

Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Building staff at 775.328.6100.

Project Information		Staff Assigned Case No.: _____	
Project Name: Roberts' Residence Major Grading SUP			
Project Description: Major grading per WCC 110.438.28(a) associated with a future single-family residence, ADU, and workshop.			
Project Address: 0 Unspecified (APN 081-160-15)			
Project Area (acres or square feet): 40			
Project Location (with point of reference to major cross streets AND area locator): North of the intersection of Peavine Creek Rd and Painted River Tr.			
Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
APN 081-160-15	40		
Indicate any previous Washoe County approvals associated with this application: Case No.(s).			
Applicant Information (attach additional sheets if necessary)			
Property Owner:		Professional Consultant:	
Name: Ricky Roberts		Name: Sierra Vista Engineering, Inc.	
Address:		Address:	
Zip:		Zip:	
Phone: Fax:		Phone: Fax:	
Email:		Email:	
Cell: Other:		Cell: Other:	
Contact Person: Ricky Roberts		Contact Person: Ryan Switzer, PE	
Applicant/Developer:		Other Persons to be Contacted:	
Name:		Name:	
Address:		Address:	
Zip:		Zip:	
Phone: Fax:		Phone: Fax:	
Email:		Email:	
Cell: Other:		Cell: Other:	
Contact Person:		Contact Person:	
For Office Use Only			
Date Received: Initial:		Planning Area:	
County Commission District:		Master Plan Designation(s):	
CAB(s):		Regulatory Zoning(s):	



To: Washoe County - Planning and Building
1001 E. Ninth Street
Reno, NV 89512

Subject: Roberts' Residence
0 Unspecified, Reno, NV 89523 (APN 081-160-15)
Major Grading Special Use Permit (SUP)

Dear Washoe County,

This memorandum has been prepared to accompany a SUP for Major Grading per section 110.438.28(a) of the Washoe County Development Code. The following numbered list has been excerpted from the application materials submittal requirements. Italicized items have been omitted due to their inapplicability. A brief narrative for both provided and omitted items is included where appropriate.

1. Fees - paid online.
2. Development Application
3. Owner Affidavit
4. Proof of Property Tax Payment
5. *Neighborhood Meeting - N/A for single-family residential project*
6. Application Materials
7. *Proposed Site Plan - access, driveway, and rough grading pad locations are included in the conceptual grading plans (items 8 & 9 herein); however, building locations and detailed site layout is planned between the Grading SUP approval and building permit design phases.*
8. Site Plan for Grading
9. Grading
10. *Traffic Impact Report - N/A*
11. *Landscaping - N/A; no landscaping is proposed*
12. *Signage Plan - N/A; no signage is proposed*
13. *Lighting Plan - N/A; no lighting is proposed*
14. *Building Elevations - N/A; no buildings are proposed*

A Geotechnical Investigation and Amendment Letter have also been provided with the application (labeled items 15a and 15b in associated attachments).

Please reach out if you have questions on this matter.

Regards,
Sierra Vista Engineering, Inc.

Ryan Switzer, PE
rswitzer@sierravistaengineering.com
Direct: 775-266-8863
Cell: 805-305-6046

cc: Ricky Roberts, Applicant / Owner, rickyroberts282@gmail.com

Special Use Permit Application Supplemental Information

(All required information may be separately attached)

1. What is the project being requested?

Major grading per WCC 110.438.28(a) for:
(1)(i) - grading of more than 4 acres on a parcel greater than 6 acres
(ii) - grading of more than 15,000 cy
(iii) - cuts greater than 20 ft and fills greater than 10 ft
(2) - grading a driveway traversing a slope of 30% or greater

2. Provide a site plan with all existing and proposed structures (e.g. new structures, roadway improvements, utilities, sanitation, water supply, drainage, parking, signs, etc.)

See attached.

3. What is the intended phasing schedule for the construction and completion of the project?

Depending on funding and permit timing, the applicant may build the access road and driveway / pad 1 in one phase (Phase 1), driveway / pad 2 in a second phase (phase 2), and driveway / pad 3 in a third (Phase 3). Phase 1 must be completed first, but any combination of the remaining phases may be undertaken together (i.e. Phase 1 only, Phase 1 + 2, Phase 1 then Phase 2+ 3, or Phase 1 + 2 + 3).

4. What physical characteristics of your location and/or premises are especially suited to deal with the impacts and the intensity of your proposed use?

The existing site topography is very steep. Existing terrain is stable and suitable for cuts and fills per the attached Geotechnical Investigation and Update – Cut and Fill Slopes

5. What are the anticipated beneficial aspects or affects your project will have on adjacent properties and the community?

No significant aspects or effects are anticipated on adjacent properties. Pad locations did consider neighbors and were selectively chosen to give both property owners privacy, where possible.

6. What are the anticipated negative impacts or affect your project will have on adjacent properties? How will you mitigate these impacts?

Although anticipated to be minimal, dust and noise may affect neighboring properties during construction. However, a dust control permit and limited hours of construction are anticipated mitigation measures for the project.

7. Provide specific information on landscaping, parking, type of signs and lighting, and all other code requirements pertinent to the type of use being purposed. Show and indicate these requirements on submitted drawings with the application.

N/A - grading only at this time.

8. Are there any restrictive covenants, recorded conditions, or deed restrictions (CC&Rs) that apply to the area subject to the special use permit request? (If so, please attach a copy.)

☐ Yes	☒ No
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9. Utilities:

a. Sewer Service	N/A - septic
b. Electrical Service	N/A - off grid
c. Telephone Service	N/A - off grid
d. LPG or Natural Gas Service	
e. Solid Waste Disposal Service	
f. Cable Television Service	N/A - off grid
g. Water Service	N/A - well

For most uses, Washoe County Code, Chapter 110, Article 422, Water and Sewer Resource Requirements, requires the dedication of water rights to Washoe County. Please indicate the type and quantity of water rights you have available should dedication be required.

h. Permit #	Unknown at this time	acre-feet per year	
i. Certificate #	Unknown at this time	acre-feet per year	
j. Surface Claim #	Unknown at this time	acre-feet per year	
k. Other #	Unknown at this time	acre-feet per year	

Title of those rights (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources).

N/A

10. Community Services (provided and nearest facility):

a. Fire Station	City of Reno - 2105 Hawk Meadow Trail, Reno, NV 89523
b. Health Care Facility	Renown Urgent Care, Northwest - 960 Ambassador Dr Ste 1
c. Elementary School	George Westergard Elementary School - 1785 Ambassador I
d. Middle School	B.D. Billingham Middle School- 6685 Chesterfield Ln, Reno,
e. High School	Robert McQueen High School- 6055 Lancer St, Reno, NV 89
f. Parks	Somerset East Park- 1900 Park Hollow Ct, Reno, NV 89523
g. Library	Northwest Reno Library- 2325 Robb Dr, Reno, NV 89523
h. Citifare Bus Stop	Avenida De Landa and Enchanted Valley Drive

**Special Use Permit Application
for Grading
Supplemental Information**
(All required information may be separately attached)

1. What is the purpose of the grading?

Access, driveways, and pads for a future single-family residence, ADU, and workshop.

2. How many cubic yards of material are you proposing to excavate on site?

Cut: 51,000 cy Fill: 18,200 cy Net: 32,800 cy (export, to be dispersed onsite)

3. How many square feet of surface of the property are you disturbing?

362,512 sf (8.3 acres)

4. How many cubic yards of material are you exporting or importing? If none, how are you managing to balance the work on-site?

None, net "export" will be disposed of onsite.

5. Is it possible to develop your property without surpassing the grading thresholds requiring a Special Use Permit? (Explain fully your answer.)

No, the access easement to the property includes slopes greater than 30%, triggering a Grading SUP per WCC 110.438.28(a)(2) regardless of onsite grading area, volume or depth.

6. Has any portion of the grading shown on the plan been done previously? (If yes, explain the circumstances, the year the work was done, and who completed the work.)

No.

7. Have you shown all areas on your site plan that are proposed to be disturbed by grading? (If no, explain your answer.)

Yes.

8. Can the disturbed area be seen from off-site? If yes, from which directions and which properties or roadways?

Yes, the access, driveways, and pads will be viewable from the south, primarily by currently undeveloped APN 232-720-06 owned by Somerset Owners Association.

9. Could neighboring properties also be served by the proposed access/grading requested (i.e. if you are creating a driveway, would it be used for access to additional neighboring properties)?

Potentially.

10. What is the slope (horizontal/vertical) of the cut and fill areas proposed to be? What methods will be used to prevent erosion until the revegetation is established?

Cuts are approved up to 1H:1V and fills to 2H:1V per the attached Geotechnical Investigation and Update - Cut and Fill Slopes

11. Are you planning any berms?

Yes	NoX	If yes, how tall is the berm at its highest?N/A
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12. If your property slopes and you are leveling a pad for a building, are retaining walls going to be required? If so, how high will the walls be and what is their construction (i.e. rockery, concrete, timber, manufactured block)?

No.

13. What are you proposing for visual mitigation of the work?

Riprap or other mechanical stabilization for all slopes greater than 3H:1V.

14. Will the grading proposed require removal of any trees? If so, what species, how many and of what size?

Yes. 3-4 Jeffrey Pines < 6" dbh.

15. What type of revegetation seed mix are you planning to use and how many pounds per acre do you intend to broadcast? Will you use mulch and, if so, what type?

N/A

16. How are you providing temporary irrigation to the disturbed area?

N/A

17. Have you reviewed the revegetation plan with the Washoe Storey Conservation District? If yes, have you incorporated their suggestions?

N/A

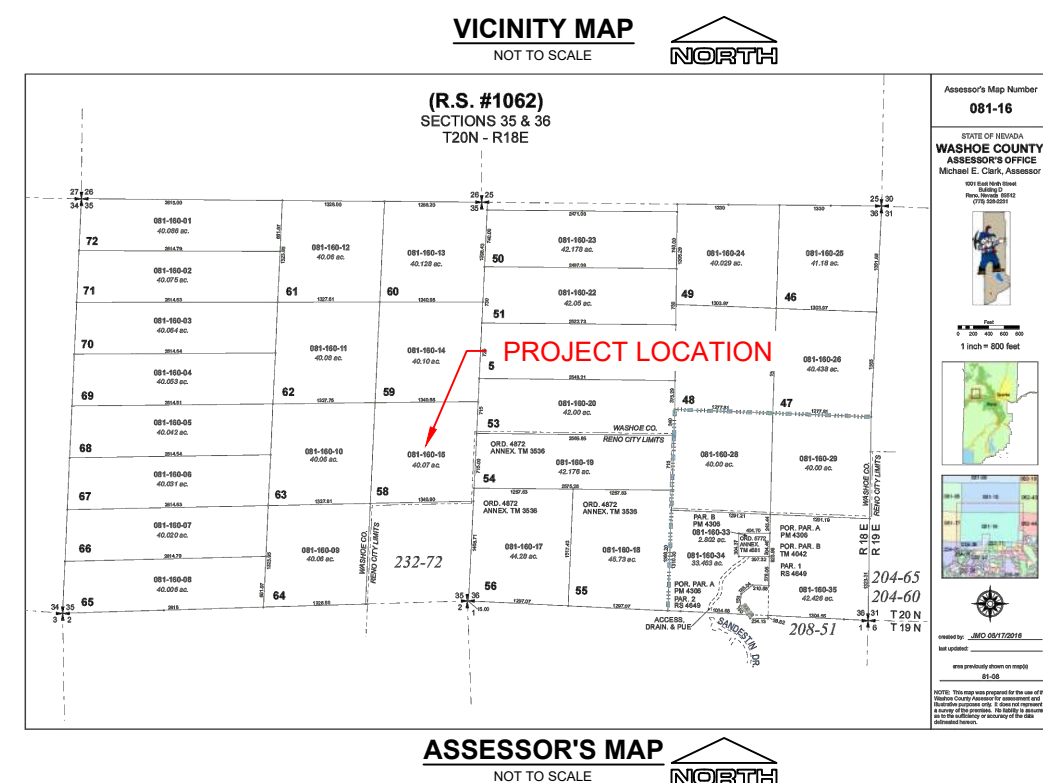
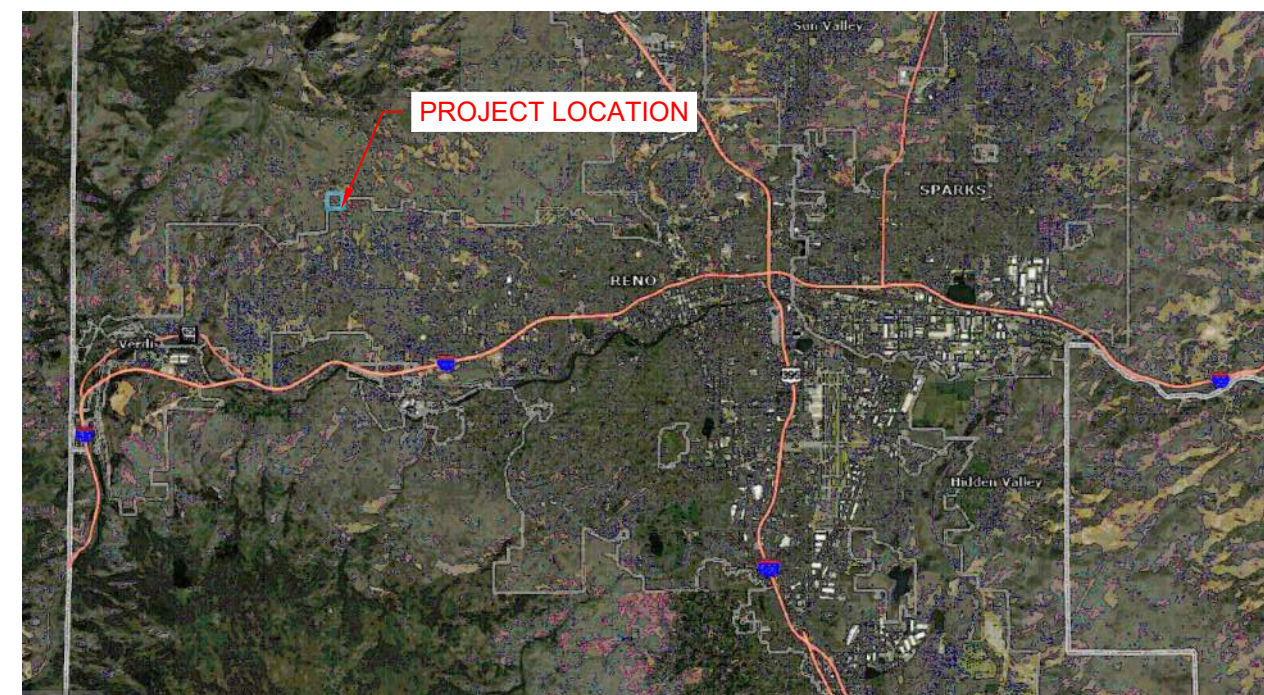
18. Are there any restrictive covenants, recorded conditions, or deed restrictions (CC&Rs) that may prohibit the requested grading?

