R|O|Anderson

October 27, 2022

Washoe County Community Development
Planning Division
1001 E Ninth Street
Reno, NV 89512

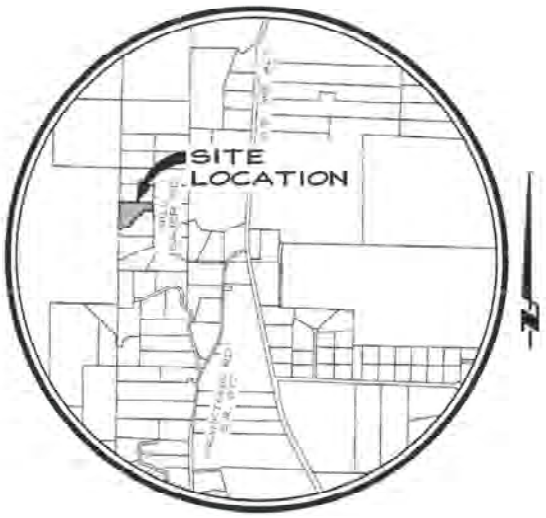
Hillside Development
Dahlin Residence 65 Will Sauer Road A.P.N. 172-010-05

To Whom It May Concern:

On behalf of the Owners, Stan and Debra Dahlin, please consider this letter our response to the requirements and special use permit findings necessary for the grading plan prepared in support of the development of a single-family home on the above-referenced parcel. The work contemplated within the grading plan has reached certain thresholds (analysis found below) triggering the need for a Major Grading Permit and corresponding Special Use Permit.

Site Location and Characteristics

The project site is located at 65 Will Sauer Road, within the South Valleys Area Plan. The parcel is five acres in size and is zoned General Residential (GR). The parcel is not within a primary flood plain per the effective Flood Insurance Rate Map (FIRM) Panel No. N32031C335OG, dated March 16, 2009. The parcel was created as Parcel 7 of Parcel Map 3206 for the Heidenreich Family Trust, recorded on May 8, 1997. The creation of this parcel appears to pre-date Article 438 Grading Standards (Ordinance 1499 effective 11/2/2012). The Site Location is graphically depicted on the following Vicinity Map.



VICINTIY MAP
NO SCALE

Physical
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Minden, Nevada 89423
775.782.2322

Mailing
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OFFICES
Minden, Nevada
Reno, Nevada

Topography, Creeks, and Irrigation Facilities
The site topography is characterized by relatively steep slopes, and the parcel is bifurcated by one perennial creek and an ephemeral irrigation ditch. A 30' existing easement on each side of the Franktown Creek is located near the southerly property line. An existing irrigation ditch with 15' setbacks on either side runs, more or less, west to east through the center of the parcel. The area between the ditch and the creek is strewn with large boulders—suggesting either historic run-out(s) from avalanche(s) initiated at the head of the canyon or debris flows from large run-off events. For these reasons, this area was deemed unsafe for residential building purposes.

Additional physical features present additional administrative constraints such as the need for sanitary setbacks to the water courses that require the effluent from the individual sewage disposal system (ISDS) to be pumped and piped under the ditch to a disposal field located north of the irrigation ditch.

Therefore, the area that can reasonably accommodate homesite development is that portion of the site located north of the irrigation ditch. After removing the setbacks from this area, the buildable area is approximately 2.6 acres. An estimated 84% of the area features slopes greater than 15%.

Utilities
The site is served by electricity and telephone from Will Sauer Road. There is neither a community water system nor a public sewer provided within 1,000 feet of the site. Therefore, a drilled and cased domestic well will provide residential water supply, and sewage treatment and disposal will be provided by an ISDS.

Road Access
Will Sauer Road, a private road maintained by the Will Sauer Road Association, provides access to the site.

Section 110.438.35 Major Grading Permit Thresholds – Owner Response

(a) Major Grading Permits (Grading Requiring a Special Use Permit). A special use permit, pursuant to Article 810, is required for all major grading. Major grading is defined as "*...any clearing, excavating, cutting, filling, grading, earthwork construction, earthen structures and storage of earth, including fills and embankments that meet or exceed any one or more of the following thresholds (for the purposes of this section the County Engineer shall determine the slope of the project area).*":

(1) Grading on slopes of less than (flatter than) fifteen (15) percent:

(i) Area:

(A) Grading of an area of one (1) acre (43,560 square feet) or more on parcels less than six (6) acres in size; or

(B) Grading of twenty (20) percent or more (up to a maximum of four (4) acres) of the area of the parcel on parcels six (6) acres or greater in size; or

(C) Grading of an area of more than four (4) acres on a parcel of any size; or

(ii) Volume:
(A) Excavation of five thousand (5,000) cubic yards or more whether the material is intended to be permanently located on the project site or temporarily stored on a site for relocation to another, final site, or;

(B) Importation of five thousand (5,000) cubic yards or more whether the material is intended to be permanently located on the project site or temporarily stored on a site for relocation to another, final site; or

(2) Grading on slopes of fifteen (15) percent or greater (steeper):

(i) Area:
(A) Grading of one-half (0.5) acre (21,780 square feet) or more on parcels less than six (6) acres in size; or

(B) Grading of ten (10) percent or more of the area of the parcel on parcels six (6) acres or greater in size; or

(C) Grading of more than two (2) acres on any size parcel; or

(iii) Volume:
(A) Excavation of one thousand (1,000) cubic yards or more whether the material is intended to be permanently located on the project site or temporarily stored on a site for relocation to another, final site, or;

(B) Importation of one thousand (1,000) cubic yards or more whether the material is intended to be permanently located on the project site or temporarily stored on a site for relocation to another, final site; or

(3) Any driveway or road that traverses any slope of thirty (30) percent or greater (steeper); or

(4) Grading to construct a permanent earthen structure greater than four and one-half (4.5) feet in height within the required front yard setback, or greater than six (6) feet in height

on the remainder of the property. The height of an earthen structure is measured from existing grade at the time of permit issuance; or

(5) Grading within a special flood hazard area that results in importation and placement of more than one thousand (1,000) cubic yards of fill material; or

(6) The creation of a dam structure that holds (retains) more than twenty-five thousand (25,000) cubic feet of water; or

(7) Any grading in the Critical Stream Zone Buffer Area (CSZBA) of any Significant Hydrologic Resource (SHR) as defined by Article 418, Significant Hydrologic Resources.

Response to Grading Standard Requirements
As noted above, the Owner's property is physically and administratively constrained by slopes, existing water courses, and what is seemingly a potential avalanche run-out area. The planned site improvements together with the grading required to meet the county's adopted standards (e.g., maximum 3:1 (H:V) fill slopes, maximum height of retaining walls, etc.) result in a disturbed area greater than ½-acre; thus, a Major Grading Permit is required per Section 110.438.35.

In the grading design, professional care and prudence was taken to protect and safeguard life, property, and the public welfare by minimizing the area of disturbance to the extent feasible while observing planning and sanitary setbacks and using maximum driveway slopes all while locating the home for the property owner to realize the natural views available from this site. The requirements of Article 438 Grading Standards and more specifically Section 110.438.45 Grading of Slopes, Section 110.438.50 Cuts, Section 110.438.55 Fills, Section 110.438.60 Setbacks, Section 110.438.65 Drainage and Terracing, and Section 110.438.70 Erosion Control were accounted for in the final design.

Major Grading Special Use Permit Findings

Section 110.810.30 Findings. Prior to approving an application for a special use permit, the Planning Commission, Board of Adjustment or a hearing examiner shall find that all of the following are true. The owner's response to each of the required findings are provided below.

(a) Consistency. The proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the applicable area plan;

Response: This application does not seek to modify or change in any way the adopted policies, standards, or maps of either the local Area Plan or the county-wide master plan.

(b) Improvements. Adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided; the

proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven;

Response: As demonstrated above, utilities, access, water supply, domestic sewage treatment and disposal facilities have been addressed professionally for this planned residence in manners consistent with good engineering practice as for nearby sites and residences in this part of the county.

(c) *Site Suitability. The site is physically suitable for the type of and intensity of development;*

***Response:** With the professional design elements and considerations included in the proposed architecture and site grading design, the site is physically suitable for the proposed use and the physical site and administrative constraints have been addressed consistent with the county's expressed purposes of safeguarding life, property, and public welfare.*

(d) *Issuance Not Detrimental. Issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area; and*

Response: As designed the planned site improvements and grading elements serve to ensure that the public health, safety and general welfare have been professionally considered and addressed; the improvements and proposed use will not prove to be injurious to the property or adjacent properties nor detrimental to the character of the surrounding area.

(e) *Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.*

Response: This site is not proximate to any military installation. Therefore, approval of the requested special use permit will have no effect on such facilities.

Constraint and Mitigation Analysis

The 5.01-acre Site is located along the west side of Will Sauer Road, a paved private road. The parcel south of the Site is developed with a single-family home, as is the property across the street on the east side of Will Sauer Road. The parcel adjacent to the north is undeveloped, as is the U.S. Forest Service property adjacent to the western boundary of the Site.

View from area roads/highways
The residences surrounding the lot are not visible from any roadway, be it Franktown Road, Old U.S. Hwy 395 or U.S. Hwy 395 as shown in the images below.

Photo 1: View from Old Hwy 395 – *Site behind ridge and trees*

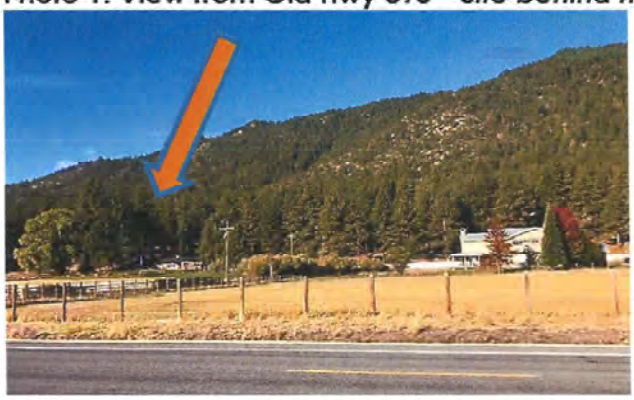


Photo 2: View from Franktown Road – *Site below ridge line*

Photo 3: View from Hwy 395 – Site below ridgeline

View from the site to nearby roads and highways
These photos illustrate that residences in the general area of the project site are not visible from any road within one mile from the site.

Photo 4: Viewshed from Will Sauer Road to project site
Will Sauer Rd is identified in the foreground of this image—which faces the project site.

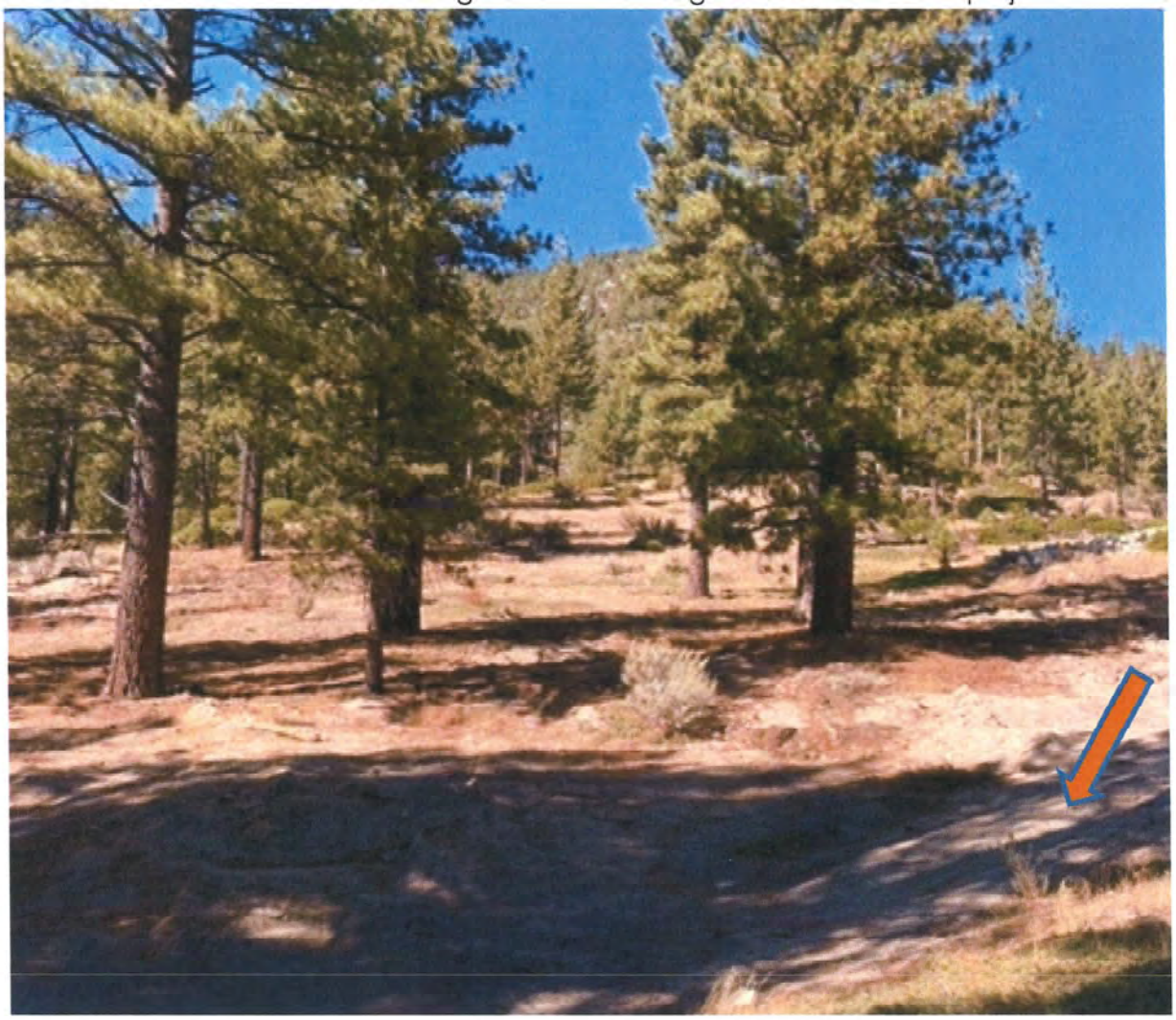


Photo 5: Viewshed from building site to Will Sauer Road
Will Sauer Rd is identified behind the tree on the large tree on the left.

