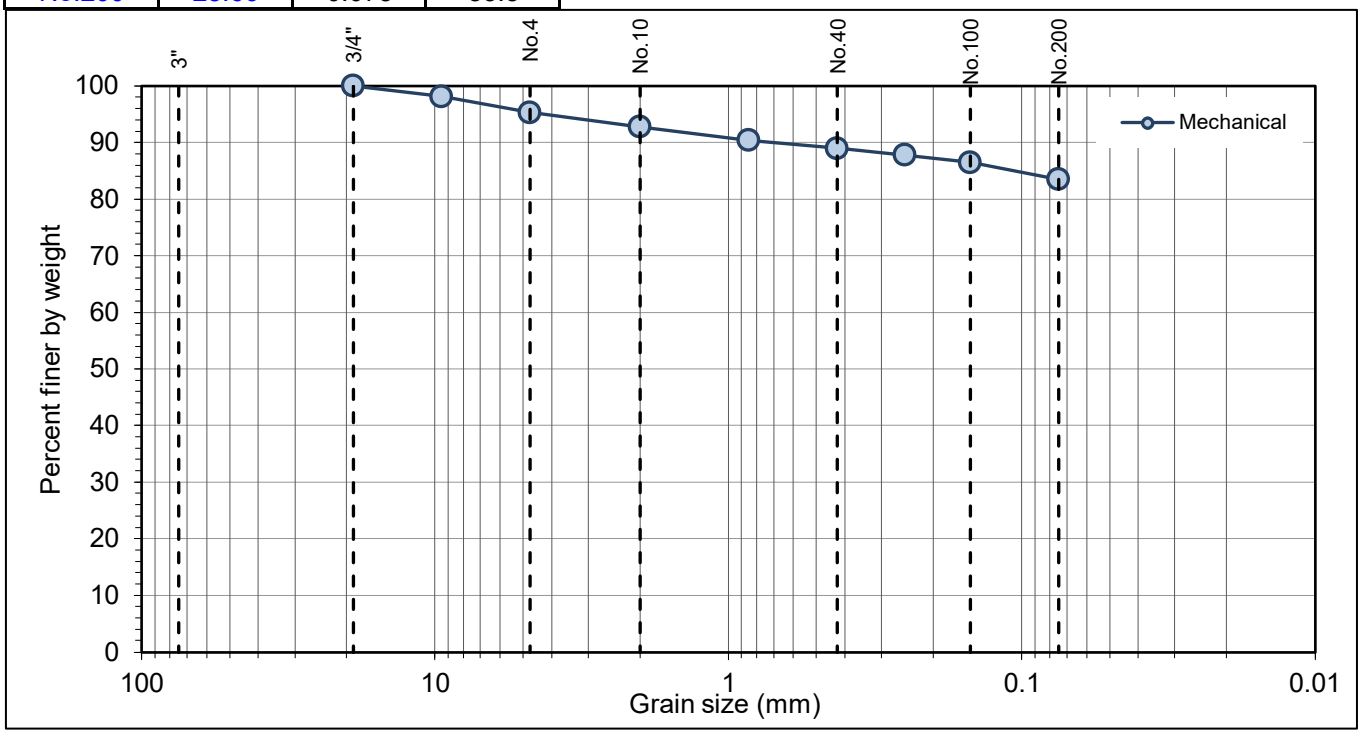
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	180.39	155.31
	-	
	180.39	155.31
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	377.19
Dry soil + tare (g):	-	352.11
Tare (g):	-	196.80
Moisture content (%):	0.0	16.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	2.89	9.5	98.1
No.4	7.30	4.75	95.3
No.10	11.23	2	92.8
No.20	14.96	0.85	90.4
No.40	17.13	0.425	89.0
No.60	18.94	0.25	87.8
No.100	20.99	0.15	86.5
No.200	25.66	0.075	83.5



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 17.5-19 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: ol bn - lt bn clay

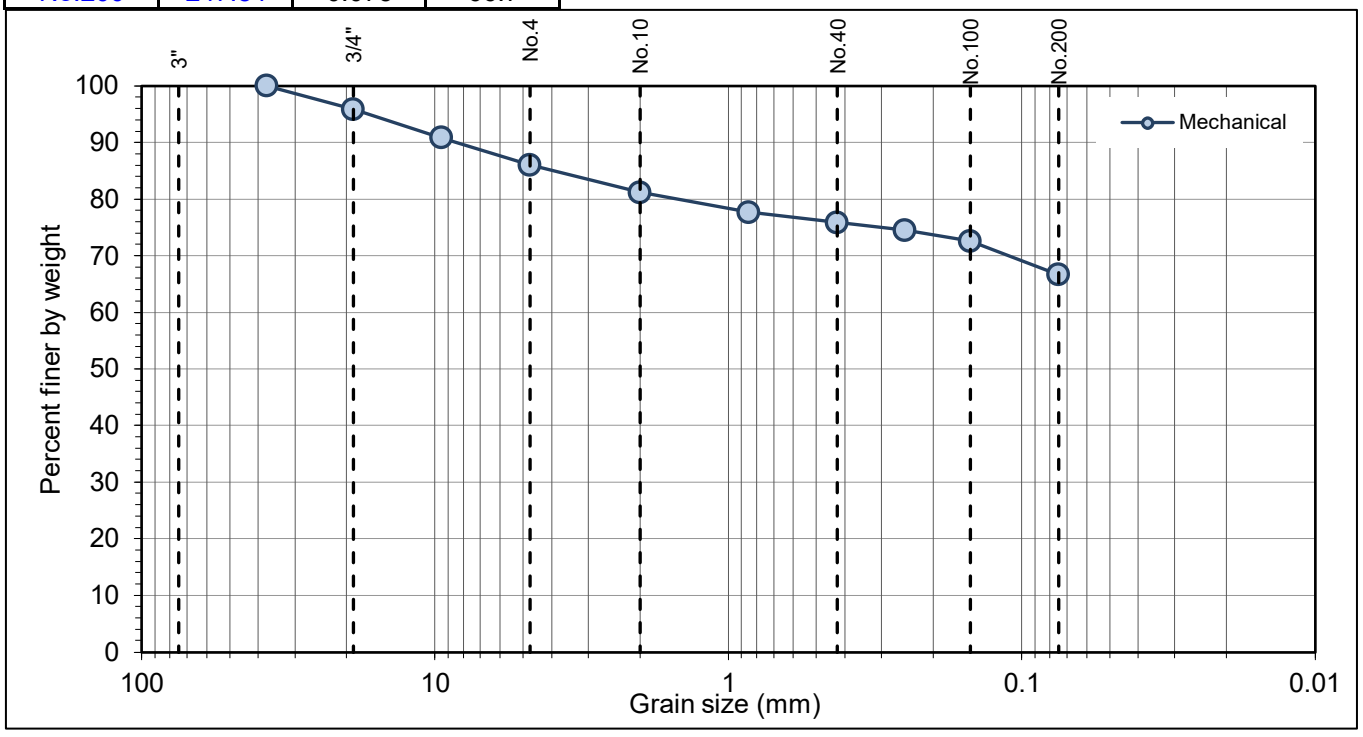
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	847.04	744.57
	-	
	847.04	744.57
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	860.87
Dry soil + tare (g):	-	758.40
Tare (g):	-	13.83
Moisture content (%):	0.0	13.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	30.57	19	95.9
3/8"	68.26	9.5	90.8
No.4	103.76	4.75	86.1
No.10	140.26	2	81.2
No.20	166.43	0.85	77.6
No.40	179.81	0.425	75.9
No.60	189.87	0.25	74.5
No.100	204.29	0.15	72.6
No.200	247.84	0.075	66.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-11

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Date: 13-Nov-23 Location: -

Tested by: DBW Lab soil description: bn - dk bn clay

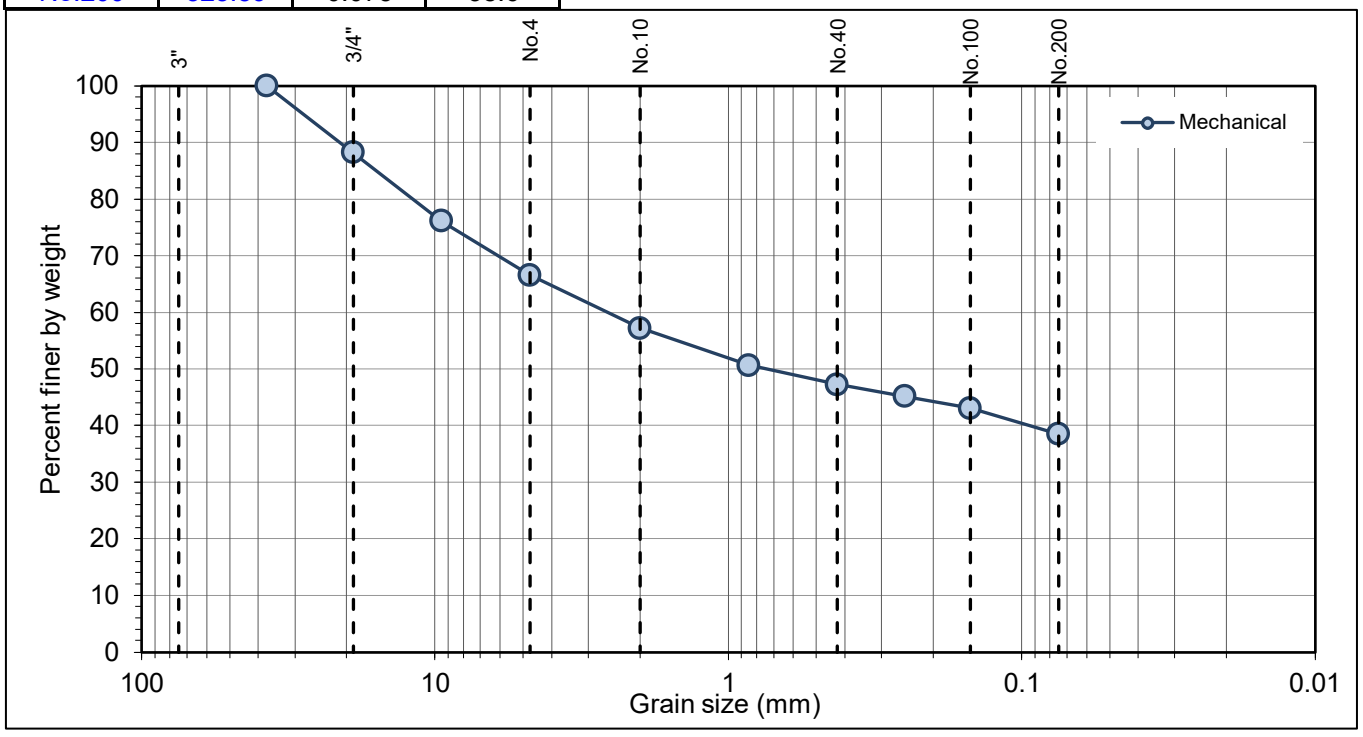
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	563.94	526.72
	-	
	563.94	526.72
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	758.29
Dry soil + tare (g):	-	721.07
Tare (g):	-	194.35
Moisture content (%):	0.0	7.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	61.88	19	88.3
3/8"	125.78	9.5	76.1
No.4	175.93	4.75	66.6
No.10	225.46	2	57.2
No.20	259.93	0.85	50.7
No.40	277.80	0.425	47.3
No.60	288.84	0.25	45.2
No.100	299.98	0.15	43.0
No.200	323.59	0.075	38.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 5-7 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - lt bn clay

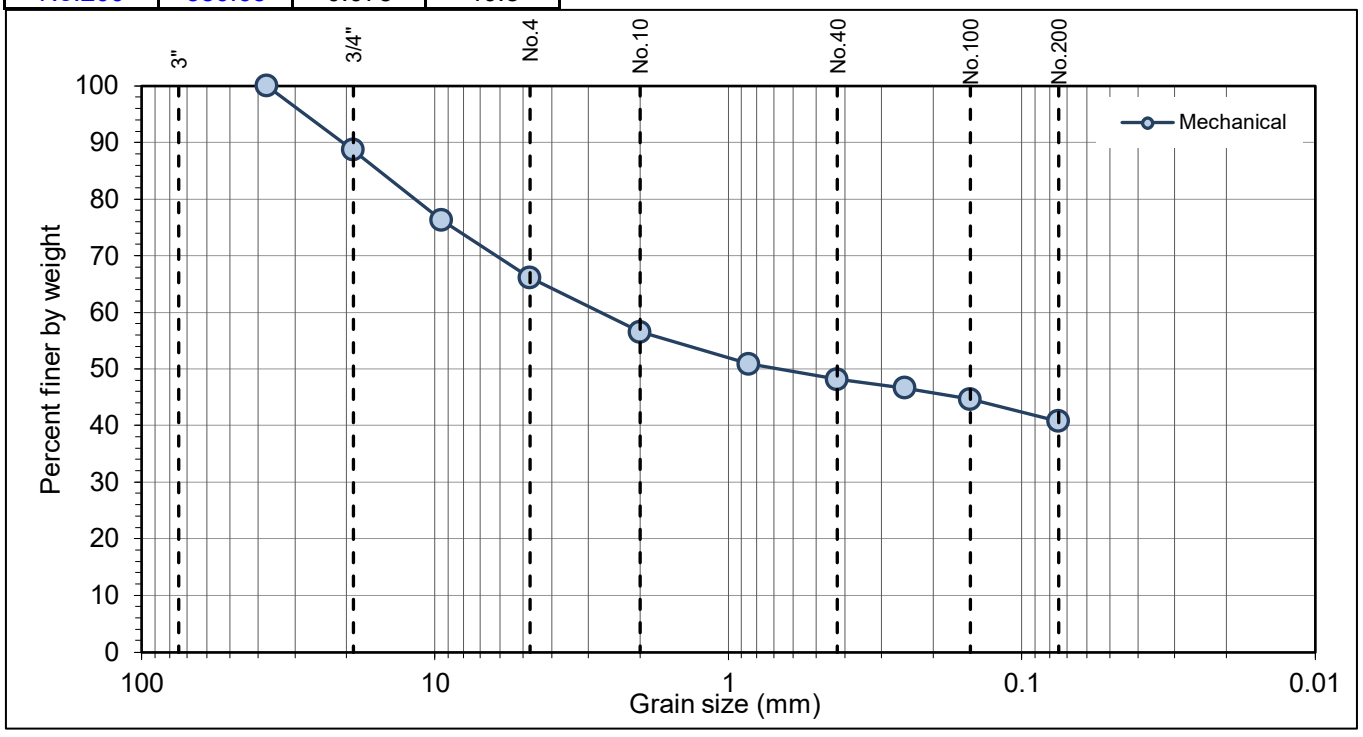
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	708.58	643.08
	-	
	708.58	643.08
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	902.19
Dry soil + tare (g):	-	836.69
Tare (g):	-	193.61
Moisture content (%):	0.0	10.2

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	72.52	19	88.7
3/8"	152.37	9.5	76.3
No.4	217.84	4.75	66.1
No.10	279.58	2	56.5
No.20	316.07	0.85	50.9
No.40	333.42	0.425	48.2
No.60	343.28	0.25	46.6
No.100	355.83	0.15	44.7
No.200	380.65	0.075	40.8



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 10-12 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - lt bn silt

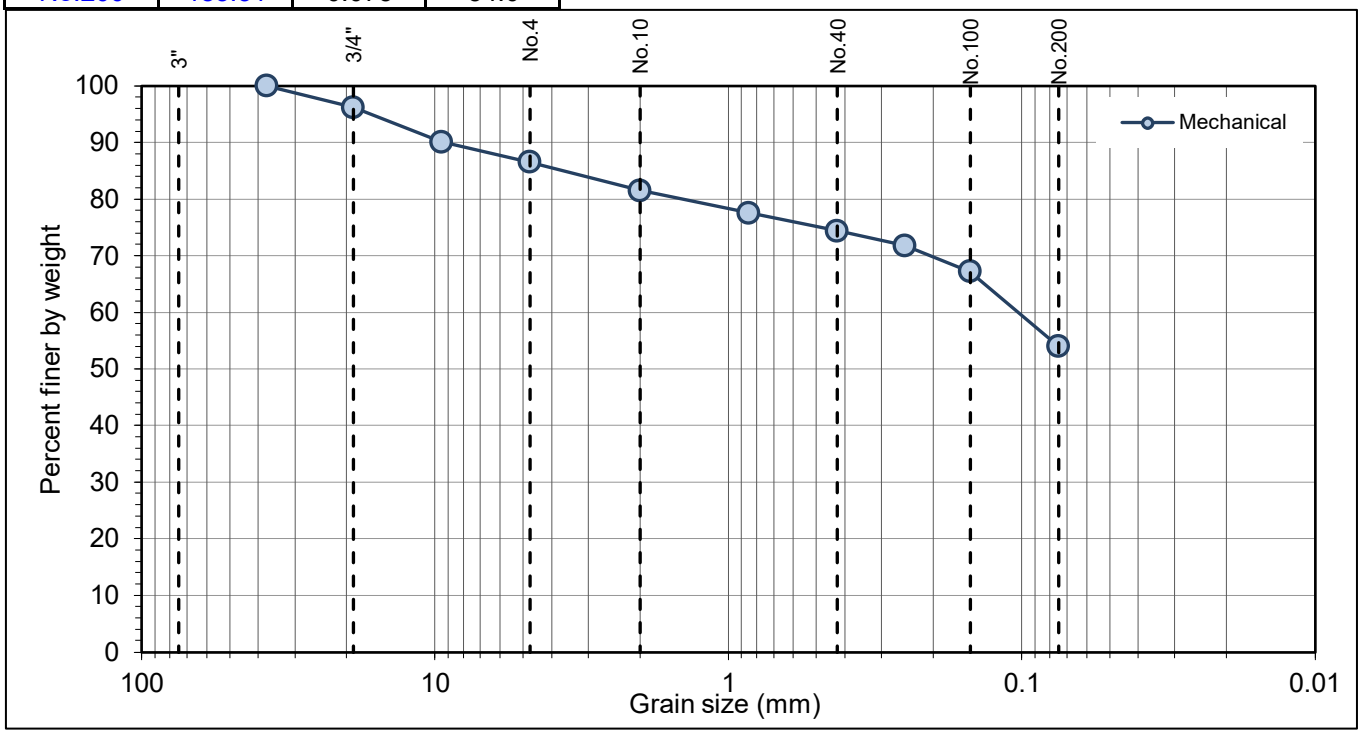
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	450.03	398.84
	-	
	450.03	398.84
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	566.12
Dry soil + tare (g):	-	514.93
Tare (g):	-	116.09
Moisture content (%):	0.0	12.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	15.06	19	96.2
3/8"	39.46	9.5	90.1
No.4	53.76	4.75	86.5
No.10	73.83	2	81.5
No.20	89.44	0.85	77.6
No.40	102.08	0.425	74.4
No.60	112.55	0.25	71.8
No.100	130.86	0.15	67.2
No.200	183.31	0.075	54.0



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-12

No: 23072 (23-1725) **Depth:** 20-21 ft

Date: 14-Nov-23 Location: -

Tested by: DBW Lab soil description: lt ol bn - lt bn clay

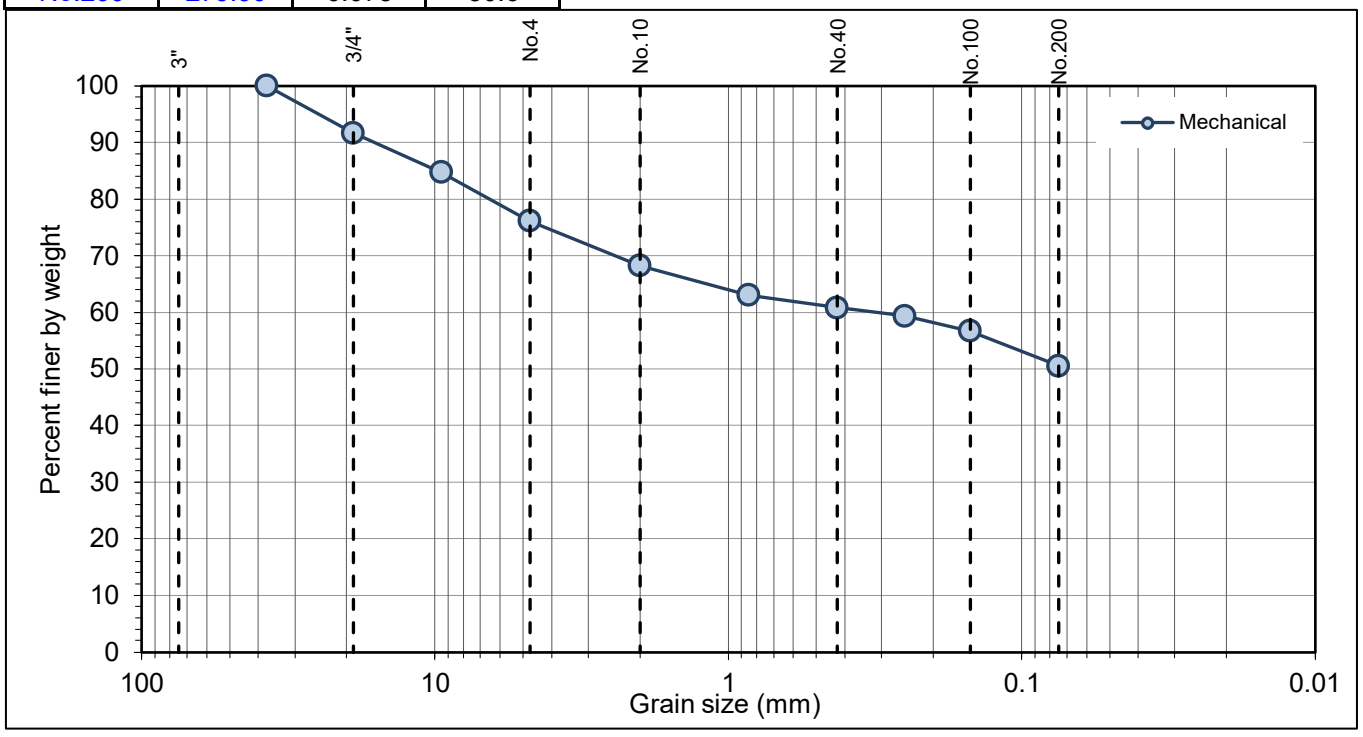
Reduced by: AT Comments:

Reviewed by: CML

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	625.88	566.11
	-	
	625.88	566.11
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	742.99
Dry soil + tare (g):	-	683.22
Tare (g):	-	117.11
Moisture content (%):	0.0	10.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	47.10	19	91.7
3/8"	86.55	9.5	84.7
No.4	135.05	4.75	76.1
No.10	179.77	2	68.2
No.20	209.38	0.85	63.0
No.40	221.94	0.425	60.8
No.60	230.21	0.25	59.3
No.100	245.14	0.15	56.7
No.200	279.90	0.075	50.6



Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-01

No: 23072 (23-1725) **Depth:** 37-39 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: gy - lt gy gravel

Reduced by: AT Comments:

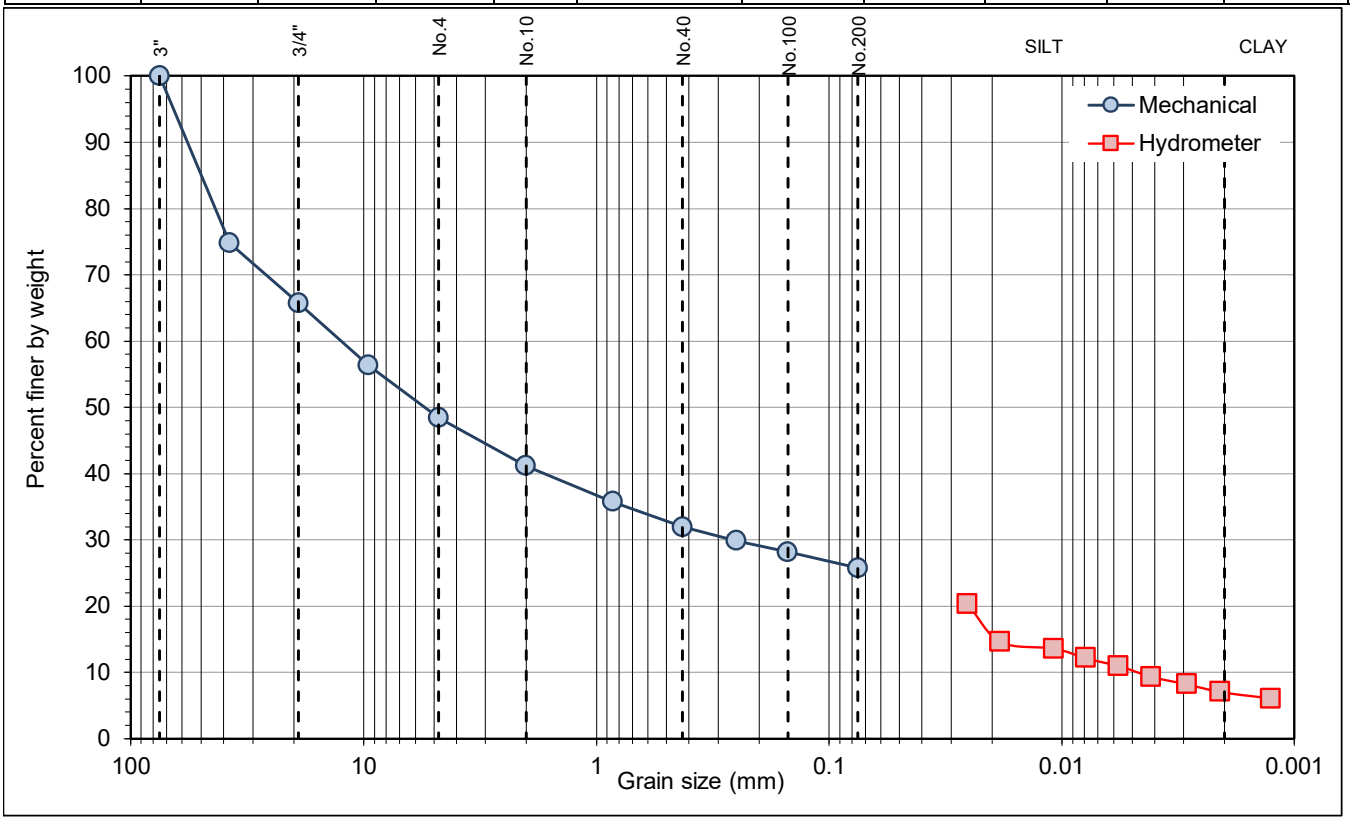
Reviewed by: JC

Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	1237.63	1179.38
+3" Coarse fraction (g):		
-3" Split fraction (g):	1237.63	1179.38
Hydrometer fraction (g):	100.02	99.95
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	1382.61	224.79
Dry soil + tare (g):	-	1324.36	224.77
Tare (g):	-	144.98	196.59
Moisture content (%):	0.00	4.94	0.07

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	41.14
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer		Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
12"	300	-	-		2	21.0	55	5.2	0.02534	20.28
8"	200	-	-		5	21.0	41	5.2	0.01838	14.58
6"	150	-	-		15	21.0	38.5	5.2	0.01084	13.57
4"	100	-	-		30	20.9	35	5.2	0.00789	12.13
3"	75	-	100.0	<=Split	60	21.0	32	5.2	0.00570	10.92
1.5"	37.5	298.03	74.7		120	21.2	28	5.1	0.00414	9.32
3/4"	19	404.72	65.7		250	22.0	25	4.9	0.00290	8.19
3/8"	9.5	515.59	56.3		500	22.5	22	4.7	0.00208	7.02
No.4	4.75	608.62	48.4		1440	20.9	20	5.2	0.00126	6.02
No.10	2	694.22	41.1	<=Split hyd.						
No.20	0.85	13.07	35.8							
No.40	0.425	22.42	31.9							
No.60	0.25	27.41	29.9							
No.100	0.15	31.53	28.2							
No.200	0.075	37.39	25.7							



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Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-02

No: 23072 (23-1725) **Depth:** 44.5-47 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: lt bn - bn gravel

Reduced by: AT Comments:

Reviewed by: JC

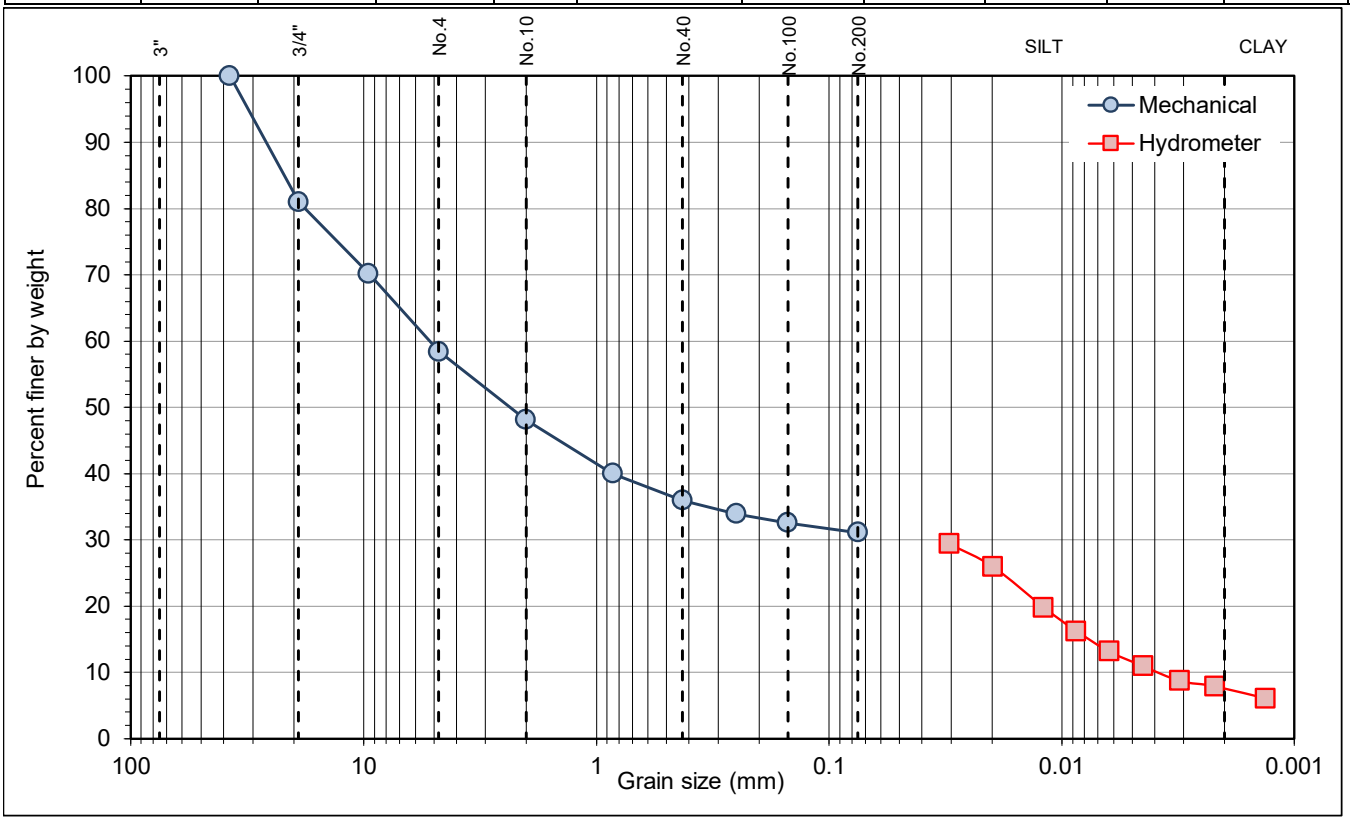
Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	446.03	423.48
+3" Coarse fraction (g):		
-3" Split fraction (g):	446.03	423.48
Hydrometer fraction (g):	50.04	50.01
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	572.96	229.12
Dry soil + tare (g):	-	550.41	229.10
Tare (g):	-	126.93	195.70
Moisture content (%):	0.00	5.32	0.06

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	48.08
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer
12"	300	-	-
8"	200	-	-
6"	150	-	-
4"	100	-	-
3"	75	-	-
1.5"	37.5	-	100.0
3/4"	19	80.60	81.0
3/8"	9.5	126.26	70.2
No.4	4.75	176.21	58.4
No.10	2	219.86	48.1
No.20	0.85	8.39	40.0
No.40	0.425	12.64	35.9
No.60	0.25	14.77	33.9
No.100	0.15	16.16	32.5
No.200	0.075	17.67	31.1

	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
	2	20.8	36.1	5.2	0.03034	29.35
	5	20.8	32.5	5.2	0.01973	25.93
	15	20.8	26	5.2	0.01193	19.75
	30	20.8	22.25	5.2	0.00865	16.19
<=Split	60	20.9	19	5.2	0.00623	13.12
	120	21.4	16.5	5.1	0.00445	10.88
	250	22.1	14	4.9	0.00310	8.69
	500	22.6	13	4.7	0.00219	7.88
	1448	20.9	11.5	5.2	0.00133	5.99
<=Split hyd.						



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Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10

No: 23072 (23-1725) **Depth:** 15-17 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: ol bn - yl bn clay

Reduced by: AT Comments:

Reviewed by: JC

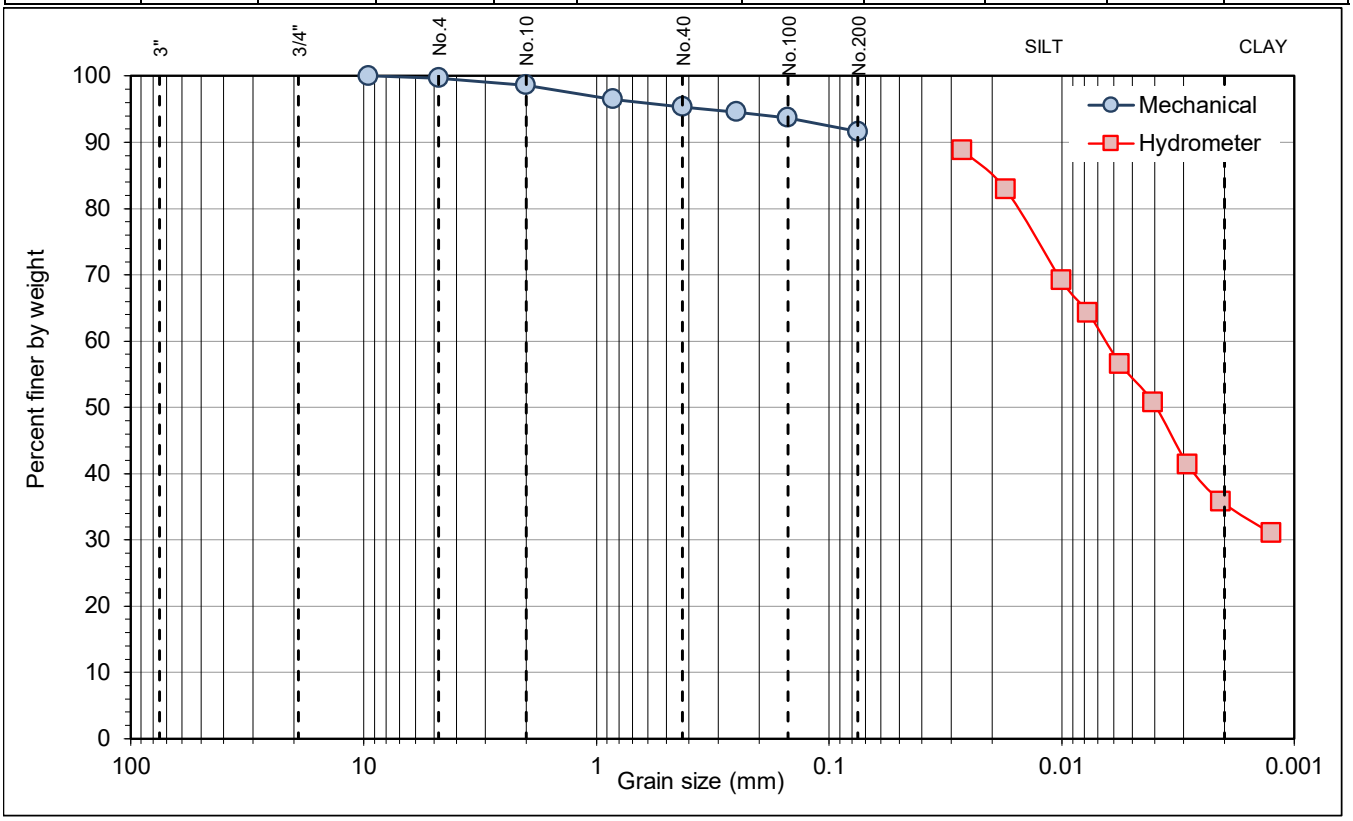
Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	133.83	114.98
+3" Coarse fraction (g):		
-3" Split fraction (g):	133.83	114.98
Hydrometer fraction (g):	50.01	49.74
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	250.79	239.17
Dry soil + tare (g):	-	231.94	238.94
Tare (g):	-	116.96	196.69
Moisture content (%):	0.00	16.39	0.54

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	98.62
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer
12"	300	-	-
8"	200	-	-
6"	150	-	-
4"	100	-	-
3"	75	-	-
1.5"	37.5	-	-
3/4"	19	-	-
3/8"	9.5	-	100.0
No.4	4.75	0.38	99.7
No.10	2	1.59	98.6
No.20	0.85	1.06	96.5
No.40	0.425	1.66	95.3
No.60	0.25	2.04	94.6
No.100	0.15	2.49	93.7
No.200	0.075	3.54	91.6

	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
	2	20.8	50.5	5.2	0.02667	88.77
	5	20.8	47.5	5.2	0.01737	82.88
	17	20.8	40.5	5.2	0.01004	69.16
	30	20.8	38	5.2	0.00772	64.26
<=Split	60	21.0	34	5.2	0.00562	56.53
	120	21.2	31	5.1	0.00405	50.76
	250	22.0	26	4.9	0.00288	41.40
	500	22.5	23	4.7	0.00206	35.79
	1444	20.9	21	5.2	0.00125	30.98
<=Split hyd.						



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Particle-Size Analysis of Soils with Hydrometer*

(after ASTM D422)

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-11

No: 23072 (23-1725) **Depth:** 10-12 ft

Date: 16-Nov-23 Location: -

Tested by: MGS/DBW Laboratory sample description: lt ol bn - ol bn clay

Reduced by: AT Comments:

Reviewed by: JC

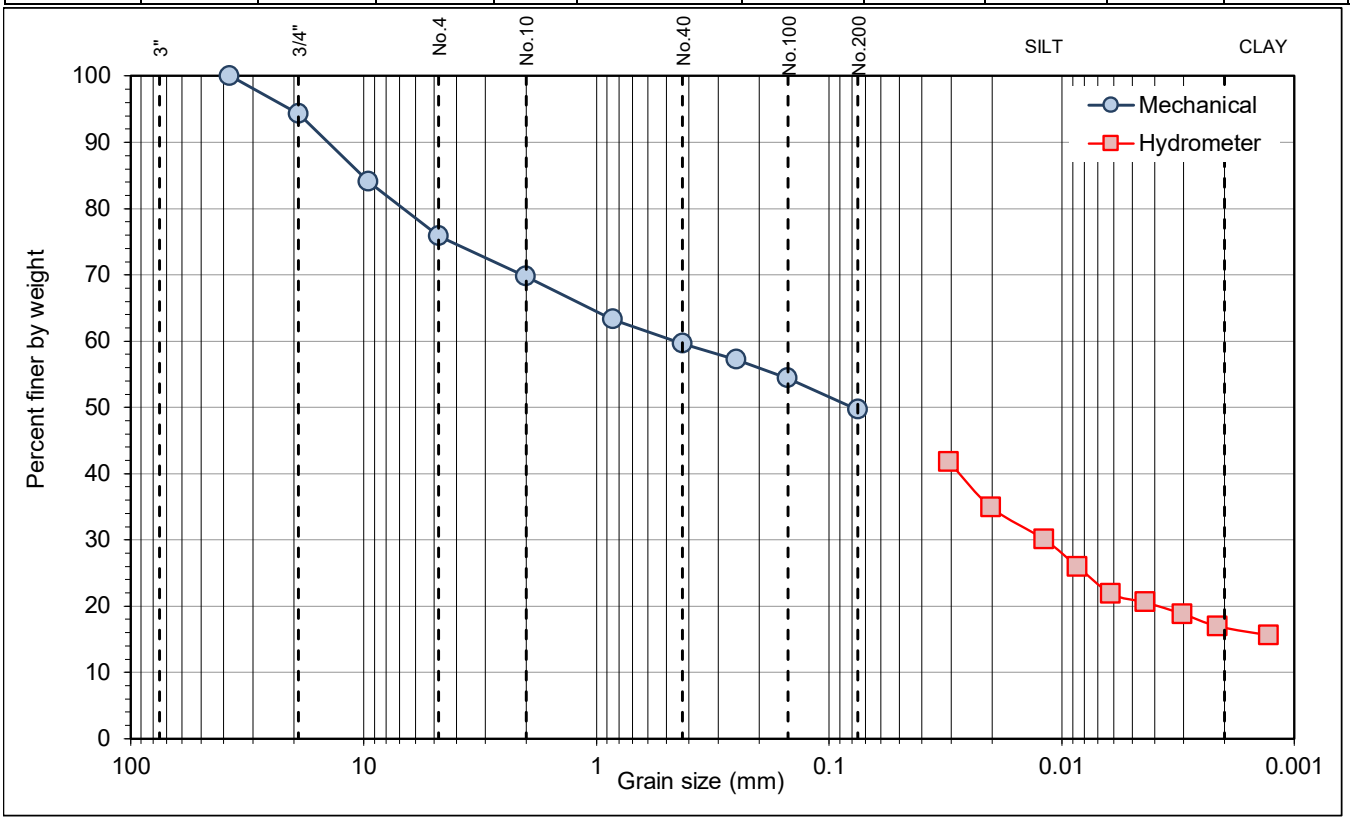
Split sieve:	Yes	
Split sieve:	3"	
	Moist	Dry
Total sample wt. (g):	621.27	566.27
+3" Coarse fraction (g):		
-3" Split fraction (g):	621.27	566.27
Hydrometer fraction (g):	50.09	50.00
Split fraction:	1.000	

Moisture data	C.F.(+3")	S.F.(-3")	Hyd.(-No.10)
Moist soil + tare (g):	-	766.77	150.52
Dry soil + tare (g):	-	711.77	150.46
Tare (g):	-	145.50	117.79
Moisture content (%):	0.00	9.71	0.18

Hydrometer data				
Hyd. split:	No.10		Slope:	-0.164
Gs:	2.7	Assumed	Intercept:	16.3
Hydrometer Seral #:	626325		a:	0.99
Dispersion period (min):	10		Hyd. fraction:	69.77
			Dispersion device:	Air-jet

Sieve	Grain Size (mm)	Accum. Wt. Ret. (g)	Percent Finer
12"	300	-	-
8"	200	-	-
6"	150	-	-
4"	100	-	-
3"	75	-	-
1.5"	37.5	-	100.0
3/4"	19	32.39	94.3
3/8"	9.5	90.42	84.0
No.4	4.75	136.85	75.8
No.10	2	171.18	69.8
No.20	0.85	4.67	63.3
No.40	0.425	7.27	59.6
No.60	0.25	9.04	57.2
No.100	0.15	11.05	54.4
No.200	0.075	14.44	49.6

	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Composite Correction	Grain Size (mm)	% Soil in Suspension
	2	20.7	35.5	5.3	0.03051	41.74
	5	20.7	30.5	5.3	0.02004	34.84
	15	20.7	27	5.3	0.01186	30.01
	30	20.8	24	5.2	0.00855	25.91
<=Split	60	21.0	21	5.2	0.00615	21.85
	120	21.2	20	5.1	0.00436	20.54
	250	22.0	18.5	4.9	0.00302	18.79
	500	22.6	17	4.7	0.00214	16.95
	1446	20.9	16.5	5.2	0.00129	15.60
<=Split hyd.						



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One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project:	**Bear Development Snow King Lot 53 and 58**	**TH/TP/Sample:**	**JG-10**
No:	**23072 (23-1725)**	**Depth:**	**12.5-14 ft**
Location:	-	Laboratory sample description:	ol bn - lt bn clay
Date:	14-Nov-23	USCS classification:	not requested
Tested by:	AT	Sample type:	Rel. undisturbed, Shelby Tube
Reduced by:	AT	Inundation stress (psf):	100, completion
Checked by:	JC	Swell pressure (psf):	408
Comments:	Gravel up to 1.5" in sample.	Test method:	B
		Preparation procedure:	trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.995	-
	90°	1.002	-
	180°	0.999	-
	270°	1.003	-
Avg Height, Havg (in)		1.000	0.887
Height, H (cm)		2.539	2.253
Dia., D (in)	0°	2.494	-
	90°	2.495	-
Avg Dia., Davg (in)		2.495	2.495
Dia., D (cm)		6.336	6.336
Wt. rings + wet soil (g)		373.54	369.19
Wt. rings (g)		216.21	216.21
Wet soil + tare (g)		1129.47	350.66
Dry soil + tare (g)		1044.36	324.68
Tare (g)		422.15	198.47
Moisture cont., w (%)		13.7	20.6
Gs, assumed		2.70	2.70
Mass total (g)		157.3	153.0
Mass of solids (g)		138.4	138.4
Volume (cm^3)		80.1	71.0
Vol. of water (cm^3)		18.9	14.6
Vol. of solids (cm^3)		51.3	51.3
Vol. of voids (cm^3)		28.8	19.8
Vol. of air (cm^3)		9.9	5.2
Area, A (cm^2)		31.5	31.5
Ht. solids, Hs (cm)		1.626	1.626
Void ratio, e		0.562	0.386
Porosity, n		0.360	0.278
Vol.moisture, T		0.236	0.205
Saturation, S (%)		66	74
Dry density (gm/cm^3)		1.729	1.949
Wet unit wt., gm (pcf)		122.7	146.7
Dry unit wt., gd (pcf)		107.9	121.6

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9998	0.0000	0.5620	0
408	0.0000	0.9997	0.0000	0.5620	120
800	0.0034	0.9964	0.0034	0.5568	131
1,600	0.0108	0.9890	0.0108	0.5452	207
3,200	0.0278	0.9719	0.0278	0.5185	480
6,400	0.0528	0.9470	0.0528	0.4796	369
12,800	0.0843	0.9154	0.0843	0.4303	269
25,600	0.1173	0.8825	0.1173	0.3787	334
51,200	0.1513	0.8484	0.1514	0.3255	480
25,600	0.1474	0.8523	0.1475	0.3316	120
6,400	0.1325	0.8672	0.1326	0.3550	240
1,600	0.1129	0.8869	0.1129	0.3856	343

C'c

(0.1514-0.0528)/[Log(51200)-Log(6400)]

0.0986/(4.71-3.81)

C'c= 0.1096

C'c = Cc/(1+e0)

0.1096 = Cc/(1+0.562)

Cc = 0.171

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

To be determined by the Geotechnical Engineer

Notes:

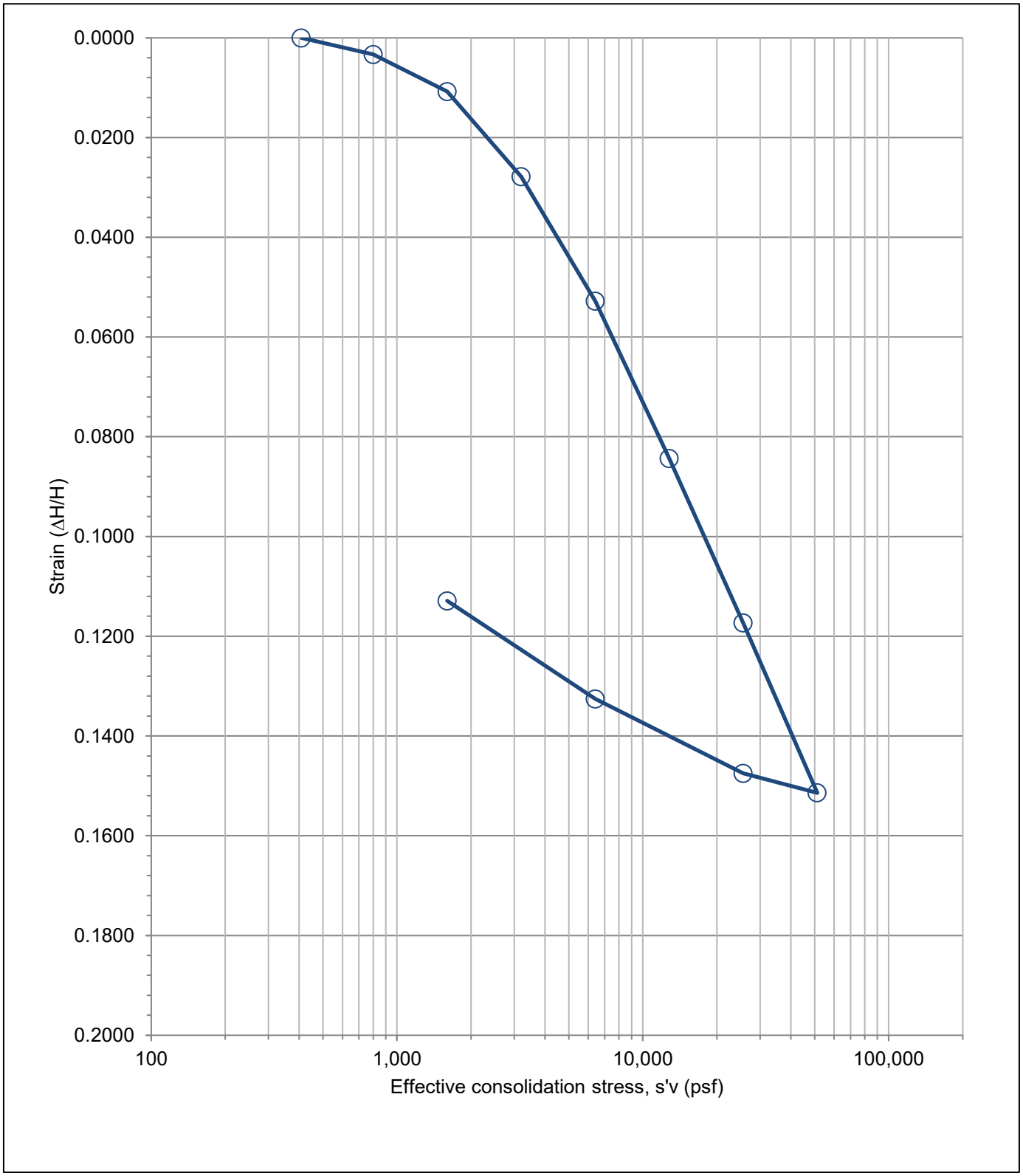
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation

[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10
No: 23072 (23-1725) **Depth:** 12.5-14 ft



One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 | **TH/TP/Sample:** JG-10
No: 23072 (23-1725) | **Depth:** 17.5-19 ft
Location: - | Laboratory sample description: ol bn - lt bn clay
Date: 14-Nov-23 | USCS classification: not requested

Tested by: AT | Sample type: Rel. undisturbed, Shelby Tube
Reduced by: AT | Inundation stress (psf): 100, completion
Checked by: JC | Swell pressure (psf): <100
Comments: | Test method: B
Preparation procedure: trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.985	-
	90°	0.987	-
	180°	0.988	-
	270°	0.989	-
Avg Height, Havg (in)		0.987	0.884
Height, H (cm)		2.508	2.245
Dia., D (in)	0°	2.487	-
	90°	2.496	-
Avg Dia., Davg (in)		2.492	2.492
Dia., D (cm)		6.328	6.328
Wt. rings + wet soil (g)		384.09	380.81
Wt. rings (g)		214.28	214.28
Wet soil + tare (g)		860.87	285.37
Dry soil + tare (g)		758.40	266.49
Tare (g)		13.83	119.06
Moisture cont., w (%)		13.8	12.8
Gs, assumed		2.70	2.70
Mass total (g)		169.8	166.5
Mass of solids (g)		149.3	149.3
Volume (cm^3)		78.9	70.6
Vol. of water (cm^3)		20.5	17.3
Vol. of solids (cm^3)		55.3	55.3
Vol. of voids (cm^3)		23.6	15.3
Vol. of air (cm^3)		3.0	-1.9
Area, A (cm^2)		31.5	31.5
Ht. solids, Hs (cm)		1.758	1.758
Void ratio, e		0.427	0.278
Porosity, n		0.299	0.217
Vol.moisture, T		0.260	0.244
Saturation, S (%)		87	113
Dry density (gm/cm^3)		1.892	2.113
Wet unit wt., gm (pcf)		134.4	148.8
Dry unit wt., gd (pcf)		118.1	131.9

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9873	0.0000	0.4267	0
100	0.0000	0.9872	0.0000	0.4267	108
200	0.0029	0.9844	0.0029	0.4225	123
400	0.0060	0.9813	0.0061	0.4181	210
800	0.0111	0.9761	0.0113	0.4106	96
1,600	0.0185	0.9687	0.0188	0.3999	176
3,200	0.0296	0.9576	0.0300	0.3839	480
6,400	0.0512	0.9360	0.0519	0.3527	89
12,800	0.0722	0.9150	0.0732	0.3223	123
25,600	0.0998	0.8875	0.1010	0.2826	155
51,200	0.1267	0.8605	0.1284	0.2436	315
25,600	0.1236	0.8637	0.1251	0.2482	120
6,400	0.1163	0.8709	0.1178	0.2586	210
1,600	0.1032	0.8840	0.1046	0.2775	980

C'c

(0.1284-0.0732)/[Log(51200)-Log(12800)]

0.0552/(4.71-4.1072)

C'c= 0.091

C'c = Cc/(1+e0)

0.091 = Cc/(1+0.427)

Cc = 0.13

Check:

Cc=(change in void ratio)/(Log change in pressure)

Cc=(0.2436-0.3223)/[Log(51200)-Log(12800)]

Cc=-0.0787/0.6028

Cc=-0.13

~~WHY DOES IT CALCULATE A NEGATIVE VALUE?~~

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

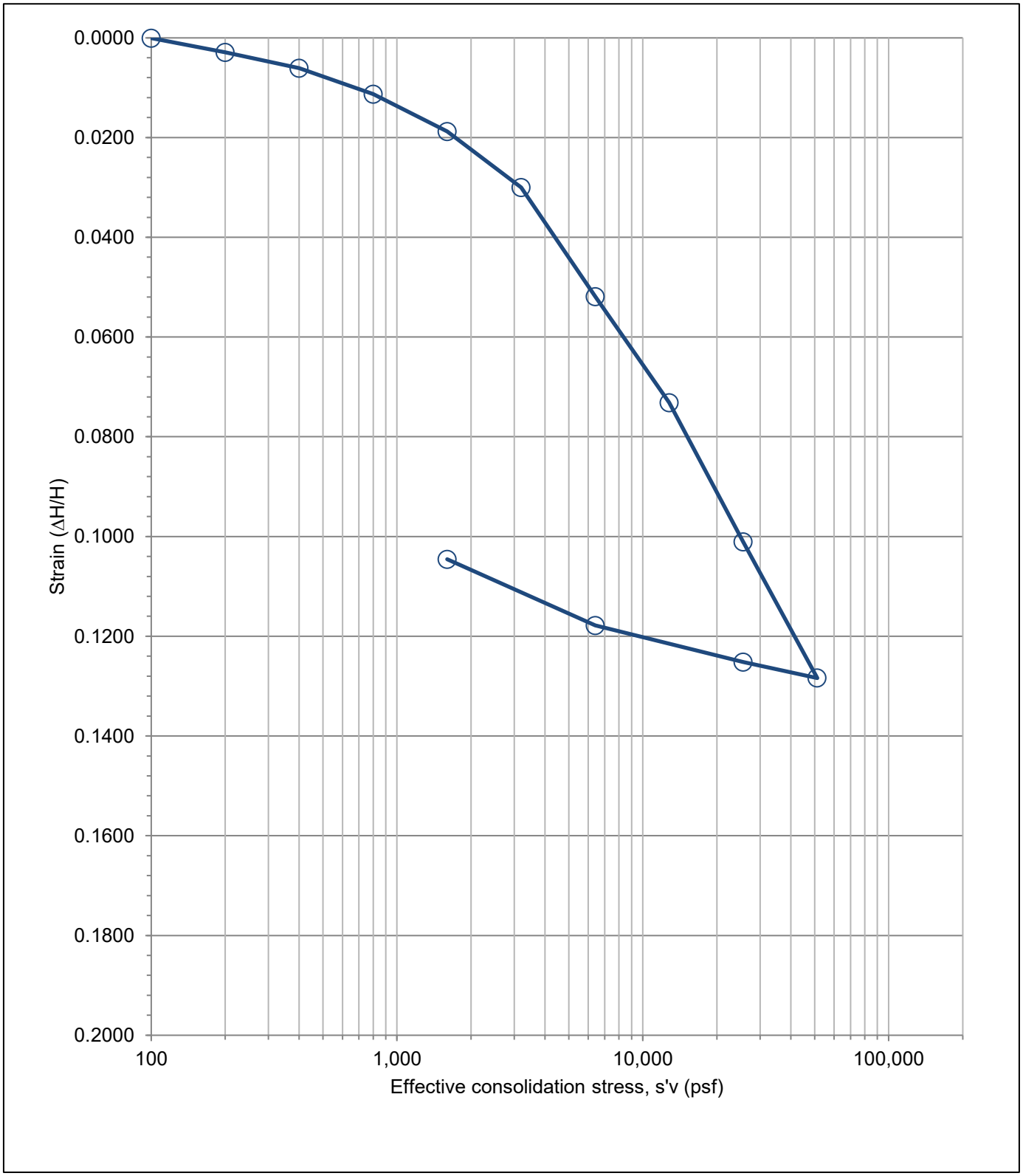
To be determined by the Geotechnical Engineer

Notes:
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation
[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 53 and 58 **TH/TP/Sample:** JG-10
No: 23072 (23-1725) **Depth:** 17.5-19 ft



Direct Shear of Soils Under Consolidated Drained Conditions, ASTM D3080

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson # 21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

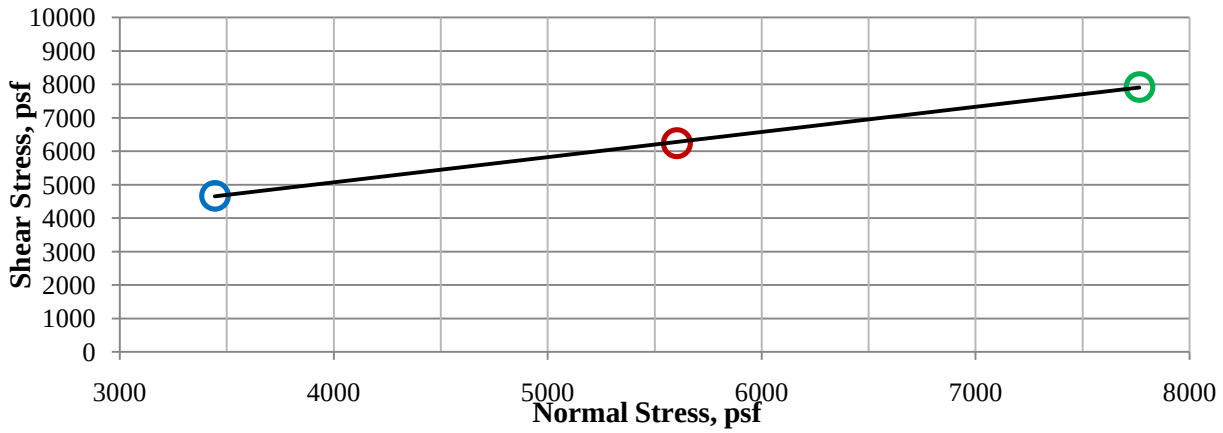
Sample Data:

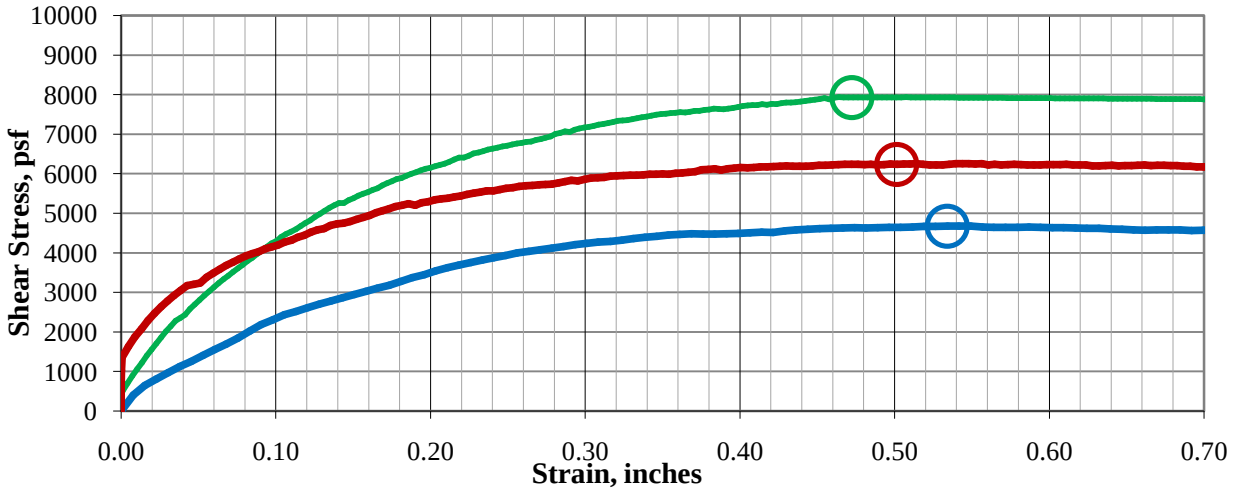
Boring: BH6-11 **Depth:** 52.5'-53' **Density:** 137.7 pcf moist

Description: Sandy Lean Clay, CL

Normal Stress, psf	Initial Moisture,%	Final Moisture,%	Consol + Collapse,%	Final Wet Density, pcf	Final Dry Density, pcf	Max Shear Stress, psf	Failure Strain,%
3444	14.4	16.2	2.2	143.1	123.1	**4673**	**22.1**
5604	14.4	15.6	3.0	143.5	124.1	**6234**	**20.7**
7764	14.4	14.7	3.8	143.6	125.2	**7924**	**19.5**

Peak Angle, ϕ° **37.0** Peak Cohesion, C, psf **2059** Strain rate, %/hour **4.1**





Remarks: Friction angle and cohesion in practice are sensitive to several other material properties, and conditions, in the field and lab. No individual lab property of a material can substitute for overall best practices in geotechnical design, construction, and field testing by qualified professionals.

Direct Shear of Soils Under Consolidated Drained Conditions, ASTM D3080

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson # 21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

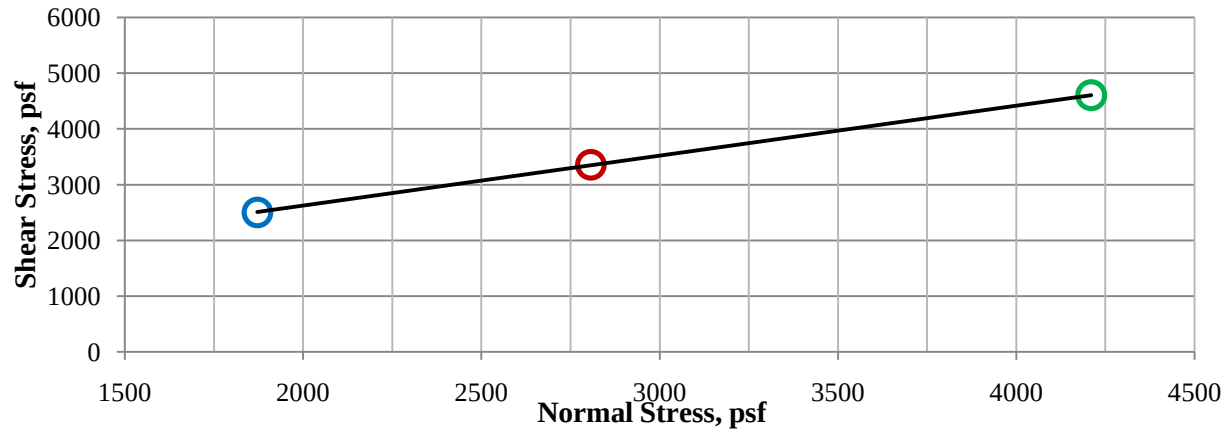
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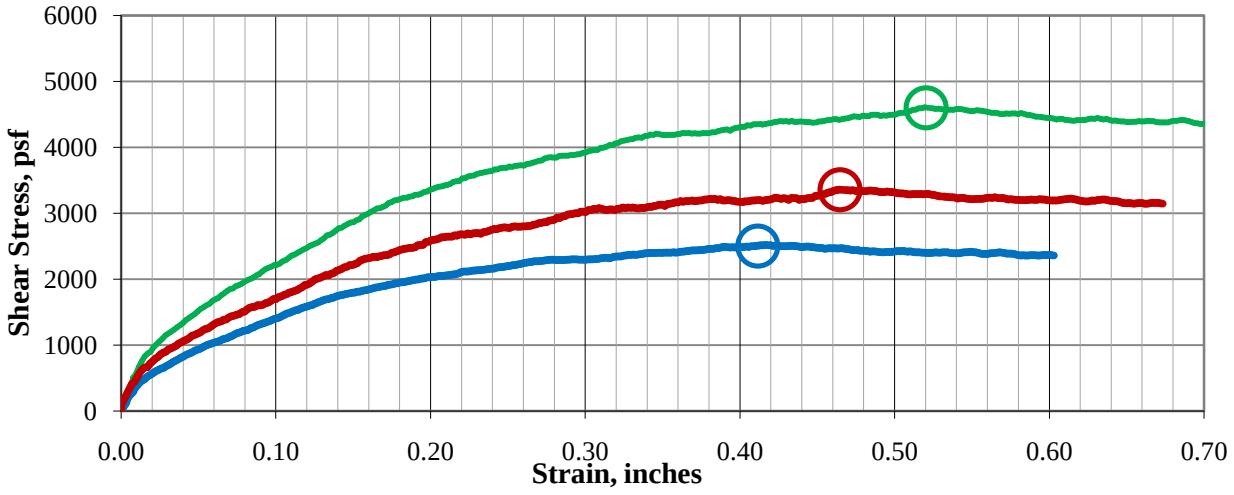
Boring: BH7-4 **Depth:** 19.5'-20' **Density:** 135.1 pcf moist

Description: Sandy Lean Clay, CL

Normal Stress, psf	Initial Moisture,%	Final Moisture,%	Consol + Collapse,%	Final Wet Density, pcf	Final Dry Density, pcf	Max Shear Stress, psf	Failure Strain,%
1871	15.5	19.5	1.5	141.9	118.7	**2505**	**17.0**
2806	15.5	17.6	2.6	141.2	120.1	**3358**	**19.2**
4210	15.5	15.8	3.6	140.5	121.3	**4602**	**21.5**

Peak Angle, ϕ° **41.9** Peak Cohesion, C, psf **835** Strain rate, %/hour **4.1**





Remarks: Friction angle and cohesion in practice are sensitive to several other material properties, and conditions, in the field and lab. No individual lab property of a material can substitute for overall best practices in geotechnical design, construction, and field testing by qualified professionals.

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P. O. Box 80190
Billings, Montana 59108-0190
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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

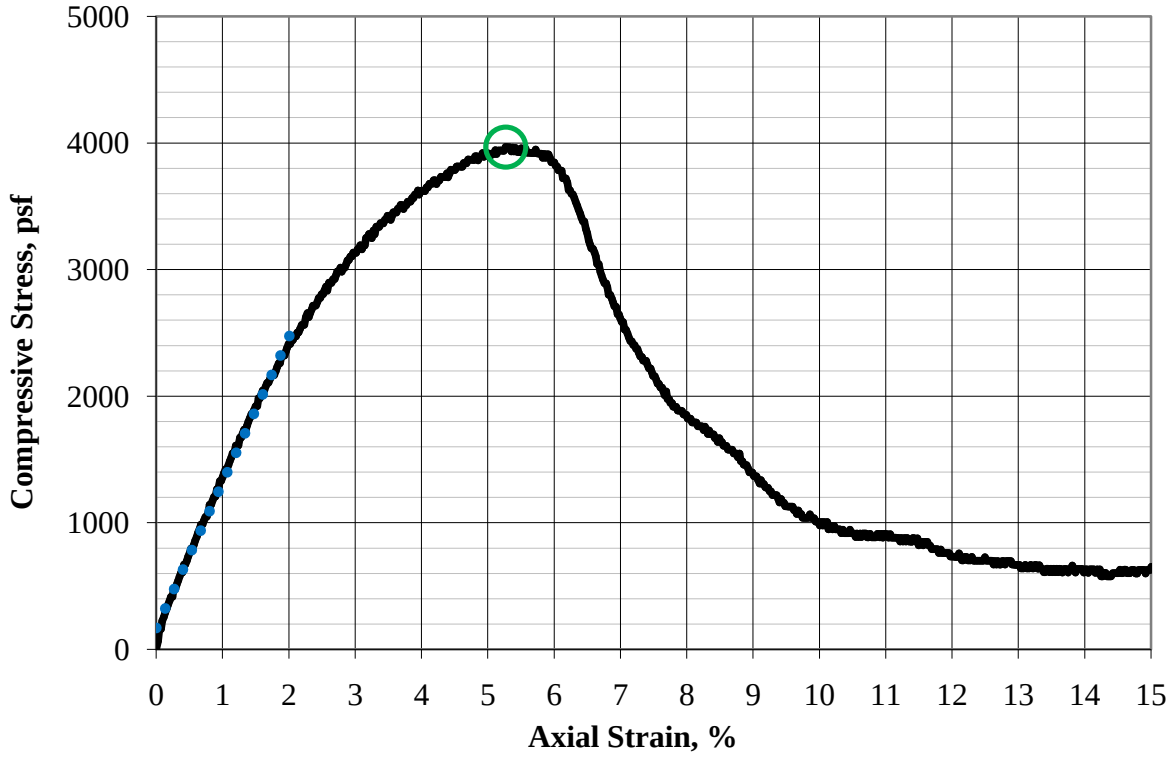
Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

Sample Data:

Boring: BH6-4B
Depth: 22.5' - 23'
Description: Lean Clay, CL

Specimen Properties:	
Average Diameter, in.	2.395
Average Height, in.	5.186
Height/Diameter (L/D)	2.17
Moisture, %	18.6
Wet density, pcf	128.5
Dry density, pcf	108.3

Undrained Unconfined Strength Properties:	
Compressive strength, psf	3968
Shear strength, psf	1984
Axial elastic modulus, psi	798
Failure strain, %	5.3
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
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pgyr@nelsonengineering.net

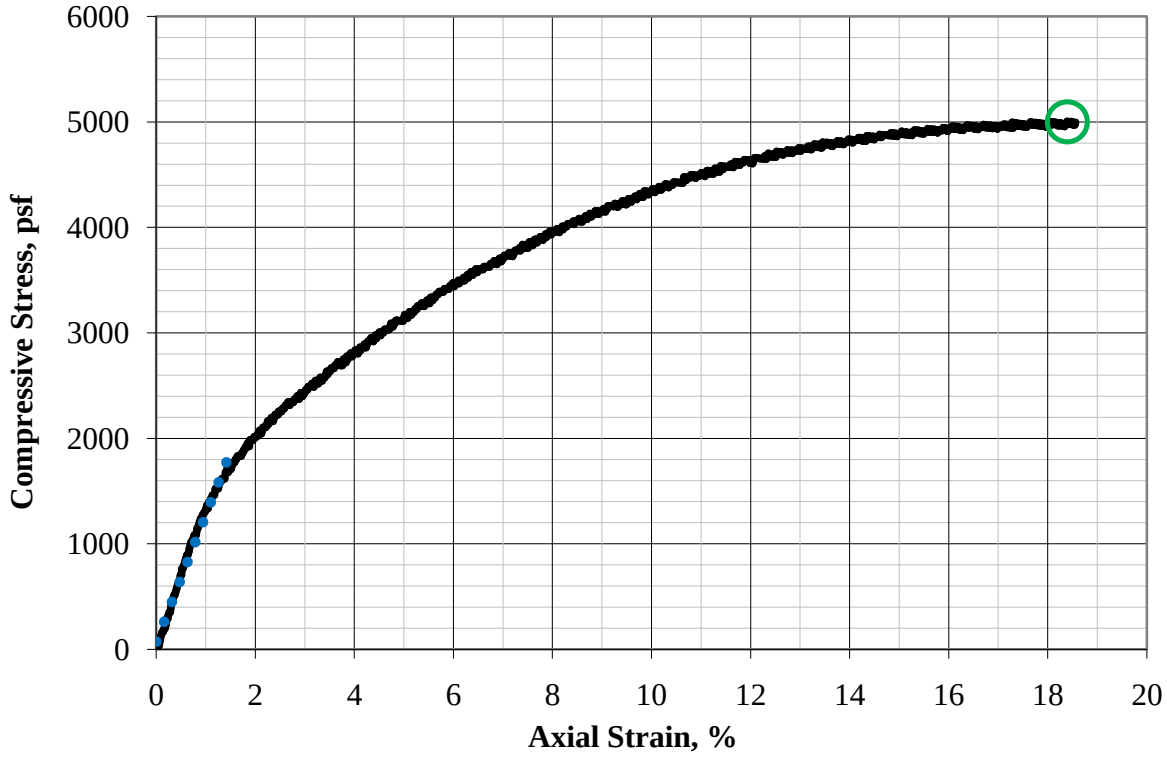
Sample Data:

Boring: BH7-6 Depth: 26' - 26.5'

Description: Lean Clay w/Sand, CL

Specimen Properties:	
Average Diameter, in.	2.389
Average Height, in.	6.044
Height/Diameter (L/D)	2.53
Moisture, %	25.6
Wet density, pcf	126.6
Dry density, pcf	100.8

Undrained Unconfined Strength Properties:	
Compressive strength, psf	5002
Shear strength, psf	2501
Axial elastic modulus, psi	834
Failure strain, %	18.4
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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Billings, Montana 59108-0190
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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

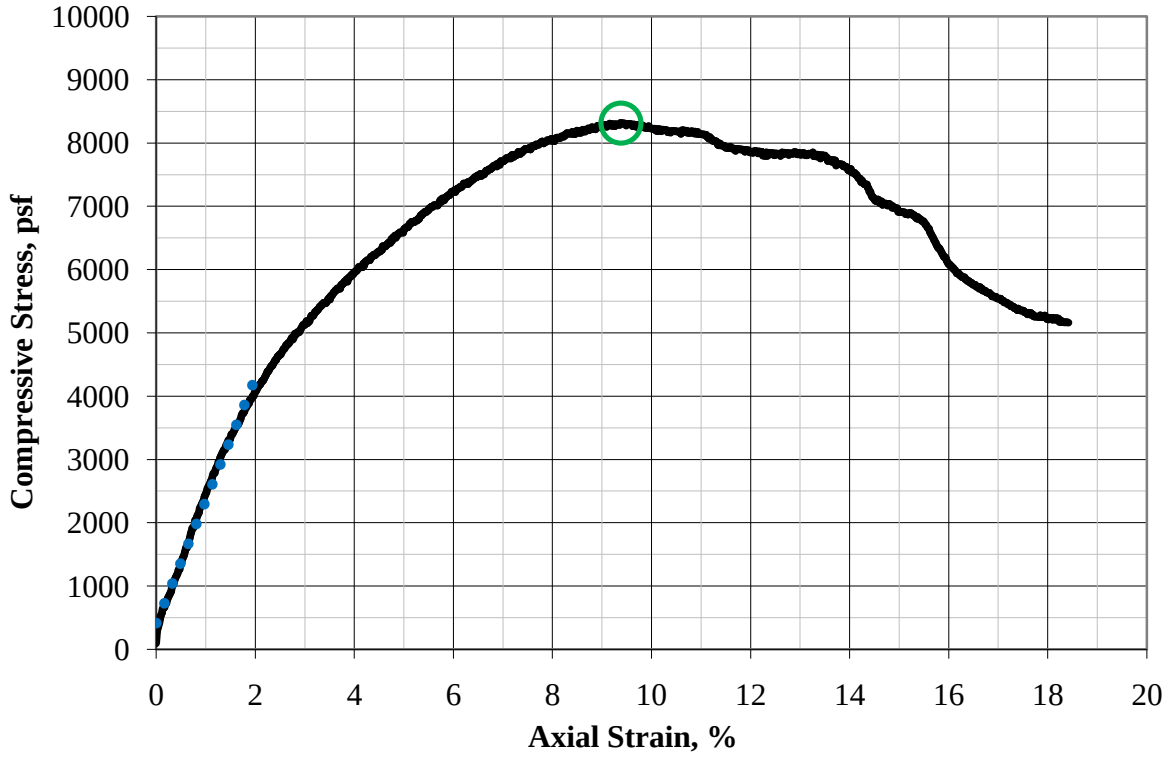
Sample Data:

Boring: BH7-13 Depth: 59.5' - 60'

Description: Sandy Lean Clay, CL

Specimen Properties:	
Average Diameter, in.	2.407
Average Height, in.	5.987
Height/Diameter (L/D)	2.49
Moisture, %	17.1
Wet density, pcf	133.3
Dry density, pcf	113.8

Undrained Unconfined Strength Properties:	
Compressive strength, psf	8315
Shear strength, psf	4158
Axial elastic modulus, psi	1346
Failure strain, %	9.4
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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USCS CLASSIFICATION

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Sample ID: BH1-4 Depth (ft): 29.75'-31.75'

Unified Soils Classification
SC (Clayey Sand with Gravel)

Gravel	22%
Sand	56%
Fines	23%

Liquid Limit:	27
Plastic Limit:	12
Plasticity Index:	15

In-Situ Moisture Content	10.2%

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	115.1	115.1	0.0	0%	100%
1"	25	115.1	115.1	0.0	0%	100%
3/4"	18.75	115.1	143.7	28.6	7%	93%
#4	4.75	115.1	174.2	59.1	22%	78%
#10	2.00	115.1	130.4	15.3	25%	75%
#40	0.425	115.1	131.8	16.7	29%	71%
#200	0.075	115.1	310.1	195.0	77%	23%
Pan	0	115.1	208.2	93.1	100%	0%
		Total Weight of Sample (g)		407.8		

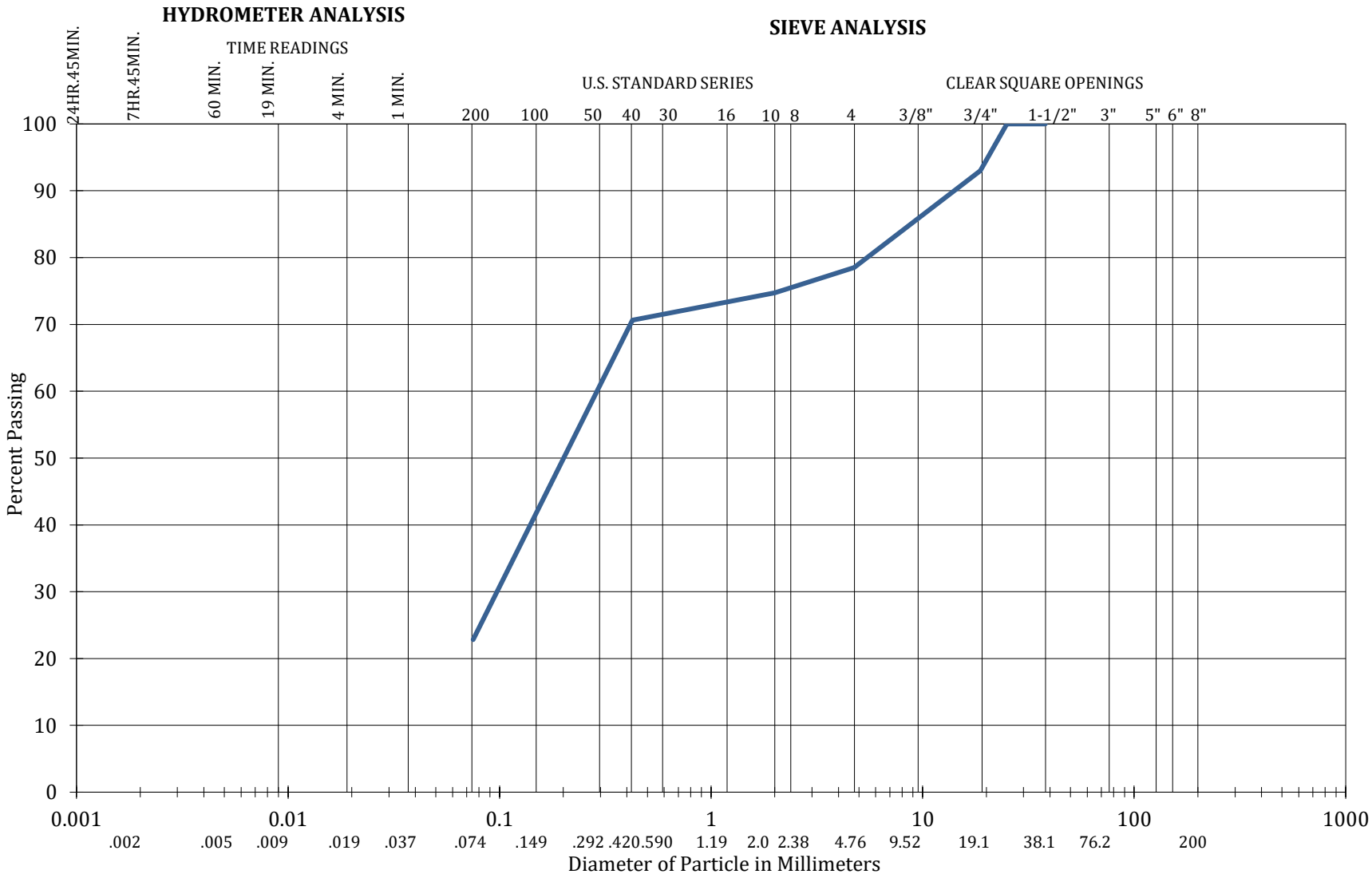
Moisture Content	
Wet Wt + Tare (g)	563.0
Dry Wt. + Tare (g)	521.6
Wt of Water (g)	41.4
Tare Wt. (g)	113.8
Dry Wt. (g)	407.8
Moisture Content	10.2%
Wash	
Wet Wt. + Tare (g)	563.0
Pre Wash Dry (g)	407.8
Post Wash Dry (g)	314.7
Tare Wt. (g)	113.8
Wt.Of Minus #200 =	93.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Brown Clayey Sand w/Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	12/7/2005

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

BH1-4

Lot 58 Grand View Lodges

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Sample ID: BH1-5 Depth (ft): 40'-42'

Unified Soils Classification
SC (Clayey Sand)

Gravel	14%
Sand	57%
Fines	28%

Liquid Limit:	19
Plastic Limit:	4
Plasticity Index:	15

In-Situ Moisture Content	11.6%

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	115.1	115.1	0.0	0%	100%
1"	25	115.1	115.1	0.0	0%	100%
3/4"	18.75	115.1	127.5	12.4	2%	98%
#4	4.75	115.1	186.5	71.4	14%	86%
#10	2.00	115.1	144.7	29.6	19%	81%
#40	0.425	115.1	127.2	12.1	21%	79%
#200	0.075	115.1	411.2	296.1	72%	28%
Pan	0	115.1	282.0	166.9	100%	0%
		Total Weight of Sample (g)		588.5		