Yes	NoX	If yes, please attach a copy.
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ROBERTS' RESIDENCE
CONCEPT GRADING PLANS
FOR
SPECIAL USE PERMIT

SLOPES TABLE FOR APN 081-160-15				
#	MIN SLOPE	MAX SLOPE	AREA (SF)	COLOR
1	0%	15%	26,541	
2	15%	20%	30,216	
3	20%	25%	63,322	
4	25%	30%	115,455	
5	30%	100%	1,507,911	

AVERAGE SLOPE: 45%



LEGEND:

	PROPERTY LINE
	ADJOINING PROPERTY LINE
	SETBACKS
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING FENCE
	EXISTING FLOW LINE
	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS
	EXISTING SEWER
	EXISTING WATER
	ROADWAY CENTERLINE
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED FLOW LINE
	PROPOSED ELECTRIC
	PROPOSED GAS
	PROPOSED SEWER
	PROPOSED STORM DRAIN
	PROPOSED FOUNDATION DRAIN
	PROPOSED WATER
	PROPOSED FIRE WATER
	PROPOSED GRADING LIMITS
	PROPOSED RETAINING WALL
	PROPOSED CHIP SEAL (1.0 ACRE)
	PROPOSED COMPACTED BASE (1.2 ACRE)

PRELIMINARY
NOT FOR
CONSTRUCTION

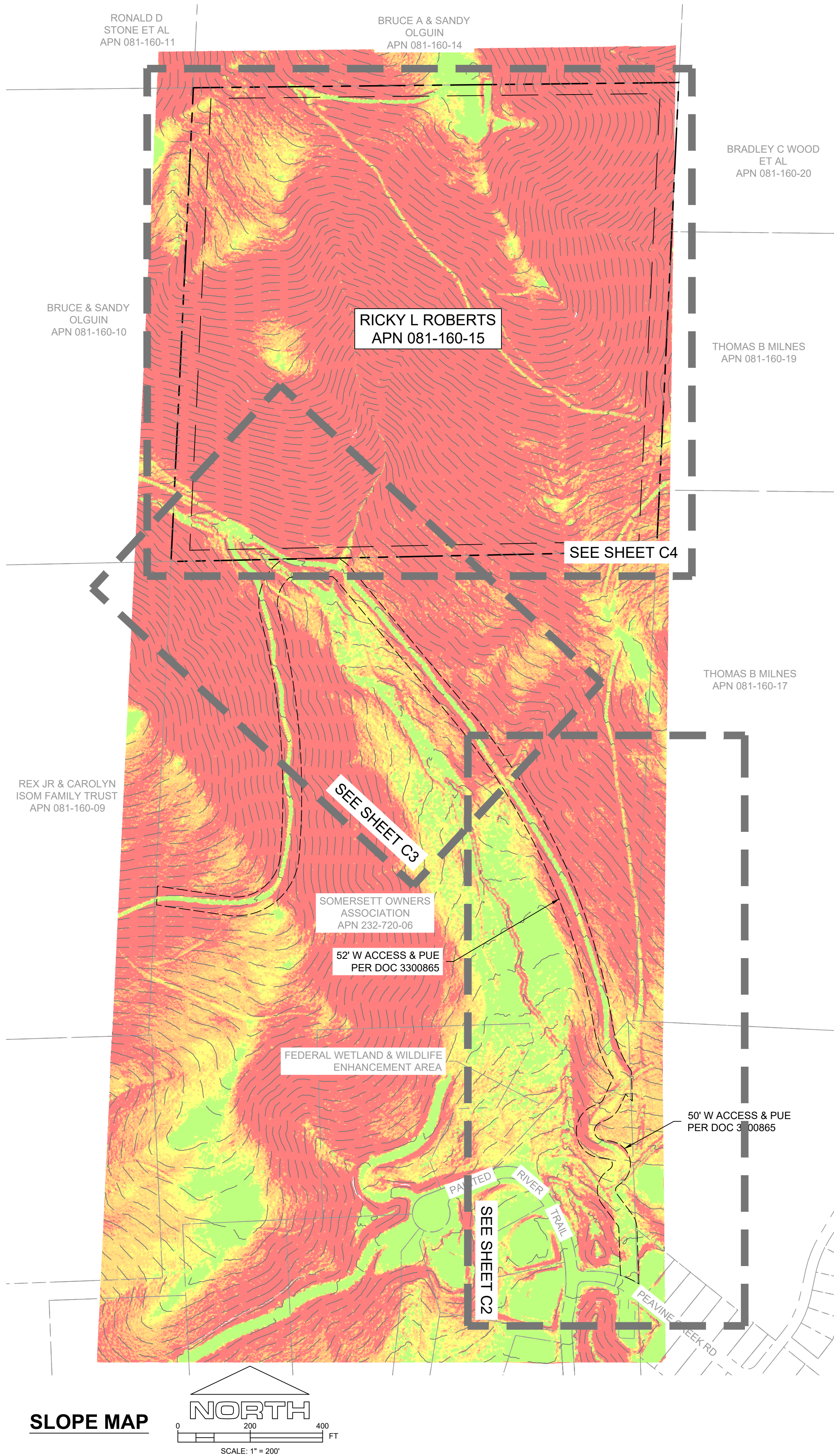


PROJECT INFORMATION

RICKY ROBERTS
ROBERTS' RESIDENCE
GRADING SUP

0 UNSPECIFIED
WASHOE COUNTY, NV 89523
WASHOE COUNTY APN 081-160-15

SHEET TITLE		TITLE SHEET & NOTES
JOB NUMBER	0092	
DATE	9/4/2026	
SCALE	AS NOTED	
		SHEET NUMBER
		C1



SHEET INDEX:

C1	TITLE SHEET & NOTES
C2	ACCESS P&P STA 0+50 TO 16+00
C3	ACCESS P&P STA 16+00 TO 27+00
C4	PRELIMINARY SITE GRADING PLAN
C5	ONSITE DRIVEWAY PROFILES

PROJECT SUMMARY:

APPLICANT / OWNER RICKY ROBERTS
rickyroberts282@gmail.com
530-864-0907

CIVIL ENGINEER SIERRA VISTA ENGINEERING, INC
RYAN SWITZER, PE
rswitzer@sierravistaengineering.com
775-266-8863

GEOTECHNICAL ENGINEER CORESTONE ENGINEERING, INC.
VIMAL VIMALARAJ, PE, GE
vimal@corestoneengineering.com
775-636-5916

PROJECT ADDRESS	0 UNSPECIFIED WASHOE COUNTY, NV 89523
COUNTY	WASHOE
APN	081-160-15
ZONING	GR (GENERAL RURAL)
FLOOD ZONE	ZONE X, AREA OF MINIMAL FLOOD HAZARD PER FIRM PANEL 32031C3016G (REVISED 3/16/2009, NOT PRINTED)
PROJECT DESCRIPTION	MAJOR GRADING PER WCC 110.438.28(a) ASSOCIATED WITH A SINGLE-FAMILY RESIDENCE, ADU, AND WORKSHOP.

GENERAL NOTES:

1. THESE PLANS HAVE BEEN PREPARED TO ACCOMPANY AN APPLICATION FOR A GRADING SPECIAL USE PERMIT. THEY HAVE BEEN AUTHORED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PROCEDURES AND GUIDELINES, AND ARE BELIEVED TO BE IN SUBSTANTIAL COMPLIANCE WITH APPLICABLE STATUTES, ORDINANCES, OR STANDARDS SPECIFIED BY WASHOE COUNTY.
2. WHEN NOT OTHERWISE SPECIFICALLY NOTED, THE PLANS SHALL CONFORM TO THE 2016 VERSION (REVISION 9) OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SPSWC) ADOPTED BY WASHOE COUNTY (AKA THE "ORANGE BOOK").
3. IN THE EVENT OF A CONFLICT BETWEEN ANY PORTION OF THESE PLANS AND PERMITTING STANDARDS, THE MORE CONSERVATIVE STANDARD CONSISTENT WITH THE INTENT OF THE PLANS SHALL BE ADOPTED.
4. THE ENGINEER SHALL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING BY THE ENGINEER.
5. REFER TO GEOTECHNICAL INVESTIGATION BY CORESTONE ENGINEERING, INC., WHICH IS INCORPORATED BY REFERENCE, HEREIN.
6. SHOULD ANY CAIRN OR GRAVE OF A NATIVE AMERICAN BE DISCOVERED DURING SITE DEVELOPMENT, WORK SHALL TEMPORARILY BE HALTED AT THE SPECIFIC SITE AND THE SHERIFF'S OFFICE AS WELL AS THE STATE HISTORIC PRESERVATION OFFICE SHALL BE NOTIFIED. THE STATE AND LOCAL AND NATURAL RESOURCES SHALL BE IMMEDIATELY NOTIFIED PER NRS 383.170.
7. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS BETWEEN 7AM TO 7PM, MONDAY THROUGH SATURDAY ONLY. MACHINERY SHALL NOT BE STARTED NOR SHALL ARRIVE ON SITE PRIOR TO 7AM. NO CONSTRUCTION ACTIVITIES SHALL TAKE PLACE ON SUNDAYS.
8. ALL PROPERTIES, REGARDLESS OF IF THEY ARE LOCATED WITHIN OR OUTSIDE OF A FEMA DESIGNATED FLOOD ZONE, MAY BE SUBJECT TO FLOODING. THE PROPERTY OWNERS ARE REQUIRED TO MAINTAIN ALL DRAINAGE EASEMENTS AND NATURAL DRAINAGES AND NOT PERFORM OR ALLOW UNPERMITTED AND UNAPPROVED MODIFICATIONS TO THE PROPERTY THAT MAY HAVE DETRIMENTAL IMPACTS TO SURROUNDING PROPERTIES.

TRUCKEE MEADOWS CONSTRUCTION SITE BMP HANDBOOK NOTES.

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF WASHOE COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE REMOVED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE WASHOE COUNTY DEVELOPMENT CODE AND THE TRUCKEE MEADOWS CONSTRUCTION SITE BMP HANDBOOK.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS BEEN COMPLETED. PERMANENT STABILIZATION PRACTICES MAY APPLY; REFER TO STORMWATER GENERAL PERMIT NVR100000.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPs WEEKLY, PRIOR TO A FORECASTED RAIN EVENT AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS FROZEN GROUND CONDITIONS OR SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO STORMWATER GENERAL PERMIT NVR100000.
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

ABBREVIATIONS:

AC	ASPHALTIC CONCRETE
ADS	ADVANCED DRAINAGE SYSTEMS
ALTA	AMERICAN LAND TITLE ASSOCIATION
APN	ASSESSOR'S PARCEL NUMBER
BEG	BEGINNING
BLM	BUREAU OF LAND MANAGEMENT
BMP	BEST MANAGEMENT PRACTICE(S)
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
COTG	CLEAN OUT TO GRADE
CTS	COPPER TUBE SIZE
CY	CUBIC YARDS
DIA OR Ø	DIAMETER
DW	DRIVEWAY
(E) OR EX	EXISTING
E	EAST OR ELECTRIC
EG	EXISTING GRADE
FG	FISHED GRADE
FIRM	FLOOD INSURANCE RATE MAP
FL	FLOW LINE
FT	FEET
GB	GRADE BREAK
GPD	GALLONS PER DAY
H	HEIGHT
HDPE	HIGH DENSITY POLYETHYLENE
IE	INVERT ELEVATION
IFC	INTERNATIONAL FIRE CODE
IR	IGNITION RESISTANT
IWUCI	INTERNATIONAL WILDLAND URBAN INTERFACE CODE
INV	INVERT
L	LENGTH
LLC	LIMITED LIABILITY COMPANY
LS	LANDSCAPE
MDM	MAXIMUM DRY DENSITY
N	NORTH
NDEP	NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NRCS	NATURAL RESOURCES CONSERVATION SERVICE
OSDS	ONSITE SEWAGE DISPOSAL SYSTEM
(P)	PROPOSED
P&P	PLAN & PROFILE
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE
PE	PROFESSIONAL ENGINEER
PL	PROPERTY LINE
PT	POINT OF TANGENCY
R	RADIUS
RCF	REINFORCED CONCRETE PIPE
RET	RETAINING
ROW	RIGHT OF WAY
S	SOUTH
SCS	SOIL CONSERVATION SERVICE
SD	STORM DRAIN
SDR	STANDARD DIMENSION RATIO
SF	SQUARE FEET
SS	SANITARY SEWER
STA	STATION
SUP	SPECIAL USE PERMIT
TW	TOP OF WALL
TYP	TYPICAL
W	WEST OR WIDTH
WCC	WASHOE COUNTY CODE

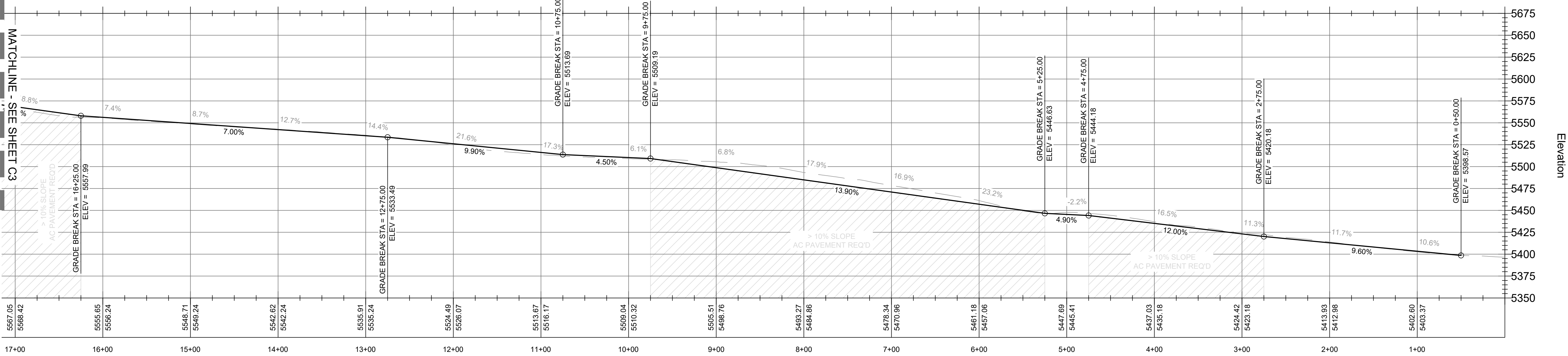
EARTHWORK SUMMARY

	ACCESS	DRIVEWAY 1	DRIVEWAY 2	DRIVEWAY 3	PAD 1	PAD 2A	PAD 2B	PAD 3	TOTAL
DISTURBANCE (SF)	66,952	53,546	123,035	27,640	8,915	33,129	26,509	22,786	362,512
DISTURBANCE (ACRES)	1.5	1.2	2.8	0.6	0.2	0.8	0.6	0.5	8.3
CUT (CY)	-2,800	-7,400	-32,000	-1,600	-2,700	-100	-200	-4,200	-51,000
FILL (CY)	+2,000	+2,800	+2,000	+900	+0	+7,100	+3,200	+200	+18,200
NET (CY)	-800	-4,600	-30,000	-700	-2,700	+7,000	+3,000	-4,000	-32,800

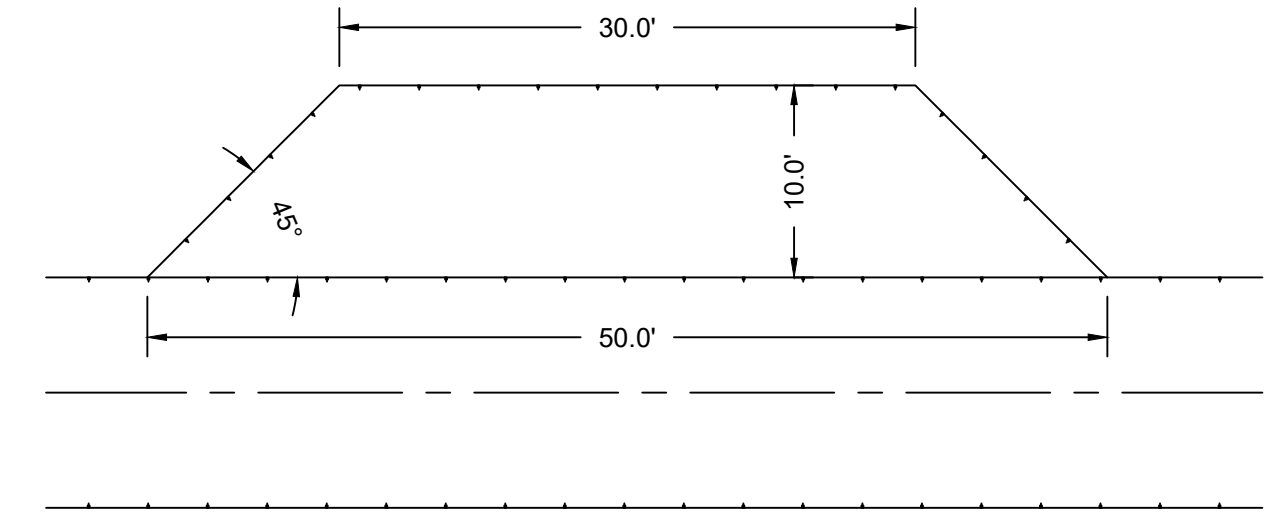
QUANTITIES ARE A SURFACE TO SURFACE MODEL COMPARISON WITH NO FINISHED GRADE OR SUBGRADE THICKNESS INCLUDED. QUANTITIES ARE PROVIDED FOR PERMITTING PURPOSES ONLY. CONTRACTOR IS RESPONSIBLE FOR CONDUCTING INDEPENDENT TAKE-OFFS FOR BIDDING AND CONSTRUCTION. NO FACTORS SUCH AS SHRINKAGE, SWELL, OR OTHER ARE INCLUDED. IMPORT IS TO BE OBTAINED ONSITE AND SUBJECT TO APPROVAL BY OWNER AND GEOTECHNICAL ENGINEER PRIOR TO USE.