Identified Development Site
The 5.01-acre Site is located along the west side of Will Sauer Road, a paved private road. The parcel south of the Site is developed with a single-family home, as is the property across the street on the east side of Will Sauer Road. The parcel adjacent to the north is undeveloped, as is the U.S. Forest Service property adjacent to the western boundary of the Site.

The Owner is proposing to develop a single-family home, detached garage, and accessory shop building along with driveway, well, and septic system improvements—all located

Figure 1: Proposed area of development

within the northern portion of the Site as shown in Figure 1.

Mitigation per Proposed Grading Plan

As discussed above, the site is constrained by topography, creeks, and irrigation facilities. To address the noted site constraints, the design of the residence and site improvements incorporate numerous elements to minimize site disturbance and earthwork requirements. Some of these elements include incorporating a daylight basement design having a 10' drop to account for the existing slopes and minimize grading required; detaching the garage and shop to site them at varying elevations from the residence in recognition of the natural grade; orienting the primary axis of the home parallel to the existing topography thereby reducing required cuts and fills; and, observing the county's adopted grading standards (e.g., maximum slopes, retaining wall heights, etc.).

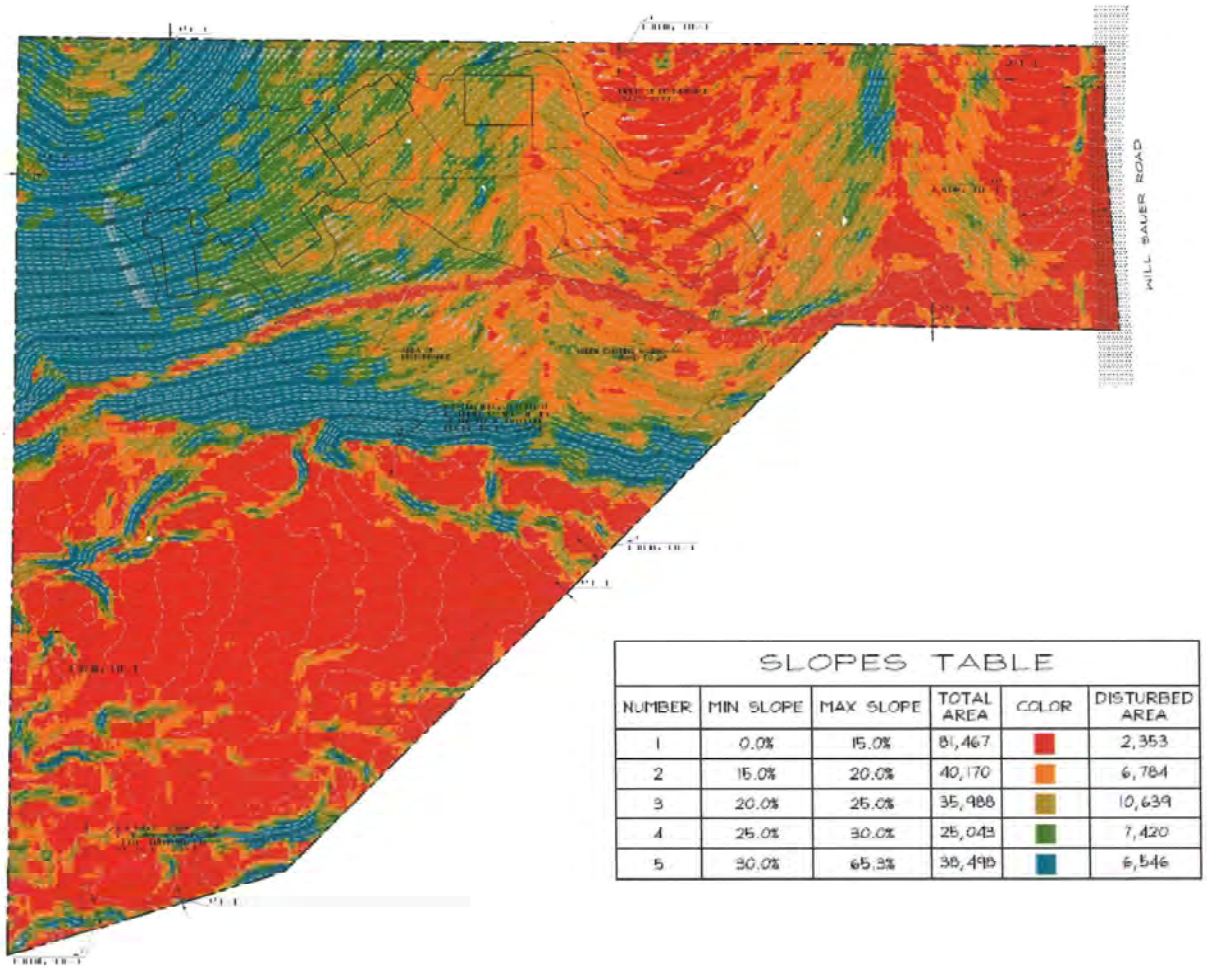
Furthermore, the grading design seeks to balance cuts and fills to avoid the need to export soil materials from the site. Additionally, the slope of the planned driveway is less than 10-percent and, where possible, is oriented parallel with the elevation contours, again, to minimize required cut and fill slopes. Finally, the depth of the back yard area has been minimized and rockery walls implemented to lessen cut slopes to the extent possible while observing the 3:1 slope limit.

The Slope Analysis below (see also Attachment A) illustrates the percentage of sloped areas by color. The proposed building footprints are outlined in the upper left corner of the drawing.

Determination of Developable Area

The minimum and maximum slopes on the proposed project site range from 0% to 65%. The applicant seeks approval to include a portion of the residential footprint primarily within an area identified as having a 30% to 65% slope. This site, however, was chosen to avoid areas with landslide potential (at the back of the property), existing streams, and irrigation facilities. As discussed below under Environmental Considerations, according to the U.S. Fish and Wildlife Service IPac System, there is no designated critical habitat for the five federally protected species with the potential to occur near the Site. The geotechnical report included with this submittal found no fault zones on the project site; however, the report acknowledges that the site is within an active earthquake area and provides general recommendations to mitigate their impact.

The site plan set includes the partial site grading plan and condensed slope analysis.



SLOPES TABLE

NUMBER	MIN SLOPE	MAX SLOPE	TOTAL AREA	COLOR	DISTURBED AREA
1	0.0%	15.0%	81,467		2,353
2	15.0%	20.0%	40,170		6,784
3	20.0%	25.0%	35,988		10,639
4	25.0%	30.0%	25,043		7,420
5	30.0%	65.3%	38,498		6,546

Figure 2: Slopes Table

Environmental Considerations

Community Types and Existing Vegetation

The Site is composed primarily of Ponderosa pines (*Pinus jeffreyi*), upland scrub-shrub dominated by big basin sagebrush (*Artemisia tridentata* v. *tridentata*, UPL), Rabbitbrush (*Chrysothamnus*) and Manzanita (*Arctostaphylos patula*). The commonly observed herbaceous and grass species included Cheatgrass (*Bromus tectorum L.*).

Hydrological Conditions

Based on Washoe County GIS data, approximately 6,700 square feet (0.15 acre) of the Site is located within primary flood plan (Zone "A") attributed to Franktown Creek (reference Figure 2). Franktown Creek is an intermittent stream formed from the discharge of the Hobart Creek Reservoir. The stream flows west to northeast near the Site and ultimately exits at Washoe Lake.

The balance of the Site is located outside of the 500-year flood plain (Zone "X" Unshaded).

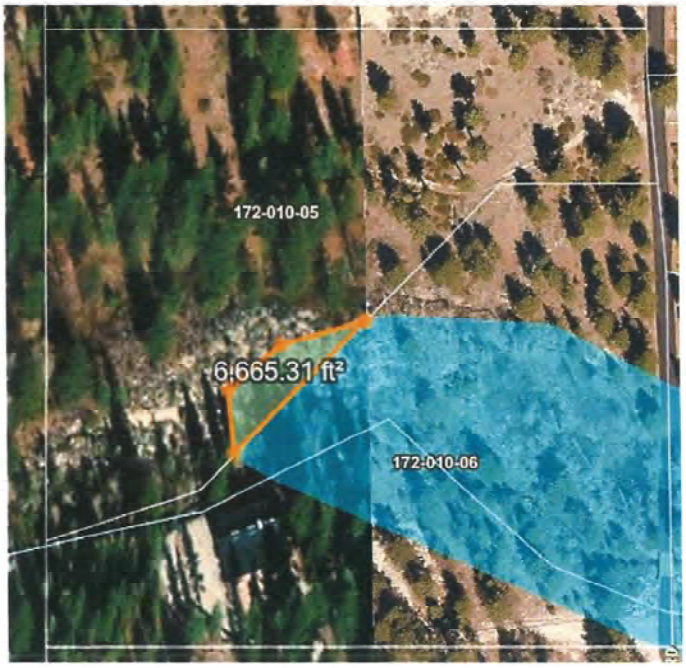


***Figure 3*: Floodplain Illustration**

GIS data indicates that the flowline of Franktown Creek is not located on the Site; however, the buffer area identified in GIS as a "Regulated Waterway" is located within the property boundary (reference Figure 3). This area is approximately 40,000 square feet (0.92 acres). The proposed developed portions of the Site are located outside of the Franktown Creek buffer area and the primary flood plain.

The National Wetland Inventory (NWI) maps a small portion of the southwest corner of the Site as Riverine Habitat/Intermittent Stream (reference Figure 4). This area is not proposed for development. No other wetlands or aquatic resources were mapped by the NWI. See Figure 4 below.

Figure 4: Wetland Area

Habitat areas for Rare or Endangered species
The U.S. Fish & Wildlife Service Information for Planning and Consultation Website (accessed October 20, 2022) identified five federally protected species with potential to occur near the Site Area.

Mammals
- North American Wolverine (*Gulo gulo luscus*) Proposed Threatened

Amphibians
- Sierra Nevada Yellow-legged Frog (*Rana sierrae*) Endangered

Fishes
- Cui-ui (*Chasmistes cujus*) Endangered

Insects
- Monarch Butterfly (*Danaus plexippus*), Candidate

Conifers and Cycads
- Whitebark Pine (Pinus albicaulis) Proposed Threatened

According to the U.S. Fish & Wildlife Service IPac System, there is **no designated critical habitat** for these listed species within the Site.

Sources: https://ipac.ecosphere.fws.gov/
https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper
https://gis.washoecounty.us/wrms?apn=17201005

Thank you in advance for your consideration of this special use permit request. As you review these responses and the project's design should you have any questions or require any clarifications, we trust you will not hesitate to contact us.
Sincerely,

R.O. ANDERSON ENGINEERING, INC.

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R.O. ANDERSON ENGINEERING, INC.

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Attachments

cc. Stan and Debra Dahlin

Ms. Debra Dahlin
P.O. Box 370
Hilmar, CA 95324

Project No.: 2688-01-1
June 7, 2022

RE: Geotechnical Investigation
65 Will Sauer Road, Single-Family Residence
Washoe County, Nevada

Dear Ms. Dahlin,

Black Eagle Consulting, Inc. (BEC) is pleased to present the results of our geotechnical investigation for the proposed single-family residence at 65 Will Sauer Road in Washoe County, Nevada. The purpose of this geotechnical investigation was to evaluate in-situ soils and to provide any associated recommendations that would aid in adequate performance of structural elements.

Project Description

The project will involve the design and construction of a single-family home on an approximately 5.0-acre parcel (APN 172-010-05) located at 65 Will Sauer Road in Washoe County, Nevada. We understand the home will be a 2-story, wood-framed structure with separate garage and shop buildings. Site grading will utilize multi-tiered retaining walls which will retain cut and fill soils. The structures will be supported on Portland cement concrete (PCC) spread footings and will have a PCC slab-on-grade floor garage with raised wooden floors constructed over a crawl space within the living area. An asphalt concrete paved driveway will be constructed from Will Sauer Road. The residence is to be served by an individual sewage disposal system designed by others.

The grading plan by R.O. Anderson indicates cuts of approximately 15 feet and fills up to approximately 10 feet will be involved in grading building pads and the driveway for the residence.

Site Conditions

The site is generally undeveloped with the exception of some minor grading and tree removal and is moderately to densely forested with grass and sagebrush. A creek drainage, flowing to the east, forms the southern property boundary. The site exhibits steep topography, with approximately 60 feet of vertical relief from west to east. Access to the site is obtained by Will Sauer Road near the southwest corner of the site.

Site Investigation

The site was explored on May 23, 2022, by excavating 2 test pits using a John Deere 310 backhoe. Test pits were excavated near the southern and northern ends of the building area as shown on Plate 1 (Plot Plan). Bulk samples for index testing were collected from the trench wall sides at specific depths in each soil horizon.

A geotechnical engineer examined and classified all soils in the field in accordance with the American Society for Testing and Materials (ASTM) D 2488. During test pit excavation, representative bulk samples were placed in sealed plastic bags and returned to our Reno, Nevada, laboratory for analysis. Additional

soil classification was subsequently performed in accordance with ASTM 2487 (Unified Soil Classification System [USCS]) upon completion of laboratory testing as described below in the **Laboratory Testing** section. Logs of the test pits are presented as Plate 2 (Test Pit Logs), and a USCS chart has been included as Plate 3 (Graphic Soils Classification Chart).

Laboratory Testing

All soils testing performed in the BEC soils laboratory is conducted in accordance with the standards and methodologies described in Volume 4.08 and 4.09 of ASTM Standards. Representative samples were analyzed to determine their in-situ moisture content (ASTM D 2216) and grain size distribution (ASTM D 6913), and the results of these tests are shown on the attached Plates 4a and 4b (Grain Size Distribution Test Results). Results of these tests were used to classify the soils according to ASTM D 2487 and to verify the field classification.

Chemical testing is underway and will be provided in an addendum to this report. This testing is being performed on a representative sample of site foundation soils to evaluate the material's potential to corrode buried steel and concrete in contact with the ground. The samples are being tested for pH, resistivity, redox potential, soluble sulfates and sulfides. Chemical testing is performed by Silver State Analytical Laboratories of Reno, Nevada.