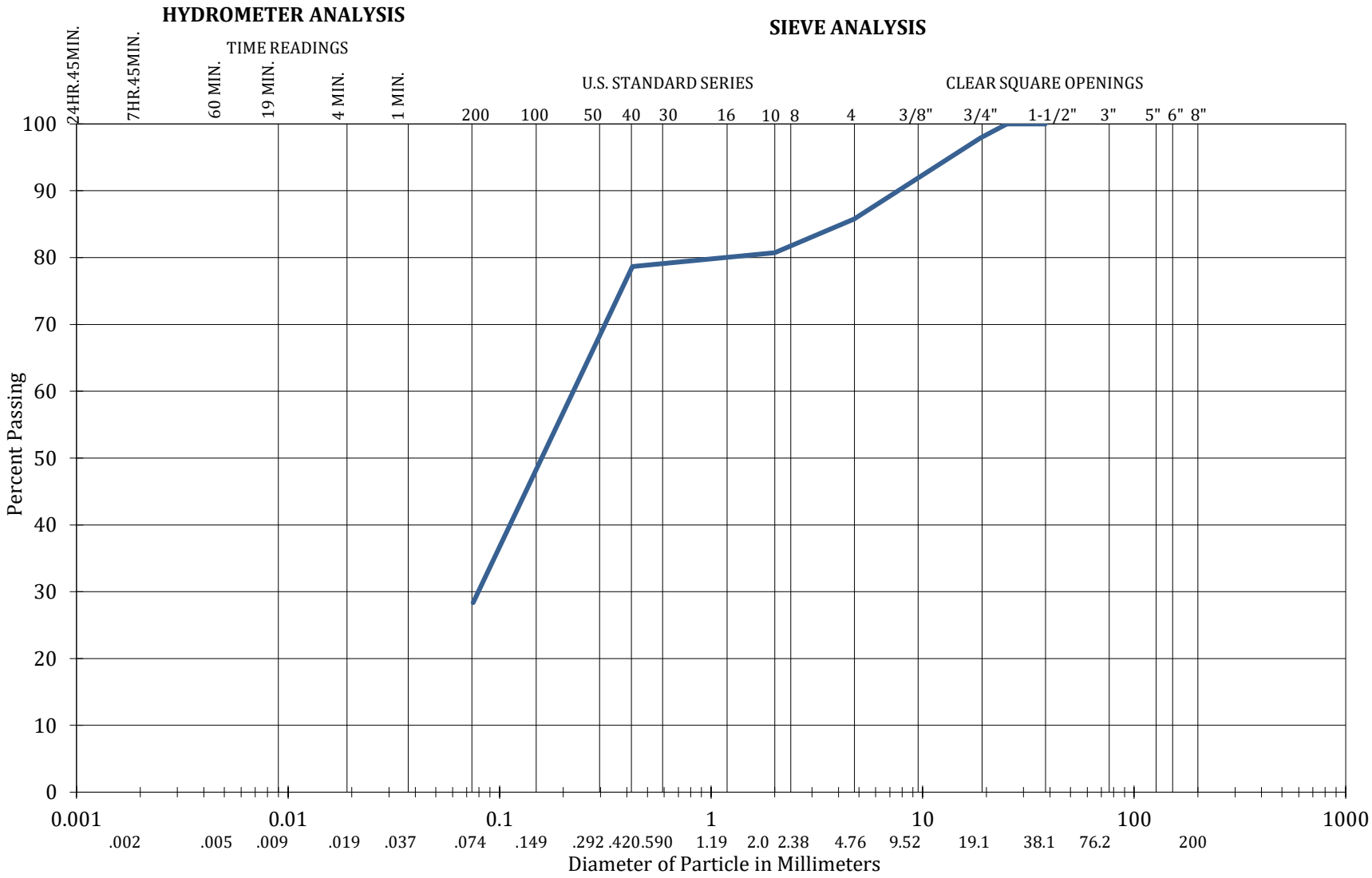
Moisture Content	
Wet Wt + Tare (g)	770.5
Dry Wt. + Tare (g)	702.3
Wt of Water (g)	68.2
Tare Wt. (g)	113.8
Dry Wt. (g)	588.5
Moisture Content	11.6%
Wash	
Wet Wt. + Tare (g)	770.5
Pre Wash Dry (g)	588.5
Post Wash Dry (g)	421.6
Tare Wt. (g)	113.8
Wt.Of Minus #200 =	166.9

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Brown Sandy Clay

Sampled By:	PG
Date:	
Tested By:	AP
Date:	12/7/2005

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

BH1-5

Lot 58 Grand View Lodges

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Sample ID: BH1-6 Depth (ft): 45'-47'

Unified Soils Classification
SC (Clayey Sand)

Gravel	0%
Sand	66%
Fines	34%

Liquid Limit:	30
Plastic Limit:	6
Plasticity Index:	24

In-Situ Moisture Content	19.3%

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.7	110.7	0.0	0%	100%
1"	25	110.7	110.7	0.0	0%	100%
3/4"	18.75	110.7	110.7	0.0	0%	100%
#4	4.75	110.7	110.7	0.0	0%	100%
#10	2.00	110.7	110.7	0.0	0%	100%
#40	0.425	110.7	129.9	19.2	2%	98%
#200	0.075	110.7	622.1	511.4	66%	34%
Pan	0	110.7	382.8	272.1	100%	0%
		Total Weight of Sample (g)		802.7		

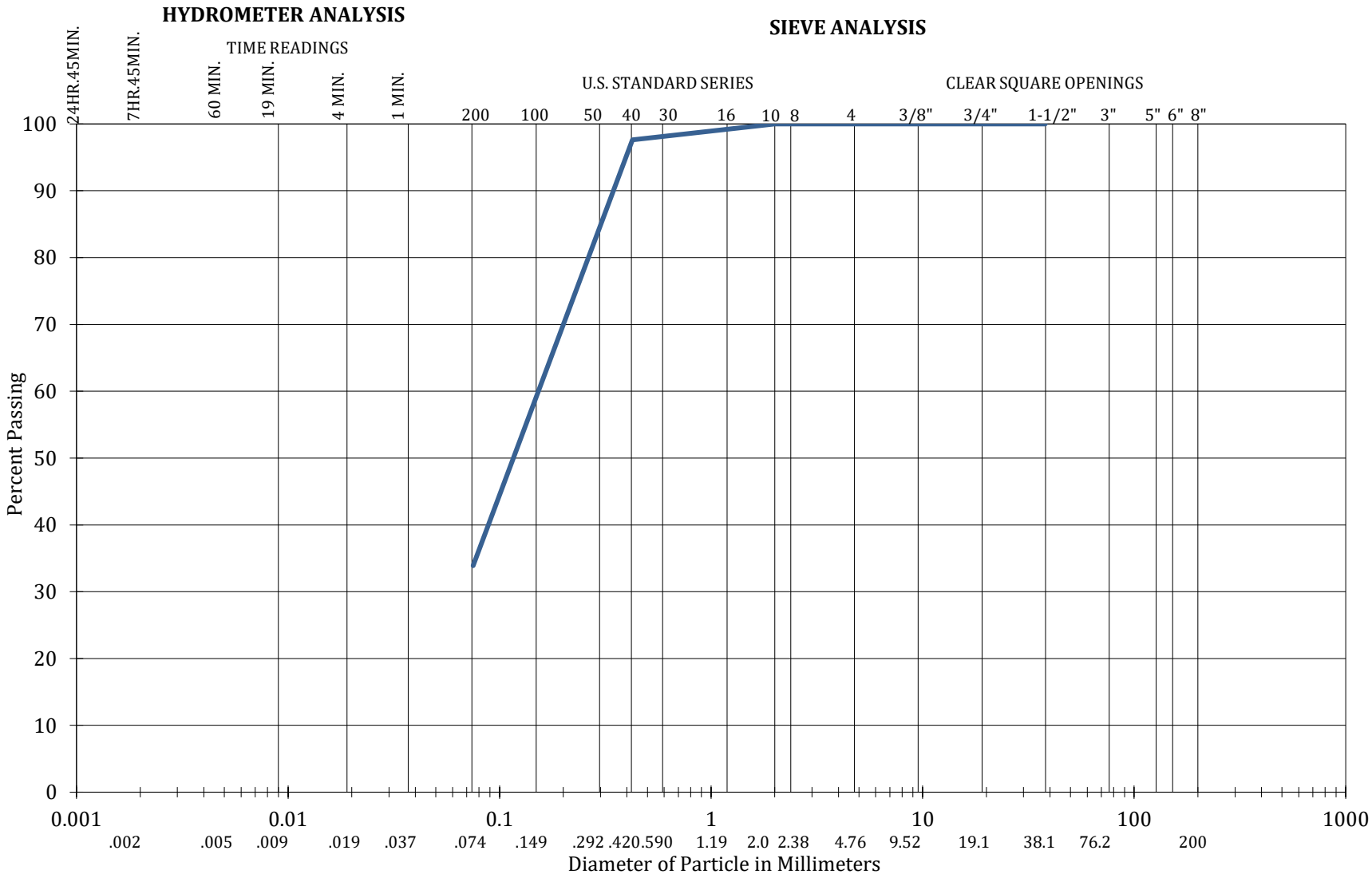
Moisture Content	
Wet Wt + Tare (g)	1067.4
Dry Wt. + Tare (g)	912.6
Wt of Water (g)	154.8
Tare Wt. (g)	109.9
Dry Wt. (g)	802.7
Moisture Content	19.3%
Wash	
Wet Wt. + Tare (g)	1067.4
Pre Wash Dry (g)	802.7
Post Wash Dry (g)	530.6
Tare Wt. (g)	109.9
Wt.Of Minus #200 =	272.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Brown Clayey Sand

Sampled By:	PG
Date:	
Tested By:	AP
Date:	12/7/2005

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

BH1-6

Lot 58 Grand View Lodges

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Sample ID: BH5 @ 23'-28' Depth (ft): 23'-28'

Unified Soils Classification
SC (Clayey Sand)

Gravel	7%
Sand	55%
Fines	38%

Liquid Limit:	29
Plastic Limit:	4
Plasticity Index:	25

In-Situ Moisture Content	N/A

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.1	110.1	0.0	0%	100%
1"	25	110.1	110.1	0.0	0%	100%
3/4"	18.75	110.1	110.1	0.0	0%	100%
#4	4.75	110.1	147.1	37.0	7%	93%
#10	2.00	110.1	134.6	24.5	11%	89%
#40	0.425	110.1	145.4	35.3	18%	82%
#200	0.075	110.1	343.2	233.1	62%	38%
Pan	0	110.1	316.3	206.2	100%	0%
		Total Weight of Sample (g)		536.1		

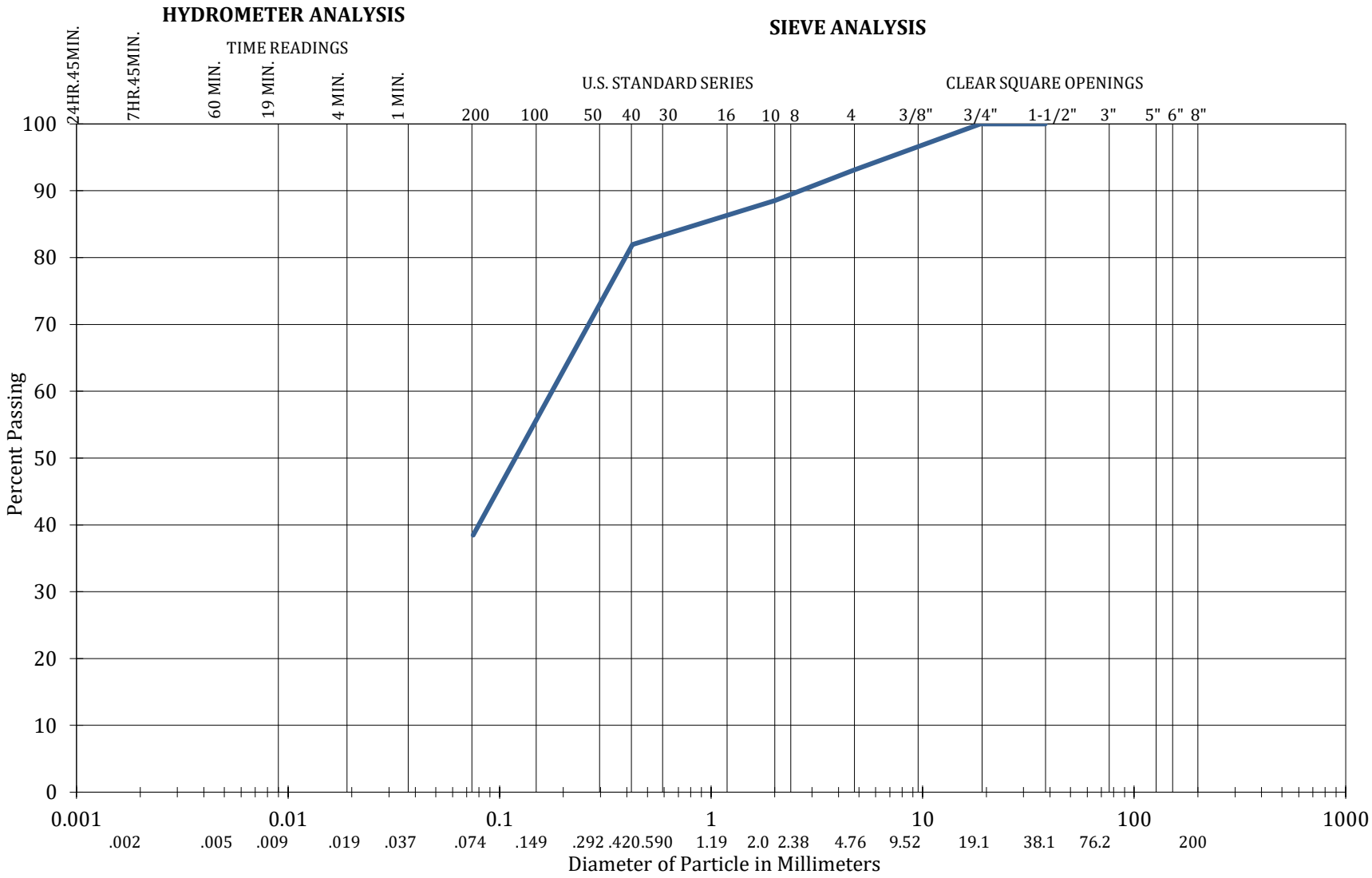
Moisture Content	
Wet Wt + Tare (g)	-
Dry Wt. + Tare (g)	-
Wt of Water (g)	-
Tare Wt. (g)	-
Dry Wt. (g)	-
Moisture Content	-
Wash	
Wet Wt. + Tare (g)	
Pre Wash Dry (g)	536.1
Post Wash Dry (g)	329.9
Tare Wt. (g)	109.9
Wt.Of Minus #200 =	206.2

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Tan Clayey Sand with Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	1/8/2005

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

BH5 @ 23'-28'

Lot 58 Grand View Lodges

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Sample ID: BH5 @ 37'-41' Depth (ft): 37'-41'

Unified Soils Classification
SC (Clayey Sand)

Gravel	7%
Sand	68%
Fines	25%

Liquid Limit:	28
Plastic Limit:	12
Plasticity Index:	16

In-Situ Moisture Content	N/A

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.1	110.1	0.0	0%	100%
1"	25	110.1	110.1	0.0	0%	100%
3/4"	18.75	110.1	110.1	0.0	0%	100%
#4	4.75	110.1	163.8	53.7	7%	93%
#10	2.00	110.1	139.7	29.6	11%	89%
#40	0.425	110.1	196.8	86.7	23%	77%
#200	0.075	110.1	502.4	392.3	75%	25%
Pan	0	110.1	298.2	188.1	100%	0%
		Total Weight of Sample (g)		750.4		

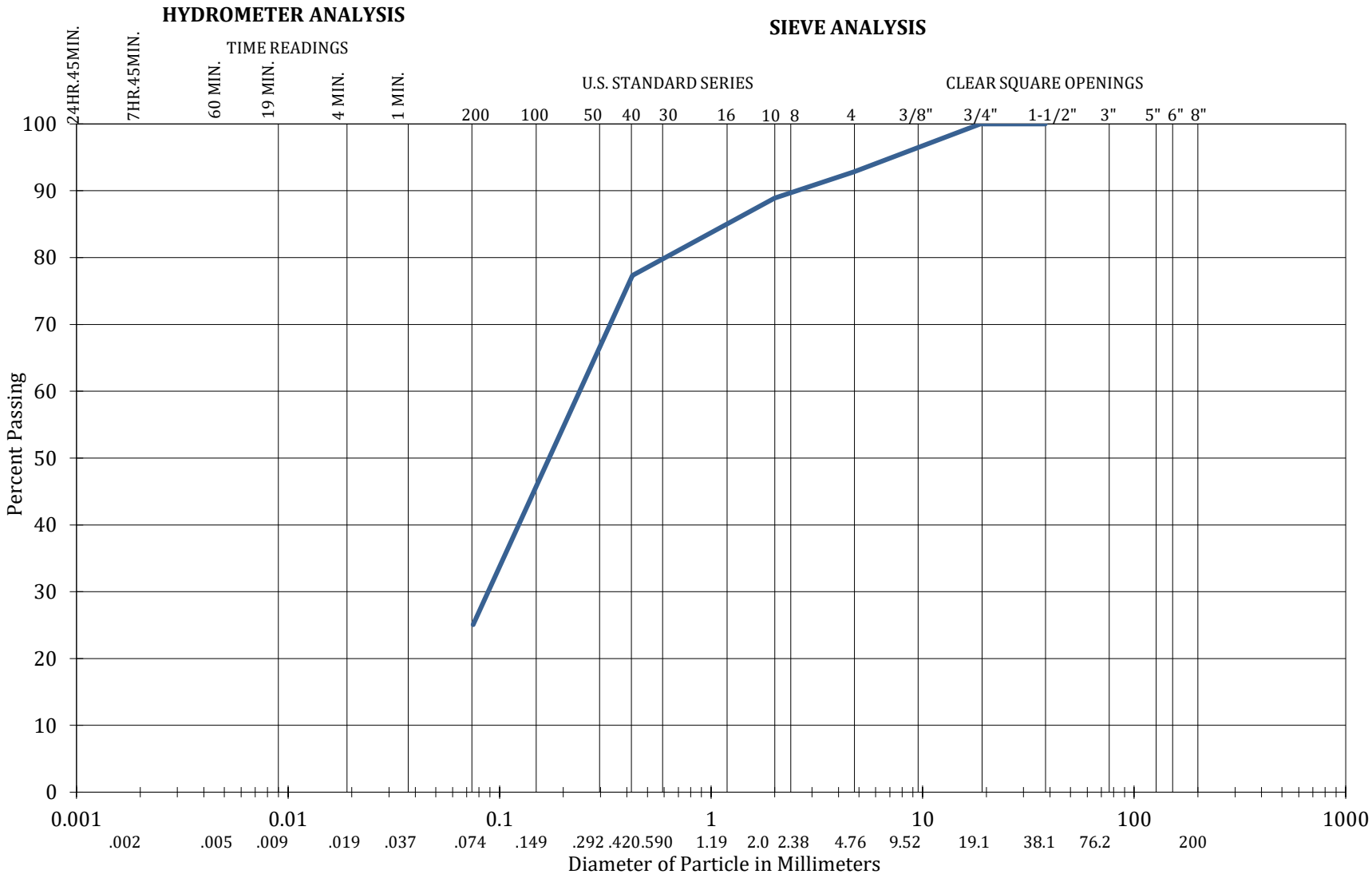
Moisture Content	
Wet Wt + Tare (g)	-
Dry Wt. + Tare (g)	-
Wt of Water (g)	-
Tare Wt. (g)	-
Dry Wt. (g)	-
Moisture Content	-
Wash	
Wet Wt. + Tare (g)	
Pre Wash Dry (g)	750.4
Post Wash Dry (g)	562.3
Tare Wt. (g)	114.3
Wt.Of Minus #200 =	188.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Gray Clayey Sand with Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	1/8/2005

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

BH5 @ 37'-41'

Lot 58 Grand View Lodges

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Sample ID: BH6-4B Depth (ft): 22'-23'

Unified Soils Classification
Lean Clay, CL

Gravel	**0%**
Sand	**12%**
Fines	**87%**

Liquid Limit:	**33**
Plastic Limit:	**15**
Plasticity Index:	**18**

In-Situ Moisture Content	**17.5%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.2	292.2	0.0	0%	100%
1"	25	292.2	292.2	0.0	0%	100%
3/4"	18.75	292.2	292.2	0.0	0%	100%
3/8"	9.5	292.2	292.2	0.0	0%	100%
#4	4.75	292.2	293.3	1.0	0%	100%
#10	2.00	292.2	293.3	1.1	1%	99%
#40	0.425	292.2	304.0	11.8	5%	95%
#100	0.15	292.2	301.3	9.1	9%	91%
#200	0.075	292.2	303.4	11.2	13%	87%
Pan	0	292.2	527.4	235.2	100%	0%
		Total Weight of Sample (g)		**269.3**		

Moisture Content	
Wet Wt + Tare (g)	940.7
Dry Wt. + Tare (g)	825.9
Wt of Water (g)	114.8
Tare Wt. (g)	170.9
Dry Wt. (g)	654.9
Moisture Content	17.5%
Wash	
Wet Wt. + Tare (g)	940.7
Pre Wash Dry (g)	269.3
Post Wash Dry (g)	34.2
Tare Wt. (g)	292.2
Wt.Of Minus #200 =	235.2

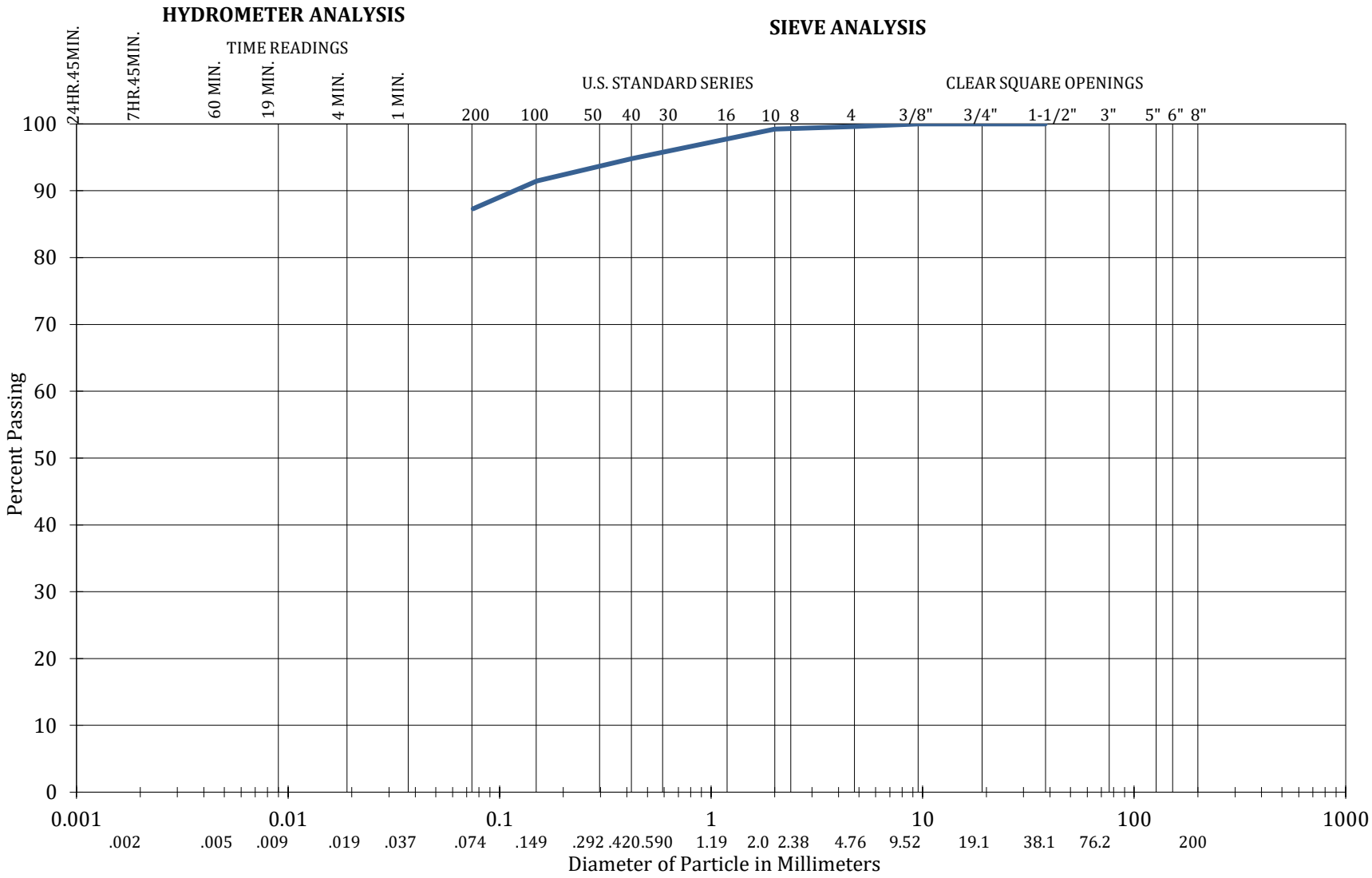
Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Olive Green Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/2/2021

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

BH6-4B

Lot 58 Grand View Lodges

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Sample ID: BH6-11 Depth (ft): 52'-53'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**9%**
Sand	**25%**
Fines	**66%**

Liquid Limit:	**25**
Plastic Limit:	**11**
Plasticity Index:	**14**

In-Situ Moisture Content	**16.5%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	171.0	171.0	0.0	0%	100%
1"	25	171.0	171.0	0.0	0%	100%
3/4"	18.75	171.0	171.0	0.0	0%	100%
3/8"	9.5	171.0	205.5	34.5	5%	95%
#4	4.75	171.0	206.3	35.3	9%	91%
#10	2.00	171.0	231.4	60.4	17%	83%
#40	0.425	171.0	226.7	55.7	25%	75%
#100	0.15	171.0	200.2	29.2	29%	71%
#200	0.075	171.0	213.6	42.7	34%	66%
Pan	0	171.0	661.8	490.9	100%	0%
		Total Weight of Sample (g)		**748.7**		

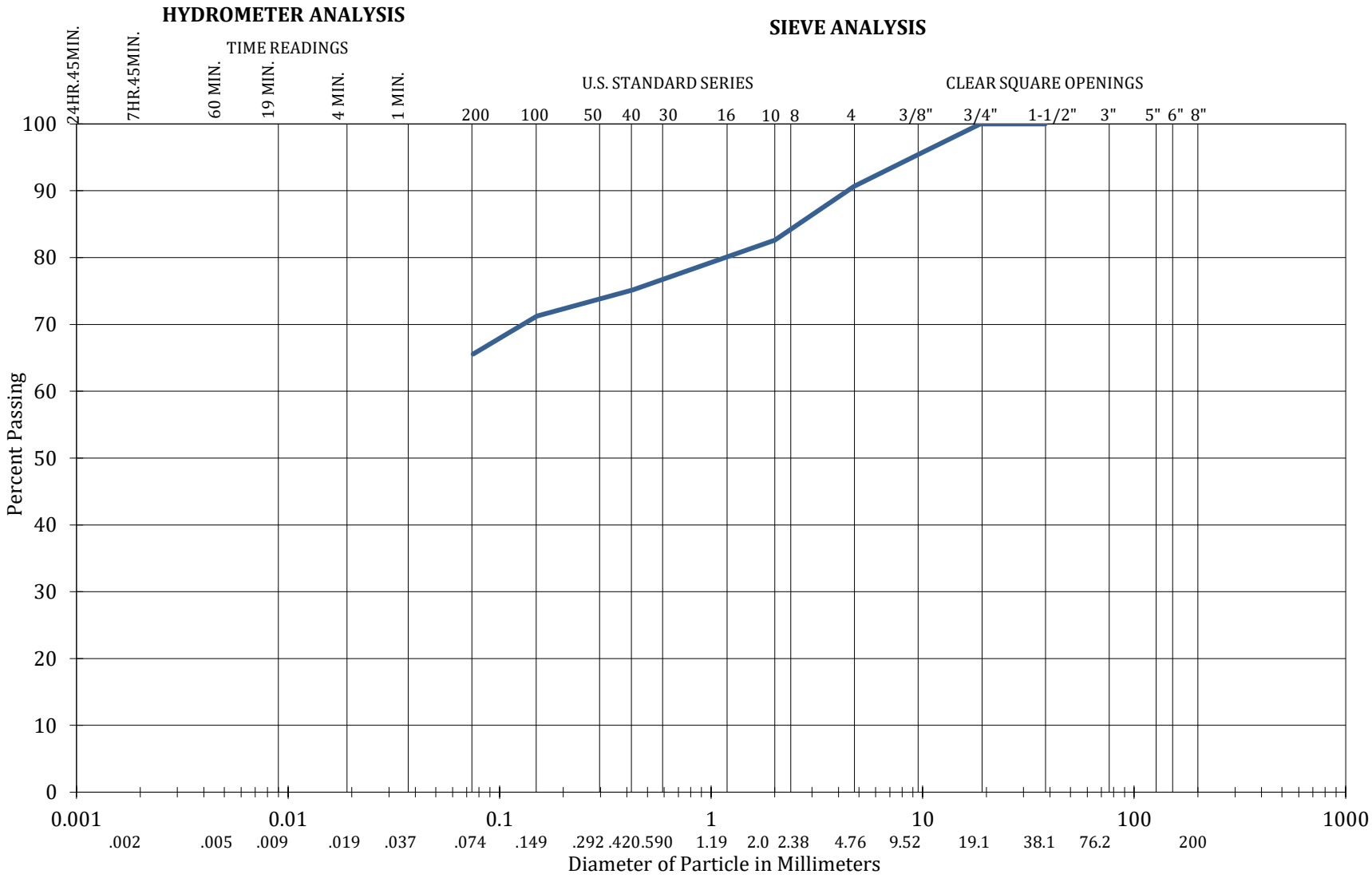
Moisture Content	
Wet Wt + Tare (g)	851.2
Dry Wt. + Tare (g)	754.8
Wt of Water (g)	96.4
Tare Wt. (g)	170.8
Dry Wt. (g)	584.0
Moisture Content	16.5%
Wash	
Wet Wt. + Tare (g)	851.2
Pre Wash Dry (g)	748.7
Post Wash Dry (g)	257.8
Tare Wt. (g)	170.4
Wt.Of Minus #200 =	490.9

Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Sandy Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/7/2021

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

BH6-11

Lot 58 Grand View Lodges

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Sample ID: BH7-4 Depth (ft): 19'-20'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**9%**
Sand	**27%**
Fines	**64%**

Liquid Limit:	**25**
Plastic Limit:	**14**
Plasticity Index:	**11**

In-Situ Moisture Content	**13.2%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.3	292.3	0.0	0%	100%
1"	25	292.3	292.3	0.0	0%	100%
3/4"	18.75	292.3	292.3	0.0	0%	100%
3/8"	9.5	292.3	301.7	9.5	3%	97%
#4	4.75	292.3	307.6	15.4	9%	91%
#10	2.00	292.3	310.8	18.5	16%	84%
#40	0.425	292.3	311.2	18.9	23%	77%
#100	0.15	292.3	306.4	14.1	28%	72%
#200	0.075	292.3	313.4	21.1	36%	64%
Pan	0	292.3	467.0	174.8	100%	0%
		Total Weight of Sample (g)		**272.2**		

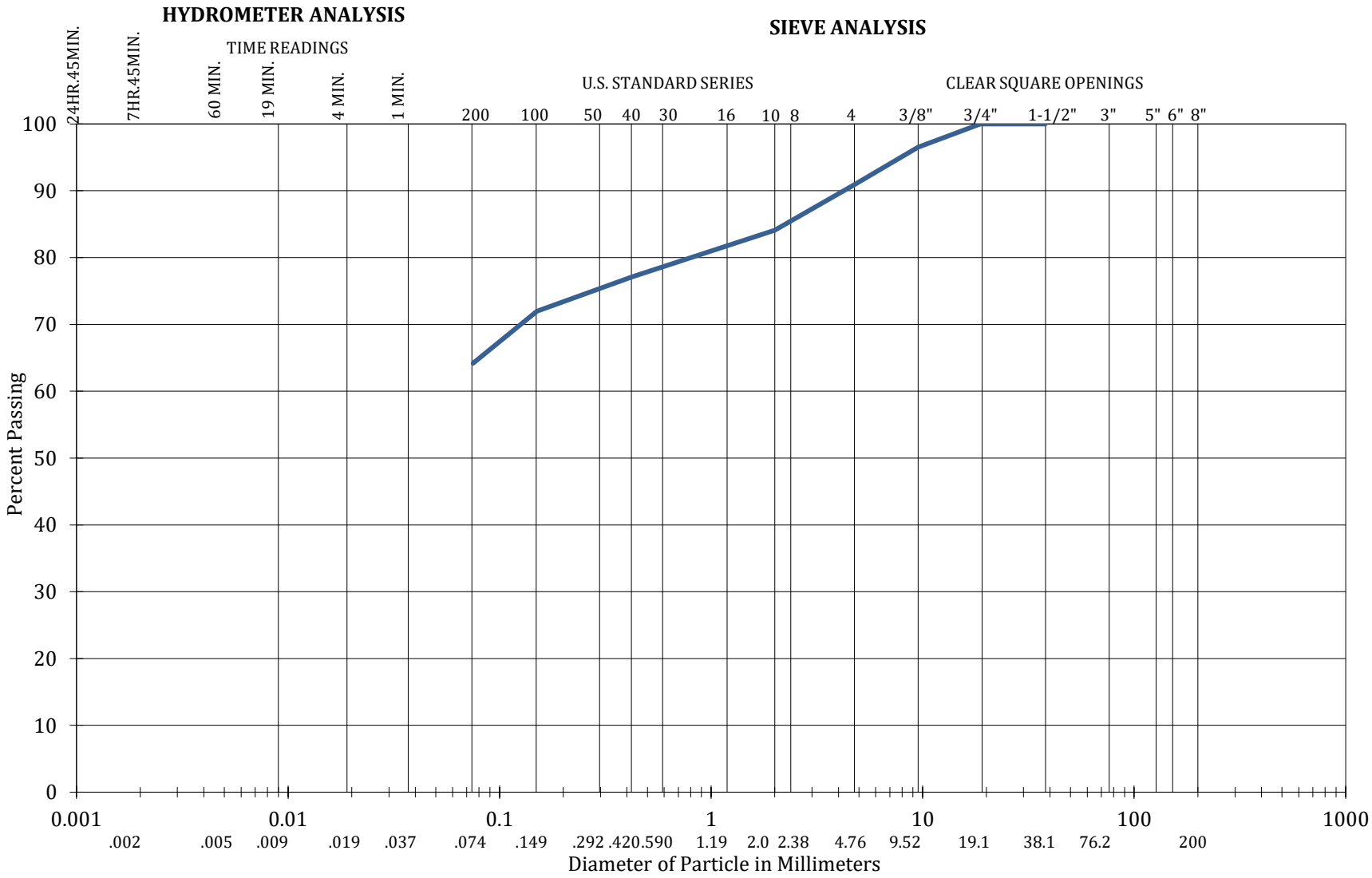
Moisture Content	
Wet Wt + Tare (g)	1193.5
Dry Wt. + Tare (g)	1074.5
Wt of Water (g)	118.9
Tare Wt. (g)	170.9
Dry Wt. (g)	903.7
Moisture Content	13.2%
Wash	
Wet Wt. + Tare (g)	1193.5
Pre Wash Dry (g)	272.2
Post Wash Dry (g)	97.5
Tare Wt. (g)	292.3
Wt.Of Minus #200 =	174.8

Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Sandy Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/2/2021

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USCS CLASSIFICATION SIEVE CHART



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

BH7-4

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH7-6 Depth (ft): 25.5'-26.5'

Unified Soils Classification

Lean Clay with Sand, CL

Gravel	**4%**
Sand	**15%**
Fines	**81%**

Liquid Limit:	**35**
Plastic Limit:	**17**
Plasticity Index:	**18**

In-Situ Moisture Content	**20.6%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.3	292.3	0.0	0%	100%
1"	25	292.3	292.3	0.0	0%	100%
3/4"	18.75	292.3	292.3	0.0	0%	100%
3/8"	9.5	292.3	298.7	6.4	2%	98%
#4	4.75	292.3	297.1	4.8	4%	96%
#10	2.00	292.3	296.7	4.4	5%	95%
#40	0.425	292.3	300.0	7.7	8%	92%
#100	0.15	292.3	302.7	10.4	12%	88%
#200	0.075	292.3	312.9	20.6	19%	81%
Pan	0	292.3	531.7	239.4	100%	0%
		Total Weight of Sample (g)		**293.8**		

Moisture Content	
Wet Wt + Tare (g)	1304.2
Dry Wt. + Tare (g)	1110.3
Wt of Water (g)	193.9
Tare Wt. (g)	170.6
Dry Wt. (g)	939.7
Moisture Content	20.6%
Wash	
Wet Wt. + Tare (g)	1304.2
Pre Wash Dry (g)	293.8
Post Wash Dry (g)	54.4
Tare Wt. (g)	292.3
Wt.Of Minus #200 =	239.4

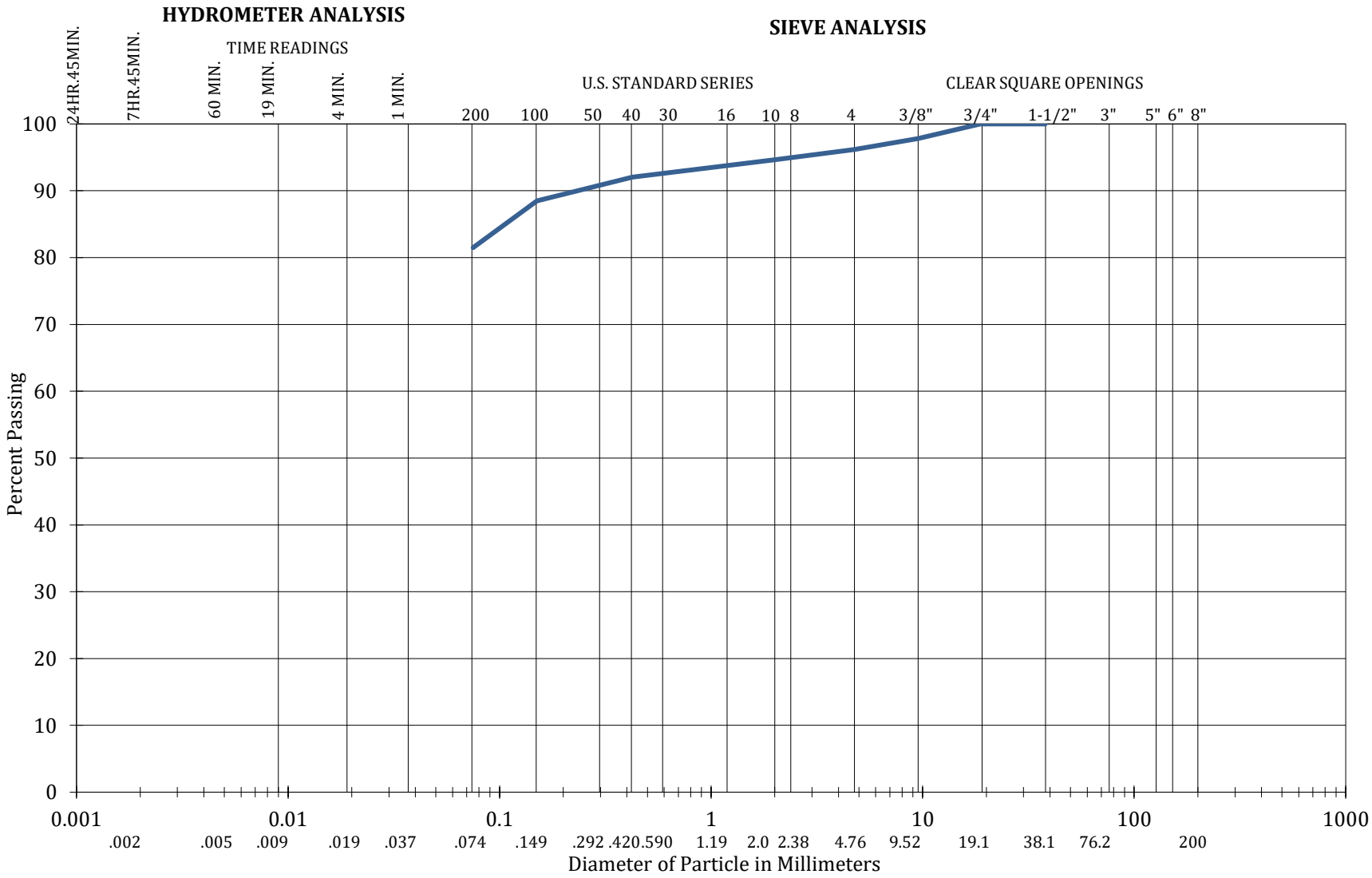
Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/1/2021

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USCS CLASSIFICATION SIEVE CHART

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

BH7-6

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH7-13 Depth (ft): 59'-60'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**11%**
Sand	**22%**
Fines	**67%**

Liquid Limit:	**29**
Plastic Limit:	**15**
Plasticity Index:	**14**

In-Situ Moisture Content	**17.9%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.2	292.2	0.0	0%	100%
1"	25	292.2	332.0	39.8	6%	94%
3/4"	18.75	292.2	292.2	0.0	6%	94%
3/8"	9.5	292.2	306.5	14.2	8%	92%
#4	4.75	292.2	311.7	19.4	11%	89%
#10	2.00	292.2	325.3	33.1	16%	84%
#40	0.425	292.2	327.0	34.8	21%	79%
#100	0.15	292.2	319.8	27.6	25%	75%
#200	0.075	292.2	344.3	52.0	33%	67%
Pan	0	292.2	748.9	456.6	100%	0%
		Total Weight of Sample (g)		**677.5**		

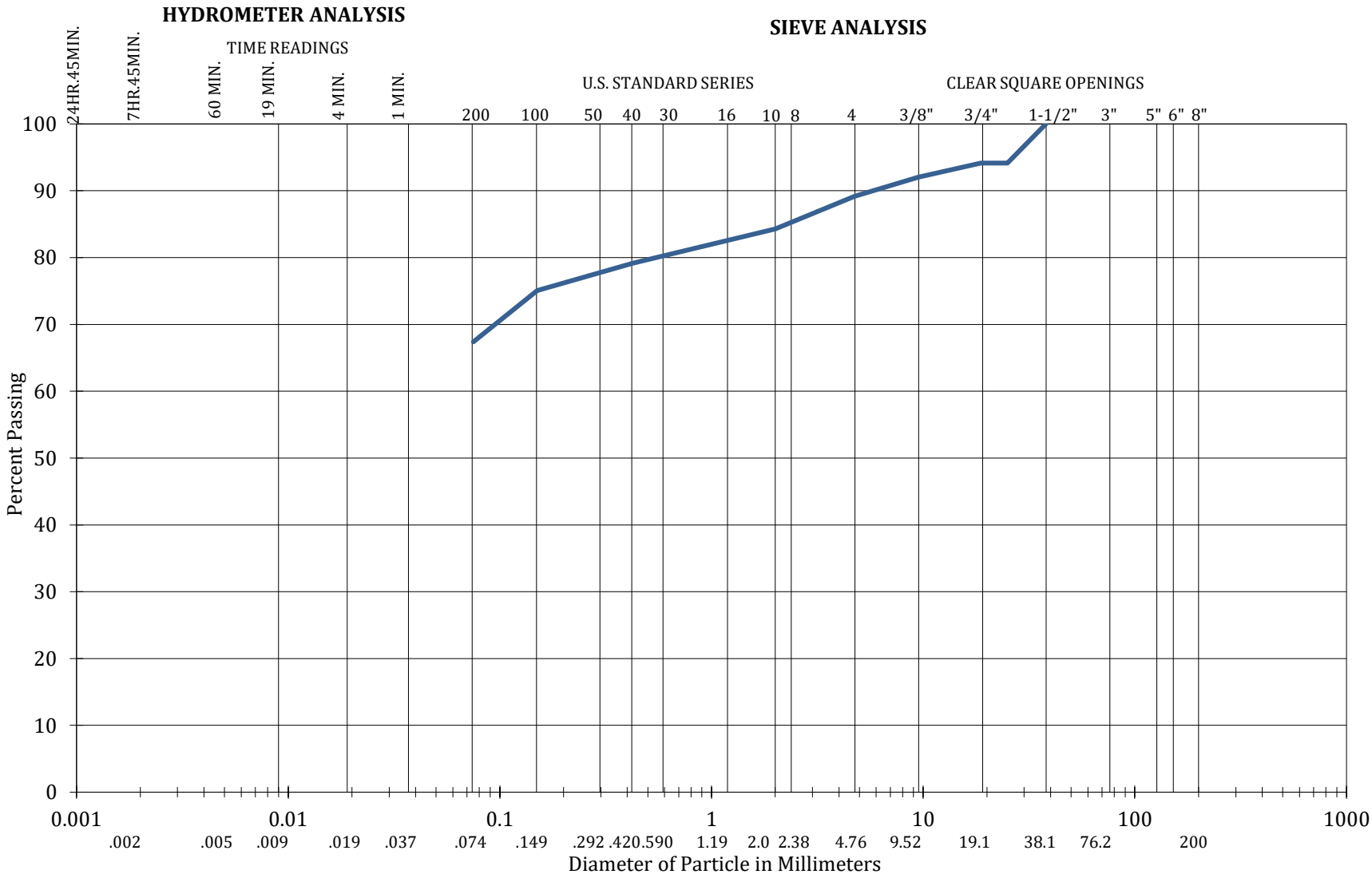
Moisture Content	
Wet Wt + Tare (g)	1000.2
Dry Wt. + Tare (g)	873.8
Wt of Water (g)	126.4
Tare Wt. (g)	169.7
Dry Wt. (g)	704.2
Moisture Content	17.9%
Wash	
Wet Wt. + Tare (g)	1000.2
Pre Wash Dry (g)	677.5
Post Wash Dry (g)	220.9
Tare Wt. (g)	169.7
Wt.Of Minus #200 =	456.6

Project:	Lot 58 Gand View Lodges
Job Number	21-222-02
Visual ID:	Gray Lean Clay with Sand

Sampled By:	AP
Date:	6/25/2021
Tested By:	AE
Date:	7/1/2021

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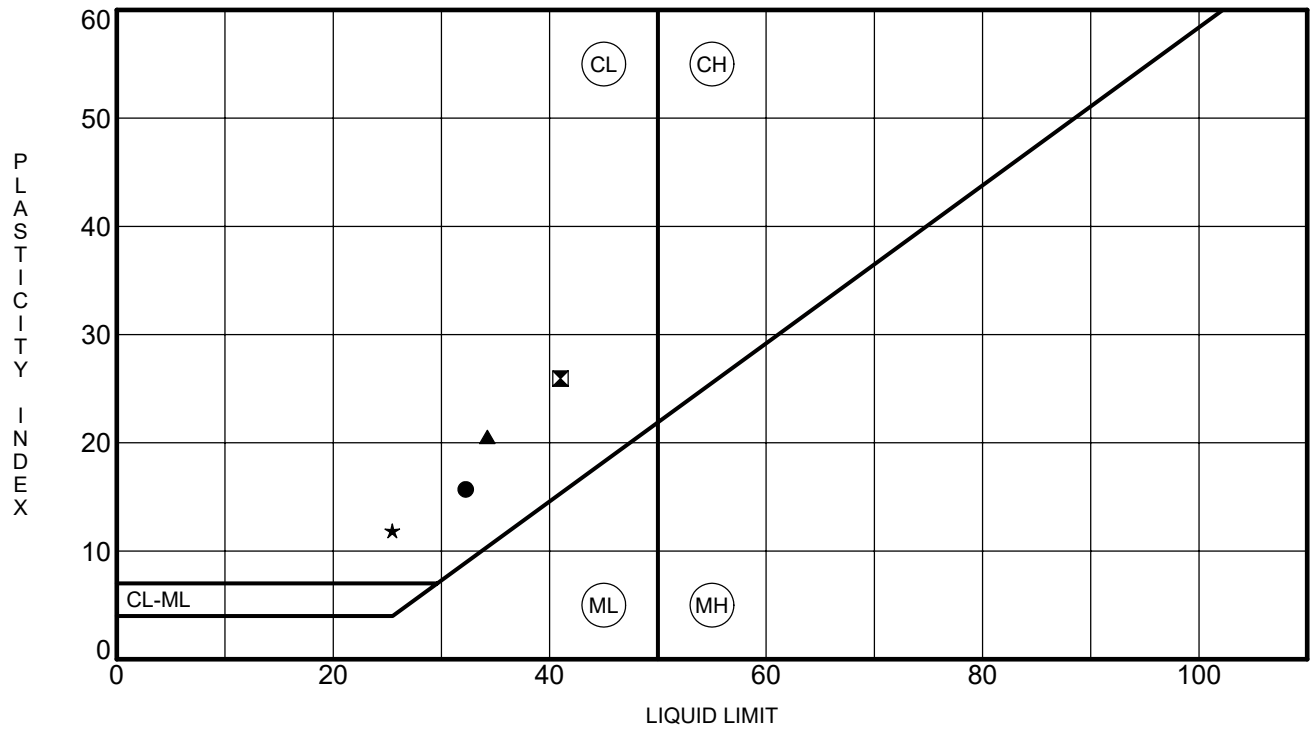
USCS CLASSIFICATION SIEVE CHART



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

BH7-13

Lot 58 Grand View Lodges



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**TP-1**	**9.0**	**32**	**17**	**15**		
⊠	**TP-1**	**10.0**	**41**	**15**	**26**		
▲	**TP-1**	**25.0**	**34**	**14**	**20**		
★	**TP-1**	**27.5**	**25**	**14**	**11**		

Womack & Associates, Inc.
P.O. Box 12650
Jackson, WY 83002
Telephone: (307)733-7209
Fax:

ATTERBERG LIMITS' RESULTS

Project: TOJ - Snow King Water Tank

Location: Jackson, Wyoming

Number:

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX D

Soil-Engineering Parameters

Engineering parameters for site soils were evaluated based on a variety of methods, including:

- direct laboratory testing (shear strength and consolidation),
- correlations with index tests,
- empirical relationships between SPT N-values and shear strength, and
- visual classification and empirical estimates.

Due to the chaotic and random nature of the soils (i.e., mixture of fine-grained and coarse-grained soils), collecting relatively undisturbed shelby tube samples of fine-grained soil layers during the drilling effort to perform shear tests and consolidation tests on was difficult. Therefore, very limited soil parameters for soil unit weight, consolidation values, and shear strength values were directly determined from their respective tests. Most of the samples that underwent lab testing were disturbed samples collected during SPT sampling and sonic drilling, of which their results were used to estimate the soil parameters based on correlations. Jorgensen Geotechnical (JG) was able to submit two relatively undisturbed Shelby tube samples to undergo consolidation testing, while the 2021 Nelson Engineering Report presented shear testing results from five relatively undisturbed Shelby tube samples, which were reviewed.

A discussion regarding the selection of soils parameters is found below.

Soil Unit Weight

Two consolidation tests were performed which produced dry unit weights, while five shear test results presented in the Nelson Engineering report produced dry unit weights. These direct unit weight measurements, SPT blow counts, and observations made in the open test pits were used to estimate the in-situ unit weight of the soils. Estimated unit weights are presented below in Table D-1.

Table D-1: Estimated Soil Unit Weight Values

Soil Layer	Unit Weight (Pounds per cubic foot)
CL – Lean Clay	115
SC – Clayey Sand	120
GC – Clayey Gravel	125
SC – Weathered Bedrock	140

Consolidation Parameters

Two consolidation tests were performed on samples collected during the drilling effort performed by JG. No consolidation tests were presented in the Nelson Engineering or Womack and Associates, reports. Coefficients of consolidation, C_c, were calculated based on the direct consolidated test results, as well as methods recommended by Skempton (1944), Nagaraj and Murthy (1985), Wroth and Wood (1978), and Kulhawy and Mayne (1990). These calculation methods use index properties such as the Liquid Limit and the Plasticity Index to estimate the coefficients of consolidation. The results presented below are the average of all C_c, values calculated from the direct results and correlation calculations.

Table D-2: Estimated Coefficients of Consolidation

Soil Layer	Coefficient of Consolidation
CL – Clay	0.20
SC – Clayey Sand	0.18
GC – Clayey Gravel	0.16

Strength Parameters

Internal Friction Angle (phi)

Strength parameters used in the slope stability model were selected by examining direct shear results, calculations based on SPT blow count values, as recommended by Hatanaka and Uchida (1996) and Schmertmann (1975), and calculated based on index properties as recommended by Duncan (1989). Minimum, maximum, and average internal friction angles (phi) are summarized in the table below.

Table D-3: Estimated Internal Friction Values (Degrees)

	Minimum	Maximum	Average	Standard Deviation	Selected phi[1]
CL – Clay	30.0	56.3	37.3	7.2	35
SC – Clayey Sand	27.5	54.2	37.9	9.4	37
GC – Clayey Gravel	29.0	63.3	47.5	9.7	40
SC – Weathered Bedrock	--	--	--	--	60

1. Dashes indicate a refusal condition was met during SPT samples, therefore phi value was estimated

As summarized in the table above, the minimum and maximum calculated internal friction angles for a single soil layer sometimes varied by over 20-degrees. Therefore, internal friction angles were selected by reviewing all calculated values, as well as reviewing suggested values in Chapter 9 of the Pit Slope Manual (1982).

Soils that have undergone movement are assumed to be in a residual strength state; i.e., weaker than the strength of the soils prior to the movement. Though the published geologic maps and our observations in the field classified the origin of the soils as landslide debris, no direct shear zones were observed and no signs of previous shearing (i.e., slickensides) were observed. Additionally, loess, typically formed from windblown glacial silt, was observed overlying the landslide deposit, therefore it is assumed the landslide occurred prior to or during the Pinedale Glaciation approximately 10 to 30 thousand years ago. If the soils observed in the boreholes and test pits were once in a residual state following failure, it is assumed since their mobilization in the failure event, they have been naturally consolidating and therefore regaining strength. Therefore, residual shear strengths were not used for the slope stability model and peak shear strengths were used.

Cohesion

Cohesion was added to the material models in the slope stability model to avoid selecting slip surfaces representing the “infinite slope” solution. Cohesion values used in the slope stability models can be found in Appendix F.

Compression Index (C_c) Calculation Spreadsheet

							Skempton	*Nagaraj*	*Wroth*	*Kulhawy*				
Project	**BH**	**Depth**	**LL**	**PL**	**PI**	**Consol Results**	**Compression Index (Cc)**				**Average**	**Median**	**Std Dev**	**Classification**
Bear Development - Snow King Loop Lots 53 and 58	JG-10	12.5-14.0	39	15	24	0.17	*0.26*	*0.24*	*0.32*	*0.32*	0.29	0.29	0.04	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-10	17.5-19.0	32	14	18	0.13	*0.20*	*0.20*	*0.24*	*0.24*	0.22	0.22	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	18-19	31	16	15		*0.19*	*0.19*	*0.20*	*0.20*	0.20	0.20	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	27-29	28	16	12		*0.16*	*0.18*	*0.16*	*0.16*	0.17	0.16	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	54.5-57	33	15	18		*0.21*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	67-69	26	16	10		*0.14*	*0.16*	*0.14*	*0.14*	0.14	0.14	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	72.5-75	38	17	21		*0.25*	*0.24*	*0.28*	*0.28*	0.26	0.27	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	7-8.5	20	15	5		*0.09*	*0.13*	*0.07*	*0.07*	0.09	0.08	0.03	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-02	14.5-16	31	15	16		*0.19*	*0.19*	*0.22*	*0.22*	0.20	0.21	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	22-25	29	15	14		*0.17*	*0.18*	*0.19*	*0.19*	0.18	0.19	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	32-35	21	16	5		*0.10*	*0.13*	*0.07*	*0.07*	0.09	0.08	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	38.5-40	29	17	12		*0.17*	*0.18*	*0.16*	*0.16*	0.17	0.17	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	52-55	16	4	12		*0.05*	*0.10*	*0.16*	*0.16*	0.12	0.13	0.05	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	60-62	37	23	14		*0.24*	*0.23*	*0.19*	*0.19*	0.21	0.21	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	64.5-67	31	17	14		*0.19*	*0.19*	*0.19*	*0.19*	0.19	0.19	0.00	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-02	69.5-72	21	16	5		*0.10*	*0.13*	*0.07*	*0.07*	0.09	0.08	0.03	SC
Bear Development - Snow King Loop Lots 53 and 58	JG-03	4.5-7	33	14	19		*0.21*	*0.21*	*0.26*	*0.26*	0.23	0.23	0.03	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-03	14.5-17	30	15	15		*0.18*	*0.19*	*0.20*	*0.20*	0.19	0.20	0.01	SC
Bear Development - Snow King Loop Lots 53 and 58	JG-03	22-25	35	15	20		*0.23*	*0.22*	*0.27*	*0.27*	0.25	0.25	0.03	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-03	30-33	29	15	14		*0.17*	*0.18*	*0.19*	*0.19*	0.18	0.19	0.01	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-04	7-8.5	34	16	18		*0.22*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-04	14.5-17	19	14	5		*0.08*	*0.12*	*0.07*	*0.07*	0.08	0.07	0.02	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-04	22-25	31	17	14		*0.19*	*0.19*	*0.19*	*0.19*	0.19	0.19	0.00	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-04	30-33	33	15	18		*0.21*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-10	7.5-9	25	16	9		*0.14*	*0.16*	*0.12*	*0.12*	0.13	0.13	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-10	15-17	38	21	17		*0.25*	*0.24*	*0.23*	*0.23*	0.24	0.23	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-11	7.5-9	22	15	7		*0.11*	*0.14*	*0.09*	*0.09*	0.11	0.10	0.02	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-12	5-6.5	27	15	12		*0.15*	*0.17*	*0.16*	*0.16*	0.16	0.16	0.01	GC
Bear Development - Snow King Loop Lots 53 and 58	JG-12	10-11.5	27	17	10		*0.15*	*0.17*	*0.14*	*0.14*	0.15	0.14	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-12	20-21.5	26	14	12		*0.14*	*0.16*	*0.16*	*0.16*	0.16	0.16	0.01	SC
Nelson 53&58	BH1	29.75	27	12	15		*0.15*	*0.17*	*0.20*	*0.20*	0.18	0.19	0.02	SC
Nelson 53&58	BH1	40	19	4	15		*0.08*	*0.12*	*0.20*	*0.20*	0.15	0.16	0.06	SC
Nelson 53&58	BH1	45	30	6	24		*0.18*	*0.19*	*0.32*	*0.32*	0.25	0.26	0.08	SC
Nelson 53&58	BH5	23	29	4	25		*0.17*	*0.18*	*0.34*	*0.34*	0.26	0.26	0.09	SC
Nelson 53&58	BH5	37	18	2	16		*0.07*	*0.11*	*0.22*	*0.22*	0.15	0.16	0.07	SC
Nelson 53&58	BH6	22	33	15	18		*0.21*	*0.21*	*0.24*	*0.24*	0.23	0.23	0.02	CL
Nelson 53&58	BH6	52	25	11	14		*0.14*	*0.16*	*0.19*	*0.19*	0.17	0.17	0.03	CL
Nelson 53&58	BH7	19	25	14	11		*0.14*	*0.16*	*0.15*	*0.15*	0.15	0.15	0.01	CL
Nelson 53&58	BH7	25.5	35	17	18		*0.23*	*0.22*	*0.24*	*0.24*	0.23	0.23	0.01	CL
Nelson 53&58	BH7	59	29	15	14		*0.17*	*0.18*	*0.19*	*0.19*	0.18	0.19	0.01	CL
Womack Water Tank	TP-1	9	32	17	15		*0.20*	*0.20*	*0.20*	*0.20*	0.20	0.20	0.00	CL
Womack Water Tank	TP-1	10	41	15	26		*0.28*	*0.26*	*0.35*	*0.35*	0.31	0.32	0.05	CL
Womack Water Tank	TP-1	25	34	14	20		*0.22*	*0.21*	*0.27*	*0.27*	0.24	0.24	0.03	CL
Womack Water Tank	TP-1	27.5	25	14	11		*0.14*	*0.16*	*0.15*	*0.15*	0.15	0.15	0.01	CL

Phi Calculation Spreadsheet

Shear Strength Correlation Summary - Peak Friction Angle

					Hatanaka and Uchida (1996)	*Schmertmann (1975)*						Duncan, 1989							
Project	**BH**	**Sample**	**Depth (ft)**	**(N1)60**	**Peak Phi (N160)**	**Peak Phi (N160)**	**Phi (Direct Shear)**	**LL**	**PI**	**Overburden**	**% Clay**	**Peak Phi**	**Classification**	**Unit Weight (pcf)**	**Cohesion**	**Min**	**Max**	**Average**	**Std Dev**
Bear Dev - 53&58	**JG-01**	**D-8**	18	--	--	--		31	15			34	CL	115	0	24.0	26.0	25.0	1.4
Bear Dev - 53&58	**JG-01**	**D-12**	27	38	47	53		28	12			35	CL	115	0				
Bear Dev - 53&58	**JG-01**	**D-17**	37	94	63	60				4300	7		GC	120	0	31.0	32.0	31.5	0.7
Bear Dev - 53&58	**JG-01**	**D-26**	47	84	61	59							GC	120	0				
Bear Dev - 53&58	**JG-01**	**D-27**	54.5	--	-	-		33	18			32	CL	115	0				
Bear Dev - 53&58	**JG-01**	**D-31**	67	56	53	54							CL	115	0	21.0	27.0	23.7	3.1
Bear Dev - 53&58	**JG-01**	**D-32**	67	--	-	-		26	10			36	CL	115	0				
Bear Dev - 53&58	**JG-01**	**D-36**	72.5	--	-	-		38	21			31	CL	115	0				
Bear Dev - 53&58	**JG-01**	**D-39**	80	35	47	48							GC	120	0				
Bear Dev - 53&58	**JG-02**	**D4**	7	-	-	-		20	5			37	GC	120	0	31.0	31.0	31.0	
Bear Dev - 53&58	**JG-02**	**D8**	14.5	-	-	-		31	16			32	CL	115	0				
Bear Dev - 53&58	**JG-02**	**D9**	17	6	31	31							CL	110	0				
Bear Dev - 53&58	**JG-02**	**D11**	22	-	-	-		29	14			30	CL	110	0	23.0	31.0	26.0	3.6
Bear Dev - 53&58	**JG-02**	**D13**	27	24	42	47							CL	110	0				
Bear Dev - 53&58	**JG-02**	**D16**	32	-	-	-		21	5			37	CL	110	0				
Bear Dev - 53&58	**JG-02**	**D18**	37	24	42	46		29	12			35	CL	110	0				
Bear Dev - 53&58	**JG-02**	**D22**	44.5	-	-	-				5500	8		GC	125	0	31.0	32.0	31.5	0.7
Bear Dev - 53&58	**JG-02**	**D23**	47	45	50	52							GC	125	0				
Bear Dev - 53&58	**JG-02**	**D26**	52	-	-	-		16	12			35	CL	110	0				
Bear Dev - 53&58	**JG-02**	**D28**	57	45	50	52							CL	125	0				
Bear Dev - 53&58	**JG-02**	**D30**	60	-	-	-		37	14			30	CL	125	0	23.0	26.0	24.0	1.7
Bear Dev - 53&58	**JG-02**	**D32**	64.5	-	-	-		31	14			30	CL	125	0				
Bear Dev - 53&58	**JG-02**	**D33**	67	66	56	56							CL	125	0				
Bear Dev - 53&58	**JG-02**	**D35**	69.5	-	-	-		21	5			37	SC	125	0	31.0	31.0	31.0	
Bear Dev - 53&58	**JG-02**	**D40**	80	59	54	54							SC	125	0				
Bear Dev - 53&58	**JG-03**	**D3**	4.5	-	-	-		33	19				CL	110	0	21.0	21.0	21.0	
Bear Dev - 53&58	**JG-03**	**D4**	7	7	31	33							CL	110	0				
Bear Dev - 53&58	**JG-03**	**D8**	14.5	-	-	-		30	15			34	SC	120	0	24.0	24.0	24.0	
Bear Dev - 53&58	**JG-03**	**D9**	17	33	46	51							SC	120	0				
Bear Dev - 53&58	**JG-03**	**D12**	22	-	-	-		35	20			31	GC	120	0				
Bear Dev - 53&58	**JG-03**	**D14**	27	22	41	45							GC	120	0	23.0	21.0	22.0	1.4
Bear Dev - 53&58	**JG-03**	**D19**	35	17	38	40		29	14			30	GC	120	0				
Bear Dev - 53&58	**JG-04**	**D4**	7	8	33	35		34	18			32	CL	110	0	23.0	23.0	23.0	
Bear Dev - 53&58	**JG-04**	**D8**	14.5	-	-	-		19	5			37	GC	125	0	31.0	31.0	31.0	
Bear Dev - 53&58	**JG-04**	**D9**	17	49	51	55							GC	125	0				
Bear Dev - 53&58	**JG-04**	**D12**	2	-	-	-		31	14			30	CL	115	0	23.0	23.0	23.0	
Bear Dev - 53&58	**JG-04**	**D14**	27	21	40	44							CL	115	0				
Bear Dev - 53&58	**JG-04**	**D17**	30	-	-	-		33	18			32	GC	125	0	23.0	23.0	23.0	
Bear Dev - 53&58	**JG-04**	**D19**	35	83	61	59							GC	125	0				
Bear Dev - 53&58	**JG-10**	**D-1**	2.5	4	29	28		25	9			36	SC	110	0	26.0	26.0	26.0	
Bear Dev - 53&58	**JG-10**	**D-2**	5	11	35	38							CL	110	0				
Bear Dev - 53&58	**JG-10**	**D-3**	7.5	9	33	34							CL	110	0				
Bear Dev - 53&58	**JG-10**	**D-4**	10	18	39	43							CL	115	0				
Bear Dev - 53&58	**JG-10**	**U1**	12.5	-	-	-		39	24			31	CL	110	0	18.0	24.5	21.8	2.4
Bear Dev - 53&58	**JG-10**	**D-5**	15	11	35	37		38	17	4200	36	33	CL	110	0				
Bear Dev - 53&58	**JG-10**	**U2**	17.5	-	-	-		32	18			32	CL	110	0				
Bear Dev - 53&58	**JG-10**	**D-6**	20	14	37	38							CL	110	0				
Bear Dev - 53&58	**JG-11**	**D-1**	2.5	16	43	49							GC	115	0				
Bear Dev - 53&58	**JG-11**	**D-2**	5	50	52	56							GC	125	0				
Bear Dev - 53&58	**JG-11**	**D-3**	7.5	20	40	45		22	7			37	GC	115	0				
Bear Dev - 53&58	**JG-11**	**D-4**	10	16	38	41				3600	17		GC	115	0	31.0	27.0	29.7	2.3
Bear Dev - 53&58	**JG-11**	**D-5**	12.5	33	46	50							GC	125	0				
Bear Dev - 53&58	**JG-11**	**D-6**	15	31	45	49							GC	120	0				
Bear Dev - 53&58	**JG-11**	**D-7**	17.5	79	60	59							GC	125	0				
Bear Dev - 53&58	**JG-11**	**D-8**	19	77	59	59							GC	125	0				
Bear Dev - 53&58	**JG-12**	**D-1**	2.5	5	30	29							GC	110	0				
Bear Dev - 53&58	**JG-12**	**D-2**	5	55	53	57		27	12			35	GC	125	0	26.0	26.0	26.0	
Bear Dev - 53&58	**JG-12**	**D-3**	7.5	78	59	59							GC	125	0				
Bear Dev - 53&58	**JG-12**	**D-4**	10	15	37	40		27	10			36	CL	115	0	27.0	27.0	27.0	
Bear Dev - 53&58	**JG-12**	**D-5**	12.5	17	39	42							CL	115	0				
Bear Dev - 53&58	**JG-12**	**D-6**	15	41	49	53							GC	120	0				
Bear Dev - 53&58	**JG-12**	**D-7**	17.5	45	50	53							GC	120	0	26.0	26.0	26.0	
Bear Dev - 53&58	**JG-12**	**D-8**	20	20	40	43		26	12			35	GC	120	0				
Nelson 53&58	**BH1**	4	29.75	10	32			27	15			34	SC	115					
Nelson 53&58	**BH1**	5	40	30	38			19	15			34	SC	125					
Nelson 53&58	**BH1**	6	45	16	33			30	24			31	SC	120		20	32	26.8333	
Nelson 53&58	**BH5**	-	23	-	-			29	25			30	SC	120					
Nelson 53&58	**BH5**	-	37	-	-			18	16			32	SC	120		20	32	26.5	
Nelson 53&58	**BH6**	4	22	15	32			33	18			32	CL	108.3					
Nelson 53&58	**BH6**	11	52	-	-		37	25	14			30	CL	115		22	30	26.5	
Nelson 53&58	**BH7**	4	19	-	-		41.9	25	11			36	CL	100					
Nelson 53&58	**BH7**	6	25.5	21	35			35	18			32	CL	100.8					
Nelson 53&58	**BH7**	13	59	21	35			29	14			30	CL	113.8		23	31	27.3333	
Womack Water Tank	**TP-1**		9					32	15			34	CL	110					
Womack Water Tank	**TP-1**		10					41	26			30	CL	110					
Womack Water Tank	**TP-1**		25					34	20			31	CL	110					
Womack Water Tank	**TP-1**		27.5					25	11			36	CL	110		20	30	25.625	

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PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX E

Calculations

Settlement Methodology

The settlement calculations assume the soil layer of concern comprises 100% compressible soil by volume. Though, some soils at the site only partially comprise the fine-grained soils by mass, as described in the borehole logs. Based on lab testing and visual classification, the clayey sand soils contain a maximum of 45% fines by mass. To convert the assumed mass to volume, we have used a scaling factor of 1.25, resulting in an assumed percent fines by volume of 55%.

Because the settlement is anticipated to only occur in the potentially compressible, fine-grained soils, the total settlement calculation was reduced by 55%.

Lateral Pressures Methodology

Seismic coefficients were calculated based on recommendation from NCHRP Report 611 “Seismic Analysis and Desing of Retaining Walls, Buried Structures, Slopes and Embankments” and FHWA NHI Course No 130094 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, as described below and illustrated in the equations. For our calculations, we used an average wall height of 30’ to account for the retaining wall at the site, and since the retaining wall is considered a brittle system with negligible allowable displacement, we used an r value of 1 (FHWA, 2011). In summary, the seismic coefficient (ks) is determined by applying a scaling factor (α) to the modified peak ground acceleration (PGAm).

Settlement Calculation Spreadsheet

Project: Bear Development
Project Number: 23072
Engineer: HC
Soil Sample: Average Cc value CL
Scenario: Direclty on poor soil

Settlement analysis of in-situ soil (only analyzing a maximum of 2B worth of soil below footing)

Key:

Manual Input
Calculation

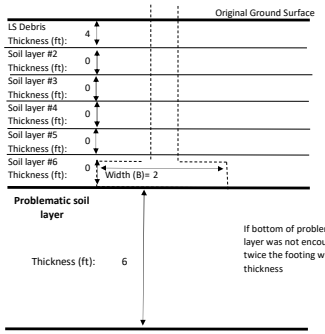
Step 1:

In-Situ Soil Properties of Problematic Soil			
	Soil Description: Lean Clay AF		
	Source of Soil Properties: SK Lab tests		
	Dry unit Weight:	15	pcf
	Moisture Content:	10.0%	
	Moist unit weight:	16.5	pcf
(Avergae 0.4 to 0.7)	Initial Void Ratio (e_0):	0.427	Vv/Vs
(Average 0.2 to 0.5)	Coefficient of Consol. (C_c):	0.2	

Step 2:

Original Overburden Pressure on Soil Element Identified in Step #1			
Soil Layer #1	Unit Weight	135	**PCF**
LS Debris	Thickness	4	**Ft.**
Soil Layer #2	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #3	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #4	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #5	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #6	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Problematic Soil Layer	Unit Weight	125	**PCF**
Below Footing	Thickess (H_0)	6	**Ft.**
Total Original Overburdern Pressure on Soil Element:		915	**PSF**

Pre-construction status. Footing is superimposed.



If bottom of problematic soil layer was not encountered, use twice the footing width for thickness

Step 3:

Foundation Characteristics		
Footing load:	3,000	psf
Estimated Footing Width (B):	2	ft
Footing Depth (D_f):	3	ft
Applied footing load applied to soil element (assuming 2V:1H)	1200	PSF

Step 4:

Backfill Soil Properties		
Dry Unit Weight:	120	pcf
Moisture Content:	12.0%	
Moist Unit Weight:	134.4	pcf
Backfill Depth:	3	ft

Step 5:

Settlement Calculation at Soil Element Identified in Step #2		
Thickness of Problematic Soil Layer (H_0):	6	ft
Depth to soil element below **OG**:	7	ft
Depth to soil element below footing:	3	ft
Original Overburden (σv_0):	915.0	psf
Applied foundation load at soil element :	1200.0	psf
Post Construction pressure at soil element (σv):	1978.2	
Change in presure at soils element:	1063	psf
$(\sigma v_f)/(\sigma v_0)$	2.162	
$Log[(\sigma v_f)/(\sigma v_0)]$	0.335	
$1+e_0$	1.427	
$H_0/(1+e_0)$	4.205	
Inches per foot:	12	
Settlement:	3.38	inches

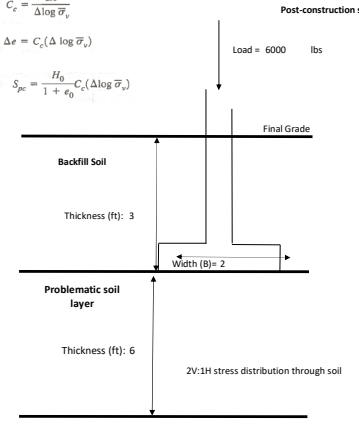
Settlement: $\text{Settlement} = S_{pc} = H_0\left(\frac{\Delta e}{1+e_0}\right)$

Compression Index: $C_c = \frac{\Delta e}{\Delta \log \overline{\sigma}_v}$

Rearranging gives: $\Delta e = C_c(\Delta \log \overline{\sigma}_v)$

Subistituting in gives: $S_{pc} = \frac{H_0}{1+e_0} C_c(\Delta \log \overline{\sigma}_v)$

Post-construction status



This formula is only valid for footings PLACED DIRECTLY ON PROBLEMATIC SOIL LAYER

$$S_{pc} = \frac{H_0}{1+e_0} C_c(\log \overline{\sigma}_{v_f} - \log \overline{\sigma}_{v_o}) = \frac{H_0}{1+e_0}(C_c)\log(\overline{\sigma}_{v_f}/\overline{\sigma}_{v_o})$$

Settlement Calculation Spreadsheet

Project: Bear Development
Project Number: 23072
Engineer: HC
Soil Sample: Average Cc value SC
Scenario: Direclty on poor soil

Settlement analysis of in-situ soil (only analyzing a maximum of 2B worth of soil below footing)

Key:

Manual Input
Calculation

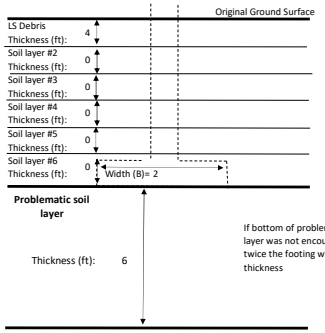
Step 1:

In-Situ Soil Properties of Problematic Soil			
	Soil Description: Lean Clay AF		
	Source of Soil Properties: SK Lab tests		
	Dry unit Weight:	15	pcf
	Moisture Content:	10.0%	
	Moist unit weight:	16.5	pcf
(Avergae 0.4 to 0.7)	Initial Void Ratio (e_0):	0.427	Vv/Vs
(Average 0.2 to 0.5)	Coefficient of Consol. (C_c):	0.18	

Step 2:

Original Overburden Pressure on Soil Element Identified in Step #1			
Soil Layer #1	Unit Weight	135	**PCF**
LS Debris	Thickness	4	**Ft.**
Soil Layer #2	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #3	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #4	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #5	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #6	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Problematic Soil Layer	Unit Weight	125	**PCF**
Below Footing	Thickess (H_0)	6	**Ft.**
Total Original Overburdern Pressure on Soil Element:		915	**PSF**

Pre-construction status. Footing is superimposed.



If bottom of problematic soil layer was not encountered, use twice the footing width for thickness

Step 3:

Foundation Characteristics		
Footing load:	3,000	psf
Estimated Footing Width (B):	2	ft
Footing Depth (D_f):	3	ft
Applied footing load applied to soil element (assuming 2V:1H)	1200	PSF

Step 4:

Backfill Soil Properties		
Dry Unit Weight:	120	pcf
Moisture Content:	12.0%	
Moist Unit Weight:	134.4	pcf
Backfill Depth:	3	ft

Step 5:

Settlement Calculation at Soil Element Identified in Step #2		
Thickness of Problematic Soil Layer (H_0):	6	ft
Depth to soil element below **OG**:	7	ft
Depth to soil element below footing:	3	ft
Original Overburden (σv_0):	915.0	psf
Applied foundation load at soil element :	1200.0	psf
Post Construction pressure at soil element (σv):	1978.2	
Change in presure at soils element:	1063	psf
$(\sigma v_f)/(\sigma v_0)$	2.162	
$Log[(\sigma v_f)/(\sigma v_0)]$	0.335	
$1+e_0$	1.427	
$H_0/(1+e_0)$	4.205	
Inches per foot:	12	
Settlement:	3.04	inches

Note: Maximum % fines by mass 45%. Scaling factor of 1.25 used to assume volume of fines, resulting in 55%.

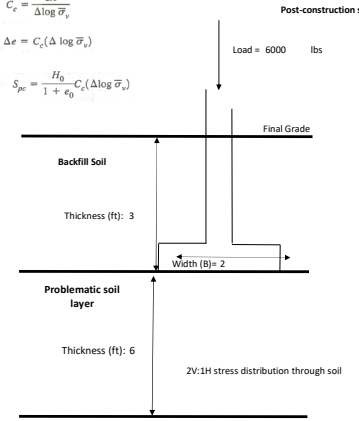
Settlement: $\text{Settlement} = S_{pc} = H_0\left(\frac{\Delta e}{1+e_0}\right)$

Compression Index: $C_c = \frac{\Delta e}{\Delta \log \bar{\sigma}_v}$

Rearranging gives: $\Delta e = C_c(\Delta \log \bar{\sigma}_v)$

Subistituting in gives: $S_{pc} = \frac{H_0}{1+e_0} C_c(\Delta \log \bar{\sigma}_v)$

Post-construction status



This formula is only valid for footings PLACED DIRECTLY ON PROBLEMATIC SOIL LAYER

$$S_{pc} = \frac{H_0}{1+e_0} C_c(\log \bar{\sigma}_{v_f} - \log \bar{\sigma}_{v_o}) = \frac{H_0}{1+e_0}(C_c)\log\left(\bar{\sigma}_{v_f}/\bar{\sigma}_{v_o}\right)$$

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Project Bear Dev | Project No. 23072
Calculated By JBJ | Date 12/20/2023
Sheet 1 of 1

Known:
$F_v = 1.5$
$S_1 = 0.336$
$k_{max} = 0.545$
$H = 30'$
$PGA = 0.454$
$r = 1.0$
$f_a = 1.2$

$\beta = (F_v S_1) / k_{max}$

$\alpha = 1 + 0.01 H [(0.5\beta) - 1]$

$k_s = r PGA \alpha$

$\beta = (1.5)(0.336) / 0.545$

$\boxed{\beta = 0.92}$

$\alpha = 1 + 0.01(30)[(0.5)(0.92) - 1]$

$\boxed{\alpha = 0.838}$

$k_s = (1.0)(0.454)(0.838)$

$k_s = 0.38$

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PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
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APPENDIX F

Slope-Stability Analysis

Slope-Stability Analysis

Methodology

1. **Analyses:** Slope stability analyses were performed using the SLOPE/W stability module of GeoStudio 2023.1.2 version 23.1.2.11, produced by Bentley Systems. The Morgenstern-Price limit equilibrium method, which takes into consideration moment and force equilibrium, was used to analyze slope stability.

   Based on the existing and proposed geometry of the project and the mapped geology, we determined the project area may be subject to potential failure. Therefore, we evaluated each cross-section for existing conditions, proposed conditions, and seismic proposed conditions scenarios.

2. **Geometry:** Two cross-sections for the project were analyzed: Cross sections B-B' and C-C' (Figure 4 and Figure 5). Cross section locations are shown in Figure 2. The Cross Section B-B' Proposed Conditions model includes foundation loads for each housing unit because the applied loads from the buildings foundation elements and the change in geometry were identified as potential items that can affect the factor of safety (FS). The Cross Section C-C' Proposed Conditions also includes foundation loads for each housing unit, as well as the existing retaining wall on Lot 53. We based the external existing geometry on topographic data collected by Jorgensen Associates, Inc., proposed finished grade elevations were taken for the preliminary design documents provided by Hoyt Architects, and we based the internal geometry (material boundaries within the slope) on the results of the subsurface exploration (i.e., borehole and test pit logs), statistical correlations based on published literature, geologic conditions, and our experience with similar soils in the area.

   Subsurface conditions at the site were dominated by chaotically deposited landslide debris consisting of fine-grained Lean Clay (CL) and coarse-grained Clayey Gravels (GC) and Clayey Sands (SC). Often, soil layers identified in the SPT samples didn't correspond to similar soil layers at similar depths in the other boreholes indicating the soil layers were not continuous. To create a subsurface soil model with continuous soil layers, the discrete soil samples were interpolated and often combined between boreholes. Where discrete soil samples of different soil types were combined, an average phi value of the combined samples was applied to the entire soil layer.

3. **Materials:** We estimated the shear strength parameters used in the analyses based on correlation to index tests and direct shear testing from the previous Geotechnical Investigation Report from July 2021, provided by Nelson Engineering. See the discussion in Appendix D regarding development of the soil-engineering parameters. Final parameters used in the stability analysis are summarized below in Table F-1.

   Where two separate soil classifications were combined to one layer (i.e., GC/CL), a unit weight and phi angle were selected using a "weighted average" approach; the boreholes shown on figures 4 and 5 were reviewed and depending on the soil shown in each borehole, a weighted average value was selected.

   We used a Mohr-Coulomb strength model to define the soil parameters. Two parameters are used to describe this strength model: cohesion (c) and friction angle (φ). Cohesion is the soil's shear strength at zero overburden stress, and the friction angle expresses the relationship between overburden stress and shear stress. Mathematically, the shear strength is defined by the equation: $\tau = c + \sigma_n \tan(\varphi)$, where τ is the shear strength and σ_n represents the overburden stress. We used effective stress parameters as the soils are anticipated to drain well.

Table F-1: Soil Parameters Used for Slope Stability Analysis B-B'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (CL)	115	100[1]	35
Landslide Debris (GC)	125	50[2]	40
Landslide Debris (GC/CL)	120	100[2]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

Table F-2: Soil Parameters Used for Slope Stability Analysis C-C'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Fill/GC	125	50[1]	38
Landslide Debris (GC/CL)	120	100[1]	36
Weathered Bedrock (SC)	140	0	60

1. Cohesion added where infinite slope stability failures occurred

4. **Phreatic Surface:** Groundwater was encountered during the subsurface exploration in borehole JG-02, JG-03, and JG-04 during the subsurface exploration and are summarized below in Table F-2. Groundwater conditions encountered in the field were used in the slope stability model. It is important to note, the subsurface exploration occurred during a time of year when peak groundwater conditions are assumed to have already occurred, implying potential peak groundwater conditions are *not* shown in the model and are unknown.

Table F-3: Groundwater Conditions

Borehole	Date	Depth BGS (ft)	Approximate Elevation (ft)
JG-02	October 1 and 2, 2023	47	6,393
JG-03	October 2, 2023	27 to 30	6379 to 6376
JG-04	October 2, 2023	30	6374

5. **Seismicity:** Each post-construction scenario was evaluated in a seismic condition. Based on the ReMi and MASW results provided by Atlas Geophysics and direct shear testing data in the previous Nelson Engineering Site Investigation Report, the site is categorized as Site Class C – Very Dense Soil and Soft Rock. Seismicity was incorporated into the model using a pseudo-static limit equilibrium analysis approach where inertial forces from seismic accelerations were applied statically to the model. Seismic loads have been applied to the critical slip surface determined by static analysis for each post construction cross section, as it is assumed to be the most stressed region within the slope (Abramson et al., 2002). A seismic coefficient (k_s) of 0.163 was applied to cross section B-B' and a seismic coefficient of 0.169 was applied to cross section C-C'.

Seismic coefficients were calculated based on recommendation from NCHRP Report 611 "Seismic Analysis and Desing of Retaining Walls, Buried Structures, Slopes and Embankments" and FHWA NHI Course No 130094 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, as described below and illustrated in the equations. In summary, the seismic coefficient (k_s) is determined by applying a scaling factor (α) to the modified peak ground acceleration (PGA_m). Additionally, a seismic FS of 1.1 was used because it is assumed the system is ductile and an allowable total permanent seismic deformation of 2.0-inches is acceptable.

$$\beta=F_v \cdot S_1/PGA_m$$

$$\alpha=1+0.01H[(0.5\beta)-1]$$

$$k_s = r^* PGA_m * \alpha$$

Where:

- β = 0.92
- F_v = 1.5
- S_1 = 0.336
- PGA_m = 0.545
- α is equal to 0.595 for the B-B' seismic model, and α is equal to 0.623 for the C-C' seismic model.
- *H* is equal to the height of the critical slip surface; we used conservative values of 75' for the B-B' seismic model, and 70' for the C-C' seismic model
- r = 0.5. A value of 0.5 is used in calculating k_s when dealing with ductile systems (i.e., soils with no rigid structures) with allowable permanent seismic deformation of up to 2-inches.
- PGA is equal to 0.454, taken from ASCE 7-16 seismic design tool.

Our calculations can be found attached to this Appendix.