ACCESS PROFILE

HOR / VERT SCALE: 1" = 60'



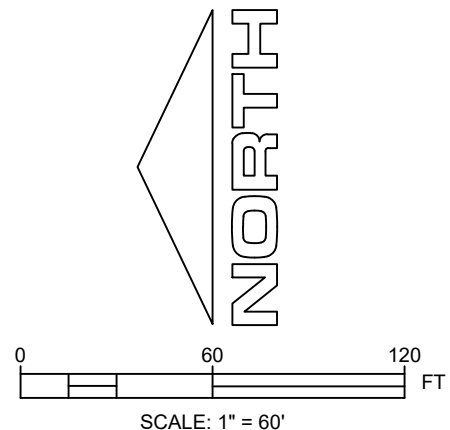
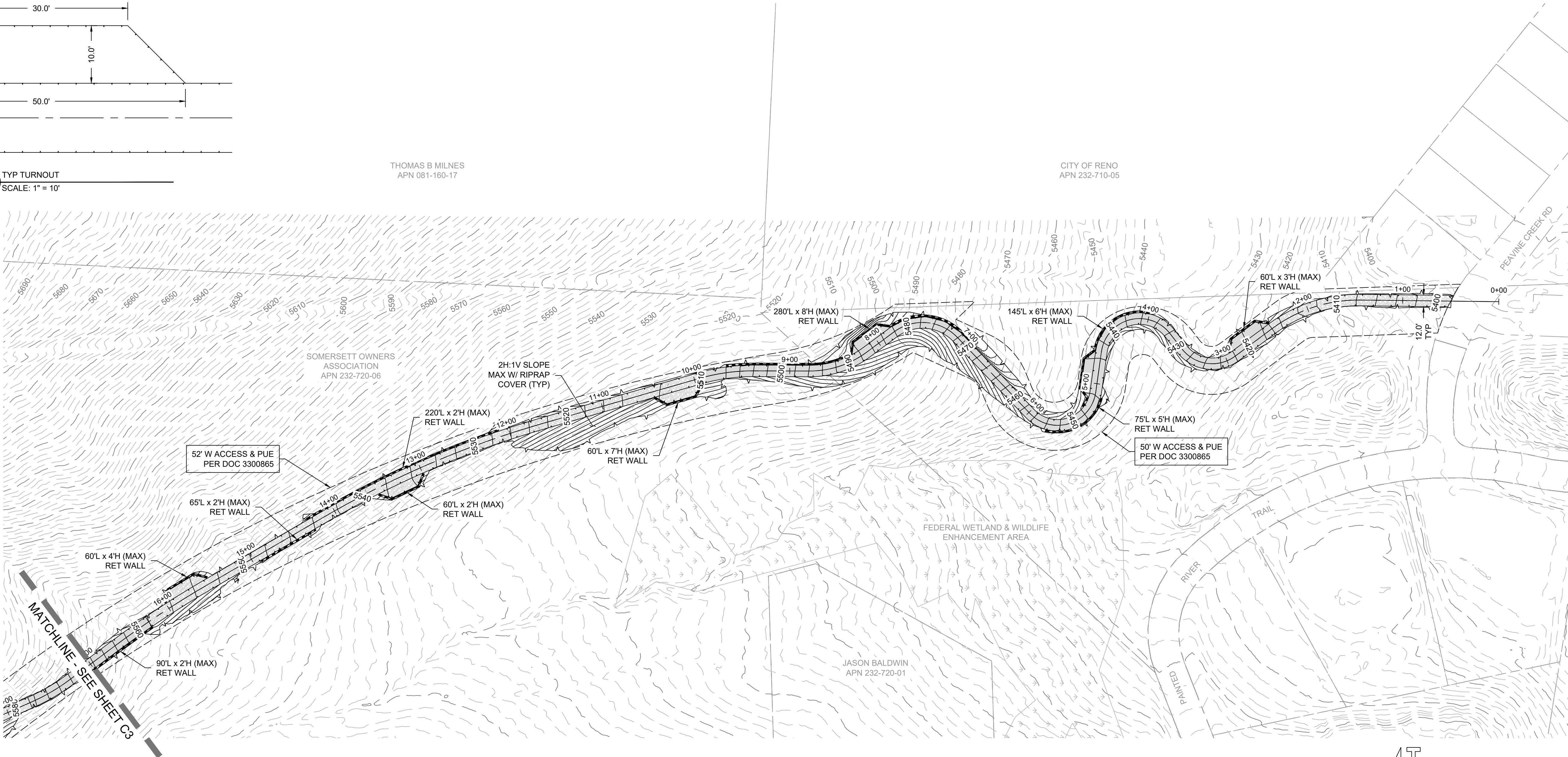
Elevation



1 TYP TURNOUT
SCALE: 1" = 10'

THOMAS B MILNES
APN 081-160-17

CITY OF RENO
APN 232-710-05



SHEET NOTES

CORESTONE ENGINEERING GEOTECH INVESTIGATION, 2026

MANHARD CONSULTING ACCESS EASEMENT & PUE LINWORK, 2005

WASHOE COUNTY GIS 1' LIDAR CONTOURS, 2017

WASHOE COUNTY GIS PARCEL BNDYRS, 2026

REFERENCES

#	REVISION DESCRIPTION	DATE

ENGINEER'S SEAL

**PRELIMINARY
NOT FOR
CONSTRUCTION**



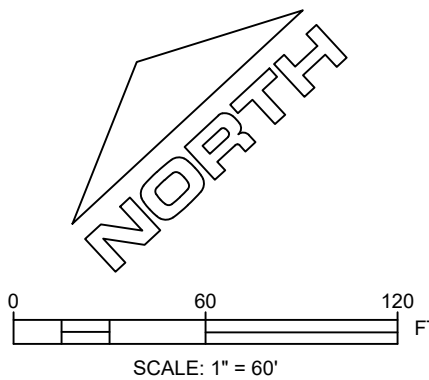
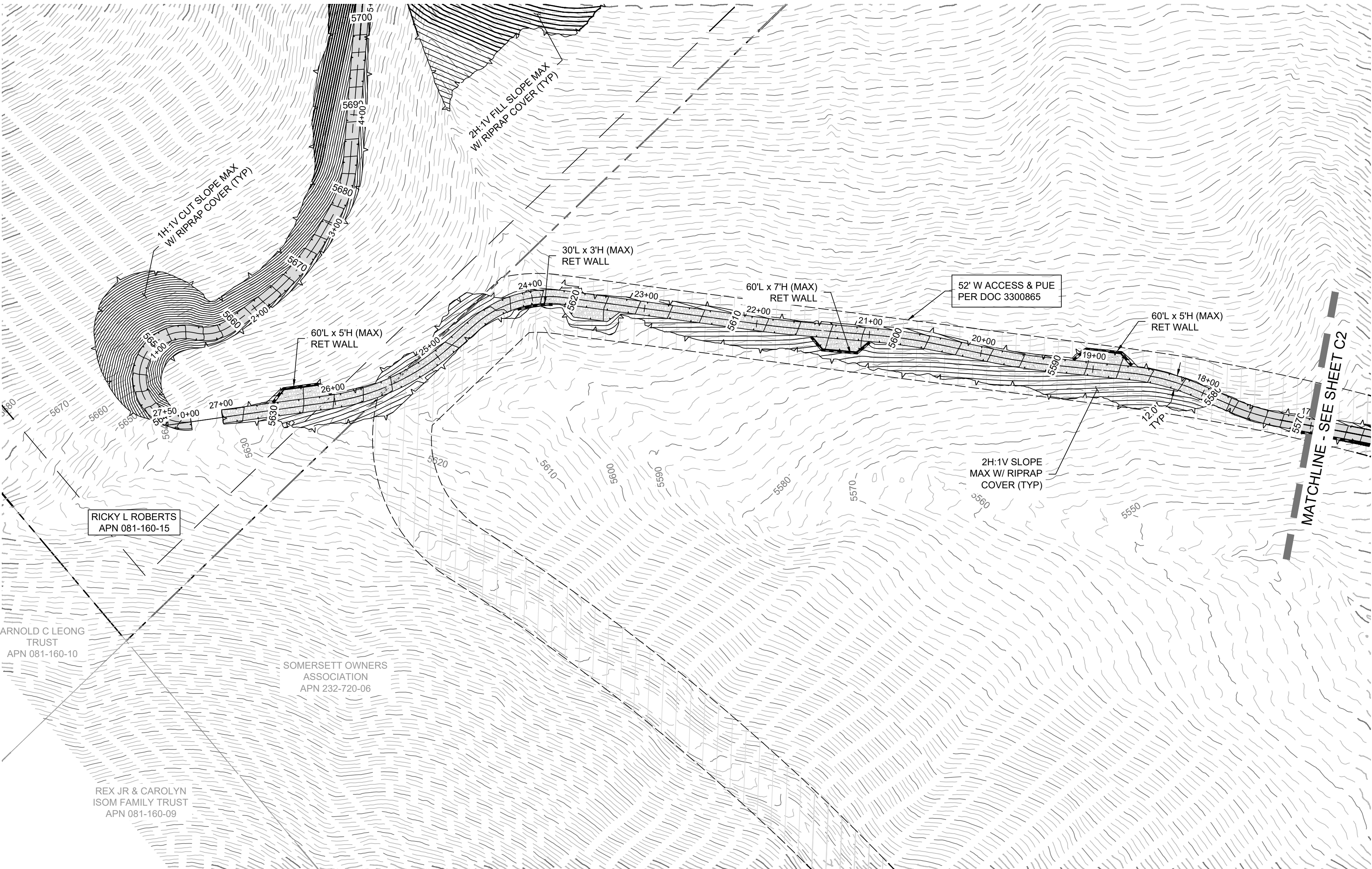
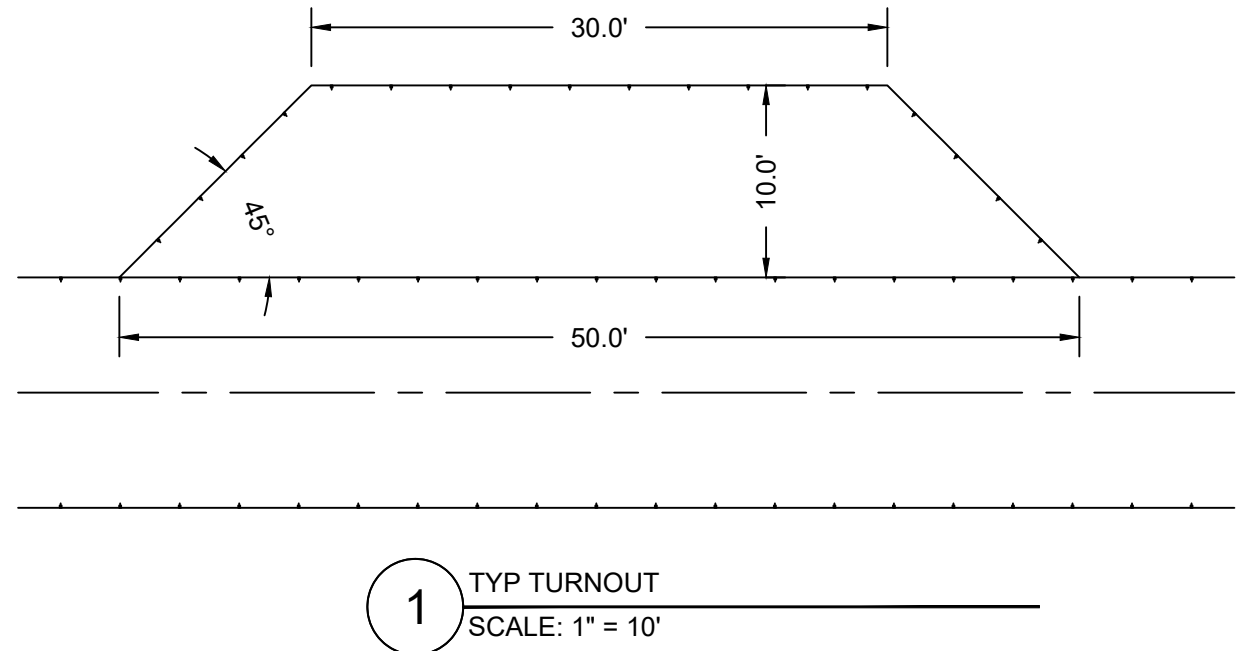
PROJECT INFORMATION

RICKY ROBERTS
ROBERTS' RESIDENCE
GRADING SUP

0 UNSPECIFIED
WASHOE COUNTY, NV 89523
WASHOE COUNTY APN 081-160-15

SHEET TITLE
ACCESS P&P STA 0+50 TO 16+00

JOB NUMBER 0092	SHEET NUMBER C2
DATE 9/4/2026	
SCALE AS NOTED	



SHEET NOTES

CORESTONE ENGINEERING GEOTECH INVESTIGATION, 2026

MANHARD CONSULTING ACCESS EASEMENT & PUE LINEWORK, 2005

WASHOE COUNTY GIS 1' LIDAR CONTOURS, 2017

WASHOE COUNTY GIS PARCEL BNDRYS, 2026

REFERENCES

#	REVISION DESCRIPTION	DATE

ENGINEER'S SEAL

PRELIMINARY
NOT FOR
CONSTRUCTION

DESIGN FIRM



SIERRA VISTA
ENGINEERING

GENERAL BLDG. 22740 Sierra Vista Engineering.com
PROJ. RES. BLDG. 22740 Sierra Vista Engineering.com
CALL OR TEXT 805-305-4046 OR 775-506-8862
MAIL 215 E. THOMPSON BLVD., STE. D VENTURA, CA 93001