Geology and Soil Conditions

The site lies in an area mapped by the Nevada Bureau of Mines and Geology (NBMG) as *Cretaceous aged Granite* (Carlson, et al., 2019). The NBMG describes this unit as *Light- to medium-gray, medium-grained plutonic igneous rock along the western part of the quadrangle. Composed of approximately equal amounts of plagioclase, quartz, K-feldspar, and brown to black, anhedral to subhedral biotite 2–5 mm in diameter. Biotite phenocrysts are commonly intergrown giving a hackled appearance. Outcrops along the western boundary of the quadrangle are commonly highly fractured and/or sheared*. The materials encountered during exploration are generally consistent with the geologic map.

The site materials consist of silty sand soils ranging from 8 to 10 feet thick underlain by granitic bedrock extending through the maximum depth of exploration, about 10 feet below the existing ground surface. The granitic bedrock is typically decomposed, but hard rock or corestones should be expected sporadically around the site.

The silty sand soils are described as light brown, greyish brown and brown, moist, loose to medium dense, and as containing about 12 percent non-plastic fines, 70 percent fine to coarse sand, and up to 18 percent gravel. The underlying decomposed granite generally increases in hardness with depth and has variable degrees of weathering. The bedrock encountered in test pit TP-01 was excavated until digging refusal at 8 feet below the ground surface. The bedrock is described as moderately weathered and moderately strong to strong, and during test pit excavation broke down to poorly graded gravel with sand. Cobbles up to 10 inches in diameter make up over 60 percent of the total rock mass.

Groundwater was not encountered in the test pit exploration. In general, groundwater is anticipated to be perched at or near the ground surface during the spring thaw, percolating downslope over the soil/bedrock interface during years with normal to heavy snowfall. The duration of saturated surface soils will be dependent on snow accumulation over the winter months, recent precipitation, and runoff conditions.

Geologic Hazards

Seismicity

Much of the western United States is a region of moderate to intense seismicity related to movement of crustal masses (plate tectonics). By far, the most seismically active regions, outside of Alaska, are in the vicinity of the San Andreas Fault system of western California. Other seismically active areas include the Wasatch Front in Salt Lake City, Utah, which forms the eastern boundary of the Basin and Range physiographic province, and the eastern front of the Sierra Nevada mountains, which is the western margin of the province. Washoe Valley lies along the eastern escarpment of the Sierra Nevada, within the western extreme of the Basin and Range. It must be recognized that there are probably few regions in the United States not underlain at some depth by older bedrock faults. Even areas within the interior of North America have a history of strong seismic activity.

The Washoe Valley lies in an area with a high potential for strong earthquake shaking. Seismicity within the area is considered about average for the western Basin and Range Province (Ryall and Douglas, 1976). It is generally accepted that a maximum credible earthquake in this area would be in the range of magnitude 7 to 7.5 along the frontal fault system of the eastern Sierra Nevada.

Faulting

The Nevada Bureau of Mines and Geology's (NBMG) MyHazards web mapping tool (NBMG, 2022a) shows splays of the Mount Rose fault zone in the vicinity of the property. The nearest mapped Holocene age fault is located about 400 feet east of the property and trends north-south. Review of the NBMG's Lidar data for this area (NBMG, 2022b) reveals 2 linear features at the site. A BEC geologist made a site visit and confirmed these features are associated with site drainage. No fault scarps or evidence of past earthquake displacement were observed within the project area.

The Nevada Earthquake Safety Council (1998) has developed and adopted the criteria for evaluation of Quaternary age earthquake faults. *Holocene Active Faults* are defined as those with evidence of movement within the past 10,000 years (Holocene time). Those faults with evidence of displacement during the last 130,000 years are termed *Late Quaternary Active Faults*. A *Quaternary Active Fault* is one that has moved within the last 1.6 million years. An *Inactive Fault* is a fault *without recognized activity within Quaternary time* (last 1.6 million years). Holocene Active Faults normally require that occupied structures be set back a minimum of 50 feet (100-foot-wide zone) from the ground surface fault trace. An *Occupied Structure* is considered a building, as defined by the *International Building Code* (*IBC*), *which is expected to have a human occupancy rate of more than 2,000 hours per year* (International Code Council [ICC], 2018b).

Recurrence intervals for Nevada earthquakes along faults that have been studied are estimated to be in the range of 6,000 to 18,000 years in western Nevada (Bell, 1984). The very active eastern boundary faults of the Sierra Nevada mountains may have a shorter recurrence interval of 1,000 to 2,000 years. Many of the smaller faults may be the result of one-time events in response to movement along a better developed and more active fault system a considerable distance away.

Because no faults are mapped on the lot nor were detected during our site exploration, no mitigation measures are deemed necessary.

Ground Motion

The United States Geological Survey seismic design maps that have been incorporated with the American Society of Civil Engineers (ASCE) Online *ASCE 7 Hazard Tool* indicate that there is a 2 percent probability that a *bedrock* ground acceleration of 0.51 g will be exceeded in any 50-year interval (ASCE, 2022). Only localized amplification of ground motion would be expected during an earthquake.

Liquefaction

Because the proposed homesite is underlain by dense granular soils and bedrock, liquefaction potential is negligible.

Flood Plains

The Federal Emergency Management Agency (FEMA) has identified the homesite as lying in unshaded Zone X, or outside the limits of a 500-year flood plain The creek area on the southern end of the property lies within Zone A, which is the 1 percent annual flood hazard zone (FEMA, 2009).

Discussion and Recommendations

The recommendations provided herein are intended to minimize risks of structural distress related to consolidation or expansion of native soils and/or structural fills. These recommendations, along with proper design and construction of the structure and associated improvements, work together as a system to improve overall performance. If any aspect of this system is ignored or poorly implemented, the performance of the project will suffer. Sufficient quality control should be performed to verify that the recommendations presented in this report are followed.

Structural areas referred to in this report include all areas of concrete slabs and asphalt pavements as well as pads for any minor structures. All compaction requirements presented in this report are relative to ASTM D 1557.

Any evaluation of the site for the presence of surface or subsurface hazardous substances is beyond the scope of this investigation. When suspected hazardous substances are encountered during routine geotechnical investigations, they are noted in the exploration logs and immediately reported to the client. No such substances were revealed during our exploration.

Construction Recommendations

1. The test pits were excavated by a backhoe at the approximate locations near the building footprint. The test pits were backfilled to the extent possible with the equipment on hand; however, the backfill was not compacted to the requirements for structural fill. As a result, over-excavation and recompaction of the test pit backfill must be performed in accordance with Item 9 of this report. Failure to properly compact backfill will result in excessive settlement of improvements located over test pit backfill.

2. All vegetation should be stripped and grubbed from structural areas and removed from the site. A stripping depth of 6 to 12 inches is anticipated in soil areas. Tree roots greater than one-half inch in diameter should be removed to a minimum depth of 12 inches below finished grade. Larger roots should be removed to the maximum depth possible. Resulting excavations should be backfilled to the specifications in Item 9 of this report.

3. The site materials include granular surficial soils and weathered granitic bedrock which increases in hardness with depth. The site materials are exclusively granular and are suitable to support the proposed improvements in cut when properly prepared, and can be reused as structural fill/rock fill after exclusion of oversized particles.

4. All soil areas to receive structural fill or structural loading shall be scarified to a depth of 6 inches, moisture-conditioned to near optimum moisture content, and compacted to a minimum 90 percent relative compaction.

   Where greater than 30 percent is retained on the ¾-inch sieve, as could occur within site materials, standard density testing is not valid and the materials will be considered rock fill. See Item 9 for grading requirements concerning rock fill. In all cases, the final surface should be firm and exhibit no signs of deflection.

5. If construction takes place during winter or spring snowmelt runoff, localized site soils will be well over optimum moisture content and difficult to compact to the specified levels. In some situations, moisture-conditioning may be possible by scarifying the top 12 inches of subgrade and allowing it to air-dry to near optimum moisture prior to compaction. Where this procedure is ineffective or where construction schedules preclude delays, mechanical stabilization will be necessary. Mechanical stabilization may be achieved by over-excavation and/or placement of an initial 12- to 18-inch-thick lift of 12-inch-minus, 3-inch-plus, well graded, angular rock fill. Some of the on-site cobbles may be suitable for this purpose. The more angular and well graded the rock is, the more effective it will be. This fill should be densified with large equipment, such as a self-propelled sheepsfoot or large loader, until no further deflection is noted. Additional lifts of rock may be necessary to achieve adequate stability. The use of a geotextile will prevent mud from pumping up between the rocks, thereby increasing rock-to-rock contact and decreasing the required thickness of stabilizing fill. The geotextile should meet or exceed the following minimum properties.

TABLE 1 - MINIMUM AVERAGE ROLL STRENGTH PROPERTIES FOR GEOTEXTILE	
Trapezoid Strength (ASTM D 4533)	80 x 80 lbs.
Puncture Strength (ASTM D 4833)	105 lbs.
Grab Tensile/Elongation (ASTM D 4632)	200 x 200 @ 50 %

As an alternate to rock fill, a geotextile/gravel system may be used for stabilization. Aggregate base (*Standard Specifications for Public Works Construction* [*SSPWC*], 2016), Class C or D drain rock (*SSPWC*, 2016) or approved pit-run gravels should be placed above the geotextile. Regardless of which alternate is selected, a test section is recommended to determine the required thickness of stabilization.

6. The site bedrock will likely be excavatable with variable difficulty through depths approaching 10 to 12 feet using large excavators. Isolated areas of hard corestones may be encountered that require aggressive excavation techniques which may include ripping shanks or hydraulic hammers. If cuts deeper than 12 feet are planned, blasting cannot be ruled out.

7. Temporary trenches with near-vertical sidewalls should be stable in soils to a depth of approximately 4 feet. Excavations to greater depths in soils will require laying back of sidewalls at a slope no steeper than 1H:1V (horizontal to vertical) to maintain adequate stability. Depending on the bedrock conditions, it may be considered stable rock in temporary excavations and may be excavated at a near-vertical configuration; however, any loose particles exposed on the bedrock should be cleaned to ensure worker safety from dislodging rocks. All trenching and excavation should conform to Occupational Safety and Health Administration (OSHA) standards.

8. The maximum particle size in trench backfill should be 4 inches. Bedding and initial backfill 12 inches over the pipe will require import of Class A bedding sand (*SSPWC*, 2016) and should conform to the requirements of the utility having jurisdiction. Bedding and initial backfill should be densified to at least 90 percent relative compaction. Native soils and excavated bedrock will provide adequate final backfill as long as oversized material is removed, and they should be placed in maximum 8-inch-thick loose lifts which are compacted to a minimum of 90 percent relative compaction in all structural areas.

9. All structural fill shall be moisture conditioned to near optimum moisture content, spread in maximum 8-inch-thick loose lifts, and densified to at least 90 percent relative compaction. Native materials are exclusively granular; as such, excavated surficial soils and bedrock materials will be suitable for use as structural fill provided particles larger than 6 inches are removed. Oversized particles removed from structural fill may be stockpiled for later use as erosion protection or as landscape features. Imported structural fill is not anticipated for this project. If imported structural fill is necessary, we recommend it satisfy the specifications of Table 2 (Guideline Specification for Imported Structural Fill).

TABLE 2 - GUIDELINE SPECIFICATION FOR IMPORTED STRUCTURAL FILL		
Sieve Size	**Percent by Weight Passing**	
6 Inch	100	
3/4 Inch	70 – 100	
No. 40	15 – 70	
No. 200	5 – 30	
Percent Passing No. 200 Sieve	**Maximum Liquid Limit**	**Maximum Plastic Index**
5 – 10	50	20
11 – 20	40	15
21 – 30	35	10

These recommendations are intended as guidelines to specify readily available, prequalified material. Adjustments to the recommended limits can be provided to allow the use of other granular, non-expansive material in specific areas, but any such adjustments must be made and approved by the geotechnical engineer, in writing, prior to importing fill to the site.

Beyond about 5 feet depth, the site materials will commonly have greater than 30 percent retained on the ¾-inch sieve, such that standard density testing is not valid. These materials will be treated as rock fills with a maximum lift thickness and maximum particle size of 12 inches and 8 inches, respectively. A proof rolling program of at least 5 single passes of a minimum 10-ton vibratory roller in mass grading, or at least 5 complete passes with hand compactors in footing trenches, is recommended.

Properly constructed rock fills have a long history of excellent performance in northern Nevada. Acceptance of this rock fill is based upon observation of particle size, lift thickness, moisture content, and applied compactive effort. Compaction must continue to the satisfaction of the engineer. In all cases, the finished surface shall be firm and show no signs of deflection.

All fill slopes should be keyed into the hillside at the toe of the slope. The keyway should extend a minimum of 18 inches deep into native soils or bedrock and should be a minimum of 4 feet wide.

10. All exterior footings should be placed a minimum 2 feet below adjacent finished grade for frost protection. Where footings are located on steep slopes, they should be at a sufficient depth so that they are located 2 feet below grade and at least 3 feet horizontally from daylighting.

11. If footing excavations are open for extended periods of time and disturbed soils are encountered at the foundation subgrade at the time of concrete placement, these soils should be recompacted or removed to expose undisturbed, native, coarse-grained soils or bedrock and the resulting over-excavation backfilled with compacted structural fill. The base of all excavations should be dry and free of loose soils at the time of concrete placement.

12. Based on the available grading plans, new cut and fill slopes on the order of 10 to 15 feet will be necessary for grading. Permanent cut and fill slopes should be stable at a 2H:1V ratio in the types of materials encountered at the site. Depending on the materials encountered, bedrock cuts may be stable at 1.5H:1V, but plans should be evaluated by the engineer and will require field verification.

    Temporary (during construction) and permanent (after construction) erosion control of disturbed areas will be required in accordance with local standards. Dust potential at this site will be moderate during dry periods. The project specifications should include an indemnification by the contractor of the owner and engineer for any dust generation during the construction period. The owner will be responsible for mitigation of dust after his/her acceptance of the project.

13. Foundation and stem wall backfill should be thoroughly compacted to decrease permeability and reduce the potential for irrigation and snowmelt to migrate beneath the slab or crawl space.