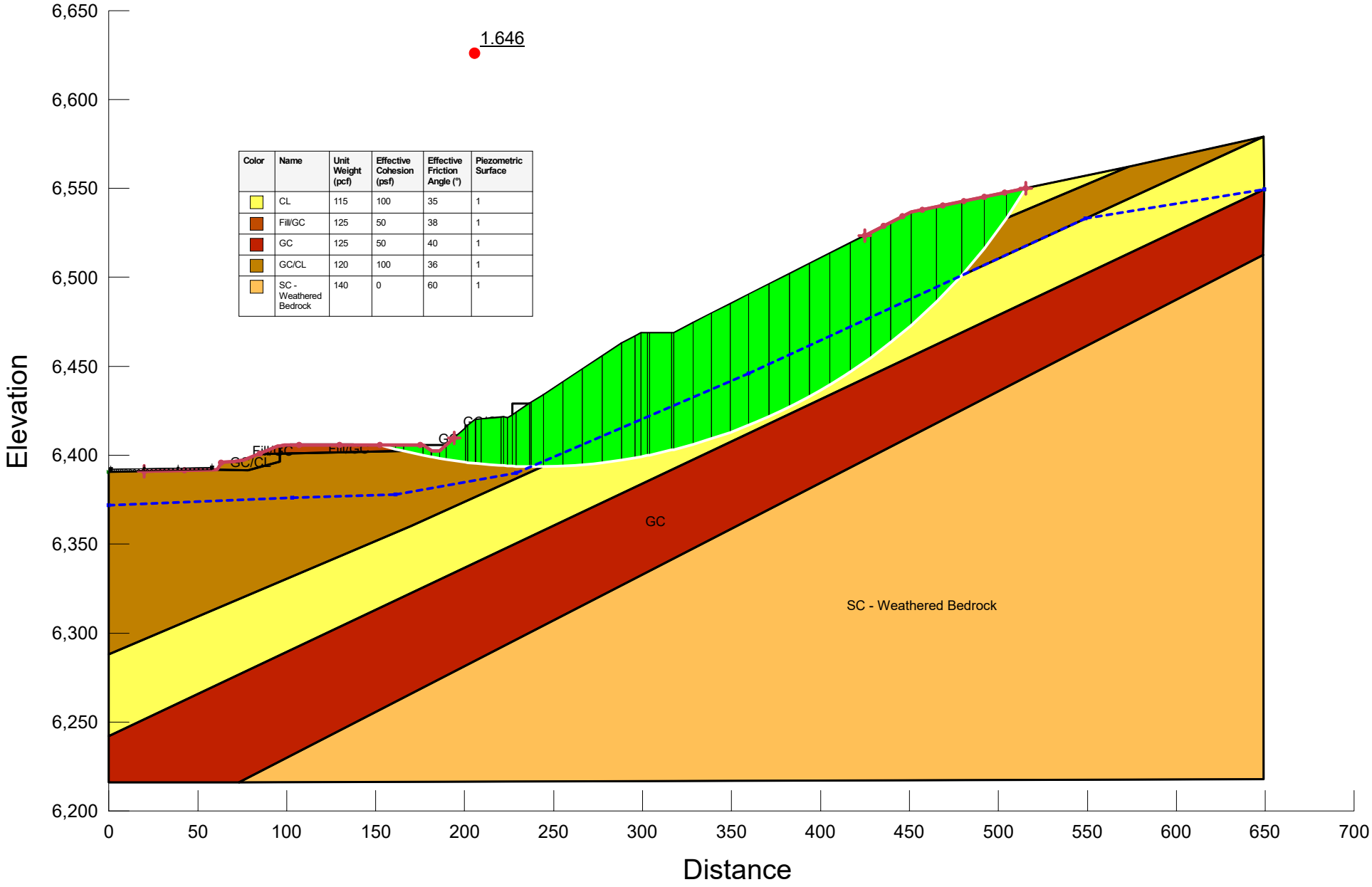
Surcharge Loads and Retaining Wall: Typical foundation loads were incorporated into the model, based on data in Section 1806 of the IBC, 2021. We use a distribution surcharge load of 2000 psf to account for the weight of any structures within the model.

The retaining wall on Lot 53 was also included in the geometry of the models. For the length of the soil nails, spacing and batter we used the Grand View, Building 53 Jackson, Wyoming Permanent Soldier Pile Wall and Temporary Soil Nail Wall Construction Drawings. Although the construction drawings show a slight variation in soil nail lengths, spacing and batter, we used the values applicable to the highest number of soil nails. In our model we used 48' soil nails, vertically spaced 9 feet, and battered -15 degrees.

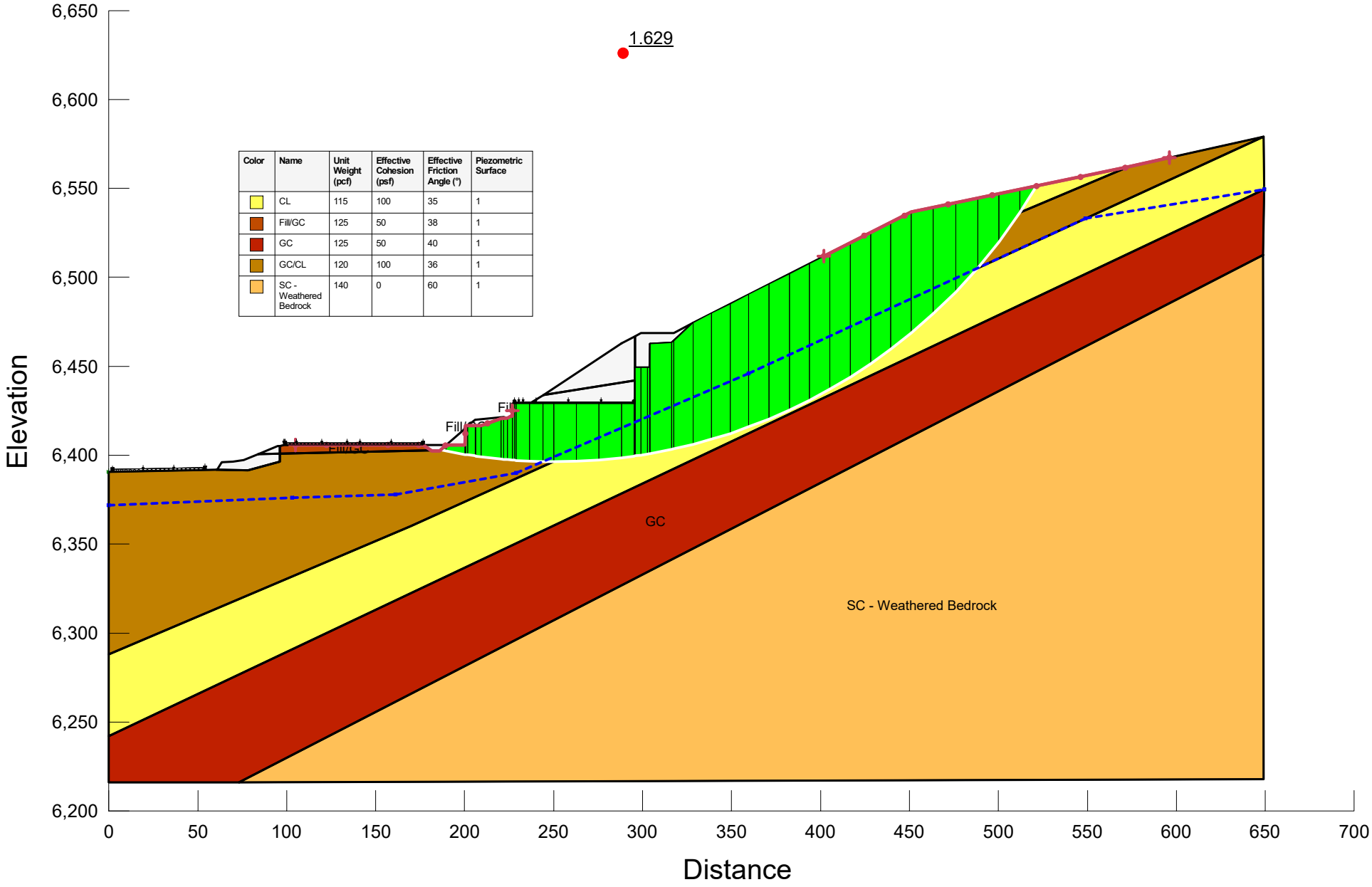
Results

We summarize factor of safety (FS) results for each cross section and analysis in Section 5.1.2 of the Report. The figures that follow are the output from each analysis. The critical slip surface and factor of safety are shown. Output files, reports, convergence data, or other data from Geostudio may be made available upon request.

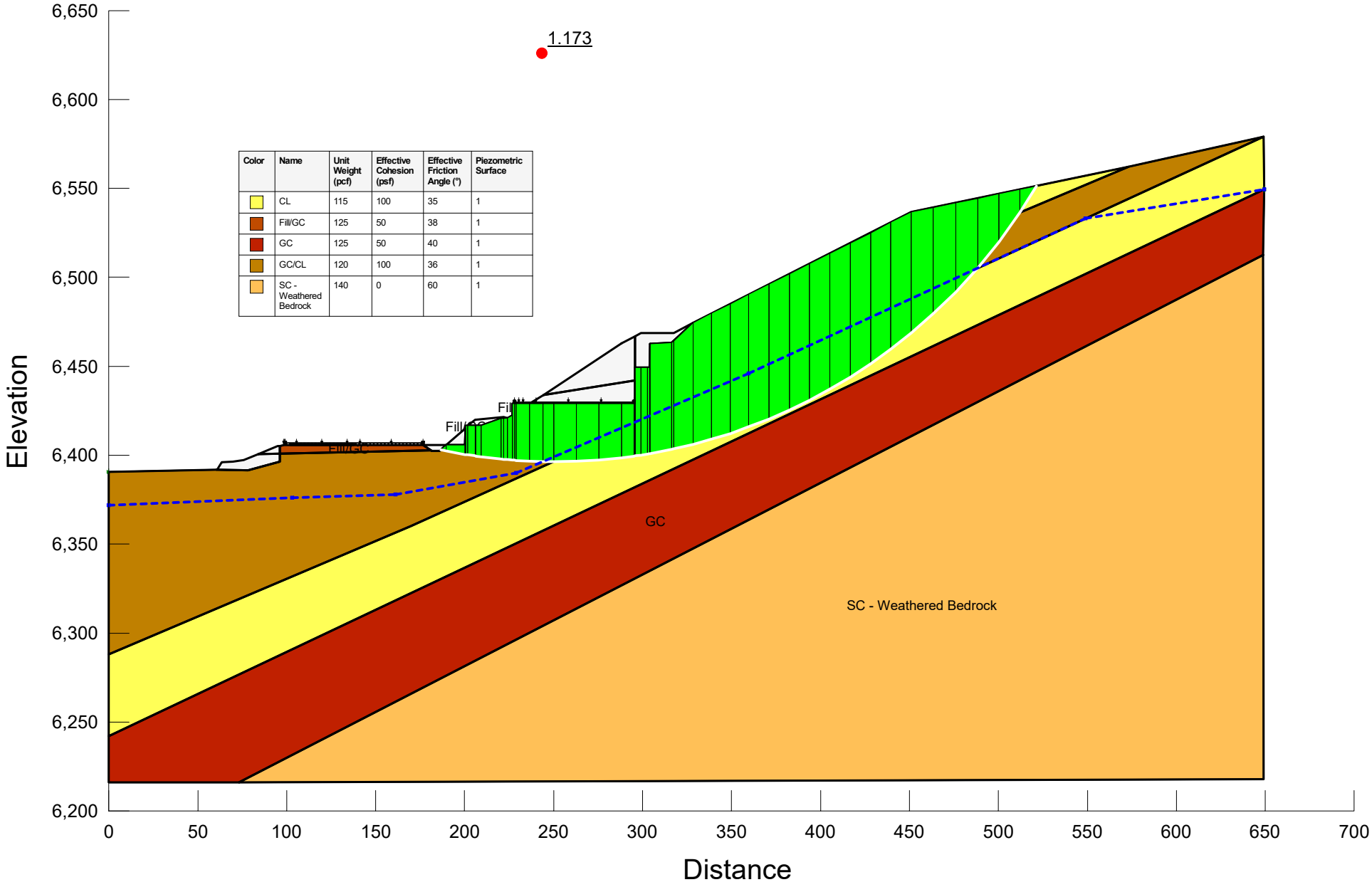
Lot 53 and 58 B-B' Existing Conditions



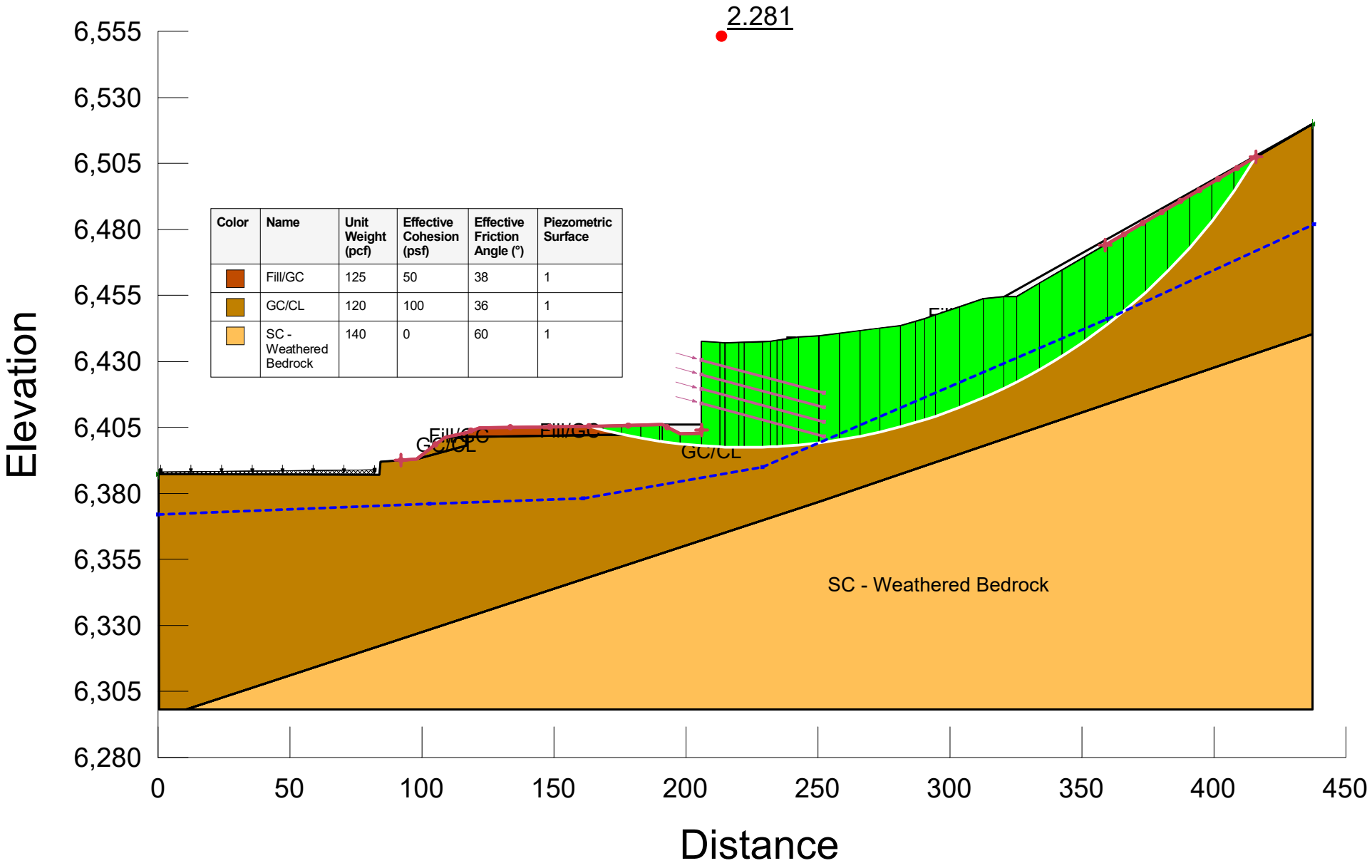
Lot 53 and 58 B-B' Proposed Conditions



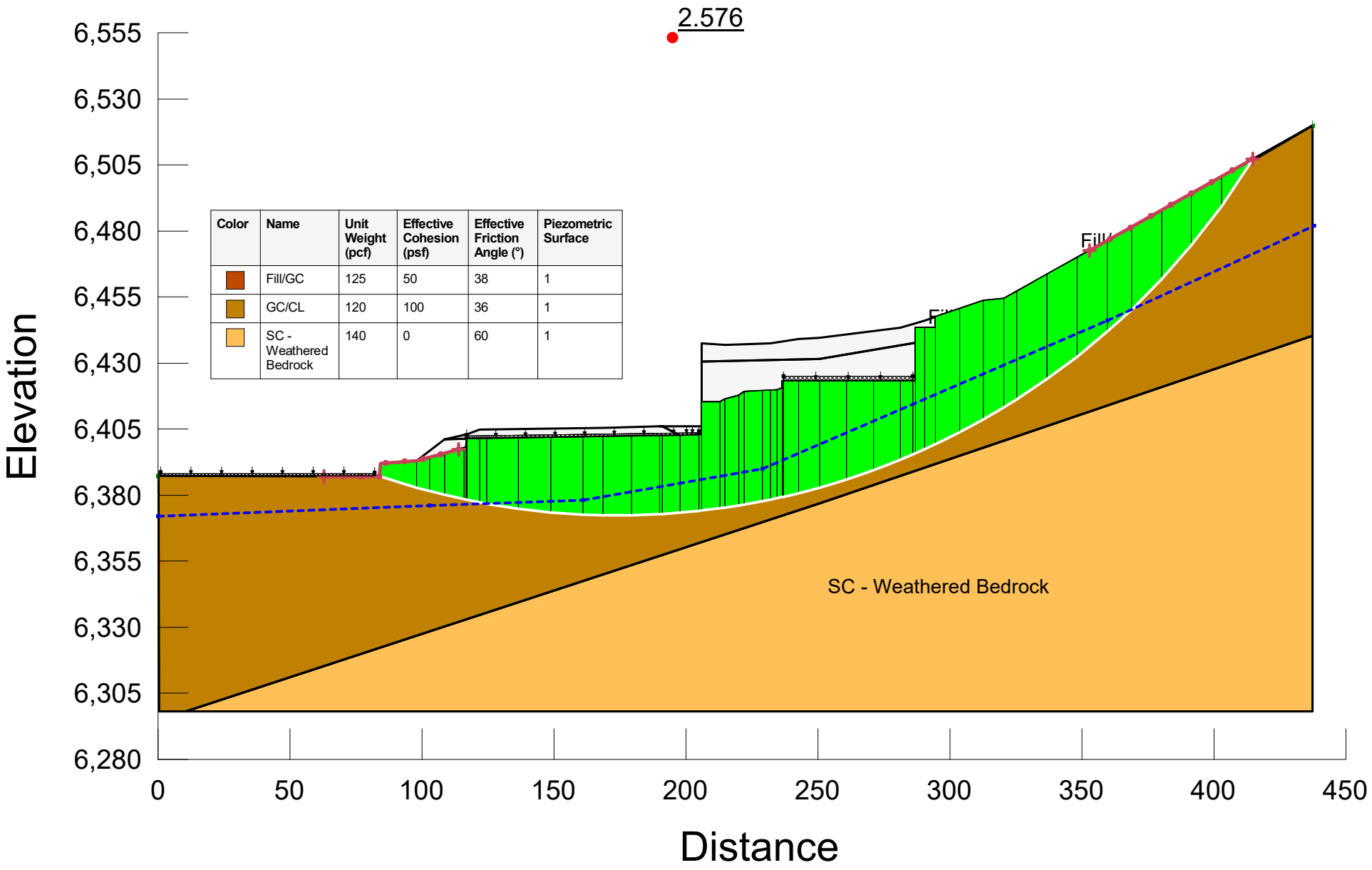
Lot 53 and 58 B-B' Proposed Conditions Siesmic



Lot 53 and 58 C-C' Existing Conditions

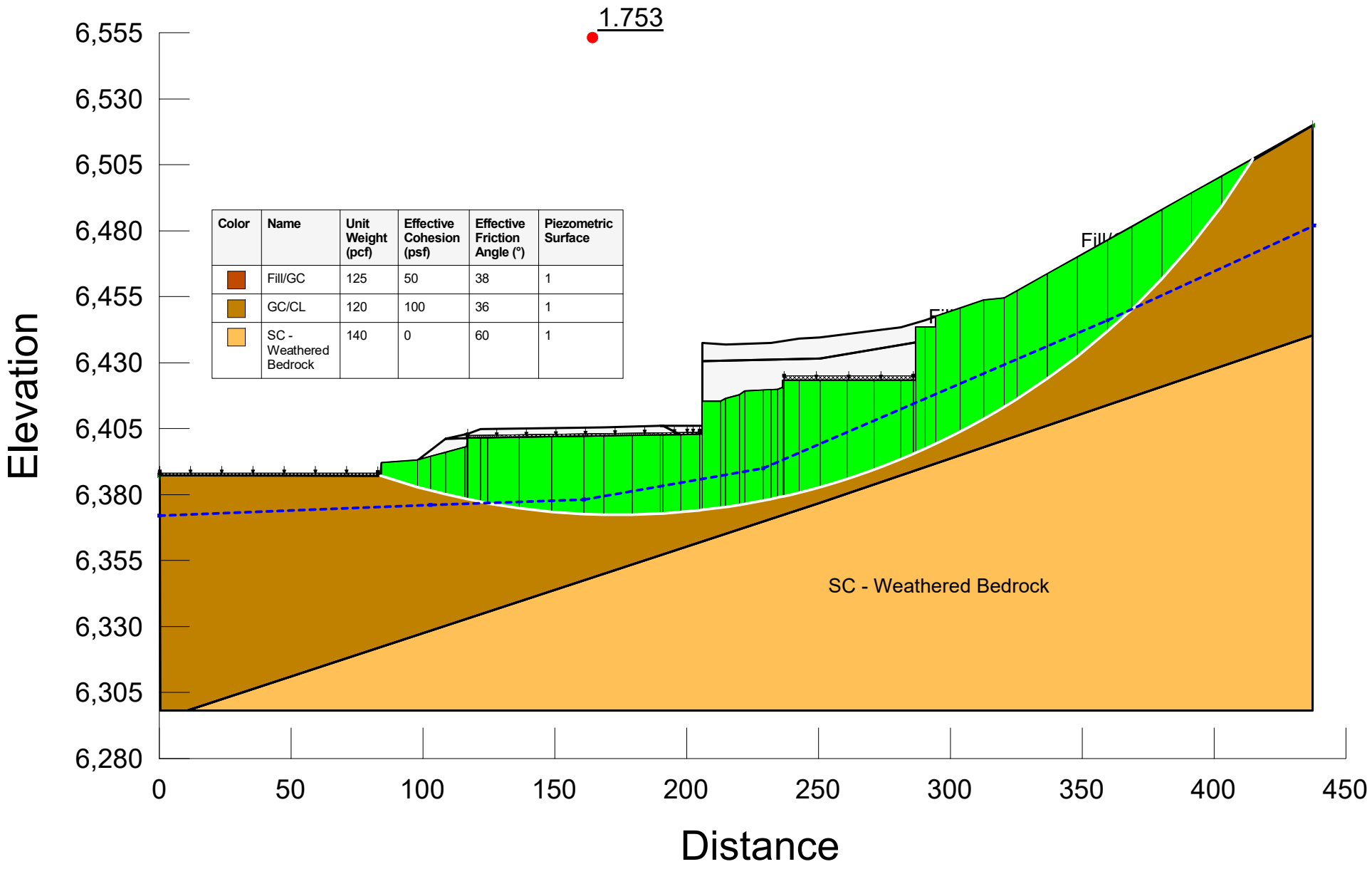


Lot 53 and 58 C-C' Proposed Conditions



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Piezometric Surface
	Fill/GC	125	50	38	1
	GC/CL	120	100	36	1
	SC - Weathered Bedrock	140	0	60	1

Lot 53 and 58 C-C' Proposed Conditions Siesmic

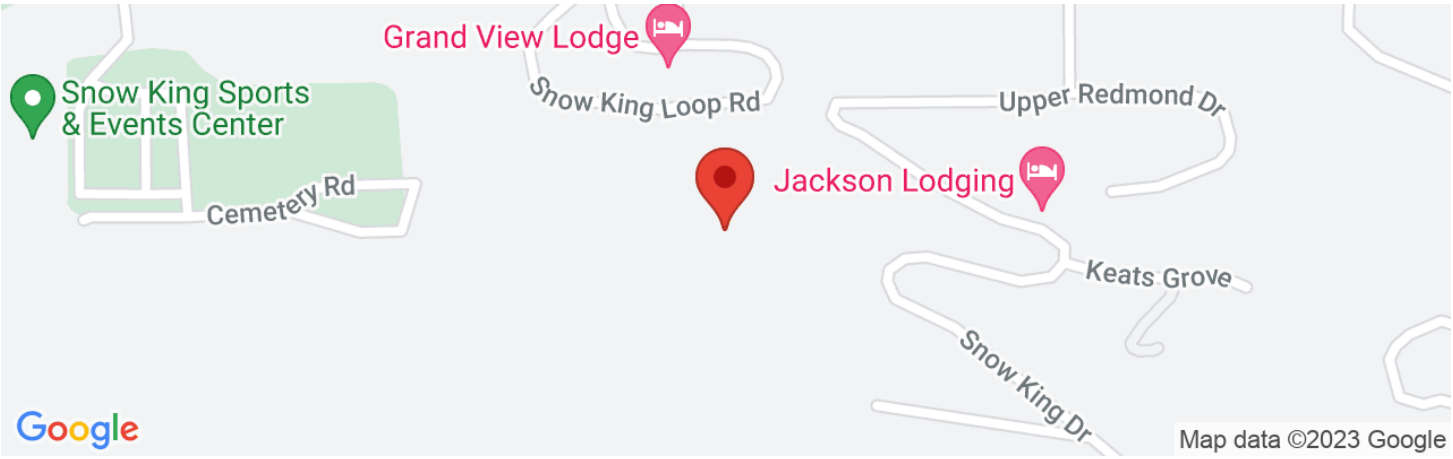


Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Piezometric Surface
	Fill/GC	125	50	38	1
	GC/CL	120	100	36	1
	SC - Weathered Bedrock	140	0	60	1

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

Latitude, Longitude: 43.47138391, -110.75322571



Date	20/12/2023, 15:51:56
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.024	MCE_R ground motion. (for 0.2 second period)
S_1	0.336	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.229	Site-modified spectral acceleration value
S_{M1}	0.505	Site-modified spectral acceleration value
S_{DS}	0.819	Numeric seismic design value at 0.2 second SA
S_{D1}	0.336	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.5	Site amplification factor at 1.0 second
PGA	0.454	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.545	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.024	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.145	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.894	Factored deterministic acceleration value. (0.2 second)
S1RT	0.336	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.374	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.721	Factored deterministic acceleration value. (1.0 second)
PGAd	0.66	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.454	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.895	Mapped value of the risk coefficient at short periods

Type	Value	Description
C_{R1}	0.9	Mapped value of the risk coefficient at a period of 1 s
C_V	1.105	Vertical coefficient

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Project BEAR Dev - Lots 53+56 Project No. 23272
Calculated By HC Date 12/20/2023
Sheet 1/2

K_s Determination

U.S. Seismic Design Maps - Structural Engineers Association of California Design Code Reference Document - ASCE 7-16

Risk Category II
Site Class C - Very Dense Soil & Soft Rock

FHWA (2011)

$$K_{MAX} = F_{PGA} \cdot PGA \qquad (6-1)$$

PGA = 0.454
F_{PGA} = 1.20

K_{MAX} or PGA_m = 1.2(0.454) = **0.545**

K_{AV} or MHA (Maximum Average Horizontal Acceleration) = $\alpha \cdot K_{MAX}$ (6-2)

Where $\alpha = 1 + 0.01(H)[(0.5B)-1]$ (6-3)

Where $B = f_v \cdot S_1 / K_{MAX}$ (6-4)

- B Cross Section B-B'

F_v = 1.5
S_1 = 0.336
K_{MAX} = 0.545

$B = 1.5(0.336)/0.545$ (6-4)

B = 0.924

- B Cross Section C-C'

F_v = 1.5
S_1 = 0.336
K_{MAX} = 0.545

$B = 1.5(0.336)/0.545$ (6-4)

B = 0.924

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Project BEAR DEN - LOTS 53+58 Project No. 23072
Calculated By HC Date 12/20/2023
Sheet 2/2

- α Cross Section B-B'

$\beta = 0.924$
$H = 75'$

$\alpha = 1 + 0.01(75)[0.5(0.924) - 1]$ (6-3)

$\alpha = 0.597$

- α Cross Section C-C'

$\beta = 0.924$
$H = 70'$

$\alpha = 1 + 0.01(70)[0.5(0.924) - 1]$ (6-3)

$\alpha = 0.623$

- k_{AV} Cross Section B-B'

$\alpha = 0.597$
$k_{MAX} = 0.545$

$k_{AV} = 0.597\ (0.545)$ (6-2)

$k_{AV} = 0.325$

- k_{AV} Cross Section C-C'

$\alpha = 0.623$
$k_{MAX} = 0.545$

$k_{AV} = 0.623\ (0.545)$ (6-2)

$k_{AV} = 0.339$

- k_S Cross Section B-B'

$k_S = r \cdot k_{AV}$ (6-5)

$r = 0.5$ ASSUMING 2-INCHES OF ALLOWABLE PERMANENT SEISMIC DEFORMATION

$k_S = 0.5\ (0.325)$

$k_S = 0.163$

- k_S Cross Section C-C'

$k_S = r \cdot k_{AV}$ (6-5)

$r = 0.5$ ASSUMING 2-INCHES OF ALLOWABLE PERMANENT SEISMIC DEFORMATION

$k_S = 0.5\ (0.339)$

$k_S = 0.169$

MINIMUM FACTOR OF SAFETY OF 1.1 USING r OF 0.5 AND ASSUMING 2-INCHES OF ALLOWABLE PERMANENT SEISMIC DEFORMATION

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

January 25, 2024

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosh, WI 53142

RE: GEOTECHNICAL-ENGINEERING REPORT, BEAR DEVELOPMENT – SNOW KING LOOP LOT 57, TETON COUNTY, WYOMING
PROJECT NO: 23072

Dear Nick,

We are pleased to present this Geotechnical-Engineering Report on our geotechnical site exploration for the proposed development at Lot 57 on Snow King Loop in Teton County, Wyoming. This report describes site conditions observed during the subsurface exploration, presents engineering analyses and recommendations to support the design and construction of foundation elements, and presents pre-construction and post-construction slope stability analyses.

Jorgensen Geotechnical explored subsurface conditions by drilling five (5) boreholes and excavating three (3) exploratory test pits throughout Lot 57, as well as reviewing other available geotechnical data. A geophysical exploration was also performed comprising MASW and ReMi exploration techniques. In general, the site is primarily underlain by landslide debris, comprising a chaotic mixture of fined grained soils (lean clay and silt),and coarse grained soils (clayey gravels). The site sits on a mapped landslide which was likely mobilized prior to the Quaternary period. As such, we assume the soil at the site to be well consolidated. Loess, a fine-grained windblown deposit was also encountered at the site.

Building locations and foundation elevations are based on preliminary design data provided by Hoyt Architecture, dated July 19, 2023, though it is our understanding that the design is subject to substantial change. As the design progresses, we will be able to make site-specific recommendations and additionalconsulting services.

If you have any questions about this report, or if we may provide other services to you, please contact us. As the project progresses, we will be available to answer questions for you.

Respectfully submitted,
JORGENSEN GEOTECHNICAL

Bruce Jackson G.I.T.
Geotechnical Design Engineer Technician

Harrison Carter, P.E.
Geotechnical Project Manager

Dominique Brough, P.G.
Geotechnical Project Manager

Geotechnical-Engineering Report

Bear Development – Snow King Loop Lot 57 | Teton County, Wyoming



43.472019°N, -110.754636°W

January 25, 2024

PREPARED FOR

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosh, WI 53142

PREPARED BY

Jorgensen Geotechnical, LLC
PO Box 9550
1315 HIGHWAY 89 S., Ste. 201
Jackson, WY 83002

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Appendix A: Site Exploration Procedures and Subsurface Exploration Logs
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1.0 INTRODUCTION

Jorgensen Geotechnical, LLC was commissioned by Bear Development, LLC to perform a subsurface surface exploration and geotechnical engineering analyses for the proposed development for Lot 57 accessed by Snow King Loop in Teton County, Wyoming. The purposes of the exploration were to provide information and geotechnical-engineering recommendations pertaining to:

- Subsurface soil conditions
- Site preparation and earthwork
- Geophysical exploration
- Seismic site classification per the International Building Code
- Evaluation of settlement and/or collapse potential
- General foundation design and construction recommendations
- Slabs-on-grade design and construction recommendations
- Lateral earth pressures for retaining structures
- Subgrade preparation
- Slope Stability Analyses
    - Existing Conditions
    - Proposed Conditions
    - Proposed Seismic Conditions

A detailed description of the subsurface exploration and graphical logs are shown in Appendix A, Figures in Appendix B, laboratory testing results are included as Appendix C, determination of soil engineering parameters in Appendix D, Calculations for settlement in Appendix E, and Slope Stability Analyses in Appendix F.

2.0 PROJECT DESCRIPTION

The project site is located in Jackson, Wyoming and is situated near the base of Snow King Resort. Preliminary plans were provided by Hoyt Architecture, dated July 19, 2023. The plans indicate the development for lot 57 will include a new four-story housing unit with a two-floor parking garage with two floors of living space above.

It is our understanding the project is in the early stages of the design, and the architectural plans are subject to substantial changes. As the project progresses, Jorgensen Geotechnical is available to consult with team members to increase design and construction efficiency based on our understanding of the subsurface conditions and the proposed design.

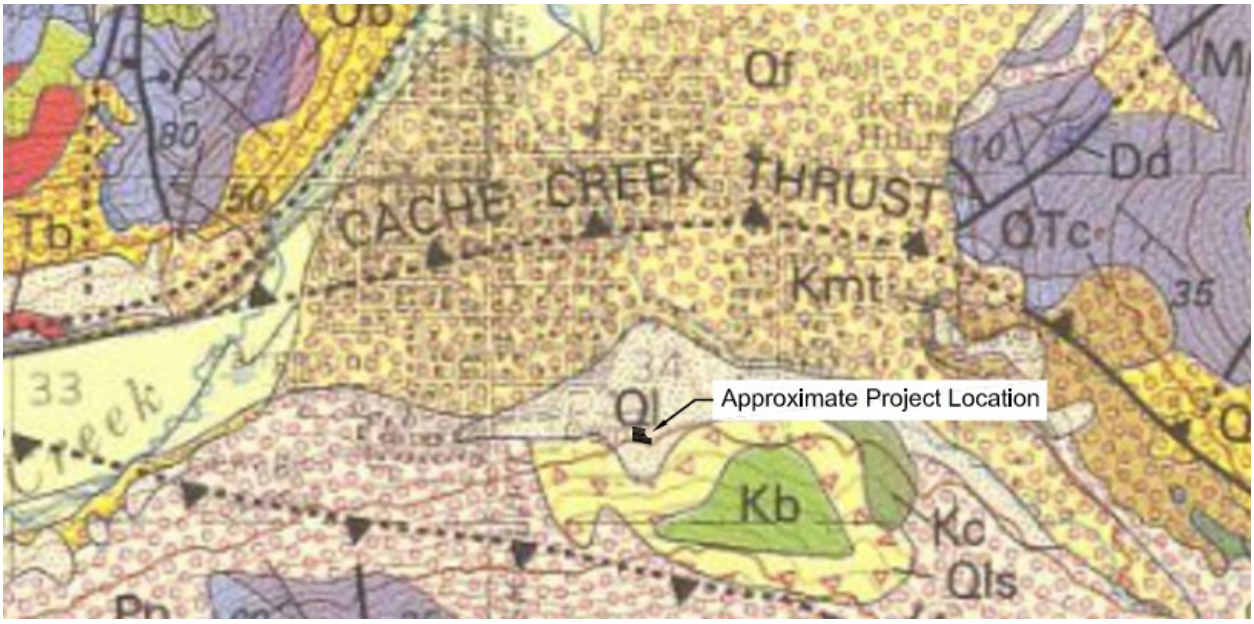


Figure 1: Site Location and Geologic Map

3.0 GEOTECHNICAL EXPLORATION

3.1 Description

JG developed the following description of the site based on field visits, meetings with the project team, our review of available historical aerial imagery, and observations made during the subsurface exploration.

Item	Description
Location and Parcel Information	• Lot 57 is located at the base of Snow King Resort and is accessed via Snow King Loop. The project area sits at a generalized latitude and longitude of 43.471°N, -110.754°W.
Existing Conditions	• The project location gently slopes from the north upwards to the south and ranges in elevation from approximately 6,370-ft Above Mean Sea Level (AMSL) on the northern boundary to approximately 6,390-ft AMSL on the southern property boundary of Lot 57. The lot is bisected by a dirt road that provides access for employees at Snow King Resort. • Lot 57 is currently being used for storage by Snow King Resort. • Current utilities at the site include power, gas, and water.
Geologic Setting	• The project location is found on the Geologic Map of Grand Teton National Park (Love et. al., 1992), in an area that contains three mapped geologic units including Loess (Ql), a fine-grained, windblown deposit, Landslide Debris (Qls), and the Bacon Ridge Sandstone (Kb). The soils observed from the subsurface exploration seem to be consistent with mapped geology.

- The project location sits on a mapped multiple slump/multiple flow landslide, and is understood to be deep seated (WSGS, Wyoming Geologic Hazards Map Tool). A portion of the project site is capped with a wind-blown deposit known as loess which was likely deposited during or after the Pinedale Glaciation Period, or between approximately 30,000 to 10,000 years ago. The mapped loess stratigraphically overlies portions of the mapped landslide unit.
- Numerous Quaternary faults (i.e., relatively young and potentially active) are mapped throughout the area. The Teton Fault is mapped approximately 8 miles northwest of the project, at the base of the eastern flank of the Teton Range (Zellman, 2019). Slip rates along the Teton fault is estimated to be between 0.2 and 1.0 mm/year. The Hoback Fault is located approximately 3 miles to the southwest of the project site but is considered old and inactive.

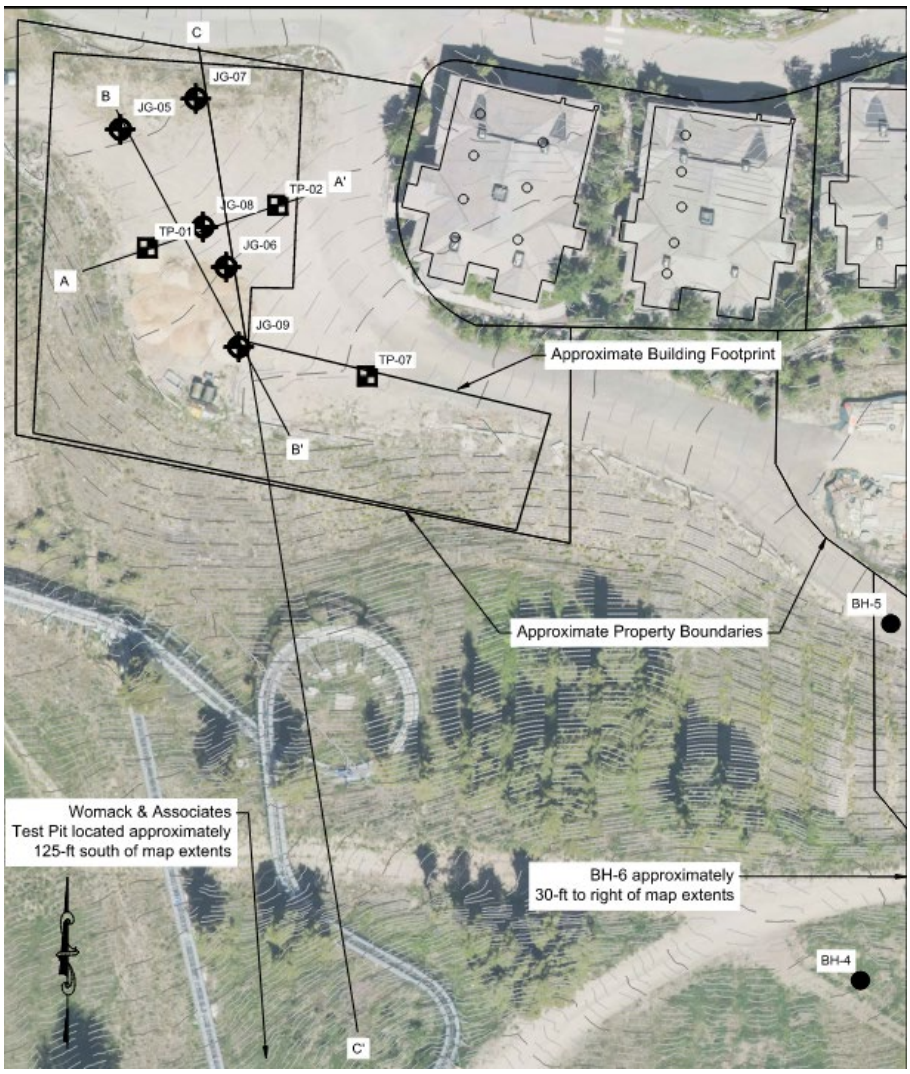


Figure 2: Borehole, Test Pit and Geologic Cross Section Location Map

3.2 Subsurface Soil Conditions

In general, two soil types were encountered during the subsurface exploration:

- **Landslide Debris** – consisting of clayey gravels (GC, GC-GM), and lean clays (CL, ML). The landslide debris soils are assumed to be derived from native colluvium and bedrock soils prior to mobilization of the landslide. These landslide debris soils exhibited chaotic composition, which is also represented in the MASW plots provided by Atlas Geophysics. These results can be found attached to Appendix A.
- **Loess** – consisting of windblown lean clay or silt with sand (CL, ML).

Below are three generalized geologic cross-sections spanning both north-south and east-west depicting the subsurface soil conditions as interpreted by Jorgensen and approximate foundation elevations for the buildings on Lot 57. Cross-section alignment locations can be found in Figure 2 and complete figures can be found in Appendix B.

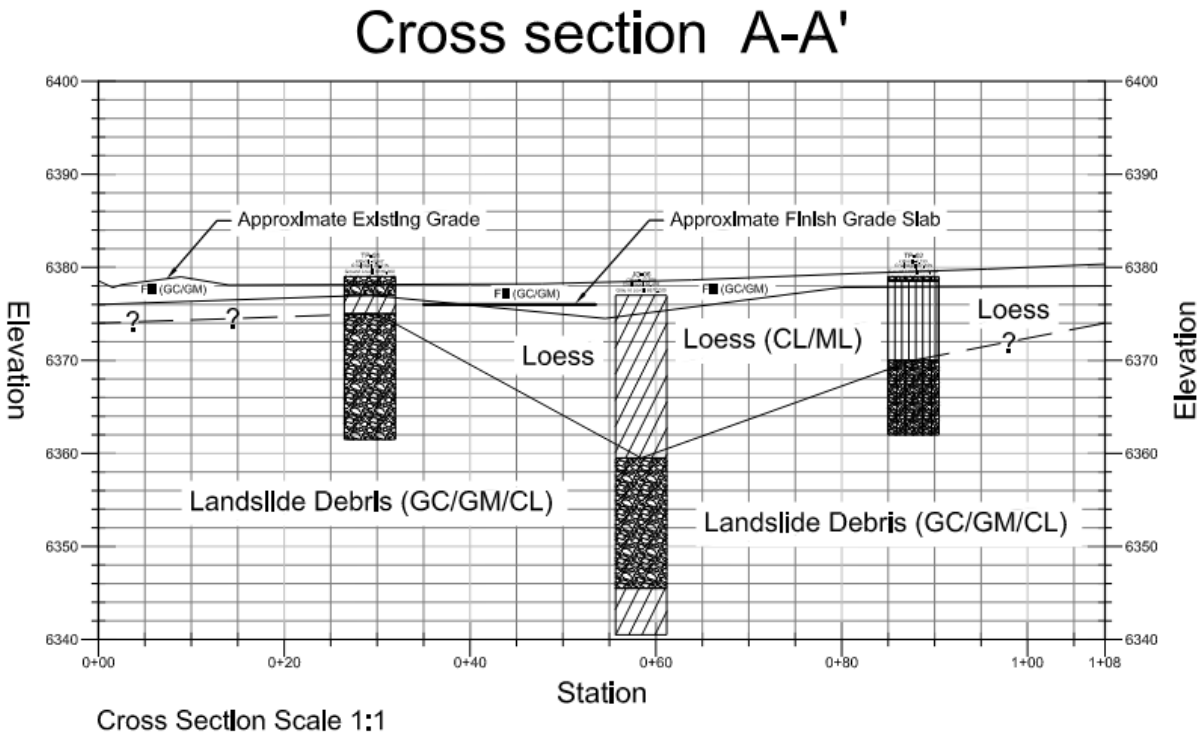


Figure 3: Geologic Cross Section A-A'

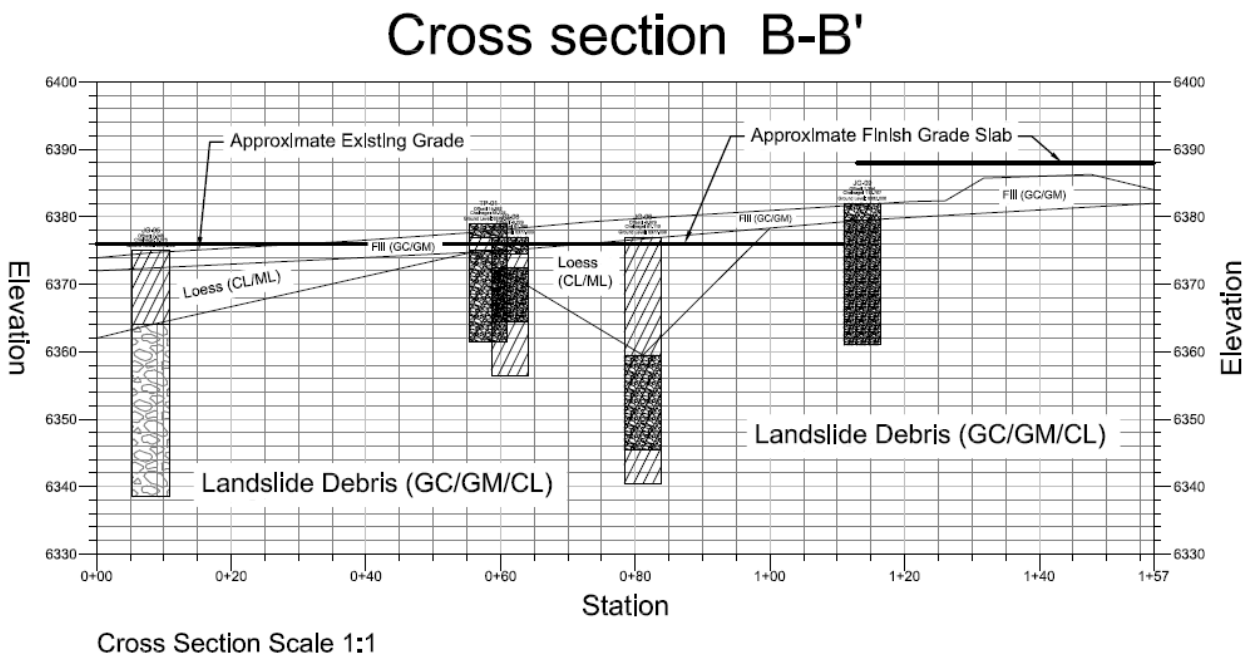


Figure 4: Geologic Cross Section B-B'

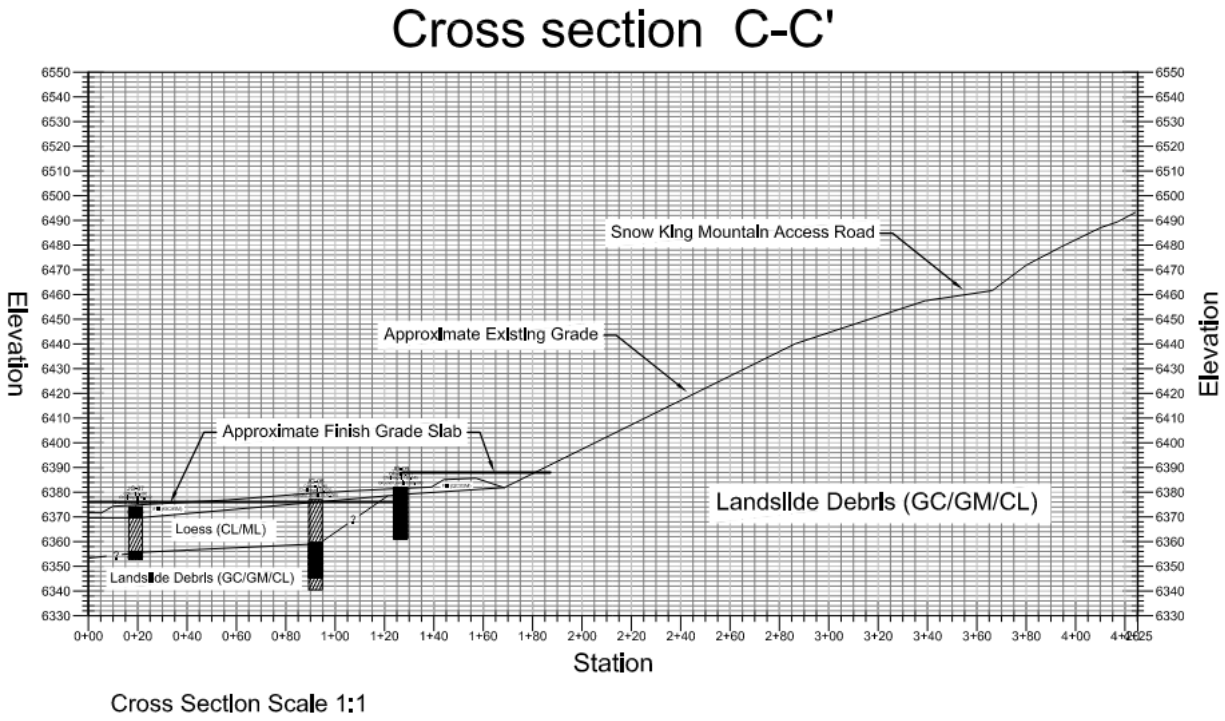


Figure 5: Geologic Cross Section C-C'

The table below describes each soil layer encountered, and detailed borehole logs are represented graphically in Appendix A. **It is important to note that** the borehole exploration techniques used either a 4-inch coring barrel or a 1.5-inch diameter split spoon sampler, limiting the soil that was collected during the drilling effort. It is likely that gravels larger and cobbles larger than 3.0-inches are present but were

unable to be logged due to the sampling method. Cobbles and boulders were encountered in the test pits.

Layer	Layer Name	Description	Geotechnical Considerations and Uses
1	**Fill (GC/GM)**	• Observed in JG-07, JG-08, JG-09, TP-01, TP-02 and TP-07 • Depths ranging from 0.5- to 4-ft bgs • Classified as a Clayey **Gravel** with Sand and silty **Gravel** with sand • The fill at the site could comprise native site soils and crushed road base • Brown to dark brown • Contains up to 15% cobbles by volume • 45-55% gravel • 25-30% sand • 20-25% clay/silt	• Undocumented construction fill should be remove from beneath foundations • Non-structural applications
2	**Loess (CL/ML)**	• Observed in all boreholes and test pits at the site except for JG-09 • Classified as **Lean Clay, Lean Clay** with sand, **Lean Clay** with Gravel, and **Silt** • Tan to light tan • Very soft to stiff • 0-25% gravel • 10-30% sand • 50-95% clay/silt	• Settlement concerns • Non-structural applications
3	**Landslide Debris (GC/GC-GM/CL/SC)**	• Observed in all boreholes and test pits • Classified as Clayey **Gravel** with Sand, **Lean Clay**, **Lean Clay** with Sand, Sandy **Lean Clay** with Gravel, • Reddish brown to brownish gray • Coarse-grained soils are loose to very dense • Fine-grained soils are soft to very stiff	• Acceptable bearing layer with appropriate subgrade improvement methods • Settlement concerns • Structural applications • Non-structural applications

		• **Chaotic deposition, including charcoal fragments** • Observed 15-25% cobbles by volume • 10-55% gravel • 15-30% sand • 25-90% Clay/Silt	

3.3 Groundwater

Groundwater was not encountered in any of the boreholes or test pits during the subsurface exploration. However, we have observed groundwater in areas near the project site and understand the subsurface to include various perched groundwater levels and seeps and springs. Approximate groundwater levels are included in the Slope Stability Analysis models, but are not shown in the cross sections as groundwater was not directly observed at the site in the boreholes.

The exploration occurred during a time of year that is considered to take place after peak groundwater levels have occurred. Groundwater levels fluctuate in response to seasonal snowmelt. Soil moisture conditions on this site are most likely influenced by surface infiltration due to precipitation, snowmelt, and uphill natural springs. One groundwater standpipe was installed in JG-08 to a total depth of 20-ft on Lot 57 as part of the subsurface exploration.

3.4 Earthquakes and Ground Shaking

Jackson, Wyoming is located within the Intermountain Seismic Belt, a zone of seismicity that extends from southern Utah through eastern Idaho, western Montana, and Western Wyoming (Smith and Arabasz, 1991). The Teton fault, located along the eastern margin of the Teton Range, approximately 8-miles northeast of the site, is considered an important structural element of the Intermountain Seismic Belt. Predicted recurrence intervals for maximum credible earthquakes have passed for most of the fault systems capable of generating magnitude 7.5 earthquakes in western Wyoming (Case, 1997), implying the risk of major earthquakes is relatively high. In the event of a large magnitude earthquake (i.e., approximately 7.5), strong ground shaking, or slope movement could potentially cause damage to structures (Smith, et al., 1993).

Shear wave velocity calculated by Atlas Technical Consulting LLC, of Salt Lake City, Utah using ReMi geophysical exploration method for the project site is 1,320 ft/s. The IBC references ASCE 7-16 to determine the ground motion accelerations. Based on subsurface soils, and the results from the geophysical exploration, the site is classified as Site Class C (“Very dense soil and soft rock”). For your convenience, Seismic Design Maps (SEAOC, 2019) values are summarized in Table 3-1: U.S. Seismic Design Maps Summary.

Table 3-1: U.S. Seismic Design Maps Summary

Maximum Considered Earthquake (MCE) Spectral Response Acceleration Parameters			
Short Period (S_s) =	1.025		
1-Second Period (S_1) =	0.337		
Site Coefficients and Adjusted MCE Spectral Response Acceleration Parameters			
F_a =	1.2	S_{MS} =	1.230
*F_v =	1.5	*S_{M1} =	0.506
Design Spectral Response Parameters			
S_{DS} =	0.820		
*S_{D1} =	0.337		

*Note: Values for F_v, S_{M1}, and S_{D1} were determined in accordance with Section 11.4.4 of ASCE 7-16. Per Section 11.4.8 of ASCE 7-16, if the proposed structure foundation will include seismic isolators or damping systems, a site response analysis shall be performed in accordance with Section 21.1.

The project site is located in an area of moderate seismic activity. The current peak horizontal acceleration (PGA) with a probability of occurrence of 2% in 50 years is approximately 0.454g (USGS, 2014). The site amplification factor at PGA is 1.2, resulting in a site modified peak ground acceleration (PGA_M) of 0.545. This has been applied for the analysis of seismic lateral loading on retaining walls Section 4.3.

The provisions of the IBC are intended to provide uniform levels of performance for structures depending on their intended use and the risk inherent to their failure. The approach adopted in the IBC is intended to provide a uniform margin of safety against collapse at the design motion. The design earthquake ground motion is selected at a ground shaking level that is 2/3 of the maximum considered earthquake (MCE) ground motion, which has a likelihood of exceedance of 2% in 50 years (corresponding to a return period of 2,500 years). The IBC is not intended to prevent damage or loss of function during a major earthquake; it is intended to reduce the risk of loss of life. Structural design should follow the level of risk tolerable by the Design team.

3.5 Geologic and Geotechnical Hazards

3.5.1 Potential Settlement/Compressible Clays

The primary geotechnical concern at the project site is differential settlement of foundation elements placed on unimproved landslide and loess deposits. Based on the borehole and test pit logs, in-situ testing, lab testing, and geophysical exploration, the subgrade soils comprise a range of chaotic mixture of soils, from compressible clays to competent stony soils. The soft clays are expected to experience moderate to severe settlement, while the stony soils ware *not* expected to experience substantial settlement. Calculated settlement values are discussed in Section 5.2 and calculation spreadsheets are shown in Appendix E.

3.5.2 Seismic and Fault Related Hazards

The owner should be aware that in the event of a large magnitude earthquake (i.e., approximately 7.5), strong ground shaking could potentially cause damage to structures (Smith et al, 1993). The owners may

wish to consider the option of carrying earthquake insurance in addition to homeowner's insurance. Older faults mapped in the immediate vicinity of the property are believed to be old and inactive. Surface rupture due to faulting is very unlikely, and no slope failure is anticipated to occur.

3.5.3 Slope-Related Hazards

In the event of an earthquake or extreme precipitation event, rock fall, debris flows, or avalanches produced from the steep slopes to the south of the development area could potentially cause damage to structures, especially following wildfires. Risk assessment of the slope related hazards was beyond the scope of this Report, but we present slope stability analyses of several slopes captured in the Geologic Cross Sections B-B' and C-C' for Lot 57. These are discussed in Section 4.1 and presented in Appendix F.

4.0 GEOTECHNICAL ENGINEERING ANALYSES

4.1 Slope Stability Analyses

The slope stability analyses were performed using SLOPE/W module of Geostudio. We analyzed two sets of geometry for global slope stability, taken from cross section C-C'. Pre-construction and post-construction external geometry was determined using topographic data provided by Jorgensen Associates and preliminary architectural plans provided by Hoyt Architects.

Determination of strength values used in the Slope Stability Model can be found in Appendix D.

Results of the stability analyses are summarized in Table 4-1. Appendix F shows the output of the stability model for Cross-Section B-B' and C-C'.

Table 4-1: Summary of Stability Analyses Results

Cross section	Analysis	FS	Change in FS[1]
C-C'	Pre-construction	1.93	0.0%
	Post-construction	1.93	
	Post-Construction Seismic	1.15	N/A

Discussion regarding accepted FS can be found in Appendix F. There does not appear to be a change in FS from existing condition to post-construction conditions based on our understanding of the proposed development. As the design process progresses, we are available to analyze the proposed design approach. Post-construction seismic conditions indicate factor of safety of 1.15, of which is above the 1.1 FS threshold for maximum allowable permanent seismic deformations of 2 inches (FHWA 2011).

Residual strength results from strain-softensing behavior; i.e., soils become weaker with shearing (as in the case of slope movement) decreasing from peak strength to residual strength. Reduced shear strength usually occurs only in soils that have been previously sheared while undisturbed soils typically exist at peak strength. It is possible that sheared soils exist on this site or nearby and exhibit behavior consistent with residual strength. In this case, seismic slope stability may result in factors of safety less than 1.0. **However, soil shearing was not observed during subsurface exploration at this site. If pockets or layers of soft, weak, or sheared soils are observed during construction, work shall cease,**

and Jorgensen Geotechnical be notified immediately to evaluate site conditions and review the stability model.

4.2 Settlement

As described in Section 3.5.1, several different soil types were encountered at the site, all of which represent different levels of settlement potential, increasing the risk of differential settlement which is particularly damaging to structures. Settlement calculations were performed for the compressible clay loess soils and the landslide debris. Because the landslide debris contain varying amounts of matrix soils (i.e., clays and sands), estimated settlement is difficult. Though, it is important to note that in general, as the matrix content increases, the risk of settlement increases.

Item	Settlement Analyses – Loess and Landslide Debris	
	Scenario 1	**Scenario 2**
Bearing Layer	**Loess** – Foundation system is placed in direct contact with the loess soils	Landslide Debris - Foundation placed in direct contact with Landslide Debris
Foundation Assumptions	Comprises typical reinforced concrete spread footings	
	Bearing pressure of 3,000 pounds per square foot	
	Buried 3-feet below finished grade	
	Spread footings is 2-feet wide	
Calculated Settlement	4.75-inches	2.37 -inches

The risk of settlement can be reduced by several subgrade improvement methods, of which are discussed below in Section 5.0.

4.3 Lateral Earth Pressures

Lateral pressures were calculated using methods suggested by Bowles (1996) for at-rest, active, and passive conditions and are presented in Table 4-2. These values assume a combination of lean clay and clayey gravel landslide debris will be used as non-structural backfill. We have assumed an estimated internal friction angle of 36° and a unit weight of 130 pcf based on experience working with similar soil deposits and laboratory testing. Calculations assume level backfill against foundation walls or retaining walls.

Table 4-2: Lateral Pressure Parameters for Landslide Debris

Condition	Coefficient of Earth Pressures	γK (equivalent fluid pressure)
Static Conditions Level Backfill	K_o = 0.41 K_a = 0.26 K_p = 3.85	54 pcf 34 pcf 501 pcf
Earthquake Conditions Level Backfill	K_{ae} = 0.33 K_{pe} = 3.60	43 pcf 468 pcf

Lateral earth pressure design will be estimated based on the concept of equivalent fluid pressures, in which the soil pressure-distribution is triangular against the foundation or retaining wall. The following sections summarize each design situation.

4.3.1 Active Pressures

Application	Retaining walls which are allowed to deflect and develop an active soil wedge
Resultant Force Calculation	½ $\gamma K_a H^2$; pounds per horizontal foot of wall
Resultant Force Location	one-third the wall height (1/3 H) above the base
Seismic Coefficient[1]	K_s = 0.25g (r·α·PGA) per the FHWA (2011)
Seismic Calculation Basis	Mononobe-Okabe equations (Bowles, 1996)
Seismic Resultant Force	½ (γK_{ae} - γK_a) H^2; pounds per horizontal foot of wall
Seismic Resultant Force Location[2]	Applied at 60% of the wall height above the base

1. Discussion and calculations for the Seismic Coefficient can be found in Appendix F.
2. Research has indicated that lateral pressures due to earthquakes are non-hydrostatic in distribution, and the resultant acts above the lower third-point of the wall (Bakeer, et al, 1990).

4.3.2 At-Rest Pressures

Application[1]	Walls which are restrained and not allowed to deflect
Resultant Force Calculation	½ $\gamma K_0 H^2$; pounds per horizontal foot of wall
Resultant Force Location	One-third the wall height (1/3 H) above the base

1. Design control of such walls shall be whichever generates the higher resultant force: at-rest pressures or active seismic pressures.

4.3.3 Passive Pressures

Application[1]	Toe of retaining walls where the wall is allowed to move into soil
Resultant Force Calculation	½ $\gamma K_p H^2$; pounds per horizontal foot of wall
Resultant Force Location	One-third the wall height (1/3 H) above the base
Design Control	k_s = 0.25g (r·α·PGA) per the FHWA (2011)
Seismic Calculation Basis	Mononobe-Okabe equations (Bowles, 1996)
Seismic Resultant Force Location	One-third the wall height (1/3 H) above the base

1. Passive pressure design should neglect loose fill and soil located within the frost zone.

5.0 GEOTECHNICAL RECOMMENDATIONS

5.1 Recommendations Overview

The fine-grained soils encountered at the site exhibit moderate settlement potential as described above in Section 4.2. Typical spread footings are likely to experience settlement greater than 1-inch if placed above the compressible soils. The risk of settlement can be reduced by **ground improvement techniques** such as geosynthetic reinforced fills, or engineered aggregate piers (EAPs). The risk of settlement can also be reduced by incorporating **deep foundation elements** such as driven piles or micropiles into the foundation design. Subgrade improvement methods to reduce the risk of future differential settlement are discussed in Sections 5.2, 5.3, and 5.4, below.

If a construction shoring system is needed,, the shoring system will need to be extended at or below the over-excavation limit, increasing the overall height of the shoring system mass excavation (i.e., over-ex and replace with geosynthetic reinforced fill) is selected. Deep foundation elements and aggregate piers would negate the need for mass excavation below the shoring system.

It should be noted that different subgrade improvement methods correspond with different levels of risk reduction. Any subgrade improvement method that leaves problematic soil beneath foundation systems has a higher level of risk than those that do not. Similarly, deep foundation elements greatly reduce the risk of settlement by transferring the foundation load past the problematic soils and into the underlying competent soils. Typically, the cost of a foundation system correlates to the risk reduction (i.e., the more expensive foundation system the more risk reduction).

5.2 Reinforced Fills

Reinforced fill comprise imported soil compacted and interbedded with a pre-determined geosynthetic. The reinforced fill will better distribute the foundation load thereby reducing the load applied to the fine-grained, compressible and reducing the amount of future potential settlement. Exact thickness of a reinforced fill is currently unknown due to the limited design data available, though it can be expected to be four to six fee thick with a geosynthetic layer placed at every 1-ft increment.

5.3 Engineered Aggregate Piers

Engineered aggregate piers are a ground improvement technique that utilize compacted aggregate to reinforce potentially problematic soils. The piers are predrilled with an auger to the full design-depth (or to a refusal condition on competent rock/soil), a select aggregate is dumped into the predrilled hole from the surface, and the aggregate is then compacted with a down hole compactor attached to an excavator. The compaction effort not only compacts the imported aggregate, but also densifies the surrounding native soils. The increased density of the select aggregate as well as the surrounding native soils reduces the potential of future foundation settlement. One major benefit of EAPs compared to deep foundation elements, is the EAPs are a ground improvement technique, therefore the foundation footings do not need to be designed as grade beams as it would need to be for deep foundation elements, but typical spread footings.

Aggregate piers are typically designed and installed by a design-build contractor. Such as Keller or Geotech Foundation Company West. Jorgensen is available to provide design values and recommendations to the selected contractor for final design and price estimates.

5.4 Deep Foundation Elements

Foundations consisting of grade beams supported by deep foundation elements, such as driven piles or micropiles, typically allow very little vertical movement of structural elements. This option represents the lowest risk of future foundation settlement.

Both micropiles and driven piles are typically designed and installed by a design-build contractor. Jorgensen is available to provide design values and recommendations to the selected contractor for final design and price estimates.

5.5 Earthwork

5.5.1 Site Preparation

Prior to the placement of any fill, concrete slabs, or foundation elements, the site should be cleared and stripped of topsoil and all organic debris. No brush, roots, frozen material, or other deleterious or unsuitable materials shall be incorporated in the foundation subgrade or structural fill. All exposed subgrade surfaces should be free of mounds and depressions which could prevent uniform compaction. If unexpected fills or obstructions are encountered during site clearing or excavation, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

During the excavation, the equipment may disturb and loosen the surface of the subgrade soils. All disturbed areas should be compacted with a smooth-drum vibratory roller, in vibratory mode with a minimum of three passes, prior to the placement of structural fill and footing construction. The actual number of passes should be determined by observing whether the surface is yielding after each pass. If the surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed and approved by a representative of this office.

5.5.2 Excavation and Cut Slope Stability

OSHA regulations (29CFR1926) appear to classify the coarse-grained at the site as Type C soil. For planning and design purposes, simple cut slopes should be no steeper than 1.5H:1V. According to OSHA, any cut slope greater than 20 feet in height requires additional analysis. Shallow groundwater conditions at the site may impact shoring requirements. These recommendations are based on observations made at the time of the site exploration. The contractor shall be responsible for adherence to OSHA and other safety regulations by observing soil conditions at the time of construction.

The design of a temporary construction shoring system is beyond the scope of this report. Jorgensen Geotechnical is available to coordinate with shoring contractors to provide design parameters and local expertise to the project and deliver the most efficient shoring option.

5.5.3 Final Backfilling and Grading

Properly compacted backfill and site drainage are very important to protect subgrade soils and prevent water from flowing to undesirable locations (i.e., to the highway). All soils at the site are acceptable for use as backfill and general site grading. Compaction guidelines for both soil types can be found in Section 5.5.4.

5.5.4 Compaction

Based on our borehole logs, compaction of the on-site soils during construction can be measured by performing a Standard Proctor test per ASTM D698 and performing nuclear density gauge testing during the compaction process. Site soils should be moisture-conditioned and placed in lifts and compacted to a predetermined percentage (typically either 92% or 95%) of the maximum dry density as determined by Standard Proctor testing. Soil should be moisture conditioned to between -2% and +2% of the optimum moisture content (OMC). Fine-grained soils require a sheepsfoot or padfoot roller.

It is important to note, the on-site soils contain fine-grained soils which become difficult to compact if moisture contents become too high. Moisture management of the compacted soils will be paramount to reach adequate densities. Additionally, groundwater may impact the ability to compact the soils during construction.

If imported "pit-run" is used as structural fill or if soils at the site contain more oversized clasts (greater than 3-inches) compaction testing with a nuclear density gauge is usually problematic due to the presence of stones. Therefore, we recommend compacting stony soils using a **method specification**, for which Table 5-1 provides initial guidelines.

Table 5-1: Compaction Parameters for Stony Fill

Compactor Type	Lift Thickness	Maximum Particle Size	Minimum Number of Passes[1]
5-ton vibratory	12 inches	9-inch[2]	3
1.5-ton vibratory	9 inches	6-inch	5
Hand-held	4 inches	4-inch	5

1. The actual number of passes should be determined by observing whether the surface is yielding after each pass. If the surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed.
2. Occasional clasts to 12-inch are permitted, if encountered, but should not be nested.

The method specification may be established as follows:

- The contractor will place fill in loose lifts no greater than specified in the above table for whichever class of compactor is used.
- Fill will be compacted with the *minimum* number of passes specified above. The actual number of passes should be determined by observing compaction after each pass to determine if the surface is non-yielding. If the fill surface appears to be yielding, the number of passes should be increased until a non-yielding condition is observed.
- Once the number of passes is determined, this **method** (unique to the material type, compactor, lift thickness, and number of passes) may be continued for the rest of the project as long as fill material properties and subgrade soil conditions remain the same.

It is important to establish a method specification as early in the construction as possible and apply it consistently for the entirety of the project. JG should observe lift thickness, number of passes, and equipment used during compaction. Additional guidance on construction observations may be found in Section 5.5.6.

5.5.5 Compaction Requirements

We recommend the following requirements for engineered fill materials:

Material Type and Location	Minimum Compaction Requirement	Moisture
Stony soils[1]: All Locations (Structural and Non-Structural Applications)	Non-yielding Condition	Usually 6-8%[2]
Non-stony soils	92% or 95% maximum dry density	+2-2% OMC

1. Stony soil may be imported or site-derived
2. Clean, stony soils are typically moisture insensitive and field observations are usually adequate to estimate when soils achieve the proper moisture.

We recommend compaction of fills be observed and tested during construction. If stony fill is not observed to be in a non-yielding condition or non-stony fills do not achieve the recommended compaction requirements, the area represented by the test should be reworked and retested as required to meet the requirements.

5.5.6 Observation during Construction

Recommendations in this report are contingent upon our involvement. If any unexpected soils or conditions are revealed during construction, this office should be notified immediately to survey the conditions and make necessary modifications. All excavations and foundation subgrades should be observed by a representative of JG prior to fill or concrete placement, especially if questionable materials are exposed. Notice shall be provided at a minimum of 24 hours before the requested observation.
We are able to provide the most value observing site conditions at the following times:

1. Upon completion of site preparation to verify all organics and unsuitable material have been removed, and to verify stony alluvial soils have been reached and structural fills have been prepared in accordance with Sections 5.5.1 and 5.5.4.
2. we can observe placement and compaction of fill and aid in the development of a method specification, Section 5.5.4.
3. We can perform density testing by means of proof rolls and with the use of a Nuclear Density Gauge for structural and non-structural soils.

6.0 LIMITATIONS

This report has been prepared based on a limited amount of data. Actual site conditions may vary. These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty is made or implied.

This report is site-specific and has been prepared in support of the proposed project. The report is for the sole use of the current property owner and their design and construction team and shall be considered non-transferable to future property owners without the written consent of Jorgensen Geotechnical. Under no circumstances are the figures and text to be used separately.

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JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX A

Site Exploration Procedures and Subsurface Exploration Logs

Field Exploration

Borehole Locations and Elevations

Borehole and test pit locations were determined by Jorgensen Geotechnical (JG) staff to bracket the approximate location of the proposed development. Approximate locations of the boreholes and test pits are presented in Figure 2. The approximate location of each borehole and test pit were estimated based on relative proximity to landmarks identifiable on aerial photography as well as approximate GPS coordinates which were collected in the field. Approximate elevations were based on topographic data from Jorgensen Associates.

Subsurface Exploration Procedure

JG conducted a site exploration at the proposed project site utilizing two different subsurface exploration techniques: geotechnical boreholes and open test pits. During the exploration effort, several disturbed samples from SPTs and continuous disturbed samples from the sonic drilling were collected. Bulk disturbed grab samples were collected during the test pit excavation. Shelby tubes were used to collect relatively undisturbed samples of soft material for consolidation testing, shear testing, and index testing. The samples were tested at Gerhart Cole, Inc. (GCI) in Salt Lake City, Utah, and the results are presented in Appendix B. Soil-engineering properties were based on visual classification, direct lab testing results, and accepted correlations based on index test results and SPT blow counts and are discussed further in Appendix D. The subsurface exploration techniques are described below.

Sonic Boreholes

On October 2, 2023, JG directed and oversaw the drilling of two boreholes, JG-05 and JG-06, to 35-feet below the ground surface (bgs) using a sonic drill rig operated by Cascade Drilling of West Jordan, Utah. Sonic drilling utilizes high frequency vibrations to advance a core barrel or casing into the subsurface soils while collecting one continuous disturbed sample. At predetermined intervals, standard penetration tests (SPT) were performed to generate blow count values and collect additional disturbed samples.

Hollow Stem Auger Boreholes

Three additional boreholes, JG-07, JG-08 and JG-09, were completed each to approximately 20-feet bgs on October 24, 2023 using a hollow stem auger (HSA) drilling technique with a Diedrich D120 drill rig operated by SK Geotechnical of Billing, Montana. The HSA drilling technique utilized a 4.25-inch inside diameter hollow auger with a solid stem rod in the center that is removed to perform standard penetration tests every 2.5-feet.

Open Test Pits

On October 31, 2023, JG directed and oversaw the excavation of three open test pits, TP-01, TP-07, and TP-08. The test pits were excavated using a Hitachi Zaxis 160 steel tracked excavator operated by FCExcvation and ranged in depth from 16 to 17.5-feet bgs. Disturbed bulk samples were collected from pertinent soil layers.

Borehole and Test Pit Logs

Field data were collected in the field digitally using the application pLog on a tablet for both Boreholes and Test Pits. Draft logs were reviewed in the office, and final versions are presented below. Blow counts for SPT (field N-values) were adjusted to a standard hammer efficiency of 60% and overburden pressure of one atmosphere as suggested by Youd and Idriss (1997) and Fang (1991), to obtain the adjusted (N1)60 values in blows per foot. Soil type, thickness, consistency, and relative moisture content were observed and documented by Jorgensen

Geotechnical staff. The final logs represent JG's interpretation of the subsurface soil conditions. Site soil conditions may differ from those presented in the boreholes.

In addition to borehole and test pit logs produced by Jorgensen Geotechnical, borehole logs presented in a report produced by Nelson Engineering dated July 28, 2021 were also reviewed to aid in determining subsurface soil conditions and are presented below. Approximate borehole locations performed by Nelson Engineering are presented in Figure 2. Test pit logs presented in a report prepared by Womack and Associated dated June 4, 2012 for the water tank due south of the proposed project site were also reviewed, but are not shown in Figure 2 due to their distance from the project site.

Geophysical Exploration

Jorgensen Geotechnical contracted with Atlas Technical Consultants LLC of Salt Lake City to perform a geophysical evaluation at the project site. The primary purpose of the geophysical study was to develop subsurface shear-wave velocity profiles using Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Waves (MASW). The geophysical exploration was performed on October 23 and 24th 2024. One ReMi line (RL-1) and one MASW line (ML-1) were performed at the specific project site (Lot 57), while the other ReMi and MASW lines were performed to the east of the project site on Lots 53 and 58.

The ReMi study extended to a maximum depth of 100-ft below the ground surface, allowing us to select a Site Class based on the results. Shear wave velocity for the ReMi line RL-1 performed at Lot 57 produced a shear wave velocity of 1,320 ft/s, classifying the site as a Site Class C per ASCE 7-16.

The MASW line ML-1 performed at the project site indicates the upper approximately 25-feet are softer (i.e., slower shear wave velocity), and the soils become denser at approximately 30 to 40-feet below the ground surface. Though the soils appear to become denser at 30-feet, the soils at the site appear to chaotic and have portions that are dense, and portions that are soft, consistent with the observations made in the boreholes and test pits.

The full draft version of the Geophysical Evaluation Report – Snow King – Jackson, Wyoming dated January 2, 2024 from Atlas is attached.



Photo 1: Typical Hollow Stem Auger drilling setup/JG--07



Photo 2: Typical sonic drilling bulk sample/Landslide Debris (GC/CL)



Photo 3: Typical SPT sample/JG-05 D4



Photo 4: Typical test pit excavation setup/TP-07



Photo 5: Landslide Debris (GC)/TP-01



Photo 6: Loess (CL/ML)/TP-02

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-05

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.472132 **Longitude:** -110.754770 **Elevation:** 6375.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1			D1				LEAN CLAY, LEAN CLAY with Sand (CL): slightly moist, brownish tan, medium stiff, 0-5% gravel, 10-15% sand, 80-90% fines [LOESS]					
2												
3			D2									
4												
5			D3									
6												
7			D4	73	8-9-15 22							
8												
9			D5									
10			D6					14		39	14	25
11			D7				SILTY CLAYEY GRAVEL, SILTY CLAYEY GRAVEL with Sand (GC-GM): slightly moist, brownish tan, medium dense to very dense, approximately 25% angular cobbles by volume, matrix supported, 40-65% angular gravel, 10-35% sand, 20-25% fines [LANDSLIDE DEBRIS]					
12												
13												
14			D8									
15												
16			D9									
17												
18			D10 a									
19			D10 b									

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-05

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.472132 **Longitude:** -110.754770 **Elevation:** 6375.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	SPT N1(60) / MC (%) / PL & LL (%) / Fines Content (%)
21			D11				SILTY CLAYEY GRAVEL, SILTY CLAYEY GRAVEL with Sand (GC-GM): slightly moist, brownish tan, medium dense to very dense, approximately 25% angular cobbles by volume, matrix supported, 40-65% angular gravel, 10-35% sand, 20-25% fines [LANDSLIDE DEBRIS]						
22													
23			D12					6		26	15	11	● ⊢
24													
25			D13										
26													
27			D15	87	13-40-50								
28			~~D14~~		76								
29			D16										
30													
31			D17										
32													
33			D18										
34													
35			D19	67	28-25-12			2					● ▲
36					19								
37													
38													
39													

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1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-06

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471972 **Longitude:** -110.754598 **Elevation:** 6377.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
1			D1				LEAN CLAY, LEAN CLAY with Sand, SANDY LEAN CLAY with Gravel (CL): slightly moist, brown, medium stiff to stiff, 0-25% angular gravel, 5-25% sand, 50-95% fines [LOESS]						
2													
3													
4			D2					27		38	19	19	● ⊢
5													
6			D3	87	10-10-25 31								▲
7			D4										
8													
9			D5										
10													
11			D6	60	6-6-9 12								▲
12													
13			D8					10		32	13	19	● ⊢
14			D9										
15													
16			D10	20	10-15-15 26								▲
17													
18			D11				CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, medium dense to dense, approximately 25% angular cobbles by volume, matrix supported, 45-50% angular gravel, 25-30% sand, 20-25% fines [LANDSLIDE DEBRIS]						
19													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-06

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 02 2023 **Completed:** Oct 02 2023
Drilling Contractor: Cascade Drilling
Drilling Method: Sonic
Equipment: Sonic Drill Rig
Hammer Type: Automatic

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 36.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471972 **Longitude:** -110.754598 **Elevation:** 6377.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21			D12	100	8-12-17 26		CLAYEY GRAVEL with Sand (GC): slightly moist, brownish tan, medium dense to dense, approximately 25% angular cobbles by volume, matrix supported, 45-50% angular gravel, 25-30% sand, 20-25% fines [LANDSLIDE DEBRIS]	5		18	14	4
22			D13									
23			D14									
24												
25			D15	87	20-28-50 66							
26			D16									
27												
28			D17									
29												
30			D18	73	12-30-34 54							
31												
32			D19				LEAN CLAY with Sand (CL): slightly moist, brownish tan, medium stiff, 10% angular gravel, 15-20% sand, 70-75% fines [LANDSLIDE DEBRIS]					
33			D20					15		28	15	13
34												
35			D21	100	12-10-12 18							
36												
37												
38												
39												

Atterberg Limits

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-07

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 24 2023 **Completed:** Oct 24 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 21.0 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.472169 **Longitude:** -110.754649 **Elevation:** 6374.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
1–4			D-1	20	4-3-1 2		CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, very loose, 55% sub-rounded gravel, 25% sand, 20% fines [FILL]					
4–6			U-1 D-2	73	3-2-4 5		LEAN CLAY, Sandy LEAN CLAY (CL): tan, very soft to stiff, 0-10% angular gravel, 10-30% sand, 60-90% fines, medium plasticity, [LOESS]	14		31	20	11
7–9			D-3	73	2-2-2 3							
9–11			U-2 D-4	80	4-16-25 32	2.25		23		33	18	15
12–14			D-5	80	18-23-21 36							
15–16			D-6	87	14-13-14 23							
17–19			D-7	113	50/5" 82		CLAYEY GRAVEL with Sand (GC): dry, whitish tan, dense, approximately 25% angular cobbles by volume, matrix supported, 65% angular gravel, 15% sand, 20% fines [LANDSLIDE DEBRIS]	13		29	15	14

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-07

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 24 2023 **Completed:** Oct 24 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 21.0 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.472169 **Longitude:** -110.754649 **Elevation:** 6374.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
21			D-8	60	10-7-28 31		CLAYEY GRAVEL with Sand (GC): dry, whitish tan, dense, approximately 25% angular cobbles by volume, matrix supported, 65% angular gravel, 15% sand, 20% fines [LANDSLIDE DEBRIS]						▲
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-08

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 24 2023 **Completed:** Oct 24 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 20.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.472019 **Longitude:** -110.754636 **Elevation:** 6377.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-1 installed to Total depth of 20ft bgs.

Depth	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
0					CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, very loose, 55% sub-angular gravel, 25% sand, 20% fines [FILL]					
3		D-1	67	4-7-10 15	GRAVELLY LEAN CLAY with Sand (CL): slightly moist, tan, medium stiff, 15% angular gravel, 15% sand, 70% fines [LOESS]					
5		D-2	67	8-13-17 25	Poorly Graded GRAVEL with silt and Sand, SILTY CLAYEY GRAVEL with Sand (GP-GM, GC): dry, whitish brown, medium dense to dense, approximately 25% angular cobbles by volume, matrix supported, 65-75% angular gravel, 15-20% sand, 10-20% fines, [LANDSLIDE DEBRIS]					
8		D-3	87	6-13-15 23						
10		D-4	80	13-24-20 31		2				
13		D-5	50	8-9-16 21	Gravelly LEAN CLAY with Sand (CL): dry, reddish tan, medium stiff to very stiff, 20-25% sub-angular to angular gravel, 10-15% sand, 60-65% fines, medium plasticity [LANDSLIDE DEBRIS]	10		32	15	17
15		D-6	60	12-29-14 23						
18		D-7	100	46-14-15 23						
19		D-8	0	50/3" 79						

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-08

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 24 2023 **Completed:** Oct 24 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 20.5 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.472019 **Longitude:** -110.754636 **Elevation:** 6377.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings. MW-1 installed to Total depth of 20ft bgs.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
21							Gravelly LEAN CLAY with Sand (CL): dry, reddish tan, medium stiff to very stiff, 20-25% sub-angular to angular gravel, 10-15% sand, 60-65% fines, high plasticity, [LANDSLIDE DEBRIS]					
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												

▲ SPT N1(60) 8 16 24 32
● MC (%)
⊢ PL & LL (%) 20 40 60 80
☐ Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-09

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 24 2023 **Completed:** Oct 24 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 21.0 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471879 **Longitude:** -110.754577 **Elevation:** 6382.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index
0							CLAYEY GRAVEL with Sand (GC): slightly moist, reddish brown, very loose, 55% sub-rounded to rounded gravel, 25% sand, 20% fines [FILL]					
3			D-1	50	3-5-6 9		SILTY GRAVEL with Sand (GC): dry to slightly moist, brown, loose to very dense, approximately 25% angular cobbles by volume, matrix supported, 30-45% angular gravel, 20-30% sand, 30-40% silty fines, [LANDSLIDE DEBRIS]					
5			D-2	83	9-11-15 21							
8			D-3	100	8-15-15 24			7		17	16	1
10			D-4	100	12-19-18 28							
13			D-5	100	8-18-19 31							
15			D-6	87	9-18-24 34			6				
18			D-7	111	5-13-50/4" 50							
19			D-8	0	50/2" 78							

SPT N1(60) 8 16 24 32
MC (%)
PL & LL (%) 20 40 60 80
Fines Content (%) 20 40 60 80

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Borehole ID: JG-09

Client: Bear Development, LLC
Project Number: 23072
Date Started: Oct 24 2023 **Completed:** Oct 24 2023
Drilling Contractor: SK Geotechnical
Drilling Method: 4-1/4" Hollow stem auger
Equipment: Diedrich D120
Hammer Type: Automatic hammer

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Total Depth: 21.0 ft
Logged By: Bruce Jackson **Checked By:** HC
Latitude: 43.471879 **Longitude:** -110.754577 **Elevation:** 6382.00
Notes: No groundwater encountered. Stopped at target depth. Backfilled with cuttings.