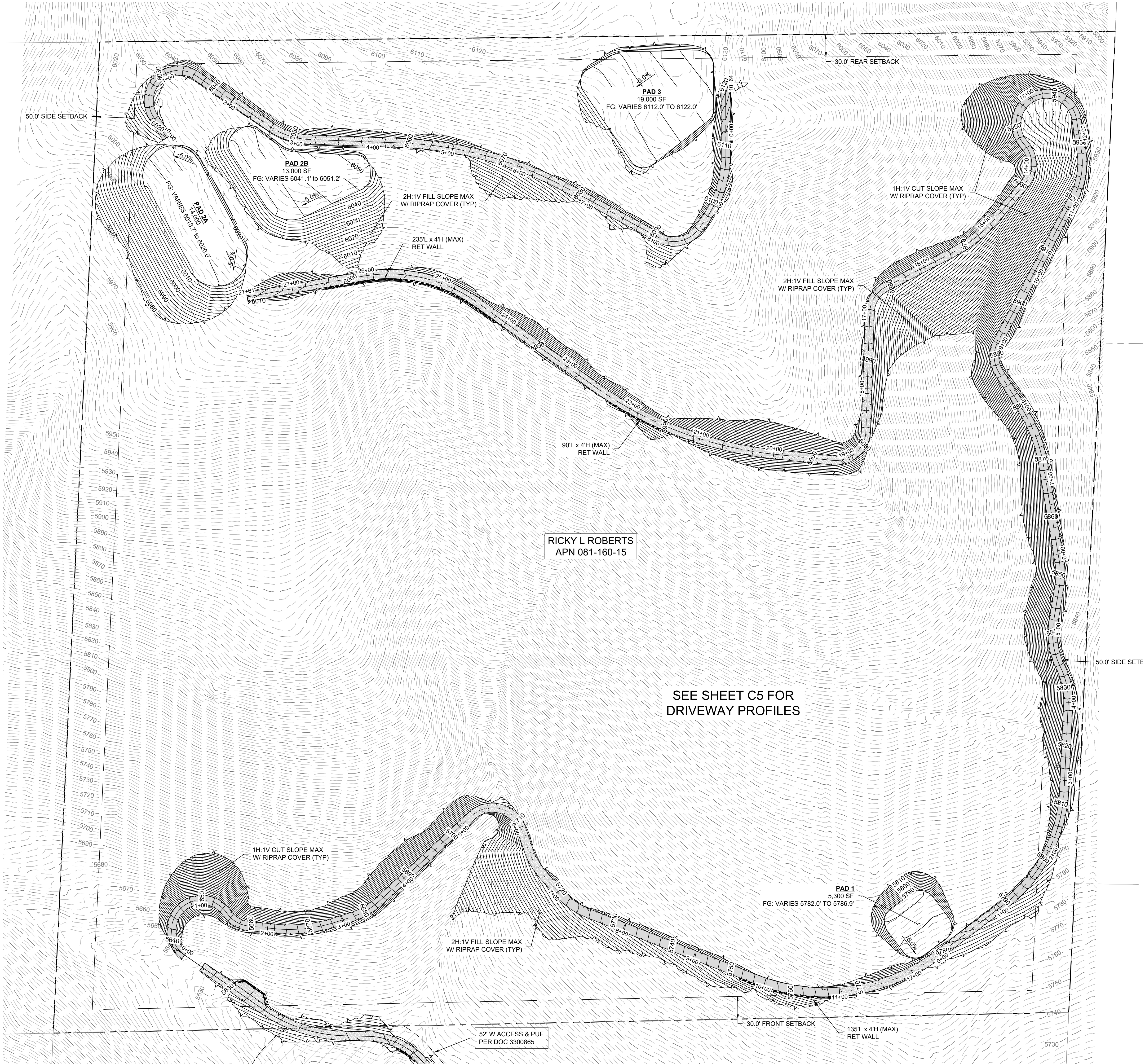
PROJECT INFORMATION

RICKY ROBERTS
ROBERTS' RESIDENCE
GRADING SUP

0 UNSPECIFIED
WASHOE COUNTY, NV 89523
WASHOE COUNTY APN 081-160-15

SHEET TITLE
ACCESS P&P STA 16+00 TO 27+00

JOB NUMBER 0092	SHEET NUMBER C3
DATE 9/4/2026	
SCALE AS NOTED	



SHEET NOTES

- CORESTONE ENGINEERING GEOTECH INVESTIGATION, 2026
- MANHARD CONSULTING ACCESS EASEMENT & PUE LINework, 2005
- WASHOE COUNTY GIS 1' LIDAR CONTOURS, 2017
- WASHOE COUNTY GIS PARCEL BNDrys, 2026

REFERENCES

#	REVISION DESCRIPTION	DATE

ENGINEER'S SEAL

**PRELIMINARY
NOT FOR
CONSTRUCTION**

DESIGN FIRM



**SIERRA VISTA
ENGINEERING**

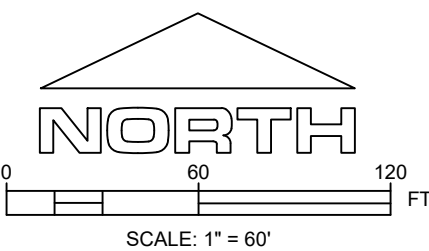
GENERAL BUILDING, CIVIL, AND LANDSCAPE ARCHITECTURE
PROJECTS: RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL
CALL OR TEXT: 805-305-4046 OR 775-596-8862
211 E. THOMPSON BLVD., STE. D
VENTURA, CA 93001

PROJECT INFORMATION

**RICKY ROBERTS
ROBERTS' RESIDENCE
GRADING SUP**

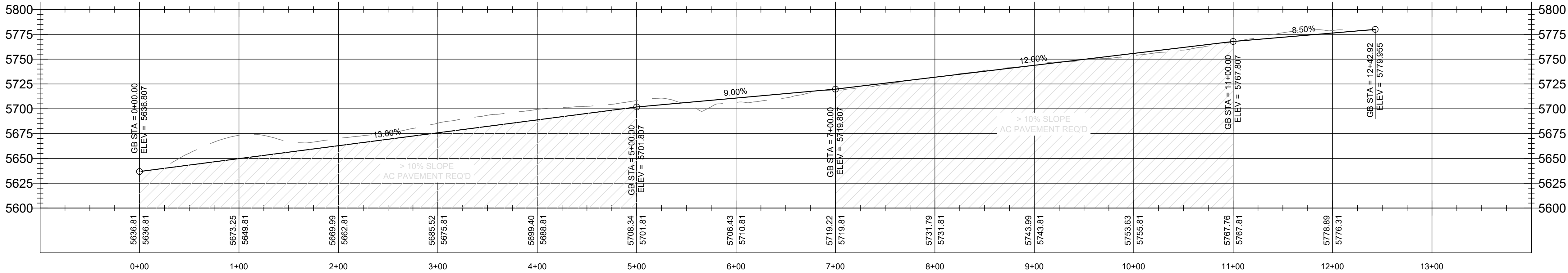
0 UNSPECIFIED
WASHOE COUNTY, NV 89523
WASHOE COUNTY APN 081-160-15

SHEET TITLE PRELIMINARY SITE GRADING PLAN		
JOB NUMBER	0092	
DATE	9/4/2026	
SCALE	AS NOTED	
SHEET NUMBER		C4



DRIVEWAY 1 PROFILE

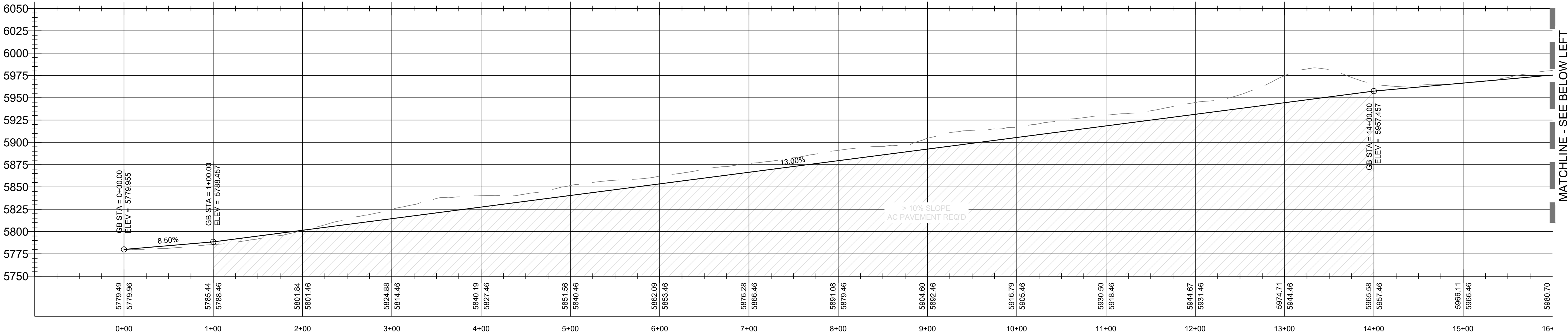
HOR / VERT SCALE: 1" = 60'



DRIVEWAY 2 PROFILE

STA 0+00 TO 16+00

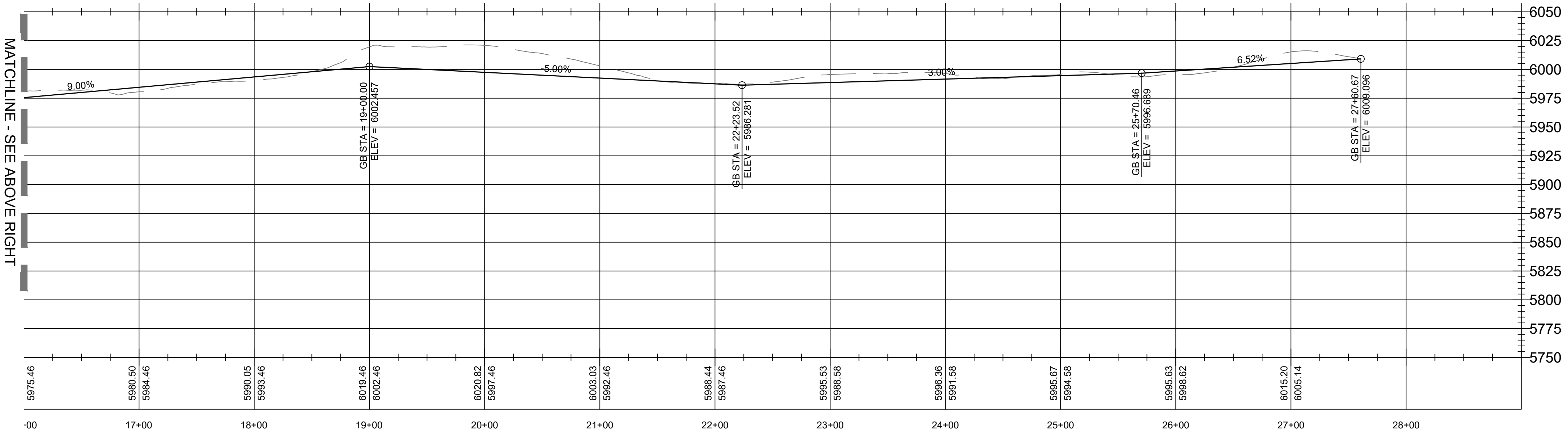
HOR / VERT SCALE: 1" = 60'



DRIVEWAY 2 PROFILE

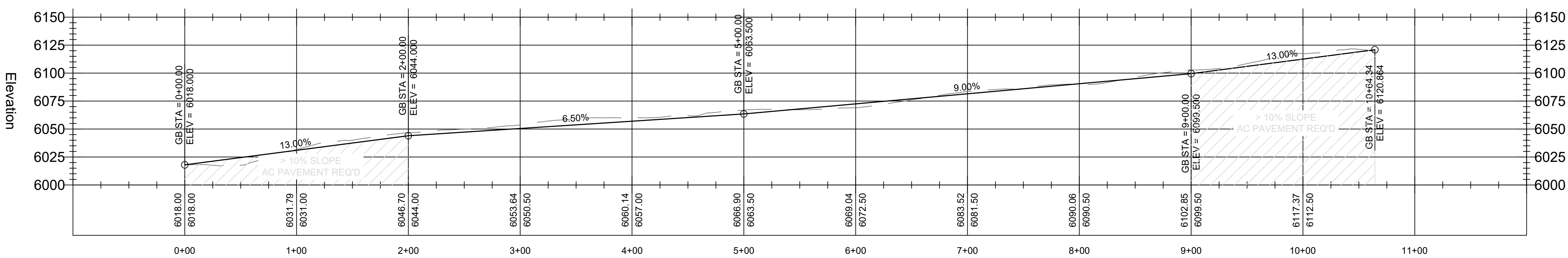
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HOR / VERT SCALE: 1" = 60'



DRIVEWAY 3 PROFILE

HOR / VERT SCALE: 1" = 60'



SHEET NOTES

CORESTONE ENGINEERING GEOTECH INVESTIGATION, 2026

MANHARD CONSULTING ACCESS EASEMENT & PUE LINWORK, 2005

WASHOE COUNTY GIS 1' LIDAR CONTOURS, 2017

WASHOE COUNTY GIS PARCEL BNDRIES, 2026

REFERENCES

#	REVISION DESCRIPTION	DATE

ENGINEER'S SEAL

PRELIMINARY

NOT FOR

CONSTRUCTION



PROJECT INFORMATION

RICKY ROBERTS
ROBERTS' RESIDENCE
GRADING SUP

0 UNSPECIFIED
WASHOE COUNTY, NV 89523
WASHOE COUNTY APN 081-160-15

SHEET TITLE		
ONSITE DRIVEWAY PROFILES		
JOB NUMBER	SHEET NUMBER	
0092	C5	
DATE	9/4/2026	
SCALE	AS NOTED	



**RE: Geotechnical Investigation Update – Cut and Fill Slopes
Northwest Reno Parcel: APN 081-160-15
Washoe County, Nevada**

Dear Mr. Roberts:

In July 2026, Corestone Engineering, Inc. (CEI) completed a geotechnical investigation for the above-referenced residential parcel in northwest Reno area of Washoe County, Nevada (CEI, 2026). This geotechnical update provides additional and updated geotechnical recommendations with respect to the cut slopes proposed in the needed grading for interior drive paths and pads for the structures per our review of preliminary grading plans for the project.

Based on the review of grading plans and our follow up discussion with the project civil engineer Sierra Vista Engineering of Ventura, California, it is our understanding that cut slope up to 30 feet in vertical height and fill slopes up to 20 feet in vertical height are anticipated in the grading of building pads and drive paths within the site exhibiting native steep hillside slopes. Due to steep native slopes, the depths of cuts and thickness of fills will be significantly smaller than the expected vertical heights of the cut and fill slopes, respectively.