14. Adequate surface drainage should be provided away from the structure. In particular, the upslope sides of the house should have drainage swales to divert surface snowmelt runoff away from the structure. Designated snow storage areas should be placed downslope, away from the house, and should have drainage swales to direct meltwater away from downslope structures. Snow should not be allowed to accumulate directly adjacent to the foundations.

15. A surface swale should be installed along the upper shoulder of any cut slope and graded to drain around and away from the slope face.

16. Subsurface foundation drainage must be installed along the exterior perimeter of the residence and associated footings. This may be accomplished by placing a non-woven geotextile/gravel system with a network of perforated drain pipes below and along the outside base of the exterior footings. The geotextile should consist of Mirafi® 140N or an approved equivalent. A trench should be excavated to a depth of at least 6 inches below the base and directly adjacent to the outside of the footings. A perforated, 4-inch-diameter drain pipe should be placed in the bottom of the trench and graded to drain downslope of the residence. A minimum of 12 inches of Class C or D drain rock (*SSPWC,* 2016) should be placed above the drain pipe and around the footing, then covered by the geotextile. The permeable material should extend up above any soil/bedrock contact exposed in footing excavations and above the footing/stem wall cold joint.

17. Positive crawl space drainage must be provided. This can be accomplished by grading the crawl space to drain to one or more localized areas and providing 3-inch-diameter pipes to daylight beneath the footing and tie into the exterior foundation drain.

18. Additional exterior subsurface drainage should also be considered, especially for areas of cut, to aid in control of seepage and surface drainage from snowmelt. Because the exterior of the structure will be graded to drain away from the residence, subsurface drains can be installed in front of landscaping walls or along the toe of cut slopes to help collect snowmelt and runoff and route it around the structure and foundations. Subsurface drains should be installed in a minimum 12-inch-wide trench to a minimum depth of 4 feet below finished grade and consist of a minimum 4-inch-diameter, perforated drain pipe. The drain pipe shall be bedded and backfilled to finished grade with clean, granular drain fill which is fully encapsulated by a non-woven geotextile.

19. The cold joint between the footing and stem wall shall be waterproofed using a waterstop or silicone-based caulk in order to further minimize seepage potential.

20. All structure retaining walls shall have a drainage layer behind the wall that is hydraulically connected to the foundation drain. The drainage layer behind the retaining wall can consist of a pre-fabricated drain system such as Mirafi® G100N or an approved equivalent.

21. Any interior concrete slab-on-grade floors shall be a minimum of 4 inches thick and will require a moisture barrier system. Installation should conform to the specifications provided for a Class B vapor restraint (ASTM E 1745-97). The vapor barrier should consist of placing a 15-mil-thick Stego® Wrap Vapor Barrier or an approved equal directly on a properly prepared subgrade surface in areas of fill or on a minimum of 6 inches of clean, compacted granular drain fill in areas of cut. The drain fill should be hydraulically connected to the exterior foundation drainage system. A 4-inch-thick layer of Type 2, Class B aggregate base (*SSPWC,* 2016) should be placed over the vapor barrier and compacted with a vibratory plate. The base layer should remain compacted and a uniform thickness maintained during the concrete pour, as its intended purpose is to facilitate even curing of the concrete and minimize curling of the slab. Extra attention should be given during construction to ensure that rebar reinforcement and equipment do not damage the integrity of the vapor barrier. Care must be taken so that concrete discharge does not scour the base material from the vapor barrier. This can be accomplished by maintaining the discharge hose in the concrete and allowing the concrete to flow out over the base layer.

22. Interior floor slab reinforcement, as a minimum, shall consist of No. 3 reinforcing steel placed on 24-inch centers in each direction, or flat sheets of 6x6, W4.0xW4.0 welded wire mesh (WWM). Rolls of WWM are not recommended for use because vertically centered placement of rolled WWM within a floor slab is difficult to achieve. All reinforcing steel and WWM should be centered in the floor slab through the use of concrete dobies or an approved equivalent. Final reinforcement design should be performed by the project structural engineer.

23. All exterior concrete slabs, masonry pavers, and asphalt pavements shall be directly underlain by a minimum of 6 inches of Type 2, Class B aggregate base (*SSPWC*, 2016). Aggregate base courses shall be densified to at least 95 percent relative compaction (ASTM D 1557). A minimum 1-inch sand leveling course is also required for masonry pavers.

24. Special considerations should be given to concrete placed and cured during hot or cold weather temperatures, low humidity conditions, and windy conditions such as are common in the eastern Sierra Nevada. Proper control joints and reinforcement should be provided to minimize any damage resulting from shrinkage as discussed below. In particular, crack-control joints shall be installed on maximum 10-foot centers and shall be installed to a minimum depth of 25 percent of the slab thickness. Saw-cuts, zip strips, and/or trowel joints are acceptable; however, saw-cut joints must be installed as soon as initial set allows and prior to the development of internal stresses that will result in a random crack pattern. If trowel joints are used in the main living area floor slab, they will need to be grouted over prior to installation of floor covering.

25. Tile and natural stone flooring will require that the floor be checked and corrected for flatness in accordance with the product manufacturer's specifications. All construction joints, crack-control joints and random cracks must be prepared so as to prevent reflective cracking through brittle flooring. A stress-relief tile set product must be used.

26. If asphalt concrete is planned for the driveway, it shall be a minimum of 3 inches thick and underlain by a minimum of 6 inches of Type 2, Class B aggregate base (*SSPWC*, 2016). Edge drains or roadside v-ditches are recommended to minimize subgrade saturation. Edge drains should consist of either a narrow trench backfilled with a 3-inch-diameter drain pipe and geotextile/gravel system or a pre-manufactured drain system. In either case, the drain or ditch should extend at least 12 inches below the aggregate base section. The drains or ditches should daylight on the property.

Geotechnical Design Criteria

1. The residential structure should be designed in accordance with the 2018 *International Residential Code* ([IRC] ICC, 2018a) adopted by Washoe County. Based on materials encountered during site exploration, our experience at the site and the regional geology of the Franktown Road area, it is our opinion that a Soil Profile Type C is appropriate for this site. The recommended seismic design criteria using the 2018 *IRC* are provided in Table 3a (Seismic Design Criteria Using 2018 *International Residential Code*).

TABLE 3a - SEISMIC DESIGN CRITERIA USING 2018 *INTERNATIONAL RESIDENTIAL CODE* (ASCE, 2022)	
Latitude	39.2723
Longitude	-119.8462
Spectral Response at Short Periods, S_s, percent of gravity	213.2
Site Class	C
Soil Factor for Site Class C	1.0
Risk Category	II
Residential Site Value, percent of gravity	170.5
Residential Seismic Design Category	E

With the Residential Seismic Design Category of E provided in Table 3a, the proposed home may be designed using the 2018 *IBC* (ICC, 2018b), subject to various other requirements of the 2018 *IRC* (ICC, 2018a) that should be adhered to by the structural engineer.

The 2018 *IBC* and *IRC* seismic design loads are based on the ASCE 7-16 Standards titled *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE, 2017). The recommended seismic design criteria using the 2018 *IBC* for Site Class C are presented in Table 3b (Seismic Design Criteria Using 2018 *International Building Code*).

TABLE 3b - SEISMIC DESIGN CRITERIA USING 2018 *INTERNATIONAL BUILDING CODE* (ASCE, 2022)	
Approximate Latitude	39.2723
Approximate Longitude	-119.8462
Spectral Response at Short Periods, S_s, percent of gravity	213.2
Spectral Response at 1-Second Period, S_1, percent of gravity	76.3
Site Class	C
Risk Category	II
Site Coefficient F_a, decimal	1.2
Site Coefficient F_v, decimal	1.4
Site Adjusted Spectral Response at Short Periods, S_{MS}, percent of gravity	255.8
Site Adjusted Spectral Response at Long Periods, S_{M1}, percent of gravity	106.9
Design Spectral Response at Short Periods, S_{DS}, percent of gravity	170.5
Design Spectral Response at Long Periods, S_{D1}, percent of gravity	71.3
Seismic Design Category	D

These parameters were derived from a maximum moment magnitude earthquake of 7 to 7.5 occurring on the Mount Rose fault, approximately 400 feet west of the site.

2. Individual column footings and continuous wall footings underlain by properly prepared native granular soils or bedrock, compacted structural fill, or rock fill can be designed for a net maximum allowable bearing pressure of 2,500 pounds per square foot (psf). This bearing value may be increased by one-third for total loads. With this allowable bearing pressure, total foundation movements of ¾ of an inch or less should be anticipated. Differential movements between footings with similar loads, dimensions, and base elevations should not exceed ½ inch. The majority of the anticipated movement will occur during the construction period as the loads are applied.

3. Lateral loads, such as wind or seismic, may be resisted by passive soil pressure and friction on the bottom of the footing. The recommended coefficient of base friction is 0.45 and has been reduced by a factor of 1.5 on the ultimate soil strength. Design values for active and passive equivalent fluid pressures are 35 and 420 psf per foot of depth, respectively. These design values are based on spread footings bearing on properly prepared native granular soils, bedrock, or structural/rock fill and backfilled with structural fill.

4. The following recommendations are for small retaining walls with vertical back faces, near-horizontal backfill, and a drainage layer behind the wall that is hydraulically connected to the foundation drain. Surcharge loads, including construction/traffic and snow loads, should be added to the following values. In order to develop dynamic lateral earth pressure values, dynamic earth pressure coefficients were determined using the Mononobe-Okabe (Richards and Elms, 1979) equation and a 2 percent probability that a *bedrock* ground acceleration of 0.51 g will be exceeded in any 50-year interval.

TABLE 4 - RETAINING WALL DESIGN PARAMETERS	
Bearing Pressure	2,500 psf
Coefficient of Friction	0.45
At Rest Equivalent Fluid Pressure (static/dynamic)	55 pcf/NA[1]
Active Equivalent Fluid Pressure (static/dynamic)	35 pcf/67 pcf
Passive Equivalent Fluid Pressure (static/dynamic)	147[2] pcf/220 pcf
Unit Weight of Soil	120 pcf
[1]NA = Not Applicable. For design of structure under dynamic at-rest conditions, use dynamic active earth pressure. [2]Reduced by a factor of 0.67 to minimize wall rotation.	

Homeowner's Responsibilities

1. The custom homebuilder/contractor will finish grade the area near the structure to prevent ponding of water adjacent to structural improvements and to provide drainage away from the structure in accordance with local building codes. If the homeowner alters the drainage present at

the time of completion of construction, either by landscaping and/or making improvements on the lot, he/she must provide drainage away from the structure in accordance with local building codes. If positive drainage is not provided by the homeowner, differential movement of structural improvements could be experienced and result in cracking of interior walls and foundations.

2. The site is located in an area with active earthquakes in relatively close proximity. While the potential for ground rupture or liquefaction is minimal, the site does lie within a seismically active region with a high potential for ground shaking. The recurrence interval for earthquakes along the major active faults in the region is generally thought to be in the range of 1,000 years or more. The most recent earthquakes in northern Nevada, however, have occurred along lesser-known faults which seem to represent tectonic plate boundary motion. Approximately 85 percent of this motion is taken up along the San Andreas Fault in California, but as much as 15 percent of the plate motion appears to be occurring along numerous, smaller strike-slip faults in western Nevada. The realization that plate boundary faulting extends so far inland is relatively recent, such that the probable recurrence intervals and magnitudes of the consequent earthquakes are unknown. For this reason and the general high potential for ground shaking in this area, homeowners should be advised to consider purchasing earthquake insurance. Typically, such insurance is of very low cost but has such a high deductible that it is only beneficial during a very large-scale seismic event.

Closing

1. All plans and specifications should be reviewed for conformance with this geotechnical report and approved by the geotechnical engineer prior to submitting to the building department for review.

2. The recommendations presented in this report are based on the assumption that sufficient field testing and construction review will be provided during all phases of construction. We should review the final plans and specifications for conformance with the intent of our recommendations. Prior to construction, a pre-job conference should be scheduled to include, but not be limited to, the owner, design engineer, general contractor, building official, and geotechnical engineer. The conference will allow parties to review the project plans, specifications, and recommendations presented in this report and discuss applicable material quality and mix design requirements. All quality control reports should be submitted to and reviewed by the geotechnical engineer.

3. During construction, we should have the opportunity to provide sufficient on-site observation of site preparation and grading, foundation excavation, fill placement, and foundation and drainage installation. These observations would allow us to verify that the geotechnical conditions are as anticipated and that the contractor's work is in conformance with the approved plans and specifications.

4. This report has been prepared with generally accepted geotechnical practices. The analyses and recommendations submitted are based upon field exploration performed at the locations described in this report. This report does not reflect soils or groundwater variations that may

become evident during the construction period, at which time re-evaluation of the recommendations may be necessary. We recommend our firm be retained to perform construction observation in all phases of the project related to geotechnical factors to ensure compliance with our recommendations.

5. This report has been prepared to provide information allowing the architect and/or engineer to design the project. The owner is responsible for distribution of the report to all designers and contractors whose work is affected by geotechnical aspects. In the event of changes in the design, location, or ownership of the project from the time of this report, recommendations should be reviewed and possibly modified by the geotechnical engineer. If the geotechnical engineer is not granted the privilege of making this recommended review, he can assume no responsibility for misinterpretation or misapplication of his recommendations or their validity in the event changes have been made in the original design concept without his prior review. The geotechnical engineer makes no other warranties, either express or implied, as to the professional advice provided under the terms of this agreement and included in this report.

We appreciate being of service to you on this project. If you have any questions or require any additional information, please do not hesitate to contact us.

Sincerely,

Black Eagle Consulting, Inc.

C. Remington Walker, P.E.
Project Engineer

Jonathan Payne, P.G.
Senior Geologist

KC:CRW:JP:mrc

Enclosure(s): Plate 1 – Plot Plan
Plate 2 – Test Pit Logs
Plate 3 – USCS Soil Classification Chart
Plate 4 – Grain Size Distribution Test Results

Copies to: Addressee (PDF via email)

References

American Society of Civil Engineers (ASCE), 2017, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*, ASCE Standard ASCE/SEI 7-16.