Depth	Graphic	Sampler Type	Number	Recovery % RQD	SPT Blow Count (N1)60	Pocket Pen. (tsf)	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	▲ SPT N1(60) 8 16 24 32 / ● MC (%) / ⊢ PL & LL (%) 20 40 60 80 / □ Fines Content (%) 20 40 60 80
21							SILTY GRAVEL with Sand (GC): dry to slightly moist, brown, loose to very dense, homogeneous, approximately 25% angular cobbles by volume, matrix supported, 30-45% angular gravel, 20-30% sand, 30-40% silty fines, [LANDSLIDE DEBRIS]						
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-01

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471994
Longitude: -110.754725
Elevation: 6379.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

Notes:
No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
1						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, dense, homogeneous, 15% cobbles by volume, remaining 45% gravel, 30% sand, 25% fines by mass [FILL]						
2												
3						LEAN CLAY with Sand (CL): slightly moist, light tan, pinholed, 5% gravel, 15% sand, 80% fines, medium plasticity, Some gravels present [LOESS]						
4												
5						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, clast supported, 15-25% angular cobbles and boulders by volume, 55% angular gravel, 20% sand, 25% fines, [LANDSLIDE DEBRIS]						
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-02

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.472045
Longitude: -110.754516
Elevation: 6379.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

Notes:
No groundwater encountered. Stopped at target depth and limits of excavator. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
0						(GM): dry to slightly moist, brown, homogeneous, 10% cobbles by volume, remaining 45% gravel, 30% sand, 25% fines by mass, [FILL]						
1						SILT (ML): slightly moist, light tan, pinholed, 6.5% sand, 93.5% fines, Some sand present [LOESS]						
2												
3												
4												
5												
6			U-1				18					
7												
8												
9						SILTY GRAVEL with Sand (GM): dry to slightly moist, brown, clast supported, 25% angular cobbles by volume, remaining 55% angular gravel, 20% sand, 25% fines by mass, More cobbles than TP-1 [LANDSLIDE DEBRIS]						
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

JORGENSEN GEOTECHNICAL, LLC
1315 HWY 89 S., Suite 201 - Jackson, WY 83002
Telephone: 307.733.5150

Test Pit ID: TP-07

Project Name: Bear Development - Snow King Loop Lot 57
Project Location: Jackson, WY
Client: Bear Development, LLC
Logged By: Bruce Jackson
Checked By: HC
Project Number: 23072
Latitude: 43.471846
Longitude: -110.754370
Elevation: 6384.00
Date Started: Oct 31 2023
Completed: Oct 31 2023
Contractor: FCE
Equipment: Hitachi Zaxis 160

Notes:
No groundwater encountered. Stopped due to large boulder. Pit walls remained vertical. Backfilled with spoils.

Depth	Graphic	Sampler Type	Number	Pocket Pen (tsf)	Classification	Material Description	Moisture Content (%)	Dry Unit Wt. (pcf)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Well
0						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, homogeneous, 15% cobbles by volume, remaining 45% gravel, 30% sand, 25% fines by mass, Frozen [FILL]						
2						LEAN CLAY with Sand (CL): slightly moist, light tan, pinholed, 5% gravel, 15% sand, 80% fines, medium plasticity, Some gravels present [LOESS]						
3						CLAYEY GRAVEL with Sand (GC): dry to slightly moist, brown, clast supported, 25% cobbles by volume, remaining 55% gravel, 20% sand, 25% fines by mass, Increased amount of cobbles with depth. Encountered large Boulder at total depth [LANDSLIDE DEBRIS]						

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-4**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **10/22/05 10/23/05**	DRILLER: **PIEDMONT**	
LOGGED BY: **GYR**	DRILL TYPE: **TRACK MOUNT B-50**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6487.8**	HOLE DIAMETER: **4"**	
	HAMMER TYPE: **140#**	

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	ABUNDANT GRAVEL TO COBBLE AND BOULDER SIZE CLASTS THROUGHOUT	1						*BORING LOCATED ON UNDISTURBED GROUND. SOILS EXPOSED 50' HIGH CUT SLOPE DOWNSLOPE TO THE NORTH ARE GENERALLY STIFF TO HARD/DENSE SILT/FINE SAND/SILTY CLAY, CLAY MIXTURES WITH FREQUENT LIMESTONE CLASTS FROM COBBLE TO BOULDER SIZE (6' M.D.) SEEPS ARE EVIDENT IN AREA OF CUT FACE DOWNSLOPE OF BORING.*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-6' ARE ROCK CHIPS AND MOIST SILTY CLAYEY SAND*						
		4												*CUTTINGS MOISTURE % INCREASING FROM 6' FEWER ROCKS AND FREQ. BIT PLUGGING.*
		5												
		6												
		7												
		8												
		9	X			BH4-1 2.5" SS	79	*MOIST LT TAN GREEN SILTY SAND, TRACE CLAY, TRACE COAL, HARD.*			35			
		10	X											
		11												
		12												
		13												
		14	X			BH4-2 2" SS	50	*MOIST TO WET RED SILTY CLAYEY GRAVEL W/SAND, MED. PLASTICITY, STIFF TO V. STIFF. MOIST. CHAOTIC, NOT STRATIFIED*			17			*DRILLING WITH 3.75" ø TRICONE AND WATER FROM 15'*
		15	X											
		16												
		17												
		18												
		19												
		20												*DR ROCK 19.5-20.2'*
		21												

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

CLIENT: **SNOW KING MOUNTAIN RESORT**
JACKSON, WYOMING

S:\PROJECTS\06-07\TRANSFER STATION GEOTECH\TRANSFER MAIN BUILDING BORING LOGS.DWG GINT-D MAR 14 2005 01:31:31 PM PLOTTED BY:

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-4* PAGE: *2 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		22												*DR SOFT 20.5–22 DR 50% ROCK WITH 4"–8" INTERVALS OF SOFTER MATERIAL BETWEEN 22–29'*
		23												
		24												
		25												
		26												
		27												
		28												
		29												
▼		30												*WATER LEVEL 11/3/05*
		31												
		32												
		33												
		34						*AT 34' ATTEMPTED SPLIT SPOON, BORING CAVED TO 29' DRILLING WITH CASED 3.75" TRICONE FROM 34' DR SMOOTHER DRILLING AT 35'*						
		35												
		36												
		37												
		38												
		39				BH4-3 2" SS	92	*MOIST TO WET SILT, ML, TAN, MED PLASTICITY. SEAMS .5–1" THICK MAY BE SATURATED. STIFF.*			8			
		40												
		41												*DR COBBLES FROM 39.5 LOSING WATER FROM 40.5*
		42												
		43												
		44												

S:\STANDARD\BORERS\NE_BOREHOLE.DWG (BOREHOLE PLT) JUN 20 2002 09:35:53 AM PLOTTED BY: GREEN

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CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-4* PAGE: *3 OF 3*

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 boring and at the time of the drilling. 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	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		44						*DR CONT FRACTURED ROCKY DRILLING FROM 39' CUTTINGS ARE ANGULAR LIMETONE/SANDSTONE GRAVEL SIZE FRAGMENTS*						
		45												
		46												
		47												
		48												
		49												
		50												
		51												
		52												
		53						*DR CONT FRACTURED ROCKY DRILLING FROM 39' CUTTINGS ARE ANGULAR BLUE BLACK LIMESTONE/SANDSTONE GRAVEL SIZE FRAGMENTS*						
		54						*MAJORITY OF WATER LOST, 39'–BOH*						
		55						*BOH =55.75*						
		56						*SET PIEZO (¾"PVC) BOTTOM AT 36.1' SLOTTED BOTTOM 6' BENTONITE IN HOLE TO 36.1, SAND TO 20' FILLED ANNULUS WITH SAND TO 38'*						
		57												
		58												
		59												
		60												
		61												
		62												
		63												
		64												
		65												
		66												

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CLIENT: *SNOW KING MOUNTAIN RESORT JACKSON, WYOMING*

S:\PROJ\2002\130-12 GRAND VIEW GEOTECH\BH\BORINGLOGS.DWG (BH-4 (3)) FEB 13 2006 11:07:07 AM PLOTTED BY: GVR

PROJECT NAME: **LOT 58 GRAND VIEW LODGES**		**DRILL HOLE No.** BH-5	PAGE: 1 OF 4
DATE STARTED / FINISHED: 10/24/05 10/25/05		DRILLER: PIEDMONT	
LOGGED BY: GYR/ROLFE		DRILL TYPE: TRACK MOUNT B-50	
BOREHOLE LOCATION/ELEVATION: SEE LOCATION MAP/6409.9		HOLE DIAMETER: 4"	
		HAMMER TYPE: 140#	

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WELL LOG	GRAPHIC LOG	DEPTH (FT)	SAMPLES: DRIVE	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	RECOVERY (%)	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	SPT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1						*BORING LOCATED AT BASE OF 60' PLUS CUT SLOPE*						*DRILLING W/DOWNHOLE PNEUMATIC HAMMER*
		2												
		3						*CUTTINGS 0-10' ARE MOIST TO WET LT BROWN CLAY, SILTY CLAY WITH SOME GRAVEL FRAGMENTS.*						
		4						*DRILLING INDICATES OCCASIONAL COBBLES*						
		5						*MOIST TO WET PLASTIC SOIL CAUSING FREQ. PLUGGING FROM 4'*						
		6												
		7												
		8												
		9												
		10						*DR ROCK 9.5-11'*						
		11						*WET FROM 11' FREQ. HAMMER PLUGGING*						
		12												
		13												*NO WATER IN HOLE @13' AFTER 28 HOURS*
		14												
		15						*NQ CORING FROM 15' RETURN LOGGED AS IN"/IN"*						
		16					10/36	*MOIST LT BROWN CLAYEY SAND W. GRAVEL, COBBLE FRAG. IN SHOE. V. STIFF TO HARD PP> 3.0 TSF*						
		17												
		18												*18-23 LITTLE WATER LOSS SMOOTH DRILLING W/OCCASIONAL COBBLES*
		19					10/60	*AS ABOVE*						
		20												
		21												

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CLIENT: **SNOW KING MOUNTAIN RESORT**
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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *2 OF 4*

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		22												*MINIMAL WATER LOSS 23–28'*
		23												
		24												
		25					19/60	*COBBLE IN BIT. MOIST BROWN CLAYEY SAND, SC, SANDS FINE, CLAY FRACTION MED. TO HIGH PLASTICITY, TRACE GRAVELS, HARD*	29	4				
		26												*SOME WATER LOSS @29' REGAINED BY 30'*
		27												
		28												
		29												*DRILLING IND. SAT. SOFT/LOOSE ZONE 30'±1 28–33 SMOOTH DRILLING W/SOME COBBLES LOWER PORTION*
		30					51/60	*AS ABOVE W/COBBLES TO 6", MOIST TAN BROWN SILTY CLAY W/GRAVELS*						
▼		31						*DRILLER REPORTS SAND LENSE "PUSHING IN ON HOLE" AT 30' HOLE CASED TO 33'*						
		32												
		33												
		34												
		35					18/36	*ALL GRAVEL AND COBBLE FRAGMENTS, LITTLE FINE GRAINED MATERIAL*						*MIN. WATER LOSS 33–40'*
		36						*36–38' MOIST TAN BROWN CLAYEY SAND, SC, TRACE GRAVEL, MED. PLASTIC*						
		37					13/24	*ABUNDANT GRAVEL MOIST TAN TO GREY CLAYEY SAND W/GRAVEL, SC, MED. PLASTICITY*						*DRILLING IND. HIGHER GRAVEL FRACTION THAN IN RETURN FROM 33'*
		38												
		39					15/17	*MOIST BROWN CLAYEY SAND, SC, SANDS FINE, FINES MED. PLASTIC, V.STIFF TO HARD, TRACE GRAVEL*	28	12				
		40												
		41					9/43	*MOIST GREY CLAYEY SAND, W/ GRAVEL AND COBBLES, SC, V. STIFF TO HARD*						
		42												
		43												
		44												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
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S:\PROJECTS\2006\126-02 GRAND VIEW LODGES\CAD\BHSBORINGLOG.DWG (BH-5C2) JAN 06 2006 10:56:56 AM PLOTTED BY CYR

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *3 OF 4*

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		44												
		45					21/60	*MOIST TAN SILTY TO SANDY CLAY W/GRAVEL, CL, MED. PLASTICITY, V. STIFF TO HARD*						*TAN BROWN RETURN*
		46												
		47												
		48												
		49					13/24	*AS ABOVE*						
		50												*GOOD RETURN*
		51												
		52					15/36	*MOIST TAN BROWN SILTY CLAYEY SAND W/GRAVEL, SC-SM COAL IN SHOE @53' V/ STIFF TO HARD*						
		53												
		54					30/30	*MOIST TAN BROWN SILTY CLAY W/GRAVEL, INTERBEDDED COAL STRATA, V. STIFF, SOME MOTTLEING*						
		55												
		56												
		57					27/30	*AS ABOVE*						
		58												
		59												
		60					14/60	*MOIST BROWN SANDY SILTY CLAY W/GRAVEL, CL-ML, VERY STIFF*						
		61												
		62												
		63												
		64						*63-68 SOME KNOCKING, SOME FAST DRILLING*						
		65						*ORGANICS AT 65'*						
		66												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
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PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-5* PAGE: *4 OF 4*

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		67					34/60	*AS ABOVE TO 65' <u>FIBROUS ORGANIC MATERIAL @65±</u> BELOW ORGANICS IS MOIST BLUE GREY SANDY CLAY/CLAYEY SAND, STIFF TO VERY STIFF, WITH GRAVEL. BOTTOM 1' IS MOIST SILTY SAND/SANDY SILT/HARD/V. DENSE*						
		68												
		69												
		70					37/60	*SILTY SAND AS ABOVE SMOOTH DRILLING OCCASION KNOCKING, MOD FAST DRILLING*						
		71												
		72												*GOOD RETURN BLUE/GREY TO WHITE GREY*
		73												
		74						*<u>ORGANIC DEBRIS</u> MOIST BLUE GREY CLAYEY SAND W/ GRAVEL AND OCCASIONAL LARGE FRAGS OF WHITE LIMESTONE, STIFF TO VERY STIFF, CHARCOAL AND ORGANIC DEBRIS*						
		75					44/48							
		76												
		77												
		78					9/12	*MOIST BLUE GREY SANDY SILT, ML, TRACE GRAVEL LOW PLASTICITY STIFF TO VERY STIFF, CHARCOAL*						
		79												
		80					24/33	*AS ABOVE CHARCOAL IN SHOE*						
		81						*BOH AT 80.75 3/4" PIEZO INSTALLED PULLED CASING, CAVED TO 50' WATER IN BORING ABOVE 50' AS SEEN ON CLOTH TAPE. BENTONITE TO 45.5' BOTTOM OF PIEZO AT 45.5' SLOTTED TO 35.5 SAND TO 35.0' CAVED ABOVE*						
		82												
		83												
		84												
		85												
		86												
		87												
		88					18/30							
		89												

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PROJECT NAME: **LOT 58 GRAND VIEW LODGES**	**DRILL HOLE No. BH-6**	PAGE: **1 OF 3**
DATE STARTED / FINISHED: **6/24/2021 6/25/2021**	DRILLER: **IME**	
LOGGED BY: **PRUETT**	DRILL TYPE: **TRUCK-MOUNTED CME85**	
BOREHOLE LOCATION/ELEVATION: **SEE LOCATION MAP/6466.0'**	HOLE DIAMETER: **8" OD HOLLOW STEM AUGER (HSA)**	
	HAMMER TYPE: **140# AUTO**	

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1						*BORING LOCATED ON CENTERLINE OF MOUNTAIN ACCESS ROAD W/GRAVEL SURFACE. UPHILL ROAD CUTS EST. 3-7' HEIGHT. STEEP GRASSY SLOPES UPHILL AND DOWNHILL. SURFICIAL SOILS ON CUT SLOPES DRY SILTY/CLAYEY GRAVEL/GRAVELLY SILT/CLAY WITH COBBLES AND BOULDERS.*						*EASY DRILLING WITH INTERMITTENT BIT GRINDING FROM 1'-10'*
2												*2 MINUTES TO DRILL 0'-5'*
3												
4												
5	5			BH6-1 2" SS	83	*5.0'-6.5' MOIST, BROWN/LT BROWN GRAVELLY SILT/SILTY GRAVEL, HARD, ANGULAR LIMESTONE AND SANDSTONE GRAVELS, FILGC*			34			
6	7											*3 MINUTES TO DRILL 5'-10'*
7	11											*HARD DRILLING IN GRAVELS FROM 7'-8'*
8												
9												
10	6			BH6-2 2" SS	61	*10.0'-11.5' MOIST, LT BROWN/GRAY SILTY GRAVEL WITH SAND, DENSE, ANGULAR LIMESTONE GRAVEL FRAGMENTS, FILGC*			34			*MODERATE DRILLING WITH CONSTANT BIT GRINDING ON GRAVELS AND COBBLES FROM 10'-21'*
11	10											*4 MINUTES TO DRILL 10'-15'*
12	12											
13												
14												
15	12			BH6-3 2" SS	67	*15.0'-16.5' SAME AS ABOVE, TRACE SAND, LIMESTONE GRAVEL LODGED IN TIP OF SS*			47			
16	17											*5 MINUTES TO DRILL 15'-20'*
17	17											
18												
19												
20	17			BH6-4 2" SS	78	*20.0'-21.5' 0"-12" SAME AS ABOVE, DENSE, ANGULAR GRAY LIMESTONE AND MINOR YELLOW SANDSTONE GRAVELS, MEDIUM PLASTICITY SILT*			32			
21	15					*12"-14" MOIST, OLIVE GREEN SILTY CLAYEY GRAVEL WITH MINOR SAND*						
	11											

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22	11											
	6			BH6-4B 3" DM	83	22.0'–23.0' MOIST, OLIVE GREEN LEAN CLAY CHAOTICALLY MIXED WITH MINOR GRAY SILTY CLAY, STIFF TO VERY STIFF, MINOR COAL FRAGMENTS, PP>4.0 TSF, ORANGE OXIDATION STAINING IN TIP OF SS	33	15	15	108	18	MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 21'–25'
23	13	X										
24												4 MINUTES TO DRILL 20'–25'
25	3											
	5			BH6-5 2" SS	83	25.0'–26.5' MOIST, GRAY GRAVELLY SILTY CLAY WITH SAND, STIFF, MEDIUM PLASTICITY SILTY CLAY, PP=1–2 TSF, ANGULAR LIMESTONE AND SANDSTONE CLASTS, SANDSTONE CLAST WITH SHELL FOSSIL, ABUNDANT ORANGE OXIDATION STAINING THROUGHOUT			13			SMOOTH EASY DRILLING FROM 25'–30'
26	6											
27												2 MINUTES TO DRILL 25'–30'
28												BIT GRINDING FROM 28'–29'
29	7			BH6-5B 3" DM	83	28.5'–29.5' MOIST, BROWN SILTY CLAYEY/CLAYEY GRAVEL WITH SAND, MEDIUM DENSE, FINE SAND, ANGULAR LIMESTONE FRAGMENTS, FILGC			16			
	14											
30	14			BH6-6 2" SS	67	30.0'–31.5' MOIST, BROWN SILTY GRAVEL WITH SAND, VERY DENSE, FINE SAND, ANGULAR LIMESTONE FRAGMENTS, FILGC, FROM 4"–8" GRAVEL WITH SILT AND SAND LENS, GRAVEL LODGED IN TIP OF SS			51			MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 30'–35'
31	23											5 MINUTES TO DRILL 30'–35'
	24											
32												
33	7											INCREASED BIT GRINDING FROM 33'–35'
	20	X		BH6-6B 3" DM	100	33.0'–34.0' MOIST, OLIVE GREEN CLAYEY GRAVEL WITH SAND, MEDIUM DENSE, ANGULAR LIMESTONE, DOLOMITE, AND SANDSTONE GRAVELS			19			
34												
35	11											HARD DRILLING WITH CONSTANT BIT GRINDING 35'–45'
	18			BH6-7 2" SS	83	35.0'–36.5' TOP HALF–MOIST, OLIVE GREEN CLAYEY GRAVEL WITH SAND BOTTOM HALF–MOIST BROWN SILTY GRAVEL WITH SAND, DENSE, ANGULAR LIMESTONE FRAGMENTS, FILGC			34			
36	16											GRINDING ON COBBLE/BOULDER FROM 39'–39.5' FOR 15 MIN W/ NO PROGRESS. MOVED BH 6' EAST (BH–6B) DRILLED TO 40.4 WHERE GRINDING ON BOULDER FOR 30 MINS W/ MINOR PROGRESS. MOVED BH 7' WEST (BH–6C/ MW) OF ORIGINAL BH
37												
38						MONITORING WELL DRY ON 6/28/2021						
39												
40	23											
	50			BH6-8C 3" DM	67	39.5'–40.5' 0"–3" PULVERIZED LIMESTONE GRAVEL/COBBLE 3"–8" MOIST, SILTY CLAYEY GRAVEL WITH COBBLES, VERY DENSE, FRACTURED GRAY SANDSTONE GRAVEL AT BOS			>50			
41												
42												
43												HARD DRILLING WITH CONSTANT BIT GRINDING 40'–45'
44												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

PROJECT NAME: *LOT 58 GRAND VIEW LODGES* **DRILL HOLE No.** *BH-6* PAGE: *3 OF 3*

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		44												
		45	11			BH6-9 2" SS	117	*45.0'–46.5' 0"–4" MOIST, OLIVE GREEN SANDY LEAN CLAY WITH MINOR GRAVEL, PP>4.0 TSF*			34			*EASY TO MODERATE DRILLING WITH OCCASIONAL BIT GRINDING FROM 45'–47.5'*
		46	20					*4"–21" MOIST, BROWN/GRAY/OLIVE GREEN CHAOTICALLY MIXED GRAVELLY LEAN CLAY/SILTY CLAY/SILT WITH SAND, HARD, PP>4.0 TSF, MINOR ORANGE OXIDATION STAINING, VERTICAL CONTACTS IN BOTTOM 6"*						
			17											
		47												*STIFF SMOOTH DRILLING FROM 47.5'–50'*
		48												
		49												*9 MINUTES TO DRILL 45'–50'*
		50	6					*50.0'–51.5' SAME AS ABOVE, TRACE GRAVELS, VERY STIFF, COAL*						
			12			BH6-10 2" SS	122	*FRAGMENTS IN BOTTOM 6"*			26			
		51	18											*EASY TO MODERATE DRILLING WITH INCREASING BIT GRINDING FROM 50'–55'*
		52												
			15					*52.0'–53.0' SAME AS ABOVE WITH GRAVELS, HARD, COAL FRAGMENTS*						
			50	X		BH6-11 3" DM	67	*THROUGHOUT, TOP PORTION OF SAMPLE IS SATURATED DUE TO SURFACE WATER INFILTRATION FOR THUNDERSTORM INTO DRILL STRING*	25	11	>50	121	15	
		53												
		54												
		55												
			9					*55.0'–56.3' SAME AS ABOVE WITH COAL FRAGMENTS*						
			16			BH6-12 2" SS	94				>50			
		56	50/4"											*MODERATE DRILLING WITH INTERMITTENT BIT GRINDING FROM 55'–60'*
		57												
		58												*6 MINUTES TO DRILL 55'–60'*
		59												
		60	10					*60.0'–61.5' MOIST, GRAY SILTY SAND, DENSE, FINE SAND, FINE GRAVEL*						*INITIAL BORING CAVED TO 22' AFTER HSA REMOVAL*
			18			BH6-13 2" SS	89	*INTERVALS, COAL FRAGMENTS THROUGHOUT*			43			
		61	36											
		62												
			21			BH6-14 3" DM	55	*62.0'–62.9' SAME AS ABOVE, VERY DENSE*			>50			
			50/5"											
		63						*BOH = 62.9'*						
								MONITORING WELL CONSTRUCTION						
		64						*PIPE*						
								37.9 FEET OF 2" DIAMETER SCHEDULE 40 PVC CASING FROM 0.3'–18.2', 20–SLOT SCREEN FROM 18.2'–38.2'						
		65						*BACKFILL*						
								BENTONITE– 0.5'–1.5', SPOILS– 1.5'–16.5', BENTONITE– 16.5'–17.5', SILICA SAND– 17.5'–40', BENTONITE– 40'–49', SPOILS– 49'–62.9'						
		66												

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CLIENT: *SNOW KING MOUNTAIN RESORT*
JACKSON, WYOMING

PROJECT: Town of Jackson, Snow King Water Tank

PIT LOCATION: Southwest of center of tank

TEST PIT: TP- 1

Approximate Pit Dimensions (feet): Length: 40 Width: 15 Depth: 31.5

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6740' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① Clayey GRAVEL and COBBLE: Slightly moist to moist, dark brown, loose to medium dense, ~40% sandy clay is moderately plastic, ~60% angular gravel and cobbles up to 6" diameter, some silt, grades into below over 10" [COLLUVIUM]

② Silty sandy GRAVEL with clay and cobbles: Slightly moist, yellow tan, very slightly plastic, medium dense, few clasts up to 12" diameter, limestone clasts angular to subangular, grades into below [COLLUVIUM]

③ GRAVEL and COBBLE: Dry to slightly moist, reddish gray, fractures/voids lined with calcium carbonate, abundant voids, very loose, limestone, follows topography, consistently overlies olive sandy layer below, calcium carbonate mineralization on clasts, abundant raveling, bottom contact ~35-45 degrees [TALUS]

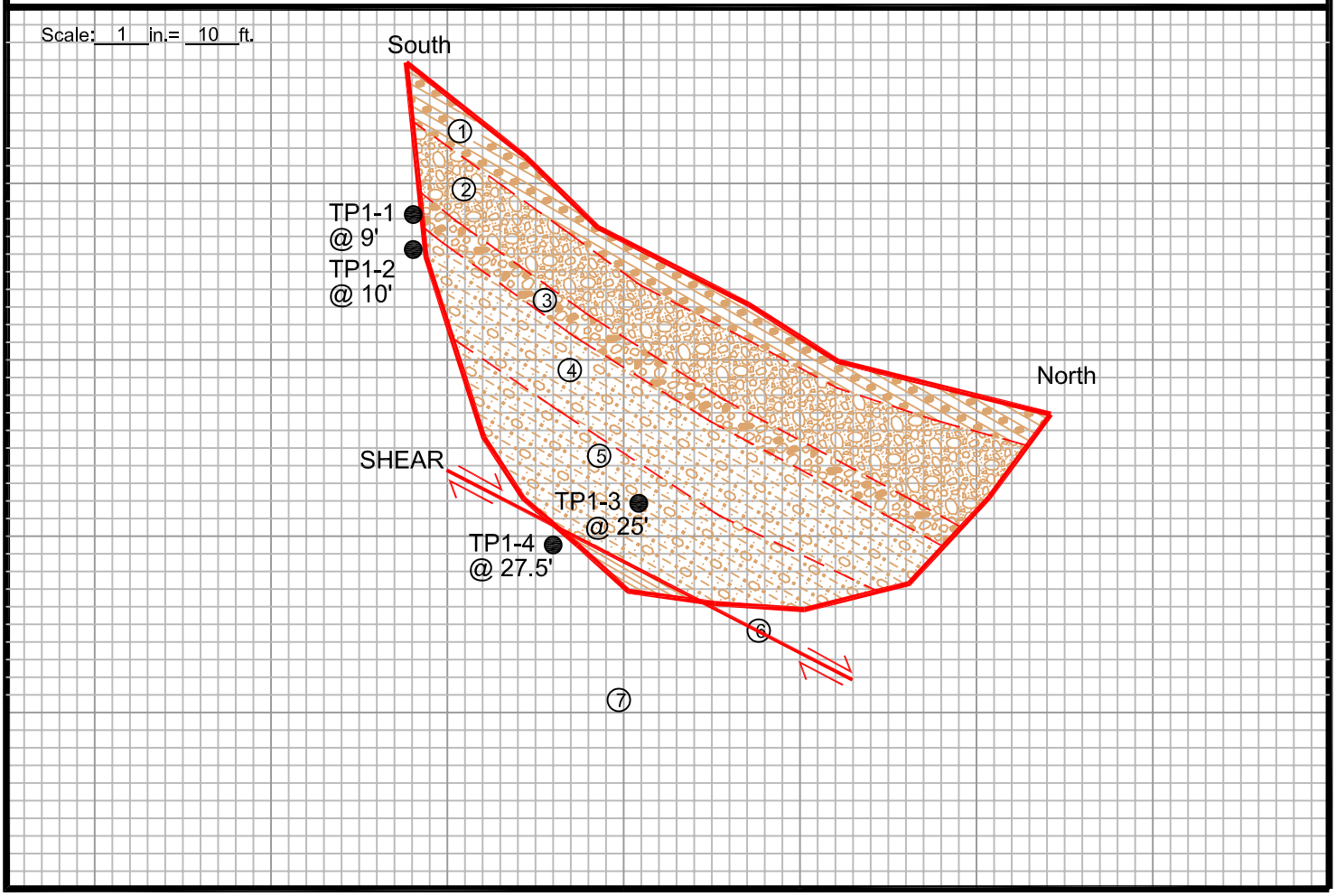
④ Sandy CLAY with gravel and cobble: Slightly moist, olive green, stiff to very stiff, moderately to highly plastic, abundant polished surfaces, irregularly follows silty sandy gravel, cobbles and boulders below contact with material below, varies, ~20% sand, ~15% gravel, ~15% cobble, ~50% sand [LANDSLIDE DEBRIS]

⑤ CLAY and sandy silty GRAVEL and COBBLE: Yellow tan to gray green, intervals of claye and sandy silty gravel and cobbles, few boulders, multiple irregular planar (~bedding) surfaces, angular to subangular boulders up to 2' diameter (mostly limestone), medium dense/very stiff, combination of the olive green sandy clay and the yellow tan silty sandy gravel with clay and cobbles, little consistency with shear orientations, abundant limestone fragments, very irregular contacts [LANDSLIDE DEBRIS]

⑥ CLAY: Pale blue gray, up to 1" thick, soft, moderately plastic, slickensided, dip 30° north [SHEAR ZONE]

⑦ CLAY with sand: Moist, gray, massive, heavily sheared, abundant polished surfaces, highly plastic, darker irregular beds throughout, wavy sheared zone, lots of slickensided surfaces, few coal beds, stiff [LANDSLIDE DEBRIS]

Note: No groundwater observed. Backfilled with spoils. Underlain by stony sandy clay.
Note: Soil Classifications (USCS) based on field descriptions



PROJECT: Town of Jackson, Snow King Water Tank

PIT LOCATION: ~20' northwest of northeast BH-3 (NE 2009)

TEST PIT: TP- 2

Approximate Pit Dimensions (feet): Length: 16 Width: 15 Depth: 12.6

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6711' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① 0.0-1.6ft Clayey sandy GRAVEL and COBBLES: Moist to very moist, medium to dark brown, abundant organics, moderately plastic, angular clasts up to 6" diameter, massive, medium dense [FILL]

② 1.6-2.6ft Sandy CLAY with gravel and cobble: Very moist, dark gray, medium stiff, massive, ~60% clay, ~40% gravel and cobbles up to 6" diameter [TOPSOIL]

③ 2.6-4.8ft Clayey sandy GRAVEL: Very moist, pale brown, medium dense, ~50% fine gravel [COLLUVIUM]

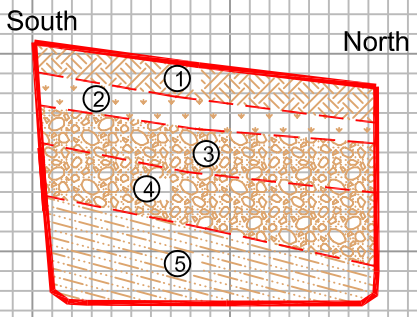
④ 4.8-7.0ft Clayey SAND and GRAVEL: Very moist, pale brown, medium dense, ~50% fine gravel [COLLUVIUM]

⑤ 7.0-12.6ft Sandy CLAY: Moist, green, slightly mottled yellow brown, very stiff, massive, abundant angular to subangular limestone clasts to 1' diameter (most up to 2" diameter) [LANDSLIDE DEBRIS]

Note: No groundwater observed. Backfilled hole with spoils.

Note: Soil Classifications (USCS) based on field descriptions

Scale: 1 in.= 10 ft.



PROJECT: Town of Jackson, Snow King Water Tank

TEST PIT: TP- 3

PIT LOCATION: ~25' east of northeast BH-1 (NE 2009)

Approximate Pit Dimensions (feet): Length: 15 Width: 15 Depth: 11.0

Date: 05-10-10 Logged By: wrw/jr

Approximate Surface Elevation: 6762' Log View Direction: South to North

Excavation Contractor: Schupman Excavation Equipment: JD 240D LC

WOMACK AND ASSOCIATES, INC.
• Geotechnical Engineering • Geology
P.O. Box 12650, Jackson, Wyoming 83002
(307) 733-7209 (Fax) 733-8005

MATERIAL DESCRIPTIONS

① 0.0-1.2ft Silty CLAY with gravel: Moist to very moist, dark brown to blackish brown, abundant organics, highly plastic, soft [TOPSOIL]

② 1.2-3.5ft Gravelly silty CLAY: Buff yellow tan, stiff, ~25-35% gravel to 3" diameter [COLLUVIUM]

③ 3.5-5.0ft Silty CLAY: Moist, greenish brown with yellow mottling, very stiff [LANDSLIDE DEBRIS]

④ 5.0-6.0ft Gravelly silty CLAY: Moist, yellow tan (buff), stiff to very stiff [LANDSLIDE DEBRIS]

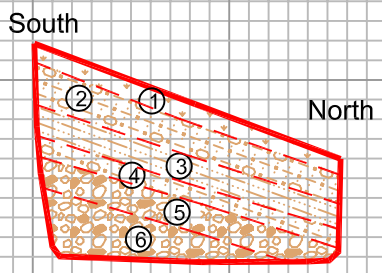
⑤ 6.0-7.5ft Rubble zone: Loose, white precipitates [TALUS]

⑥ 7.5-11.0ft Silty clayey GRAVEL and COBBLE: Yellow brown to red brown, dense, 50-60% clasts up to 8" diameter, oversize [TALUS]

Note: No groundwater observed. Hole standing OK. Backfilled hole with spoils.

Note: Soil Classifications (USCS) based on field descriptions

Scale: 1 in.= 10 ft.





GEOPHYSICAL EVALUATION

SNOW KING

Jackson, Wyoming

PREPARED FOR:

Colter Lane, P.E.
Jorgensen Geotechnical
1315 Highway 89 South, Suite 201
Jackson, Wyoming 83002

PREPARED BY:

Atlas Technical Consultants LLC
358 South 700 East, Suite B518
Salt Lake City, Utah 84102

January 2, 2024

358 South 700 East
Salt Lake City, UT 84102
(310) 951-1993 | OneAtlas.com

January 2, 2024

Atlas No. 11143

MR. COLTER LANE, P.E.
JORGENSEN GEOTECHNICAL
1315 HIGHWAY 89 SOUTH, SUITE 201
JACKSON, WYOMING 83002

Subject: Geophysical Evaluation
Snow King
Jackson, Wyoming

Dear Mr. Lane:

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to a portion of the Snow King project located in Jackson, Wyoming. The primary purpose of our study was to develop subsurface shear-wave velocity profiles and characterize subsurface geologic conditions at select locations of the project site. This was accomplished through the collection of Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Wave (MASW) data. Our services were conducted on October 23rd and 24th, 2023. This report presents our methodology, equipment used, analysis, and findings.

We appreciate the opportunity to be of service on this project. Should you have any questions, please contact the undersigned at (310) 951-1993.

Respectfully submitted,
Atlas Technical Consultants LLC

Stephan A. Callas
Project Geophysicist

Patrick F. Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

SAC:ERC:PFL:ds

Distribution: Mr. Colter Lane at CLane@JorgEng.com

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Figure 2 Line Location Map
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Figure 4a ReMi Results (RL-1)
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Figure 5a MASW Profile (ML-1)
Figure 5b MASW Profile (ML-2)

1. INTRODUCTION

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to a portion of the Snow King project located in Jackson, Wyoming (Figure 1). The primary purpose of our study was to develop subsurface shear-wave velocity profiles and characterize subsurface geologic conditions at select locations of the project site. This was accomplished through the collection of Refraction Microtremor (ReMi) and Multichannel Analysis of Surface Wave (MASW) data. Our services were conducted on October 23rd and 24th, 2023. This report presents our methodology, equipment used, analysis, and findings.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two one-dimensional (1-D) ReMi profiles (RL-1 & RL-2).
- Performance of two 2-D MASW profiles (ML-1 & ML-2).
- Compilation and geophysical analysis of the collected data.
- Preparation of this illustrated report presenting our methodology and findings.

3. SITE AND PROJECT DESCRIPTION

The project site is generally located just southeast of the Snow King Mountain Resort in Jackson, Wyoming (Figure 1). Specifically, the study area is located on the south side of Snow King Loop Road. The locations of the seismic traverses were generally selected by a representative of your office and adjusted when necessary to account for surface conditions. The study area was composed of two graded lots with an access road separating the two lots. The seismic traverses were performed over relatively flat terrain on the east and west sides of the access road. The surface of the site was generally covered with soil, gravel and seasonal vegetation. Additionally, several surface obstructions including construction materials, a firewood pile, snow grooming equipment, vehicles, and temporary fencing were located within the study area boundaries. Figure 2 depicts the approximate locations of the seismic traverses while Figure 3 depicts the general site conditions.

4. STUDY METHODOLOGY

As previously indicated, our evaluation included the performance of two ReMi and two MASW transects. The following sections detail the methods and instrumentations used.

4.1 ReMi

The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a shear-wave velocity profile of the study area down to a depth, in this case, of approximately 100 feet. The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi

method are displayed as a one-dimensional profile which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with ReMi.

Our ReMi evaluation included the use of a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. Geophones were spaced 10 feet apart for a total line length of 230 feet for each line. A total of 22 records, each 32 seconds in duration, were recorded at each location, while 10 records utilized passive data collection of ambient ground vibration noise and 12 utilized an active source. The active source data gathers included generating a seismic signal at both ends of the seismic spread, approximately 10 or 30 feet off the ends of the geophone array. Six active source files were collected at each end of the line. The recorded data was then downloaded to a field computer for post-processing. The data was later processed using Surface Plus 9.1 - Advanced Surface Wave Processing Software (Geogiga Technology Corp., 2020), which uses the refraction microtremor method (Louie, 2001), and other surface wave analysis methods. The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool to determine the best fitting model. The result is a one-dimensional shear-wave velocity model of the site with roughly 85 to 95 percent accuracy (Louie, 2001). For situations in which the shear wave velocity values are close to the limit between site class boundary values, Geotechnical consultants should consider the site's subsurface geologic stratigraphy and structure, soil mechanics, and ReMi evaluation results when assessing seismic site classification. Figures 2 and 3 depict the general site conditions in the study area.

4.2 MASW

Surface waves (specifically Rayleigh waves) were recorded along lines ML-1 and ML-2 in order to provide S-wave velocity information for portions of the site (Figure 2). The surface waves were generated by a hammer and plate (shot) and recorded using a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. The geophones were coupled to the ground surface using a Geostuff Landstreamer with geophones stationed 4 feet apart and shots conducted off the end of the lines. Prior to the collection of surface wave data, near and far field effects were evaluated for several shot offset distances. The results indicated that an offset shot of 16 feet off the end of the line was optimal for our evaluation.

Three records, each one second long, were recorded at each shot location. After each shot location, the shot location and geophones were moved an integer multiple of the geophone spacing longitudinally along the profile direction and the line was reshot. The number of shots, spread length, and start and end stations are presented in Table 1.

Table 1: MASW Array Geometry

Line No.	No. of Shots	Total Spread Length (feet)	Profile Length/Start and End Stations (feet)
ML-1	21	252	160/(0-160)
ML-2	25	284	192/(0-192)

The recorded MASW data was processed using SurfSeis® (Kansas Geological Survey, 2019), a MASW software program. One dimensional (1-D) shear-wave (S-wave) velocity (Vs) profiles were generated for each shot location, which correspond to the middle of the geophone array. A two-dimensional color gradient model was then created from the 1-D models using the SurfSeis® interpolation scheme. It should be emphasized that the 2-D profile represents the area between the midpoint of the first shot location and the midpoint of the last shot location. The actual model section length and start and end stations for the sections are also listed in Table 1.

5. RESULTS AND CONCLUSIONS

As previously indicated, our evaluation consisted of performing two 1-D ReMi profiles (RL-1 & RL-2) and two 2-D MASW profiles (ML-1 & ML-2) at the project site. Figures 4a and 4b present the ReMi results for RL-1 and RL-2, respectively. Figures 5a and 5b present the MASW results for ML-1 and ML-2, respectively. The analysis of each is detailed below.

5.1 ReMi

The purpose of our ReMi evaluations were to develop shear-wave velocity profiles to be used for design and construction parameters at the project site. Table 2 and Figures 4a and 4b present the results from our ReMi evaluations. It should be noted that the ReMi results represent the average condition across the length of the line. When the 1-D ReMi surface wave velocity results (analogous to shear wave) show an IBC Vs100 velocity value that is close to the "border line" boundary between IBC Site Classes, the project geotechnical consultant of record should be consulted. The geotechnical consultant of record should also consider other existing available site information and whether obtaining additional new geotechnical evaluation data such as boreholes, surface to downhole seismic (ASTM D7400), crosshole seismic (ASTM D4428), and/or additional 1-D ReMi data collections would be needed concerning the site's subsurface geologic stratigraphy and structure, soil mechanics and soil modulus, along with the initial 1-D ReMi evaluation results when assessing the "borderline" IBC Vs100 Seismic Site Class.

Table 2: ReMi Results

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)	Average Shear Wave Velocity (Vs in feet/second)	Site Class (IBC, 2019)
RL-1 (NW-SE)	0-6	618	Vs100' = 1,320 ft/s	C
	6-14	1170		
	14-25	1494		
	25-35	1435		
	35-69	1152		
	69-100	2010		

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)	Average Shear Wave Velocity (Vs in feet/second)	Site Class (IBC, 2019)
RL-2 (W-E)	0-9	390	Vs100' = 1,201 ft/s	C
	9-14	799		
	14-25	1361		
	25-69	1446		
	69-100	2052		

5.2 MASW

Two MASW traverses were conducted as part of our study. Figures 5a and 5b present the S-wave velocity models generated from our analysis of lines ML-1 and ML-2, respectively. Based on the results, it appears that the project site is generally underlain by low-velocity materials in the near-surface and higher velocity materials at depth. Distinct vertical and lateral velocity variations are evident within the models. Specifically, ML-1 appears to contain pockets of low and high velocity materials in the near surface, possibly related to reported landslide deposits. At depth, ML-1 displays a high velocity contact that spans the length of the profile from northwest to southeast. This high velocity contact is generally contained towards the bottom of the profile; however, protrudes closer to the surface between 90 and 120 feet along the x-axis. This high velocity material may represent bedrock contacts. ML-2 displays slightly more homogenous material in the near surface compared to ML-1. At depth, ML-2 displays a moderately high velocity contact that spans the length of the profile from west to east. This moderately high velocity contact is generally contained within 20 and 50 feet below ground surface and may represent weathered bedrock contacts. It should be noted that there were several underground utilities present in the vicinity of ML-1, and possibly ML-2, which could be affecting the results from our evaluation. As a general rule of thumb, the S-wave velocity of a given material might be between approximately 0.4 to 0.6 of the P-wave velocity, depending on the soil/rock type and condition.

6. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

7. SELECTED REFERENCES

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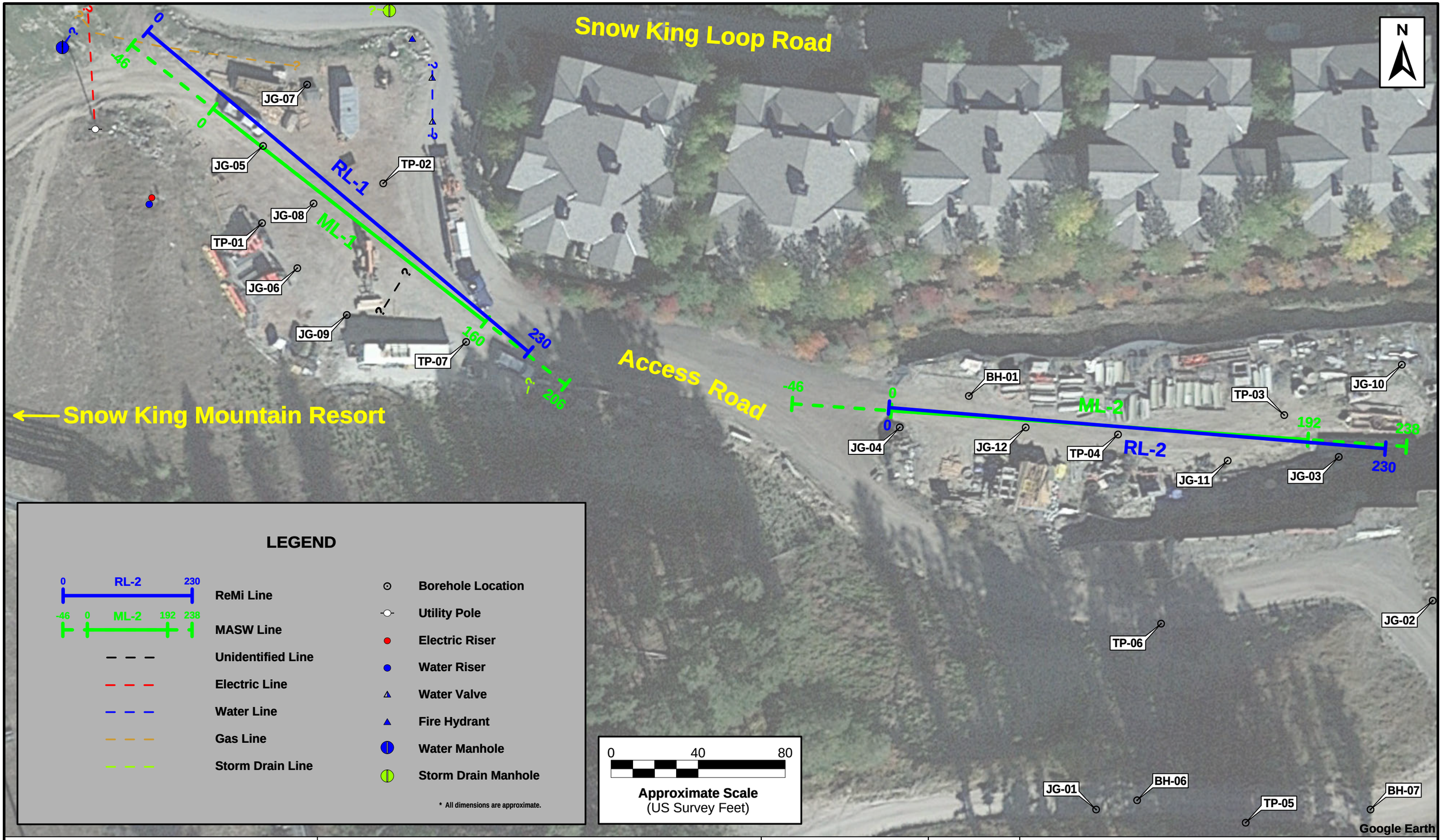
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ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 1	**SITE LOCATION MAP**



LEGEND

- RL-2 (0 – 230): ReMi Line
- ML-2 (-46, 0, 192, 238): MASW Line
- Unidentified Line
- Electric Line
- Water Line
- Gas Line
- Storm Drain Line
- Borehole Location
- Utility Pole
- Electric Riser
- Water Riser
- Water Valve
- Fire Hydrant
- Water Manhole
- Storm Drain Manhole

* All dimensions are approximate.

0 40 80

Approximate Scale
(US Survey Feet)

ATLAS

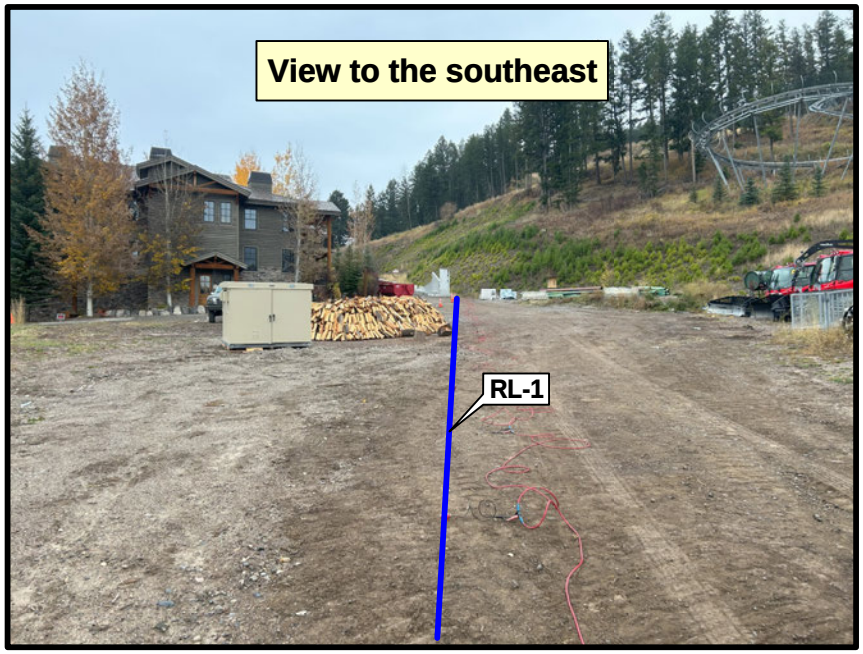
Snow King
Jackson, Wyoming

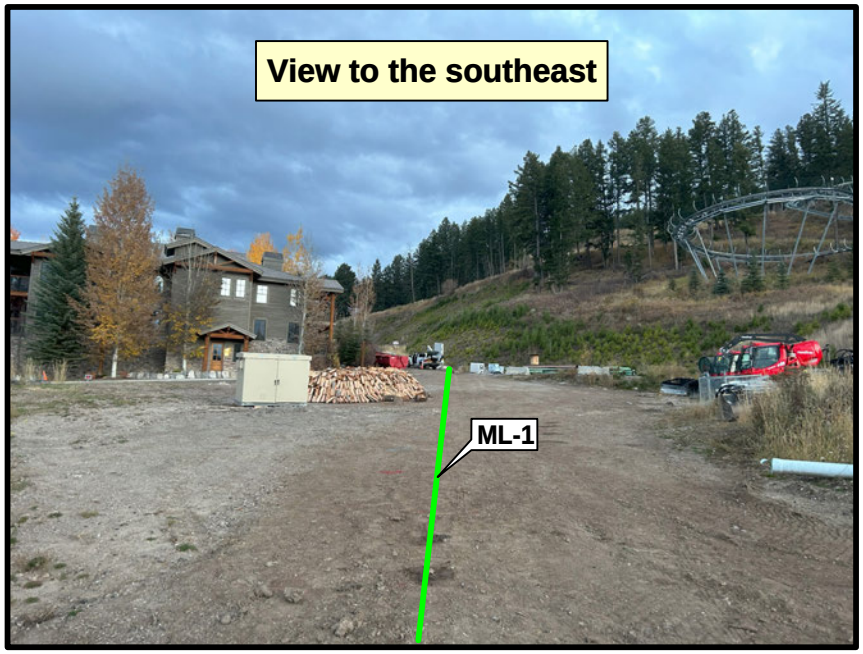
Project No.: 11143

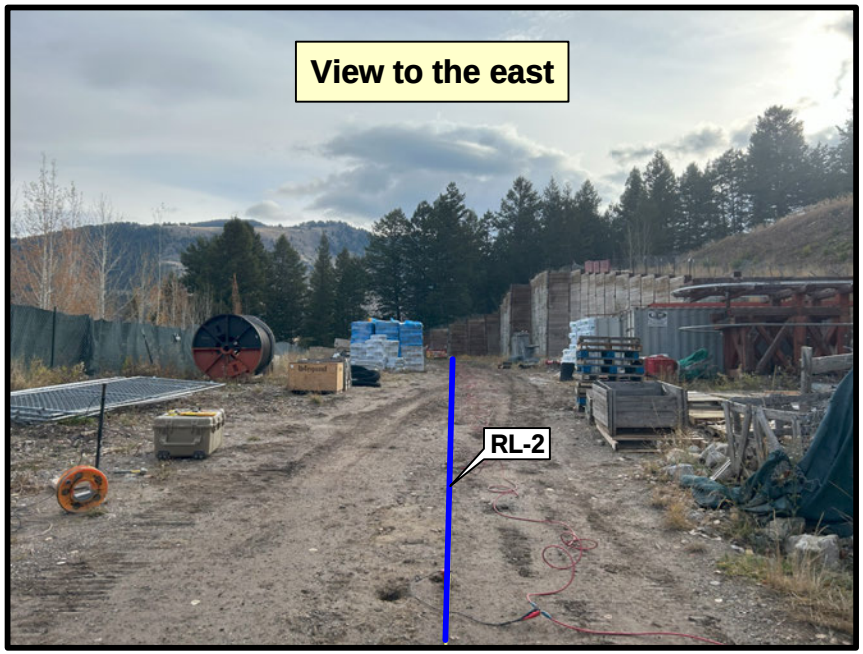
Date: 01/23

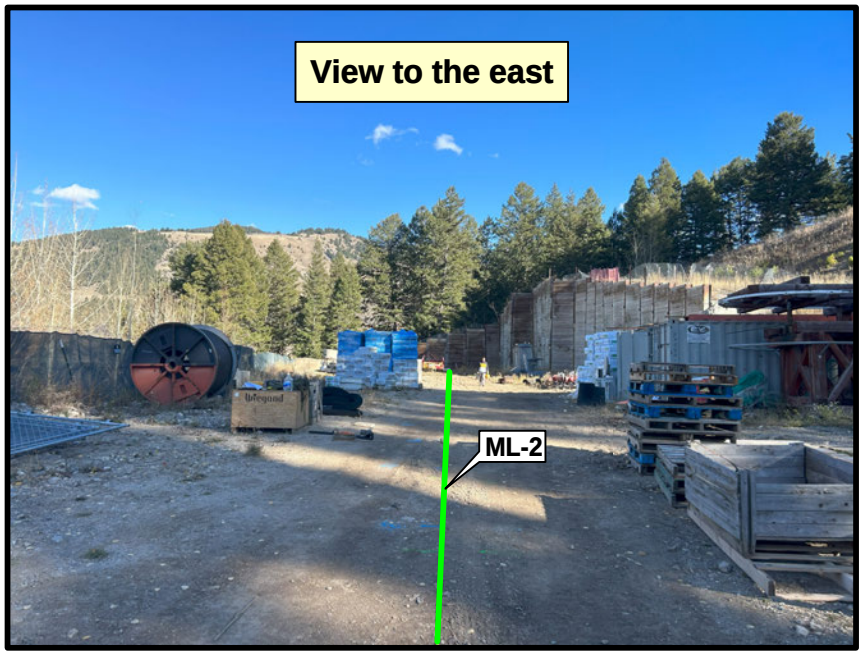
Figure 2

LINE LOCATION MAP



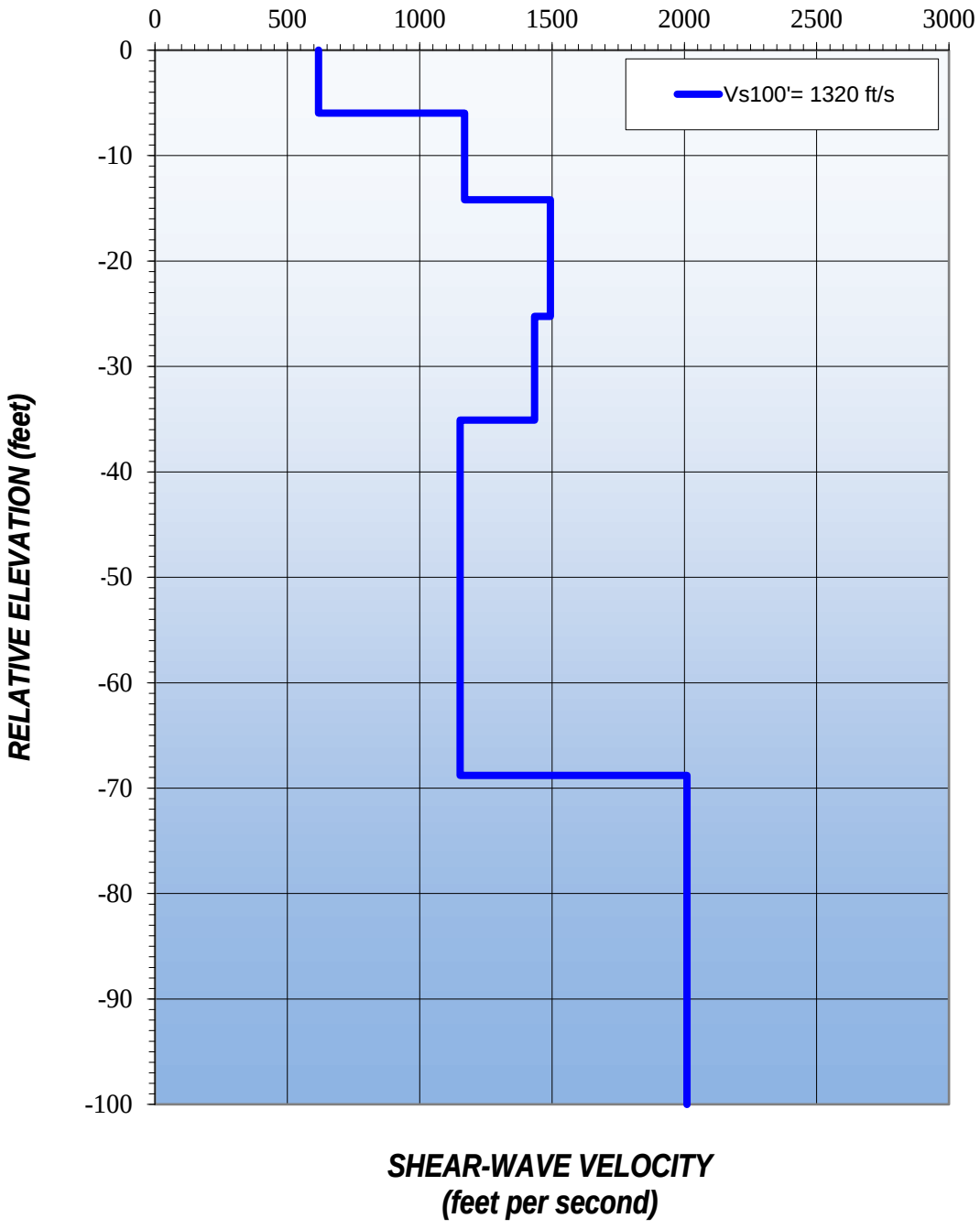




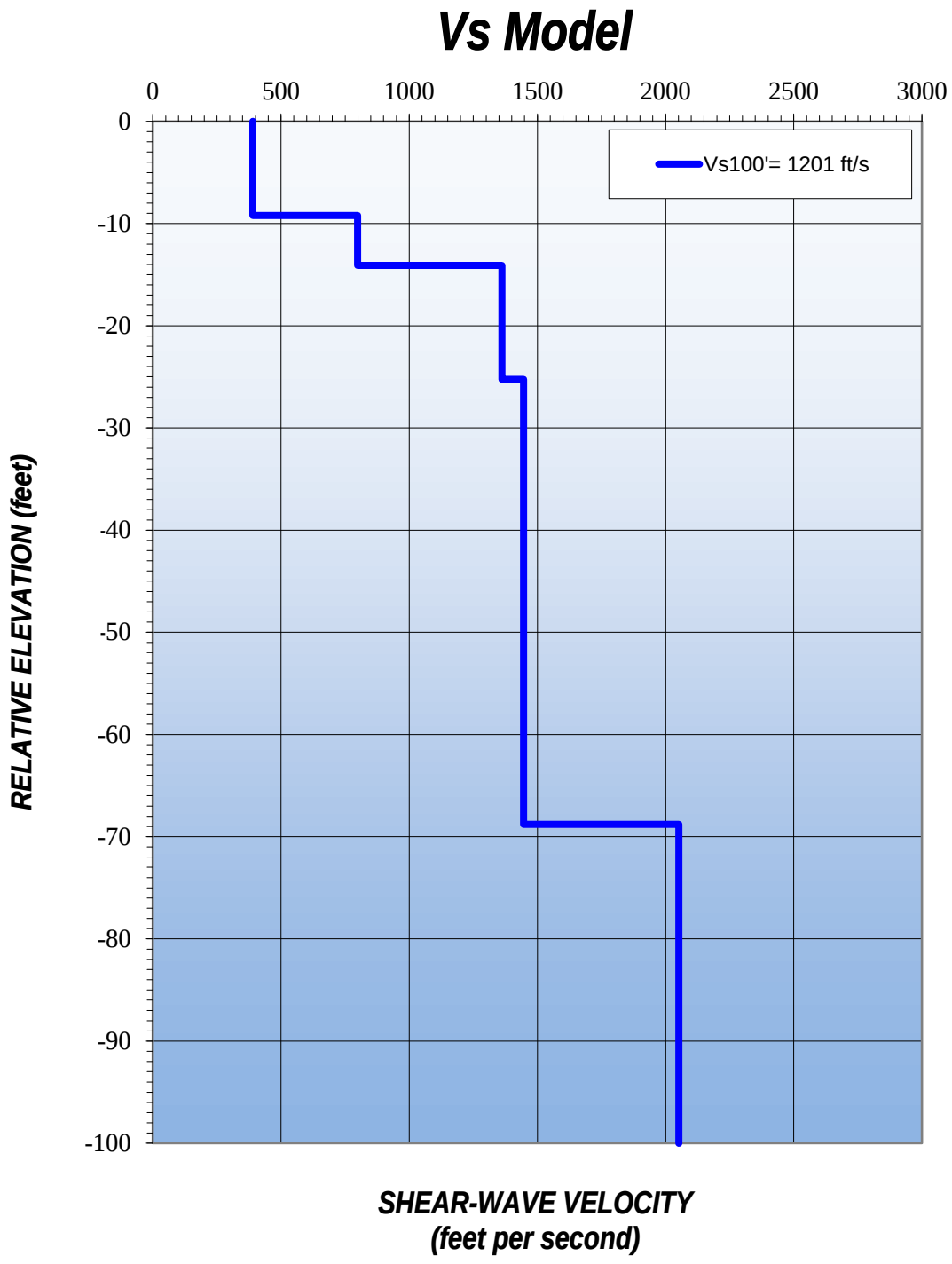


ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 3	**SITE PHOTOGRAPHS**

Vs Model



ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 4a	**ReMi RESULTS** **RL-1**



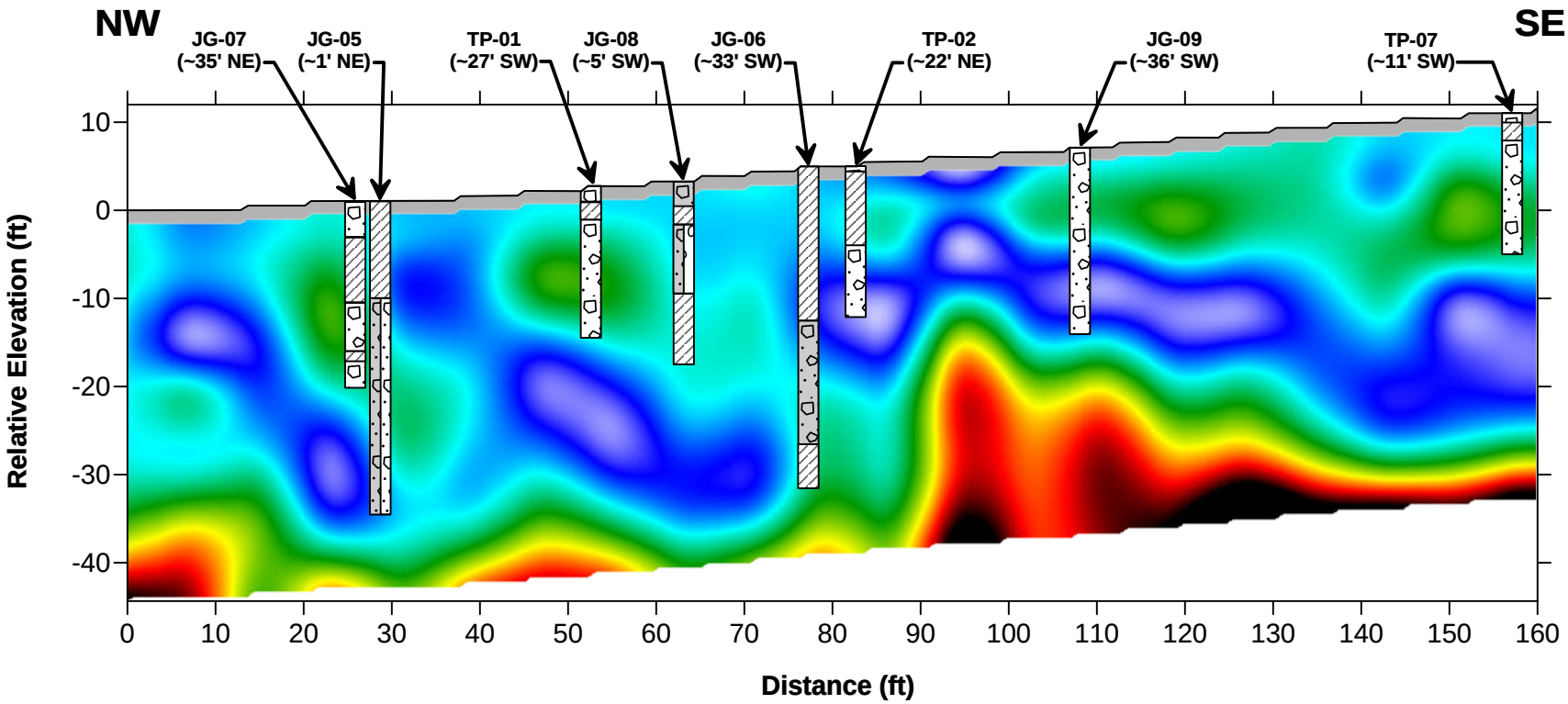
ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 4b	**ReMi RESULTS** **RL-2**

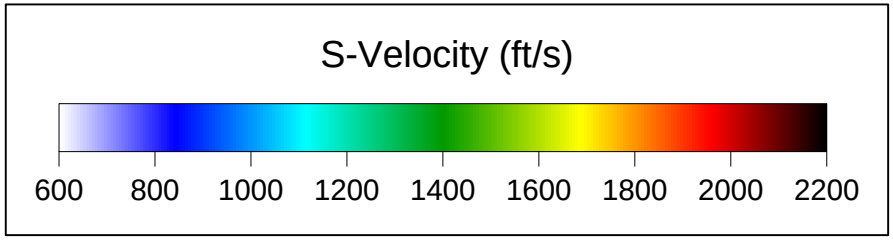
MASW PROFILE
ML-1

LEGEND

CL GM
GP GC

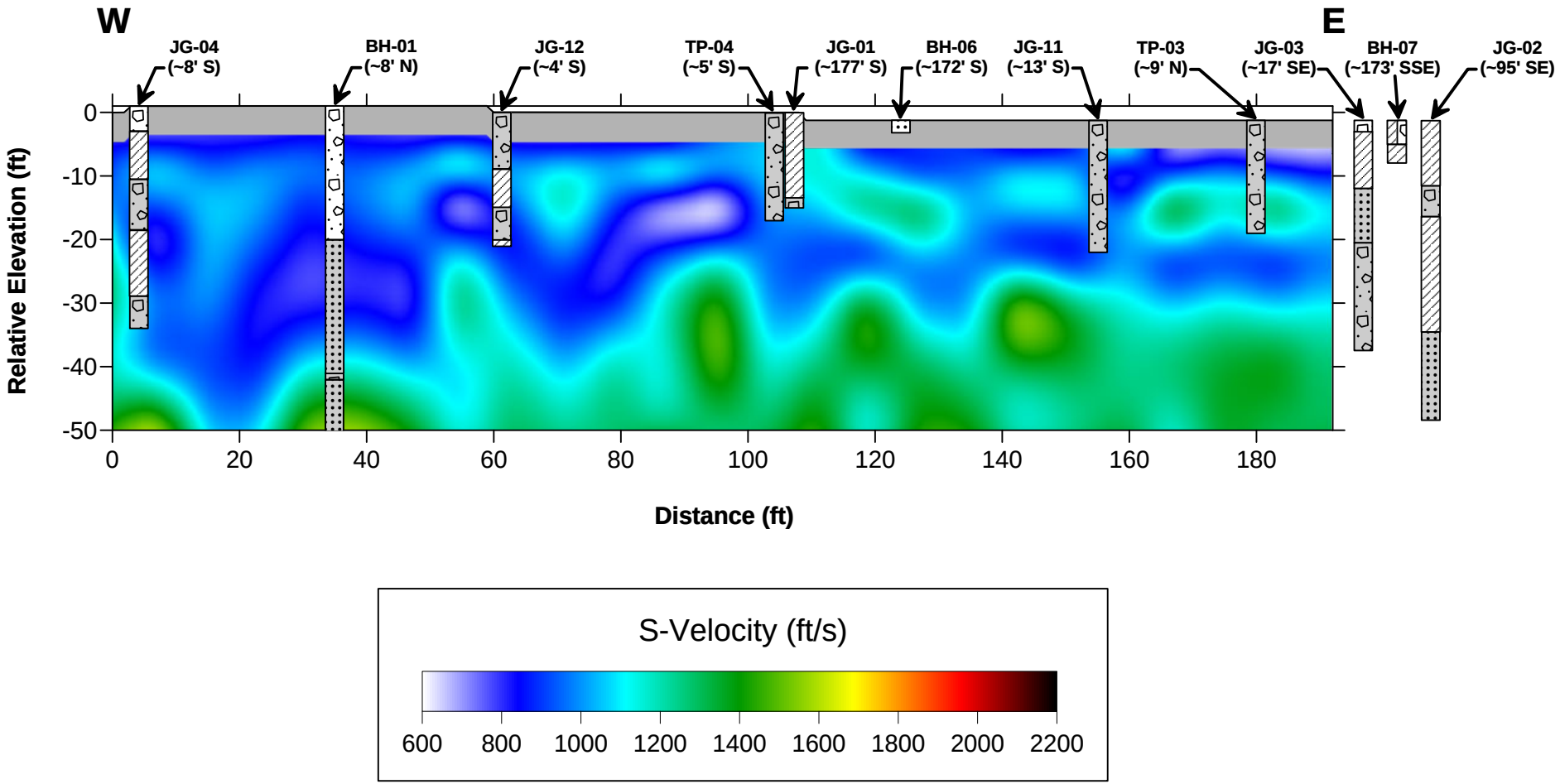
* All dimensions are approximate.
* Borehole data provided by Jorgensen.





ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 5a	**MASW PROFILE ML-1**

MASW PROFILE
ML-2



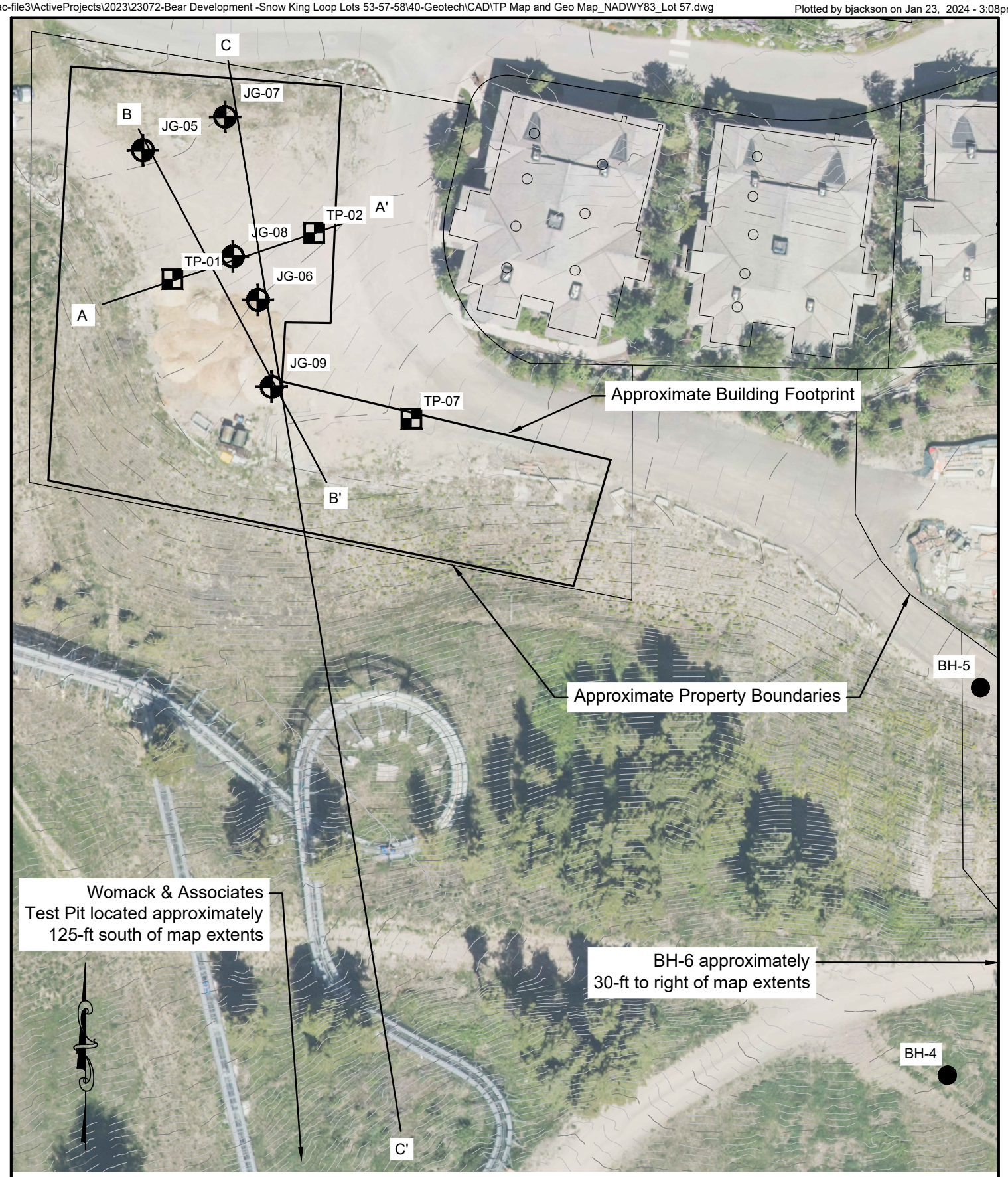
ATLAS	Snow King Jackson, Wyoming	Project No.: 11143 Date: 01/24	Figure 5b	**MASW PROFILE** **ML-2**

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX B

Figures



0 50 100

SCALE: 1 INCH = 50 FEET
THIS SCALE VALID ONLY FOR 8.5x11 PRINTS

Borehole (BH-XX), test pit (TP-XX), and Nelson Engineering boreholes (BH-X) locations are approximate and may be surveyed upon request. Existing ground surface topography provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023. Additional topographic data provided by Teton County, 2015. Aerial imagery provided by Teton County, 2019.

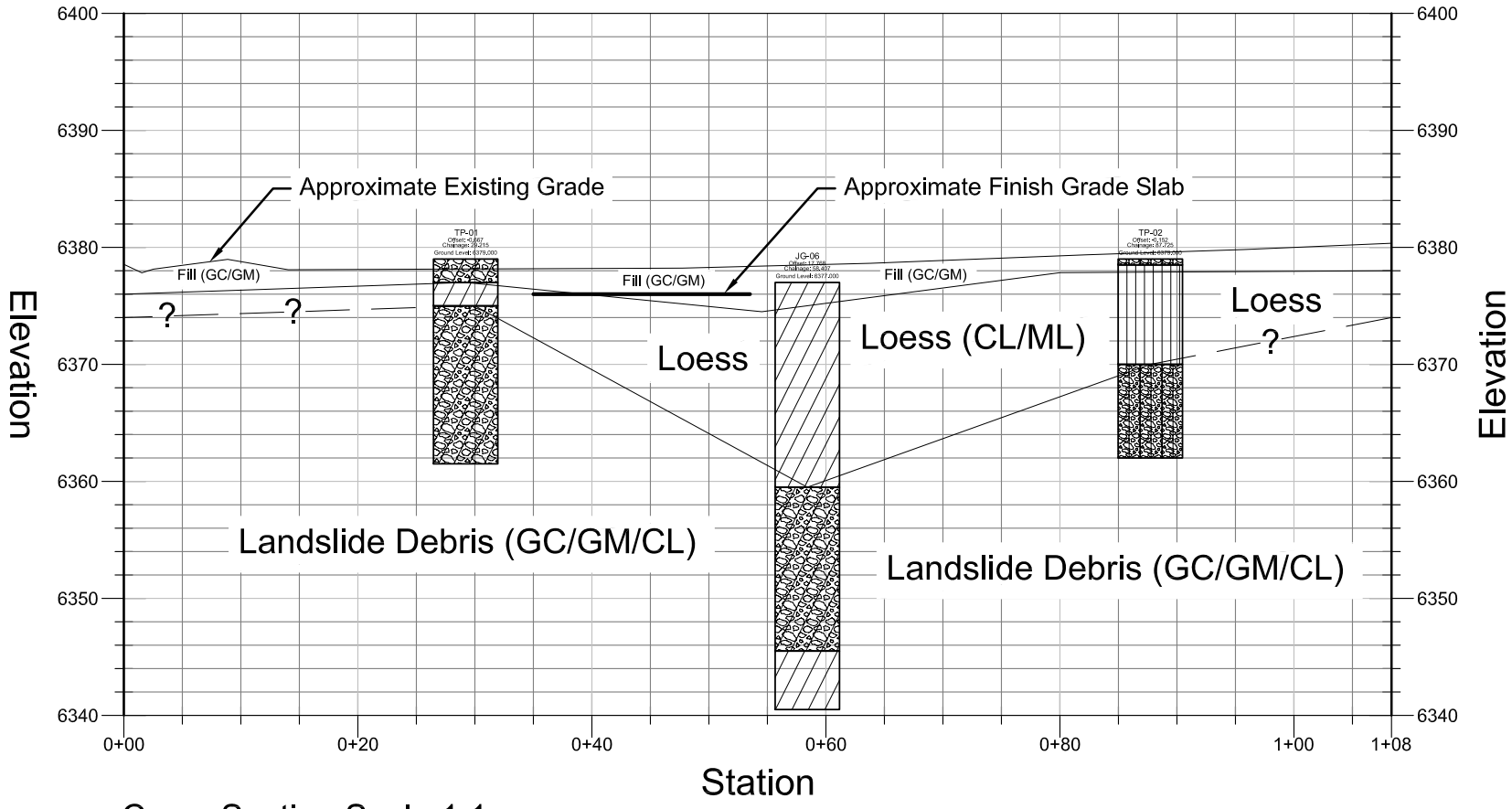
DRAFTED BY:	BJ
REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 2
Borehole, Test Pit and Geologic Cross Section Location Map

PROJECT TITLE:
Geotechnical Engineering Report
Bear Development - Lot 57
Teton County, Wyoming

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Cross section A-A'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

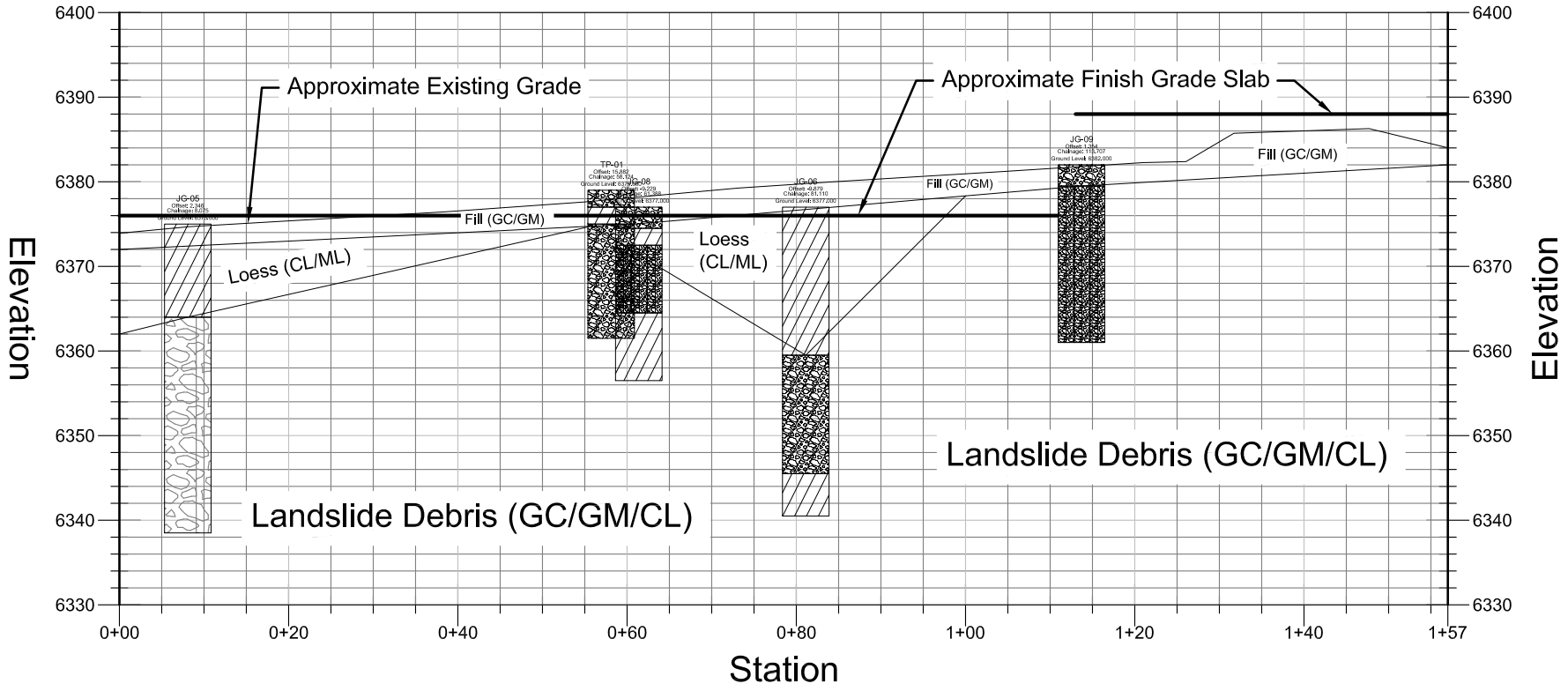
DRAFTED BY:	BJ
REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 3
Geologic Cross Section A-A'

PROJECT TITLE:
Geotechnical Engineering Report
Bear Development - Lot 57
Teton County, Wyoming

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Cross section B-B'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

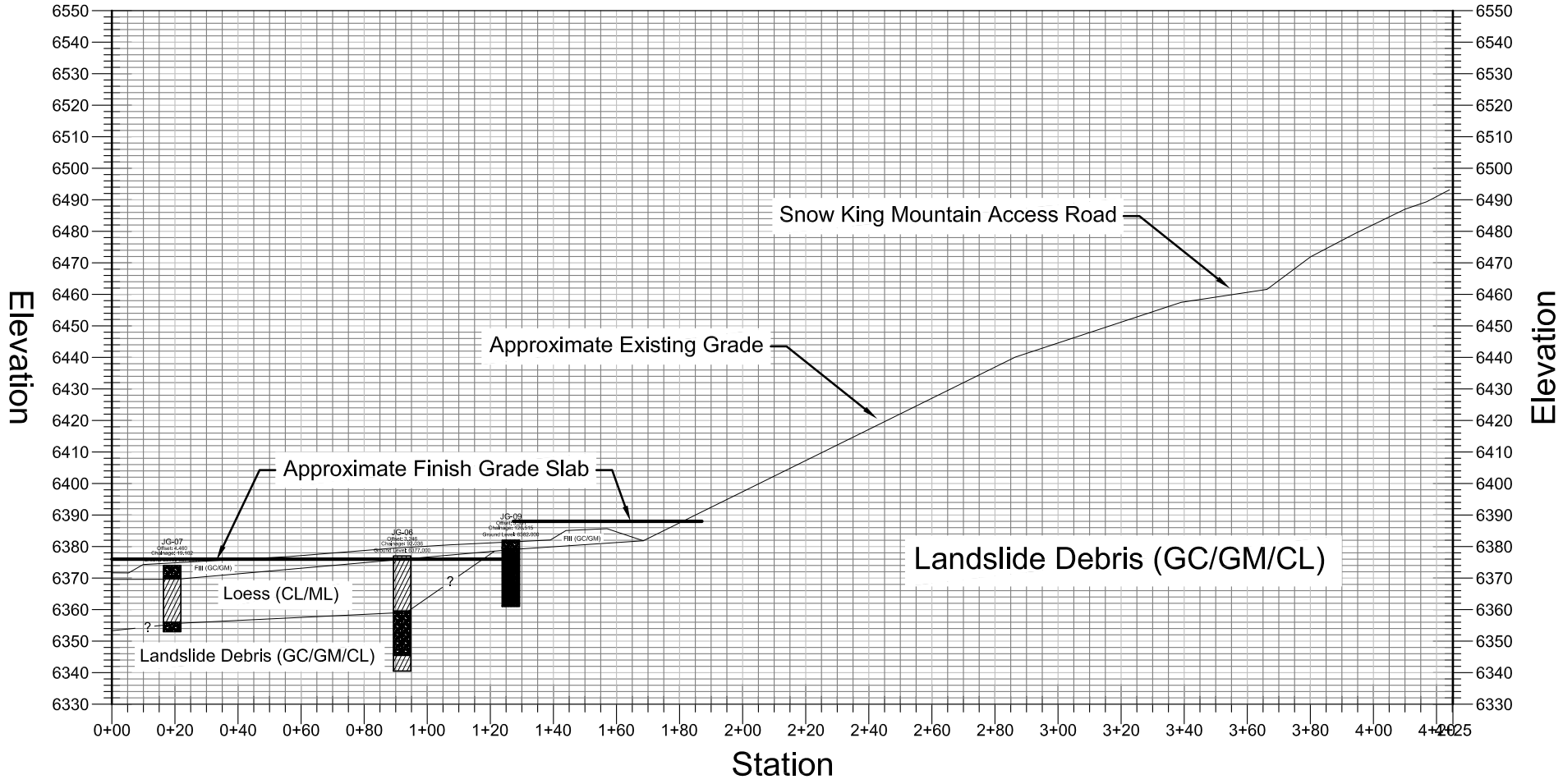
DRAFTED BY:	BJ
REVIEWED BY:	HC/DB
PROJECT NUMBER	23072

SHEET TITLE:
Figure 4
Geologic Cross Section B-B'

PROJECT TITLE:
Geotechnical Engineering Report
Bear Development - Lot 57
Teton County, Wyoming

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PH: 307.733.5150
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Cross section C-C'



Cross Section Scale 1:1

Garage slab elevations provided by Hoyt Architects Preliminary Design dated July 19, 2023. Existing ground surface provided by Jorgensen Associates, taken from topographic survey completed November 1, 2023.