Native materials within the project parcel consist of approximately 1 to 1.5 feet of overburden sandy lean clay to clayey sand with gravel soils followed by volcanic rock materials that show a variable weathering and alteration. Volcanic rock materials generally increase in consistency and hardness with depth. Cut slopes in these native materials will be globally stable at 1H:1V (horizontal to vertical) ratio or flatter. Fill slopes constructed using native materials generated from cut areas will be globally stable at 2H:1V ratio or flatter when placed and compacted per the recommendations contained in the geotechnical report (CEI, 2026). We recommend a minimum 95 percent relative compaction for densified fills, as determined per American Society for Testing and Materials (ASTM) D 1557, when the thickness/depth of the fill is 8 feet or more. Slopes that are shorter than 30 feet in height will not require mid height maintenance access roads per 2024 *International Building Code* (International Code Council, 2024).

Fill slopes should be mechanically stabilized against surface erosion (e.g. riprap). The cut slopes will also require mechanical erosion protection after further onsite evaluation of exposed volcanic rock materials on the face of the slope. Competent rocks will have low potential for erosion; however, weathered /altered volcanic rocks can be subject to erosion resulting in long-term instability of the overall cut slope. Special details for riprap placement should be utilized for proper riprap protection of steep cut slopes. This may include 12 inches burial of 2-foot-diameter riprap rocks at the toe of the cut slope and then progressively reducing the size of the riprap up to Class 150 riprap per *Standard Specifications for Public Works Construction* (2016). During final grading design, when requested, CEI will provide additional geotechnical design services for the project to develop details and recommendations for slope production.



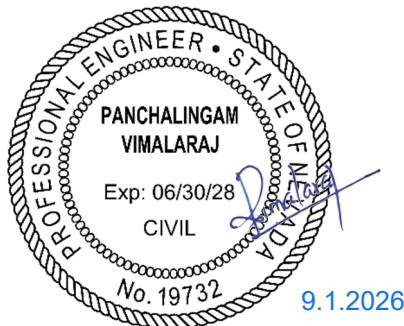
Alternate, steep nail/shotcrete slope walls with short soil nail anchors and shotcrete facing may also be utilized to complete stable cuts into native materials at significantly steeper than 1H:1V ratio. These soil nail/shotcrete slope walls should be properly designed and constructed; when requested, CEI can provide these design services.

This geotechnical update provides some additional and updated geotechnical recommendations for the expected cut and fill slopes on the project. All other findings, discussions, recommendations, and limitations contained in our July 2026 geotechnical report for the project remain unchanged and valid.

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,

Corestone Engineering, Inc.



Vimal P. Vimalaraj, P.E., G.E.
President/Principal Geotechnical Engineer
PV:pv

Copies to: Addressee (PDF via Email)

References

American Society for Testing and Materials (ASTM), 2018, *Soil and Rock*, Volumes 4.08 and 4.09.

Corestone Engineering, Inc. (CEI), 2026, *Geotechnical Investigation, Northwest Reno Parcel: APN 081-160-15, Washoe County, Nevada*, Private Consultant Report dated July 6, 2026.

International Code Council, 2024, *International Building Code*.

Standard Specifications for Public Works Construction (SSPWC), 2016 (Washoe County, Sparks-Reno, Carson City, Yerington, Nevada).



Corestone Engineering, Inc.
10751 Grayslake Dr, Reno, Nevada 89521

Geotechnical Services & Construction Materials Testing
775-636-5916 vimal@corestoneengineering.com

**RE: Geotechnical Investigation
 Northwest Reno Parcel: APN 081-160-15
 Washoe County, Nevada**

Dear Mr. Roberts:

Corestone Engineering, Inc. (CEI) is pleased to present the results of our geotechnical investigation for the referenced single-family home structures proposed within a residential parcel in northwest Reno area, north of Somerset community in Washoe County, Nevada. Our geotechnical investigation consisted of research, field exploration, laboratory testing, and engineering analysis to allow formulation of geotechnical conclusions and recommendations for design and construction of the proposed project. The purpose of this geotechnical investigation was to evaluate existing foundation materials and to provide associated geotechnical recommendations that will aid in adequate performance of structural elements.

Project Description

The proposed project will ultimately include a single-family home project with multiple structures within portions of an approximately 40-acre parcel (Assessor's Parcel Number [APN 081-160-15]) located north of Somerset community in northwest Reno area of Washoe County, Nevada. The improvements will also require establishment of an access road that will be located along an existing unimproved, rough graded path that extends from existing asphalt concrete paved Peavine Creek Road. At the time of this geotechnical report, no site plan and grading concepts were available to review. Once the final project details become available, CEI should be provided with the opportunity to review them and provide any needed updated and/or additional geotechnical recommendations for the proposed project.

Based on the layout sketch provided by you, a house, detached garage, solar, well/pump house, and septic system are being planned within the southeastern corner portion of the large 40-acre parcel in Phase 1 (refer to Plate 1 (Plot Plan)). A future phase (Phase 2) is expected to include 2 additional standalone structures within the northern limits of the parcel. The remainder parcel is expected to remain unimproved. Percolation testing for the proposed septic system has been completed by others, and it is our understanding that septic system design will be completed by others. The house is expected to be a 1- or 2-story wood-framed structure supported by conventional Portland cement concrete (PCC) shallow spread footings and will include slab on-grade PCC floor garages on the main level and possibly raised wooden floor elsewhere in the living areas. Other structures within the parcel are expected to be single-story buildings supported on PCC shallow footings with slab-on-grade floors. Depending on the final design, the proposed home structure may include a partially below-grade level with PCC cast-in-place building retaining walls. The access road grading and improvements will be located within an easement along an existing unimproved path (jeep rail) located mostly in a separate parcel (APN 232-720-06) owned by Somerset Homeowners Association.



A majority of the project parcel as well as the area of access path are located on mountainous terrain that exhibit relatively steep topography. The proposed structures are planned somewhat flatter areas of the parcel. With the limited building pad limits and the existing grades, we assume the grading for the building pads and access paths may involve cuts and fills on the order of 10 feet. The access road will extend from existing Peavine Creek Road, and the current steeper segments of jeep trail will likely require grading to accomplish moderate grades as part of the proposed residential project.

Site Conditions

The project parcel is located in northwest Reno area just outside City of Reno limits, north of Somerset community area in Washoe County, Nevada. The project parcel is entirely contained in Section 35, Township 20 North, Range 18 East, Mount Diablo Meridian. The project parcel is accessed via an unimproved, rough graded path that extends from asphalt concrete paved Peavine Creek Road near its termination. Unimproved path rises up through about 350 feet elevation on the side of the ridges for about 2,000 feet to reach the project parcel. The Peavine Creek Road is an asphalt concrete paved, 2-way, 2-lane residential street within City of Reno jurisdiction. There are unimproved, rough graded paths (jeep trails) and relatively small, graded pads within the parcel at various locations. Based on our site visit and limited record search, no structures or improvements appear to exist along the access path and within the 40-acre parcel.

The project parcel and access path are located within a mountainous terrain with ridges, valleys, and moderate to steep hillside slopes. In general, existing topography within the parcel rises up from southern edge of the parcel towards northern edge along 2 predominant ridges. Based on the Washoe County Regional Mapping System, the elevations within the parcel changes from about 5,620 feet above mean sea level (msl) within the drainage path near the southwestern corner of the parcel about 6,120 feet above msl near center of the northern boundary of the parcel (near the area of potential future buildings). The portion of the project parcel to host the home and other structures (Phase 1 improvements) exhibits somewhat flatter sloping gradient of about 15 to 20 percent but there are hillsides that slope at as much as 50 percent gradient (2 horizontal to 1 vertical [2H:1V] ratio) within the overall parcel. The existing access path had generally been graded (appears to be rough graded using a bulldozer) with progressively rising grades on the sides of the hillside with native slopes at about 2.5H:1V to 3H:1V ratio as well as through much flatter areas.

The overall project parcel includes pine trees, undergrowth, and sage brush at a variable intensity. The areas proposed for the improvements within the parcel generally do not exhibit pine trees and are moderately to densely populated with sage brush up to about 4 feet in height. Mature trees are also rare along access path leading to the parcel. Native slopes on the sides of the access path includes sage brush and other desert plants. Partially buried cobbles and boulders (some are possibly outcrops) also exist at a variable concentration throughout the parcel and also on the sides of the unimproved access



path to the parcel. Segments of graded access path also exhibit rocky surface with partially buried rocks consisting of mostly cobbles and some small boulders.

Site Investigation

The proposed improvements areas of the single-family home project were explored on June 11 of 2026 by excavating 8 test pits (TP-1 through TP-8) using a Cat® 308 rubber track-mounted excavator. The approximate test pit locations are shown on Plate 1. Test pits TP-6 through TP-8 were excavated along the proposed access drive outside the limits of the residential parcel. The maximum depth of exploration was 13 feet below the existing ground surface. Test pits advanced within the and about half of the test pits encountered practical refusal at shallow depths on relatively hard volcanic rock. Bulk samples for index testing were collected from the trench wall sides at specific depths in selected soil horizons. The test pits were backfilled immediately after exploration. Backfill was loosely placed and the area re-graded to the extent possible with equipment on hand.



Test Pit Exploration

A geotechnical engineer examined and identified all soils and volcanic rock materials excavated with the physical characteristics of soils in the field in accordance with ASTM D 2488. During test pit exploration, representative bulk samples were placed in sealed plastic bags and returned to our office in Reno, Nevada for additional evaluation and laboratory testing assignments. Additional soil classification was subsequently performed in accordance with ASTM 2487 (Unified Soil Classification System [USCS]) upon completion of laboratory testing, as described 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 (USCS Soil Classification Chart).

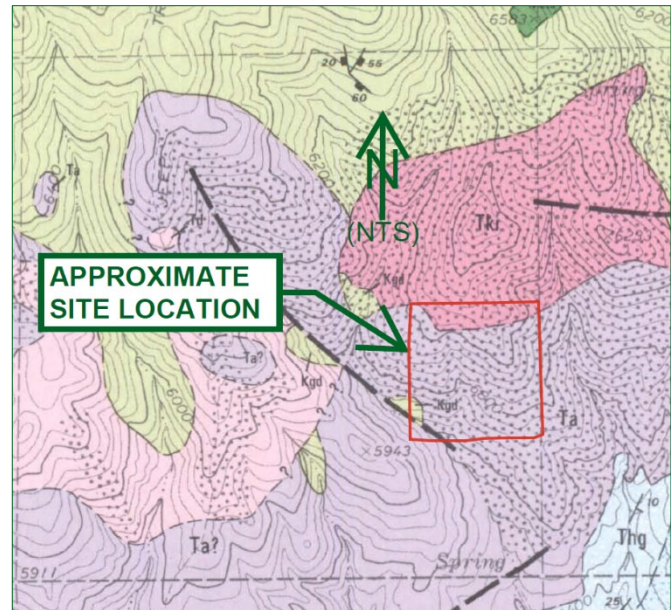
Laboratory Testing

Corestone Engineering, Inc. subcontracted Construction Materials Engineers, Inc. of Reno, Nevada to complete laboratory testing to analyze soil characteristics (detailed below) in general accordance with the standards and methodologies described in Volume 4.08 of the ASTM Standards. Chemical tests detailed below were performed by SGS North America, Inc. of Reno, Nevada.



Representative samples of selected significant soil types were analyzed to determine the in-situ moisture content (ASTM D 2216), grain size distribution (ASTM D 422), and plasticity index (ASTM D 4318). The results of these tests are shown on Appendix A (Index Test Results) and were used to classify the soils according to ASTM D 2487 and to verify field classification.

Chemical testing was performed on a representative sample of site foundation materials to evaluate the site materials' potential to corrode steel and PCC in contact with the ground. The sample was tested for pH, resistivity, redox potential, soluble sulfates, and sulfides. The results of the chemical tests are shown on Appendix B (Chemical Test Results).



Portion of Geologic Map (Bell and Garside, 1987)

Geologic and Soil Conditions

Most of the project parcel is mapped by the Nevada Bureau of Mines and Geology (NBMG) to lie in Tertiary age *Andesite* (Ta) and *Kate Peak Formation* (Tki) volcanic rocks (Bell and Garside, 1987). The proposed access drive also lies in andesite volcanic unit. Minor granitic rock unit is mapped within the drainage area near the southwestern corner portion of the parcel. The mapped andesite flows and lahars units within the parcel and along access path are mapped to be altered rocks. The materials encountered generally include a relatively thin (1 to 1.5 feet) upper soil layer followed by volcanic rock material mapped by NBMG. The volcanic rock encountered in the test pits is intensely to moderately weathered and was generally excavated with the characteristics of clayey sand to clayey or silty gravel with sand and a variable percentage of volcanic cobbles. Some intensely weathered volcanics result in fine-grained soils.

The project parcel is underlain by approximately 1 to 1.5 feet of overburden sandy lean clay to clayey sand with gravel soils followed by volcanic rock materials that show a variable weathering and alteration. The overburden soils encountered in test pits TP-1 through TP-3 advanced within the portion of the parcel to host the main house and associated structures include dense clay-rich clayey sand with gravel to clayey gravel consisting of 38 to 40 percent medium plasticity fines and up to 35 percent of angular fine to coarse gravel. The underlying moderately to intensely weathered volcanic rock materials exhibit the characteristics of very stiff to hard sandy silt to dense to very dense clayey sand to silty/clayey gravel with sand soils. The excavated materials contain 15 to 54 percent low to medium plasticity fines. The upper portion of the parcel that may host additional future structures (area of test pits TP-4 and TP-5) exhibits



about 1 to 1.5 feet of sandy lean clay consisting of 60 to 70 percent medium plasticity fines underlain by volcanic materials. The volcanic material is moderately weathered and becomes hard at shallow depths of about 6.5 to 7.5 feet below existing ground surface. The test pit excavated within the rough graded limits of existing unimproved path (jeep trail) shows weathered volcanics consisting of clayey gravel with sand and cobbles. Test pit TP-8 advanced on the fill side of the graded path contain about 1 foot of dense clayey sand with gravel fill soils. Test pit TP-6 that was advanced near in the native slope above the path encountered about 1 foot of sandy lean clay overburden soils underlain by weathered volcanic that was excavated as very dense clayey sand with gravels. Total excavated volcanic material mass includes a variable percentage of about 5 to 25 percent angular cobbles up to 8 inches in diameter. Overburden soils also contain cobbles and partially boulders.

Groundwater was not encountered during our exploration that extended to a depth of 13 feet below the existing ground surface. Groundwater in the area is generally expected to be hundreds of feet depth below existing ground surface. Groundwater should not be a concern for the design and construction of the proposed home and associated improvements. On bedrock sites located on hillsides, there is always a potential exist to encounter perched groundwater and groundwater seepage during winter and snowmelt months.

Geologic Hazards

Seismicity and Faults

The Truckee Meadows, including adjacent hillsides lies within an area with a high potential for strong earthquake shaking. Seismicity within the Reno-Sparks area is considered about average for the western Basin and Range Province. 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. The most active segment of this fault system in the Reno area is located at the base of the mountains near Thomas Creek, Whites Creek, and Mt. Rose Highway, some 14 miles south to southeast of the project site.

The NBMG *MyHazards* web-mapping tool shows southwest to northeast trending early Quaternary age (active within last 1.8 million years) faults at 1,600 feet or more south of the project parcel (NBMG, 2026). Because no faults are mapped within or adjacent to the project site and no evidence of faulting was suggested in our field exploration, no further fault investigation or fault mitigation in the form of building setback are necessary for this project.

Ground Motion and Liquefaction

The USGS 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 0.64 g will be exceeded in any 50-year interval (ASCE, 2025). Some amplification of ground motion would be expected during an earthquake due to shallow bedrock.