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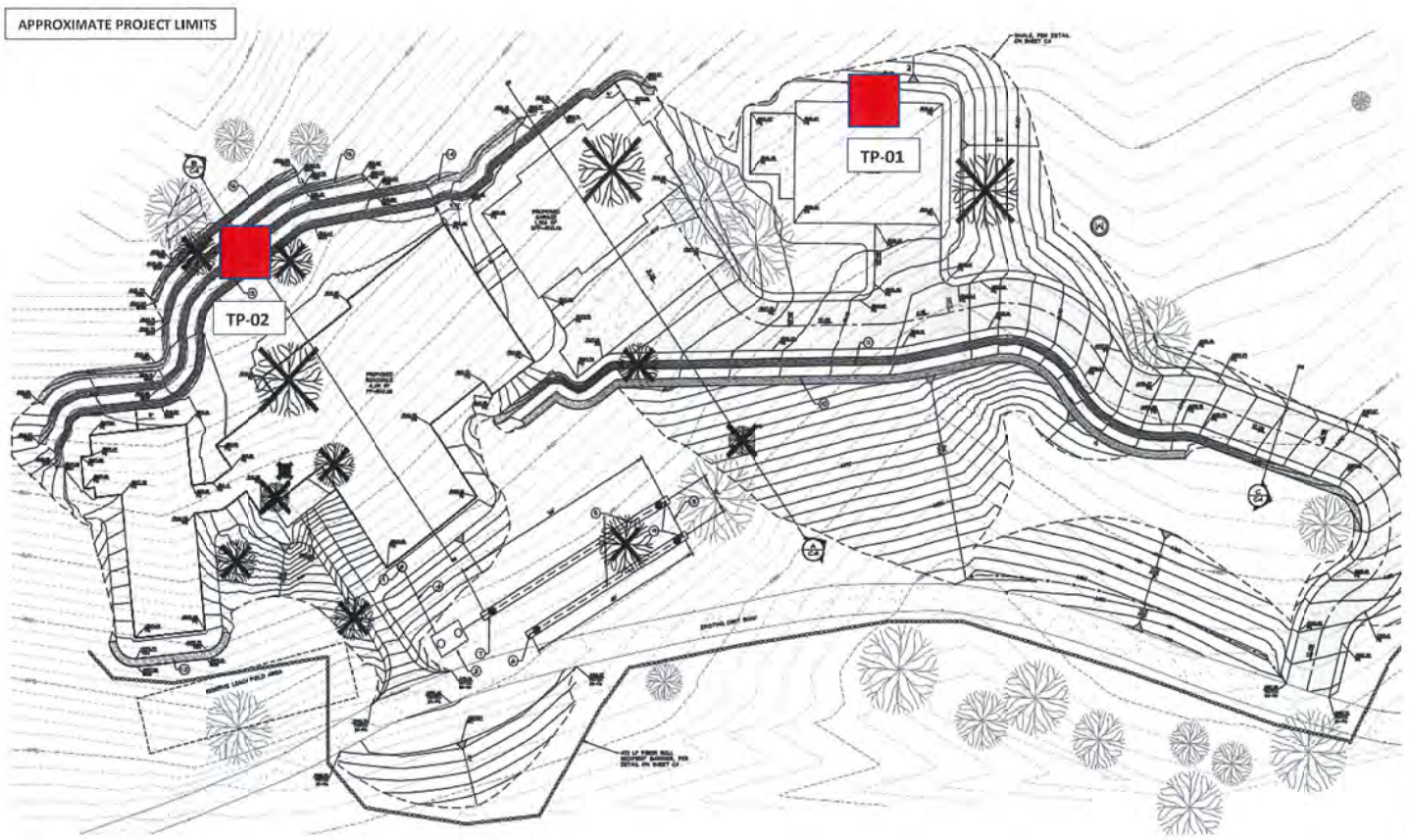
PLATES



NORTH
Overall Scale: 1" = ~ 205'

LEGEND

TP-01 APPROXIMATE TEST PIT LOCATION

Base and vicinity maps provided by R.O. Anderson Engineering

VICINITY MAP

NOT TO SCALE

MS. DEBRA DAHLIN

PLOT PLAN

65 WILL SAUER ROAD
WASHOE COUNTY, NEVADA

Black Eagle Consulting, Inc.
Project No. 2688-01-1

Plate 1

TEST PIT LOG

TEST PIT NO.: TP-1

DATE: 5/23/22

EXCAVATOR TYPE: John Deere 310 Backhoe

DEPTH TO GROUND WATER (ft): N/E

LOGGED BY: CRW

GROUND ELEVATION (ft): N/A

SAMPLE NO.	SAMPLE TYPE	PENETROMETER (tsf)	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
								Topsoil Brown, dry, medium dense, with pine needles and other organics.
					5	SM		**Silty Sand** Light Brown, moist, medium dense, with 12% non-plastic fines, 70% fine to coarse sand and 18% fine to coarse rounded gravel. Cobbles up to 10 inches in diameter make up about 10% of the total soil mass (tsm).
A	GRAB							
					10			Refusal on very dense, weathered granite.

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Washoe County, Nevada

PROJECT NO.: 2688-01-1

PLATE: 2

SHEET 1 OF 1

TEST_PIT 1880361.GPJ BLACKEAGLE.GDT 6/3/22

TEST PIT LOG

TEST PIT NO.: TP-2 | DATE: 5/23/22

EXCAVATOR TYPE: John Deere 310 Backhoe | DEPTH TO GROUND WATER (ft): N/E

LOGGED BY: CRW | GROUND ELEVATION (ft): N/A

SAMPLE NO.	SAMPLE TYPE	PENETROMETER (tsf)	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
								Topsoil Dark brown, dry, medium dense, sand with with pine needles and other organics.
					5	SM		**Silty Sand** Light brown, slightly moist, medium dense, with an estimated 10% low plasticity fines, 75% fine to medium sand and 15% fine to coarse rounded gravel.
					10			No bedrock encountered

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PROJECT NO.: 2688-01-1

PLATE: 2

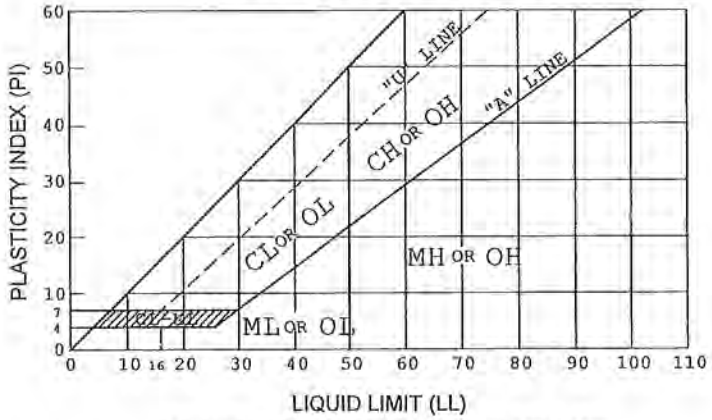
SHEET 1 OF 1

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
FILL MATERIAL				--	FILL MATERIAL, NON-NATIVE

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

PLASTICITY CHART



FOR CLASSIFICATION OF FINE-GRAINED SOILS AND FINE-GRAINED FRACTION OF COARSE-GRAINED SOILS

EXPLORATION SAMPLE TERMINOLOGY

Sample Type	Sample Symbol	Sample Code
Auger Cuttings		Auger
Bulk (Grab) Sample		Grab
Modified California Sampler		MC
Shelby Tube		SH or ST
Standard Penetration Test		SPT
Split Spoon		SS
No Sample		

GRAIN SIZE TERMINOLOGY

Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	# 4 to #200 sieve (4.75mm to 0.074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

RELATIVE DENSITY OF GRANULAR SOILS

N - Blows/ft	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
greater than 50	Very Dense

CONSISTENCY OF COHESIVE SOILS

Unconfined Compressive Strength, psf	N - Blows/ft	Consistency
less than 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,000 - 2,000	5 - 8	Firm
2,000 - 4,000	9 - 15	Stiff
4,000 - 8,000	16 - 30	Very Stiff
8,000 - 16,000	31 - 60	Hard
greater than 16,000	greater than 60	Very Hard

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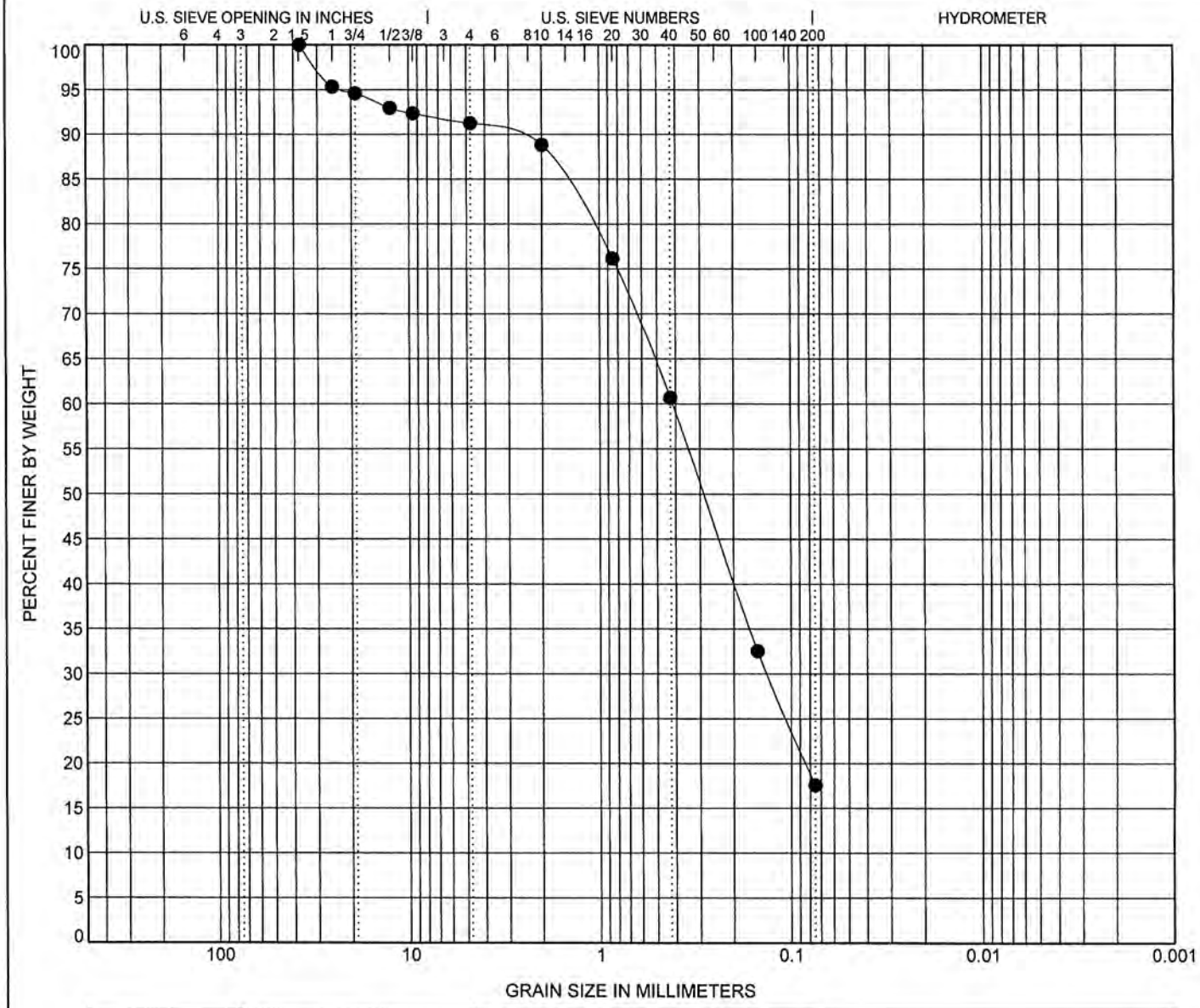
Fax: (775) 359-7766

USCS Soil Classification Chart

Project: 65 WILL SAUER ROAD
Location: WASHOE VALLEY, NEVADA
Project Number: 2688-01-1 Plate: 3



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	TP-1	6.5						

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TP-1	6.5	37	0.415	0.133		8.7	73.7	17.6	

Black Eagle Consulting, Inc.
1345 Capital Blvd., Suite A
Reno, Nevada 89502-7140
Telephone: (775) 359-6600

GRAIN SIZE DISTRIBUTION

Project: 65 Will Sauer Road SFH
Location: Washoe County, Nevada
Project Number: 1880-36-1