DRAFTED BY: BJ REVIEWED BY: HC/DB PROJECT NUMBER 23072	SHEET TITLE: Figure 5 Geologic Cross Section C-C'	PROJECT TITLE: Geotechnical Engineering Report Bear Development - Lot 57 Teton County, Wyoming	JORGENSEN GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

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PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX C

Soils Laboratory Procedures and Results

Laboratory Testing

Laboratory Testing Procedures

Lab samples were submitted for testing at GCI in Salt Lake City, Utah from boreholes JG-05, JG-06, JG-07, JG-08, JG-09, and TP-02.

During the October 2023 site exploration for the Development at Lot 57, JG collected relatively undisturbed (i.e., thin-walled Shelby tubes) and disturbed samples (i.e., split spoon (SPT) samples, sonic drilling grab samples, and test pit bulk samples). Of the samples collected, 12 disturbed samples and three relatively undisturbed samples were selected for lab analysis. Laboratory testing included natural moisture content, unit weight, Atterberg limits, grain-size distribution, hydrometer, and consolidation testing.

The laboratory testing program consisted of:

- Fifteen (15) Moisture Contents (ASTM D2937/D2216)
- Fifteen (15) Atterberg Limits (ASTM D4318)
- Fifteen (15) Grain Size Analysis (ASTM D422)
- Two (2) Direct Shear Strength (ASTM D3080)
- Three (3) One Dimension Consolidation (ASTM D2435)

We also included applicable laboratory testing data from our site exploration on the nearby Lots 53 And 58, laboratory testing results from Nelson Engineering for Lots 53 and 58, and laboratory testing data for a nearby project provided by Womack & Associates, Inc.

Combined results are shown on the following pages.

Laboratory Test Results: Detailed Summary

Laboratory testing included index testing for classification per USCS, and direct testing of strength, as well as one dimensional consolidation tests. Classification tests – including Atterberg limits and grain-size analysis – have been summarized in table 4-1, with Direct Shear tests and consolidation tests summarized in Tables 4-2 and 4-3, respectively. Full laboratory data sheets are attached.

The data herein are provided for informational purposes. Design-build contractors shall be responsible for providing their own analysis of the test results and for development of appropriate design parameters. Jorgensen is available to assist in the selection of design parameters, if requested.

Table 4-1: Classification Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	Gravel (%)	Sand (%)	Fines (%)	Moisture Content (%)	Liquid Limit	Plasticity Index
JG-05	D6	8.5	CL	1.4	12.4	86.2	13.7	39	25
JG-05	D12	22	GC	66.2	11.6	22.2	5.5	26	11
JG-05	D19	35	GM	48	32.1	19.9	1.8	NP	NP
JG-06	D2a	3.5	CL	0.4	7.3	92.3	26.8	38	19
JG-06	D8	12.5	CL	24.6	21.4	54	9.6	32	19
JG-06	D15	20	GC	48.7	27.3	24	4.7	18	4
JG-06	D20	32.5	CL	11.3	18.6	70.1	14.9	28	13
JG-07	U1	5	CL	12.9	26.9	60.2	14.1	31	11
JG-07	U2	9	CL	1.3	12.5	86.2	22.7	33	15
JG-07	D7	17.5	CL	1.9	15.4	82.7	12.6	29	14
JG-08	D4	10	GM	70.9	18	11.1	2.2	NP[1]	NP
JG-08	D5	12.5	CL	21.2	15.5	63.3	10	32	17
JG-09	D3	7.5	GC	32.3	29.2	38.6	7	17	1
JG-09	D6	15	GM	42.7	22.2	35.1	5.7	NP	NP
TP-02	U1	6	ML	0	6.5	93.5	17.5	NP	NP
BH5[2]	‘-	23	SC	7	55	38	‘-	29	25
BH5[2]	‘-	37	SC	7	98	25	‘-	28	16
BH6[2]	4B	22	CL	0	12	87	17.5	33	18
BH6[2]	‘11	52	CL	9	25	66	16.5	25	14
TP-1[3]	‘-	9	CL	‘-	‘-	‘-	‘-	32	15
TP-1[3]	‘-	10	CL	‘-	‘-	‘-	‘-	41	26
TP-1[3]	‘-	20	CL	‘-	‘-	‘-	‘-	34	20
TP-1[3]	‘-	27.5	CL	‘-	‘-	‘-	‘-	25	11

[1]NP designates non-plastic soils
[2]Designates data from Nelson Engineering
[3]Designates data from Womack & Associates, Inc.

Table 4-2: Direct Shear Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	Cohesion (c)	Peak Friction Angle (f)
JG-07	U1	9-10	CL	379	30
TP-02	U1	6-7	ML	144	34
BH-6[2]	11	52.5	CL	2059	37

[2]Designates data from Nelson Engineering

Table 4-3: Consolidation Testing Summary

Borehole	Sample ID	Depth (ft)	USCS Symbol	C_C
JG-07	U1	5-6	CL	0.17
JG-07	U2	9-10	CL	0.28
TP-02	U1	6-7	ML	0.17

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 57**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	JG-05	JG-05	JG-05	JG-06	JG-06	JG-06
	Depth:	8.5-11 ft	22-25 ft	35-37 ft	3.5-5 ft	12.5-14 ft	20-22 ft
	Date Sampled:	-	-	-	-	-	-
	Date tested:	16-Nov-23	16-Nov-23	16-Nov-23	16-Nov-23	16-Nov-23	16-Nov-23
	Laboratory sample description:	ol bn - dk ol bn silt	lt bn - bn gravel	tn - bn sandy gravel	bn - ol bn sandy clay	bn - tn clayey gravel	bn - tn sandy gravel
Moisture	Wet soil + tare (g)	706.71	1702.45	480.97	733.41	740.83	549.20
	Dry soil + tare (g)	645.29	1614.91	474.66	619.61	693.33	529.85
	Tare (g)	195.99	13.73	116.46	194.83	197.69	117.39
	Moisture content, w (%)	13.7	5.5	1.8	26.8	9.6	4.7
Comments							
QC/QA	Tested By:	MGS	MGS	MGS	MGS	MGS	MGS
	Reduced By:	AT	AT	AT	AT	AT	AT
	Reviewed By:	MGS	MGS	MGS	MGS	MGS	MGS

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 57**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-06**	**JG-07**	**JG-07**	**JG-07**	**JG-08**	**JG-08**
	Depth:	**32.5-35 ft**	**5-6 ft**	**9-10 ft**	**17.5-18 ft**	**10-12 ft**	**12.5-14 ft**
	Date Sampled:	**-**	**-**	**-**	**-**	**-**	**-**
	Date tested:	**16-Nov-23**	**14-Nov-23**	**14-Nov-23**	**16-Nov-23**	**16-Nov-23**	**16-Nov-23**
	Laboratory sample description:	**lt bn - bn clay**	**lt bn - bn gravelly clay**	**lt bn - bn clay**	**lt bn - bn sandy clay**	**tn - bn sandy gravel**	**lt bn - bn sandy clay**
Moisture	Wet soil + tare (g)	764.63	708.54	398.83	282.48	584.18	467.72
	Dry soil + tare (g)	680.77	645.37	361.41	272.74	574.02	443.13
	Tare (g)	117.13	197.20	196.69	195.23	118.03	197.42
	Moisture content, w (%)	14.9	14.1	22.7	12.6	2.2	10.0
Comments							
QC/QA	Tested By:	MGS	MGS	MGS	MGS	MGS	MGS
	Reduced By:	AT	AT	AT	AT	AT	AT
	Reviewed By:	MGS	MGS	MGS	MGS	MGS	MGS

Moisture Content Determination

ASTM D2937 / D2216

Project: **Bear Development Snow King Lot 57**

No: **23072 (23-1725)**

Location: **-**

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Sample Info.	Sample:	**JG-09**	**JG-09**	**TP-02**			
	Depth:	**7.5-9 ft**	**15-17 ft**	**6-7 ft**			
	Date Sampled:	**-**	**-**	**-**			
	Date tested:	**16-Nov-23**	**16-Nov-23**	**15-Nov-23**			
	Laboratory sample description:	**dk yl bn - dk bn sandy gravel**	**dk yl bn - bn sandy gravel**	**lt bn - bn silt**			
Moisture	Wet soil + tare (g)	644.83	632.20	577.49			
	Dry soil + tare (g)	610.41	604.61	508.79			
	Tare (g)	118.01	118.24	116.54			
	Moisture content, w (%)	7.0	5.7	17.5			
Comments							
QC/QA	Tested By:	MGS	MGS	AT			
	Reduced By:	AT	AT	AT			
	Reviewed By:	MGS	MGS	MGS			

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-05

No: 23072 (23-1725) **Depth:** 8.5-11 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	ol bn - dk ol bn silt
As-received water content(%):	13.7	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

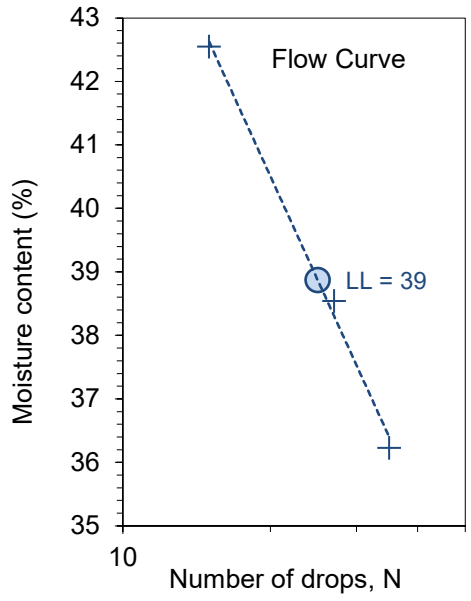
Determination No:	1	2
Wet Soil + Tare (g):	20.43	21.24
Dry Soil + Tare (g):	19.47	20.33
Moisture Loss (g):	0.96	0.91
Tare (g):	12.63	13.55
Dry Soil (g):	6.84	6.78
Moisture Content, w (%):	14.04	13.42

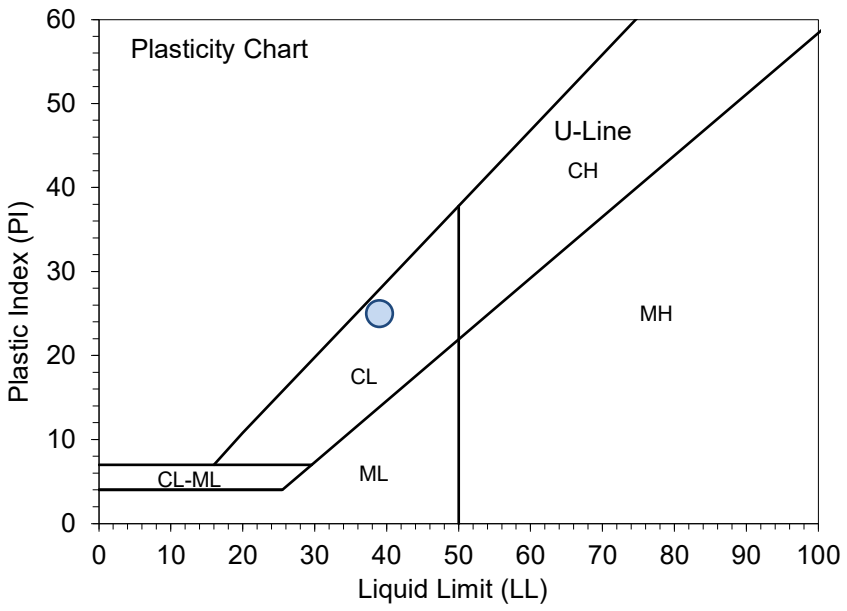
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	27	15
Wet Soil + Tare (g):	23.35	22.53	23.80
Dry Soil + Tare (g):	20.81	20.04	20.63
Moisture Loss (g):	2.54	2.49	3.17
Tare (g):	13.80	13.58	13.18
Dry Soil (g):	7.01	6.46	7.45
Moisture Content, w (%):	36.23	38.54	42.55
One-Point LL:		39	

Results

Liquid Limit, LL:	39
Plastic Limit, PL:	14
Plasticity Index, PI:	25





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-05

No: 23072 (23-1725) **Depth:** 22-25 ft

Tested by: CRC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn gravel
As-received water content(%):	5.5	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

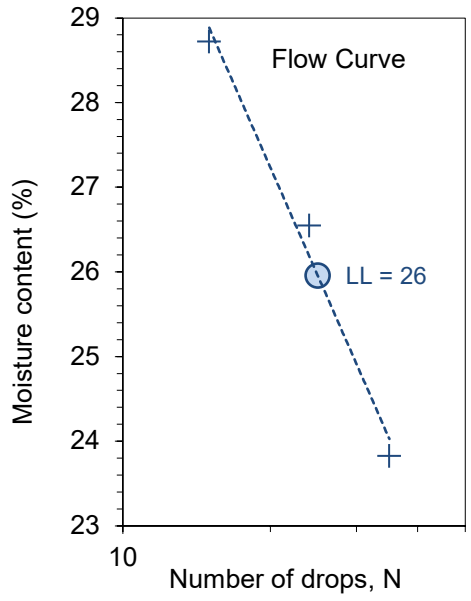
Determination No:	1	2
Wet Soil + Tare (g):	20.29	20.09
Dry Soil + Tare (g):	19.38	19.22
Moisture Loss (g):	0.91	0.87
Tare (g):	13.41	13.37
Dry Soil (g):	5.97	5.85
Moisture Content, w (%):	15.24	14.87

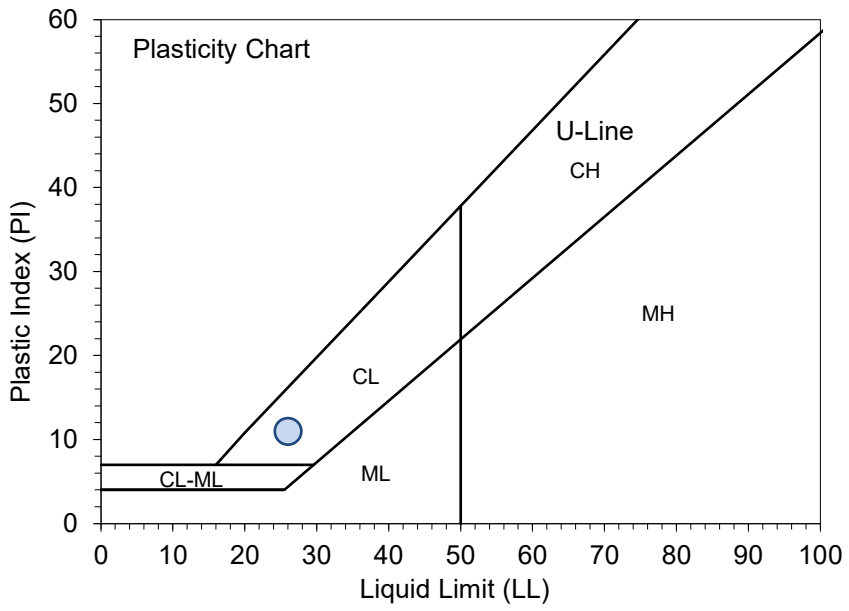
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	24	15
Wet Soil + Tare (g):	20.87	22.12	24.49
Dry Soil + Tare (g):	19.34	20.28	22.08
Moisture Loss (g):	1.53	1.84	2.41
Tare (g):	12.92	13.35	13.69
Dry Soil (g):	6.42	6.93	8.39
Moisture Content, w (%):	23.83	26.55	28.72
One-Point LL:		26	

Results

Liquid Limit, LL:	26
Plastic Limit, PL:	15
Plasticity Index, PI:	11





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 | **TH/TP/Sample:** JG-05

No: 23072 (23-1725) | **Depth:** 35-37 ft

Tested by: CML | Date: 16-Nov-23

Reduced by: CML | Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	tn - bn sandy gravel
As-received water content(%):	1.8	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid Limit:	Could not be determined (N.P.)

Plastic Limit

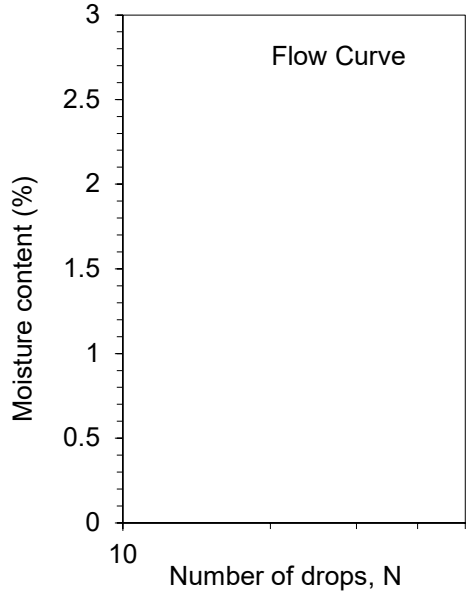
Determination No:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	

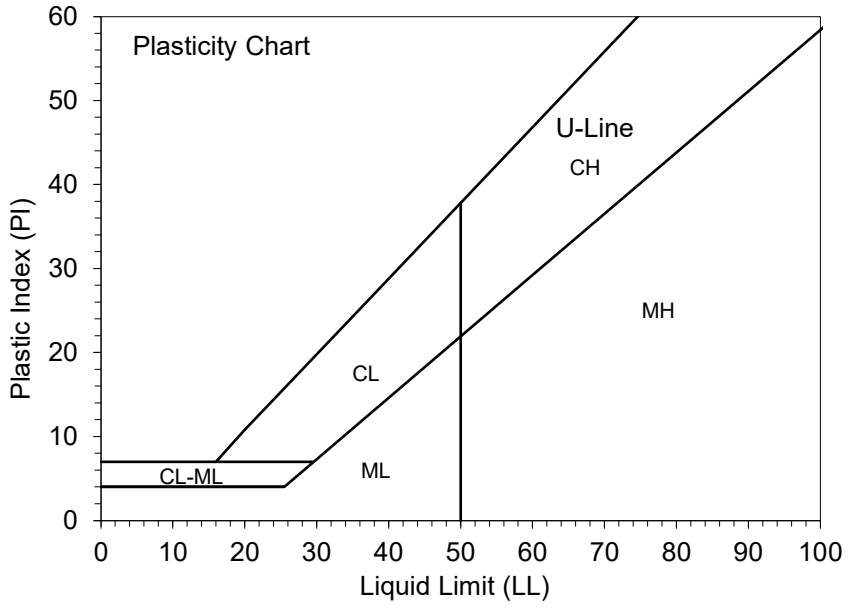
Liquid Limit

Determination No:	
Number of Drops, N:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	
One-Point LL:	

Results

Liquid Limit, LL:	Nonplastic (N.P.)
Plastic Limit, PL:	Nonplastic (N.P.)
Plasticity Index, PI:	Nonplastic (N.P.)





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 3.5-5 ft

Tested by: CRC Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - dk bn sandy clay
As-received water content(%):	26.8	Approximate maximum particle size:	No. 20
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	20
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

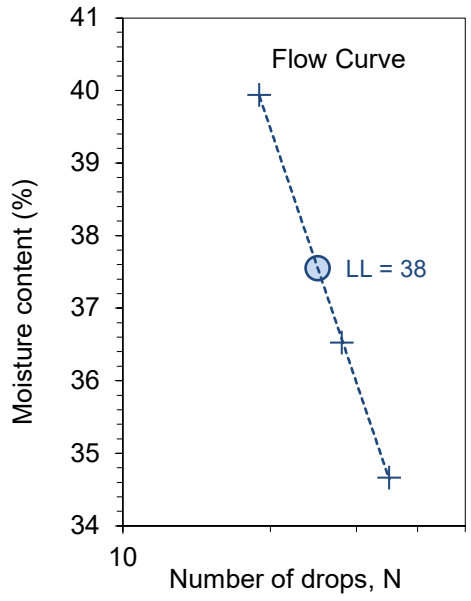
Determination No:	1	2
Wet Soil + Tare (g):	20.24	20.19
Dry Soil + Tare (g):	19.19	19.11
Moisture Loss (g):	1.05	1.08
Tare (g):	13.47	13.35
Dry Soil (g):	5.72	5.76
Moisture Content, w (%):	18.36	18.75

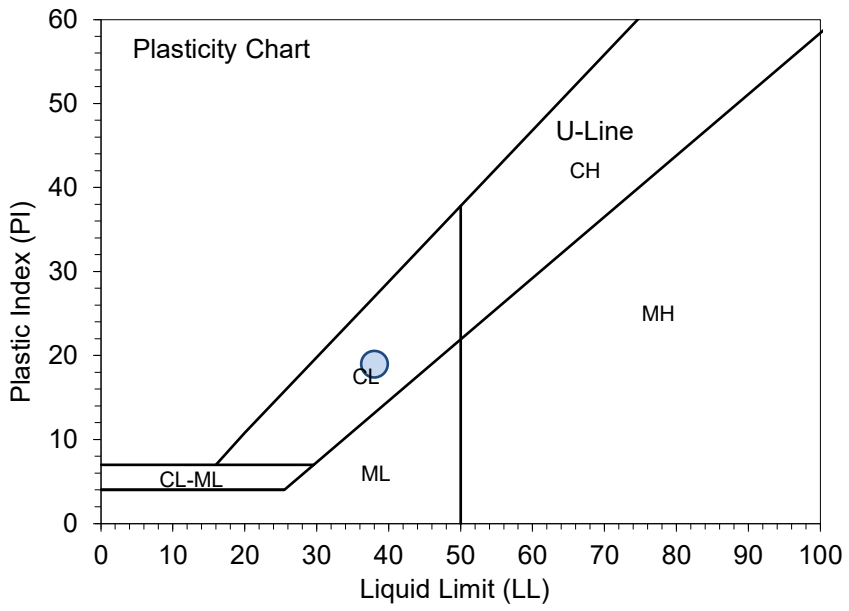
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	28	19
Wet Soil + Tare (g):	23.62	22.15	23.24
Dry Soil + Tare (g):	20.94	19.56	20.48
Moisture Loss (g):	2.68	2.59	2.76
Tare (g):	13.21	12.47	13.57
Dry Soil (g):	7.73	7.09	6.91
Moisture Content, w (%):	34.67	36.53	39.94
One-Point LL:		37	

Results

Liquid Limit, LL:	38
Plastic Limit, PL:	19
Plasticity Index, PI:	19





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - tn clayey gravel
As-received water content(%):	9.6	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

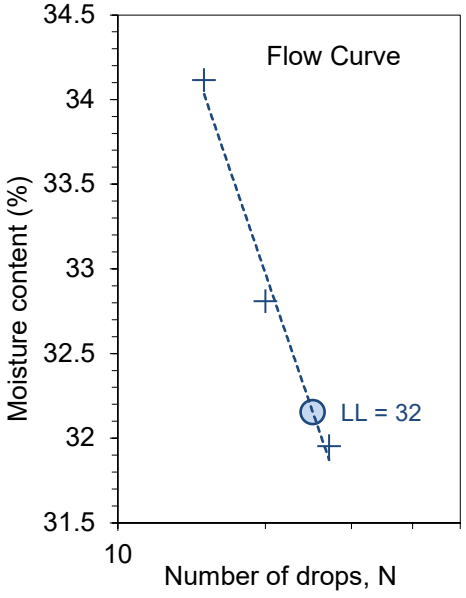
Determination No:	1	2
Wet Soil + Tare (g):	21.39	21.33
Dry Soil + Tare (g):	20.49	20.44
Moisture Loss (g):	0.90	0.89
Tare (g):	13.54	13.63
Dry Soil (g):	6.95	6.81
Moisture Content, w (%):	12.95	13.07

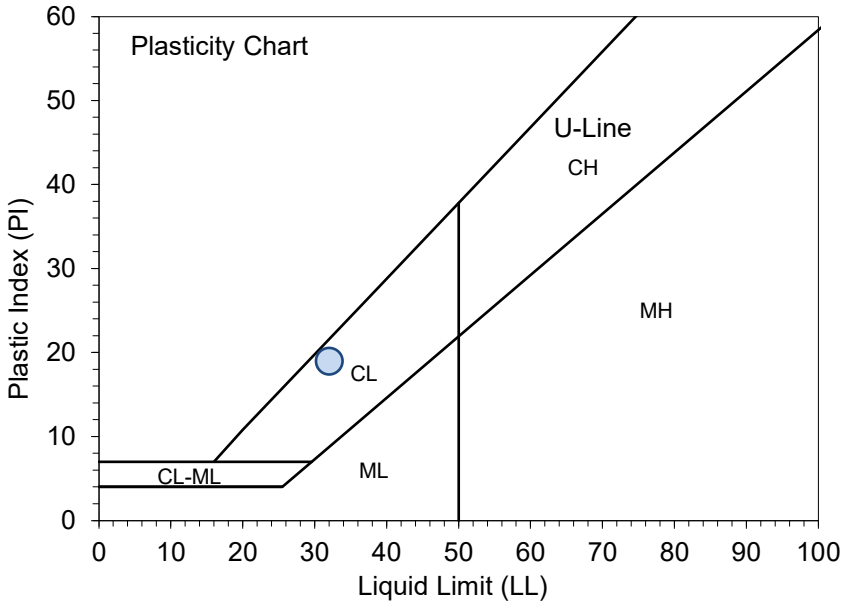
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	27	20	15
Wet Soil + Tare (g):	21.43	22.84	23.23
Dry Soil + Tare (g):	19.19	20.54	20.76
Moisture Loss (g):	2.24	2.30	2.47
Tare (g):	12.18	13.53	13.52
Dry Soil (g):	7.01	7.01	7.24
Moisture Content, w (%):	31.95	32.81	34.12
One-Point LL:	32	32	

Results

Liquid Limit, LL:	32
Plastic Limit, PL:	13
Plasticity Index, PI:	19





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 20-22 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	bn - tn sandy gravel
As-received water content(%):	4.7	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

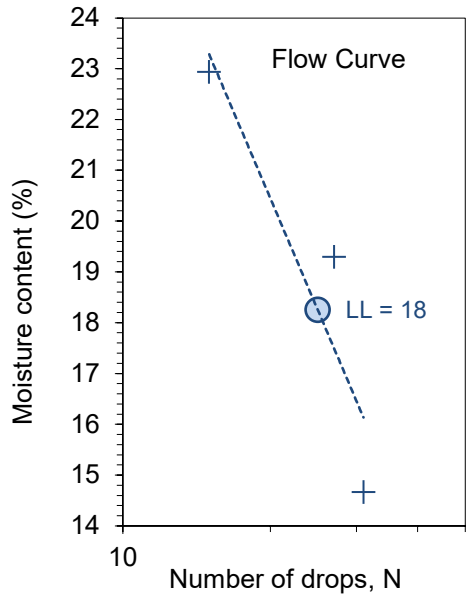
Determination No:	1	2
Wet Soil + Tare (g):	21.25	20.66
Dry Soil + Tare (g):	20.28	19.73
Moisture Loss (g):	0.97	0.93
Tare (g):	13.54	13.07
Dry Soil (g):	6.74	6.66
Moisture Content, w (%):	14.39	13.96

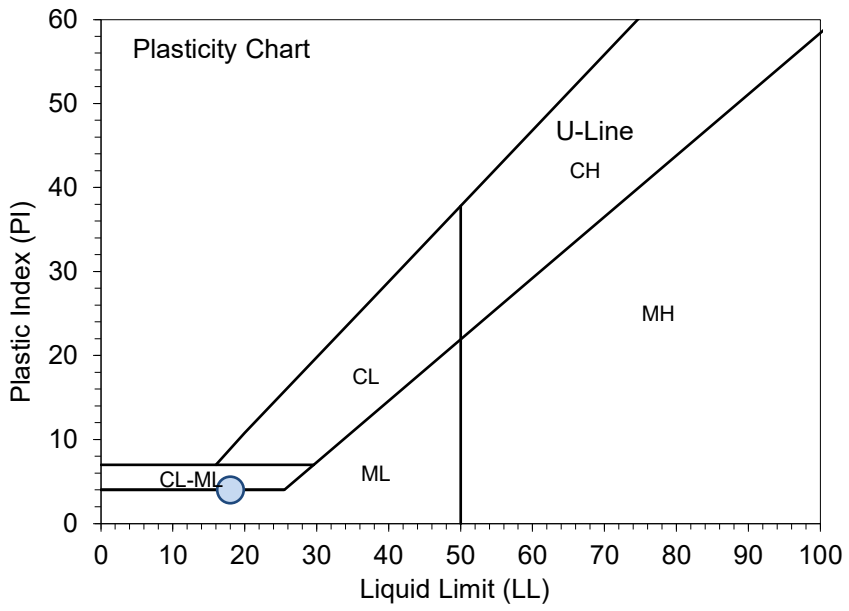
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	31	27	15
Wet Soil + Tare (g):	21.30	25.01	21.22
Dry Soil + Tare (g):	20.27	23.18	19.66
Moisture Loss (g):	1.03	1.83	1.56
Tare (g):	13.25	13.70	12.86
Dry Soil (g):	7.02	9.48	6.80
Moisture Content, w (%):	14.67	19.30	22.94
One-Point LL:		19	

Results

Liquid Limit, LL:	18
Plastic Limit, PL:	14
Plasticity Index, PI:	4





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 32.5-35 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	14.9	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	30
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

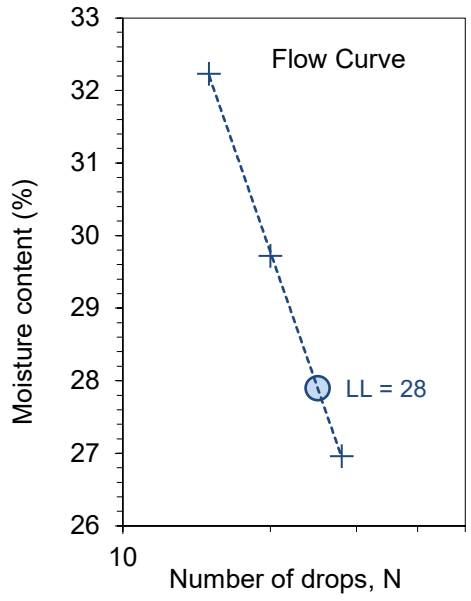
Determination No:	1	2
Wet Soil + Tare (g):	21.35	21.41
Dry Soil + Tare (g):	20.35	20.41
Moisture Loss (g):	1.00	1.00
Tare (g):	13.56	13.61
Dry Soil (g):	6.79	6.80
Moisture Content, w (%):	14.73	14.71

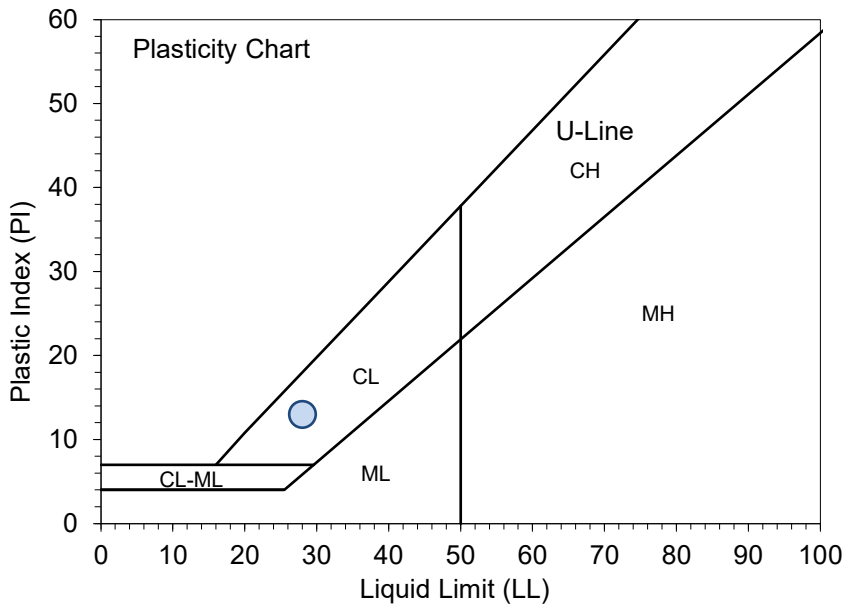
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	28	20	15
Wet Soil + Tare (g):	22.54	23.04	22.69
Dry Soil + Tare (g):	20.62	20.87	20.44
Moisture Loss (g):	1.92	2.17	2.25
Tare (g):	13.50	13.57	13.46
Dry Soil (g):	7.12	7.30	6.98
Moisture Content, w (%):	26.97	29.73	32.23
One-Point LL:	27	29	

Results

Liquid Limit, LL:	28
Plastic Limit, PL:	15
Plasticity Index, PI:	13





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 5-6 ft

Tested by: CRC Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn gravelly clay
As-received water content(%):	14.1	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	10
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

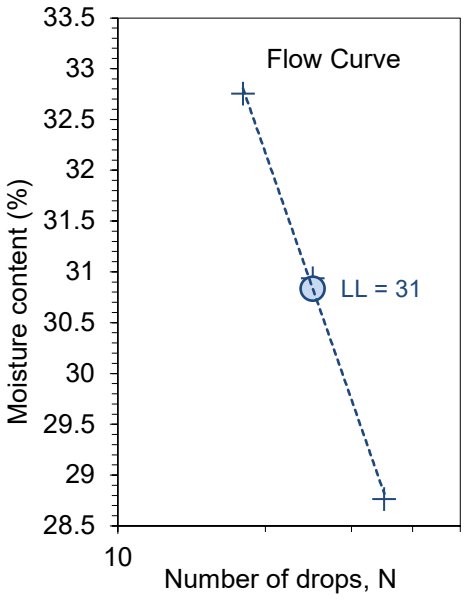
Determination No:	1	2
Wet Soil + Tare (g):	20.40	20.47
Dry Soil + Tare (g):	19.27	19.28
Moisture Loss (g):	1.13	1.19
Tare (g):	13.53	13.34
Dry Soil (g):	5.74	5.94
Moisture Content, w (%):	19.69	20.03

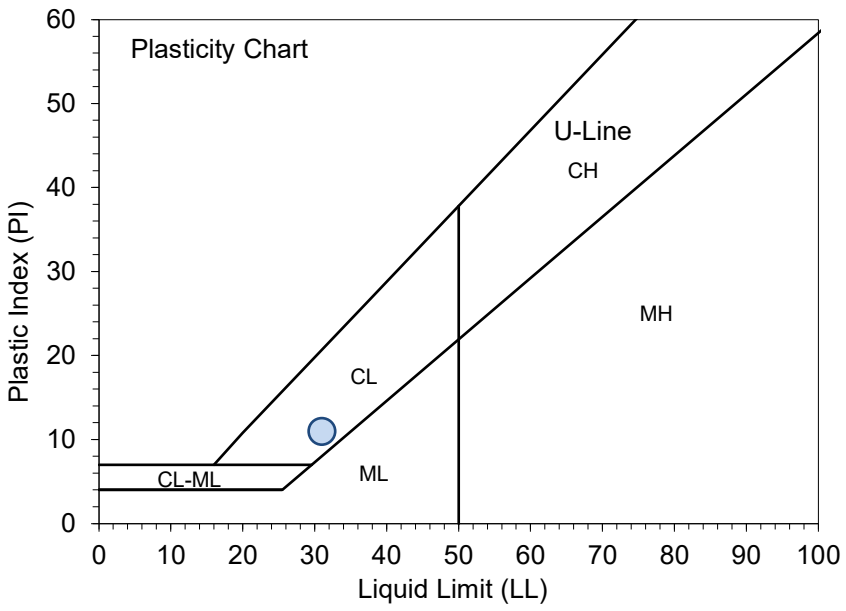
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	25	18
Wet Soil + Tare (g):	25.76	24.30	24.08
Dry Soil + Tare (g):	23.03	21.80	21.24
Moisture Loss (g):	2.73	2.50	2.84
Tare (g):	13.54	13.72	12.57
Dry Soil (g):	9.49	8.08	8.67
Moisture Content, w (%):	28.77	30.94	32.76
One-Point LL:		31	

Results

Liquid Limit, LL:	31
Plastic Limit, PL:	20
Plasticity Index, PI:	11





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 9-10 ft

Tested by: CML Date: 14-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn clay
As-received water content(%):	22.7	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

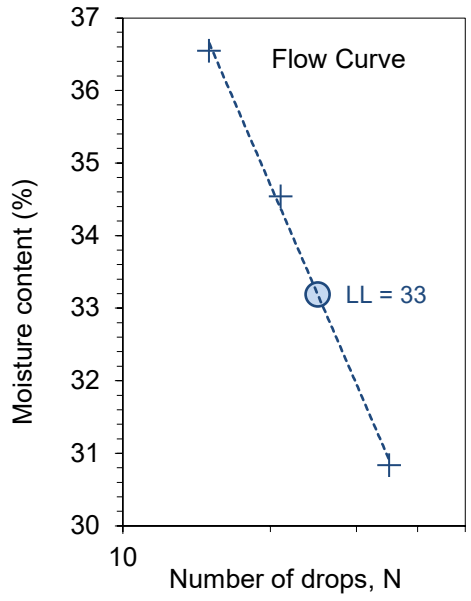
Determination No:	1	2
Wet Soil + Tare (g):	20.85	21.39
Dry Soil + Tare (g):	19.67	20.21
Moisture Loss (g):	1.18	1.18
Tare (g):	13.08	13.63
Dry Soil (g):	6.59	6.58
Moisture Content, w (%):	17.91	17.93

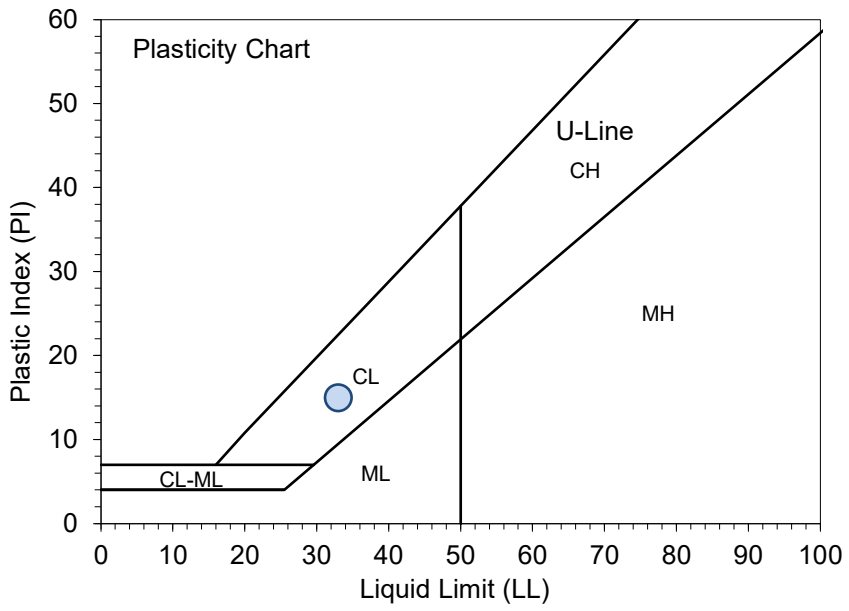
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	21	15
Wet Soil + Tare (g):	20.71	23.47	23.24
Dry Soil + Tare (g):	19.02	20.90	20.59
Moisture Loss (g):	1.69	2.57	2.65
Tare (g):	13.54	13.46	13.34
Dry Soil (g):	5.48	7.44	7.25
Moisture Content, w (%):	30.84	34.54	36.55
One-Point LL:		34	

Results

Liquid Limit, LL:	33
Plastic Limit, PL:	18
Plasticity Index, PI:	15





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 17.5-18 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn sandy clay
As-received water content(%):	12.6	Approximate maximum particle size:	3/8"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	20
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

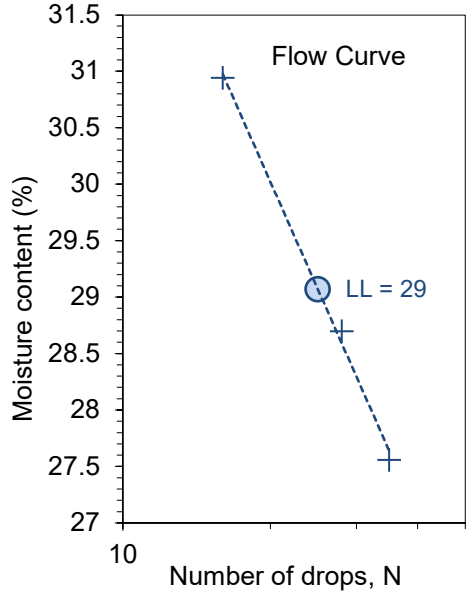
Determination No:	1	2
Wet Soil + Tare (g):	20.56	20.74
Dry Soil + Tare (g):	19.56	19.71
Moisture Loss (g):	1.00	1.03
Tare (g):	12.92	12.99
Dry Soil (g):	6.64	6.72
Moisture Content, w (%):	15.06	15.33

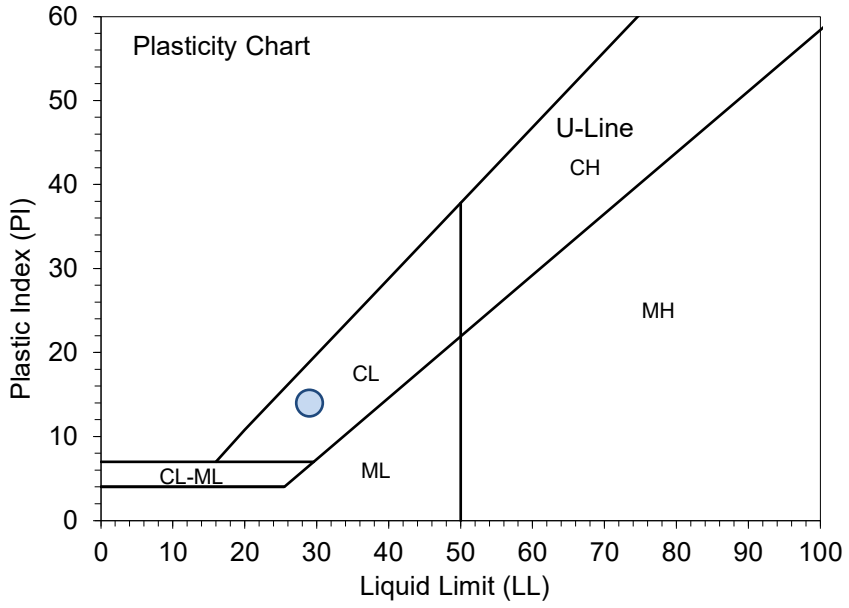
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	35	28	16
Wet Soil + Tare (g):	20.20	19.91	24.55
Dry Soil + Tare (g):	18.72	18.30	21.96
Moisture Loss (g):	1.48	1.61	2.59
Tare (g):	13.35	12.69	13.59
Dry Soil (g):	5.37	5.61	8.37
Moisture Content, w (%):	27.56	28.70	30.94
One-Point LL:		29	

Results

Liquid Limit, LL:	29
Plastic Limit, PL:	15
Plasticity Index, PI:	14





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-08

No: 23072 (23-1725) **Depth:** 10-12 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	tn - bn sandy gravel
As-received water content(%):	2.2	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	40
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid Limit:	Could not be determined (N.P.)

Plastic Limit

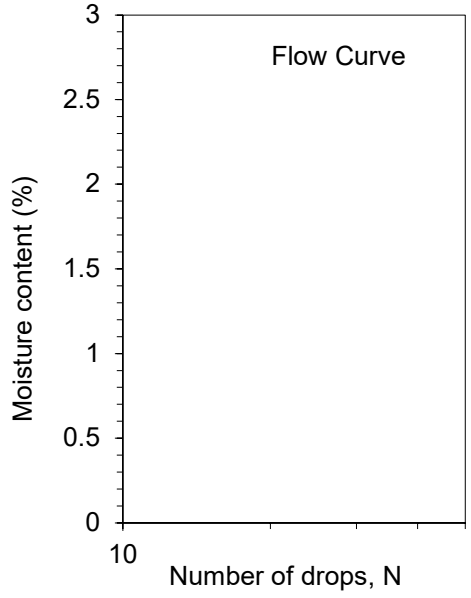
Determination No:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	

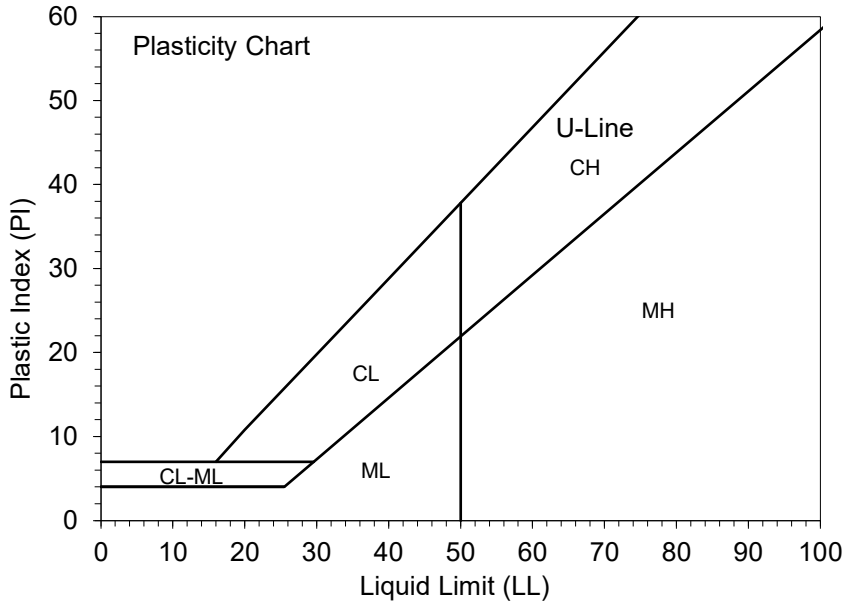
Liquid Limit

Determination No:	
Number of Drops, N:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	
One-Point LL:	

Results

Liquid Limit, LL:	Nonplastic (N.P.)
Plastic Limit, PL:	Nonplastic (N.P.)
Plasticity Index, PI:	Nonplastic (N.P.)





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-08

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	lt bn - bn sandy clay
As-received water content(%):	10.0	Approximate maximum particle size:	3/4"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	30
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

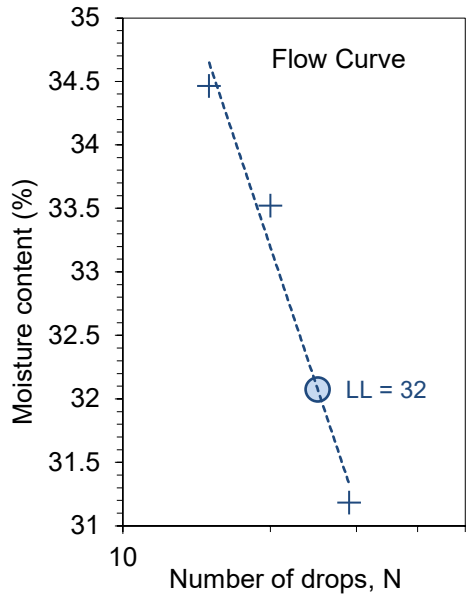
Determination No:	1	2
Wet Soil + Tare (g):	21.19	20.93
Dry Soil + Tare (g):	20.19	19.95
Moisture Loss (g):	1.00	0.98
Tare (g):	13.51	13.39
Dry Soil (g):	6.68	6.56
Moisture Content, w (%):	14.97	14.94

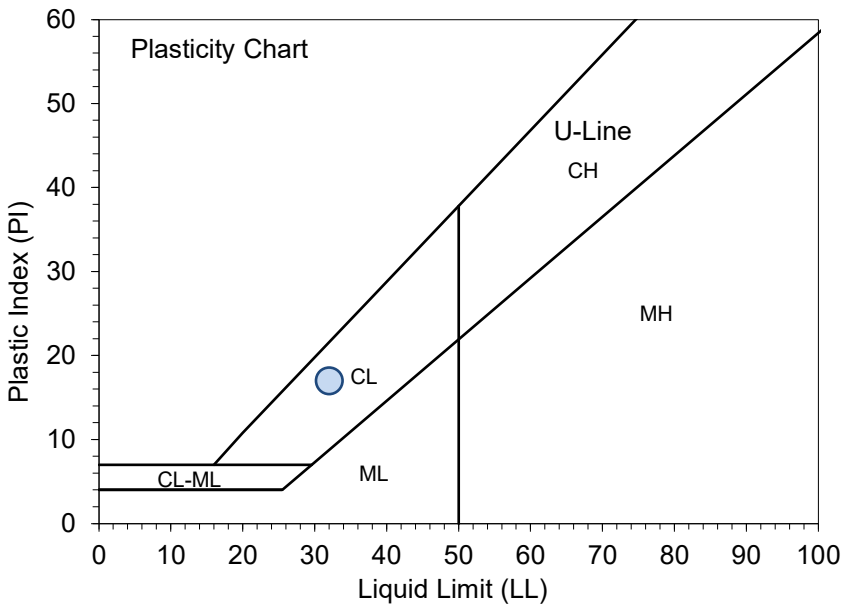
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	29	20	15
Wet Soil + Tare (g):	22.53	22.75	25.44
Dry Soil + Tare (g):	20.40	20.39	22.40
Moisture Loss (g):	2.13	2.36	3.04
Tare (g):	13.57	13.35	13.58
Dry Soil (g):	6.83	7.04	8.82
Moisture Content, w (%):	31.19	33.52	34.47
One-Point LL:	32	33	

Results

Liquid Limit, LL:	32
Plastic Limit, PL:	15
Plasticity Index, PI:	17





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-09

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: JC

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	dk yl bn - bn sandy gravel
As-received water content(%):	7.0	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	30
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid limit test method:	Multipoint

Plastic Limit

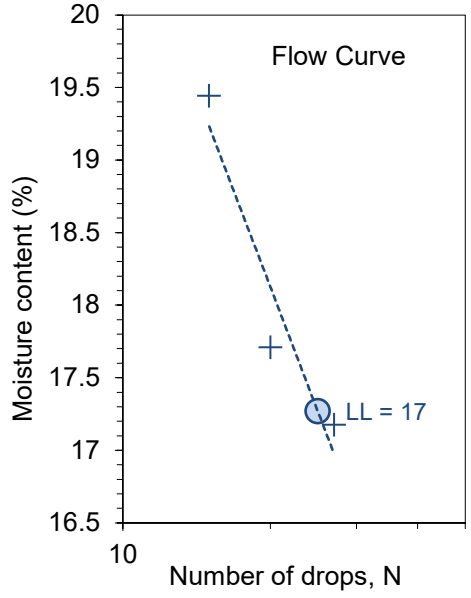
Determination No:	1	2
Wet Soil + Tare (g):	21.04	21.18
Dry Soil + Tare (g):	20.03	20.11
Moisture Loss (g):	1.01	1.07
Tare (g):	13.42	13.46
Dry Soil (g):	6.61	6.65
Moisture Content, w (%):	15.28	16.09

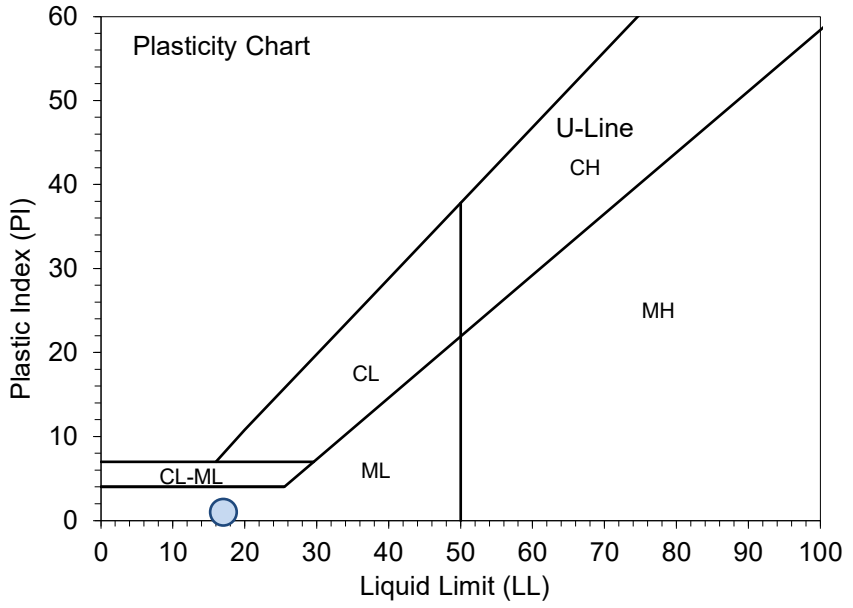
Liquid Limit

Determination No:	1	2	3
Number of Drops, N:	27	20	15
Wet Soil + Tare (g):	25.12	24.21	25.51
Dry Soil + Tare (g):	23.33	22.46	23.55
Moisture Loss (g):	1.79	1.75	1.96
Tare (g):	12.91	12.58	13.47
Dry Soil (g):	10.42	9.88	10.08
Moisture Content, w (%):	17.18	17.71	19.44
One-Point LL:	17	17	

Results

Liquid Limit, LL:	17
Plastic Limit, PL:	16
Plasticity Index, PI:	1





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-09

No: 23072 (23-1725) **Depth:** 15-17 ft

Tested by: CML Date: 16-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	dk yl bn - bn sandy gravel
As-received water content(%):	5.7	Approximate maximum particle size:	1"
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	30
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid Limit:	Could not be determined (N.P.)

Plastic Limit

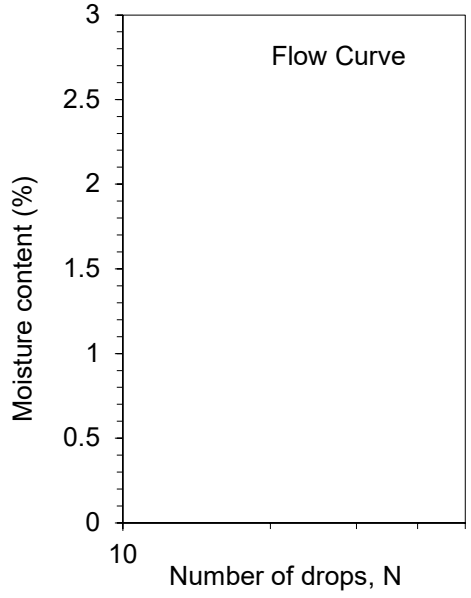
Determination No:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	

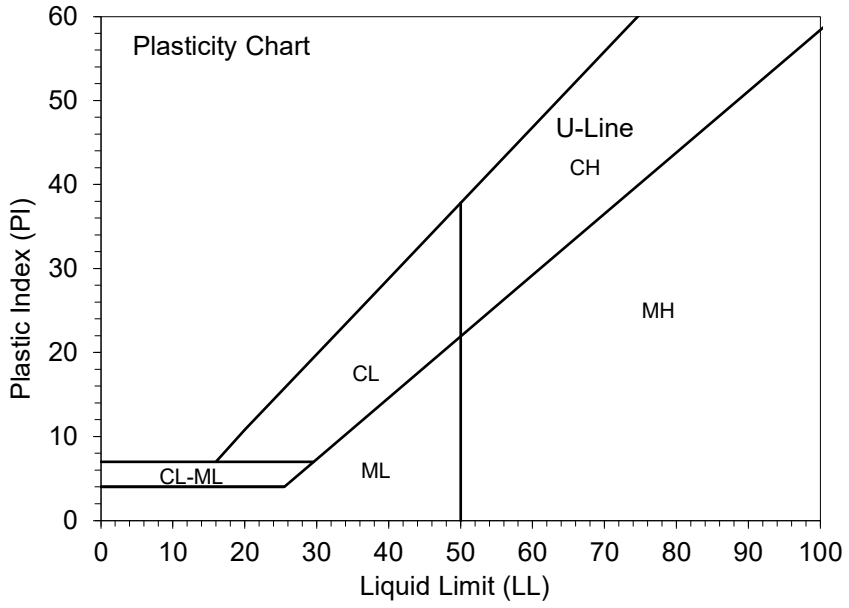
Liquid Limit

Determination No:	
Number of Drops, N:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	
One-Point LL:	

Results

Liquid Limit, LL:	Nonplastic (N.P.)
Plastic Limit, PL:	Nonplastic (N.P.)
Plasticity Index, PI:	Nonplastic (N.P.)





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(After ASTM D4318 and AASHTO T89/T90)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** TP-02

No: 23072 (23-1725) **Depth:** 6-7 ft

Tested by: CML Date: 15-Nov-23

Reduced by: CML Location: -

Reviewed by: AT

Sample Preparation

Preparation method:	Air Dry	Laboratory sample description:	It bn - bn silt
As-received water content(%):	17.5	Approximate maximum particle size:	No. 20
Liquid Limit device:	Mechanical	Estimate of % retained on No.40 sieve (%):	<5
Grooving tool:	Plastic	Method of removing > No. 40 sieve:	Hand Sieved
Testing method:	Hand rolled	Liquid Limit:	Could not be determined (N.P.)

Plastic Limit

Determination No:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	

Liquid Limit

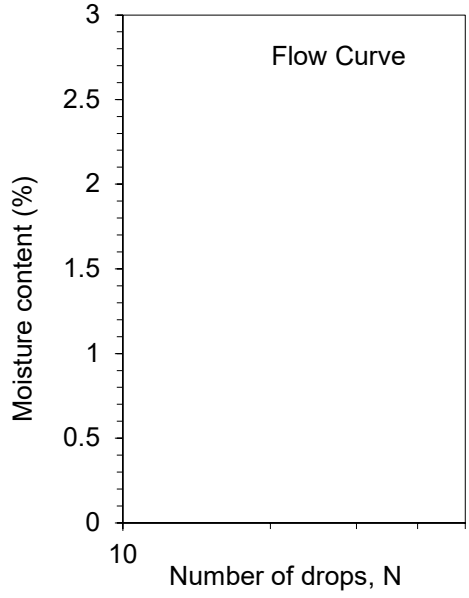
Determination No:	
Number of Drops, N:	
Wet Soil + Tare (g):	
Dry Soil + Tare (g):	
Moisture Loss (g):	
Tare (g):	
Dry Soil (g):	
Moisture Content, w (%):	
One-Point LL:	

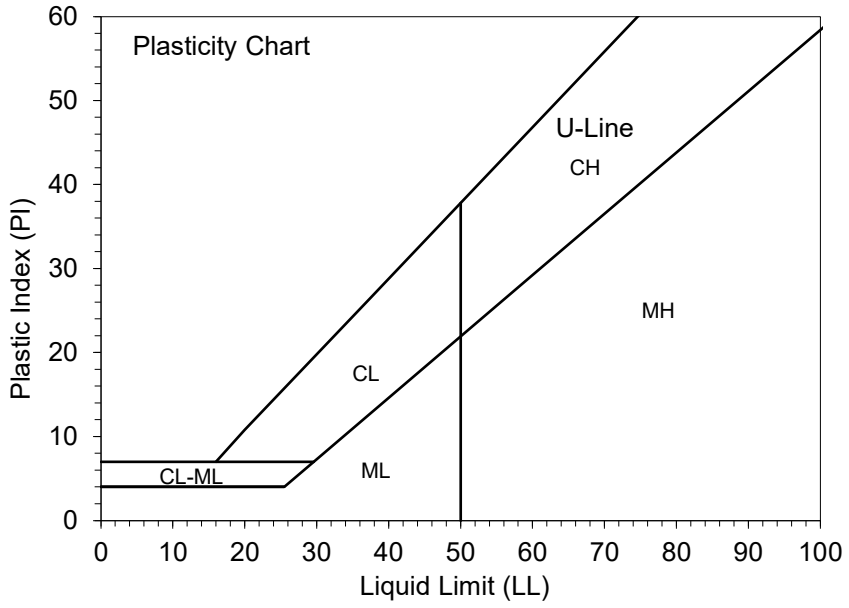
Results

Liquid Limit, LL: Nonplastic (N.P.)

Plastic Limit, PL: Nonplastic (N.P.)

Plasticity Index, PI: Nonplastic (N.P.)





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Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-05

No: 23072 (23-1725) **Depth:** 8.5-11 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: ol bn - dk ol bn silt

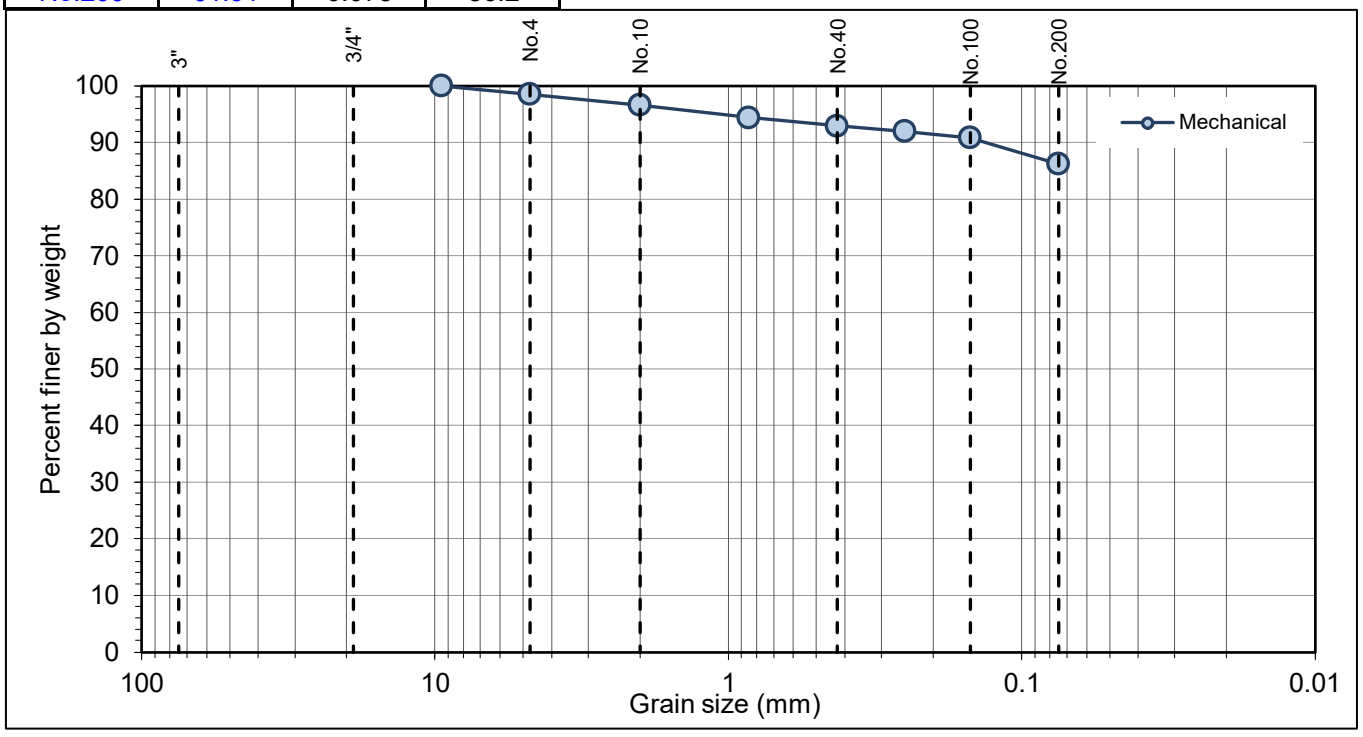
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	510.72	449.30
	-	
	510.72	449.30
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	706.71
Dry soil + tare (g):	-	645.29
Tare (g):	-	195.99
Moisture content (%):	0.0	13.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	100.0
No.4	6.47	4.75	98.6
No.10	15.15	2	96.6
No.20	25.05	0.85	94.4
No.40	31.63	0.425	93.0
No.60	36.08	0.25	92.0
No.100	41.22	0.15	90.8
No.200	61.91	0.075	86.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-05

No: 23072 (23-1725) **Depth:** 22-25 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: lt bn - bn gravel

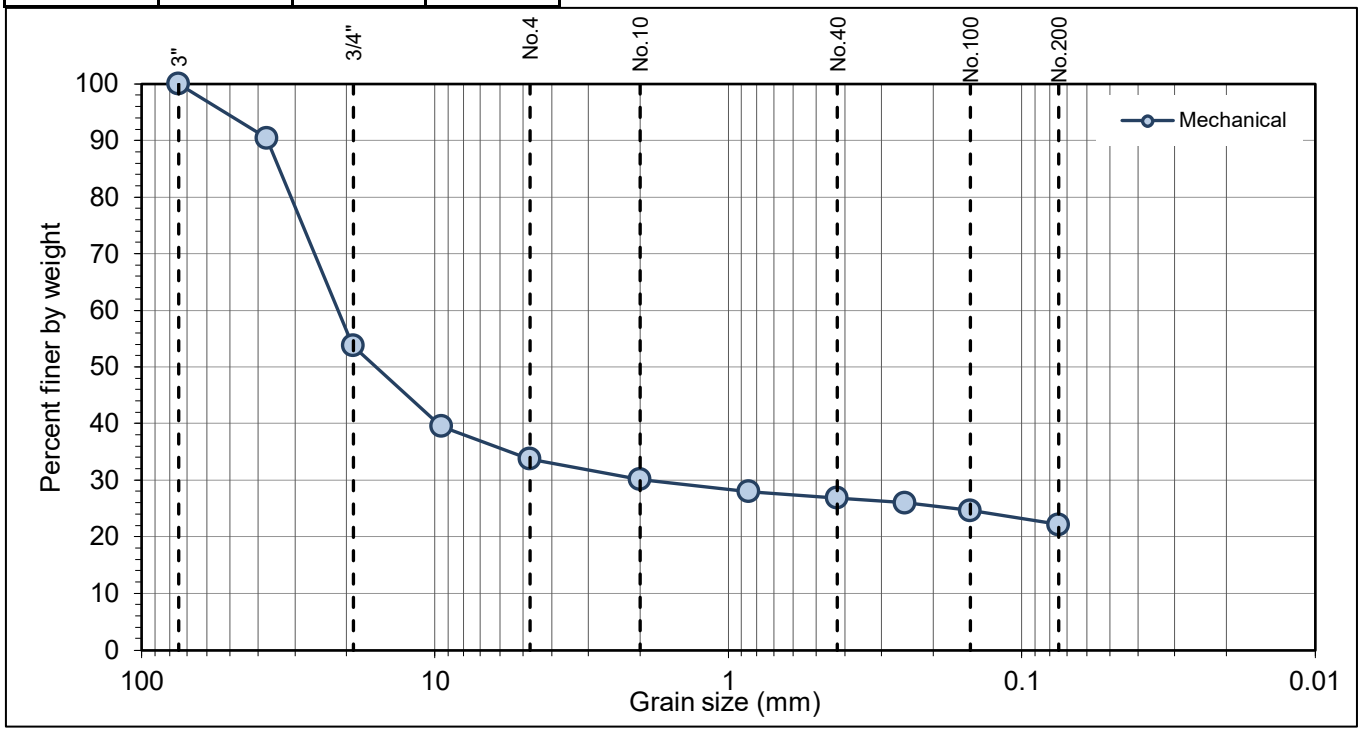
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	1688.72	1601.18
	-	
	1688.72	1601.18
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	1702.45
Dry soil + tare (g):	-	1614.91
Tare (g):	-	13.73
Moisture content (%):	0.0	5.5

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	100.0
1.5"	153.23	37.5	90.4
3/4"	740.77	19	53.7
3/8"	969.00	9.5	39.5
No.4	1060.67	4.75	33.8
No.10	1119.28	2	30.1
No.20	1153.68	0.85	27.9
No.40	1171.53	0.425	26.8
No.60	1184.79	0.25	26.0
No.100	1206.93	0.15	24.6
No.200	1246.16	0.075	22.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-05

No: 23072 (23-1725) **Depth:** 35-37 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: tn - bn sandy gravel

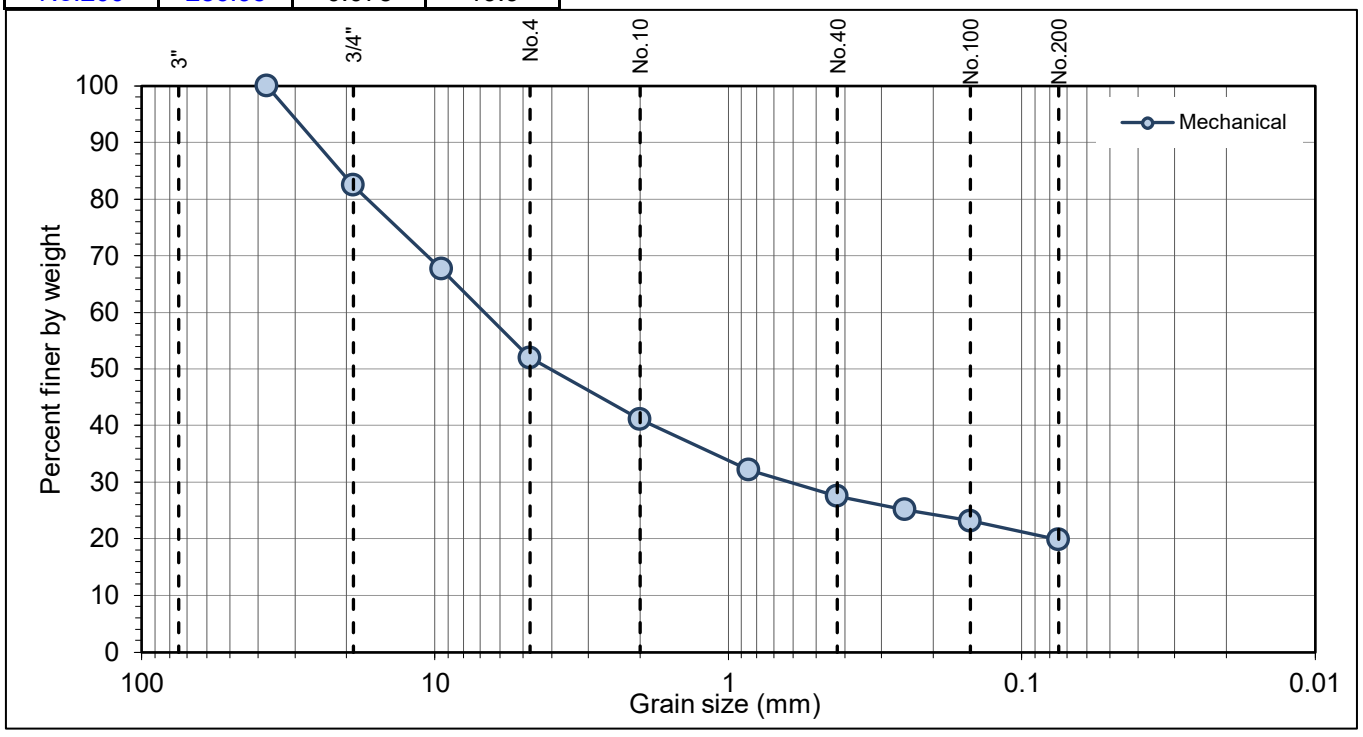
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	364.51	358.20
	-	-
	364.51	358.20
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	480.97
Dry soil + tare (g):	-	474.66
Tare (g):	-	116.46
Moisture content (%):	0.0	1.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	62.67	19	82.5
3/8"	115.82	9.5	67.7
No.4	171.91	4.75	52.0
No.10	211.10	2	41.1
No.20	243.11	0.85	32.1
No.40	259.58	0.425	27.5
No.60	268.13	0.25	25.1
No.100	275.21	0.15	23.2
No.200	286.95	0.075	19.9



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 3.5-5 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: bn - dk bn sandy clay

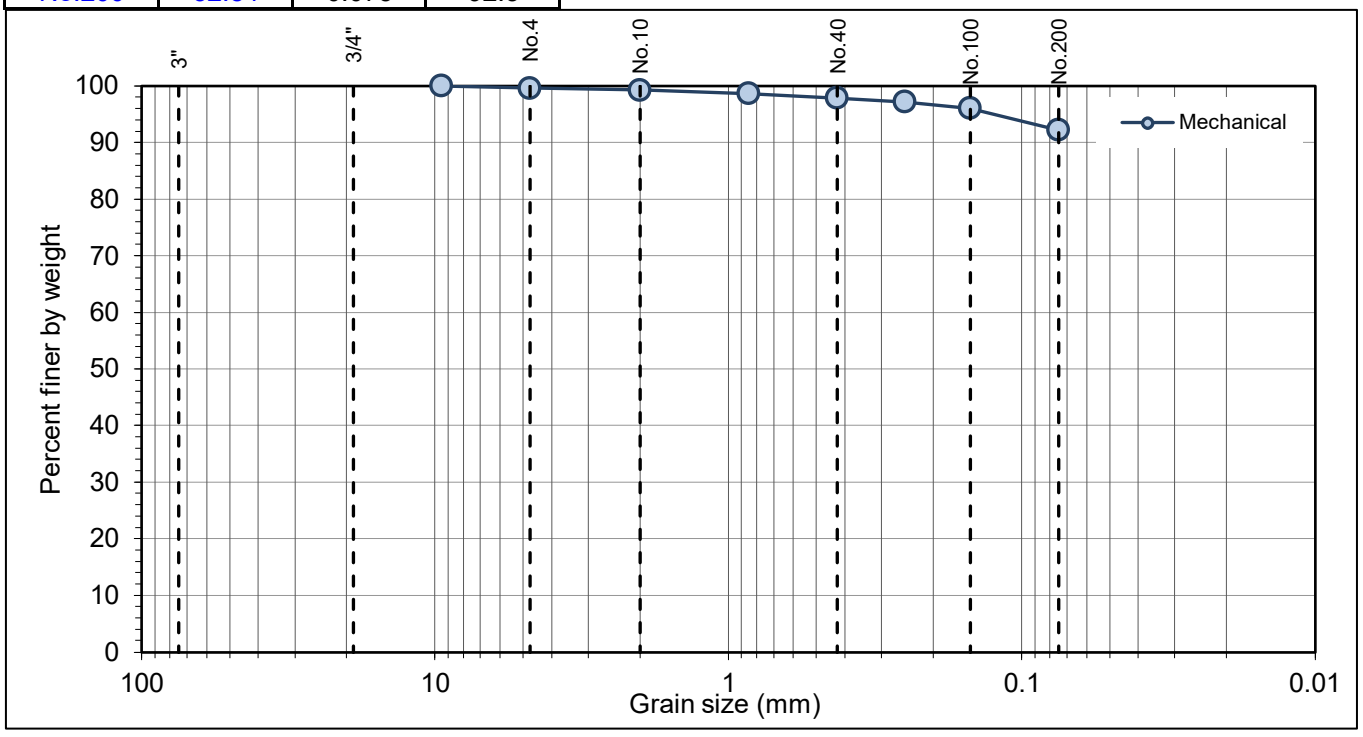
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	538.58	424.78
	-	
	538.58	424.78
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	733.41
Dry soil + tare (g):	-	619.61
Tare (g):	-	194.83
Moisture content (%):	0.0	26.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	100.0
No.4	1.68	4.75	99.6
No.10	3.01	2	99.3
No.20	5.85	0.85	98.6
No.40	9.10	0.425	97.9
No.60	11.87	0.25	97.2
No.100	16.77	0.15	96.1
No.200	32.84	0.075	92.3



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: bn - tn clayey gravel

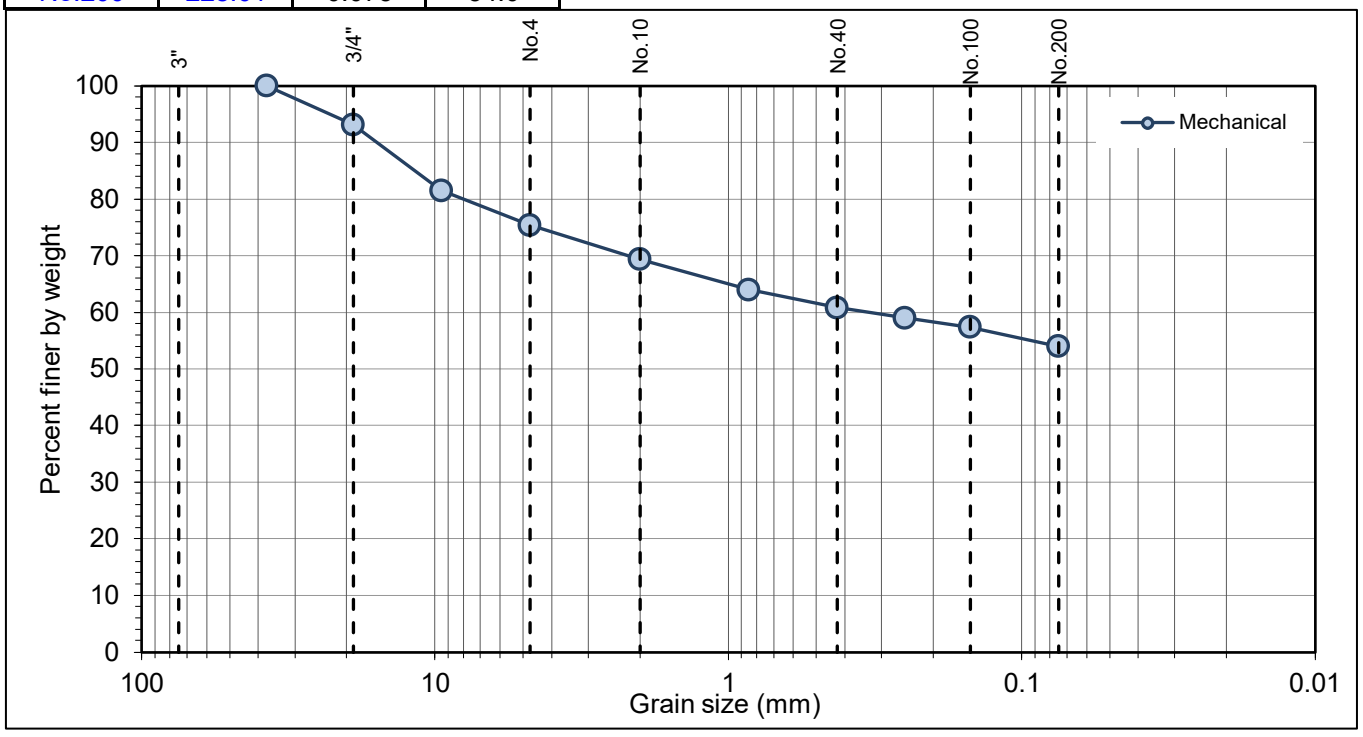
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	543.14	495.64
	-	
	543.14	495.64
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	740.83
Dry soil + tare (g):	-	693.33
Tare (g):	-	197.69
Moisture content (%):	0.0	9.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	33.86	19	93.2
3/8"	91.52	9.5	81.5
No.4	121.77	4.75	75.4
No.10	151.95	2	69.3
No.20	178.46	0.85	64.0
No.40	194.30	0.425	60.8
No.60	203.22	0.25	59.0
No.100	211.25	0.15	57.4
No.200	228.01	0.075	54.0



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 20-22 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: bn - tn sandy gravel

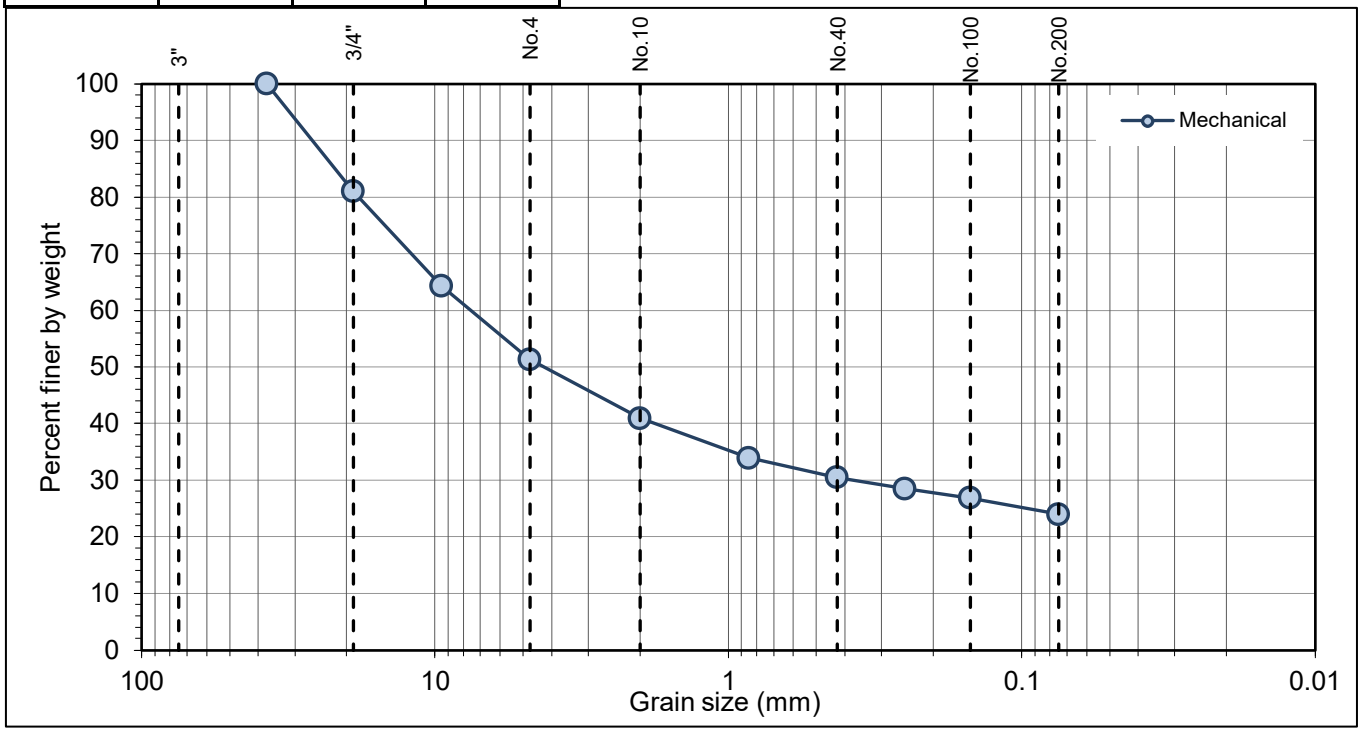
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	431.81	412.46
	-	
	431.81	412.46
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	549.20
Dry soil + tare (g):	-	529.85
Tare (g):	-	117.39
Moisture content (%):	0.0	4.7

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	78.09	19	81.1
3/8"	147.07	9.5	64.3
No.4	200.86	4.75	51.3
No.10	243.73	2	40.9
No.20	272.66	0.85	33.9
No.40	286.85	0.425	30.5
No.60	295.11	0.25	28.5
No.100	301.79	0.15	26.8
No.200	313.55	0.075	24.0



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-06

No: 23072 (23-1725) **Depth:** 32.5-35 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: lt bn - bn clay