The residential parcel is underlain by volcanic rock from shallow depth; as such, liquefaction will not occur at the site.

Flood Plains

The Federal Emergency Management Agency (FEMA) has identified the site as lying in unshaded Zone X, or outside of a 500-year flood zone (FEMA, 2009).

Other Geologic Hazards

A moderate potential for dust generation is present if grading is performed in dry weather. No other geologic hazards were identified.

Discussion and Recommendations

Executive Summary and General Information

Native materials within the project site consist of an overburden clay soil layer underlain by volcanic rock materials that consist of mostly granular sand and gravel soils. However, volcanic materials in some zones subsurface materials profiles are intensely weathered and altered to exhibit the characteristics of clay soils consisting of clayey sand and sandy silt with excessive percentage of medium plasticity fines. The surficial clay soils and localized areas of deeper clay soils (intensely weathered/altered volcanic materials) will exhibit some shrink-swell potential and low strength characteristics. When encountered at the subgrade and foundation bottom elevations for the improvements, clay soils should be separated from improvements via structural fill/rock fill. Majority of excavated volcanic materials are granular soils and will be suitable to support improvements when properly prepared and also as densified structural fill/rock fill.

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 is 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 buildings, concrete slabs and asphalt pavements, as well as pads for any minor structures. The term engineer, as presented below, pertains to the civil engineer who practices in the field of geotechnical engineering and has prepared the geotechnical engineering report for the project or who serves as a qualified geotechnical professional on behalf of the owner.



All compaction requirements presented in this report are relative to ASTM D 1557. For the purposes of this project:

- Fine-grained soils are defined as those with more than 40 percent by weight passing the number 200 sieve and a plastic index lower than 15.
- Clay soils are defined as those with more than 30 percent passing the number 200 sieve and a plastic index greater than 15.
- Granular soils are those not defined by the above criteria.

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.

Civil Engineering and Construction Recommendations

1. All vegetation should be stripped and/or grubbed from structural areas and placed elsewhere within the parcel in nonstructural areas. Existing relatively steep grades and partially buried cobbles and boulders will likely hinder stripping. Where possible, a stripping depth of about 6 inches is anticipated. Alternatively, striping (or dozing) may be completed through sufficient depths to remove overburden clay soils that are unsuitable materials for structural support or reuse as structural fill/rock fill. Where necessary, trees and roots greater than one-half inch in diameter should be removed to a minimum depth of 12 inches below finished grade. Large roots (greater than 6 inches in diameter) shall be removed to the maximum depth possible. Resulting excavation shall be backfilled with structural fill compacted per Item 10 later in this report
2. The test pits were excavated by an excavator at the approximate location shown on Plate 1. Location was determined in the field by approximate means. Test pits were backfilled upon completion of the field portion of our study, and the backfill was compacted to the extent possible with equipment on hand. However, the backfill was not compacted to the requirements presented herein under Item 10. As such, the backfill should be removed and recompacted in accordance with the requirements contained in this report. For the adequate performance of exterior improvements, it is sufficient to remove the upper 5 feet of the test pit backfill and recompact as structural fill. Failure to properly compact backfill could result in excessive settlement of improvements located over a test pit.
3. Native materials consist of surficial clay soils and some deeper zones of weathered/alterd volcanic materials that exhibit the characteristics of clay soils with excessive percentage medium plasticity fines. Native clay soils will exhibit a moderate shrink-swell of native materials with changes in moisture content. Further, more importantly, moisture intrusion and wetting of native



clay soils can result in significant reduction in strength. Therefore, we recommend footings and slabs of the proposed structures be underlain by a minimum 1.5 feet of granular structural fill. The exterior improvements (slabs, pavement, and pavers) should be underlain by a minimum 1 foot of structural fill. The thickness of aggregate base beneath building slabs and exterior improvements can be considered towards the structural fill separation. Since most volcanic materials are expected to exhibit the characteristics of granular soils, over-excavation of native materials in cut areas extending below the overburden soils should be expected in limited areas. Exposed foundation/subgrade materials in cuts should be evaluated and, if clay soils are present, they should be over-excavated to provide structural fill/rock fill support for improvements. Surficial overburden clay soils should be removed from the pads for the structures to lie in 4 feet or less fill and placed in nonstructural areas. The width of over-excavation should extend laterally to a minimum of 9 inches from the edges of the footings and slabs/pavements on all sides. This recommended over-excavation will result in additional quantities of earthwork.

It must be emphasized that unless clay soils are completely removed from structural areas, some differential movement should be anticipated. However, with native materials exhibiting clay soils throughout the maximum depth of exploration in some test pits, it is not feasible to entirely remove these materials. Additional depth of structural fill separation (greater than the above recommended minimum) may be provided to further improve the structural performance against shrink-swell potential and associated differential movements. In any case, the differential movements should be within reasonable and tolerable values with the above recommended minimum structural fill support thickness and proper drainage control measures (both surficial and subsurface drainage system).

Clay soils to be left in place and covered with fill shall be moisture-conditioned to 2 to 4 percent over optimum for a minimum depth of 12 inches. This will require scarification of exposed grade to properly moisture conditioning of volcanic materials and compaction. This recommended moisture level will significantly decrease the magnitude of shrink-swell movements in the upper foot of clay soils. The high moisture content must be maintained by periodic surface wetting, or other methods, until the surface is covered by at least 1 lift of fill. If allowed to dry out, subsequent expansion of clay soils beneath foundations and floor slabs could significantly exceed the design criteria set forth later within this report

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

The bottom of footing excavations that lie in in-place, competent rock materials will not need scarification and compaction but should be cleaned to remove any loose materials. Where greater than 30 percent is retained on the $\frac{3}{4}$ -inch sieve, as is likely to occur on weathered rock



materials, standard density testing is not valid, and the materials will be considered rock fill. Rockfills should be densified to a performance specification via proof rolling using large roller or other approved compaction equipment. In all cases, the final surface should be firm and exhibit no signs of deflection.

5. If wet weather construction is anticipated, onsite surficial materials 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. Air drying of native materials will likely be difficult. Where air drying procedure is ineffective or where construction schedules preclude delays, mechanical stabilization will be necessary.

Mechanical stabilization may be achieved by over-excavation of the wet soils through 12 to 18 inches depth and backfilling the over-excavation with densified aggregate base (*Standard Specifications for Public Works Construction* [SSPWC], 2016) or approved pit-run gravels. Additional depth of over-excavation may be necessary if wet and soft soils extend through deeper horizon. The use of a geotextile such as Mirafi® 160N is recommended at the base of the over-excavation to provide additional stability. Gravels should be densified to result in a firm and unyielding surface.

6. Native materials should be excavatable through intended depths with medium to large earthwork equipment. Temporary trenches with near-vertical sidewalls should be stable in onsite soils to a depth of approximately 4 feet. Excavations to greater depths in native volcanic materials that exhibit the characteristics of very dense soils will require laying back of sidewalls at a slope no steeper than 3H:14V ratio to maintain adequate stability. Any soils or intensely weathered/alterd volcanic zone should be sloped at 1H:1V ratio (Type B materials). All trenching and excavation should conform to the State of Nevada, Department of Industrial Relations, Division of Occupational Safety and Health Administration (OSHA) standards (Code of Federal Regulations, 2010).

It must be noted that the bedrock sites will have the potential to exhibit hard rock zones within generally excavatable (weathered) rock materials. When encountered, any hard rock zones will require aggressive excavation techniques such as use of excavator mounted rock hammers, rock saws, etc. Massive, hard volcanic boulders may also be present within local areas. Any excavation resulting from removal of these boulders should be backfilled with structural fill or rockfill placed and densified per Item 10 (or approved flowable sand-cement slurry backfill).

7. The maximum particle size in trench backfill shall be 4 inches. Bedding and initial backfill 12 inches over the pipe shall conform to the requirements of the utility having jurisdiction and typically will require Class A backfill (SSPWC, 2016). Bedding and initial backfill shall be densified



to at least 90 percent relative compaction. Native granular soils are suitable to use as final backfill after exclusion of oversized particles. Native clay soils are not suitable to use as final backfill within structural areas. Final backfill shall be placed in maximum 8-inch-thick loose lifts that are compacted to a minimum of 90 percent relative compaction in all structural areas.

8. Laboratory testing on representative samples of site foundation soils was performed to evaluate the corrosion potential of the soils with respect to metal pipe in contact with the ground. The results of the laboratory testing (refer to Appendix B) indicate that the site soils are not corrosive to buried metal (American Water Works Association, 1999). As a result, metal pipe in contact with the ground will not require corrosion protection.
9. Native materials consist of a surficial clay soil layer underlain by native volcanic rock materials that will mostly exhibit characteristics of granular soils with some zone of clay soils. Native granular soils (most of excavated volcanic rock materials) will be suitable to use as structural fill after exclusion of particles larger than 5 inches. Rockfills discussed later in this section may include particles up to 10 inches in diameter. Native clay soils are unsuitable for structural filling within the home and miscellaneous building/structure footprints. Native clay soils may be placed as fill beneath the required structural fill separation in exterior improvements area, but these materials should be properly moisture conditioned and compacted. Imported structural fill is not expected on this project. If imported structural fill is required, we recommend the specifications of Table 1 (Guideline Specification for Imported Structural Fill).

TABLE 1 - GUIDELINE SPECIFICATION FOR IMPORTED STRUCTURAL FILL		
Sieve Size	Percent by Weight Passing	
5 Inch	100	
¾ Inch	70 – 100	
No. 40	30 – 70	
No. 200	10 – 30	
Percent Passing No. 200 Sieve	Maximum Liquid Limit	Maximum Plastic Index
10 – 30	40	12

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.

10. All soil structural fill on the project shall be placed in maximum 8-inch loose lifts, moisture conditioned, and compacted to 90 percent relative compaction.

Any non-structural fill should be densified to at least 85 percent relative compaction to reduce consolidation and increase permeability to promote surface runoff towards drainage paths.

Most of onsite weathered volcanic rock materials will have greater than 30 percent retained on the $\frac{3}{4}$ -inch sieve, such that standard density testing is not valid. These materials will be treated as rock fills with a maximum lift thickness 12 inches and maximum particle size of 10 inches. It is recommended the maximum particle size of rock fills placed within the upper 2 feet of the finished grade be limited to 5 inches to allow for fine grading and to reduce difficulties in trenching and excavations. A proof rolling program of at least 5 single passes of a minimum 20-ton roller in grading, or at least 5 complete passes with hand compactors in footing trenches, is recommended for rockfills.

Properly constructed rockfills have a long history of excellent performance in northern Nevada. Acceptance of this rockfill is based upon observation of particle size, lift thickness, moisture content, and applied effort in achieving compaction. Compaction must continue to the satisfaction of the engineer.

All fill placed on hillsides steeper than 5H:1V shall be keyed into existing materials in equipment-wide benches. The maximum vertical separation between benches shall be 5 feet. Sloping bedrock surfaces should be evaluated by CEI on a case-by-case basis to determine the need for benching to key-in the fills

Grading shall not be performed with or on frozen soils.

11. All exterior footings should be placed a minimum 2 feet below adjacent finished grade for frost protection.
12. If footing excavations are open for extended periods of time and disturbed soils are encountered at the foundation, these soils should be recompacted or removed to expose undisturbed soils or rock, and the resulting over-excavation backfilled with compacted structural fill. The base of all excavations should be dense, dry, and free of loose soils at the time of concrete placement.
13. No grading plans were available for review at the time of this geotechnical report. Grading of the structure pads and drive path will involve cut and fill slopes that may have vertical heights up to about 10 feet. Stability of cut and filled surfaces involves 2 separate aspects. The first concerns true slope stability related to mass wasting, landslides, or the en masse downward movement of



soil or rock. Stability of cut and fill slopes is dependent upon shear strength, unit weight, moisture content, and slope angle. The *International Building Code* ([IBC] International Code Council [ICC], 2024a), adopted by Washoe County, allows cut and fill slopes up to 2H:1V in the type of overburden soils encountered in our exploration. The exploration and testing program conducted during this investigation confirms 2H:1V slopes will be stable in overburden soils. Depending on the exposed conditions of bedrock materials, cut slopes in onsite bedrock can be graded 1.5H:1V ratio.

The second aspect of stability involves erosion potential and is dependent on numerous factors involving grain size distribution, cohesion, moisture content, slope angle, and the velocity of water or wind on the ground surface. Erosion protection is required for cut and fill slopes that are 5H:1V or steeper. Soil slopes between 3H:1V and 5H:1V can be stabilized by hydroseeding. Mechanical stabilization such as riprap or other alternate stabilization methods (e.g., geo-cell systems) is recommended for slopes steeper than 3H:1V. As a minimum, tall 2H:1V slopes in soils should include a riprap lined intercepting swale behind the crest and at selected intervals along the slope face to reduce uncontrolled surface runoff on the slope which can result in significant erosional issues. Cut slopes in competent rock will not need erosion protection but a broad slope behind the crest to intercept surface runoff from uphill and possibly a swale near the toe to collect any dislodging rocks from the slope may be needed for rock cut slopes.

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 to moderate to high 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 acceptance of the project.

To minimize erosion and downstream impacts to sedimentation from this site, best management practices with respect to stormwater discharge shall be implemented.

14. Foundation, stem wall, and retaining wall backfill should be thoroughly compacted to decrease permeability and reduce the potential for irrigation and stormwater to migrate into any crawl space (if planned for home) and/or beneath foundations and slabs.
15. Adequate surface drainage should be provided away from the structures. In particular, upslope sides of the structures should have drainage swales to divert surface runoff and snowmelt away from structures. Designated snow storage areas should be placed downslope and away from the structures. Snow storage areas should have drainage swales to direct snowmelt water away from downslope structures. Snow should not be allowed to accumulate directly adjacent to the foundations.



The ponding of water on finished grade or at the edge of paver and other hardscape areas should be prevented by proper grading per 2024 *International Residential Code* ([IRC] ICC, 2024b).

A surface swale should also be installed along the upper shoulder of any cut slope and graded to drain around and away from the slope face. Depending on the gradient and contributing surface runoff area, surface swales may need to include rip-rap protection.

16. Where any portion of the proposed home structure or outbuilding is to include raised floor areas with a crawl space, subsurface foundation drainage must be installed along the exterior perimeter of the structure and associated footings. This may be accomplished by placing a non-woven geotextile/gravel system with a network of perforated drainpipes 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 drainpipe 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 drain rock (SSPWC, 2016) should be placed above the drainpipe 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. The cold joint between the footing and stem wall shall be waterproofed using a silicone-based caulk to further minimize seepage potential.
19. 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 prefabricated drain system such as Mirafi® G100N or an approved equivalent. An alternate wall drain system may include a minimum 18-inch-wide layer of Class C or D drain rock (SSPWC, 2016) with a drainage geotextile placed between the drain rock and soil backfill/retained soils. The drain rock should extend within 2 feet of finished grade and should be capped by compacted soil backfill to reduce infiltration of runoff into the drain material.

Onsite granular soils (weathered volcanic materials with the characteristics of granular soils) are suitable to use as backfill after exclusion of particles larger than 5 inches. Backfill behind retaining walls shall be compacted to 90 percent of the material's maximum dry density, but it shall not be densified to more than approximately 92 percent relative density to minimize pressure against the walls. Care must be exercised when compacting backfill against retaining walls and



foundations. To reduce temporary construction loads on the walls, heavy equipment shall not be used for placing and compacting fill within a region as determined by a 0.5H:1V line drawn upward from the bottom of the wall, or within 3 feet of the wall, whichever is greater. We recommend that hand-operated compaction equipment be used to compact soils adjacent to walls.