PLATE: 4a

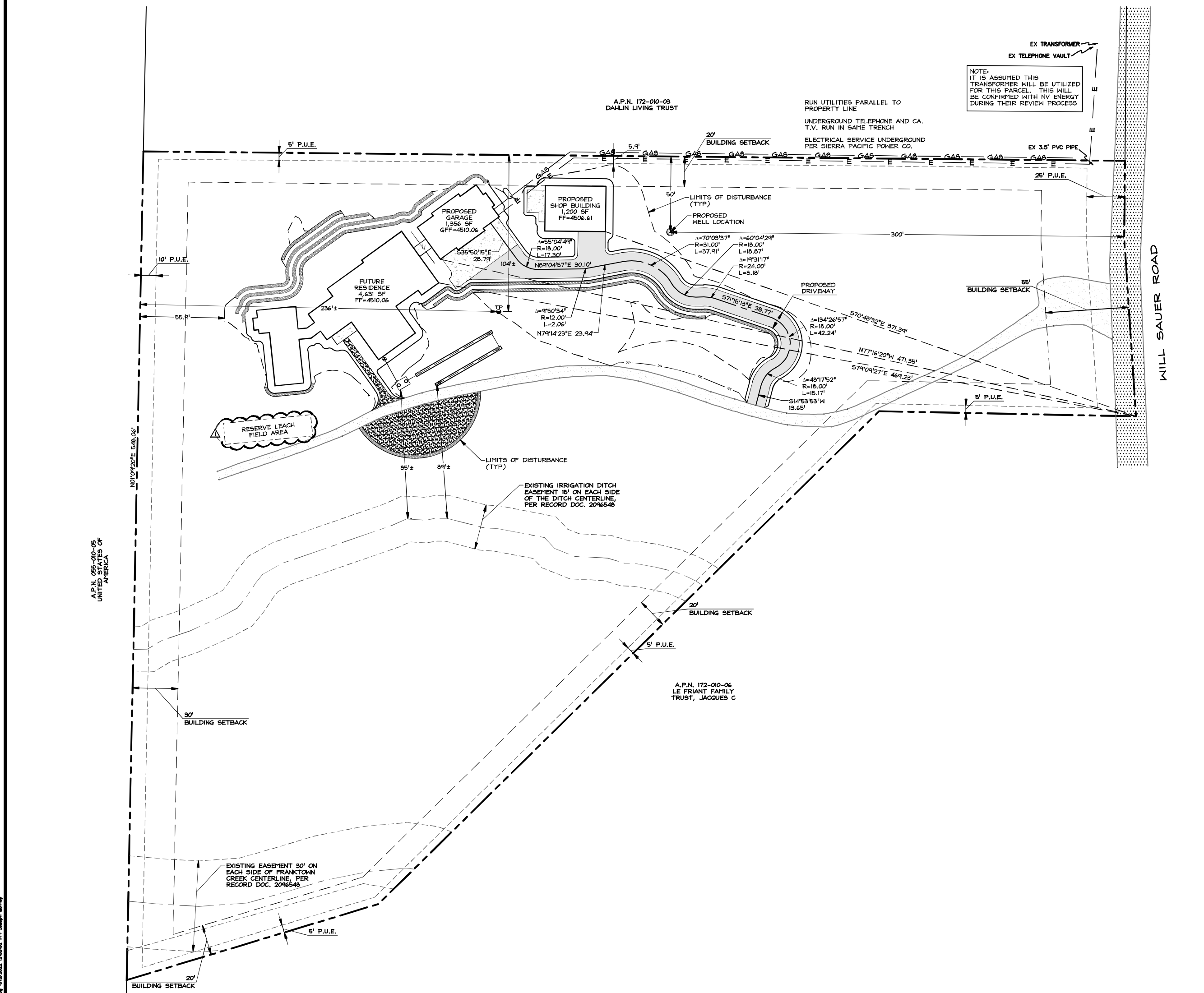
SUMMARY OF LABORATORY RESULTS

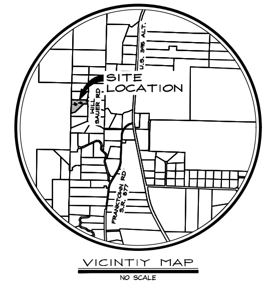
Black Eagle Consulting

CLIENT R.O. Anderson Engineering **PROJECT NAME** 65 Will Sauer Road SFH

PROJECT NUMBER 1880-36-1 **PROJECT LOCATION** Washoe County, Nevada

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
TP-1	6.5				37	18		11.9			





VICINTIY MAP

NO SCALE

PROJECT SUMMARY

A.P.N.	172-010-05
OWNER:	STAN & DEBRA DAHLIN
ADDRESS:	65 WILL SAUER RD WASHOE COUNTY, NV 89704
ENGINEER:	R.O. ANDERSON ENGINEERING, INC. P.O. BOX 2229 MINDEN, NEVADA 89423 (775) 782-2322
FLOOD ZONE:	UN-SHADDED 'X' PER FIRM MAP 32031C3350G, DATED MARCH 16, 2009
SECTION:	17
TOWNSHIP:	16
RANGE:	19
PARCEL SIZE:	5.0 AC
ZONING:	GR

GENERAL NOTES

A. NO PUBLIC SEWER SYSTEM IS AVAILABLE WITHIN 400 FEET OF RESIDENCE.

B. NO EXISTING WELLS ARE PRESENT ON ANY ADJACENT LOTS WITHIN 100' (PRIVATE WELL SETBACK) OR 200' (PUBLIC WELL SETBACK).

C. SEPTIC SYSTEM SHALL BE A STANDARD TRENCH DISPOSAL SYSTEM.

D. THE BOTTOM AND SIDEWALLS OF THE EXCAVATION SHOULD BE LEFT WITH A ROUGH OPEN SURFACE. ANY SMEARED AND COMPACTED SURFACES SHALL BE SCARIFIED PRIOR TO PLACEMENT OF DRAIN ROCK.

E. WORK SHOULD BE SCHEDULED ONLY WHEN THE INFILTRATIVE SURFACE CAN BE COVERED IN ONE DAY, BECAUSE WINDBLOWN SILT OR RAINDROP IMPACTS CAN CLOG THE SOIL.

F. ENSURE ALL PIPE PENETRATIONS AND ALL JOINTS ARE WATERTIGHT TO PREVENT INFILTRATION OF GROUNDWATER.

G. SEPTIC TANK TO HAVE 18" MINIMUM COVER. PROVIDE GRADE RINGS AND MANHOLE COVERS. PROTECT FROM VEHICULAR TRAFFIC.

H. SEWAGE DISPOSAL AREA SHALL BE PROTECTED FROM TRAFFIC, DEEP ROOTING PLANTS, AND LARGE ANIMAL HABITATION.

I. EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN AND ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITY LOCATIONS. CALL "USA DIGS" AT 1-800-227-2600 BEFORE COMMENCING CONSTRUCTION.

J. MAINTAIN ACCURATE "AS-BUILT" PLANS THROUGHOUT CONSTRUCTION. REFERENCE ALL UNDERGROUND UTILITIES, BOTH HORIZONTAL AND VERTICAL, FROM TWO (2) PERMANENT POINTS. SUBMIT "AS-BUILT" PLANS TO OWNER UPON COMPLETION OF PROJECT.

K. PLANT GRASS OVER THE ENTIRE DISPOSAL AREA USING GRASSES ADAPTED TO THE AREA. DO NOT USE DEEP ROOTED PLANTS.

L. NO LARGE TREES OR SHRUBS SHALL BE WITHIN 10' OF SEPTIC TANK OR DISPOSAL FIELD.

M. PROPOSED RESIDENCE WILL CONTAIN 4 BEDROOMS.

N. PERCOLATION TEST COMPLETED BY R.O. ANDERSON ENGINEERING ON 7/1/21.

O. FILL AREAS SHALL BE CLEARED OF VEGETATION AND DEBRIS AND SCARIFIED PRIOR TO THE PLACING OF FILL.

P. PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS SHALL BE USED TO PREVENT EXCESSIVE PONDING, EROSION AND TO PROTECT ADJOINING PROPERTIES DURING CONSTRUCTION OF IMPROVEMENTS.

Q. ALL STREETS SHALL BE MAINTAINED FREE OF DUST AND MUD CAUSED BY GRADING OPERATIONS.

R. NO ROCK OR SIMILAR MATERIAL GREATER THAN 4" IN DIAMETER SHALL BE PLACED IN THE FILL UNLESS RECOMMENDATIONS FOR SUCH PLACEMENT HAVE BEEN SUBMITTED TO AND APPROVED BY THE SOILS ENGINEER IN ADVANCE AND APPROVED BY THE COUNTY.

S. THERE ARE NO BOUNDARIES OF THE 100-YEAR FLOOD PLAIN ON OR WITHIN 100' OF THE PROPERTY.

T. THIS PROJECT IS DESIGNED IN ACCORDANCE W/ THE WASHOE COUNTY DEVELOPMENT CODE.

U. DISTRIBUTION FIELD TO BE INSPECTED BY DESIGN ENGINEER DURING CONSTRUCTION. AFTER TESTING OF THE SERIAL DISTRIBUTION SYSTEM THE ENGINEER WILL PROVIDE A CERTIFICATION OF FUNCTIONALITY LETTER TO WCHD

HATCHING

EXISTING PAVEMENT — PROPOSED PAVEMENT
EXISTING CONCRETE — PROPOSED CONCRETE
EXISTING RETAINING WALL — PROPOSED RETAINING WALL

SYMBOLS

- PERC TEST LOCATION
- EXISTING TREE REMOVAL
- SANITARY SEWER MANHOLE
- SANITARY SEWER / STORM DRAIN CLEANOUT
- WATER METER, SINGLE
- WATER GATE VALVE
- COMMUNICATION VAULT
- ELECTRICAL/POWER MANHOLE
- ELECTRICAL/POWER VAULT
- DIRECTION OF NORTH
- IDENTIFICATION OF SECTION POINTING IN THE DIRECTION IN WHICH THE SECTION IS VIEWED
- SHEET NUMBER THAT THE SECTION APPEARS ON

LINE TYPES

- BUILDING ENVELOPE
- CENTERLINE OF RIGHT-OF-WAY
- PROPOSED MAJOR CONTOUR, FIVE-FOOT INTERVAL
- PROPOSED MINOR CONTOUR, ONE-FOOT INTERVAL
- EXISTING MAJOR CONTOUR, FIVE-FOOT INTERVAL
- EXISTING MINOR CONTOUR, ONE-FOOT INTERVAL
- FLOW LINE
- GAS LINE
- POWER
- SEPTIC SYSTEM
- WATER
- COMMUNICATION
- RIGHT-OF-WAY

CALL 811 BEFORE YOU DIG

NO.	DATE	REVISION BLOCK	BY
1	07/28/2022	RESPONSE TO COMMENTS	ECH

SCALE: 1" = 30'

R|O|Anderson
WWW.ROANDERSON.COM

DAHLIN RESIDENCE
STAN & DEBBIE DAHLIN

COVER SHEET
65 WILL SAUER ROAD
A.P.N. 172-010-05

ROBERT O. ANDERSON, CIVIL, PROFESSIONAL ENGINEER, STATE OF NEVADA, Exp. 12-31-22
10/25/22

DRAWN: JAG	JOB: 3025-001
ENGINEER: ROA	DRAWING: SEE PLOT STAMP
SCALE: 1" = 30'	SHEET: C1
DATE: 10/25/2022	OF: 32 SHEETS

SPECIFIC CONSTRUCTION NOTES

◯ SYMBOL USED FOR SPECIFIC NOTE CALL OUT.

1. SANITARY SEWER CLEAN-OUT. INSTALL PER DETAIL HEREON. INSTALL MAX 2' FROM EDGE OF BUILDING.
2. 1,200 GALLON SEPTIC TANK JENSEN MODEL JS 1500 WITH JENSEN PLASTIC ACCESS RISERS TO GRADE. INSTALL PER DETAIL HEREON.
3. RELIEF LINE, INSTALL PER SEPTIC TRENCH SECTION, SEE DETAIL HEREON. ENSURE THAT INVERT OF RELIEF LINE TO SECOND DISPOSAL TRENCH IS 1"-2" ABOVE TOP OF PIPE OF UPPER DISPOSAL TRENCH.
4. 4"ϕ SDR 35 SOLID PVC SEWER PIPE, S=2% (MIN.). INSTALL PER SEPTIC TRENCH SECTION, SEE DETAIL HEREON.
5. 4" PERFORATED PVC PIPE, SLOPES GREATER THAN 2"/100' & LESS THAN 4"/100', INSTALL PER SEPTIC TRENCH SECTION, SEE DETAIL SHEET C4.
6. CAP ENDS OF 4" PERFORATED PVC PIPE DISPOSAL LINE. EXTEND TRENCH 1' BEYOND END OF LINE.
7. MONITORING WELL TO BE INSTALLED ALONG DISTRIBUTION PIPE TO MONITOR FLOW. INSTALL PER SEPTIC TRENCH SECTION, SEE DETAIL SHEET C4.
8. PERCOLATION TEST LOCATION, TYP. PERFORMED BY ROA 7/1/2021
9. RELIEF CONNECTION LINE
10. 194 LF ROCKERY WALL
11. 256 LF ROCKERY WALL
12. 43 LF ROCKERY WALL
13. 211 LF ROCKERY WALL
14. 168 LF ROCKERY WALL
15. 115 LF ROCKERY WALL
16. 131 LF ROCKERY WALL
17. 42 LF ROCKERY WALL

SLOPE STABILIZATION/RESEED NOTES

1. ALL DISTURBED AREAS SHALL BE TOPDRESSED OR REVEGETATED TO REDUCE EROSION POTENTIAL.
2. HYDROSEED DISTURBED AREAS 30' MIN. FROM BUILDING BOUNDARY WITH COMSTOCK SEED CUSTOM HOME RESEED MIXTURE (OR APPROVED EQUAL)

SPECIES	PLS LBS
WHEATGRASS CRESTED HYCRE	5.00
WHEATGRASS THICKSPIKE CRIT	5.00
BROME CALIFORNIA SIERRA	6.00
WILDRYE RUSSIAN 'GULF'	3.00
RYEGRASS BASIN	3.00
SAGEBRUSH BIG MOUNTAIN	0.50
BITTERBRUSH	1.00
CURRANT WAX	0.25
WILDFLOWER MIX GREAT BASIN	2.00

3. PROVIDE TEMPORARY IRRIGATION (AT A MINIMUM) TO ALL RESEED AREAS UNTIL SEED IS WELL ESTABLISHED (APPROX. 1 TO 2 GROWING SEASONS.)
4. ALL RESEED AREAS SHALL BE IRRIGATED OR MOWED AS NECESSARY REDUCE POTENTIAL FIRE HAZARDS.
5. ALL TREES SHALL BE SPACED TO REDUCE POTENTIAL FIRE HAZARDS & TO ELIMINATE POTENTIAL CONFLICTS WITH THE PROPOSED BUILDINGS.