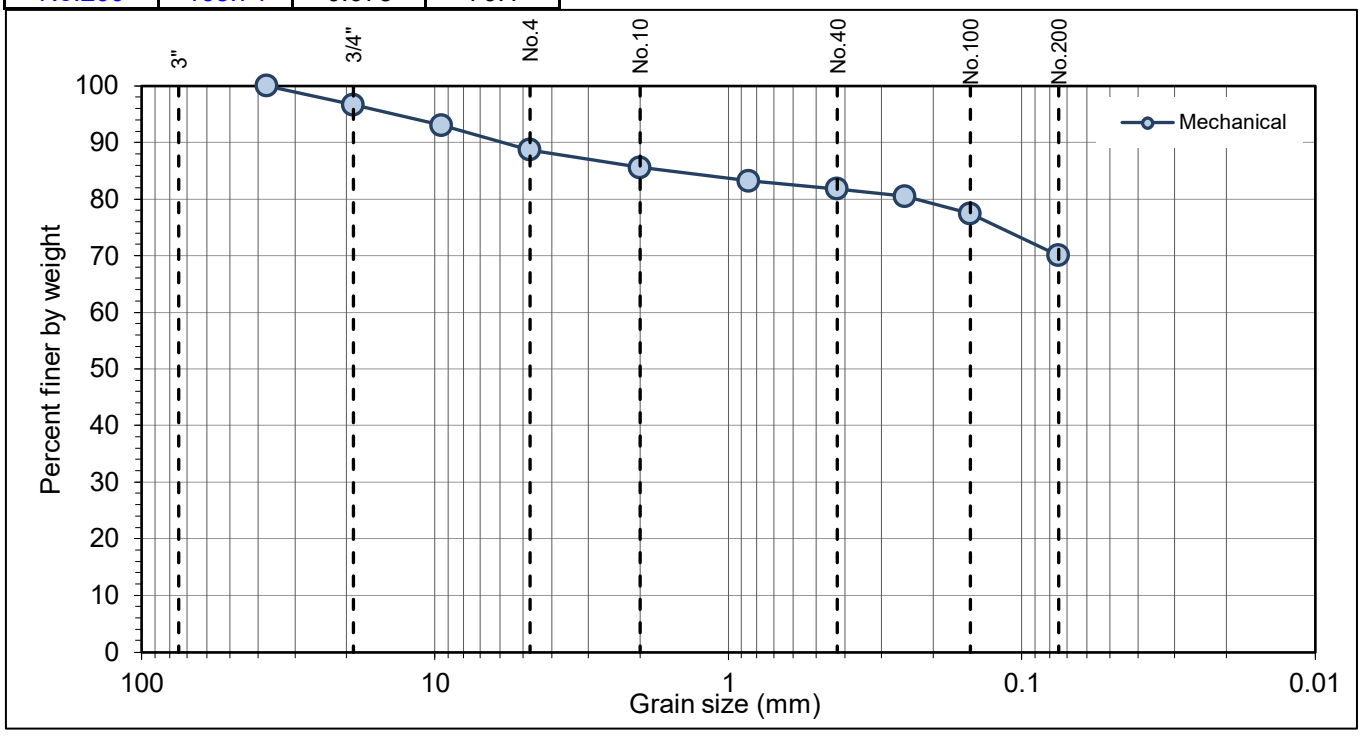
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	647.50	563.64
	-	-
	647.50	563.64
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	764.63
Dry soil + tare (g):	-	680.77
Tare (g):	-	117.13
Moisture content (%):	0.0	14.9

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	18.66	19	96.7
3/8"	39.17	9.5	93.1
No.4	63.61	4.75	88.7
No.10	81.28	2	85.6
No.20	94.55	0.85	83.2
No.40	102.61	0.425	81.8
No.60	109.80	0.25	80.5
No.100	126.97	0.15	77.5
No.200	168.74	0.075	70.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 5-6 ft

Date: 14-Nov-23 Location: -

Tested by: DW Lab soil description: lt bn - bn gravelly clay

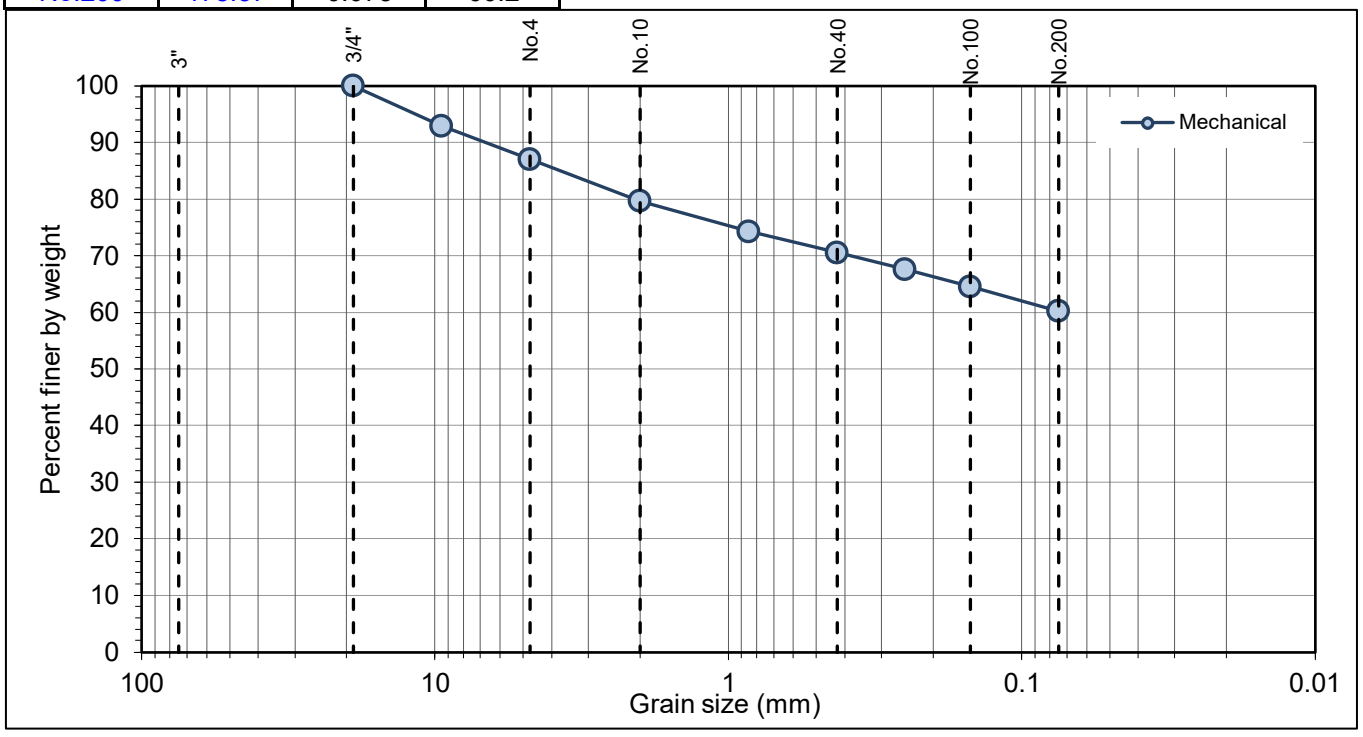
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	511.34	448.17
	-	
	511.34	448.17
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	708.54
Dry soil + tare (g):	-	645.37
Tare (g):	-	197.20
Moisture content (%):	0.0	14.1

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	100.0
3/8"	31.59	9.5	93.0
No.4	57.98	4.75	87.1
No.10	91.18	2	79.7
No.20	115.33	0.85	74.3
No.40	131.89	0.425	70.6
No.60	145.17	0.25	67.6
No.100	158.80	0.15	64.6
No.200	178.37	0.075	60.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 9-10 ft

Date: 10-Nov-23 Location: -

Tested by: JCC Lab soil description: lt bn - bn silt

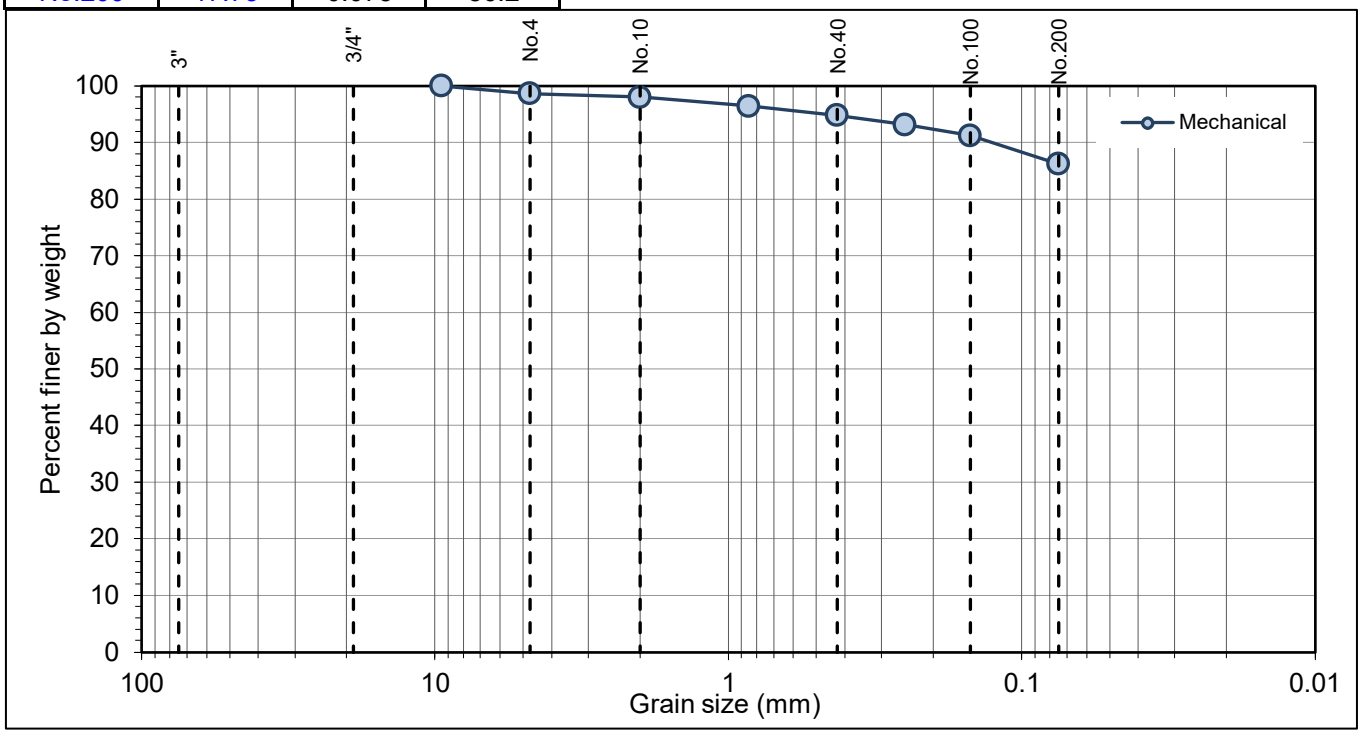
Reduced by: AT Comments:

Reviewed by: JC

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	160.04	128.80
	-	
	160.04	128.80
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	355.80
Dry soil + tare (g):	-	324.56
Tare (g):	-	195.76
Moisture content (%):	0.0	24.3

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	100.0
No.4	1.73	4.75	98.7
No.10	2.57	2	98.0
No.20	4.60	0.85	96.4
No.40	6.72	0.425	94.8
No.60	8.78	0.25	93.2
No.100	11.27	0.15	91.3
No.200	17.73	0.075	86.2



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 17.5-18 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: lt bn - bn sandy clay

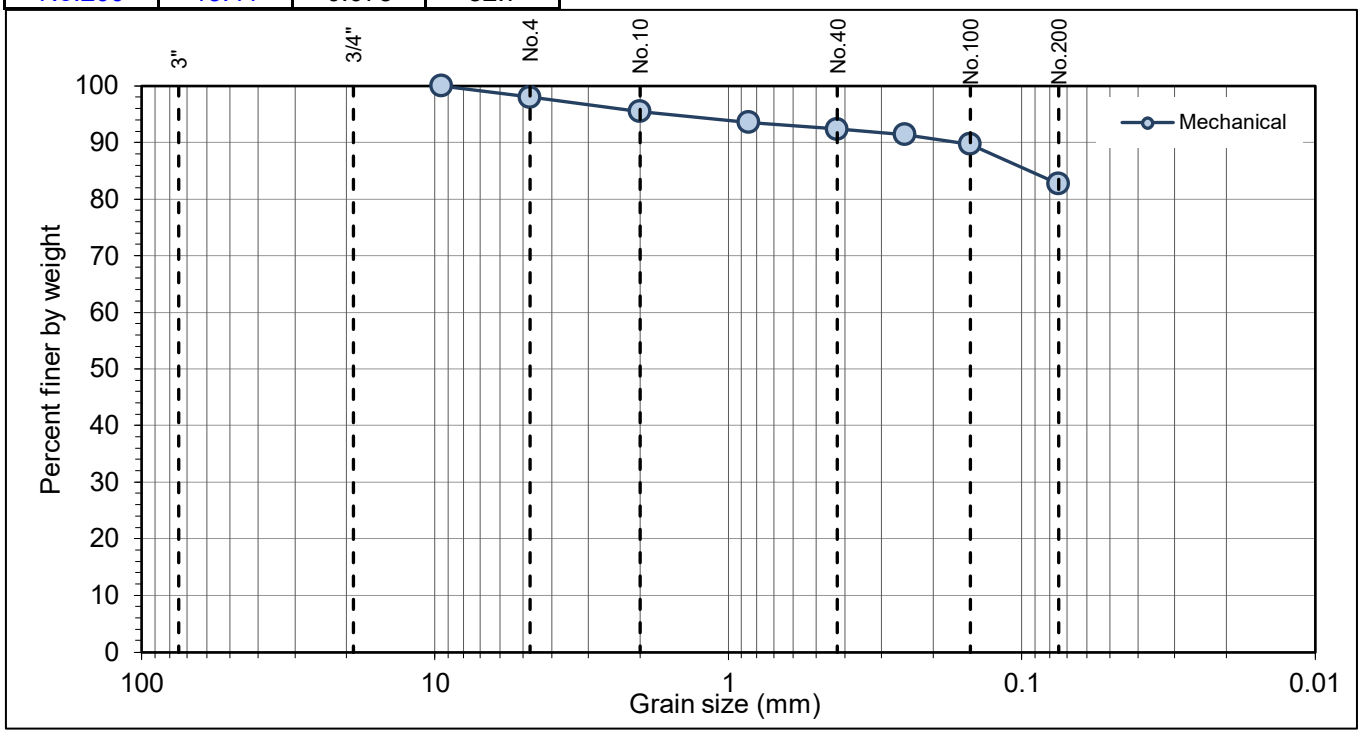
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	87.25	77.51
		-
	87.25	77.51
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	282.48
Dry soil + tare (g):	-	272.74
Tare (g):	-	195.23
Moisture content (%):	0.0	12.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	100.0
No.4	1.51	4.75	98.1
No.10	3.48	2	95.5
No.20	5.00	0.85	93.5
No.40	5.93	0.425	92.3
No.60	6.64	0.25	91.4
No.100	7.95	0.15	89.7
No.200	13.41	0.075	82.7



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-08

No: 23072 (23-1725) **Depth:** 10-12 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: tn - bn sandy gravel

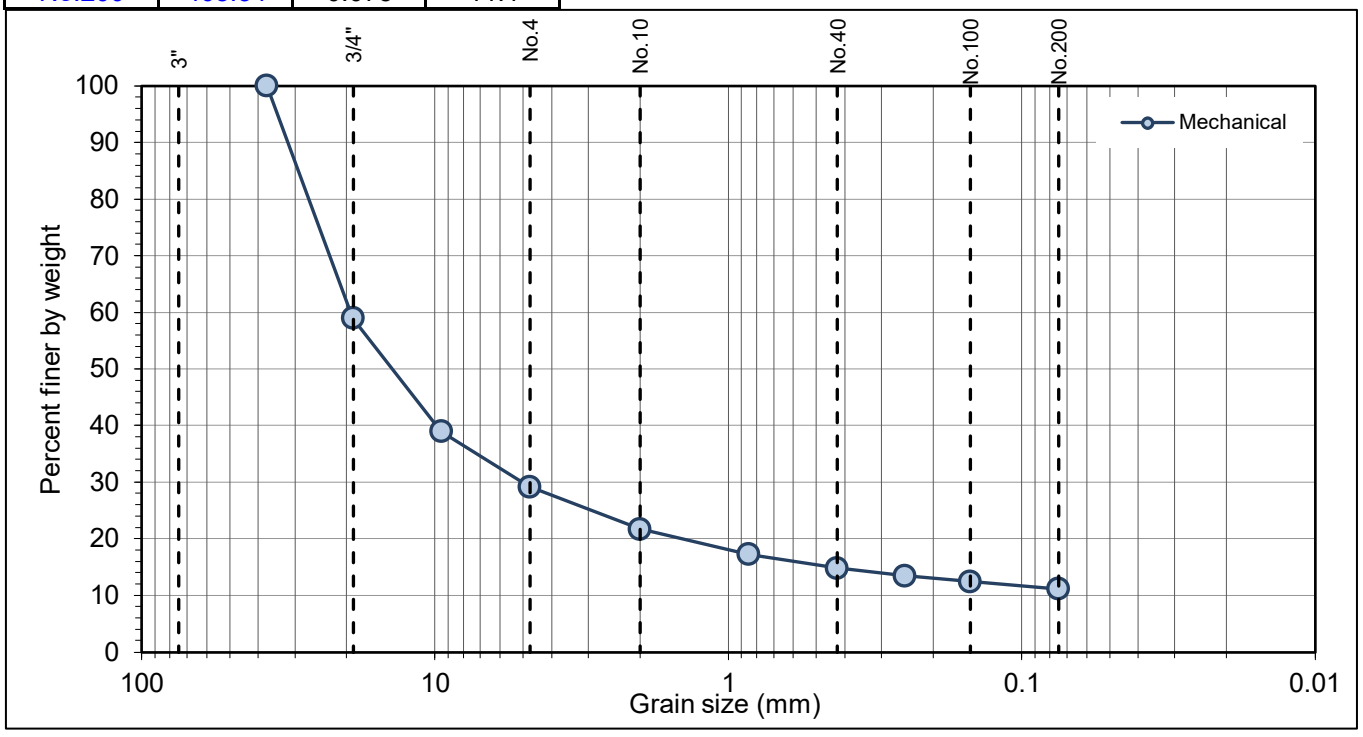
Reduced by: JC Comments:

Reviewed by: AT

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	466.15	455.99
	-	
	466.15	455.99
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	584.18
Dry soil + tare (g):	-	574.02
Tare (g):	-	118.03
Moisture content (%):	0.0	2.2

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	187.26	19	58.9
3/8"	278.45	9.5	38.9
No.4	323.16	4.75	29.1
No.10	357.01	2	21.7
No.20	377.36	0.85	17.2
No.40	388.54	0.425	14.8
No.60	394.67	0.25	13.4
No.100	399.46	0.15	12.4
No.200	405.34	0.075	11.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-08

No: 23072 (23-1725) **Depth:** 12.5-14 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: lt bn - bn sandy clay

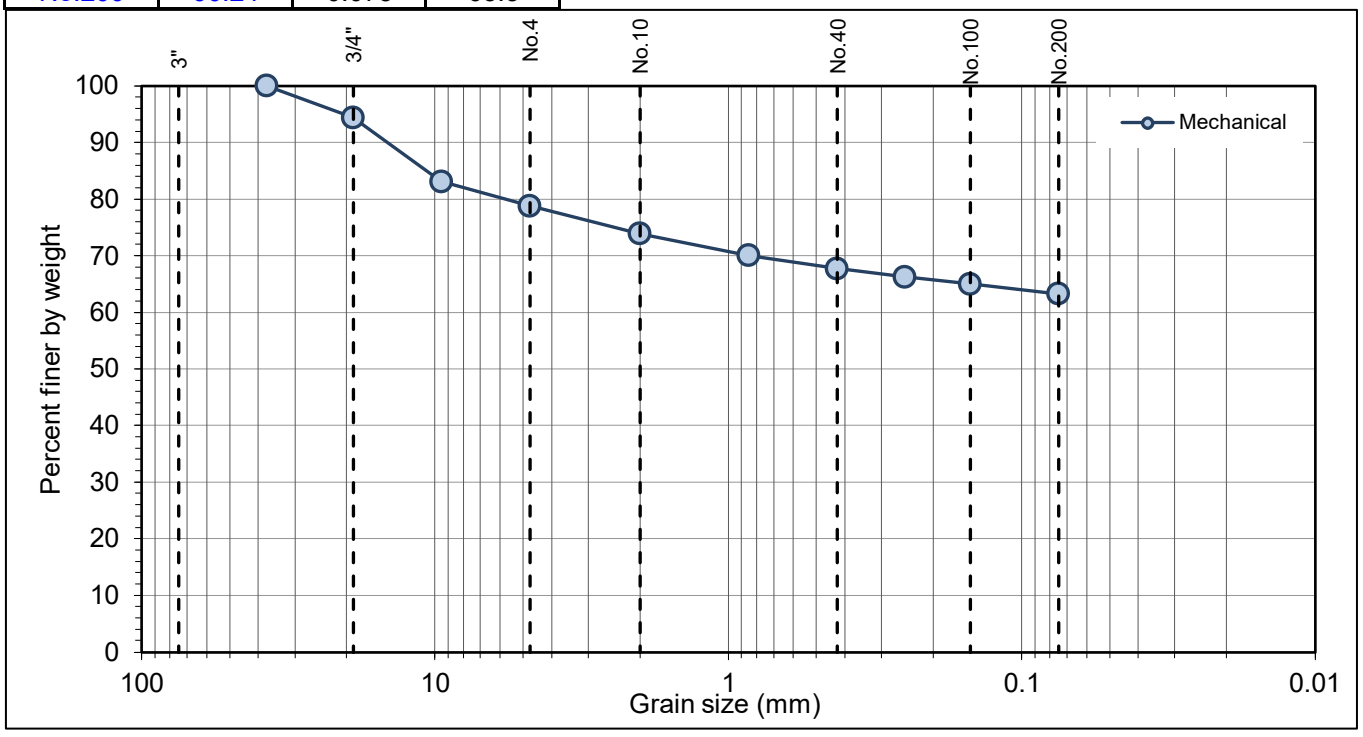
Reduced by: AT Comments:

Reviewed by: WMC

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	270.30	245.71
	-	
	270.30	245.71
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	467.72
Dry soil + tare (g):	-	443.13
Tare (g):	-	197.42
Moisture content (%):	0.0	10.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	13.71	19	94.4
3/8"	41.47	9.5	83.1
No.4	52.05	4.75	78.8
No.10	64.21	2	73.9
No.20	73.62	0.85	70.0
No.40	79.28	0.425	67.7
No.60	82.99	0.25	66.2
No.100	85.98	0.15	65.0
No.200	90.24	0.075	63.3



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-09

No: 23072 (23-1725) **Depth:** 7.5-9 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: dk yl bn - dk bn sandy gravel

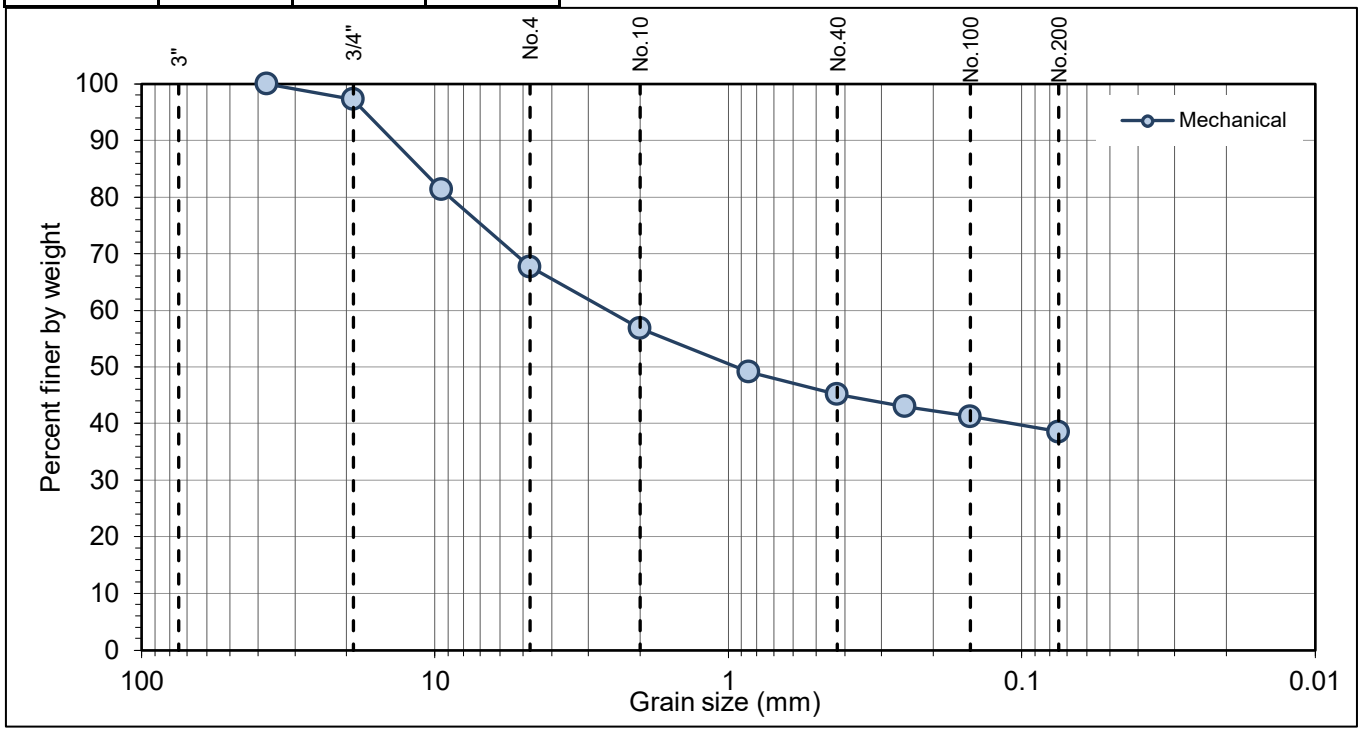
Reduced by: AT Comments:

Reviewed by: WMC

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	526.82	492.40
	-	
	526.82	492.40
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	644.83
Dry soil + tare (g):	-	610.41
Tare (g):	-	118.01
Moisture content (%):	0.0	7.0

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	13.31	19	97.3
3/8"	91.93	9.5	81.3
No.4	158.81	4.75	67.7
No.10	212.76	2	56.8
No.20	250.58	0.85	49.1
No.40	269.94	0.425	45.2
No.60	280.51	0.25	43.0
No.100	289.27	0.15	41.3
No.200	302.48	0.075	38.6



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-09

No: 23072 (23-1725) **Depth:** 15-17 ft

Date: 16-Nov-23 Location: -

Tested by: DW Lab soil description: dk yl bn - bn sandy gravel

Reduced by: AT Comments:

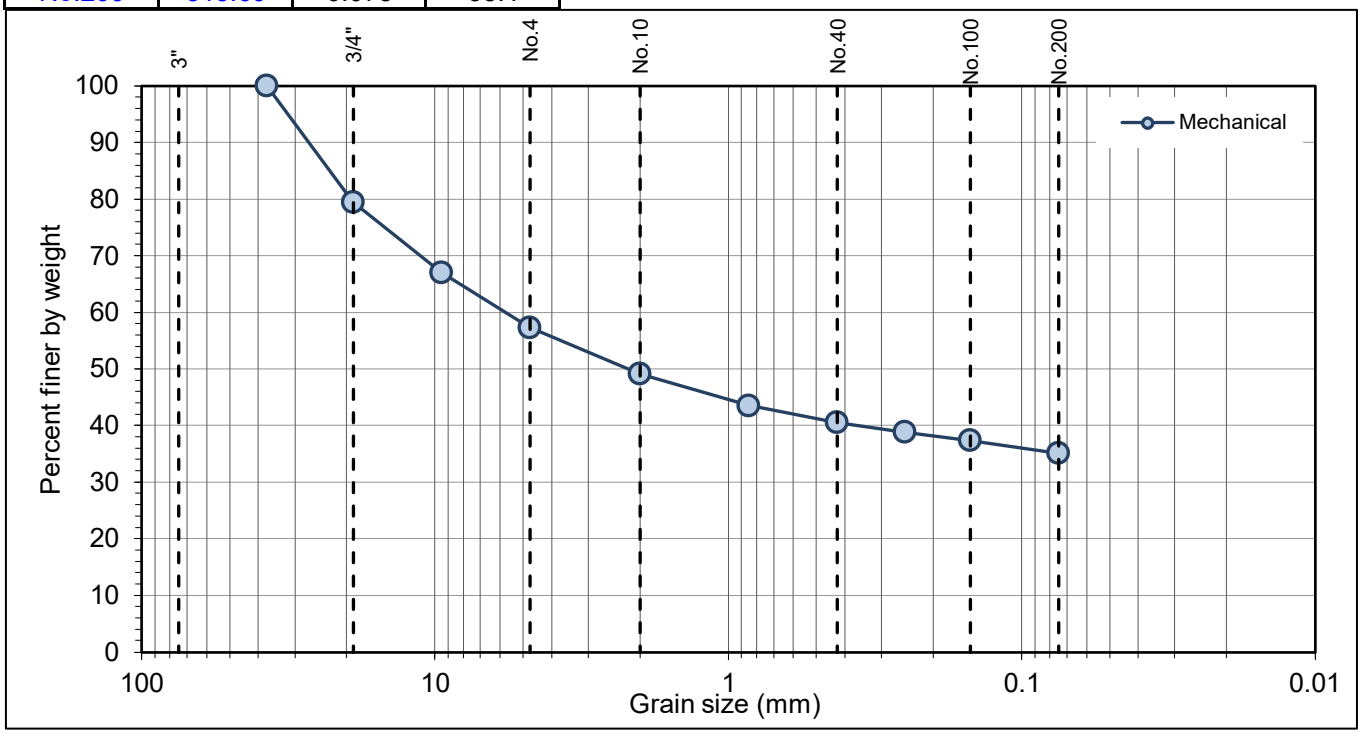
Reviewed by: WMC

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	514.46	486.37
	-	
	514.46	486.37
Split fraction:	1.000	

Moisture data

Moist soil + tare (g):	-	632.70
Dry soil + tare (g):	-	604.61
Tare (g):	-	118.24
Moisture content (%):	0.0	5.8

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	100.0
3/4"	99.92	19	79.5
3/8"	160.29	9.5	67.0
No.4	207.63	4.75	57.3
No.10	247.50	2	49.1
No.20	274.59	0.85	43.5
No.40	289.20	0.425	40.5
No.60	297.50	0.25	38.8
No.100	304.57	0.15	37.4
No.200	315.69	0.075	35.1



Particle-Size Analysis of Soils*

(after ASTM D422 and AASHTO T88)

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** TP-02

No: 23072 (23-1725) **Depth:** 6-7 ft

Date: 10-Nov-23 Location: -

Tested by: JCC Lab soil description: lt bn - bn silt

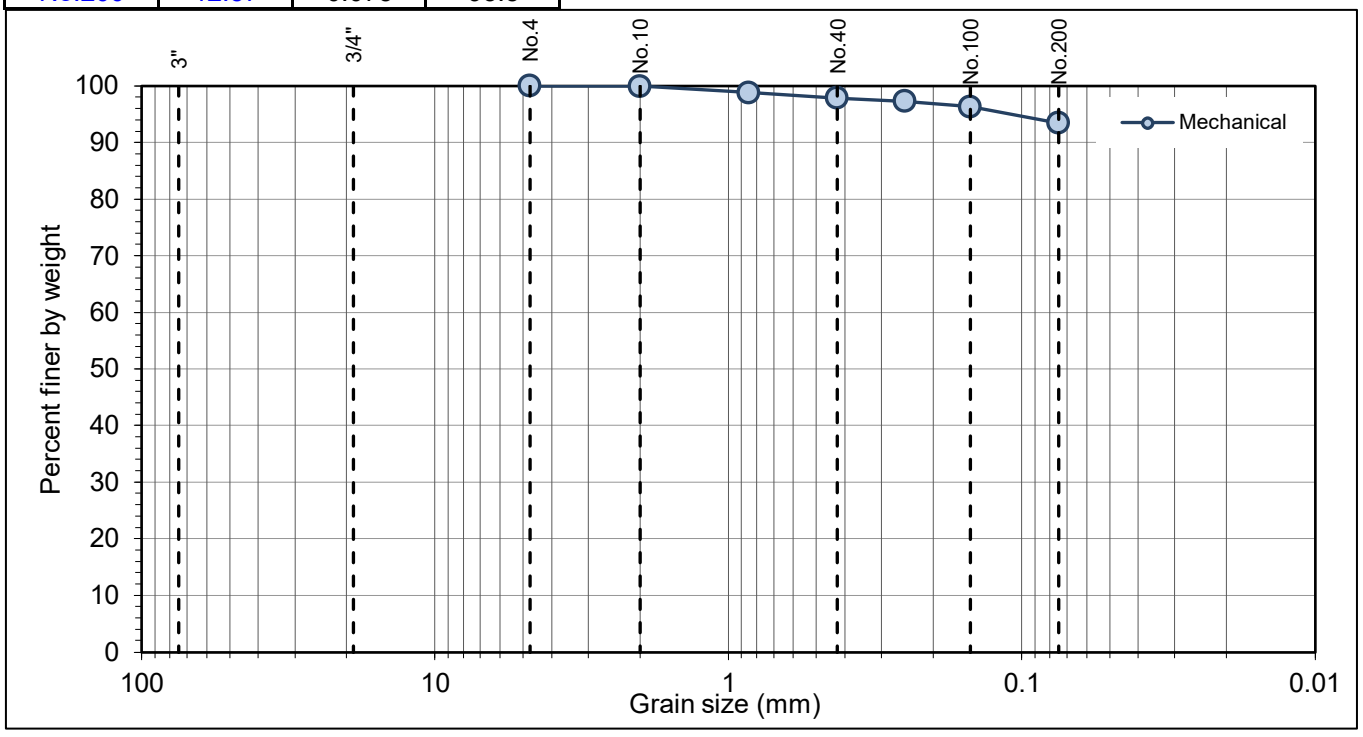
Reduced by: AT Comments:

Reviewed by: JC

Split:	No	
	-	
	Moist	Dry
Total sample wt. (g):	228.50	193.74
	-	
	228.50	193.74
Split fraction:	1.000	

Moisture data		
Moist soil + tare (g):	-	374.48
Dry soil + tare (g):	-	339.72
Tare (g):	-	145.98
Moisture content (%):	0.0	17.9

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
12"	-	300	-
8"	-	200	-
6"	-	150	-
4"	-	100	-
3"	-	75	-
1.5"	-	37.5	-
3/4"	-	19	-
3/8"	-	9.5	-
No.4	-	4.75	100.0
No.10	0.06	2	100.0
No.20	2.24	0.85	98.8
No.40	4.19	0.425	97.8
No.60	5.26	0.25	97.3
No.100	7.14	0.15	96.3
No.200	12.57	0.075	93.5



One-Dimensional Consolidation Properties of Soils

After ASTM D2435 and USBR 5700

GERHART COLE

Project:	**Bear Development Snow King Lot 57**	**TH/TP/Sample:**	**JG-07**
No:	**23072 (23-1725)**	**Depth:**	**5-6 ft**
Location:	-	Laboratory sample description:	lt bn - bn gravelly clay
Date:	14-Nov-23	USCS classification:	not requested
Tested by:	AT	Sample type:	Rel. undisturbed, Shelby Tube
Reduced by:	AT	Inundation stress (psf):	100, beginning
Checked by:	MGS	Swell pressure (psf):	179
Comments:	Gravel up to 3/8" in sample.	Test method:	B
		Preparation procedure:	trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.996	-
	90°	0.992	-
	180°	0.997	-
	270°	0.995	-
Avg Height, Havg (in)		0.995	0.876
Height, H (cm)		2.527	2.225
Dia., D (in)	0°	2.493	-
	90°	2.495	-
Avg Dia., Davg (in)		2.494	2.494
Dia., D (cm)		6.335	6.335
Wt. rings + wet soil (g)		373.57	372.12
Wt. rings (g)		216.72	216.72
Wet soil + tare (g)		708.54	351.80
Dry soil + tare (g)		645.37	331.42
Tare (g)		197.20	196.58
Moisture cont., w (%)		14.1	15.1
Gs, assumed		2.70	2.70
Mass total (g)		156.9	155.4
Mass of solids (g)		137.5	137.5
Volume (cm^3)		79.7	70.1
Vol. of water (cm^3)		19.4	17.9
Vol. of solids (cm^3)		50.9	50.9
Vol. of voids (cm^3)		28.7	19.2
Vol. of air (cm^3)		9.4	1.3
Area, A (cm^2)		31.5	31.5
Ht. solids, Hs (cm)		1.615	1.615
Void ratio, e		0.564	0.378
Porosity, n		0.361	0.274
Vol.moisture, T		0.243	0.256
Saturation, S (%)		67	93
Dry density (gm/cm^3)		1.726	1.960
Wet unit wt., gm (pcf)		122.9	140.9
Dry unit wt., gd (pcf)		107.7	122.4

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9950	0.0000	0.5644	0
179	0.0001	0.9949	0.0001	0.5642	120
400	0.0028	0.9922	0.0028	0.5601	156
800	0.0083	0.9867	0.0083	0.5514	240
1,600	0.0169	0.9781	0.0170	0.5379	233
3,200	0.0296	0.9654	0.0298	0.5179	109
6,400	0.0537	0.9413	0.0539	0.4801	144
12,800	0.0805	0.9145	0.0809	0.4378	89
25,600	0.1080	0.8870	0.1085	0.3947	85
51,200	0.1365	0.8585	0.1372	0.3498	106
25,600	0.1339	0.8611	0.1346	0.3539	54
6,400	0.1276	0.8674	0.1283	0.3637	240
1,600	0.1188	0.8762	0.1194	0.3776	631

C'c	Cc
(0.1374-0.0809)/[Log(51200)-Log(12800)]	(0.3498-0.4378)/[Log(51200)-Log(12800)]
0.0565/(4.71-4.1072)	-0.088/(4.71-4.1072)
C'c= 0.098	C'c= -0.108
C'c = Cc/(1+e0)	C'c = Cc/(1+e0)
0.098 = Cc/(1+0.564)	0.108 = Cc/(1+0.564)
Cc = 0.17	Cc = -0.17

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

To be determined by the Geotechnical Engineer

Notes:

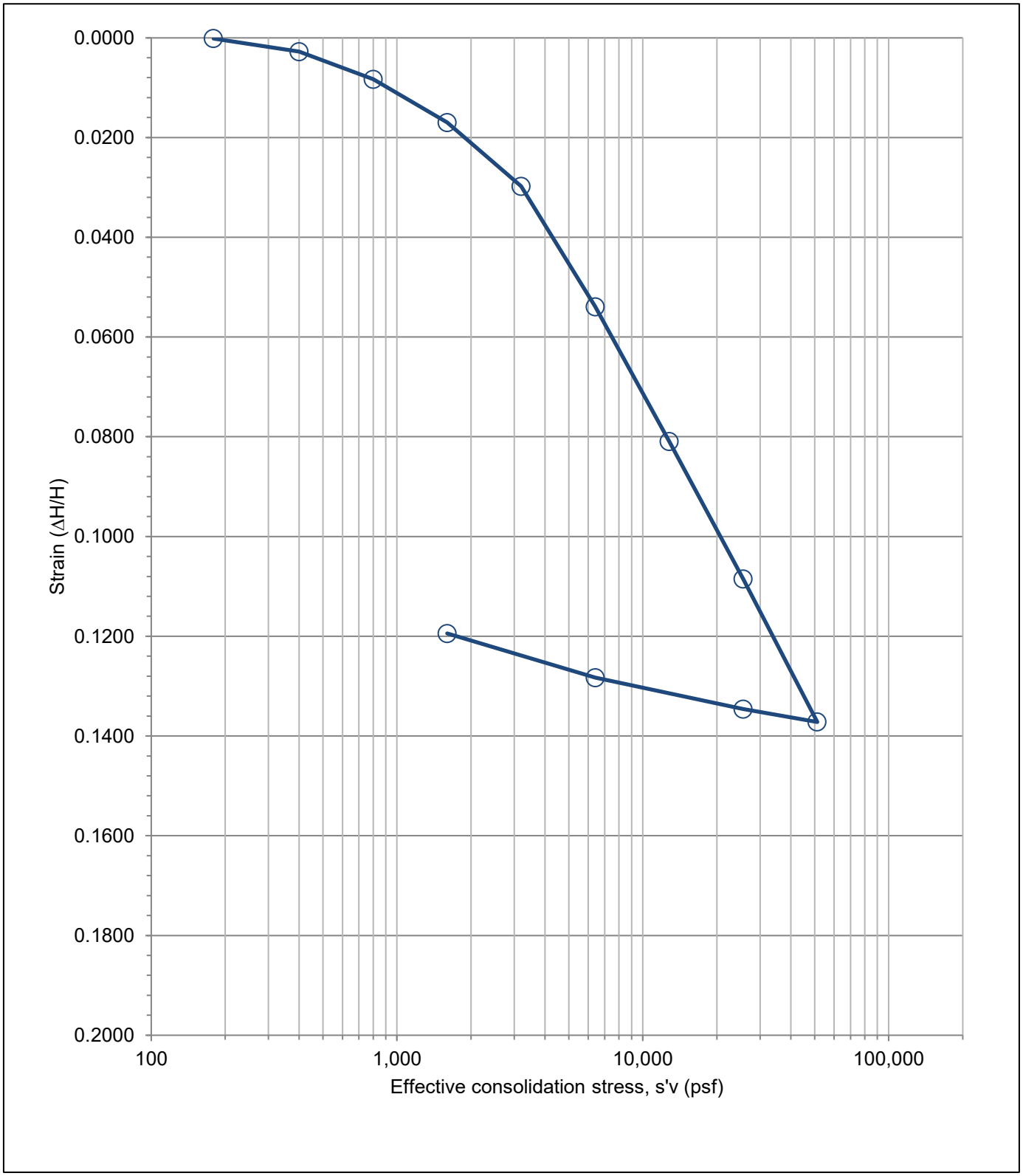
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation

[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07
No: 23072 (23-1725) **Depth:** 5-6 ft



One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 57 | **TH/TP/Sample:** JG-07
No: 23072 (23-1725) | **Depth:** 9-10 ft
Location: - | Laboratory sample description: lt bn - bn silt
Date: 13-Nov-23 | USCS classification: not requested

Tested by: AT | Sample type: Rel. undisturbed, Shelby Tube
Reduced by: AT | Inundation stress (psf): 100, completion
Checked by: MGS | Swell pressure (psf): 138
Comments: | Test method: B
Preparation procedure: trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.997	-
	90°	0.996	-
	180°	0.998	-
	270°	0.998	-
Avg Height, Havg (in)		0.997	0.806
Height, H (cm)		2.533	2.048
Dia., D (in)	0°	2.494	-
	90°	2.483	-
Avg Dia., Davg (in)		2.489	2.489
Dia., D (cm)		6.321	6.321
Wt. rings + wet soil (g)		354.85	351.75
Wt. rings (g)		216.58	216.58
Wet soil + tare (g)		355.80	330.74
Dry soil + tare (g)		324.56	305.91
Tare (g)		195.76	195.93
Moisture cont., w (%)		24.3	22.6
Gs, assumed		2.70	2.70
Mass total (g)		138.3	135.2
Mass of solids (g)		111.3	111.3
Volume (cm^3)		79.5	64.3
Vol. of water (cm^3)		27.0	23.9
Vol. of solids (cm^3)		41.2	41.2
Vol. of voids (cm^3)		38.3	23.0
Vol. of air (cm^3)		11.3	-0.8
Area, A (cm^2)		31.4	31.4
Ht. solids, Hs (cm)		1.313	1.313
Void ratio, e		0.928	0.559
Porosity, n		0.481	0.359
Vol.moisture, T		0.340	0.372
Saturation, S (%)		71	104
Dry density (gm/cm^3)		1.400	1.732
Wet unit wt., gm (pcf)		108.6	132.5
Dry unit wt., gd (pcf)		87.4	108.1

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9973	0.0000	0.9285	0
138	0.0001	0.9971	0.0001	0.9283	83
400	0.0043	0.9930	0.0043	0.9202	41
800	0.0113	0.9859	0.0113	0.9066	117
1,600	0.0213	0.9759	0.0214	0.8873	172
3,200	0.0369	0.9603	0.0370	0.8571	450
6,400	0.0615	0.9358	0.0617	0.8096	217
12,800	0.1006	0.8967	0.1008	0.7340	82
25,600	0.1550	0.8422	0.1555	0.6287	111
51,200	0.2096	0.7876	0.2102	0.5231	110
25,600	0.2070	0.7902	0.2076	0.5281	39
6,400	0.2002	0.7971	0.2008	0.5414	58
1,600	0.1910	0.8062	0.1915	0.5591	79

C'c

(0.2102-0.1008)/[Log(51200)-Log(12800)]

0.1094/(4.71-4.1072)

C'c= 0.18

C'c = Cc/(1+e0)

0.18 = Cc/(1+0.564)

Cc = 0.28

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

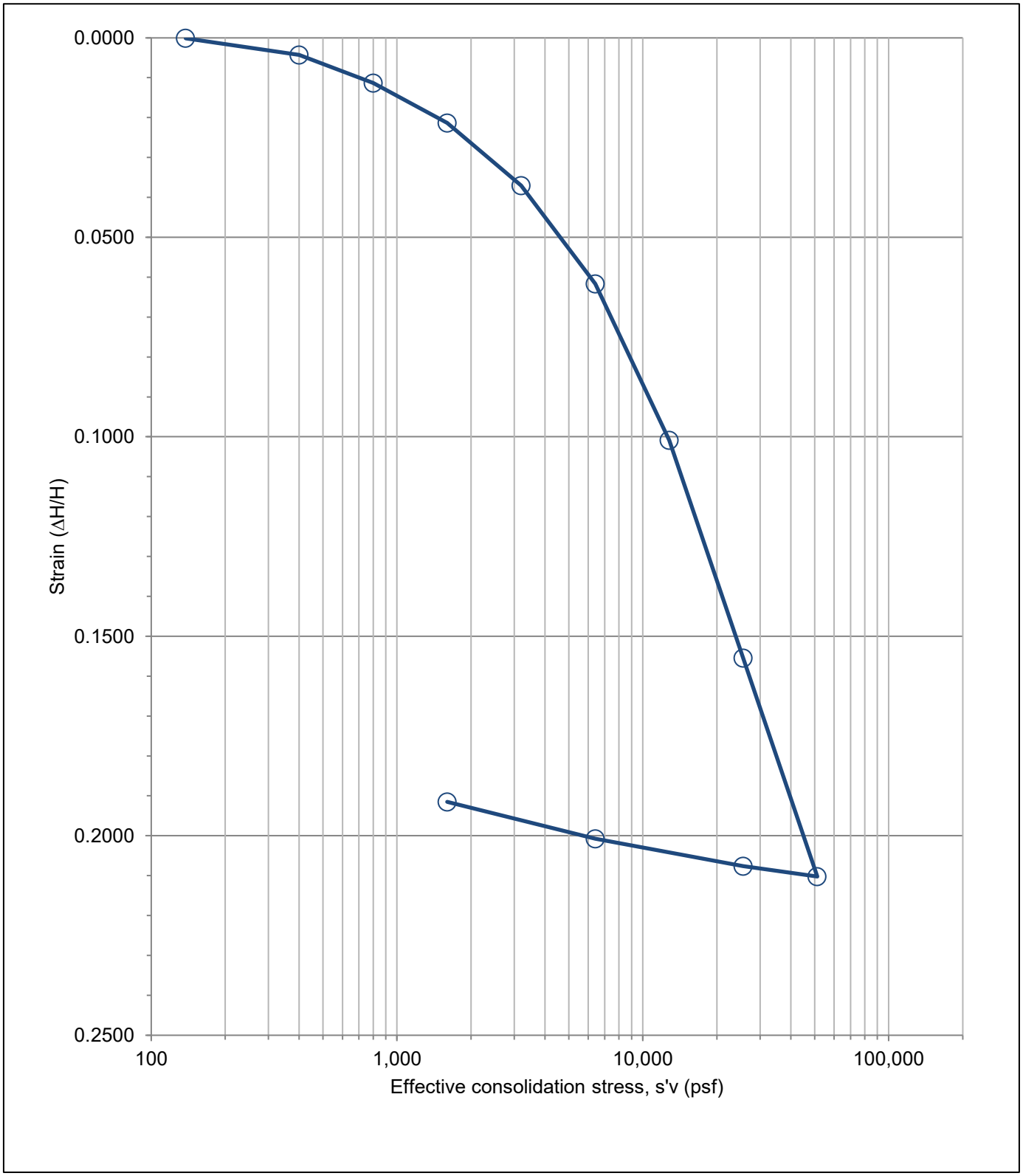
To be determined by the Geotechnical Engineer

Notes:
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation
[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** JG-07
No: 23072 (23-1725) **Depth:** 9-10 ft



One-Dimensional Consolidation Properties of Soils

After ASTM D2435 and USBR 5700

GERHART COLE

Project:	**Bear Development Snow King Lot 57**	**TH/TP/Sample:**	**TP-02**
No:	**23072 (23-1725)**	**Depth:**	**6-7 ft**
Location:	-	Laboratory sample description:	lt bn - bn silt
Date:	13-Nov-23	USCS classification:	not requested
Tested by:	AT	Sample type:	Rel. undisturbed, Shelby Tube
Reduced by:	AT	Inundation stress (psf):	100, completion
Checked by:	MGS	Swell pressure (psf):	121
Comments:	Observed fines squeezed out of ring during testing.	Test method:	B
		Preparation procedure:	trimmed

Phase Relationships

		Initial	Final
Height, H (in)	0°	0.991	-
	90°	0.989	-
	180°	0.990	-
	270°	0.990	-
Avg Height, Havg (in)		0.990	0.869
Height, H (cm)		2.515	2.208
Dia., D (in)	0°	2.494	-
	90°	2.930	-
Avg Dia., Davg (in)		2.712	2.712
Dia., D (cm)		6.888	6.888
Wt. rings + wet soil (g)		354.82	358.76
Wt. rings (g)		214.62	214.62
Wet soil + tare (g)		374.48	271.10
Dry soil + tare (g)		339.72	244.48
Tare (g)		145.98	127.16
Moisture cont., w (%)		17.9	22.7
Gs, assumed		2.70	2.70
Mass total (g)		140.2	144.1
Mass of solids (g)		118.9	118.9
Volume (cm^3)		93.7	82.3
Vol. of water (cm^3)		21.3	25.3
Vol. of solids (cm^3)		44.0	44.0
Vol. of voids (cm^3)		49.7	38.3
Vol. of air (cm^3)		28.4	13.0
Area, A (cm^2)		37.3	37.3
Ht. solids, Hs (cm)		1.181	1.181
Void ratio, e		1.129	0.869
Porosity, n		0.530	0.465
Vol.moisture, T		0.228	0.307
Saturation, S (%)		43	66
Dry density (gm/cm^3)		1.268	1.445
Wet unit wt., gm (pcf)		93.4	110.6
Dry unit wt., gd (pcf)		79.2	90.2

Vertical Stress - Deformation Results

Vert. stress (psf)	Corr. Dial, dfc [a] (in)	Hc [b] (in)	Vert. strain, ev	Void ratio, e	Load duration (min)
Seating	0.0000	0.9900	0.0000	1.1286	0
121	0.0003	0.9897	0.0003	1.1279	53
200	0.0018	0.9882	0.0018	1.1247	76
400	0.0063	0.9837	0.0064	1.1150	76
800	0.0123	0.9777	0.0124	1.1022	87
1,600	0.0203	0.9697	0.0205	1.0849	171
3,200	0.0322	0.9578	0.0325	1.0594	450
6,400	0.0484	0.9416	0.0489	1.0245	120
12,800	0.0711	0.9189	0.0719	0.9756	98
25,600	0.1006	0.8894	0.1016	0.9123	79
51,200	0.1356	0.8544	0.1370	0.8370	114
25,600	0.1340	0.8560	0.1354	0.8404	27
6,400	0.1284	0.8616	0.1297	0.8525	24
1,600	0.1207	0.8693	0.1219	0.8691	50

C'c

(0.1370-0.0719)/[Log(51200)-Log(12800)]

0.0651/(4.71-4.1072)

C'c= 0.108

C'c = Cc/(1+e0)

0.108 = Cc/(1+0.564)

Cc = 0.17

Cc

(0.8370-0.9756)/[Log(51200)-Log(12800)]

-0.14/(4.71-4.1072)

C'c= -0.108

C'c = Cc/(1+e0)

0.108 = Cc/(1+0.564)

Cc = -0.17

Data Interpretation Summary

Preconsolidation stress, s'p (psf)	---
Compression ratio, CR	---
Recompression ratio, RR	---

To be determined by the Geotechnical Engineer

Notes:

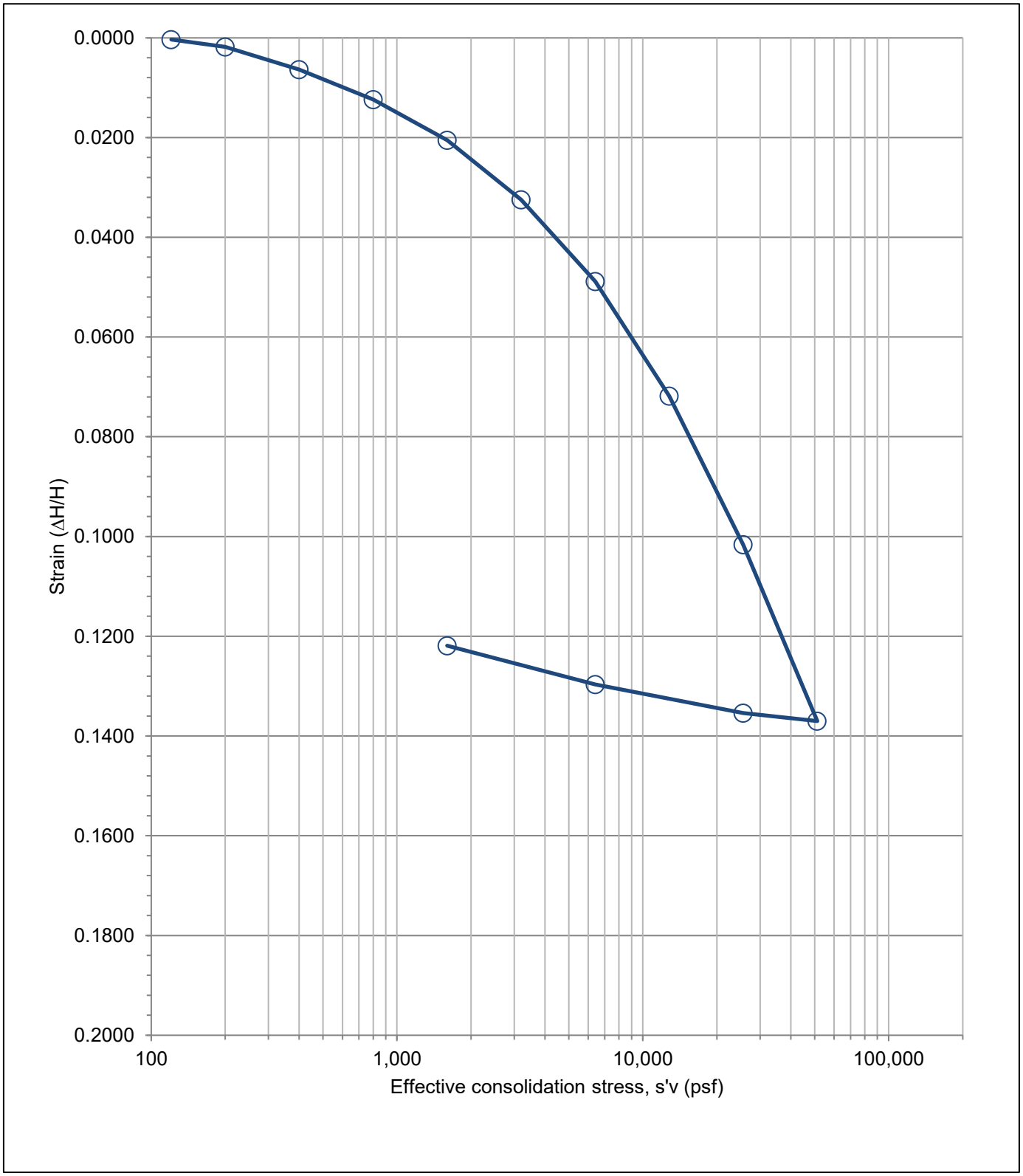
[a] Dfc = end of increment deformation corrected for machine, porous stone, and filter paper deformation

[b] Hc = height at end of consolidation of each vert. stress

One-Dimensional Consolidation Properties of Soils
After ASTM D2435 and USBR 5700

GERHART COLE

Project: Bear Development Snow King Lot 57 **TH/TP/Sample:** TP-02
No: 23072 (23-1725) **Depth:** 6-7 ft



Direct Shear Test for Soils Under Drained Conditions*

After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 9-10 ft

Location: -

Date: 14-Nov-23

Tested by: AT

Reduced by: AT

Checked by: MGS

Laboratory sample description: lt bn - bn clay

USCS classification: not requested

Comments: Gravel up to 3/8" in samples.

X:\PROJECTS\23-1725 Bear Development\Reviewed\[2023-11-10_Lot57_JG-07_DS.xlsm]Sum

Sample type: Undisturbed-trimmed from shelby tul

Testing device: GeoJac-DS

Gravel (%) 1.3

Sand (%) 12.4

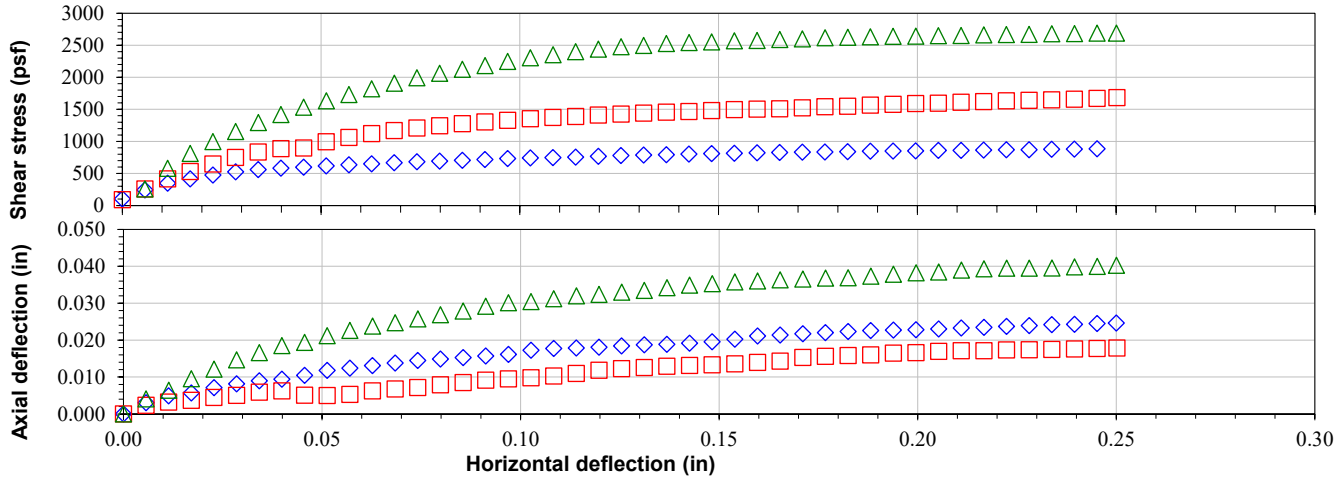
Fines (%) 86.2

LL (%): 33

PL (%): 18

Note: NP = Non-Plastic

	Test Number	Sample 1		Sample 2		Sample 3	
		Initial	Final	Initial	Final	Initial	Final
Unit weight data	Height, H (in)	1.000	0.977	1.014	0.990	1.203	1.131
	Height, H (cm)	2.540	2.482	2.576	2.515	3.056	2.872
	Dia., D (in)	2.500	2.500	2.488	2.488	2.485	2.485
	Dia., D (cm)	6.350	6.350	6.320	6.320	6.312	6.312
	Wt. rings + wet soil (g)	2064.95	2072.64	2058.40	2079.05	2106.13	2107.55
	Wt. rings (g)	1909.89	1909.89	1899.13	1899.13	1920.29	1920.29
Moisture	Wet soil + tare (g)	333.67	353.12	333.67	277.63	398.87	380.83
	Dry soil + tare (g)	311.91	322.93	311.91	248.26	361.41	345.58
	Tare (g)	194.64	197.91	194.64	117.28	196.69	197.10
	Moisture cont., w (%)	18.6	24.1	18.6	22.4	22.7	23.7
Phase Relationships	Gs, assumed	2.65	2.65	2.65	2.65	2.65	2.65
	Mass total (g)	155.1	162.8	159.3	179.9	185.8	187.3
	Mass of solids (g)	130.8	130.8	134.3	134.3	151.4	151.4
	Volume (cm^3)	80.4	78.6	80.8	78.9	95.6	89.9
	Vol. of water (cm^3)	24.3	32.0	24.9	45.6	34.4	35.9
	Vol. of solids (cm^3)	49.4	49.4	50.7	50.7	57.1	57.1
	Vol. of voids (cm^3)	31.1	29.3	30.1	28.2	38.5	32.7
	Vol. of air (cm^3)	6.8	-2.7	5.2	-17.4	4.0	-3.1
	Area, A (cm^2)	31.7	31.7	31.4	31.4	31.3	31.3
	Ht. solids, Hs (cm)	1.558	1.558	1.616	1.616	1.826	1.826
	Void ratio, e	0.630	0.593	0.594	0.556	0.673	0.573
	Porosity, n	0.386	0.372	0.372	0.357	0.402	0.364
	Vol.moisture, T	0.302	0.407	0.309	0.578	0.360	0.399
	Saturation, S (%)	78	109	83	162	89	110
	Dry density (gm/cm^3)	1.626	1.664	1.663	1.703	1.584	1.685
	Wet unit wt., gm (pcf)	120.3	128.9	123.1	130.2	121.3	130.2
	Dry unit wt., gd (pcf)	101.5	103.9	103.8	106.3	98.9	105.2
	Normal stress,Sn (psf)	1000		2000		4000	
	Peak shear stress,Tp (psf)	884		1680		2690	
	Deflection at Peak Stress (in)	0.245		0.250		0.245	
	Shear rate (in./min)	0.001		0.001		0.001	
	Consolidation time (min)	16.0		16.0		480.2	



Direct Shear Test for Soils Under Drained Conditions*

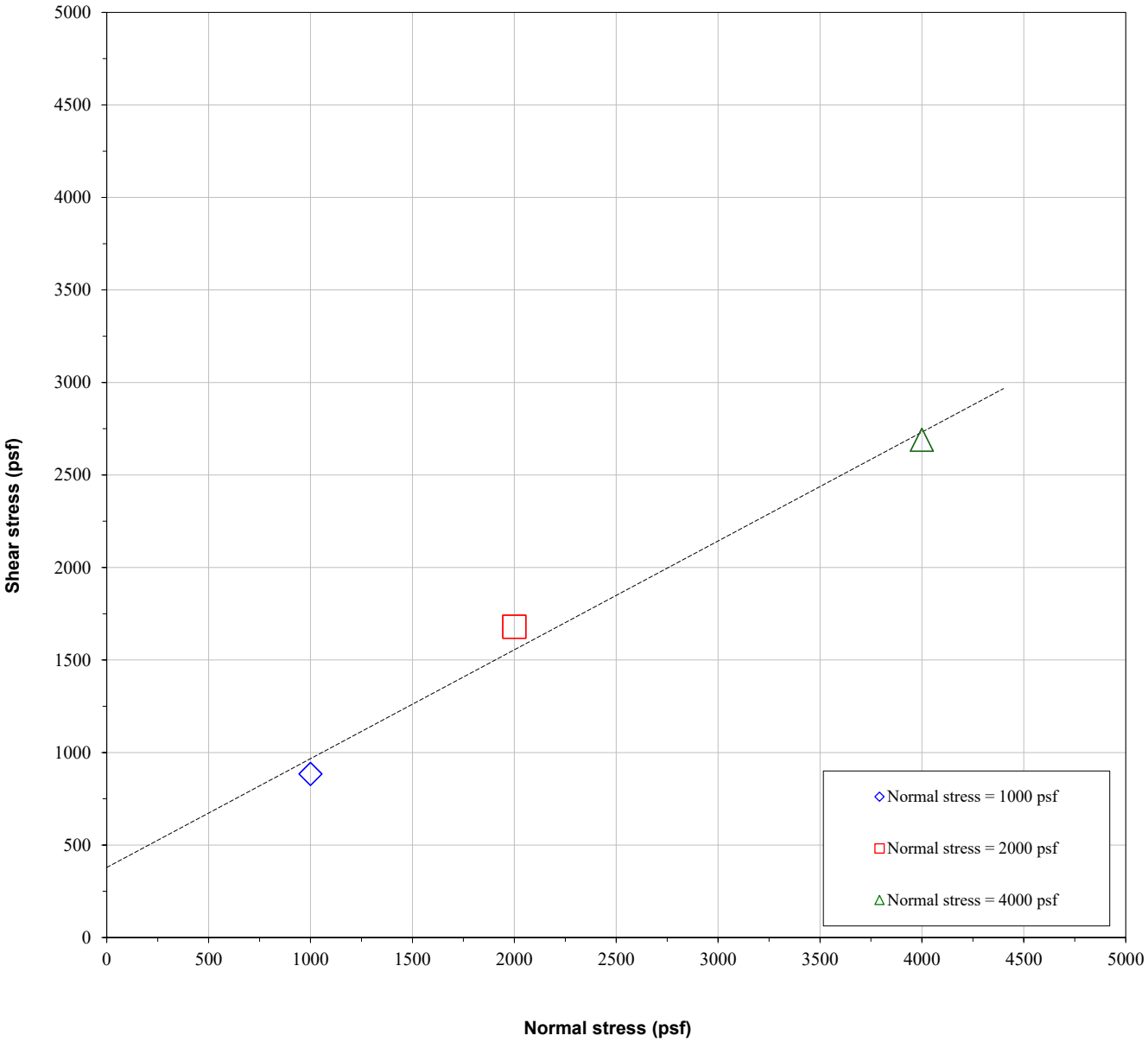
After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 9-10 ft

f (deg)	30
c (psf)	379



Direct Shear Test for Soils Under Drained Conditions*

After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 9-10 ft

Normal stress = 1000 psf			Normal stress = 2000 psf			Normal stress = 4000 psf		
Lateral Deflection (in)	Shear Stress (psf)	Axial Deflection (in)	Lateral Deflection (in)	Shear Stress (psf)	Axial Deflection (in)	Lateral Deflection (in)	Shear Stress (psf)	Axial Deflection (in)
0.000	104	0.000	0.000	92	0.000	0.000	0	0.000
0.006	243	0.003	0.006	258	0.002	0.006	259	0.004
0.011	347	0.005	0.011	415	0.003	0.011	579	0.006
0.017	415	0.006	0.017	530	0.004	0.017	813	0.010
0.023	476	0.007	0.023	648	0.004	0.023	996	0.012
0.028	524	0.008	0.028	750	0.005	0.028	1154	0.015
0.034	560	0.009	0.034	834	0.006	0.034	1294	0.017
0.040	582	0.009	0.040	887	0.006	0.040	1418	0.019
0.046	599	0.010	0.046	897	0.005	0.046	1533	0.019
0.051	618	0.012	0.051	995	0.005	0.051	1632	0.021
0.057	634	0.012	0.057	1062	0.005	0.057	1731	0.023
0.063	649	0.013	0.063	1121	0.006	0.063	1821	0.024
0.068	668	0.014	0.068	1168	0.007	0.068	1907	0.025
0.074	682	0.015	0.074	1208	0.007	0.074	1991	0.026
0.080	693	0.015	0.080	1244	0.008	0.080	2062	0.027
0.086	706	0.015	0.086	1276	0.008	0.086	2124	0.028
0.091	718	0.016	0.091	1303	0.009	0.091	2181	0.029
0.097	732	0.016	0.097	1329	0.009	0.097	2247	0.030
0.103	741	0.017	0.103	1354	0.010	0.103	2304	0.030
0.108	748	0.018	0.108	1373	0.010	0.108	2351	0.031
0.114	756	0.018	0.114	1389	0.011	0.114	2400	0.032
0.120	766	0.018	0.120	1412	0.012	0.120	2440	0.032
0.125	779	0.018	0.125	1426	0.012	0.125	2478	0.033
0.131	787	0.019	0.131	1442	0.013	0.131	2497	0.033
0.137	793	0.019	0.137	1455	0.013	0.137	2527	0.034
0.143	803	0.019	0.143	1465	0.013	0.143	2541	0.035
0.148	810	0.020	0.148	1480	0.013	0.148	2552	0.035
0.154	815	0.020	0.154	1496	0.014	0.154	2568	0.036
0.160	821	0.021	0.160	1503	0.014	0.160	2575	0.036
0.165	828	0.021	0.165	1509	0.014	0.165	2588	0.036
0.171	832	0.022	0.171	1523	0.015	0.171	2598	0.037
0.177	836	0.022	0.177	1540	0.016	0.177	2616	0.037
0.182	841	0.022	0.182	1548	0.016	0.182	2624	0.037
0.188	847	0.023	0.188	1565	0.016	0.188	2631	0.037
0.194	850	0.023	0.194	1579	0.016	0.194	2639	0.038
0.200	853	0.023	0.200	1592	0.017	0.200	2642	0.038
0.205	858	0.023	0.205	1596	0.017	0.205	2649	0.038
0.211	860	0.023	0.211	1611	0.017	0.211	2652	0.039
0.217	866	0.023	0.217	1621	0.017	0.217	2662	0.039
0.222	870	0.024	0.222	1632	0.017	0.222	2667	0.039
0.228	870	0.024	0.228	1640	0.017	0.228	2668	0.039
0.234	877	0.024	0.234	1647	0.017	0.234	2678	0.040
0.239	880	0.024	0.239	1658	0.018	0.240	2682	0.040
0.245	884	0.024	0.245	1670	0.018	0.245	2689	0.040
0.250	883	0.025	0.250	1683	0.018	0.250	2688	0.040

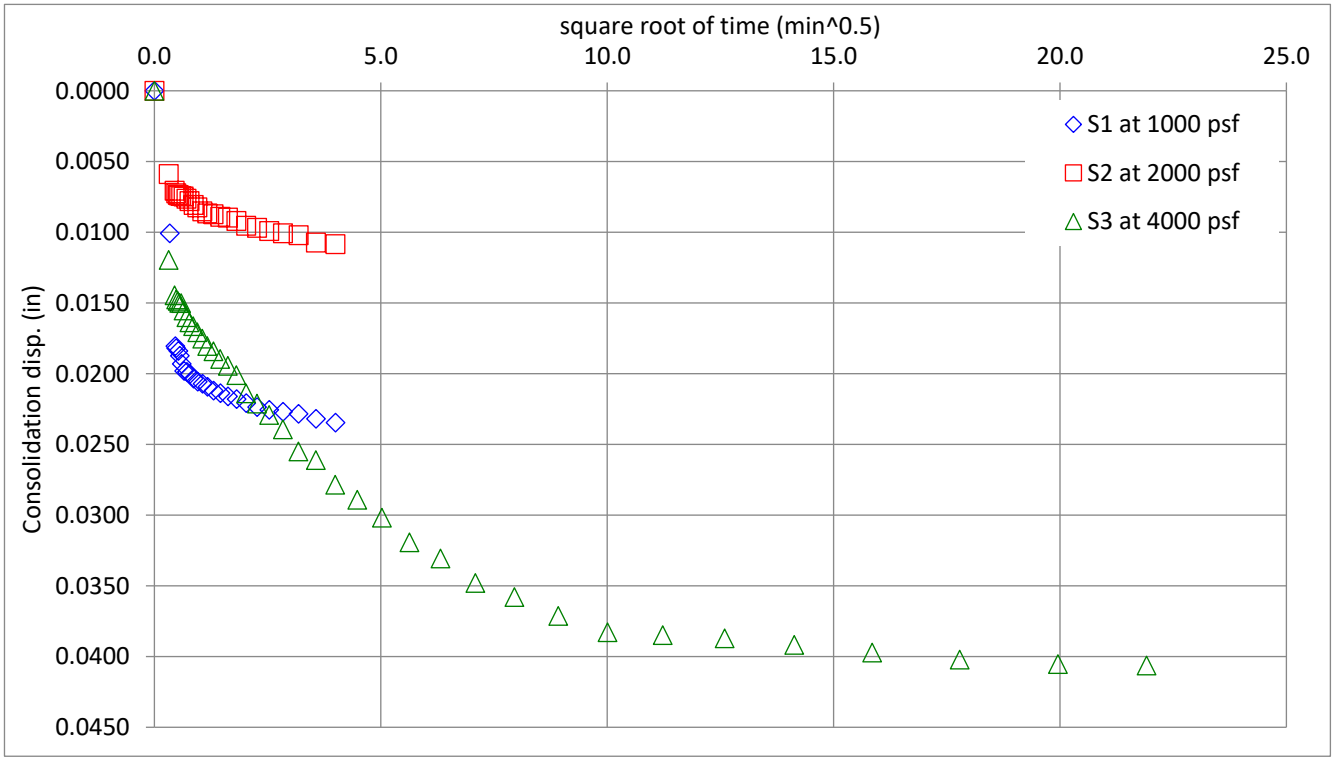
Direct Shear Test for Soils Under Drained Conditions*

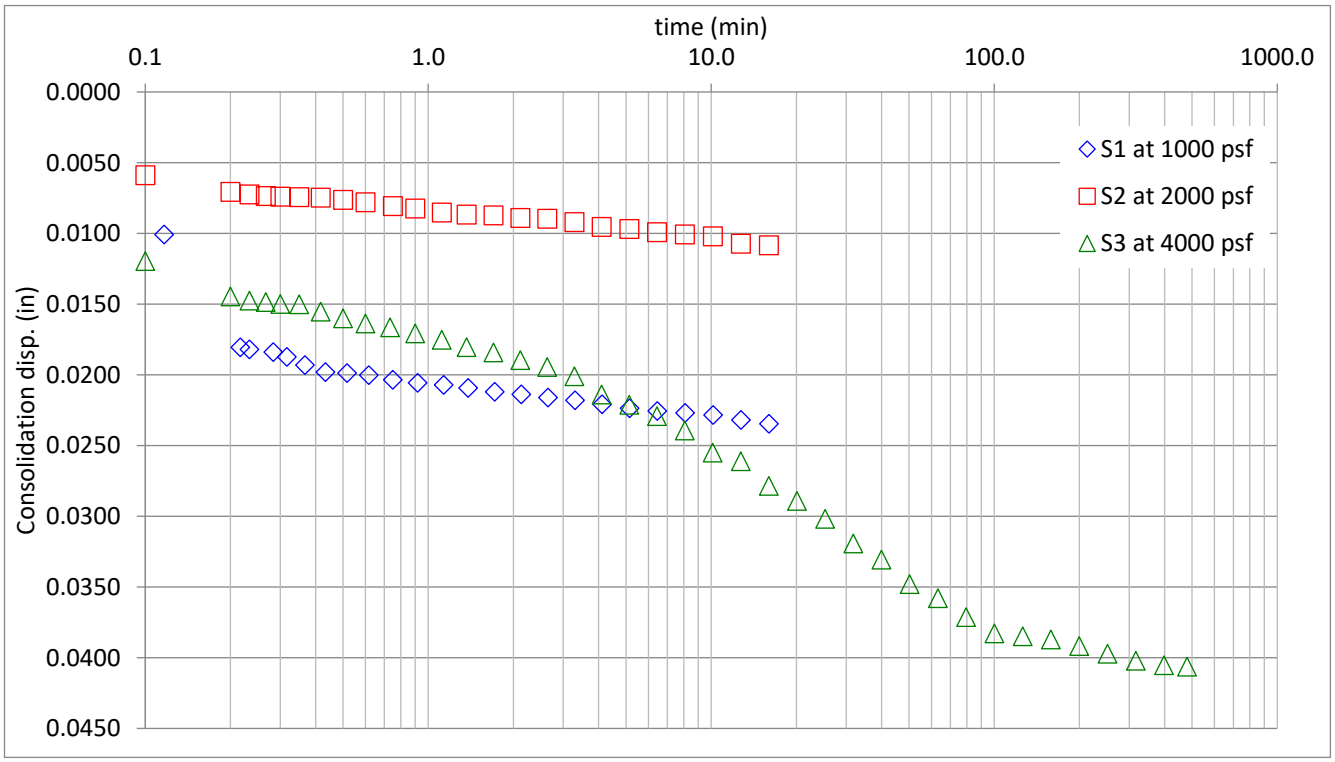
After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** JG-07

No: 23072 (23-1725) **Depth:** 9-10 ft





Direct Shear Test for Soils Under Drained Conditions*

After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** TP-02

No: 23072 (23-1725) **Depth:** 6-7 ft

Location: - Laboratory sample description: lt bn - bn silt

Date: 15-Nov-23 USCS classification: not requested

Tested by: AT Comments:

Reduced by: AT

Checked by: MGS X:\PROJECTS\23-1725 Bear Development\Reviewed\[2023-11-10_Lot57_TP-02_DS.xlsm]Sum

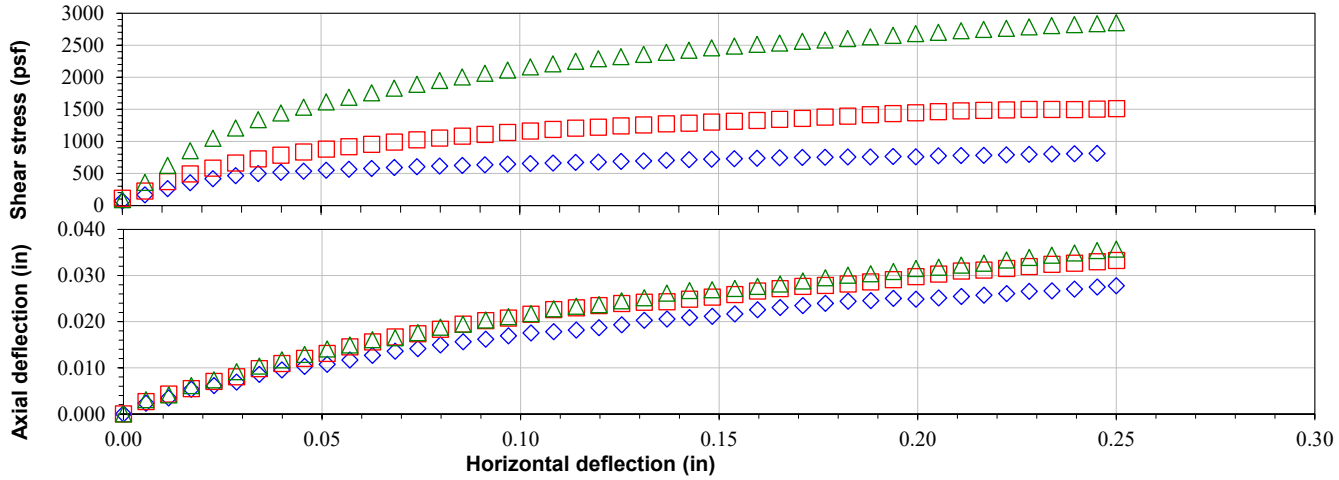
Sample type: Undisturbed-trimmed from shelby tul Gravel (%) 0.0 LL (%): NP

Testing device: GeoJac-DS Sand (%) 6.5 PL (%): NP

Fines (%) 93.5 Note: NP = Non-Plastic

	Test Number	Sample 1		Sample 2		Sample 3	
		Initial	Final	Initial	Final	Initial	Final
Unit weight data	Height, H (in)	1.000	0.975	1.000	0.965	1.000	0.954
	Height, H (cm)	2.540	2.477	2.540	2.452	2.540	2.422
	Dia., D (in)	2.500	2.500	2.500	2.500	2.500	2.500
	Dia., D (cm)	6.350	6.350	6.350	6.350	6.350	6.350
	Wt. rings + wet soil (g)	2052.51	2072.93	2040.55	2068.15	2066.16	2077.33
	Wt. rings (g)	1914.98	1914.98	1897.83	1897.83	1918.67	1918.67
Moisture	Wet soil + tare (g)	577.49	273.08	577.49	338.97	577.49	346.43
	Dry soil + tare (g)	508.79	240.64	508.79	308.78	508.79	316.58
	Tare (g)	116.54	126.81	116.54	193.75	116.54	195.96
	Moisture cont., w (%)	17.5	28.5	17.5	26.2	17.5	24.7
Phase Relationships	Gs, assumed	2.65	2.65	2.65	2.65	2.65	2.65
	Mass total (g)	137.5	158.0	142.7	170.3	147.5	158.7
	Mass of solids (g)	117.0	117.0	121.4	121.4	125.5	125.5
	Volume (cm^3)	80.4	78.4	80.4	77.7	80.4	76.7
	Vol. of water (cm^3)	20.5	40.9	21.3	48.9	22.0	33.2
	Vol. of solids (cm^3)	44.2	44.2	45.8	45.8	47.4	47.4
	Vol. of voids (cm^3)	36.3	34.3	34.6	31.8	33.1	29.3
	Vol. of air (cm^3)	15.8	-6.6	13.3	-17.0	11.1	-3.8
	Area, A (cm^2)	31.7	31.7	31.7	31.7	31.7	31.7
	Ht. solids, Hs (cm)	1.395	1.395	1.447	1.447	1.496	1.496
	Void ratio, e	0.821	0.776	0.755	0.694	0.698	0.620
	Porosity, n	0.451	0.437	0.430	0.410	0.411	0.383
	Vol.moisture, T	0.255	0.522	0.264	0.629	0.273	0.432
	Saturation, S (%)	57	119	61	154	66	113
	Dry density (gm/cm^3)	1.455	1.492	1.510	1.564	1.560	1.636
	Wet unit wt., gm (pcf)	106.7	119.7	110.8	123.3	114.5	127.4
	Dry unit wt., gd (pcf)	90.8	93.1	94.3	97.6	97.4	102.1

Normal stress,Sn (psf)	1000	2000	4000
Peak shear stress,Tp (psf)	814	1510	2850
Deflection at Peak Stress (in)	0.250	0.250	0.250
Shear rate (in./min)	0.001	0.001	0.001
Consolidation time (min)	25.3	20.1	10.1



Direct Shear Test for Soils Under Drained Conditions*

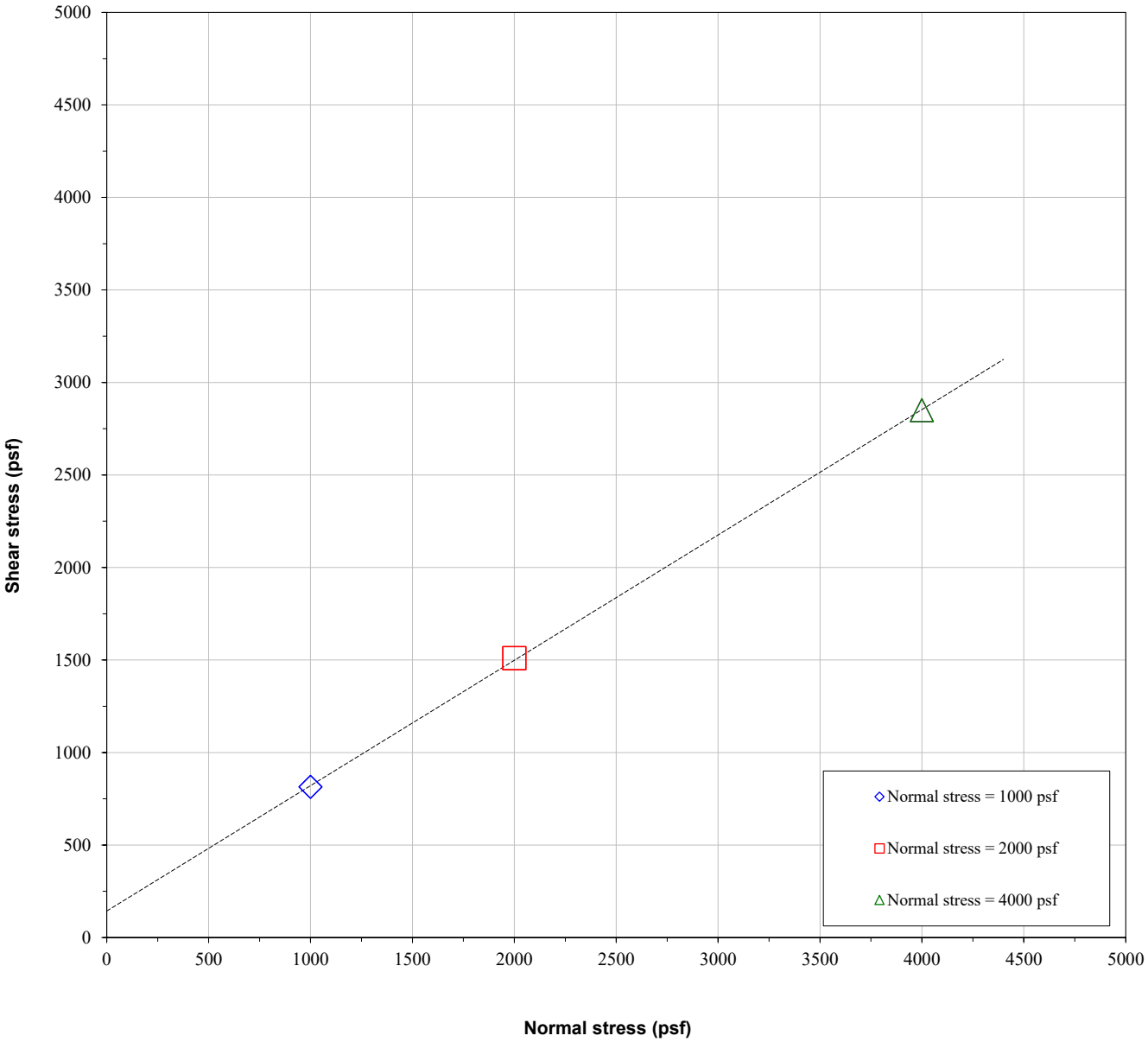
After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** TP-02