A waterproofing membrane must be applied to the back of any below grade building walls to assure seepage, excess dampness, or efflorescence is not a problem for the below-grade portion of the home. Any cold joints should be waterproofed with an appropriate, highly durable sealant. Basement seepage is extremely difficult and costly to repair; therefore, the wall drainage and waterproofing systems must be well-designed and properly installed.

20. The interior concrete slab-on-grade floors for the residential structures shall be a minimum of 4 inches thick (or as specified by the structural engineer) and will require a moisture barrier system where moisture sensitive flooring is planned for the slab-on-grade floor. 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. A minimum 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 placement, 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.
21. 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 using concrete dobies or an approved equivalent. Regardless, final reinforcement design should be performed by the project structural engineer.
22. Paved drive paths on this project should consist of 3 inches of asphalt concrete underlain by 6 inches of Type 2, Class B aggregate base (SSPWC, 2016).

If utilized, pavers for driveways subject to vehicle loading should be traffic rated and should be underlain by a minimum of 8 inches of Type 2, Class B aggregate base. A minimum 1-inch sand leveling course is also required for masonry pavers.



Gravel-surfaced drive paths and areas should be surfaced with a minimum 6 inches of Type 2, Class B aggregate base (SSPWC, 2016). Gravel-surfaced roads should generally perform adequately provided routine maintenance is performed (regrading, re-compaction, and replacement of eroded materials).

23. All aggregate base courses shall be densified to at least 95 percent relative compaction.
24. Soluble sulfate content has been determined for representative samples of the site foundation soils, and the results of the testing (Appendix B) indicate that concrete in contact with the site foundation soils should experience negligible degradation due to reaction with soil sulfate. Therefore, Type II cement should be used for all concrete work.
25. Northern Nevada is a region with exceptionally low relative humidity. As a consequence, concrete flatwork is prone to excessive shrinking and curling. Concrete mix proportions and construction techniques, including the addition of water and improper curing, can adversely affect the finished quality of concrete and result in cracking, curling, and the spalling of slabs. We recommend that all placement and curing be performed in accordance with procedures outlined by the American Concrete Institute (2011) and this report. Special considerations shall 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 Truckee Meadows area.

Proper control joints and reinforcement shall 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, they will need to be grouted over prior to installation of floor coverings.

Concrete should not be placed on frozen in-place soils.

26. 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.

Geotechnical Design Criteria

1. The proposed residential structures on the project should be designed for the 2024 *IRC* (ICC, 2024b) adopted by Washoe County. The 2024 *IRC* seismic design loads are based on the ASCE 7-22 Standards titled *Minimum Design Loads and Associated Criteria for Buildings and Other*



Structures (ASCE, 2021). The recommended seismic design criteria using the 2024 *IRC* for the home are presented in Table 3a (Seismic Design Criteria Using 2024 *International Residential Code*).

TABLE 3a - SEISMIC DESIGN CRITERIA USING 2024 <i>INTERNATIONAL RESIDENTIAL CODE</i> (ASCE, 2026)	
Approximate Latitude (Proposed Main Home Structure Location is Used)	39.553
Approximate Longitude (Proposed Main Home Structure Location is Used)	-119.919
Spectral Response at Short Periods, S_s , percent of gravity	170
Site Class	Default
Risk Category	II
Residential Site Value, S_{DS} , percent of gravity	128
Residential Seismic Design Category (for $S_{DS} > 125$)	E

With the Residential Seismic Design Category of E provided in Table 3a (Seismic Design Criteria Using 2024 *International Residential Code*), the proposed residential structures may be designed using the 2024 *IBC* (ICC, 2024a), subject to various other requirements of the 2024 *IRC* (ICC, 2024b) that should be adhered to by the structural engineer.

The 2024 *IBC* seismic design loads are also based on the ASCE 7-22 Standards (ASCE, 2021). Based on the site geology and shallow rock conditions, a Site Class C soil profile is appropriate for the project site. The recommended seismic design criteria using the 2024 *IBC* for Site Class C are presented in Table 3b (Seismic Design Criteria Using 2024 *International Building Code*).



TABLE 3b - SEISMIC DESIGN CRITERIA USING 2024 <i>INTERNATIONAL BUILDING CODE</i> (ASCE, 2026)	
Approximate Latitude	39.553
Approximate Longitude	-119.919
Spectral Response at Short Periods, S_s , percent of gravity	170
Spectral Response at 1-Second Period, S_1 , percent of gravity	54
Site Class	C
Risk Category	II
Site Adjusted Spectral Response at Short Periods, S_{MS} , percent of gravity	181
Site Adjusted Spectral Response at Long Periods, S_{M1} , percent of gravity	78
Design Spectral Response at Short Periods, S_{DS} , percent of gravity	121
Design Spectral Response at Long Periods, S_{D1} , percent of gravity	52
Seismic Design Category	D

- Individual column footings and continuous wall footings underlain by properly prepared native granular soils, weathered bedrock materials with granular characteristics or compacted structural fill/rockfill can be designed for a net maximum allowable bearing pressure of 2,500 pounds per square foot (psf). The minimum footing width for continuous walls and column footings should be 16 inches and 24 inches, respectively. The recommended bearing value may be increased by one-third for total loads. With this allowable bearing pressure, total foundation movements of $\frac{3}{4}$ of an inch or less should be anticipated. Differential movements between footings with similar loads, dimensions, and base elevations should not exceed $\frac{1}{2}$ inch. The majority of the anticipated movement will occur during the construction period as the loads are applied. Footings supported on competent bedrock should experience negligible total and differential settlement.
- 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 0.47 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 34 and 400 psf per foot of depth, respectively. These design values are based on spread footings bearing on properly prepared native soils, decomposed granite, or structural fill and backfilled with structural fill.
- The recommendations presented in Table 4 (Retaining Wall Design Parameters) are for small building or small site retaining walls with vertical back faces, horizontal backfill, and a drainage layer behind the wall that is hydraulically connected to the foundation drain. Surcharge loads, including construction/traffic, backfill sloping at steeper than 3H:1V ratio, and snow loads, should be added to the following values. The engineer should be consulted if the wall height is to exceed 8 feet or for unusual retaining conditions. 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 0.64 g will be exceeded in any 50-year interval.

TABLE 4 - RETAINING WALL DESIGN PARAMETERS

Allowable Bearing Pressure		2,500 psf ¹
Coefficient of Sliding Friction		0.47
Equivalent Fluid Pressure (Static/Dynamic) Maximum Wall Height = 8 feet	At Rest	53 pcf/NA ²
	Active – Level Backfill	34 pcf/54 pcf
	Active – 3H:1V Slope Backfill	42 pcf/82 pcf
	Passive	150 ³ pcf/NA ⁴
Unit Weight of Soil and Weathered Volcanic Materials		125 pcf

pcf – ponds per cubic foot

¹ Net allowable bearing pressure at the footing level. Bearing pressure may be increased by one-third for total loads.

² NA = Not applicable. For design of structure under dynamic at-rest conditions, use dynamic active earth pressure.

³ Reduced by a factor of 0.67 to minimize wall rotation.

⁴ NA = Not applicable. Do not exceed static passive earth pressure value.

Homeowner's Responsibilities

1. If the home is to be constructed by a custom homebuilder, they will finish grade the area near the home to prevent ponding of water adjacent to structural improvements and to provide drainage away from the structures in accordance with local building codes. If the homeowner alters the drainage present at the time of sale, either by landscaping and/or making improvements on the lot, he/she must provide drainage away from the structures 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 strong 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 that 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 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 by the engineer.
2. The recommendations presented in this report assume 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. Single-family home construction results in a complex composite of steel, PCC, lumber, and soils. Each element responds differently to loading and, consequently, minor cracking and distortion can occur. Such cracking and distortion are not in and of itself evidence of the structure failing to meet a reasonable standard or level of performance but rather is typical of new residential construction. Repair of such conditions is considered aesthetic in nature and not a structural defect.
5. This report has been prepared with generally accepted geotechnical practices. The analyses and recommendations submitted are based upon field exploration performed at the locations shown on Plate 1 and described in this report. This report does not reflect soils, bedrock, 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



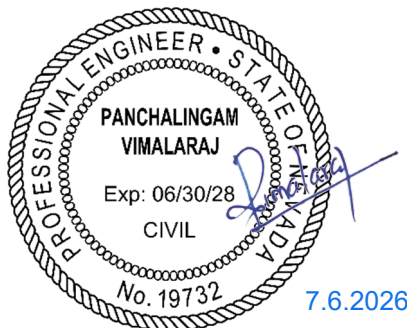
compliance with our recommendations. The client shall be responsible for distribution of this geotechnical investigation to all designers and contractors whose work is related to geotechnical factors.

6. This report has been prepared to provide information allowing the architect and/or engineer to design the project. 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,

Corestone Engineering, Inc.



Vimal P. Vimalaraj, P.E., G.E.
President/Principal Geotechnical Engineer
PV:YK:pv/lkv

Enclosures: Plate 1 - Plot Plan
 Plate 2 - Test Pit Logs
 Plate 3 - USCS Soil Classification Chart

 Appendix A - Index Test Results
 Appendix B - Chemical Test Results

Copies to: Addressee (PDF via Email)



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Geotechnical Services & Construction Materials Testing
775-636-5916 vimal@corestoneengineering.com

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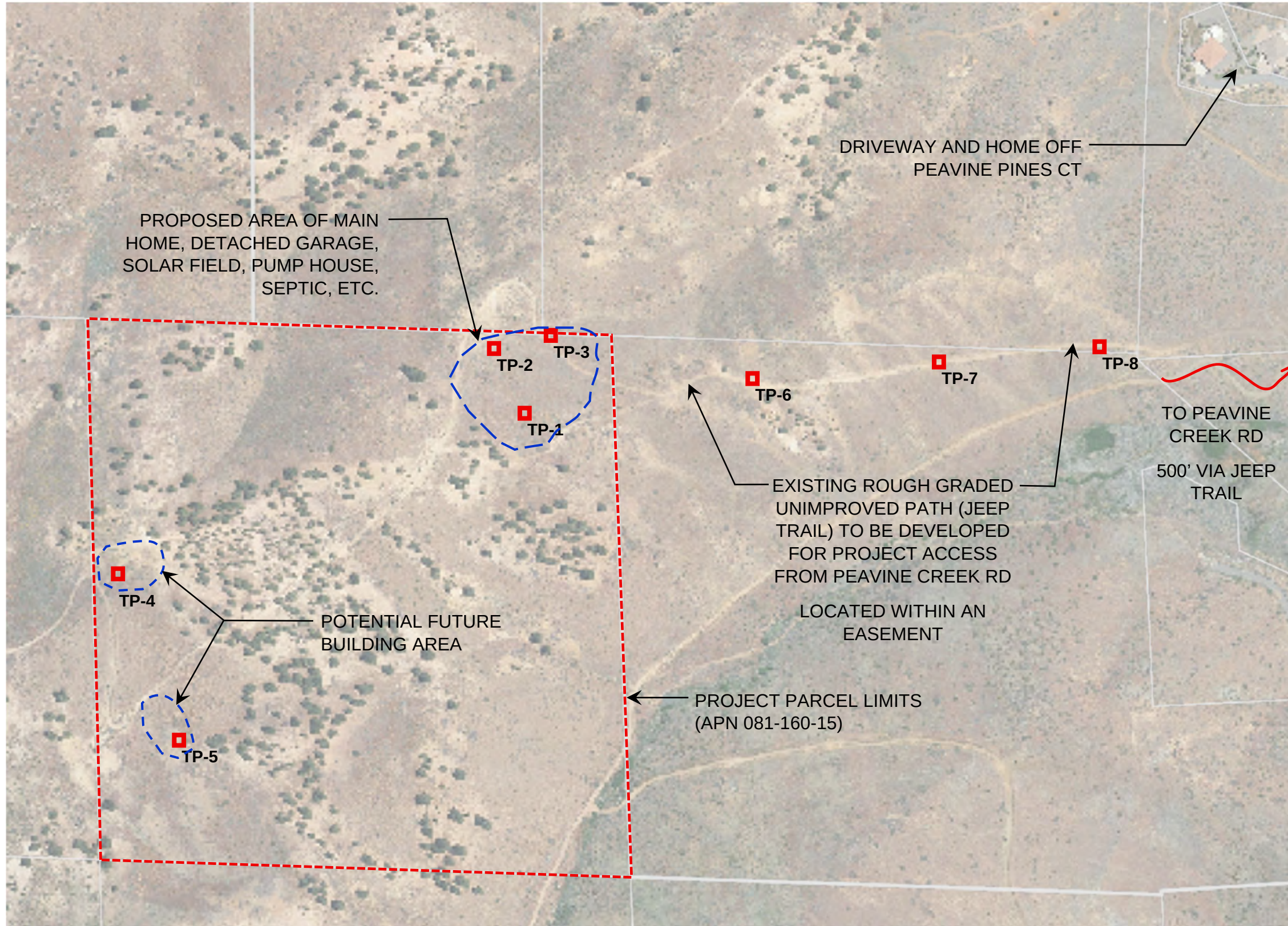
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PLATES



NORTH
SCALE: 1" ≈ 275'
(11"X17" SHEET)

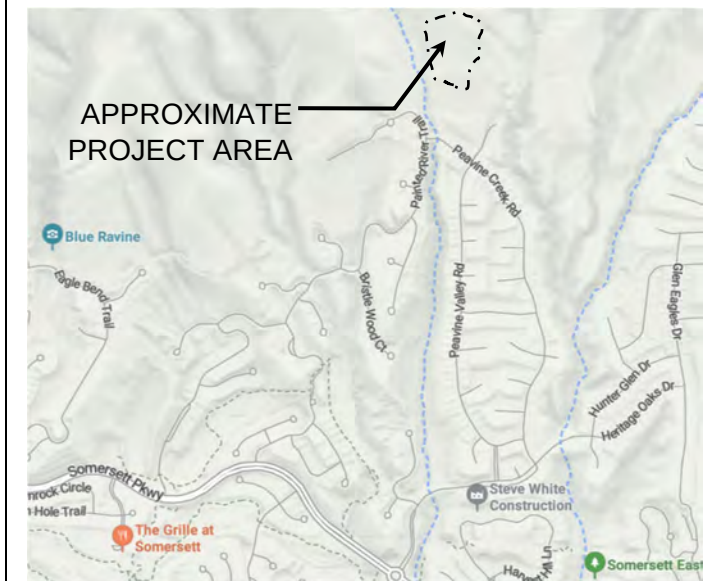
LEGEND

■ APPROXIMATE TEST PIT LOCATION
TP-1

NOTES

1. BASE MAP PROVIDED BY WASHOE COUNTY GIS MAPPING.

VICINITY MAP



NOT TO SCALE



MR. RICKY ROBERTS
PLOT PLAN
NORTHWEST RENO PARCEL: APN 081-160-15
WASHOE COUNTY, NEVADA

Corestone Engineering, Inc.
Project No. 5146-01-1

Plate 1



Corestone Engineering, Inc.
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Reno, NV 89521
Telephone: 775-636-5916

LOG OF TEST PIT NO. TP-1

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 5,812 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		GC		Clayey Gravel with Sand Dark brown, brown, dry to slightly moist, dense with estimated 40% medium plasticity fines, 25% fine to coarse sand, and 35% angular fine to coarse gravel. Partially buried boulders up to 4 feet diameter near the test pit location. Total excavated soil mass consists of about 10% angular cobbles up to 4 inches in diameter.
2.5		SC		Clayey Sand with Gravel Orange, brown, slightly moist, very dense with estimated 25% medium plasticity fines, 40% fine to coarse sand, and 35% subangular fine to coarse gravel. Total excavated soil mass contains approximately 10% angular cobbles up to 6 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of very dense soils.
5.0	GB A			Clayey Sand with Gravel Brown, orange brown, slightly moist, very dense with 47% medium plasticity fines, 38% fine to coarse sand, and 15% angular gravel up to 0.75" in diameter. Total excavated soil mass consists of about 15% angular cobbles up to 6 inches in diameter. Intensely weathered and altered volcanic rock materials excavated with the characteristics of very dense soils. Gravels break down to sand size particles and fines during mechanical processing of laboratory testing.
7.5		SC		Laboratory Test Results: Moisture Content = 16.0%; Liquid Limit = 39; Plasticity Index = 18.
10.0				Excavation depth limited by steep native slope in the test pit area.