GENERAL GRADING NOTES

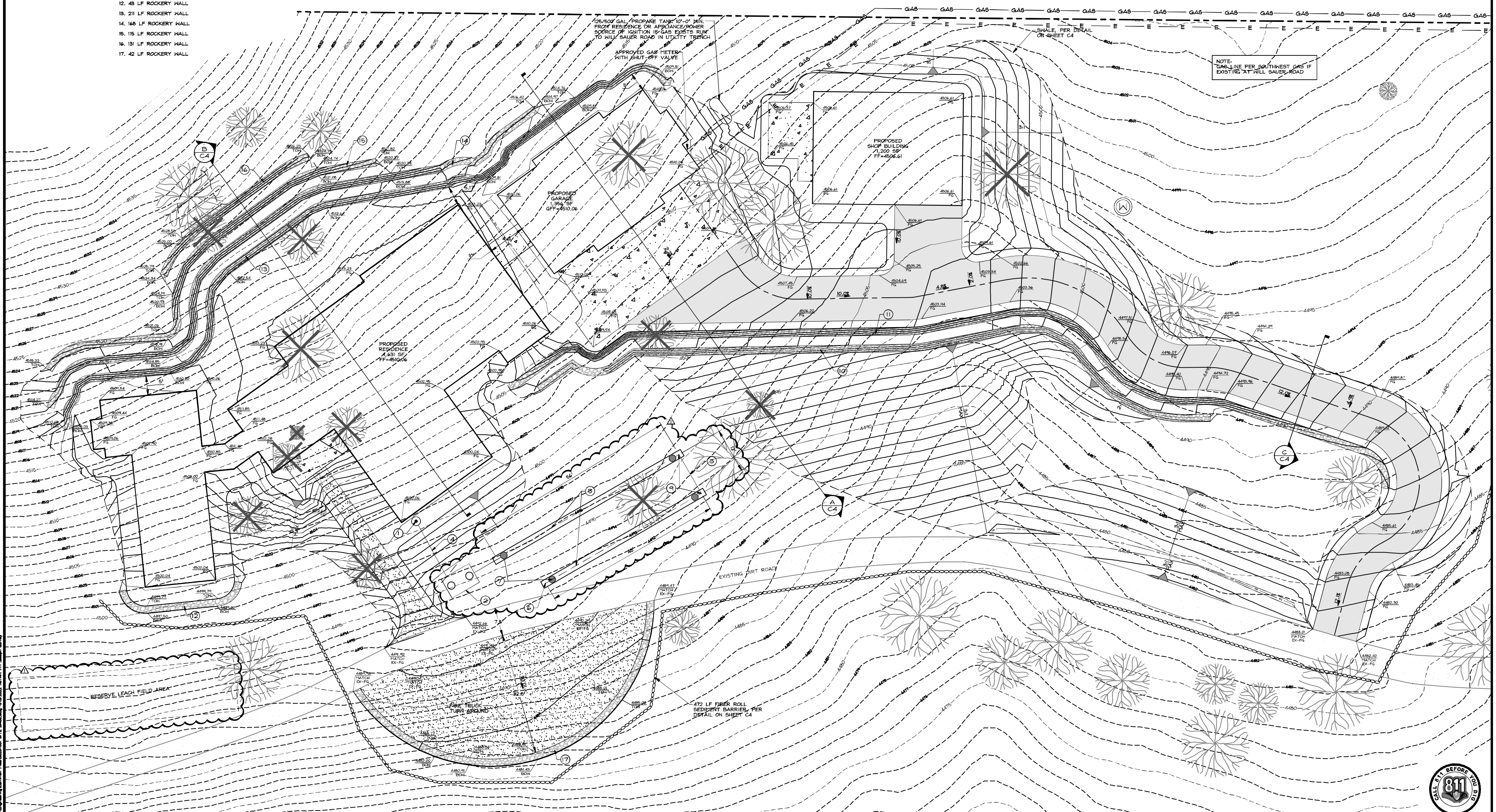
- FILL AREAS SHALL BE CLEARED OF VEGETATION AND DEBRIS, AND SCARIFIED PRIOR TO THE PLACING OF FILL.
- PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS SHALL BE USED TO PREVENT EXCESSIVE PONDING, EROSION AND TO PROTECT ADJOINING PROPERTIES DURING CONSTRUCTION OF IMPROVEMENTS.
- ALL STREETS SHALL BE MAINTAINED FREE OF DUST AND MUD CAUSED BY GRADING OPERATIONS.
- NO ROCK OR SIMILAR MATERIAL GREATER THAN 4" IN DIAMETER SHALL BE PLACED IN THE FILL UNLESS RECOMMENDATIONS FOR SUCH PLACEMENT HAVE BEEN SUBMITTED BY THE SOILS ENGINEER IN ADVANCE AND APPROVED BY THE COUNTY.
- ROCKERY WALLS PER PLAN IN HEIGHT (4' MAX), PER DETAIL ON SHEET C4

EARTHWORK QUANTITIES

1. MASS ON-SITE EARTHWORK QUANTITIES ARE ESTIMATED AS FOLLOWS:

EARTHWORK	
CUT	= 1,573 CY
FILL	= 3,698 CY
NET (FILL)	= 2,125 CY

2. THE EARTHWORK QUANTITIES PRESENTED HER ARE ESTIMATES FOR PERMITTING PURPOSES ONLY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN EARTHWORK ESTIMATE.
4. EARTHWORK AMOUNTS SHOWN ARE INSTALLED QUANTITIES.



NO.	DATE	REVISION BLOCK	BY
⚠1	07/28/2022	RESPONSE TO COMMENTS	ECH

SCALE: 1" = 20'

R|O Anderson
WWW.ROANDERSON.COM
MINDEN 1603 Esmeralda Ave P.O. Box 2229 Minden, NV 89423 p 775.782.2322 f 775.782.7084
RENO 9060 Double Diamond Pkwy, Unit 1B Reno, NV 89521 p 775.782.2322 f 775.782.7084

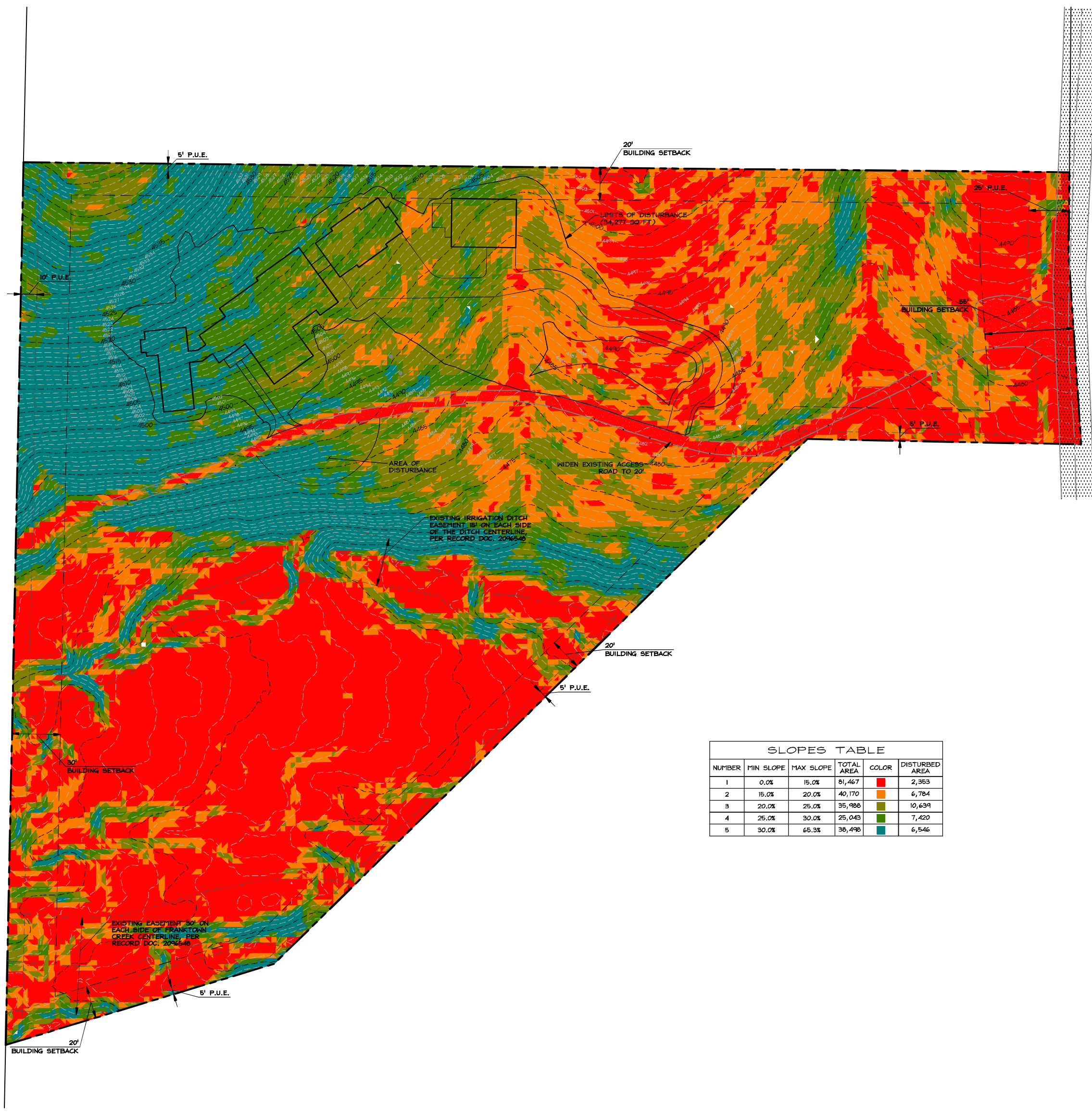
DAHLIN RESIDENCE
STAN & DEBBIE DAHLIN

PARTIAL SITE & GRADING PLAN
65 WILL SAUER ROAD
A.P.N. 172-010-05

PROFESSIONAL ENGINEER STATE OF NEVADA — ROBERT O. ANDERSON, Exp. 12-31-22, CIVIL, No. 7767 — 10/25/22

DRAWN: JAG	JOB: 3025-001
ENGINEER: ROA	DRAWING: SEE PLOT STAMP
SCALE: AS NOTED	SHEET: C2
DATE: 10/25/2022	OF: 32 SHEETS

CALL 811 BEFORE YOU DIG



SLOPES TABLE					
NUMBER	MIN SLOPE	MAX SLOPE	TOTAL AREA	COLOR	DISTURBED AREA
1	0.0%	15.0%	81,467	(red)	2,353
2	15.0%	20.0%	40,170	(orange)	6,784
3	20.0%	25.0%	35,988	(olive)	10,639
4	25.0%	30.0%	25,043	(green)	7,420
5	30.0%	65.3%	38,498	(teal)	6,546

CALL 811 BEFORE YOU DIG

NO.	DATE	REVISION BLOCK	BY

SCALE: 1" = 30'

www.roanderson.com

DAHLIN RESIDENCE

STAN & DEBBIE DAHLIN

SLOPE ANALYSIS

65 WILL SAUER ROAD

A.P.N. 172-010-05

PROFESSIONAL ENGINEER · STATE OF NEVADA · ROBERT O. ANDERSON · Exp. 12-31-22 · CIVIL · No. 7767 · 10/25/22

DRAWN: JAG

ENGINEER: ROA

SCALE: 1" = 30'

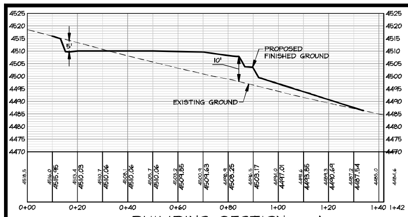
DATE: 10/25/2022

JOB: 3025-001

DRAWING: SEE PLOT STAMP

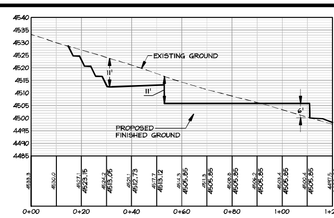
SHEET: C3

OF: 32 SHEETS



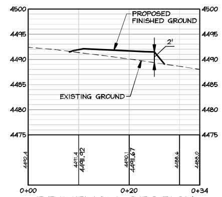
BUILIDING SECTION - A

SCALE: 1" = 20'



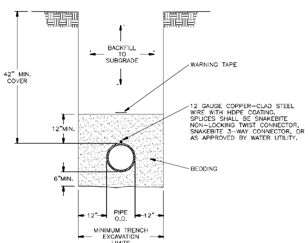
BUILIDING SECTION - B

SCALE: 1" = 20'



DRIVEWAY SECTION

SCALE: 1" = 10'

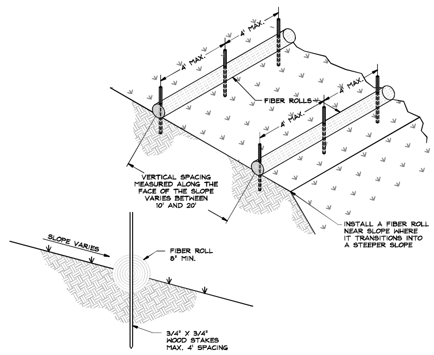


NOTES:

1. BACKFILL SHALL CONFORM TO THE REQUIREMENTS OF CLASS A (IMPORTED) OR CLASS E (NATIVE) BACKFILL AS SPECIFIED IN SUBSECTION 200.03 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. MATERIAL SHALL BE PLACED IN LIFT THICKNESS SPECIFIED IN SUBSECTION 305 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND DENSIFIED TO 90% RELATIVE COMPACTION.
2. BEDDING SHALL CONFORM TO THE REQUIREMENTS OF CLASS A BACKFILL AS SPECIFIED IN SUBSECTION 200.03.02 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. MATERIAL SHALL BE DENSIFIED TO 90% RELATIVE COMPACTION.
3. CLASS C BACKFILL OR OTHER GRADATION AS APPROVED BY WATER UTILITY, WITH FILTER FABRIC MAY BE USED TO SUPPORT BEDDING IN HIGH GROUNDWATER OR UNSTABLE SOIL CONDITIONS WITH THE APPROVAL OF THE WATER UTILITY. FILTER FABRIC SHALL BE WRAPPED AROUND BEDDING SECTION WITH 2 FOOT OVERLAP ON TOP.
4. FOR STRUCTURAL (PAVEMENT) SECTION, SEE "STREET CUT REPAIR" DETAIL A14.
5. SHORING OR SLOPED CUT SLOPES MAY BE NECESSARY. ALL EXCAVATIONS SHALL CONFORM TO THE MOST RECENT OSHA REQUIREMENTS.
6. PLACE WARNING TAPE 1 FOOT ABOVE WATER AND RECLAIMED WATER PIPE.
7. WATER STOPS SHALL BE USED IN HIGH GROUND WATER CONDITIONS PER "WATER STOP" DETAIL B02. FOR WET TRENCH BEDDING SEE DETAIL C01.
8. FOR USE OUTSIDE PAVED ROAD SECTION.