No: 23072 (23-1725) **Depth:** 6-7 ft

f (deg)	34
c (psf)	144



Direct Shear Test for Soils Under Drained Conditions*

After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** TP-02

No: 23072 (23-1725) **Depth:** 6-7 ft

Normal stress = 1000 psf			Normal stress = 2000 psf			Normal stress = 4000 psf		
Lateral Deflection (in)	Shear Stress (psf)	Axial Deflection (in)	Lateral Deflection (in)	Shear Stress (psf)	Axial Deflection (in)	Lateral Deflection (in)	Shear Stress (psf)	Axial Deflection (in)
0.000	71	0.000	0.000	114	0.000	0.000	91	0.000
0.006	166	0.002	0.006	226	0.003	0.006	361	0.003
0.011	263	0.003	0.011	373	0.004	0.011	625	0.004
0.017	354	0.005	0.017	494	0.005	0.017	855	0.006
0.023	418	0.006	0.023	583	0.007	0.023	1049	0.007
0.028	465	0.007	0.028	663	0.008	0.028	1209	0.009
0.034	497	0.009	0.034	727	0.010	0.034	1340	0.010
0.040	518	0.010	0.040	786	0.011	0.040	1445	0.012
0.046	536	0.010	0.046	835	0.012	0.046	1533	0.013
0.051	551	0.011	0.051	879	0.013	0.051	1617	0.014
0.057	564	0.012	0.057	918	0.015	0.057	1687	0.015
0.063	578	0.013	0.063	954	0.016	0.063	1757	0.016
0.068	592	0.014	0.068	990	0.017	0.068	1829	0.017
0.074	605	0.014	0.074	1023	0.017	0.074	1890	0.018
0.080	615	0.015	0.080	1052	0.018	0.080	1950	0.019
0.086	626	0.016	0.086	1083	0.019	0.086	2006	0.019
0.091	636	0.016	0.091	1110	0.020	0.091	2063	0.020
0.097	646	0.017	0.097	1138	0.021	0.097	2113	0.021
0.103	656	0.018	0.103	1162	0.022	0.103	2162	0.022
0.108	664	0.018	0.108	1188	0.023	0.108	2210	0.023
0.114	673	0.018	0.114	1206	0.023	0.114	2251	0.023
0.120	679	0.019	0.120	1222	0.023	0.120	2291	0.024
0.125	686	0.019	0.125	1242	0.024	0.125	2323	0.025
0.131	696	0.020	0.131	1258	0.024	0.131	2358	0.025
0.137	705	0.021	0.137	1274	0.024	0.137	2389	0.026
0.143	714	0.021	0.143	1284	0.025	0.143	2422	0.027
0.148	722	0.021	0.148	1301	0.025	0.148	2458	0.027
0.154	729	0.022	0.154	1314	0.026	0.154	2486	0.027
0.160	736	0.023	0.160	1326	0.027	0.160	2514	0.028
0.165	744	0.023	0.165	1343	0.027	0.165	2535	0.028
0.171	750	0.023	0.171	1359	0.028	0.171	2561	0.029
0.177	751	0.024	0.177	1378	0.028	0.177	2581	0.030
0.182	757	0.024	0.182	1394	0.028	0.182	2605	0.030
0.188	758	0.025	0.188	1415	0.029	0.188	2630	0.030
0.194	766	0.025	0.194	1432	0.029	0.194	2653	0.031
0.200	760	0.025	0.200	1447	0.030	0.200	2681	0.032
0.205	774	0.025	0.205	1463	0.030	0.205	2700	0.032
0.211	781	0.025	0.211	1476	0.031	0.211	2727	0.032
0.217	783	0.026	0.217	1484	0.031	0.217	2746	0.033
0.222	790	0.026	0.222	1492	0.032	0.222	2763	0.033
0.228	797	0.027	0.228	1498	0.032	0.228	2786	0.034
0.234	802	0.027	0.234	1499	0.032	0.234	2805	0.034
0.240	807	0.027	0.240	1495	0.033	0.239	2820	0.035
0.245	813	0.027	0.245	1504	0.033	0.245	2836	0.035
0.250	814	0.028	0.250	1512	0.033	0.250	2851	0.036

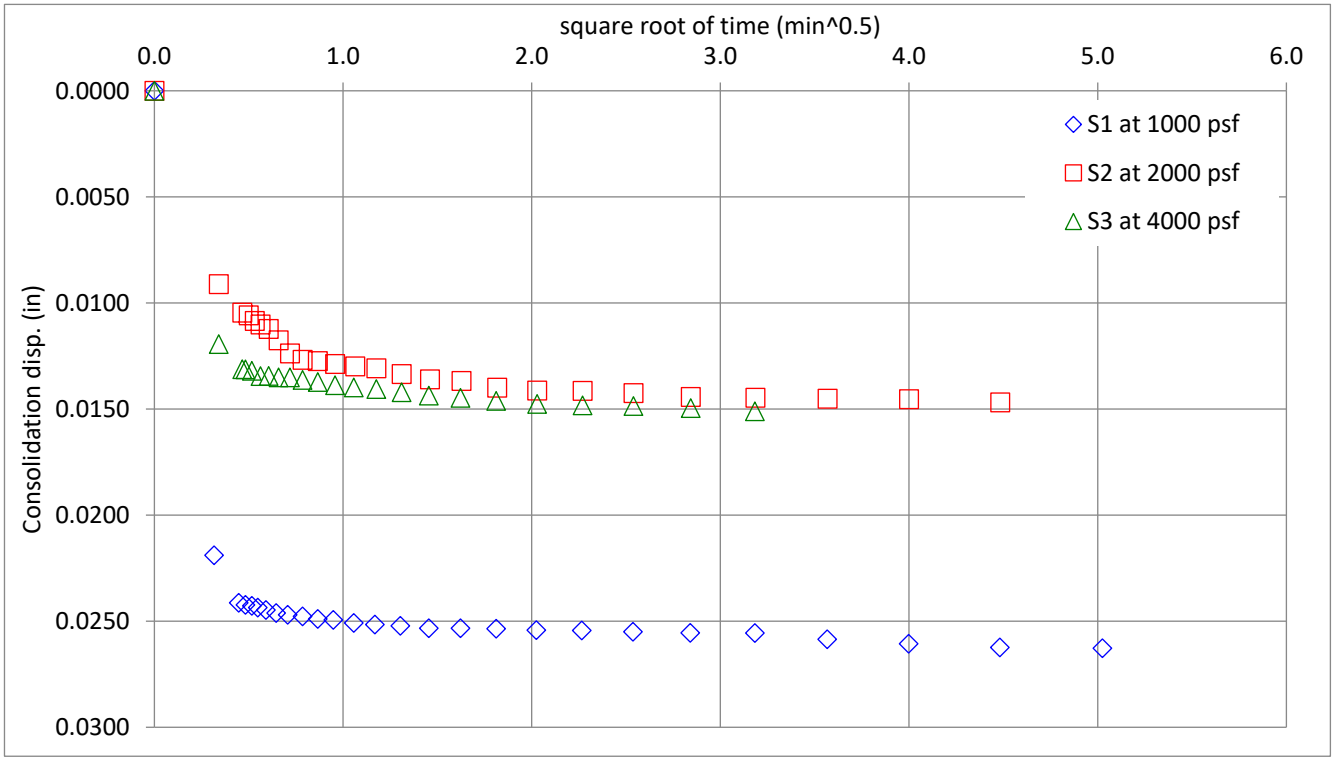
Direct Shear Test for Soils Under Drained Conditions*

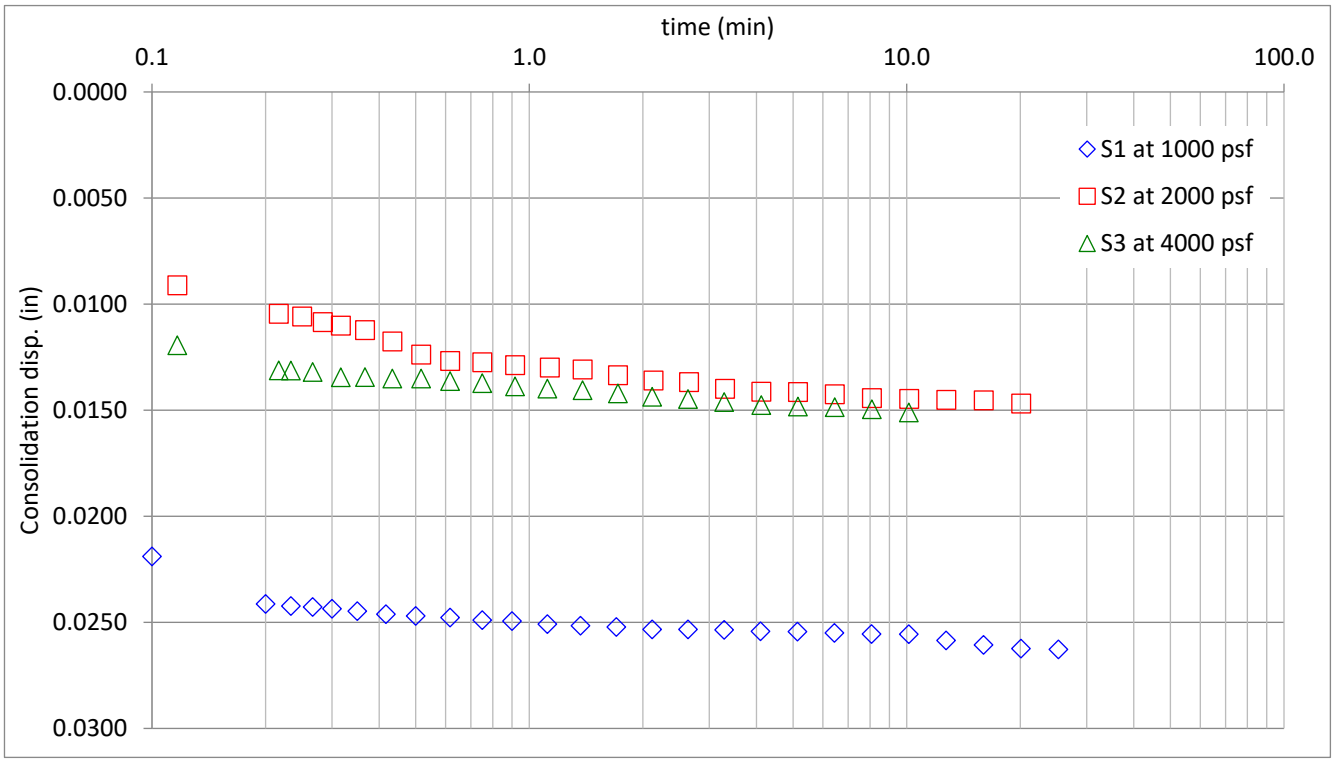
After ASTM D3080

GERHART COLE

Project: Bear Development Snow King **TH/TP/Sample:** TP-02

No: 23072 (23-1725) **Depth:** 6-7 ft





Direct Shear of Soils Under Consolidated Drained Conditions, ASTM D3080

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson # 21-222-02
Jackson, Wyoming

Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

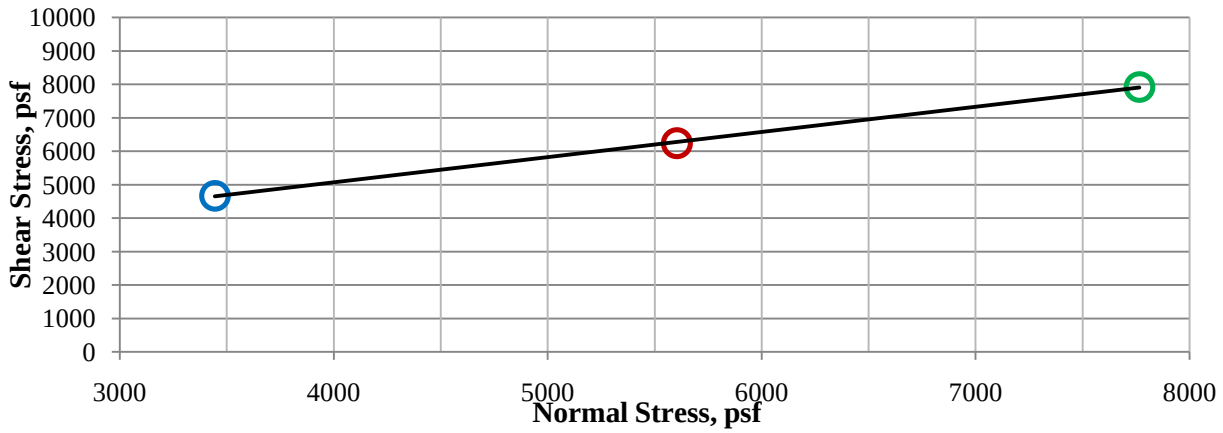
Sample Data:

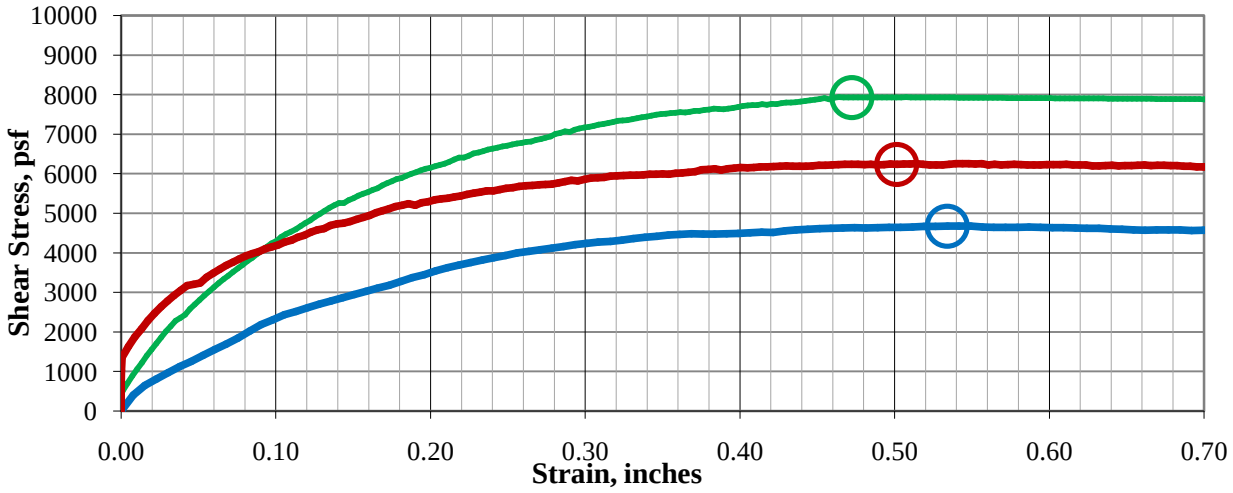
Boring: BH6-11 **Depth:** 52.5'-53' **Density:** 137.7 pcf moist

Description: Sandy Lean Clay, CL

Normal Stress, psf	Initial Moisture,%	Final Moisture,%	Consol + Collapse,%	Final Wet Density, pcf	Final Dry Density, pcf	Max Shear Stress, psf	Failure Strain,%
3444	14.4	16.2	2.2	143.1	123.1	**4673**	**22.1**
5604	14.4	15.6	3.0	143.5	124.1	**6234**	**20.7**
7764	14.4	14.7	3.8	143.6	125.2	**7924**	**19.5**

Peak Angle, ϕ° **37.0** Peak Cohesion, C, psf **2059** Strain rate, %/hour **4.1**





Remarks: Friction angle and cohesion in practice are sensitive to several other material properties, and conditions, in the field and lab. No individual lab property of a material can substitute for overall best practices in geotechnical design, construction, and field testing by qualified professionals.

2511 Holman Avenue
P. O. Box 80190
Billings, Montana 59108-0190
p: 406.652.3930; f: 406.652.3944
www.skgeotechnical.com

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Date: July 26, 2021

Project: **08-2506L Laboratory Testing**
Lot 58 Grand View Lodges
Nelson #21-222-02
Jackson, Wyoming

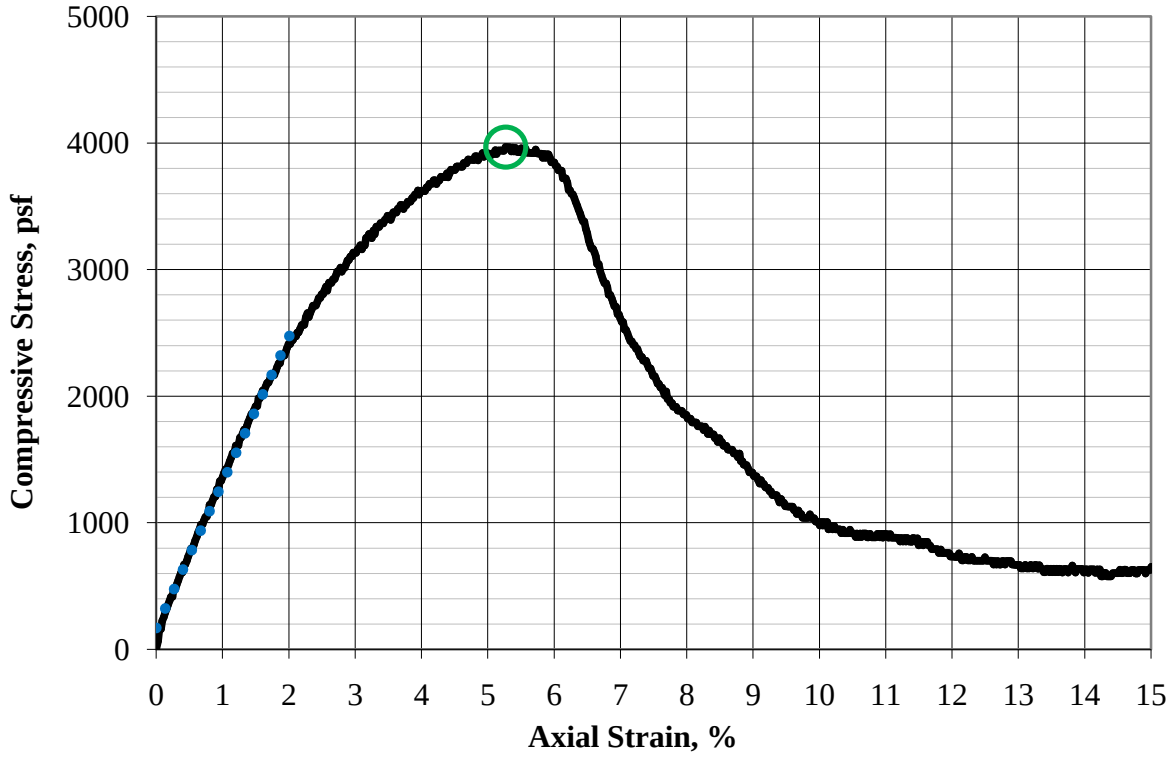
Client: Mr. Phil Gyr, PE
Nelson Engineering
pgyr@nelsonengineering.net

Sample Data:

Boring: BH6-4B
Depth: 22.5' - 23'
Description: Lean Clay, CL

Specimen Properties:	
Average Diameter, in.	2.395
Average Height, in.	5.186
Height/Diameter (L/D)	2.17
Moisture, %	18.6
Wet density, pcf	128.5
Dry density, pcf	108.3

Undrained Unconfined Strength Properties:	
Compressive strength, psf	3968
Shear strength, psf	1984
Axial elastic modulus, psi	798
Failure strain, %	5.3
Strain rate, 0.5 - 2% per minute	1.2
Temperature, °F	72.0



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USCS CLASSIFICATION

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Sample ID: BH5 @ 23'-28' Depth (ft): 23'-28'

Unified Soils Classification
SC (Clayey Sand)

Gravel	7%
Sand	55%
Fines	38%

Liquid Limit:	29
Plastic Limit:	4
Plasticity Index:	25

In-Situ Moisture Content	N/A

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.1	110.1	0.0	0%	100%
1"	25	110.1	110.1	0.0	0%	100%
3/4"	18.75	110.1	110.1	0.0	0%	100%
#4	4.75	110.1	147.1	37.0	7%	93%
#10	2.00	110.1	134.6	24.5	11%	89%
#40	0.425	110.1	145.4	35.3	18%	82%
#200	0.075	110.1	343.2	233.1	62%	38%
Pan	0	110.1	316.3	206.2	100%	0%
		Total Weight of Sample (g)		536.1		

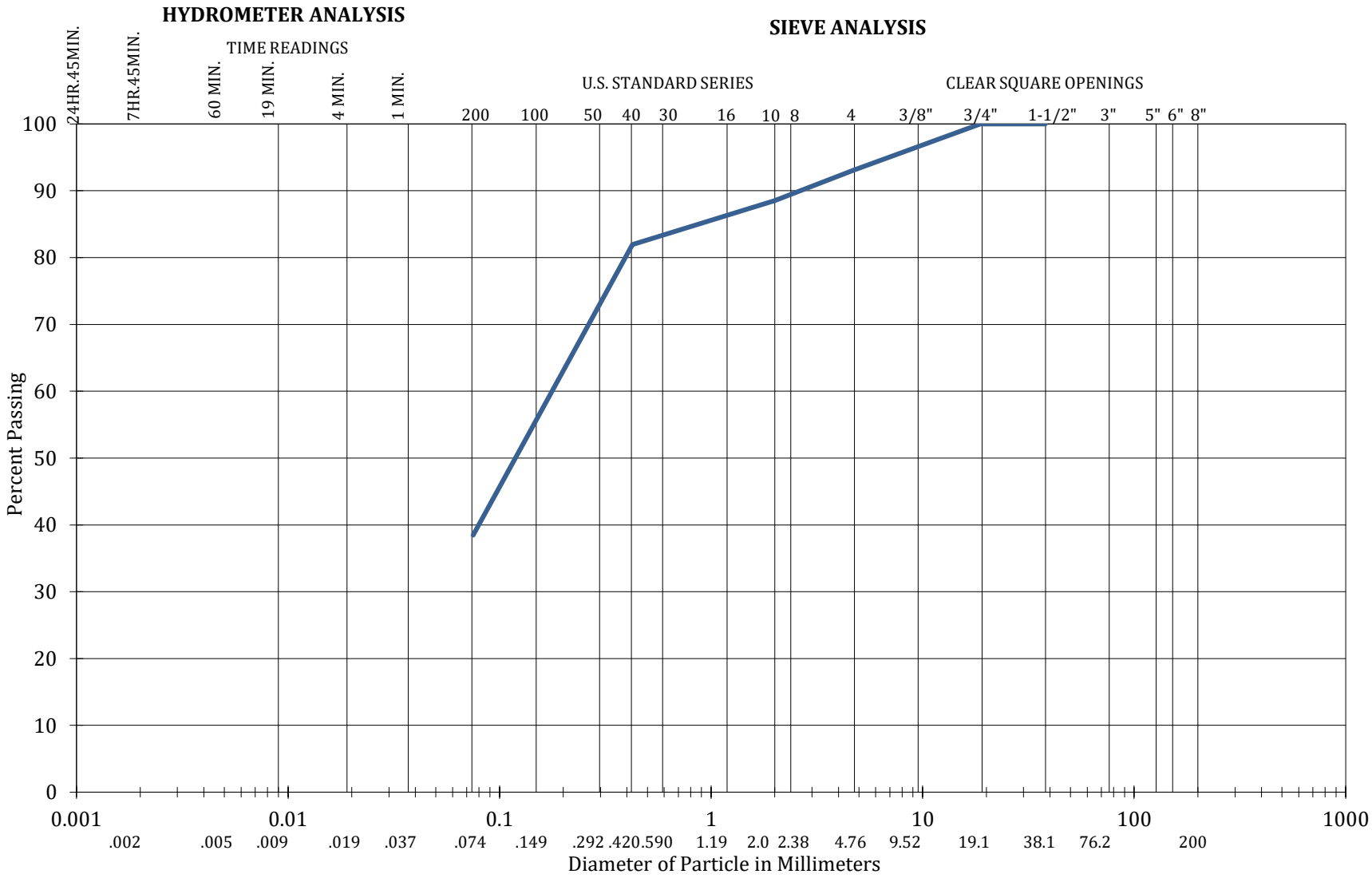
Moisture Content	
Wet Wt + Tare (g)	-
Dry Wt. + Tare (g)	-
Wt of Water (g)	-
Tare Wt. (g)	-
Dry Wt. (g)	-
Moisture Content	-
Wash	
Wet Wt. + Tare (g)	
Pre Wash Dry (g)	536.1
Post Wash Dry (g)	329.9
Tare Wt. (g)	109.9
Wt.Of Minus #200 =	206.2

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Tan Clayey Sand with Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	1/8/2005

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USCS CLASSIFICATION SIEVE CHART



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

BH5 @ 23'-28'

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH5 @ 37'-41' Depth (ft): 37'-41'

Unified Soils Classification
SC (Clayey Sand)

Gravel	7%
Sand	68%
Fines	25%

Liquid Limit:	28
Plastic Limit:	12
Plasticity Index:	16

In-Situ Moisture Content	N/A

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	110.1	110.1	0.0	0%	100%
1"	25	110.1	110.1	0.0	0%	100%
3/4"	18.75	110.1	110.1	0.0	0%	100%
#4	4.75	110.1	163.8	53.7	7%	93%
#10	2.00	110.1	139.7	29.6	11%	89%
#40	0.425	110.1	196.8	86.7	23%	77%
#200	0.075	110.1	502.4	392.3	75%	25%
Pan	0	110.1	298.2	188.1	100%	0%
		Total Weight of Sample (g)		750.4		

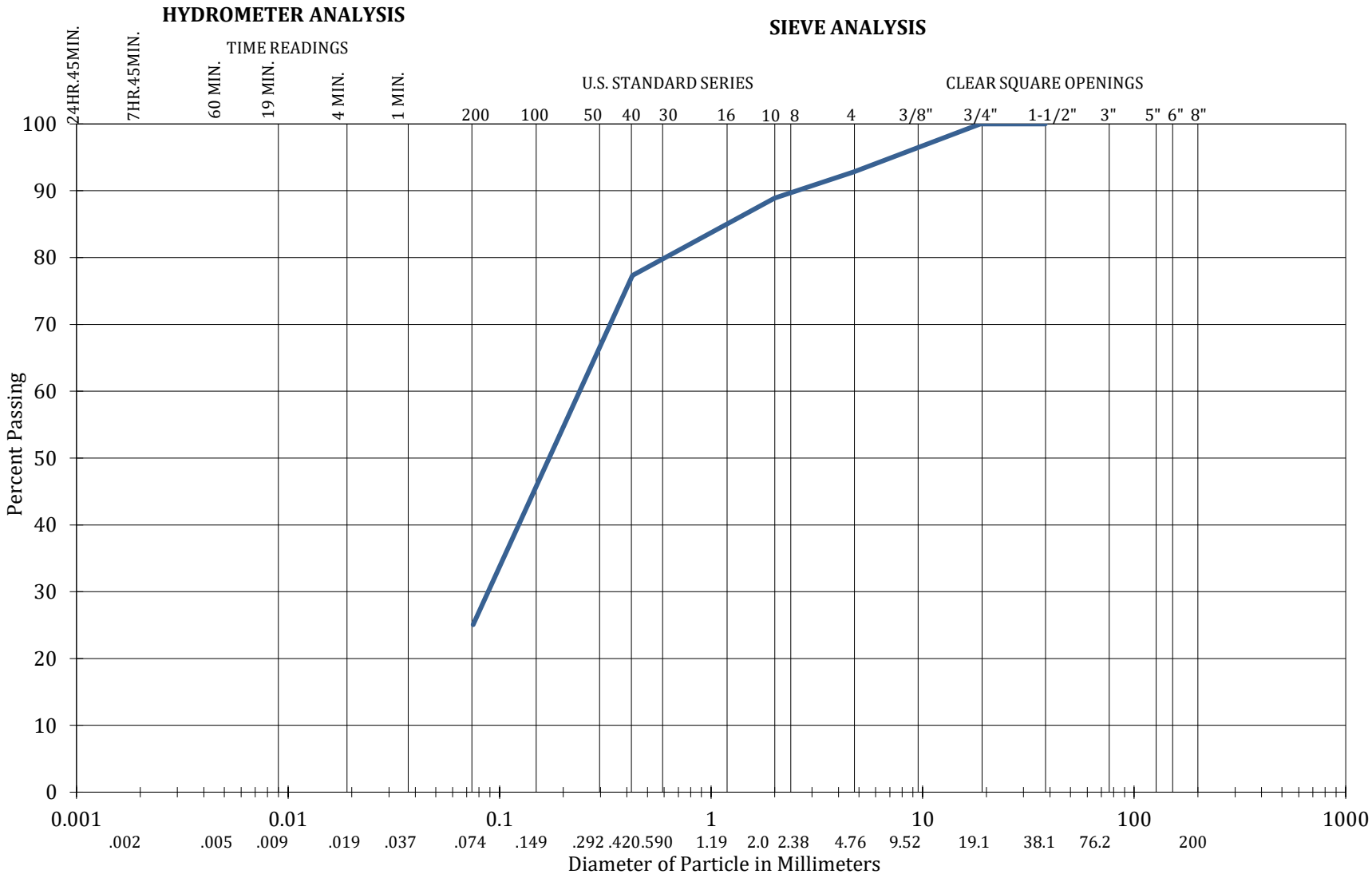
Moisture Content	
Wet Wt + Tare (g)	-
Dry Wt. + Tare (g)	-
Wt of Water (g)	-
Tare Wt. (g)	-
Dry Wt. (g)	-
Moisture Content	-
Wash	
Wet Wt. + Tare (g)	
Pre Wash Dry (g)	750.4
Post Wash Dry (g)	562.3
Tare Wt. (g)	114.3
Wt.Of Minus #200 =	188.1

Project:	Lot 58 Grand View Lodges
Job Number	02-130-12
Visual ID:	Gray Clayey Sand with Gravel

Sampled By:	PG
Date:	
Tested By:	AP
Date:	1/8/2005

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USCS CLASSIFICATION SIEVE CHART



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

BH5 @ 37'-41'

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH6-4B Depth (ft): 22'-23'

Unified Soils Classification
Lean Clay, CL

Gravel	**0%**
Sand	**12%**
Fines	**87%**

Liquid Limit:	**33**
Plastic Limit:	**15**
Plasticity Index:	**18**

In-Situ Moisture Content	**17.5%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	292.2	292.2	0.0	0%	100%
1"	25	292.2	292.2	0.0	0%	100%
3/4"	18.75	292.2	292.2	0.0	0%	100%
3/8"	9.5	292.2	292.2	0.0	0%	100%
#4	4.75	292.2	293.3	1.0	0%	100%
#10	2.00	292.2	293.3	1.1	1%	99%
#40	0.425	292.2	304.0	11.8	5%	95%
#100	0.15	292.2	301.3	9.1	9%	91%
#200	0.075	292.2	303.4	11.2	13%	87%
Pan	0	292.2	527.4	235.2	100%	0%
		Total Weight of Sample (g)		**269.3**		

Moisture Content	
Wet Wt + Tare (g)	940.7
Dry Wt. + Tare (g)	825.9
Wt of Water (g)	114.8
Tare Wt. (g)	170.9
Dry Wt. (g)	654.9
Moisture Content	17.5%
Wash	
Wet Wt. + Tare (g)	940.7
Pre Wash Dry (g)	269.3
Post Wash Dry (g)	34.2
Tare Wt. (g)	292.2
Wt.Of Minus #200 =	235.2

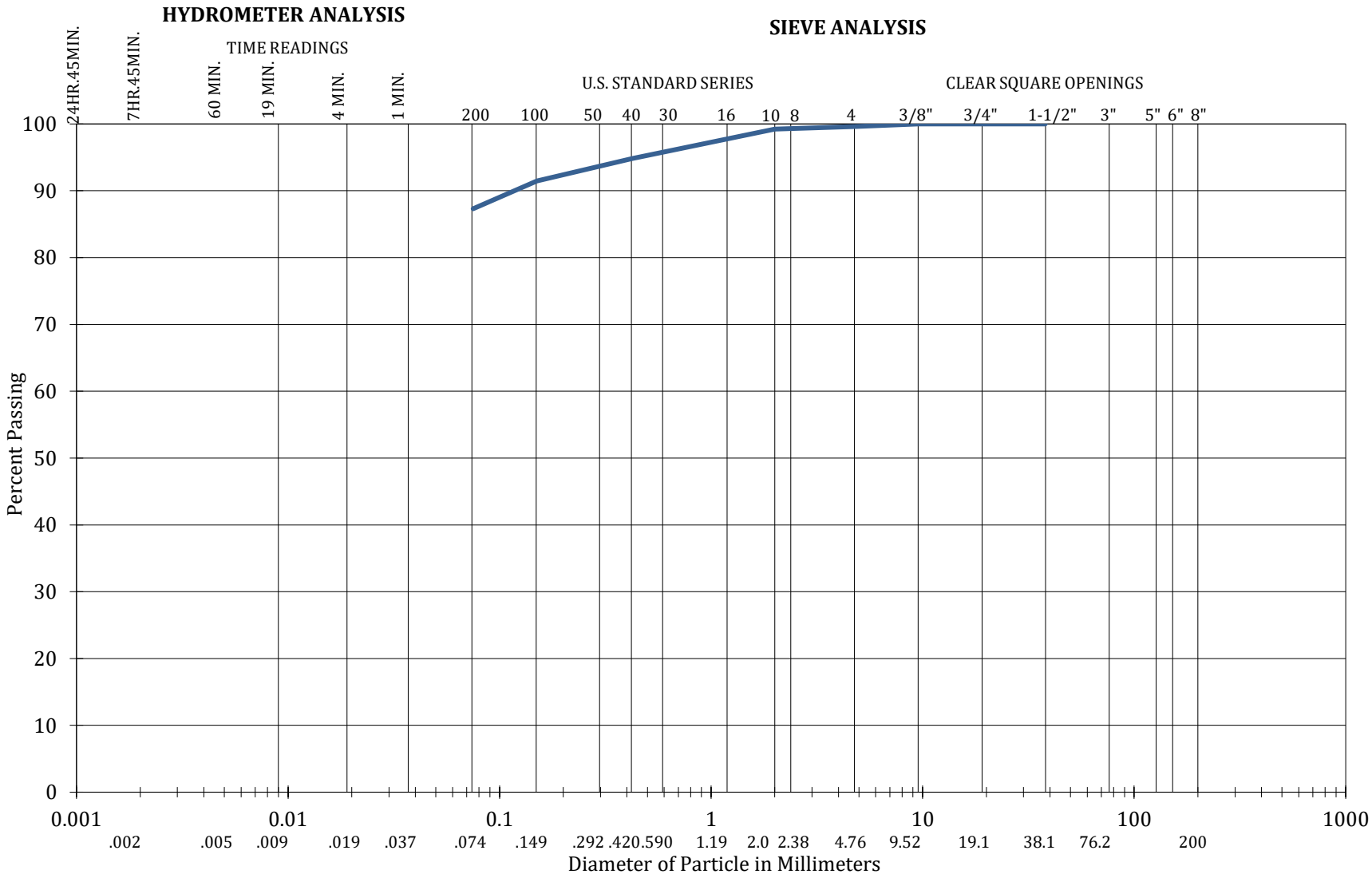
Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Olive Green Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/2/2021

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USCS CLASSIFICATION SIEVE CHART

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

BH6-4B

Lot 58 Grand View Lodges

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USCS CLASSIFICATION

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Sample ID: BH6-11 Depth (ft): 52'-53'

Unified Soils Classification
Sandy Lean Clay, CL

Gravel	**9%**
Sand	**25%**
Fines	**66%**

Liquid Limit:	**25**
Plastic Limit:	**11**
Plasticity Index:	**14**

In-Situ Moisture Content	**16.5%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	171.0	171.0	0.0	0%	100%
1"	25	171.0	171.0	0.0	0%	100%
3/4"	18.75	171.0	171.0	0.0	0%	100%
3/8"	9.5	171.0	205.5	34.5	5%	95%
#4	4.75	171.0	206.3	35.3	9%	91%
#10	2.00	171.0	231.4	60.4	17%	83%
#40	0.425	171.0	226.7	55.7	25%	75%
#100	0.15	171.0	200.2	29.2	29%	71%
#200	0.075	171.0	213.6	42.7	34%	66%
Pan	0	171.0	661.8	490.9	100%	0%
		Total Weight of Sample (g)		**748.7**		

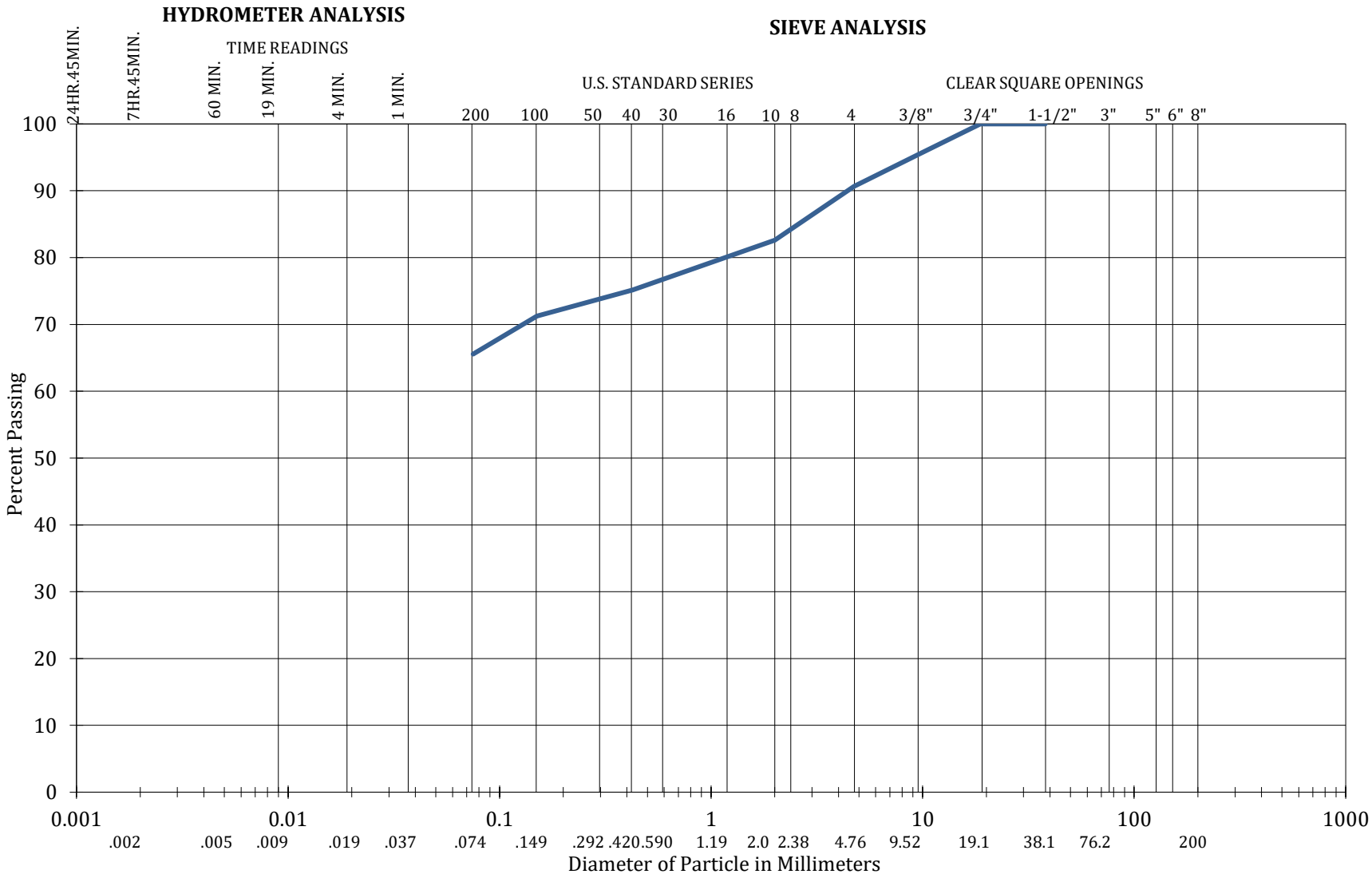
Moisture Content	
Wet Wt + Tare (g)	851.2
Dry Wt. + Tare (g)	754.8
Wt of Water (g)	96.4
Tare Wt. (g)	170.8
Dry Wt. (g)	584.0
Moisture Content	16.5%
Wash	
Wet Wt. + Tare (g)	851.2
Pre Wash Dry (g)	748.7
Post Wash Dry (g)	257.8
Tare Wt. (g)	170.4
Wt.Of Minus #200 =	490.9

Project:	Lot 58 Grand View Lodges
Job Number	21-222-02
Visual ID:	Brown Sandy Lean Clay

Sampled By:	AP
Date:	6/24/2021
Tested By:	AE
Date:	7/7/2021

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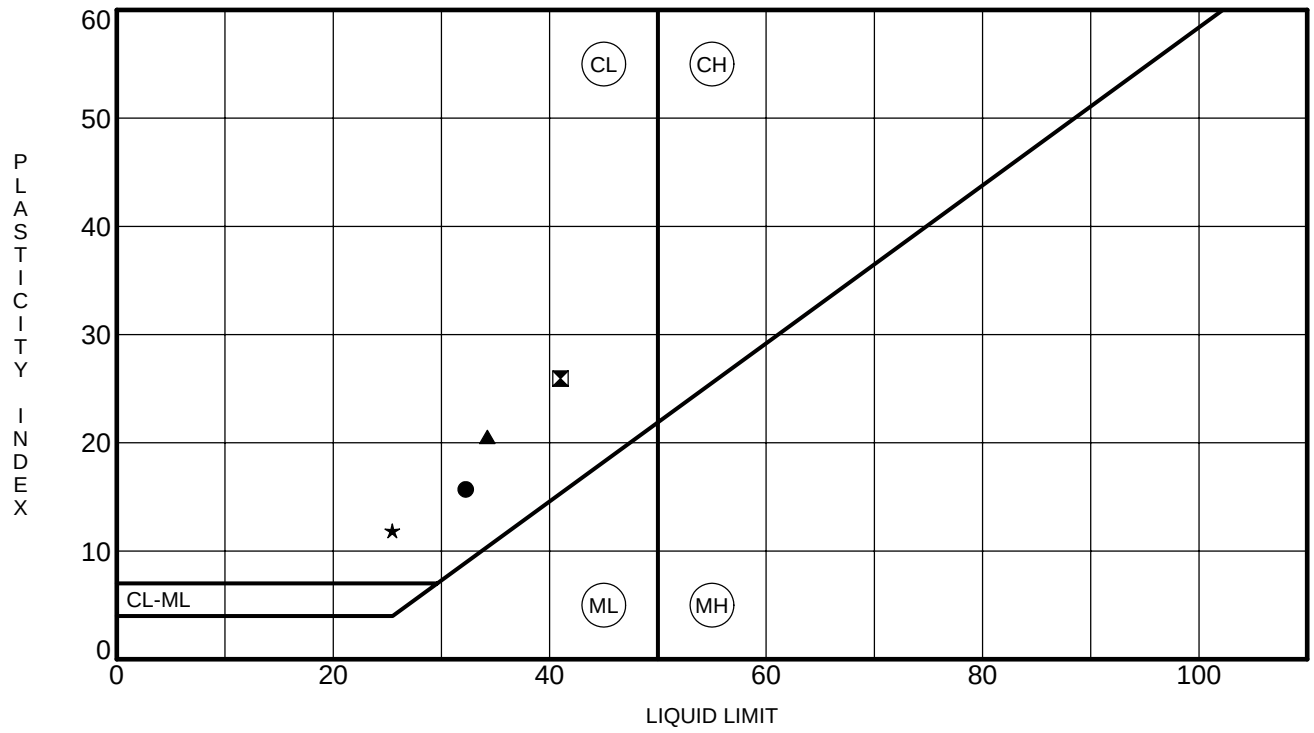
USCS CLASSIFICATION SIEVE CHART



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

BH6-11

Lot 58 Grand View Lodges



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**TP-1**	**9.0**	**32**	**17**	**15**		
⊠	**TP-1**	**10.0**	**41**	**15**	**26**		
▲	**TP-1**	**25.0**	**34**	**14**	**20**		
★	**TP-1**	**27.5**	**25**	**14**	**11**		

Womack & Associates, Inc.
P.O. Box 12650
Jackson, WY 83002
Telephone: (307)733-7209
Fax:

ATTERBERG LIMITS' RESULTS

Project: TOJ - Snow King Water Tank

Location: Jackson, Wyoming

Number:

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX D

Soil-Engineering Parameters

Engineering parameters for site soils were evaluated based on a variety of methods, including:

- direct laboratory testing (shear strength and consolidation),
- correlations with index tests,
- empirical relationships between SPT N-values and shear strength, and
- visual classification and empirical estimates.

Due to the chaotic and random nature of the soils (i.e., mixture of fine-grained and coarse-grained soils), collecting relatively undisturbed Shelby tube samples of the landslide debris during the drilling effort to perform shear tests and consolidation tests on was difficult. Therefore, very limited soil parameters for soil unit weight, consolidation values, and shear strength values were directly determined from their respective tests. Most of the samples that underwent lab testing were disturbed samples collected during SPT sampling, sonic drilling and test pit excavation, of which their results were used to estimate the soil parameters based on correlations. We submitted three relatively undisturbed Shelby tube samples to undergo consolidation and shear strength testing for the loess encountered at the site.

Since the landslide deposits are understood to cover a greater area than just Lot 57, we also included applicable soil parameters from our site exploration on the nearby Lots 53 And 58, soil parameters from Nelson Engineering for Lots 53 and 58, and soil parameters for a nearby project provided by Womack & Associates, Inc.

A discussion regarding the selection of soils parameters is found below.

Soil Unit Weight

Three consolidation tests were performed which produced dry unit weights, while two shear tests were performed which produced dry unit weights. These direct unit weight measurements, SPT blow counts, and observations made in the open test pits were used to estimate the in-situ unit weight of the soils. Estimated unit weights are presented below in Table D-1.

Table D-1: Estimated Soil Unit Weight Values

Soil Layer	Average Unit Weight (Pounds per cubic foot)
CL and ML – Lean Clay (Loess)	115
GC-GM,GC and SC– Clayey Gravel, Silty Clayey Gravel, Clayey Sand (Landslide Debris)	125

Consolidation Parameters

Coefficients of consolidation, C_c, were calculated based on the direct consolidated test results, as well as correlation methods recommended by Skempton (1944), Nagaraj and Murthy (1985), Wroth and Wood (1978), and Kulhawy and Mayne (1990). These calculation methods use index properties such as the Liquid Limit and the Plasticity Index to estimate the coefficients of consolidation. The results presented below are the average of all C_c, values calculated from the direct results and correlation calculations.

Table D-2: Estimated Coefficients of Consolidation

Soil Layer	Coefficient of Consolidation
CL - Loess	0.22
ML-Loess	0.17
GC – Landslide Debris	0.13
GM – Landslide Debris	-
SC – Landslide Debris	0.22

Strength Parameters

Internal Friction Angle (phi)

Strength parameters used in the slope stability model were selected by examining direct shear results, calculations based on SPT blow count values, as recommended by Hatanaka and Uchida (1996) and Schmertmann (1975), and calculated based on index properties as recommended by Duncan (1989). Minimum, maximum, and average internal friction angles (phi) are summarized in the table below.

Table D-3: Estimated Internal Friction Values (Degrees)

	Minimum	Maximum	Average	Standard Deviation	Selected phi
CL – Loess	19	59.8	40.4	9.6	35
ML – Loess	34	34	34	0	35
GC – Landslide Debris	20.9	60.4	47.9	6.3	40
GC-GM – Landslide Debris	26	59	44.3	9.4	40
SC – Landslide Debris	16	35	27.2	6.4	25

As summarized in the table above, the minimum and maximum calculated internal friction angles for a single soil layer sometimes varied by over 20-degrees. Therefore, internal friction angles were selected by reviewing all calculated values, as well as reviewing suggested values in Chapter 9 of the Pit Slope Manual (1982).

Soils that have undergone movement are assumed to be in a residual strength state; i.e., weaker than the strength of the soils prior to the movement. Though the published geologic maps and our observations in the field classified the origin of the soils as landslide debris, no direct shear zones were observed and no signs of previous shearing (i.e., slickensides) were observed. Additionally, loess, typically formed from windblown glacial silt, was observed overlying the landslide deposit, therefore it is assumed the landslide occurred prior to or during the Pinedale Glaciation approximately 10 to 30 thousand years ago. If the soils observed in the boreholes and test pits were once in a residual state following failure, it is assumed since their mobilization in the failure event, they have been naturally consolidating and therefore regaining strength. Therefore, residual shear strengths were not used for the slope stability model and peak shear strengths were used.

Cohesion

Cohesion was added to the material models in the slope stability model to avoid selecting slip surfaces representing the “infinite slope” solution. Cohesion values used in the slope stability models can be found in Appendix F.

Compression Index (C_c) Calculation Spreadsheet

Project	BH	Depth	LL	PL	PI	Consol Results	Compression Index (Cc)				Average	Median	Std Dev	Classification
Bear Development - Snow King Loop Lot 57	JG-05	8.5'-11'	39	14	25		0.26	0.24	0.34	0.34	0.30	0.30	0.05	CL
Bear Development - Snow King Loop Lot 57	JG-05	22'-25'	26	15	11		0.14	0.16	0.15	0.15	0.15	0.15	0.01	GC
Bear Development - Snow King Loop Lot 57	JG-05	35'-37'	NP	NP	NP		-	-	-	-	-	-	-	GM
Bear Development - Snow King Loop Lot 57	JG-06	3.5'-5'	38	19	19		0.25	0.24	0.26	0.26	0.25	0.25	0.01	CL
Bear Development - Snow King Loop Lot 57	JG-06	12.5'-14'	32	13	19		0.20	0.20	0.26	0.26	0.23	0.23	0.03	CL
Bear Development - Snow King Loop Lot 57	JG-06	20'-22'	18	14	4		0.07	0.11	0.05	0.05	0.07	0.06	0.03	GC
Bear Development - Snow King Loop Lot 57	JG-06	32.5'-35'	28	15	13		0.16	0.18	0.18	0.18	0.17	0.18	0.01	CL
Bear Development - Snow King Loop Lot 57	JG-07	5'-6'	31	20	11	0.17	0.19	0.19	0.15	0.15	0.17	0.17	0.03	CL
Bear Development - Snow King Loop Lot 57	JG-07	9'-10'	33	18	15	0.28	0.21	0.21	0.20	0.20	0.20	0.20	0.00	CL
Bear Development - Snow King Loop Lot 57	JG-07	17.5'-18'	29	15	14		0.17	0.18	0.19	0.19	0.18	0.19	0.01	CL
Bear Development - Snow King Loop Lot 57	JG-08	10'-12'	NP	NP	NP		-	-	-	-	-	-	-	GM
Bear Development - Snow King Loop Lot 57	JG-08	12.5'-14'	32	15	17		0.20	0.20	0.23	0.23	0.21	0.22	0.02	CL
Bear Development - Snow King Loop Lot 57	JG-09	7.5'-9'	17	16	1		0.06	0.11	0.01	0.01	0.05	0.04	0.04	GC
Bear Development - Snow King Loop Lot 57	JG-09	15'-17'	NP	NP	NP		-	-	-	-	-	-	-	GM
Bear Development - Snow King Loop Lot 57	TP-02	6'-7'	NP	NP	NP	0.17	-	-	-	-	-	-	-	ML
Bear Development - Snow King Loop Lots 53 and 58	JG-01	18-19	31	16	15		0.19	0.19	0.20	0.20	0.20	0.20	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	27-29	28	16	12		0.16	0.18	0.16	0.16	0.17	0.16	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	54.5-57	33	15	18		0.21	0.21	0.24	0.24	0.23	0.23	0.02	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	67-69	26	16	10		0.14	0.16	0.14	0.14	0.14	0.14	0.01	CL
Bear Development - Snow King Loop Lots 53 and 58	JG-01	72.5-75	38	17	21		0.25	0.24	0.28	0.28	0.26	0.27	0.02	CL
Nelson 53&58	BH5	23'-28'	29	4	25		0.17	0.18	0.34	0.34	0.26	0.26	0.09	SC
Nelson 53&58	BH5	37'-41'	28	12	16		0.16	0.18	0.22	0.22	0.19	0.20	0.03	SC
Nelson 53&58	BH6	22'-23'	33	15	18		0.21	0.21	0.24	0.24	0.23	0.23	0.02	CL
Nelson 53&58	BH6	52'-53'	25	11	14		0.14	0.16	0.19	0.19	0.17	0.17	0.03	CL
Womack Water Tank	TP-1	9	32	17	15		0.20	0.20	0.20	0.20	0.20	0.20	0.00	CL
Womack Water Tank	TP-1	10	41	15	26		0.28	0.26	0.35	0.35	0.31	0.32	0.05	CL
Womack Water Tank	TP-1	25	34	14	20		0.22	0.21	0.27	0.27	0.24	0.24	0.03	CL
Womack Water Tank	TP-1	27.5	25	14	11		0.14	0.16	0.15	0.15	0.15	0.15	0.01	CL

Phi Calculation Spreadsheet

Shear Strength Correlation Summary - Peak Friction Angle

					Hatanaka and Uchida (1996)	Schmertmann (1975)					Duncan, 1989			
Project	BH	Sample	Depth (ft)	(N1)60	Peak Phi (N160)	Peak Phi (N160)	Phi (Direct Shear)	LL	PI	Overburden	Peak Phi	lassificatio	Unit Weight (pcf)	Cohesion
Bear Dev - 57	JG-05	D4	8.5	22	41	47		39	25	2371	19	CL	120	0
Bear Dev - 57	JG-05	D12	22	-	-	-		26	11	-	26	GC-GM		0
Bear Dev - 57	JG-05	D14	28.5	76	59	58		-	-	4871		GC-GM	125	0
Bear Dev - 57	JG-05	D19	36.5	19	40	42		-	-	5871		GC-GM	125	0
Bear Dev - 57	JG-06	D2	3.5	-				38	19	-	22	CL		0
Bear Dev - 57	JG-06	D3	6.5	31	45	52		-	-	2421		CL	115	0
Bear Dev - 57	JG-06	D6	11.5	12	36	39		-	-	2996		CL	115	0
Bear Dev - 57	JG-06	D8	12.5	-				32	19	-	22	CL		0
Bear Dev - 57	JG-06	D9	16.5	26	43	48		-	-	3571		CL	115	0
Bear Dev - 57	JG-06	D12	20	-				18	4	-	31	GC		0
Bear Dev - 57	JG-06	D13	21.5	26	43	47		-	-	4171		GC	120	0
Bear Dev - 57	JG-06	D15	26.5	66	56	57		-	-	4796		GC	125	0
Bear Dev - 57	JG-06	D18	31.5	54	53	55		-	-	5421		GC	125	0
Bear Dev - 57	JG-06	D19	32.5	-				28	13	-	24			0
Bear Dev - 57	JG-06	D21	36.5	18	39	41		-	-	6021		CL	120	0
Bear Dev - 57	JG-07	D-1	2.5	2	26	21		-	-	2446		GC	110	0
Bear Dev - 57	JG-07	D-2	5	5	30	30		31	11	2721	26	CL	110	0
Bear Dev - 57	JG-07	D-3	7.5	3	28	25		-	-	2996		CL	110	0
Bear Dev - 57	JG-07	D-4	10	32	45	51	30	33	15	3296	23	CL	120	379
Bear Dev - 57	JG-07	D-5	12.5	36	47	52		-	-	3596		CL	120	0
Bear Dev - 57	JG-07	D-6	15	23	41	46		-	-	3896		CL	120	0
Bear Dev - 57	JG-07	D-7	17.5	82	60	59		29	14	4140	23	GC	125	0
Bear Dev - 57	JG-07	D-8	19.5	31	45	49		-	-	4459		GC	125	0
Bear Dev - 57	JG-08	D-1	2.5	15	37	42		-	-	2589		CL	110	0
Bear Dev - 57	JG-08	D-2	5	25	42	48		-	-	2876		GC-GM	115	0
Bear Dev - 57	JG-08	D-3	7.5	23	41	46		-	-	3164		GC-GM	115	0
Bear Dev - 57	JG-08	D-4	10	31	45	50		-	-	3451		GC-GM	115	0
Bear Dev - 57	JG-08	D-5	12.5	21	41	45		32	17	3739	22	CL	115	0
Bear Dev - 57	JG-08	D-6	15	23	42	46		-	-	4026		CL	115	0
Bear Dev - 57	JG-08	D-7	17.5	23	42	46		-	-	4314		CL	115	0
Bear Dev - 57	JG-08	D-8	19	79	60	59		-	-	4423		CL	125	0
Bear Dev - 57	JG-09	D-1	2.5	9	34	36		-	-	2677		GC	110	0
Bear Dev - 57	JG-09	D-2	5	21	41	46		-	-	2964		GC	115	0
Bear Dev - 57	JG-09	D-3	7.5	24	42	47		17	1	3252	35	GC	115	0
Bear Dev - 57	JG-09	D-4	10	28	44	49		-	-	3539		GC	115	0
Bear Dev - 57	JG-09	D-5	12.5	31	45	50		-	-	3827		GC	115	0
Bear Dev - 57	JG-09	D-6	15	34	46	51		-	-	4139		GC	125	0
Bear Dev - 57	JG-09	D-7	17.5	50	52	55		-	-	4443		GC	125	0
Bear Dev - 57	JG-09	D-8	19	78	60	59		-	-	4558		GC	125	0
Bear Dev - 57	TP-02			-	-	-	34	-	-	-		ML	115	144
Bear Dev - 538.58	JG-01	D-8	18	--	--	--		31	15		34	CL	115	0
Bear Dev - 538.58	JG-01	D-12	27	38	47	53		28	12		35	CL	115	0
Bear Dev - 538.58	JG-01	D-17	37	94	63	60				4300		GC	120	0
Bear Dev - 538.58	JG-01	D-26	47	84	61	59						GC	120	0
Bear Dev - 538.58	JG-01	D-27	54.5	--	-	-		33	18		32	CL	115	0
Bear Dev - 538.58	JG-01	D-31	67	56	53	54						CL	115	0
Bear Dev - 538.58	JG-01	D-32	67	--	-	-		26	10		36	CL	115	0
Bear Dev - 538.58	JG-01	D-36	72.5	--	-	-		38	21		31	CL	115	0
Bear Dev - 538.58	JG-01	D-39	80	35	47	48						GC	120	0
Nelson 538.58	BH5	-	23	-	-	-		29	25		35	SC	115	0
Nelson 538.58	BH5	-	37	-	-	-		28	16		30	SC	115	0
Nelson 538.58	BH6	4	22	15	32	-		33	18		32	CL	108.3	0
Nelson 538.58	BH6	11	52	-	-	-	37	25	14		30	CL	115	0
Nelson 538.58	BH4	1	9	79	60	-						GC	120	0
Nelson 538.58	BH4	2	14	50	52	-						GC	125	0
Nelson 538.58	BH4	3	38	92	62	-						ML	110	0
Womack Water Tank	TP-1	-	9		-	-		32	15		34	CL	110	0
Womack Water Tank	TP-1	-	10		-	-		41	26		30	CL	110	0
Womack Water Tank	TP-1	-	25		-	-		34	20		31	CL	110	0
Womack Water Tank	TP-1	-	27.5		-	-		25	11		36	CL	110	0

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX E

Calculations

Settlement Methodology

The settlement calculations assume the soil layer of concern comprises 100% compressible soil by volume. Though, some soils at the site only partially comprise the fine-grained soils by mass, as described in the borehole logs. Based on lab testing and visual classification, the clayey gravels and silty gravels contain a maximum of 40% fines by mass. To convert the assumed mass to volume, we have used a scaling factor of 1.25, resulting in an assumed percent fines by volume of 50%.

Because the settlement is anticipated to only occur in the potentially compressible, fine-grained soils, the total settlement calculation was reduced by 50%.

Lateral Pressures Methodology

Seismic coefficients were calculated based on recommendation from NCHRP Report 611 "Seismic Analysis and Desing of Retaining Walls, Buried Structures, Slopes and Embankments" and FHWA NHI Course No 130094 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, as described below and illustrated in the equations. For our calculation of the seismic coefficient (k_s), we used an average wall height of 15' to account for the estimated foundation wall height of the building, and since the foundation wall is considered a ductile system with negligible allowable displacement, we used a ductility factor (r) value of 0.5 (FHWA, 2011). In summary, the seismic coefficient (k_s) is determined by applying a scaling factor (α) to the modified peak ground acceleration (PGAm) and a selected ductility factor based on the project requirements.

As the design progresses, close coordination with the structural engineer is recommended to ensure the assumptions above correspond with the design of the structure. If assumption above do not match the design requirements, additional analyses will be required.

Project: Bear Development
Project Number: 23072
Engineer: HC
Soil Sample: Average Cc value CL
Scenario: Direclty on poor soil

Settlement analysis of in-situ soil (only analyzing a maximum of 2B worth of soil below footing)

Key:

Manual Input
Calculation

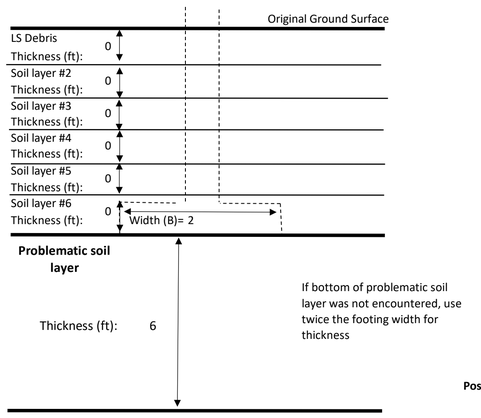
Step 1:

In-Situ Soil Properties of Problematic Soil			
	Soil Description: Lean Clay Loess		
	Source of Soil Properties: GCI Lab Data		
	Dry unit Weight:	79.4	pcf
	Moisture Content:	17.9%	
	Moist unit weight:	93.6	pcf
(Avergae 0.4 to 0.7)	Initial Void Ratio (e_0):	1.129	Vv/Vs
(Average 0.2 to 0.5)	Coefficient of Consol. (C_c):	0.17	

Step 2:

Original Overburden Pressure on Soil Element Identified in Step #1			
Soil Layer #1	Unit Weight		**PCF**
LS Debris	Thickness		**Ft.**
Soil Layer #2	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #3	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #4	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #5	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #6	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Problematic Soil Layer	Unit Weight	93.6	**PCF**
Below Footing	Thickess (H_0)	6	**Ft.**
Total Original Overburdern Pressure on Soil Element:		281	**PSF**

Pre-construction status. Footing is superimposed.



If bottom of problematic soil layer was not encountered, use twice the footing width for thickness

Step 3:

Foundation Characteristics		
Footing load:	3,000	psf
Estimated Footing Width (B):	2	ft
Footing Depth (D_f):	3	ft
Applied footing load applied to soil element (assuming 2V:1H)	1200	PSF

Step 4:

Backfill Soil Properties		
Dry Unit Weight:	120	pcf
Moisture Content:	12.0%	
Moist Unit Weight:	134.4	pcf
Backfill Depth:	3	ft

Step 5:

Settlement Calculation at Soil Element Identified in Step #2		
Thickness of Problematic Soil Layer (H_0):	6	ft
Depth to soil element below **OG**:	3	ft
Depth to soil element below footing:	3	ft
Original Overburden (σv_0):	280.8	psf
Applied foundation load at soil element :	1200.0	psf
Post Construction pressure at soil element (σv_f):	1884.0	
Change in presure at soils element:	1603	psf
$(\sigma v_f)/(\sigma v_0)$	6.709	
$Log[(\sigma v_f)/(\sigma v_0)]$	0.827	
$1+e_0$	2.129	
$H_0/(1+e_0)$	2.818	
Inches per foot:	12	
Settlement:	4.75	inches

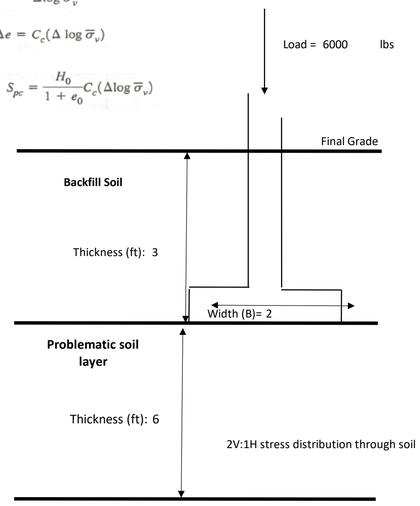
Settlement: $\text{Settlement} = S_{pc} = H_0\left(\frac{\Delta e}{1 + e_0}\right)$

Compression Index: $C_c = \frac{\Delta e}{\Delta \log \overline{\sigma}_v}$

Rearranging gives: $\Delta e = C_c(\Delta \log \overline{\sigma}_v)$

Subistituting in gives: $S_{pc} = \frac{H_0}{1 + e_0} C_c(\Delta \log \overline{\sigma}_v)$

Post-construction status



This formula is only valid for footings PLACED DIRECTLY ON PROBLEMATIC SOIL LAYER

$$S_{pc} = \frac{H_0}{1 + e_0} C_c(\log \overline{\sigma}_{v_f} - \log \overline{\sigma}_{v_e}) = \frac{H_0}{1 + e_0}(C_c)\log\left(\overline{\sigma}_{v_f}/\overline{\sigma}_{v_0}\right)$$

Project: Bear Development
Project Number: 23072
Engineer: HC
Soil Sample: Average Cc value for GC
Scenario: Directly on poor soil

Settlement analysis of in-situ soil (only analyzing a maximum of 2B worth of soil below footing)

Key:

Manual Input
Calculation

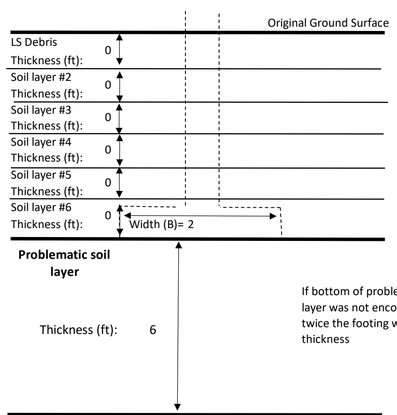
Step 1:

In-Situ Soil Properties of Problematic Soil			
	Soil Description: Clayey Silty Gravel		
	Source of Soil Properties: GCI Lab data		
	Dry unit Weight:	125	pcf
	Moisture Content:	7.0%	
	Moist unit weight:	133.8	pcf
(Avergae 0.4 to 0.7)	Initial Void Ratio (e_0):	0.427	Vv/Vs
(Average 0.2 to 0.5)	Coefficient of Consol. (C_c):	0.13	

Step 2:

Original Overburden Pressure on Soil Element Identified in Step #1			
Soil Layer #1	Unit Weight		**PCF**
LS Debris	Thickness		**Ft.**
Soil Layer #2	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #3	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #4	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #5	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Soil Layer #6	Unit Weight		**PCF**
(Descriptor)	Thickness		**Ft.**
Problematic Soil Layer	Unit Weight	125	**PCF**
Below Footing	Thickess (H_0)	6	**Ft.**
Total Original Overburdern Pressure on Soil Element:		375	**PSF**

Pre-construction status. Footing is superimposed.



If bottom of problematic soil layer was not encountered, use twice the footing width for thickness

Step 3:

Foundation Characteristics		
Footing load:	3,000	psf
Estimated Footing Width (B):	2	ft
Footing Depth (D_f):	3	ft
Applied footing load applied to soil element (assuming 2V:1H)	1200	PSF

Step 4:

Backfill Soil Properties		
Dry Unit Weight:	120	pcf
Moisture Content:	12.0%	
Moist Unit Weight:	134.4	pcf
Backfill Depth:	3	ft

Step 5:

Settlement Calculation at Soil Element Identified in Step #2		
Thickness of Problematic Soil Layer (H_0):	6	ft
Depth to soil element below **OG**:	3	ft
Depth to soil element below footing:	3	ft
Original Overburden (σv_0):	375.0	psf
Applied foundation load at soil element :	1200.0	psf
Post Construction pressure at soil element (σv_f):	1978.2	
Change in presure at soils element:	1603	psf
$(\sigma v_f)/(\sigma v_0)$	5.275	
$Log[(\sigma v_f)/(\sigma v_0)]$	0.722	
$1+e_0$	1.427	
$H_0/(1+e_0)$	4.205	
Inches per foot:	12	
Settlement:	4.74	inches

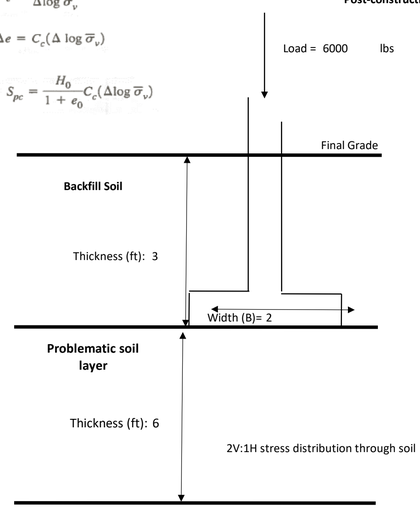
Settlement: $\text{Settlement} = S_{pc} = H_0\left(\frac{\Delta e}{1+e_0}\right)$

Compression Index: $C_c = \frac{\Delta e}{\Delta \log \overline{\sigma}_v}$

Rearranging gives: $\Delta e = C_c(\Delta \log \overline{\sigma}_v)$

Subistituting in gives: $S_{pc} = \frac{H_0}{1+e_0} C_c(\Delta \log \overline{\sigma}_v)$

Post-construction status



This formula is only valid for footings PLACED DIRECTLY ON PROBLEMATIC SOIL LAYER

$$S_{pc} = \frac{H_0}{1+e_0} C_c(\log \overline{\sigma}_{v_f} - \log \overline{\sigma}_{v_o}) = \frac{H_0}{1+e_0}(C_c)\log(\overline{\sigma}_{v_f}/\overline{\sigma}_{v_o})$$

Note: Maximum % fines by mass 40%. Scaling factor of 1.25 used to assume volume of fines, resulting in 50%.

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Project Bear Dev. Project No. 23072

Calculated By _____ Date _____

Sheet K_S Determination for Lateral Pressures

Known:

$F_v = 1.5$

$S_1 = 0.336$

$K_{max} = 0.545$

$H = 15'$ Basement Walls

$PGA = 0.454$

$F_a = 1.2$

- $\beta = F_v S_1 / K_{max}$

$\beta = 1.5(0.336) / 0.545$

$\boxed{\beta = 0.92}$

- $\alpha = 1 + 0.01(H)[(0.5\beta) - 1]$

$\alpha = 1 + 0.01(15)[(0.5)(0.92) - 1]$

$\boxed{\alpha = 0.919}$

- $K_{AV} = \alpha K_{max}$

$K_{AV} = 0.919(0.545)$

$\boxed{K_{AV} = 0.501}$

$K_S = r K_{AV}$

Assumed $r = 0.5$ for Ductile System with Negligible Allowable Displacements

$K_S = 0.5(0.501)$

$\boxed{K_S = 0.25}$

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

APPENDIX F

Slope-Stability Analysis

Slope-Stability Analysis

Methodology

1. **Analyses:** Slope stability analyses were performed using the SLOPE/W stability module of GeoStudio 2023.1.2 version 23.1.2.11, produced by Bentley Systems. The Morgenstern-Price limit equilibrium method, which takes into consideration moment and force equilibrium, was used to analyze slope stability.

   Based on the existing and proposed geometry of the project and the mapped geology, we determined the project area may be subject to potential failure. Therefore, we evaluated the cross-section for existing conditions, proposed conditions, and seismic proposed conditions scenarios.

2. **Geometry:** One cross section for the project was analyzed: Cross section C-C' (Figure 5). Cross section location is shown in Figure 2. Based on Cross section C-C', we included geometry for the existing conditions at the site, proposed conditions, and proposed conditions including seismic forces. The proposed conditions models also include estimated foundation loads for each housing unit based on preliminary plans provided to Jorgensen. We based the external existing geometry on topographic data collected by Jorgensen Associates, Inc. and supplemental topographic data provided by Teton County, 2015, proposed finished grade elevations were taken for the preliminary design documents provided by Hoyt Architects, and we based the internal geometry (material boundaries within the slope) on the results of the subsurface exploration (i.e., borehole and test pit logs), statistical correlations based on published literature, geologic conditions, and our experience with similar soils in the area.

   Subsurface conditions at the site were dominated by chaotically deposited landslide debris consisting of fine-grained Lean Clay (CL) and coarse-grained Clayey and Silty Gravels and (GC-GM) and Clayey Sands (SC). Often, soil layers identified in the SPT samples didn't correspond to similar soil layers at similar depths in the other boreholes indicating the soil layers were not continuous. To create a subsurface soil model with continuous soil layers, the discrete soil samples were interpolated and often combined between boreholes. Where discrete soil samples of different soil types were combined, an average phi value and unit weight of the combined samples was applied to the entire soil layer.

3. **Materials:** We estimated the shear strength parameters used in the analyses based on correlation to index tests and direct shear testing, as well as direct shear testing from the previous Geotechnical Investigation Report from July 2021, provided by Nelson Engineering. See the discussion in Appendix D regarding development of the soil-engineering parameters applied to the soil layers. Final parameters used in the stability analysis are summarized below in Table F-1.

   Where two separate soil classifications were combined to one layer (i.e., GC and CL), a unit weight and phi angle were selected using a "weighted average" approach; the boreholes shown on figure 5 were reviewed and depending on the soil shown in each borehole, a weighted average value was estimated.

   We used a Mohr-Coulomb strength model to define the soil parameters. Two parameters are used to describe this strength model: cohesion (c) and friction angle (φ). Cohesion is the soil's shear strength at zero overburden stress, and the friction angle expresses the relationship between overburden stress and shear stress. Mathematically, the shear strength is defined by the equation: $\tau = c + \sigma_n \tan(\varphi)$, where τ is the shear strength and σ_n represents the overburden stress. We used effective stress parameters as the overall soils are anticipated to drain well.

Table F-1: Soil Parameters Used for Slope Stability Analysis C-C'

Layer Name	Unit Weight (pcf)	Cohesion (c',psf)	Friction Angle (φ', degrees)
Construction Fill	125	50[1]	38
Landslide Debris GC/GM/SC	120	50	40
Loess – CL/ML	113	50[1]	36

1. Cohesion added where infinite slope stability failures occurred

4. **Phreatic Surface:** Groundwater was not encountered during the subsurface exploration for Lot 57. Groundwater conditions depicted in the models are based on groundwater observations at the nearby Lots 53 and 58 at an approximate depth of 30-feet below the ground surface. It is important to note, the subsurface exploration occurred during a time of year when peak groundwater conditions are assumed to have already occurred, implying potential peak groundwater conditions are *not* shown in the model and are unknown.

5. **Seismicity:** The post-construction scenario was evaluated in a seismic condition. Based on the ReMi and MASW results provided by Atlas Geophysics and direct shear testing data in the previous Nelson Engineering Site Investigation Report, the site is categorized as Site Class C – Very Dense Soil and Soft Rock. Seismicity was incorporated into the model using a pseudo-static limit equilibrium analysis approach where inertial forces from seismic accelerations were applied statically to the model. Seismic loads have been applied to the critical slip surface determined by static analysis for the post construction scenario, as it is assumed to be the most stressed region within the slope (Abramson et al., 2002). A seismic coefficient (k_s) of 0.25 was applied to Cross section C-C'.

Seismic coefficients were calculated based on recommendation from NCHRP Report 611 "Seismic Analysis and Desing of Retaining Walls, Buried Structures, Slopes and Embankments" and FHWA NHI Course No 130094 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, as described below and illustrated in the equations. In summary, the seismic coefficient (k_s) is determined by applying a scaling factor (α) to the modified peak ground acceleration (PGAm) and a selected ductility factor based on the project requirements. Additionally, a seismic FS of 1.1 was used because it is assumed the system's allowable total permanent seismic deformation is negligible.

$$\beta = F_v \cdot S_1 / PGA_m$$

$$\alpha = 1 + 0.01H[(0.5\beta) - 1]$$

$$k_s = r^* \, PGA_m * \alpha$$

Where:

- $\beta = 0.92$
- $F_v = 1.5$
- $S_1 = 0.336$
- PGA_m (k_{max}) = 0.545
- α is equal to 0.838 for the C-C' seismic model.
- *H* is equal to the height of the critical slip surface; we used a conservative value of 15' for the C-C' seismic model

- r = 0.5. A value of 0.5 is used in calculating k_s when dealing with ductile systems (i.e., soils with no rigid structures) with allowable permanent seismic deformation of up to 2-inches (i.e. negligible displacement).
- Corresponding minimum factor of safety is 1.1

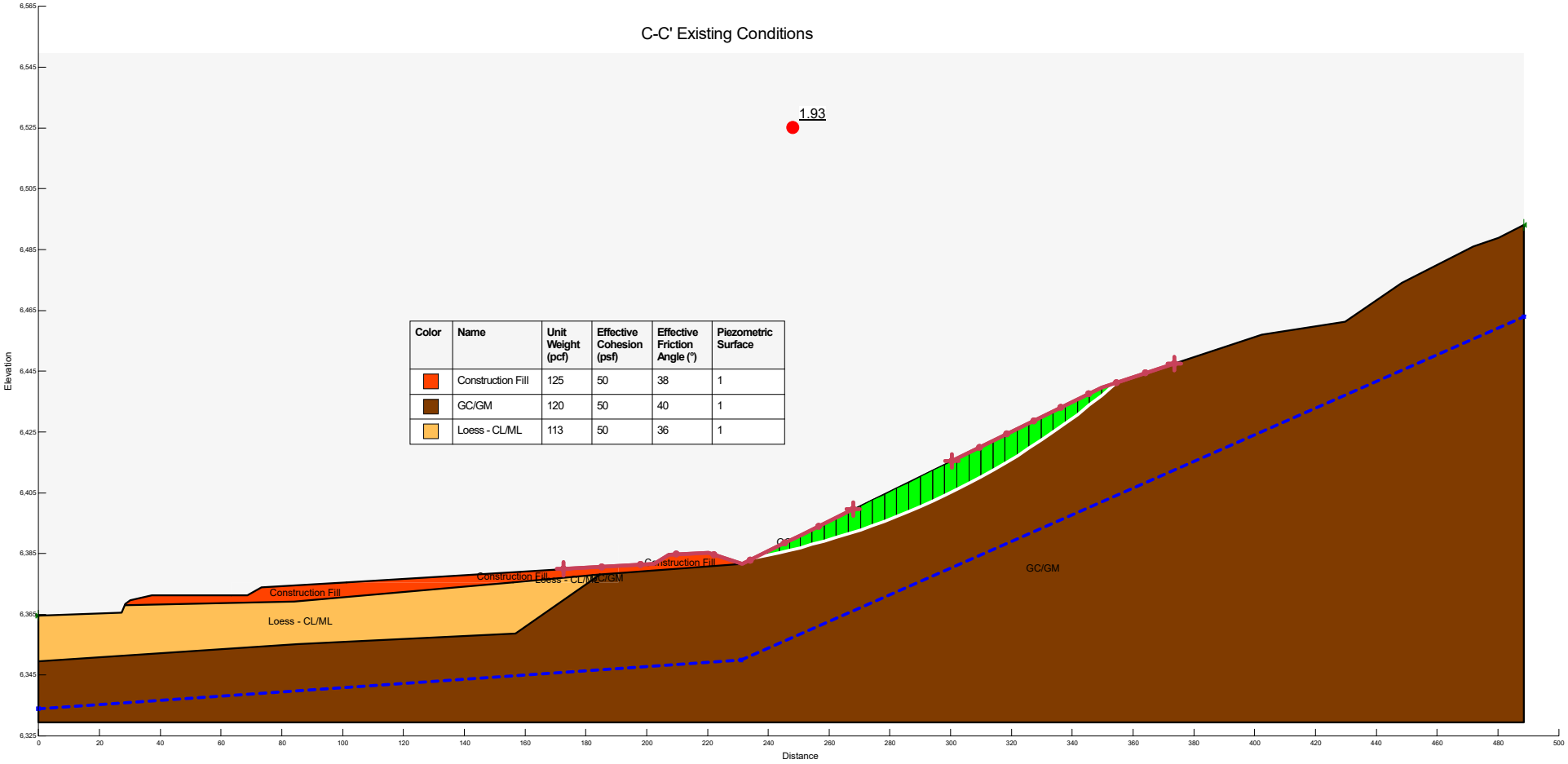
We calculated a ks value of 0.25, which we applied to our C-C' seismic model.

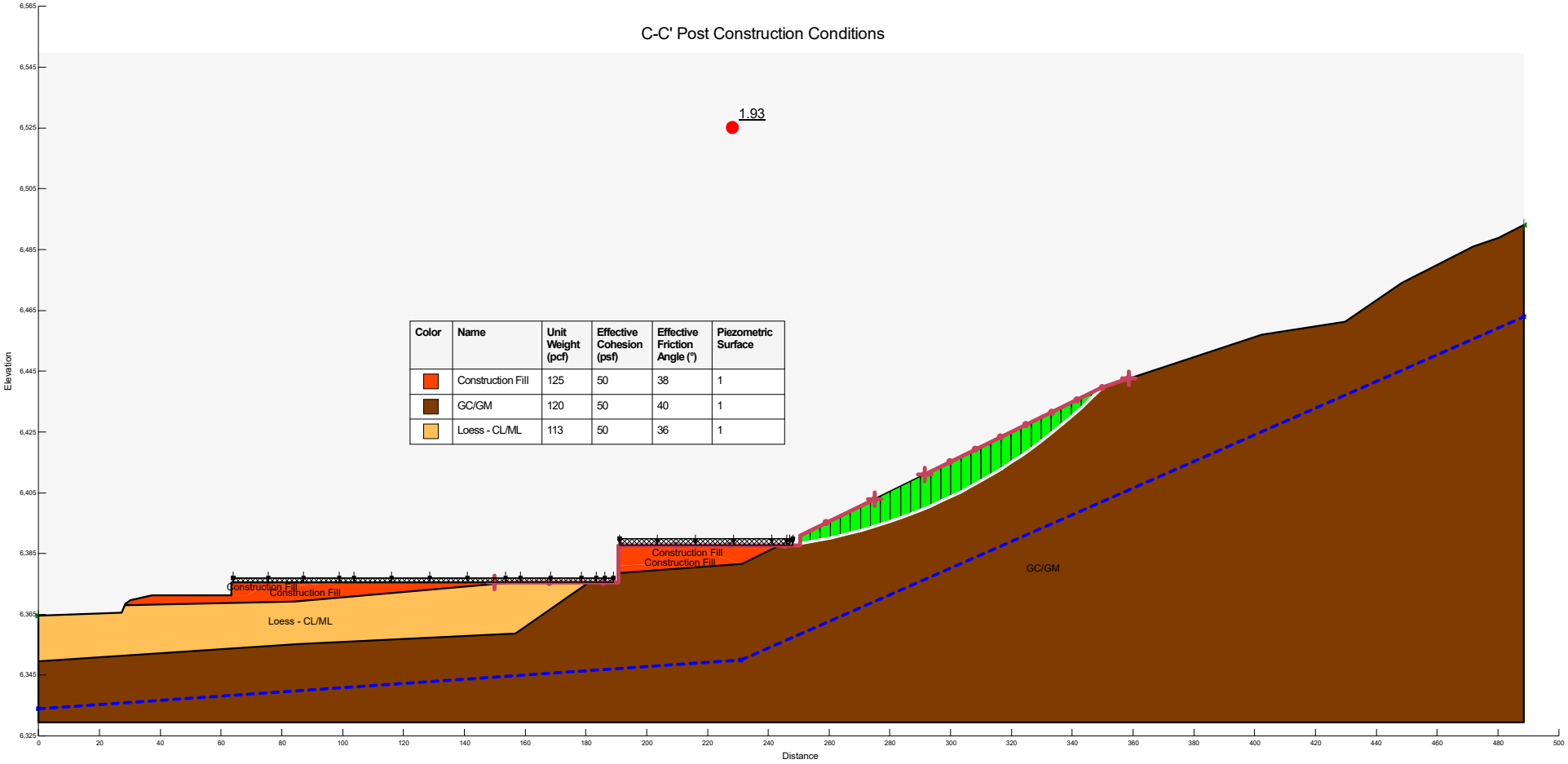
As the design progresses, close coordination with the structural engineer is recommended to ensure the assumptions above correspond with the design of the structure. If assumption above do not match the design requirements, additional analyses will be required.