PAGE 1 OF 1

NO.	REVISION	DATE	STANDARD DETAIL FOR PUBLIC WORKS CONSTRUCTION	SECTION: DOUGLAS COUNTY
			TRENCH EXCAVATION & BACKFILL	DATE: JULY 2017
				DWG: B01

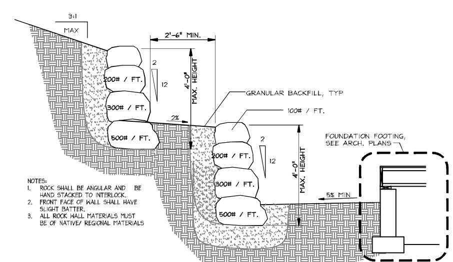


NOTES:

1. INSTALL ALONG SLOPE CONTOUR, PERPENDICULAR TO FLOWLINE DIRECTION.
2. FIBER ROLLS MUST BE ENTRENCHED 1/3 TO 1/2 HEIGHT OF ROLL TO ENSURE MAXIMUM CONTACT SURFACE AREA WITH SOIL.
3. ENSURE THAT THE FIBER ROLL MAKES GOOD CONTACT WITH THE SOIL AT ALL LOCATIONS; THERE SHALL BE NO GAPS BENEATH THE FIBER ROLL.
4. FIBER ROLLS SHALL BE STAKED IN SUCH A MANNER THAT THEY ARE NOT DISTURBED BY WIND OR SHEET FLOW RUNOFF.
5. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED A MINIMUM OF 18", NOT ABUTTED.
6. TURN THE ENDS OF THE FIBER ROLL UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL.
7. INSPECT AND MAINTAIN FIBER ROLLS DAILY AND AFTER EACH STORM EVENT. REMOVE SEDIMENT DEPOSITS WHEN DEPOSITS REACH 1/2 HEIGHT OF INSTALLED BARRIER.

FIBER ROLL INSTALLATION DETAIL

NTS

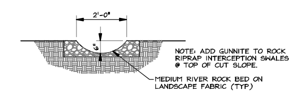


NOTES:

1. ROCK SHALL BE ANGULAR AND BE HAND STACKED TO INTERLOCK.
2. FRONT FACE OF WALL SHALL HAVE SLIGHT BATTER.
3. ALL ROCK WALL MATERIALS MUST BE OF NATIVE/ REGIONAL MATERIALS

TIERED ROCK WALL

NOT TO SCALE



SWALE DETAIL

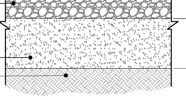
NOT TO SCALE

TYPE III, 64-22, 50 BLOW HOT MIX ASPHALT CONCRETE

TYPE II, CLASS B, AGGREGATE BASE

6" MINUS GRANULAR STRUCTURAL FILL PER GEOTECHNICAL REPORT. INSTALL IN 8"(MAX.) LOOSE LIFTS AND COMPACT EACH LIFT TO 90%(MIN.) RELATIVE COMPACTION.

SUBGRADE

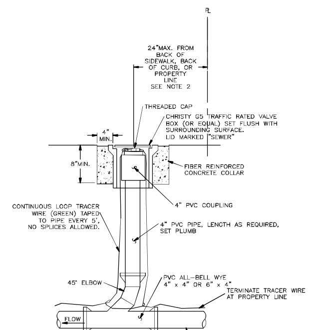


NOTES:

1. ASPHALT CONCRETE SHALL INCLUDE 4% AIR VOIDS AND 1.5% HYDRATE LIME.
2. ASPHALT CONCRETE SHALL BE INSTALLED IN UNIFORM LIFTS (2-INCH MAX.) AND EACH LIFT DENSIFIED TO 96% (MIN.) RELATIVE COMPACTION.
3. AGGREGATE BASE SHALL BE PLACED IN 8-INCH (MAX.) LOOSE LIFTS. DENSIFY EACH LIFT TO 95% RELATIVE COMPACTION (MIN.).
4. STRUCTURAL FILL SHALL BE PLACED IN 8-INCH (MAX.) LOOSE LIFTS. DENSIFY EACH LIFT TO 90% RELATIVE COMPACTION (MIN.).

FLEXIBLE PAVEMENT SECTION

NTS



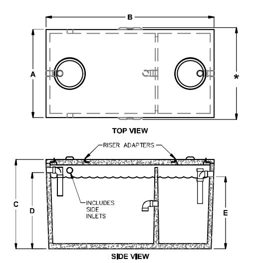
NOTE: ALL JOINTS AND CONNECTIONS SHALL BE WATERTIGHT.

NOTES:

1. CLEANOUTS TO BE PLACED AT EVERY ANGLE GREATER THAN, OR EQUAL TO 45°, EVERY 150' OF LATERAL, AND WITHIN 5' OF BUILDING AND IN CONFORMANCE WITH THE CURRENT EDITION OF THE UNIFORM BUILDING CODE. CLEANOUTS INSTALLED AT ANGLES SHALL BE LOCATED ON THE UPSTREAM SIDE OF THE ANGLE. CLEANOUTS SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE ANGLE.
2. CLEANOUT SHALL NOT BE LOCATED WITHIN A ROADSIDE DITCH UNDER ANY CIRCUMSTANCES.

PAGE 1 OF 1

NO.	REVISION	DATE	STANDARD DETAIL FOR PUBLIC WORKS CONSTRUCTION	SECTION: DOUGLAS COUNTY
			SEWER LATERAL CLEANOUT	DATE: JULY 2017
				DWG: C07



MODEL NUMBER	LIQUID CAPACITY (GALLONS)	DIM A	DIM B	DIM C	DIM D	DIM E	MINIMUM EXCAVATION WIDTH*	MINIMUM EXCAVATION LENGTH
JS-1000	1000	5'-1"	8'-2"	5'-8"	4'-10"	4'-7"	6'-10"	9'-2"
JS-1200	1200	5'-9"	8'-6"	5'-8"	4'-10"	4'-7"	7'-6"	9'-6"
JS-1500	1500	5'-7"	10'-8"	5'-8"	4'-10"	4'-7"	7'-4"	11'-8"
JS-2000	2000	4'-11"	15'-11"	5'-8"	4'-10"	4'-7"	6'-8"	16'-11"
JS-2500	2500	5'-9"	16'-10"	5'-8"	4'-10"	4'-7"	7'-6"	17'-10"
JS-3000	3000	5'-9"	16'-10"	6'-5"	5'-7"	5'-4"	7'-6"	17'-10"

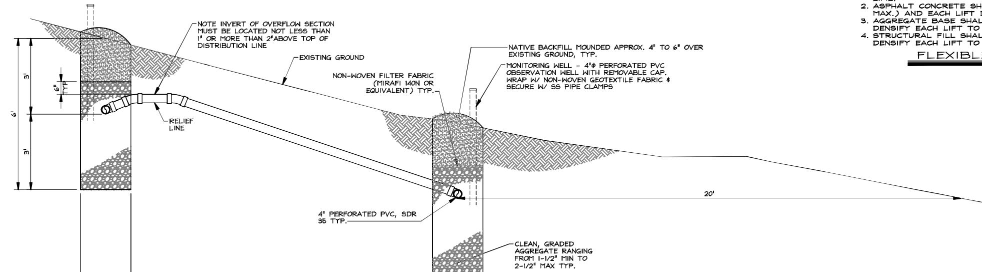
*OVERALL WIDTH CAN VARY WITH TANK MODEL. USE EXCAVATION WIDTH FOR SITE PLANNING.

DESIGN LOAD: NON-TRAFFIC WITH 3' EARTH COVER MAXIMUM AT 500 PSF.

FOR COMPLETE DESIGN AND PRODUCT INFORMATION CONTACT JENSEN PRECAST.

1,200 GALLON SEPTIC TANK DETAIL

NOT TO SCALE



NOTES:

1. SYSTEM IS A SERIAL STEPPED DISTRIBUTION DESIGN DUE TO EXISTING CROSS SLOPE.
2. AGGREGATE MUST EXTEND TO 12" OR LESS FROM THE GROUND SURFACE.
3. CAP ENDS OF DISPOSAL LINE.
4. HOLD DISPOSAL LINE 12" SHORT OF END OF DISPOSAL TRENCH.
5. SLOPE OF DISPOSAL LINES SHALL BE BETWEEN 2" PER 100' (MIN) AND 4" PER 100' (MAX).
6. THE INVERT OF THE OVERFLOW SECTION MUST BE LOCATED NOT LESS THAN 1 INCH OR MORE THAN 2 INCHES ABOVE THE TOP OF THE DISPOSAL TRENCH DISTRIBUTION LINE. THE LEACHING AGGREGATE MUST EXTEND AT LEAST 4 INCHES ABOVE THE DISPOSAL DISTRIBUTION LINE.
7. MONITORING WELLS TO BE INSTALLED NEAR THE ENDS OF EACH TRENCH, EXTENDING INTO TRENCH, ONE ON EACH END.

SEPTIC TRENCH SECTION

NOT TO SCALE

CALL 811 BEFORE YOU DIG

NO.	DATE	REVISION BLOCK	BY

SCALE: 1" = 20'

R|O|Anderson — www.roanderson.com — MINDEN 1603 Esmeralda Ave, P.O. Box 2229, Minden, NV 89423, P 775.782.2322, F 775.782.7084 — RENO 1960 Double Diamond Pkwy, Unit B, Reno, NV 89521, P 775.782.2322, F 775.782.7084

DAHLIN RESIDENCE

STAN & DEBBIE DAHLIN

DETAILS

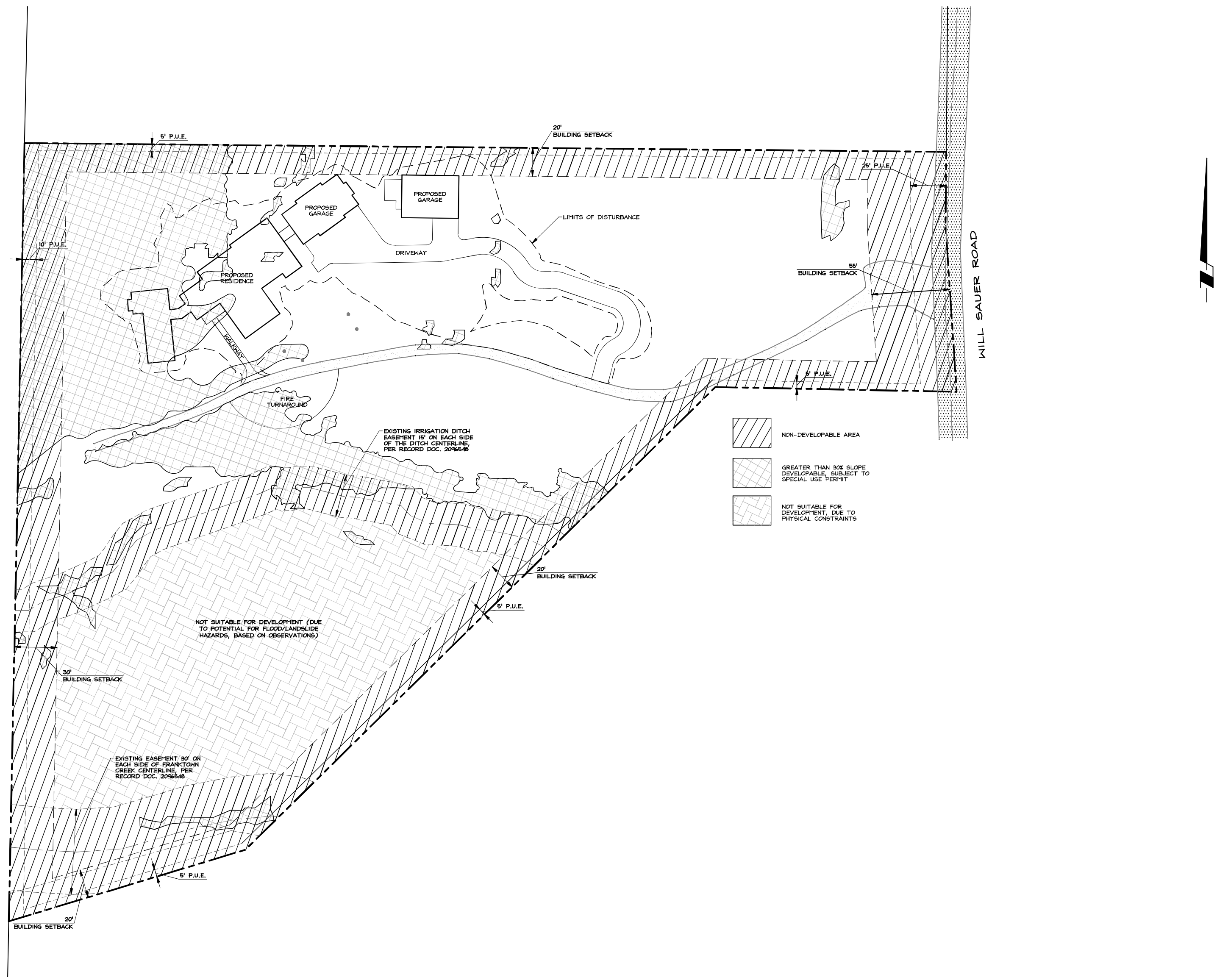
65 WILL SAUER ROAD

A.P.N. 172-010-05

PROFESSIONAL ENGINEER, STATE OF NEVADA — ROBERT O. ANDERSON — CIVIL — Exp. 12-31-22 — 10/25/22

DRAWN: JAG	JOB: 3025-001
ENGINEER: ROA	DRAWING: SEE PLOT STAMP
SCALE: AS NOTED	SHEET: C4
DATE: 10/25/2022	OF: 32 SHEETS

Y:\Client Files\3025\3025-001\CAD\Engineering\Common Files\3025-001 SITE BASE.dwg 9/15/2022 1:11:03 PM Joseph Gurney



NO.	DATE	REVISION BLOCK	BY

SCALE: 1" = 30'

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DAHLIN RESIDENCE
STAN & DEBBIE DAHLIN

DEVELOPABLE AREA MAP
65 WILL SAUER ROAD
A.P.N. 172-010-05

PROFESSIONAL ENGINEER STATE OF NEVADA — ROBERT O. ANDERSON — Exp. 12-31-22 — CIVIL — No. 7767 — 10/25/22

DRAWN: JAG	JOB: 3025-001
ENGINEER: ROA	DRAWING: SEE PLOT STAMP
SCALE: 1" = 30'	SHEET: EXHIBIT
DATE: 10/25/2022	OF: 32 SHEETS