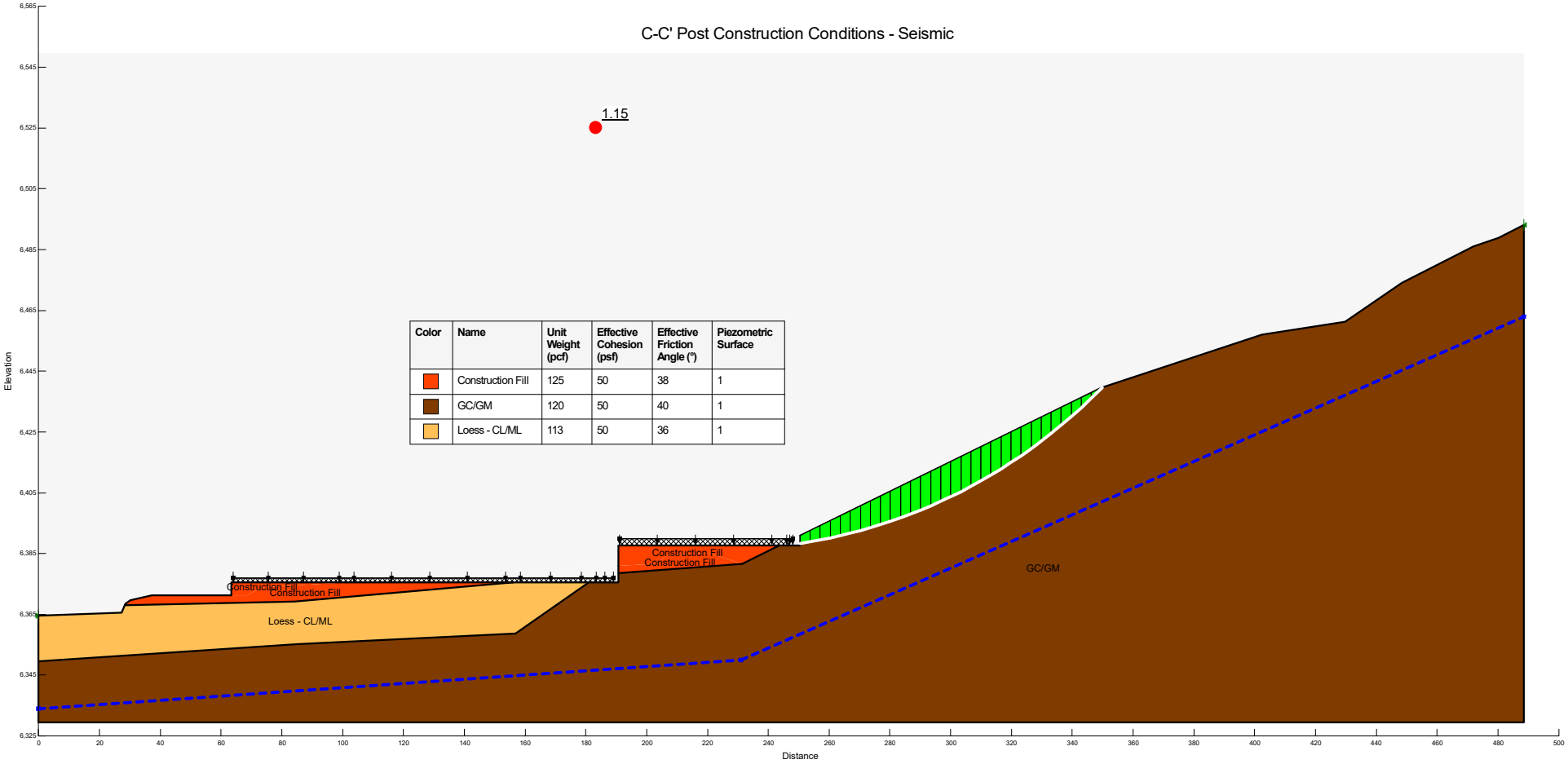
Surcharge Loads: Typical foundation loads were incorporated into the model, based on data in Section 1806 of the IBC, 2021. We use a distribution surcharge load of 2,000 psf to account for the weight of any structures within the model.

Results

We summarize factor of safety (FS) results for each cross section and analysis in Section 4.1 of the Report. The figures that follow are the output from each analysis. The critical slip surface and factor of safety are shown. Output files, reports, convergence data, or other data from Geostudio may be made available upon request.


C-C' Existing Conditions
1.93
Color
Name
Unit Weight (pcf)
Effective Cohesion (psf)
Effective Friction Angle (°)
Piezometric Surface
Construction Fill
125
50
38
1
GC/GM
120
50
40
1
Loess - CL/ML
113
50
36
1
Construction Fill
Loess - CL/ML
GC/GM
Elevation
Distance

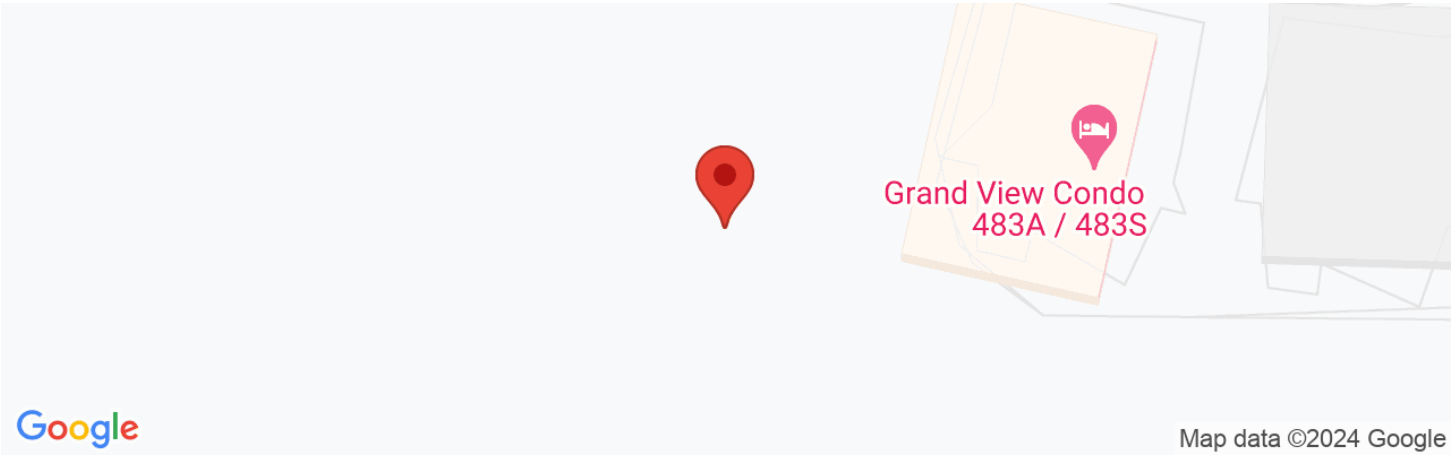

C-C' Post Construction Conditions
1.93
Color
Name
Unit Weight (pcf)
Effective Cohesion (psf)
Effective Friction Angle (°)
Piezometric Surface
Construction Fill
125
50
38
1
GC/GM
120
50
40
1
Loess - CL/ML
113
50
36
1
Construction Fill
Construction Fill
Construction Fill
Construction Fill
Loess - CL/ML
GC/GM
Elevation
Distance
6,565
6,545
6,525
6,505
6,485
6,465
6,445
6,425
6,405
6,385
6,365
6,345
6,325
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500


C-C' Post Construction Conditions - Seismic
1.15
Color
Name
Unit Weight (pcf)
Effective Cohesion (psf)
Effective Friction Angle (°)
Piezometric Surface
Construction Fill
125
50
38
1
GC/GM
120
50
40
1
Loess - CL/ML
113
50
36
1
Construction Fill
Construction Fill
Construction Fill
Construction Fill
Loess - CL/ML
GC/GM
Elevation
Distance
6,565
6,545
6,525
6,505
6,485
6,465
6,445
6,425
6,405
6,385
6,365
6,345
6,325
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

Latitude, Longitude: 43.47198215, -110.75457259



Date	05/01/2024, 14:07:21
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.025	MCE_R ground motion. (for 0.2 second period)
S_1	0.337	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.23	Site-modified spectral acceleration value
S_{M1}	0.506	Site-modified spectral acceleration value
S_{DS}	0.82	Numeric seismic design value at 0.2 second SA
S_{D1}	0.337	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.5	Site amplification factor at 1.0 second
PGA	0.454	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.545	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.025	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.146	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.901	Factored deterministic acceleration value. (0.2 second)
S1RT	0.337	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.375	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.725	Factored deterministic acceleration value. (1.0 second)
PGAd	0.662	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.454	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.895	Mapped value of the risk coefficient at short periods

Type	Value	Description
C_{R1}	0.9	Mapped value of the risk coefficient at a period of 1 s
C_V	1.105	Vertical coefficient

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Project Bear Dev. - Lot 57 Project No. 23072
Calculated By JBJ Date 1/23/2024
Sheet 1/2

k_s Determination

U.S. Seismic Design maps - Structural Engineers Association of California Design Code Reference Document - ASCE 7-16

Risk Category II
Site class C - Very Dense Soil + Soft Rock

FHWA (2011)

$$k_{max} = f_{pga} \cdot PGA \quad (6\text{-}1)$$

$PGA = 0.454$
$F_{PGA} = 1.2$

$$k_{max} \text{ or } PGA_m = 1.2(0.454) = \underline{0.545}$$

$$k_{av} \text{ or MHA (maximum Average Horizontal Acceleration)} = \alpha \cdot k_{max} \quad (6\text{-}2)$$

where: $\alpha = 1 + 0.01(H)[(0.5\beta)-1]$ (6-3)

where: $\beta = f_v \cdot S_1 / k_{max}$ (6-4)

where: $f_v = 1.5$
$S_1 = 0.336$
$k_{max} = 0.545$

$\beta = (1.5)(0.336) / 0.545$

$\boxed{\beta = 0.92}$

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Project Bear Dev. Lot 57 Project No. 23072
Calculated By JBJ Date 1/23/2024
Sheet 2/2

α Determination:

$\beta = 0.92$
$H = 15'$

$\alpha = 1 + 0.01(15)[0.5(0.92) - 1]$ (6-3)

$\boxed{\alpha = 0.919}$

k_{av} Determination:

$\alpha = 0.919$
$k_{max} = 0.545$

$k_{av} = 0.919(0.545)$

$\boxed{k_{av} = 0.501}$

k_s Determination:

$k_{av} = 0.501$ (6-5)

$r = 0.5$ (assuming allowable permanent Seismic Deformation is negligible).

$k_s = 0.5(0.501)$

$\boxed{k_s = 0.25}$

Minimum factor of Safety of 1.1 using r of 0.5 assuming negligible allowable permanent Seismic Deformation

JORGENSEN
GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

July 24, 2024

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosha, WI 53142

RE: GEOTECHNICAL-ENGINEERING REPORT: ADDENDUM No. 1 ADDITIONAL SLOPE STABILITY ANALYSIS, SNOW KING LOOP LOT 57, TETON COUNTY, WYOMING
PROJECT NUMBER: 23072

Dear Mr. Orthmann

We are pleased to present this addendum to the Geotechnical-Engineering Report (Report) for the proposed development at Lot 57 on Snow King Loop in Teton County, Wyoming. The original Report for Lot 57 was prepared and issued by this office on January 25, 2024. Per Section 2.0 of the Report, the project was in the early stages of design with our understanding that architectural plans could be subject to change, and additional slope stability analysis would be performed as the design progressed.

The purpose of this addendum is to provide additional slope stability analyses based on updated finished floor elevations for the proposed structures based on plan provided by Northworks dated May 23, 2024. The original Geotechnical-Engineering Report and this addendum should not be treated as stand-alone documents but rather be saved and transmitted to all members of the project team together. The additional slope stability analysis presented in this Addendum supersedes the original slope stability analyses presented in the original Report.

Project Background
At your request, Jorgensen Geotechnical (JG) drilled five (5) boreholes and excavated three (3) exploratory test pits for Lot 57 as part of the original geotechnical subsurface exploration. The purpose of the exploration was to bracket the proposed building locations. We identified two primary soil types at the proposed building locations: landslide debris and loess. The landslide deposits we encountered consist clayey gravels, lean clays, sandy gravels and exhibited chaotic deposition. Borehole data from Nelson engineering and MASW plots from Atlas Geophysics were incorporated into our subsurface characterization.

The original Report for Lot 57 recommended engineered aggregate piers (EAPs) or reinforced fills as soil improvement methods to reduce the risk of future potential settlement. It is our understanding that the design team elected to use EAPs for the proposed structures.

Slope Stability Analysis
The slope stability analyses were performed using SLOPE/W module of Geostudio. We analyzed one set of geometry for global slope stability taken from cross sections C-C'. All soil parameters used in this updated slope stability analyses remained consistent with the original Report; the only alteration to this updated slope stability model is the new finished floor elevations (i.e., external geometry). Refer to Appendix F of the original Geotechnical Engineering Report for general methodology of the slope

stability analyses including internal and external geometry, materials, phreatic surfaces, seismicity, and surcharges of each model. Table 1 presents the updated finish floor elevation for each structure based on the Northworks plans.

Table 1: Adjusted Finish Floor Elevations

Location	Finish Floor Elevation, ft
Lot 57 (South)	6402
Lot 57 (North)	6371

Results of the updated stability analyses are summarized in Table 2. The attached models show the output of the stability model for Cross-Section C-C'. Preconstruction slope stability results are not presented, as those are unchanged from the original Geotechnical Engineering Report.

Table 2: Lot 57 Slope Stability Analysis Results

Cross section	Analysis	FS
C-C'	Post-construction	1.96
	Post-Construction Seismic	1.16

Results

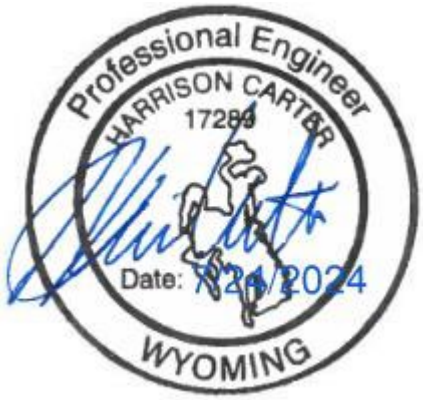
Factors of Safety (FS) with the updated finish floor elevations were 1.96 in static conditions, above the 1.5 threshold for residential construction. Post-construction seismic conditions indicate factors of safety of 1.16, above the 1.1 FS threshold for maximum allowable permanent seismic deformations of 2 inches (FHWA 2011).

Limitations
This report has been prepared based on a limited amount of data. Actual site conditions may vary. These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar conditions. No other warranty is made or implied.

If you have any questions about this letter, or if we may provide other services to you, please contact us.

Respectfully submitted,

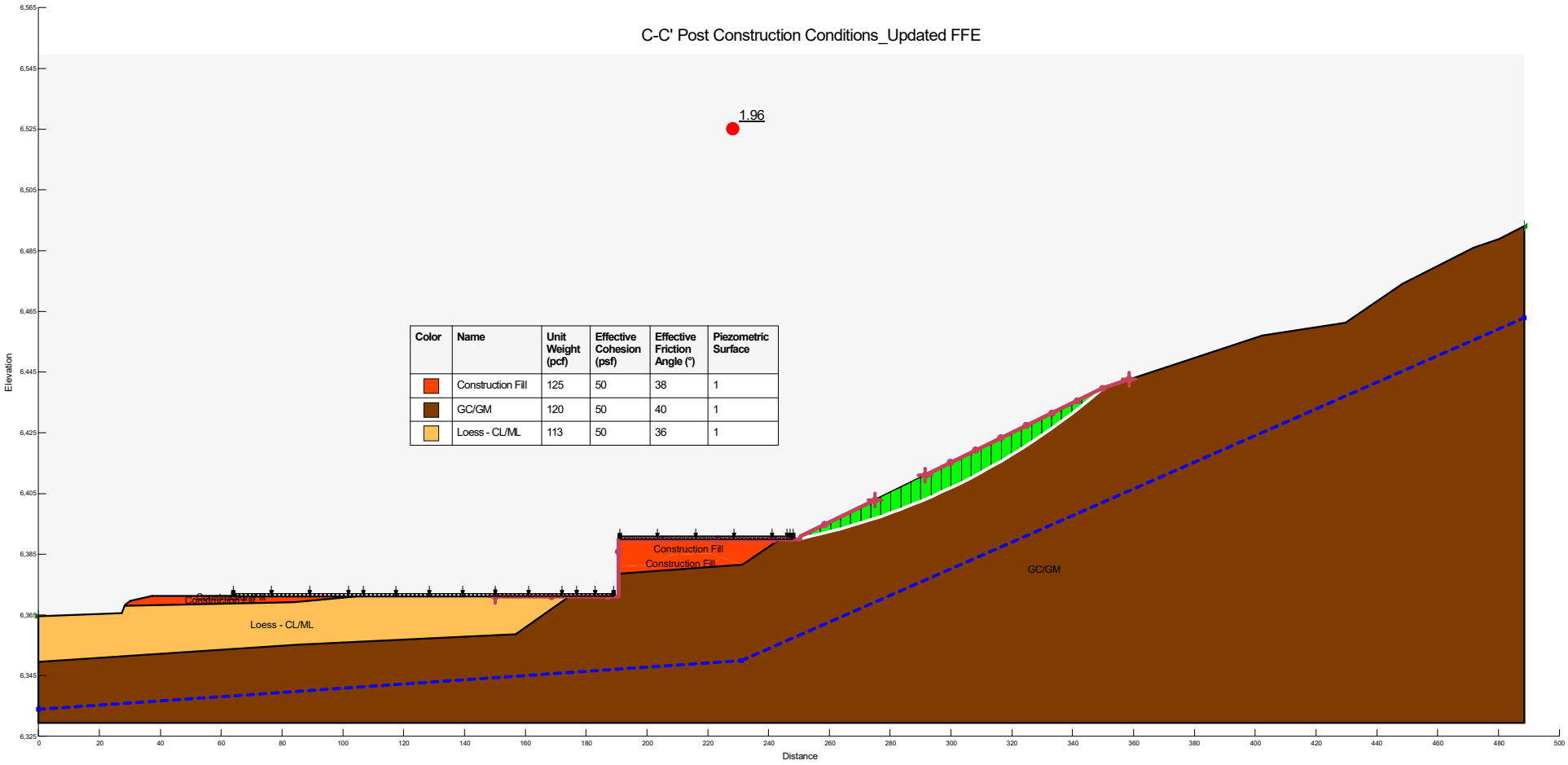
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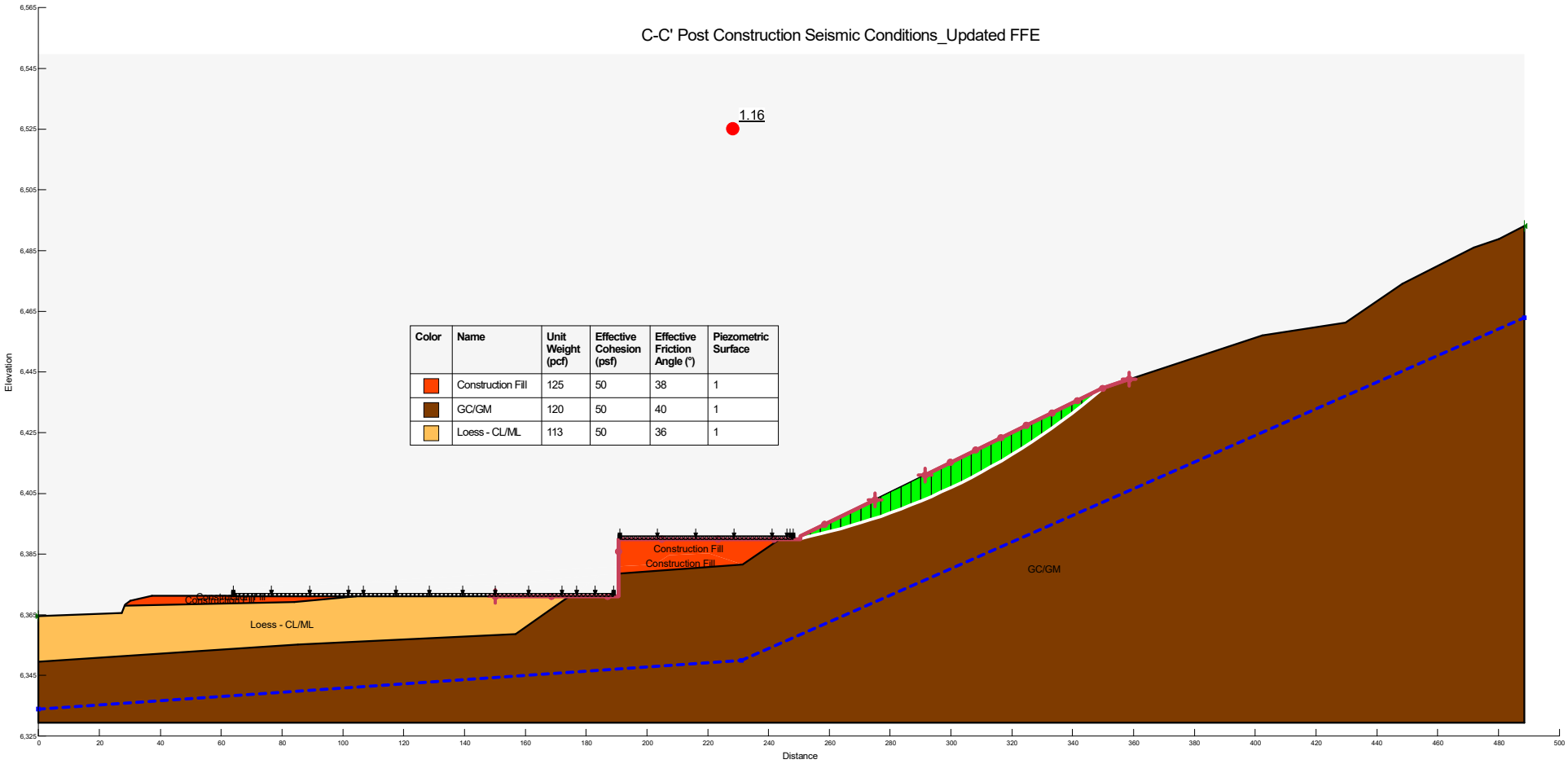


Nick Annala, E.I.
Geotechnical Design Engineer Technician

Harrison Carter, P.E.
Geotechnical Engineering Manager

Attached:
Slope Stability Models


C-C' Post Construction Conditions_Updated FFE
1.96
Color
Name
Unit Weight (pcf)
Effective Cohesion (psf)
Effective Friction Angle (°)
Piezometric Surface
Construction Fill
125
50
38
1
GC/GM
120
50
40
1
Loess - CL/ML
113
50
36
1
Construction Fill
Construction Fill
GC/GM
Loess - CL/ML
Elevation
Distance
6,565
6,545
6,525
6,505
6,485
6,465
6,445
6,425
6,405
6,385
6,365
6,345
6,325
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500


C-C' Post Construction Seismic Conditions_Updated FFE
1.16
Color
Name
Unit Weight (pcf)
Effective Cohesion (psf)
Effective Friction Angle (°)
Piezometric Surface
Construction Fill
125
50
38
1
GC/GM
120
50
40
1
Loess - CL/ML
113
50
36
1
Construction Fill
Construction Fill
Loess - CL/ML
GC/GM
Elevation
Distance
6,565
6,545
6,525
6,505
6,485
6,465
6,445
6,425
6,405
6,385
6,365
6,345
6,325
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500

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GEOTECHNICAL, LLC

PO Box 9550 | 1315 HWY 89 S., Ste. 201
Jackson, WY 83002
PH: 307.733.5150
www.jorgeng.com

July 24, 2024

Nick Orthmann
Bear Development, LLC
4011 80th Street
Kenosha, WI 53142

RE: GEOTECHNICAL-ENGINEERING REPORT: ADDENDUM No. 1 ADDITIONAL SLOPE STABILITY ANALYSIS, SNOW KING LOOP LOTS 53, AND 58, TETON COUNTY, WYOMING
PROJECT NUMBER: 23072

Dear Mr. Orthmann

We are pleased to present this addendum to the Geotechnical-Engineering Report (Report) for the proposed development at Lots 53 and 58 on Snow King Loop in Teton County, Wyoming. The original Report for Lots 53 and 58 was prepared and issued by this office on December 28, 2023. Per Section 2.0 of the Report, the project was in the early stages of design with our understanding that architectural plans could be subject to change, and additional slope stability analysis would be performed as the design progressed.

The purpose of this addendum is to provide additional slope stability analyses based on updated finished floor elevations for the proposed structures based on plans provided by Northworks with the issue date of May 23, 2024. The original Geotechnical-Engineering Report and this addendum should not be treated as stand-alone documents but rather be saved and transmitted to all members of the project team together. The additional slope stability analysis presented in this Addendum supersedes the original slope stability analyses presented in the original Report.

Project Background
At your request, Jorgensen Geotechnical (JG) drilled seven (7) boreholes and excavated four (4) exploratory test pits for Lots 53 and 58 as part of the original geotechnical subsurface exploration. The purpose of the exploration was to bracket the proposed building locations. We identified three primary soil types at the proposed building locations: landslide debris, loess, and weathered bedrock. The landslide deposits we encountered consist of clayey gravels, lean clays, sandy gravels and exhibited chaotic deposition. Borehole data from Nelson engineering and MASW plots from Atlas Geophysics were incorporated into our subsurface characterization.

The original Report for Lots 53 and 58 recommended engineered aggregate piers (EAPs) or reinforced fills as soil improvement methods to reduce the risk of future potential settlement. It is our understanding that the design team elected to use EAPs for the proposed structures.

Slope Stability Analysis
The slope stability analyses were performed using SLOPE/W module of Geostudio. We analyzed two sets of geometry for global slope stability taken from cross sections B-B' and C-C'. All soil parameters used in this update slope stability analyses remained consistent with the original report; the only alteration to this updated slope stability model is the new finished floor elevations (i.e., external geometry). Refer to

Appendix F of the original Geotechnical Engineering Report for general methodology of the slope stability analyses including internal and external geometry, materials, phreatic surfaces, seismicity, and surcharges of each model. Table 1 presents the updated finish floor elevation for each structure based on the Northworks plans.

Table 1: Adjusted Finish Floor Elevations

Location	Finish Floor Elevation, ft
Lot 58	6419
Lot 53	6402

Results of the stability analyses are summarized in Table 2. The attached models show the output of the stability model for Cross-Section B-B' and C-C'. Preconstruction slope stability results are not presented, as those are unchanged from the original Geotechnical Engineering Report.

Table 2: Lot 53 and 58 Slope Stability Analysis Results

Cross section	Analysis	FS
B-B'	Post-construction	1.55
	Post-Construction Seismic	1.12
C-C'	Post-construction	2.66
	Post-Construction Seismic	1.80

Results

Factors of Safety (FS) with the updated finish floor elevations range from 1.55 to 2.66 in static conditions indicating FS's above the 1.5 threshold for residential construction. Post-construction seismic conditions indicate factors of safety from 1.12 to 1.80, all of which are above the 1.1 FS threshold for maximum allowable permanent seismic deformations of 2 inches (FHWA 2011).

Limitations

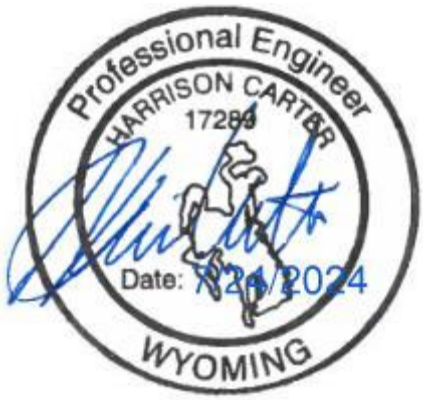
This report has been prepared based on a limited amount of data. Actual site conditions may vary. These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar conditions. No other warranty is made or implied.

If you have any questions about this letter, or if we may provide other services to you, please contact us.

Respectfully submitted,

JORGENSEN GEOTECHNICAL



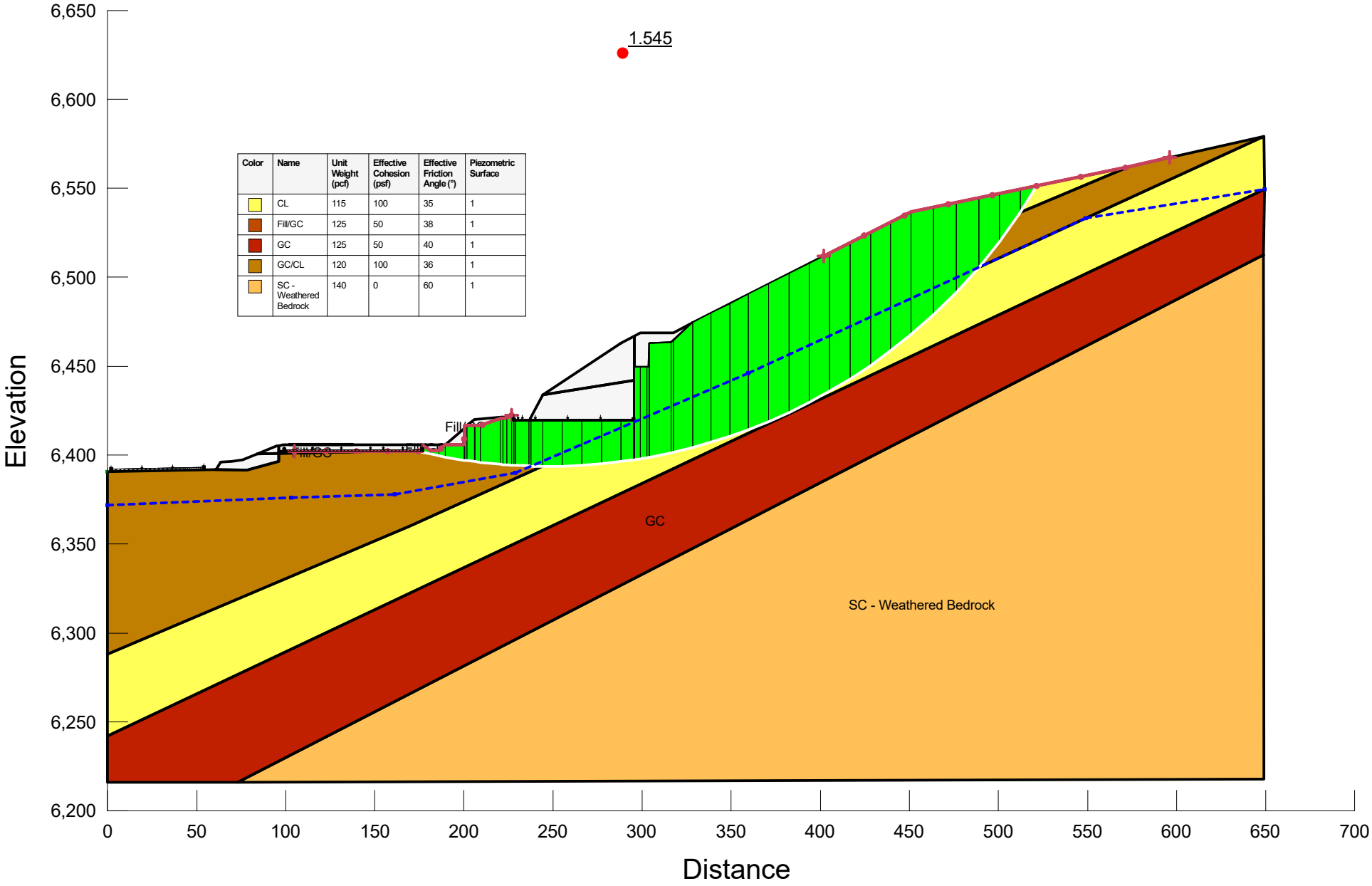


Nick Annala, E.I.
Geotechnical Design Engineer Technician

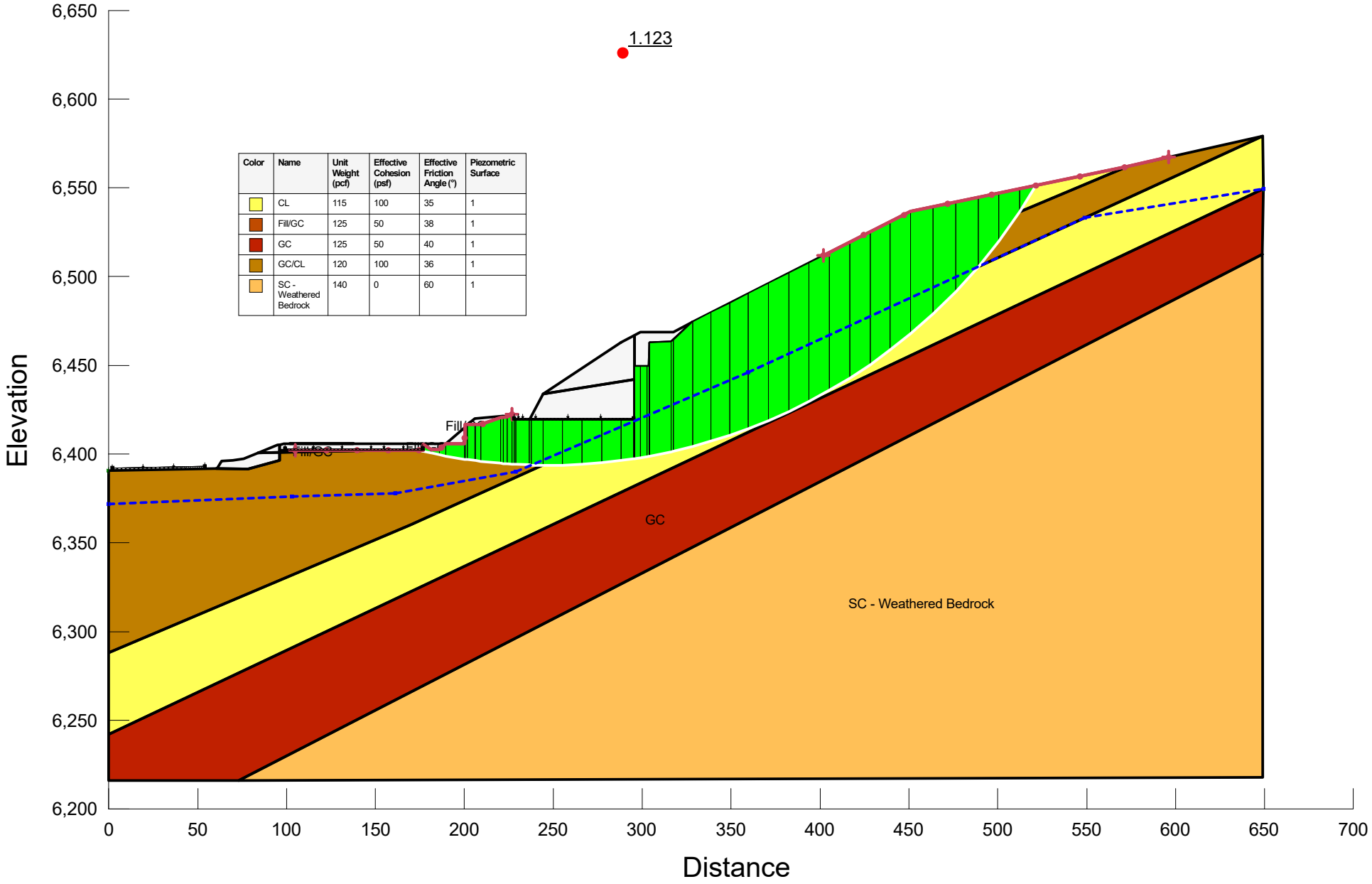
Harrison Carter, P.E.
Geotechnical Engineering Manager

Attached:
Updated Slope Stability Models

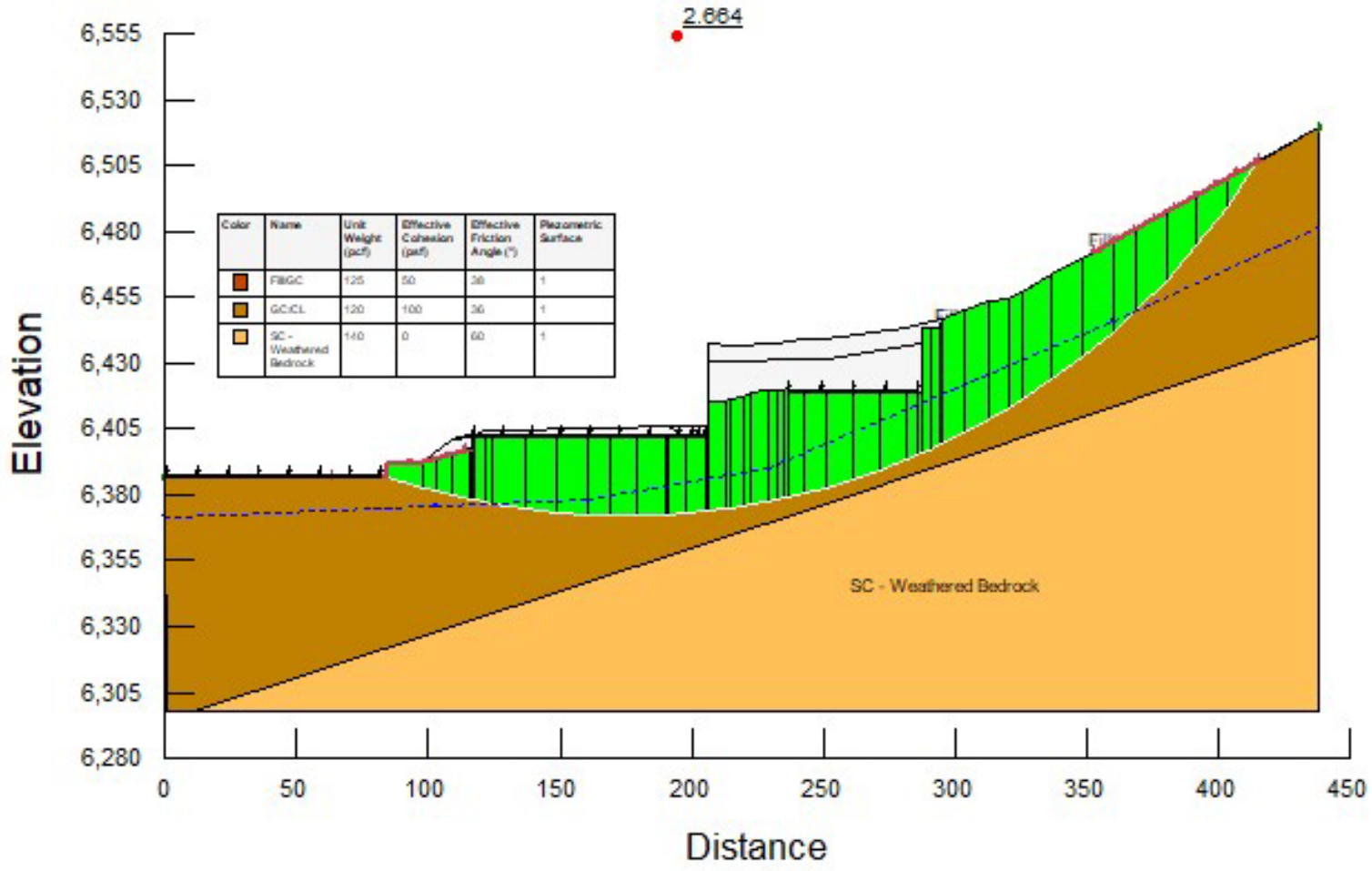
Lot 53 and 58 B-B' Proposed Conditions_Updated FFE



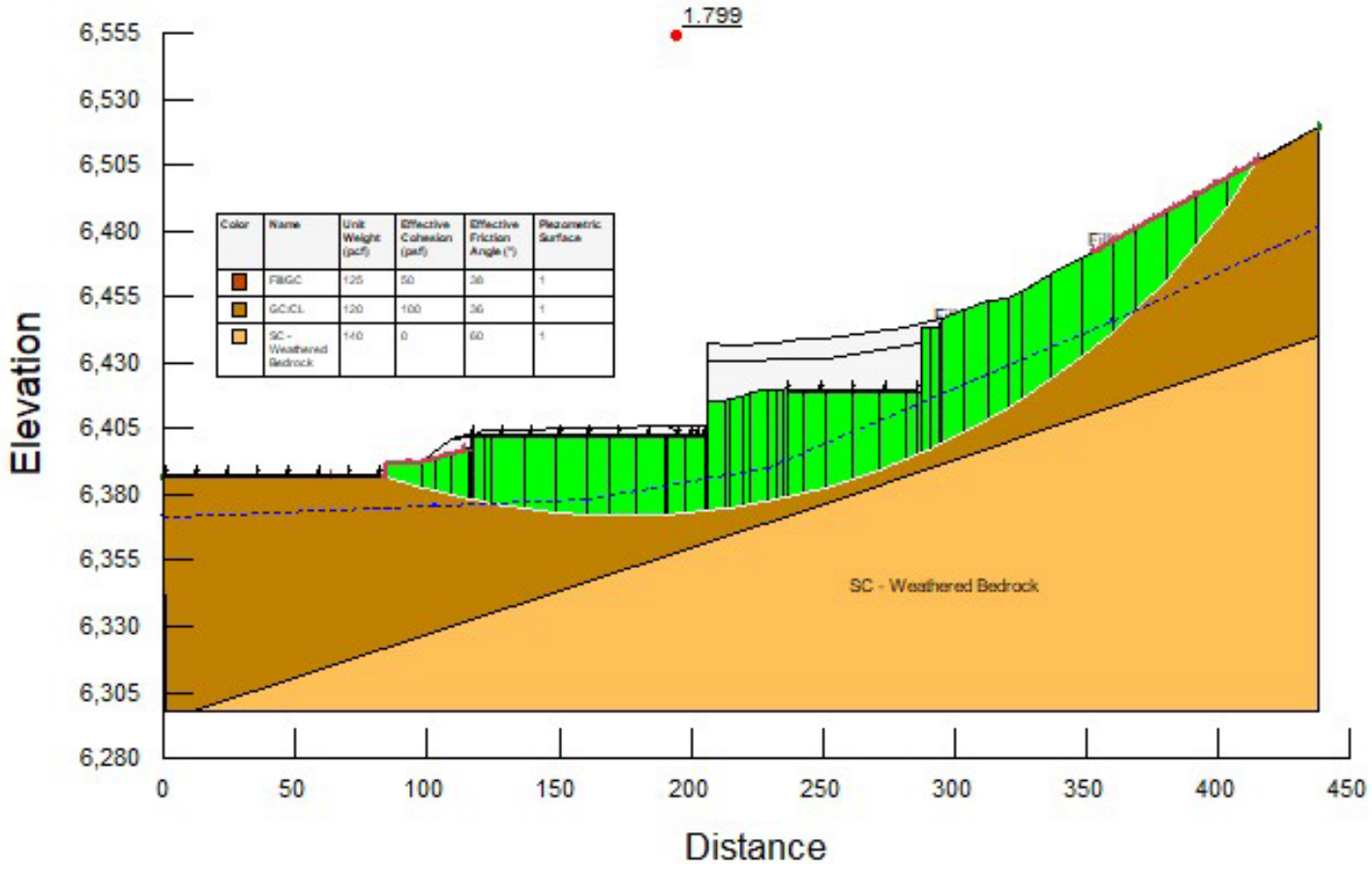
Lot 53 and 58 B-B' Proposed Seismic Conditions_Updated FFE



Lot 53 and 58 C-C' Proposed Conditions_Updated FFE



Lot 53 and 58 C-C' Proposed Seismic Conditions_Updated FFE



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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 2 YEAR

Design Storm Frequency = 2 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	18,937	0.43	0.2	1	0.2	0.2	0.09
Gravel Road	633	0.01	0.85	1	0.85	0.85	0.01
Asphalt and Concrete	495	0.01	0.95	1	0.95	0.95	0.01
Lawn, Heavy, Steep, 7%+	14,347	0.33	0.3	1	0.3	0.3	0.10
		0.00	0	1	0	0	0.00
Totals	**34412.4**	**0.79**					**0.21**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.26$

$C_{wd} \times C_f = 0.26$

$C_{wd} \times C_f \times \Sigma A_j = 0.21$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	1.07	67.62	0.22
10	0.89	112.49	0.19
15	0.73	138.39	0.15
20	0.64	161.78	0.13
30	0.5	189.58	0.10
40	0.4	202.22	0.08
50	0.34	214.86	0.07
60	0.3	227.50	0.06
70	0.29	256.57	0.06
80	0.26	262.89	0.05
90	0.24	273.00	0.05
100	0.23	290.69	0.05

Peak Flow Rate = 0.22 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 2 YEAR

Design Storm Frequency = 2 years

Discharge Rate, d = 0.22 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	0	0.00	0.08	1	0.08	0.08	0.00
Roofs	28,452	0.65	0.95	1	0.95	0.95	0.62
Asphalt and Concrete	4,308	0.10	0.95	1	0.95	0.95	0.09
Lawn, Heavy, Steep, 7%+	1,652	0.04	0.3	1	0.3	0.3	0.01
		0.00	0	1	0	0	0.00
Totals	**34412**	**0.79**					**0.73**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.92$

$C_{wd} \times C_f = 0.92$

$C_{wd} \times C_f \times \Sigma A_j = 0.73$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	1.07	234.94	67.06	167.88	0.78
10	0.89	390.83	134.12	256.71	0.65
15	0.73	480.85	201.18	279.68	0.53
20	0.64	562.09	268.23	293.86	0.46
30	0.5	658.70	402.35	256.35	0.36
40	0.4	702.62	536.47	166.15	0.29
50	0.34	746.53	670.59	75.94	0.25
60	0.3	790.44	804.70	-14.26	0.22
70	0.29	891.44	938.82	-47.38	0.21
80	0.26	913.40	1,072.94	-159.54	0.19
90	0.24	948.53	1,207.06	-258.52	0.17
100	0.23	1,010.01	1,341.17	-331.16	0.17

Water Quantity Storage Required = 294 ft^3

= 2,198 gallons

Peak Flow Rate = 0.78 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 10 YEAR

Design Storm Frequency = 10 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	18,937	0.43	0.2	1	0.2	0.2	0.09
Gravel Road	633	0.01	0.85	1	0.85	0.85	0.01
Asphalt and Concrete	495	0.01	0.95	1	0.95	0.95	0.01
Lawn, Heavy, Steep, 7%+	14,347	0.33	0.3	1	0.3	0.3	0.10
		0.00	0	1	0	0	0.00
Totals	**34412.4**	**0.79**					**0.21**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.26$

$C_{wd} \times C_f = 0.26$

$C_{wd} \times C_f \times \Sigma A_j = 0.21$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	1.8	113.75	0.38
10	1.42	179.47	0.30
15	1.19	225.60	0.25
20	1.05	265.41	0.22
30	0.83	314.71	0.17
40	0.68	343.77	0.14
50	0.57	360.21	0.12
60	0.51	386.75	0.11
70	0.47	415.82	0.10
80	0.44	444.88	0.09
90	0.4	455.00	0.08
100	0.37	467.63	0.08

Peak Flow Rate = 0.38 cfs

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PH: 307.733.5150
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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 10 YEAR

Design Storm Frequency = 10 years

Discharge Rate, d = 0.38 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	0	0.00	0.08	1	0.08	0.08	0.00
Roofs	28,452	0.65	0.95	1	0.95	0.95	0.62
Gravel Road	4,308	0.10	0.85	1	0.85	0.85	0.08
Lawn, Heavy, Steep, 7%+	1,652	0.04	0.3	1	0.3	0.3	0.01
		0.00	0	1	0	0	0.00
Totals	**34412.4**	**0.79**					**0.72**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.91$

$C_{wd} \times C_f = 0.91$

$C_{wd} \times C_f \times \Sigma A_j = 0.72$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	1.8	389.84	112.81	277.03	1.29
10	1.42	615.08	225.62	389.46	1.02
15	1.19	773.18	338.43	434.75	0.85
20	1.05	909.62	451.24	458.38	0.75
30	0.83	1,078.55	676.85	401.69	0.59
40	0.68	1,178.17	902.47	275.70	0.49
50	0.57	1,234.48	1,128.09	106.39	0.41
60	0.51	1,325.44	1,353.71	-28.26	0.37
70	0.47	1,425.07	1,579.32	-154.26	0.34
80	0.44	1,524.69	1,804.94	-280.25	0.32
90	0.4	1,559.35	2,030.56	-471.21	0.29
100	0.37	1,602.66	2,256.18	-653.52	0.26

Water Quantity Storage Required = 458 ft^3

= 3,429 gallons

Peak Flow Rate = 1.29 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 100 YEAR

Design Storm Frequency = 100 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	18,937	0.43	0.2	1.25	0.25	0.25	0.11
Gravel Road	633	0.01	0.85	1.25	1.0625	1	0.01
Asphalt and Concrete	495	0.01	0.95	1.25	1.1875	1	0.01
Lawn, Heavy, Steep, 7%+	14,347	0.33	0.3	1.25	0.375	0.375	0.12
		0.00	0	1.25	0	0	0.00
Totals	**34412.4**	**0.79**					**0.26**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.26$

$C_{wd} \times C_f = 0.33$

$C_{wd} \times C_f \times \Sigma A_j = 0.26$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	3	236.98	0.78
10	2.33	368.10	0.61
15	1.9	450.26	0.50
20	1.65	521.35	0.43
30	1.3	616.14	0.34
40	1.08	682.49	0.28
50	0.95	750.43	0.25
60	0.82	777.28	0.21
70	0.74	818.36	0.19
80	0.65	821.52	0.17
90	0.61	867.34	0.16
100	0.56	884.71	0.15

Peak Flow Rate = 0.78 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 100 YEAR

Design Storm Frequency = 100 years

Discharge Rate, d = 0.78 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	0	0.00	0.08	1.25	0.1	0.1	0.00
Roofs	28,452	0.65	0.95	1.25	1.1875	1	0.65
Asphalt and Concrete	4,308	0.10	0.95	1.25	1.1875	1	0.10
Lawn, Heavy, Steep, 7%+	1,652	0.04	0.3	1.25	0.375	0.375	0.01
		0.00	0	1.25	0	0	0.00
Totals	**34412.4**	**0.79**					**0.79**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.92$

$C_{wd} \times C_f = 1.00$

$C_{wd} \times C_f \times \Sigma A_j = 0.79$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	3	716.93	235.02	481.91	2.37
10	2.33	1,113.62	470.04	643.59	1.84
15	1.9	1,362.16	705.06	657.10	1.50
20	1.65	1,577.24	940.07	637.16	1.30
30	1.3	1,864.01	1,410.11	453.89	1.03
40	1.08	2,064.74	1,880.15	184.60	0.85
50	0.95	2,270.26	2,350.19	-79.92	0.75
60	0.82	2,351.51	2,820.22	-468.71	0.65
70	0.74	2,475.78	3,290.26	-814.48	0.58
80	0.65	2,485.34	3,760.30	-1,274.96	0.51
90	0.61	2,623.95	4,230.33	-1,606.39	0.48
100	0.56	2,676.52	4,700.37	-2,023.85	0.44

Water Quantity Storage Required = 657 ft^3
= 4,915 gallons

Peak Flow Rate = 2.37 cfs

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SNOW KING - LOT 57

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 2 YEAR

Design Storm Frequency = 2 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	19,003	0.44	0.2	1	0.2	0.2	0.09
Gravel Road	1,561	0.04	0.85	1	0.85	0.85	0.03
Asphalt and Concrete	2,461	0.06	0.95	1	0.95	0.95	0.05
Lawn, Heavy, Steep, 7%+	13,130	0.30	0.3	1	0.3	0.3	0.09
		0.00	0	1	0	0	0.00
Totals	**36154.8**	**0.83**					**0.26**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.32$

$C_{wd} \times C_f = 0.32$

$C_{wd} \times C_f \times \Sigma A_j = 0.26$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	1.07	84.74	0.28
10	0.89	140.97	0.23
15	0.73	173.44	0.19
20	0.64	202.74	0.17
30	0.5	237.59	0.13
40	0.4	253.43	0.10
50	0.34	269.27	0.09
60	0.3	285.11	0.08
70	0.29	321.54	0.08
80	0.26	329.46	0.07
90	0.24	342.13	0.06
100	0.23	364.31	0.06

Peak Flow Rate = 0.28 cfs

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SNOW KING - LOT 57

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 2 YEAR

Design Storm Frequency = 2 years

Discharge Rate, d = 0.28 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	1,011	0.02	0.08	1	0.08	0.08	0.00
Roofs	19,594	0.45	0.95	1	0.95	0.95	0.43
Asphalt and Concrete	11,235	0.26	0.95	1	0.95	0.95	0.25
Lawn, Heavy, Steep, 7%+	4,315	0.10	0.3	1	0.3	0.3	0.03
		0.00	0	1	0	0	0.00
Totals	**36155**	**0.83**					**0.70**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.85$

$C_{wd} \times C_f = 0.85$

$C_{wd} \times C_f \times \Sigma A_j = 0.70$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	1.07	227.84	84.04	143.80	0.75
10	0.89	379.03	168.08	210.94	0.63
15	0.73	466.33	252.12	214.21	0.51
20	0.64	545.12	336.16	208.95	0.45
30	0.5	638.81	504.24	134.56	0.35
40	0.4	681.39	672.32	9.07	0.28
50	0.34	723.98	840.40	-116.42	0.24
60	0.3	766.57	1,008.48	-241.92	0.21
70	0.29	864.52	1,176.57	-312.05	0.20
80	0.26	885.81	1,344.65	-458.83	0.18
90	0.24	919.88	1,512.73	-592.84	0.17
100	0.23	979.50	1,680.81	-701.30	0.16

Water Quantity Storage Required = 214 ft^3

= 1,602 gallons

Peak Flow Rate = 0.75 cfs

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SNOW KING - LOT 57

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 10 YEAR

Design Storm Frequency = 10 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	19,003	0.44	0.2	1	0.2	0.2	0.09
Gravel Road	1,561	0.04	0.85	1	0.85	0.85	0.03
Asphalt and Concrete	2,461	0.06	0.95	1	0.95	0.95	0.05
Lawn, Heavy, Steep, 7%+	13,130	0.30	0.3	1	0.3	0.3	0.09
		0.00	0	1	0	0	0.00
Totals	**36154.8**	**0.83**					**0.26**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.32$

$C_{wd} \times C_f = 0.32$

$C_{wd} \times C_f \times \Sigma A_j = 0.26$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	1.8	142.55	0.47
10	1.42	224.92	0.37
15	1.19	282.73	0.31
20	1.05	332.63	0.27
30	0.83	394.40	0.22
40	0.68	430.83	0.18
50	0.57	451.42	0.15
60	0.51	484.69	0.13
70	0.47	521.12	0.12
80	0.44	557.55	0.12
90	0.4	570.22	0.10
100	0.37	586.06	0.10

Peak Flow Rate = 0.47 cfs

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SNOW KING - LOT 57

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 10 YEAR

Design Storm Frequency = 10 years

Discharge Rate, d = 0.47 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	1,011	0.02	0.08	1	0.08	0.08	0.00
Roofs	19,594	0.45	0.95	1	0.95	0.95	0.43
Gravel Road	11,235	0.26	0.85	1	0.85	0.85	0.22
Lawn, Heavy, Steep, 7%+	4,315	0.10	0.3	1	0.3	0.3	0.03
		0.00	0	1	0	0	0.00
Totals	**36154.8**	**0.83**					**0.68**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.82$

$C_{wd} \times C_f = 0.82$

$C_{wd} \times C_f \times \Sigma A_j = 0.68$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	1.8	369.24	141.38	227.86	1.22
10	1.42	582.58	282.75	299.83	0.96
15	1.19	732.33	424.13	308.20	0.81
20	1.05	861.56	565.51	296.06	0.71
30	0.83	1,021.57	848.26	173.31	0.56
40	0.68	1,115.93	1,131.01	-15.08	0.46
50	0.57	1,169.26	1,413.76	-244.50	0.39
60	0.51	1,255.42	1,696.52	-441.10	0.35
70	0.47	1,349.78	1,979.27	-629.49	0.32
80	0.44	1,444.14	2,262.02	-817.88	0.30
90	0.4	1,476.96	2,544.77	-1,067.81	0.27
100	0.37	1,517.99	2,827.53	-1,309.54	0.25

Water Quantity Storage Required = 308 ft^3
= 2,305 gallons

Peak Flow Rate = 1.22 cfs

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SNOW KING - LOT 57

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 100 YEAR

Design Storm Frequency = 100 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	19,003	0.44	0.2	1.25	0.25	0.25	0.11
Gravel Road	1,561	0.04	0.85	1.25	1.0625	1	0.04
Asphalt and Concrete	2,461	0.06	0.95	1.25	1.1875	1	0.06
Lawn, Heavy, Steep, 7%+	13,130	0.30	0.3	1.25	0.375	0.375	0.11
		0.00	0	1.25	0	0	0.00
Totals	**36154.8**	**0.83**					**0.33**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.32$

C_{wd} x C_f = 0.39

C_{wd} x C_f x ΣA_j = 0.33

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	3	296.99	0.98
10	2.33	461.32	0.76
15	1.9	564.28	0.62
20	1.65	653.37	0.54
30	1.3	772.17	0.43
40	1.08	855.33	0.35
50	0.95	940.46	0.31
60	0.82	974.12	0.27
70	0.74	1025.60	0.24
80	0.65	1029.56	0.21
90	0.61	1086.98	0.20
100	0.56	1108.76	0.18

Peak Flow Rate = 0.98 cfs

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SNOW KING - LOT 57

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 100 YEAR

Design Storm Frequency = 100 years

Discharge Rate, d = 0.98 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	1,011	0.02	0.08	1.25	0.1	0.1	0.00
Roofs	19,594	0.45	0.95	1.25	1.1875	1	0.45
Asphalt and Concrete	11,235	0.26	0.95	1.25	1.1875	1	0.26
Lawn, Heavy, Steep, 7%+	4,315	0.10	0.3	1.25	0.375	0.375	0.04
		0.00	0	1.25	0	0	0.00
Totals	**36154.8**	**0.83**					**0.83**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.85$

$C_{wd} \times C_f = 1.00$

$C_{wd} \times C_f \times \Sigma A_j = 0.83$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	3	753.23	294.53	458.69	2.49
10	2.33	1,170.01	589.07	580.94	1.93
15	1.9	1,431.13	883.60	547.53	1.58
20	1.65	1,657.10	1,178.14	478.96	1.37
30	1.3	1,958.39	1,767.20	191.18	1.08
40	1.08	2,169.29	2,356.27	-186.98	0.90
50	0.95	2,385.21	2,945.34	-560.13	0.79
60	0.82	2,470.58	3,534.41	-1,063.83	0.68
70	0.74	2,601.14	4,123.48	-1,522.34	0.61
80	0.65	2,611.18	4,712.55	-2,101.37	0.54
90	0.61	2,756.80	5,301.61	-2,544.81	0.51
100	0.56	2,812.04	5,890.68	-3,078.64	0.46

Water Quantity Storage Required = 581 ft^3

= 4,345 gallons

Peak Flow Rate = 2.49 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 2 YEAR

Design Storm Frequency = 2 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	0	0.00	0.2	1	0.2	0.2	0.00
Gravel Road	7,280	0.17	0.85	1	0.85	0.85	0.14
Asphalt and Concrete	0	0.00	0.95	1	0.95	0.95	0.00
Lawn, Heavy, Steep, 7%+	40,636	0.93	0.3	1	0.3	0.3	0.28
		0.00	0	1	0	0	0.00
Totals	**47916**	**1.10**					**0.42**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.38$

$C_{wd} \times C_f = 0.38$

$C_{wd} \times C_f \times \Sigma A_j = 0.42$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	1.07	136.56	0.45
10	0.89	227.18	0.38
15	0.73	279.51	0.31
20	0.64	326.73	0.27
30	0.5	382.89	0.21
40	0.4	408.42	0.17
50	0.34	433.94	0.14
60	0.3	459.47	0.13
70	0.29	518.18	0.12
80	0.26	530.94	0.11
90	0.24	551.36	0.10
100	0.23	587.10	0.10

Peak Flow Rate = 0.45 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 2 YEAR

Design Storm Frequency = 2 years

Discharge Rate, d = 0.45 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	0	0.00	0.08	1	0.08	0.08	0.00
Roofs	9,344	0.21	0.95	1	0.95	0.95	0.20
Asphalt and Concrete	12,857	0.30	0.95	1	0.95	0.95	0.28
Lawn, Heavy, Steep, 7%+	25,715	0.59	0.3	1	0.3	0.3	0.18
		0.00	0	1	0	0	0.00
Totals	**47916**	**1.10**					**0.66**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.60$

$C_{wd} \times C_f = 0.60$

$C_{wd} \times C_f \times \Sigma A_j = 0.66$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	1.07	214.04	135.44	78.60	0.71
10	0.89	356.07	270.87	85.20	0.59
15	0.73	438.08	406.31	31.77	0.48
20	0.64	512.10	541.74	-29.65	0.42
30	0.5	600.11	812.62	-212.50	0.33
40	0.4	640.12	1,083.49	-443.37	0.26
50	0.34	680.13	1,354.36	-674.23	0.22
60	0.3	720.14	1,625.23	-905.10	0.20
70	0.29	812.15	1,896.10	-1,083.95	0.19
80	0.26	832.16	2,166.98	-1,334.82	0.17
90	0.24	864.16	2,437.85	-1,573.69	0.16
100	0.23	920.17	2,708.72	-1,788.55	0.15

Water Quantity Storage Required = 85 ft^3

= 637 gallons

Peak Flow Rate = 0.71 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 10 YEAR

Design Storm Frequency = 10 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	0	0.00	0.2	1	0.2	0.2	0.00
Gravel Road	7,280	0.17	0.85	1	0.85	0.85	0.14
Asphalt and Concrete	0	0.00	0.95	1	0.95	0.95	0.00
Lawn, Heavy, Steep, 7%+	40,636	0.93	0.3	1	0.3	0.3	0.28
		0.00	0	1	0	0	0.00
Totals	**47916**	**1.10**					**0.42**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.38$

$C_{wd} \times C_f = 0.38$

$C_{wd} \times C_f \times \Sigma A_j = 0.42$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	1.8	229.74	0.76
10	1.42	362.47	0.60
15	1.19	455.64	0.50
20	1.05	536.05	0.44
30	0.83	635.60	0.35
40	0.68	694.31	0.29
50	0.57	727.49	0.24
60	0.51	781.10	0.22
70	0.47	839.81	0.20
80	0.44	898.52	0.19
90	0.4	918.94	0.17
100	0.37	944.47	0.16

Peak Flow Rate = 0.76 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 10 YEAR

Design Storm Frequency = 10 years

Discharge Rate, d = 0.76 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	0	0.00	0.08	1	0.08	0.08	0.00
Roofs	9,344	0.21	0.95	1	0.95	0.95	0.20
Gravel Road	12,857	0.30	0.85	1	0.85	0.85	0.25
Lawn, Heavy, Steep, 7%+	25,715	0.59	0.3	1	0.3	0.3	0.18
		0.00	0	1	0	0	0.00
Totals	**47916**	**1.10**					**0.63**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.57$

$C_{wd} \times C_f = 0.57$

$C_{wd} \times C_f \times \Sigma A_j = 0.63$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	1.8	344.00	227.84	116.16	1.14
10	1.42	542.75	455.67	87.08	0.90
15	1.19	682.26	683.51	-1.25	0.75
20	1.05	802.66	911.35	-108.69	0.66
30	0.83	951.72	1,367.02	-415.29	0.52
40	0.68	1,039.64	1,822.69	-783.06	0.43
50	0.57	1,089.32	2,278.36	-1,189.04	0.36
60	0.51	1,169.59	2,734.04	-1,564.45	0.32
70	0.47	1,257.50	3,189.71	-1,932.21	0.30
80	0.44	1,345.41	3,645.38	-2,299.97	0.28
90	0.4	1,375.99	4,101.05	-2,725.07	0.25
100	0.37	1,414.21	4,556.73	-3,142.52	0.23

Water Quantity Storage Required = 116 ft^3

= 869 gallons

Peak Flow Rate = 1.14 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
PRE-DEVELOPMENT - 100 YEAR

Design Storm Frequency = 100 years

Discharge Rate, d = 0.00 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Unimproved	0	0.00	0.2	1.25	0.25	0.25	0.00
Gravel Road	7,280	0.17	0.85	1.25	1.0625	1	0.17
Asphalt and Concrete	0	0.00	0.95	1.25	1.1875	1	0.00
Lawn, Heavy, Steep, 7%+	40,636	0.93	0.3	1.25	0.375	0.375	0.35
		0.00	0	1.25	0	0	0.00
Totals	**47916**	**1.10**					**0.53**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.38$

$C_{wd} \times C_f = 0.48$

$C_{wd} \times C_f \times \Sigma A_j = 0.53$

Time of Concentration = 5 minutes

	Water Quantity Calculations		
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Peak Flow (ft^3/sec)
5	3	478.61	1.58
10	2.33	743.45	1.23
15	1.9	909.37	1.00
20	1.65	1052.95	0.87
30	1.3	1244.40	0.69
40	1.08	1378.41	0.57
50	0.95	1515.61	0.50
60	0.82	1569.86	0.43
70	0.74	1652.82	0.39
80	0.65	1659.20	0.34
90	0.61	1751.73	0.32
100	0.56	1786.83	0.30

Peak Flow Rate = 1.58 cfs

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SNOW KING - LOT 53

STORMWATER MANAGEMENT PLAN
RATIONAL METHOD RUNOFF CALCULATIONS
POST-DEVELOPMENT - 100 YEAR

Design Storm Frequency = 100 years

Discharge Rate, d = 1.58 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor C_f	C x C_f	Calculation Value C'	C' x A (acres)
Lawn, Sandy, Flat, 2%	0	0.00	0.08	1.25	0.1	0.1	0.00
Roofs	9,344	0.21	0.95	1.25	1.1875	1	0.21
Asphalt and Concrete	12,857	0.30	0.95	1.25	1.1875	1	0.30
Lawn, Heavy, Steep, 7%+	25,715	0.59	0.3	1.25	0.375	0.375	0.22
		0.00	0	1.25	0	0	0.00
Totals	**47916**	**1.10**					**0.83**

Weighted Runoff Coefficient, $C_{wd} = \frac{\Sigma C_i A_j}{\Sigma A_j} = 0.60$

$C_{wd} \times C_f = 0.75$

$C_{wd} \times C_f \times \Sigma A_j = 0.83$

Time of Concentration = 5 minutes

	Water Quantity Calculations				
Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume (ft^3)	Discharge Volume (ft^3)	Site Detention (ft^3)	Peak Flow (ft^3/sec)
5	3	750.14	474.66	275.48	2.48
10	2.33	1,165.22	949.32	215.90	1.93
15	1.9	1,425.27	1,423.98	1.29	1.57
20	1.65	1,650.31	1,898.64	-248.32	1.36
30	1.3	1,950.37	2,847.95	-897.59	1.07
40	1.08	2,160.41	3,797.27	-1,636.86	0.89
50	0.95	2,375.45	4,746.59	-2,371.14	0.79
60	0.82	2,460.47	5,695.91	-3,235.44	0.68
70	0.74	2,590.49	6,645.23	-4,054.74	0.61
80	0.65	2,600.49	7,594.55	-4,994.05	0.54
90	0.61	2,745.52	8,543.86	-5,798.34	0.50
100	0.56	2,800.53	9,493.18	-6,692.65	0.46

Water Quantity Storage Required = 275 ft^3

= 2,061 gallons

Peak Flow Rate = 2.48 cfs

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Average Day Occupancy Rate [1]	50%
Max Day Factor [1], MDF	2.72
Peak Hour Factor [2], PHF	4

WATER DEMAND							
a				b	c=a*b	d=MDF*c	e=d/1440 * PHF
Unit Type			No. of Units	Average gpd/unit	Average TOTAL, gpd	Maximum TOTAL, gpd	PEAK HOUR, gpm
Lot 53							
Condo	1	Bedroom	1	125	125	340	0.9
Affordable	1	Bedroom	3	125	375	1020	2.8
Condo	2	Bedroom	18	125	4500	12240	34.0
Affordable	2	Bedroom	3	125	750	2040	5.7
Condo	3	Bedroom	7	125	2625	7140	19.8
Affordable	3	Bedroom	1	125	375	1020	2.8
Condo	4	Bedroom	0	125	0	0	0.0
Subtotal Domestic Water Demand					8750	23800	66.1
Lot 58							
Condo	1	Bedroom	0	125	0	0	0.0
Condo	2	Bedroom	7	125	1750	4760	13.2
Condo	3	Bedroom	5	125	1875	5100	14.2
Condo	4	Bedroom	0	125	0	0	0.0
Subtotal Domestic Water Demand					3625	9860	27.4
Lot 57 North							
Condo	1	Bedroom	0	125	0	0	0.0
Affordable	1	Bedroom	2	125	250	680	1.9
Condo	2	Bedroom	10	125	2500	6800	18.9
Affordable	2	Bedroom	1	125	250	680	1.9
Condo	3	Bedroom	0	125	0	0	0.0
Affordable	3	Bedroom	1	125	375	1020	2.8
Condo	4	Bedroom	0	125	0	0	0.0
Subtotal Domestic Water Demand					3375	9180	25.5
Lot 57 South							
Condo	1	Bedroom	0	125	0	0	0.0
Affordable	1	Bedroom	0	125	0	0	0.0
Condo	2	Bedroom	4	125	1000	2720	7.6
Affordable	2	Bedroom	1	125	250	680	1.9
Condo	3	Bedroom	6	125	2250	6120	17.0
Affordable	3	Bedroom	0	125	0	0	0.0
Condo	4	Bedroom	2	125	1000	2720	7.6
Subtotal Domestic Water Demand					4500	12240	34.0
Total Domestic Water Demand					20,250	55,080	153.0

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FIRE SUPPRESSION						
Total Building Size	Building Type	Required Pressure [4]	Required Duration [4]	Total Fire Flow [4]	Sprinkler Reduction [5]	Adjusted Fire Flow [5]
(SF)	(IBC)	(psi)	(hours)	(gpm)	(%)	(gpm)
Lot 53						
73,743	IIB	20	4	6000	75%	1500
Lot 58						
34,849	IIB	20	4	4000	75%	1000
Lot 57 North						
32,455	IIB	20	3	3750	75%	1000
Lot 57 South						
38,378	IIB	20	4	4000	75%	1000

Note:

[1] Based on daily rates from the WYDEQ CH 12, Section 8

[2] Peak Hour Factor based on busiest hour occuring during the busiest quarter of the day.

[3] IFC - Appendix B, Table B105.1, Type II-B

[4] IFC - Appendix B, Section B105.2, 75% reduction for automatic sprinkler systems, minimum 1500 gpm

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**
Lot 53					
Condo 1 Bedroom	1	Lavatory Sink	1	1.5	2
		Shower	1	2.5	3
		Bath Tub	1	8	8
		Toilet	1	6	6
		Kitchen Sink	1	1.8	2
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	3
		Utility Sink	0	4	0
Affordable 1 Bedroom	3	Lavatory Sink	1	1.5	5
		Shower	1	2.5	8
		Bath Tub	1	8	24
		Toilet	1	6	18
		Kitchen Sink	1	1.8	5
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	9
		Utility Sink	0	4	0
Condo 2 Bedroom	18	Lavatory Sink	3	1.5	81
		Shower	1	2.5	45
		Bath Tub	1	8	144
		Toilet	2	6	216
		Kitchen Sink	1	1.8	32
		Dishwasher	1	1.3	23
		Laundry (washer)	1	3	54
		Utility Sink	0	4	0
Additional Sinks		Lavatory Sink	12	1.5	18
Additional Toilets		Toilet	5	6	30
Affordable 2 Bedroom	3	Lavatory Sink	2	1.5	9
		Shower	1	2.5	8
		Bath Tub	1	8	24
		Toilet	2	6	36
		Kitchen Sink	1	1.8	5
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	9
		Utility Sink	0	4	0
Condo 3 Bedroom	7	Lavatory Sink	5	1.5	53
		Shower	3	2.5	53
		Bath Tub	1	8	56

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**
		Toilet	3	6	126
		Kitchen Sink	1	1.8	13
		Dishwasher	1	1.3	9
		Laundry (washer)	1	3	21
		Utility Sink	0	4	0
Affordable 3 Bedroom	1	Lavatory Sink	1	1.5	2
		Bath Tub	1	8	8
		Shower	1	2.5	3
		Toilet	1	6	6
		Kitchen Sink	1	1.8	2
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	3
		Utility Sink	0	4	0
Lot 58					
Condo 2 Bedroom	7	Lavatory Sink	3	1.5	32
		Shower	1	2.5	18
		Bath Tub	1	8	56
		Toilet	2	6	84
		Kitchen Sink	1	1.8	13
		Dishwasher	1	1.3	9
		Laundry (washer)	1	3	21
		Utility Sink	0	4	0
Condo 3 Bedroom	5	Lavatory Sink	5	1.5	38
		Shower	3	2.5	38
		Bath Tub	1	8	40
		Toilet	3	6	90
		Kitchen Sink	1	1.8	9
		Dishwasher	1	1.3	7
		Laundry (washer)	1	3	15
		Utility Sink	0	4	0
Lot 57					
Affordable 1 Bedroom	2	Lavatory Sink	1	1.5	3
		Shower	1	2.5	5
		Bath Tub	1	8	16
		Toilet	1	6	12
		Kitchen Sink	1	1.8	4
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	6
		Utility Sink	0	4	0
Condo 2 Bedroom	14	Lavatory Sink	3	1.5	63
		Shower	1	2.5	35

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**
		Bath Tub	1	8	112
		Toilet	2	6	168
		Kitchen Sink	1	1.8	25
		Dishwasher	1	1.3	18
		Laundry (washer)	1	3	42
		Utility Sink	0	4	0
Additional Sinks		Lavatory Sink	3	1.5	5
Affordable 2 Bedroom	2	Lavatory Sink	2	1.5	6
		Shower	1	2.5	5
		Bath Tub	1	8	16
		Toilet	2	6	24
		Kitchen Sink	1	1.8	4
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	6
		Utility Sink	0	4	0
Affordable 3 Bedroom	1	Lavatory Sink	2	1.5	3
		Shower	2	2.5	5
		Bath Tub	1	8	8
		Toilet	2	6	12
		Kitchen Sink	1	1.8	2
		Dishwasher	0	1.3	0
		Laundry (washer)	1	3	3
		Utility Sink	0	4	0
Condo 3 Bedroom	6	Lavatory Sink	3	1.5	27
		Shower	2	2.5	30
		Bath Tub	1	8	48
		Toilet	2	6	72
		Kitchen Sink	1	1.8	11
		Dishwasher	1	1.3	8
		Laundry (washer)	1	3	18
		Utility Sink	0	4	0
Condo 4 Bedroom	2	Lavatory Sink	6	1.5	18
		Shower	3	2.5	15
		Bath Tub	1	8	16
		Toilet	3	6	36
		Kitchen Sink	1	1.8	4
		Dishwasher	1	1.3	3
		Laundry (washer)	1	3	6
		Utility Sink	0	4	0

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**

TOTAL FIXTURE VALUE	2,541
Probable Water Flow Demand (AWWA M22 - Figure 4-3)	75
Design Pressure Adjustment Factor (AWWA M22 - 60 psi)	1.00
Adjusted Probable Demand (gpm)[3]	**75**

Note:

[1] Fixture Value based on AWWA M22

[2] Fixture count based 2024.07.02 program

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WATER DEMAND - M22 FIXTURE CALCULATION					
Unit Type	**No. of Units**	**Fixture**	**Fixtures per Unit[2]**	**Fixture Value[1]**	**Fixture Value**

[3] *Domestic use only, no irrigation*

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Attachment D: Water System Evaluation

The existing Snow King Resort Public Water System consists of a duplex booster pump located in the garage of Love Ridge Condominium Building 48, at 6,372 feet, a 1,160LF long, 8" diameter water supply line running uphill to a 110,000 gallon storage tank south/above at roughly 6,600 feet.

System Configuration

The following information was drawn from the Grand View Lodges – Phase B Wyoming DEQ Permit to Construct.

Static Headloss:

Water surface elevation in tank, full:

Tank Floor Elevation:	6583.0'
Depth to shutoff:	+ 13.0'
	6596.0'

	6596.0'
Booster Station Elevation:	- 6,372.0'
	224.0'

Friction Loss:

Fittings	Number of Fittings
8" Diameter Gate Valve	3
8" Diameter Tee; flow through	5
8" Diameter Tee; branch flow	1
8" Diameter 90° Bend	2
8" Diameter 45° Bend	6
8" Diameter 22.5° Bend	2
8" Diameter 11.25° Bend	2

Minor Head Loss; calculated for various flow scenarios

$$H_m = \frac{K*V^2}{2*g}$$

Flowrate	136 gpm	272 gpm	1,000 gpm	1,190.6 gpm
Minor Losses	0.05 ft-H_2O	0.19 ft-H_2O	2.59 ft-H_2O	3.67 ft-H_2O

Pipe

1,160 LF of 8" Diameter CL-350 Ductile Iron Pipe, Cement Lined

C coefficient	140.0
Inside Diameter	8.43"

Major Head Loss; calculated for various flow scenarios using Flowmaster

Flowrate	136 gpm	272 gpm	1,000 gpm	1,190.6 gpm
Major Losses	0.36' ft-H_2O	1.28 ft-H_2O	14.32 ft-H_2O	19.78 ft-H_2O

System Total Head Loss

Flowrate	136 gpm	272 gpm	1,000 gpm	1,190.6 gpm
Head	224.41' ft-H_2O	225.47 ft-H_2O	240.91 ft-H_2O	247.45 ft-H_2O

Water Available

Storage Tank

The tank provides 110,000 gallons of water storage

Pumped

Using 272 gpm flow scenario, for both pumps operating simultaneously

System Total Head: 45psi = 225.47 ft-H_2O

Pump Intake Head: - 103.83 ft-H_2O

121.64 ft-H_2O → 60.82 ft-H_2O per stage

National Pump M6HC Pump Curve used, 2-stage, 4.400 impeller configuration

Pump flowrate, Q = 155 gpm

System Demands

Existing Demands

Existing Love Ridge Condominiums Water Demand				
	Units No. of Units	Average TOTAL, gpd	Maximum TOTAL, gpd	Peak Hour gpm
Condos	20	10,944	27,072	37.6

Proposed Demands

Domestic Water Demand				
Lot	Units No. of Units	Average TOTAL, gpd	Maximum TOTAL, gpd	Peak Hour gpm
Lot 53	34	9,250	25,160	69.9
Lot 58	12	3,625	9,860	27.4
Lot 57	26	7,375	20,060	55.7
Total	**72**	**20,250**	**55,080**	**153.0**

Fire Flow

Combined fire sprinkler and hydrant flow: 1,000 gpm for 2 hours

System Capacity Analysis

Fire Flow Event: 2-hour duration

Water Supply

Storage Tank; at pump on level, assuming 5,000-gallon operating range between pump on and pump off level

105,000 gallons

Pumped; both booster pumps operating

Pump 1, starts at beginning of fire flow event

$$155\ gpm * 120\ minutes = 18{,}600\ gallons$$

Pump 2, starts when lag pump on level is reached in the tank. Assuming 5,000 gallons to lag pump on, this takes 4 minutes at fire flows

$$155\ gpm * 116\ minutes = 17{,}980\ gallons$$

Total volume of water available: $105{,}000 + 18{,}600 + 17{,}980 = \mathbf{141{,}580\ gallons}$

Water Demands

Existing Domestic Demands

Peak Hour: $37.6\ gpm * 60\ minutes = 2{,}256\ gallons$

Typical hour of maximum day: $27{,}072\ gpd \Big/ 24\ \frac{hours}{day} = 1{,}128\ gallons$

$$2{,}256 + 1{,}128 = 3{,}384\ gallons$$

Proposed Domestic Demands

Peak Hour: $153.0\ gpm * 60\ minutes = 9{,}198\ gallons$

Typical hour of maximum day: $55{,}080\ gpd \Big/ 24\ \frac{hours}{day} = 2{,}295\ gallons$

$$9{,}198 + 2{,}295 = 11{,}493\ gallons$$

Fire Flow, sprinklers and hydrants: $1{,}000\ gpm * 120\ minutes = 120{,}000\ gallons$

Total volume of water demanded: $3{,}384 + 11{,}493 + 120{,}000 = \mathbf{134{,}877\ gallons}$

Total volume of water available exceeds total volume of water demanded

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Average Daily Flow	60%
Peak Hour Factor	4

SANITARY SEWER DEMAND						
Unit Type			No. of Units[2]	Max Flow per Bedroom, gpd[1]	Average TOTAL, gpd	Maximum TOTAL, gpd	PEAK HOUR, gpm
Lot 53							
Condo	1	Bedroom	1	150	90	150	0.4
Affordable	1	Bedroom	3	150	270	450	1.3
Condo	2	Bedroom	18	150	3240	5400	15.0
Affordable	2	Bedroom	3	150	540	900	2.5
Condo	3	Bedroom	7	150	1890	3150	8.8
Affordable	3	Bedroom	1	150	270	450	1.3
Condo	4	Bedroom	0	150	0	0	0.0
SUBTOTAL SANITARY SEWER DEMAND					6300	10500	29.2
Lot 58							
Condo	1	Bedroom	0	150	0	0	0.0
Condo	2	Bedroom	7	150	1260	2100	5.8
Condo	3	Bedroom	5	150	1350	2250	6.3
Condo	4	Bedroom	0	150	0	0	0.0
SUBTOTAL SANITARY SEWER DEMAND					2610	4350	12.1
Lot 57 North							
Condo	1	Bedroom	0	150	0	0	0.0
Affordable	1	Bedroom	2	150	180	300	0.8
Condo	2	Bedroom	10	150	1800	3000	8.3
Affordable	2	Bedroom	1	150	180	300	0.8
Condo	3	Bedroom	0	150	0	0	0.0
Affordable	3	Bedroom	1	150	270	450	1.3
Condo	4	Bedroom	0	150	0	0	0.0
SUBTOTAL SANITARY SEWER DEMAND					2430	4050	11.3
Lot 57 South							
Condo	1	Bedroom	0	150	0	0	0.0
Affordable	1	Bedroom	0	150	0	0	0.0
Condo	2	Bedroom	4	150	720	1200	3.3
Affordable	2	Bedroom	1	150	180	300	0.8
Condo	3	Bedroom	6	150	1620	2700	7.5
Affordable	3	Bedroom	0	150	0	0	0.0
Condo	4	Bedroom	2	150	720	1200	3.3
SUBTOTAL SANITARY SEWER DEMAND					3240	5400	15.0
TOTAL SANITARY SEWER DEMAND					14,580	24,300	67.5

Notes:

[1] *Based on daily flow rates from the WYDEQ CH 11, Part B, Table 1*

[2] *Bedroom count shown based on Development Plan Review, 10.25.2019*

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PH: 307.733.5150
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Attachment F: Snow King Resort Master Plan Water, Sewer, Traffic Analysis Assumptions

The Snow King Resort Master Plan evaluated impacts of development of the Master Plan area on the Town of Jackson infrastructure. Assumptions about the nature of future development were made to do these impact studies. For this Development Plan, we have broken out the assumed impacts that apply to Sub-area 3 based on the Example Development Table with the goal of ensuring the total impact of development in the sub-area is less than or equal to what was analyzed and approved in the Master Plan approval process.

The following assumed land uses for Sub-area 3, from the Example Development Table were used:
Condominium Units: 150
Hotel Rooms: 50

Traffic Impact

The traffic impacts allocated to Sub-area 3 in the Master Plan analysis are found by using the projected trip generation rates given in Table C-5 of the Master Plan.
Condo Units: 10.2 trips/unit/day
Hotel Rooms: 8.0 trips/room/day

This yields a traffic generation allocation, for sub-area 3 of:

Condominiums: $150\ units * 8.0\ \frac{trips/_{unit}}{day} = 1{,}200\ \frac{trips}{day}$

Hotel Rooms: $50\ rooms * 10.2\ \frac{trips/_{unit}}{day} = 510\ \frac{trips}{day}$

Total: $\mathbf{1710\ \frac{trips}{day}}$

Sanitary Sewer Generation

The sanitary sewer generation allocated to Sub-area 3 in the Master Plan analysis are found by using the projected maximum day sanitary sewer generation rates given in Section IX.C.4 of the Master Plan. The *Proposed Master Plan Flow Potential-2000* are:
Condominiums: 450 gpd/condominium
Hotel Units: 225 gpd/room

This yields a wastewater generation allocation, for sub-area 3 of:

Condominiums: $150\ units * 450\ \frac{gpd}{condominum} = 67{,}500\ gpd$

Hotel Units: $50\ rooms * 225\ \frac{gpd}{room} = 11{,}250\ gpd$

Total: $\boldsymbol{Maximum\ Day: 78{,}750\ gpd}$

$$\boldsymbol{Average\ Day = \frac{Maximum\ Day}{2} = 39{,}375\ gpd}$$

Water Demand

The water demand allocated to Sub-area 3 in the Master Plan analysis are found by using the projected domestic demand given in Section IX.B of the Master Plan. The Master Plan assumed that peak demand for domestic flow was double the maximum day wastewater generation rate. This yields:

Condominiums: 700 gpd/condominium
Hotel Units: 450 gpd/room

This yields a wastewater generation allocation, for sub-area 3 of:

Condominiums: $150\ units * 700 \frac{gpd}{condominum} = 105{,}000\ gpd$

Hotel Units: $50\ rooms * 450 \frac{gpd}{room} = 22{,}500\ gpd$

Total: $\boldsymbol{Maximum\ Day: 127{,}500\ gpd}$