Bottom of test pit at 11.0 feet.

TEST PIT LOGS 2 5146011.GPJ Printed On: 7/6/26



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LOG OF TEST PIT NO. TP-2

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 5,822 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

MATERIAL DESCRIPTION

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	
0.0				
		GC		Clayey Gravel with Sand Brown, light brown, dry, dense with estimated 40% low to medium plasticity fines, 30% fine to coarse sand, and 30% angular fine to coarse gravel. Partially buried cobbles and a boulders near the test pit location. Total excavated soil mass consists of about 5% angular cobbles up to 5 inches in diameter.
2.5	GB A			Silty Gravel with Sand Orange, yellow brown, slightly moist, dense with estimated 30% medium plasticity fines, 30% fine coarse sand, and 40% angular fine to coarse gravel. Total excavated soil mass contains approximately 20% angular cobbles up to 6 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of dense soils.
5.0		GM		
7.5				
10.0	GB B			Sandy Silt Orange, red, yellow, slightly moist to moist, very stiff with 54% medium plasticity fines, 40% fine to coarse sand, and 6% angular gravel up to 0.25" in diameter. Intensely and altered weathered volcanic rock materials excavated with the characteristics of very stiff soils. Gravels break down to sand size particles and fines during mechanical processing of laboratory testing.
12.5		ML		Laboratory Test Results: Moisture Content = 21.9%; Liquid Limit = 46; Plasticity Index = 17.

Bottom of test pit at 13.0 feet.

TEST PIT LOGS 2 5146011.GPJ Printed On:7/6/26



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LOG OF TEST PIT NO. TP-3

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 5,770 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		SC		Clayey Sand with Gravel Dark brown, brown, slightly moist, dense with 38% medium plasticity fines, 33% fine to coarse sand, and 29% angular fine to coarse gravel. Partially buried cobbles and a boulders near the test pit location. Total excavated soil mass consists of about 10% angular cobbles up to 6 inches in diameter. Laboratory Test Results: Moisture Content = 8.0%; Liquid Limit = 34; Plasticity Index = 18.
2.5		GC		Clayey Gravel with Sand Brown, slightly moist, very dense with estimated 20% medium plasticity fines, 35% fine to coarse sand, and 45% subangular fine to coarse gravel. Total excavated soil mass contains approximately 25% angular cobbles up to 6 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of very dense soils.
5.0		GM		Silty Gravel with Sand Brown, orange brown, slightly moist, very dense with estimated 15% low plasticity fines, 35% fine to coarse sand, and 50% angular fine to coarse gravel. Total excavated soil mass contains approximately 30% angular cobbles up to 8 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of very dense soils.
7.5				Excavation becomes increasingly difficult with depth.

Practical excavation refusal at 8 feet depth below existing ground surface on relatively hard volcanic rock.
Bottom of test pit at 8.0 feet.



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LOG OF TEST PIT NO. TP-4

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 6,118 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
	GB A	CL		Sandy Lean Clay Brown, dark brown, dry to slightly moist, very stiff to hard with estimated 70% medium plasticity fines, 25% mostly fine to medium sand, and 5% fine sand. Pocket penetrometer reading > 4.0 tons per square foot.
2.5		GC		Clayey Gravel with Sand Brown, orange brown, slightly moist, dense with estimated 25% medium plasticity fines, 35% fine to coarse sand, and 40% subangular fine to coarse gravel. Weathered volcanic rock materials excavated with the characteristics of dense soils.
5.0		GM		Silty Gravel with Sand Brown, orange brown, slightly moist, very dense with estimated 15% low to medium plasticity fines, 35% fine to coarse sand, and 45% subangular fine to coarse gravel. Total excavated soil mass contains approximately 20% subangular to angular cobbles up to 8 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of very dense soils. Excavation becomes increasingly difficult with depth.

Practical excavation refusal at 6.5 feet depth below existing ground surface on relatively hard volcanic rock.
Bottom of test pit at 6.5 feet.



Corestone Engineering, Inc.
10751 Grayslake Dr
Reno, NV 89521
Telephone: 775-636-5916

LOG OF TEST PIT NO. TP-5

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 6,042 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		CL		Sandy Lean Clay Brown, dark brown, dry to slightly moist, very stiff to hard with estimated 60% medium plasticity fines, 30% mostly fine to medium sand, and 10% subangular fine sand. Pocket penetrometer reading > 4.0 tons per square foot.
2.5	GB A	SC		Clayey Sand with Gravel Brown, reddish brown, slightly moist, dense with estimated 35% medium plasticity fines, 45% fine to coarse sand, and 20% angular gravel with up to 1" in diameter. Intensely weathered volcanic rock materials excavated with the characteristics of dense soils.
5.0		GM		Silty Gravel with Sand Red, dry to slightly moist, very dense with estimated 15% medium plasticity fines, 25% fine to coarse sand, and 60% angular fine to coarse gravel. Total excavated soil mass contains approximately 20% angular cobbles up to 4 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of very dense soils.
7.5				Excavation becomes increasingly difficult with depth.

Practical excavation refusal at 8.5 feet depth below existing ground surface on relatively hard volcanic rock.
Bottom of test pit at 8.5 feet.



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Reno, NV 89521
Telephone: 775-636-5916

LOG OF TEST PIT NO. TP-6

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 5,698 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		CL		Sandy Lean Clay Dark brown, brown, slightly moist, very stiff with estimated 55% medium plasticity fines, 35% fine to coarse sand, and 10% angular fine to coarse gravel. Test pit located within uphill slope along unimproved path.
2.5		GC		Clayey Gravel with Sand Brown, orange brown, slightly moist, medium dense to dense with estimated 40% medium plasticity fines, 25% fine to coarse sand, and 35% subangular fine to coarse gravel. Total excavated soil mass contains approximately 15% angular cobbles up to 8 inches in diameter. Intensely weathered and altered volcanic rock materials excavated with the characteristics of soils.
5.0		GC		Clayey Gravel with Sand Yellow brown, brown, slightly moist, medium dense to dense with estimated 25% medium plasticity fines, 30% fine to coarse sand, and 45% angular fine to coarse gravel. Total excavated soil mass consists of about 10% angular cobbles up to 5 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of dense soils.
7.5		GC		
10.0				

Bottom of test pit at 11.0 feet.

TEST PIT LOGS 2 5146011.GPJ Printed On: 7/6/26



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10751 Grayslake Dr
Reno, NV 89521
Telephone: 775-636-5916

LOG OF TEST PIT NO. TP-7

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 5,612 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5	GB A			Clayey Gravel with Sand Brown, orange, yellow brown, slightly moist, medium dense to dense with estimated 20-25% medium plasticity fines, 25-30% fine to coarse sand, and 45-50% angular fine to coarse gravel. Total excavated soil mass contains approximately 20% angular cobbles up to 8 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of gravelly soils. Test pit excavated near the toe of cut slope into uphill side along the unimproved path. Partially buried rocks are presnet in the cut and native slope above the test pit.
5.0		GC		
7.5				
10.0				

Bottom of test pit at 10.0 feet.



Corestone Engineering, Inc.
10751 Grayslake Dr
Reno, NV 89521
Telephone: 775-636-5916

LOG OF TEST PIT NO. TP-8

PAGE 1 OF 1

CLIENT Mr. Ricky Roberts

PROJECT NAME Northwest Reno Parcel: APN 081-160-15

PROJECT NUMBER 5146-01-1

PROJECT LOCATION Washoe County, Nevada

DATE : 6/11/26

GROUND ELEVATION (FT) : ± 5,534 (WC TOPO)

EQUIPMENT : Cat 308

GROUNDWATER DEPTH (FT) : NE

LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		GC		Clayey Gravel with Sand (Fill) Dark brown, dry to slightly moist, dense with estimated 25% medium plasticity fines, 30% fine to coarse sand, and 45% angular fine to coarse sand. Fill materials along the downhill side of unimproved access path.
	GB A	GC		Total excavated fill soil mass contains approximately 20% subangular to angular cobbles up to 10 inches in diameter. Clayey Gravel with Sand Brown, dark brown, orange brown, slightly moist, dense with estimated 30% medium plasticity fines, 25% fine to coarse sand, and 45% angular fine to coarse sand. Total excavated soil mass contains approximately 15% subangular cobbles up to 6 inches in diameter.
2.5				
		GC		Clayey Gravel with Sand Brown, dark brown, slightly moist, very dense with estimated 20% medium plasticity fines, 30% fine to coarse sand, and 50% angular fine to coarse gravel. Total excavated soil mass contains approximately 15% angular cobbles up to 4 inches in diameter. Weathered volcanic rock materials excavated with the characteristics of very dense soils.
5.0				
				Excavation becomes difficult from 5 feet depth below existing ground surface.

Practical excavation refusal at 6 feet depth below existing ground surface on relatively hard volcanic rock.
Bottom of test pit at 6.0 feet.

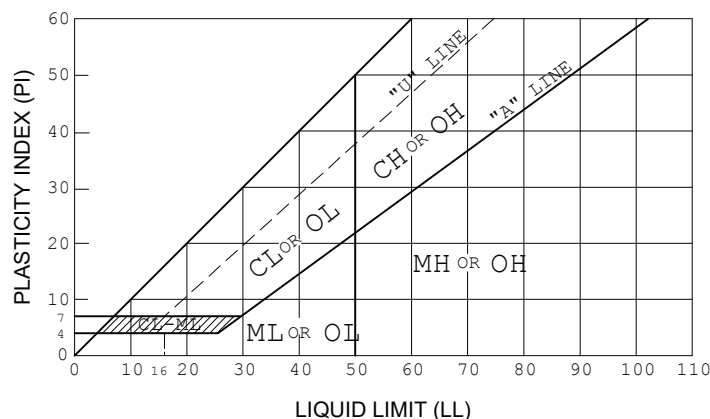
SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS	TYPICAL	
			GRAPH	LETTER	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
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO 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
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO 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

NOTES:

1. DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.
2. SYMBOL COLORS ARE NOT SHOWN IN THE GRAPHIC DISPLAY.

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 2mm)
Sand	#4 to #200 sieve (2mm 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



Corestone Engineering, Inc.
10751 Grayslake Dr
Reno, Nevada 89521
Telephone: (775) 636-5916

USCS Soil Classification Chart

Project: **Northwest Reno Parcel: APN 081-160-15**

Location: **Washoe County, Nevada**

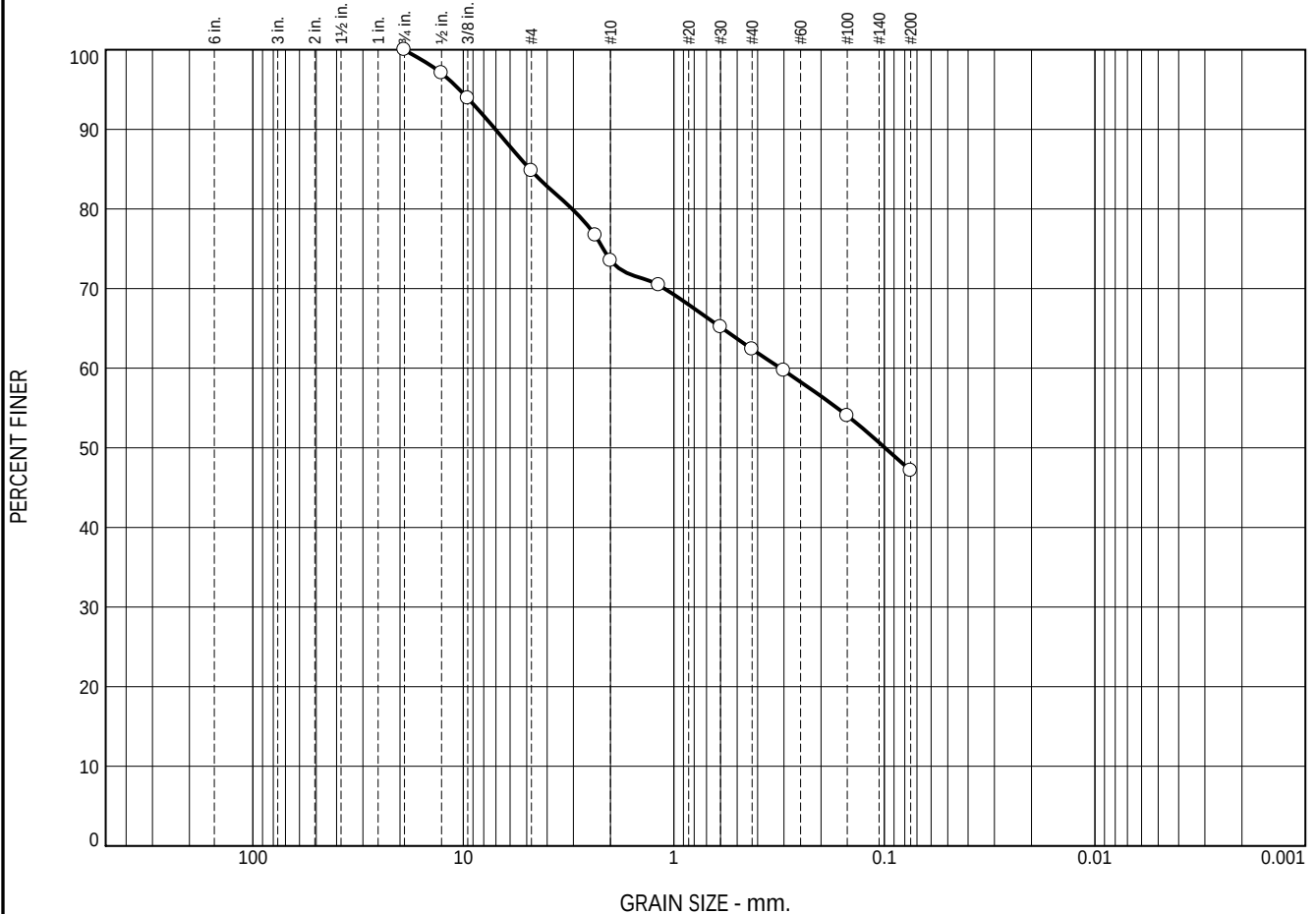
Project Number: **5146-01-1**

Plate Number: **3**

APPENDIX A

INDEX TEST RESULTS

Particle Size Distribution Report



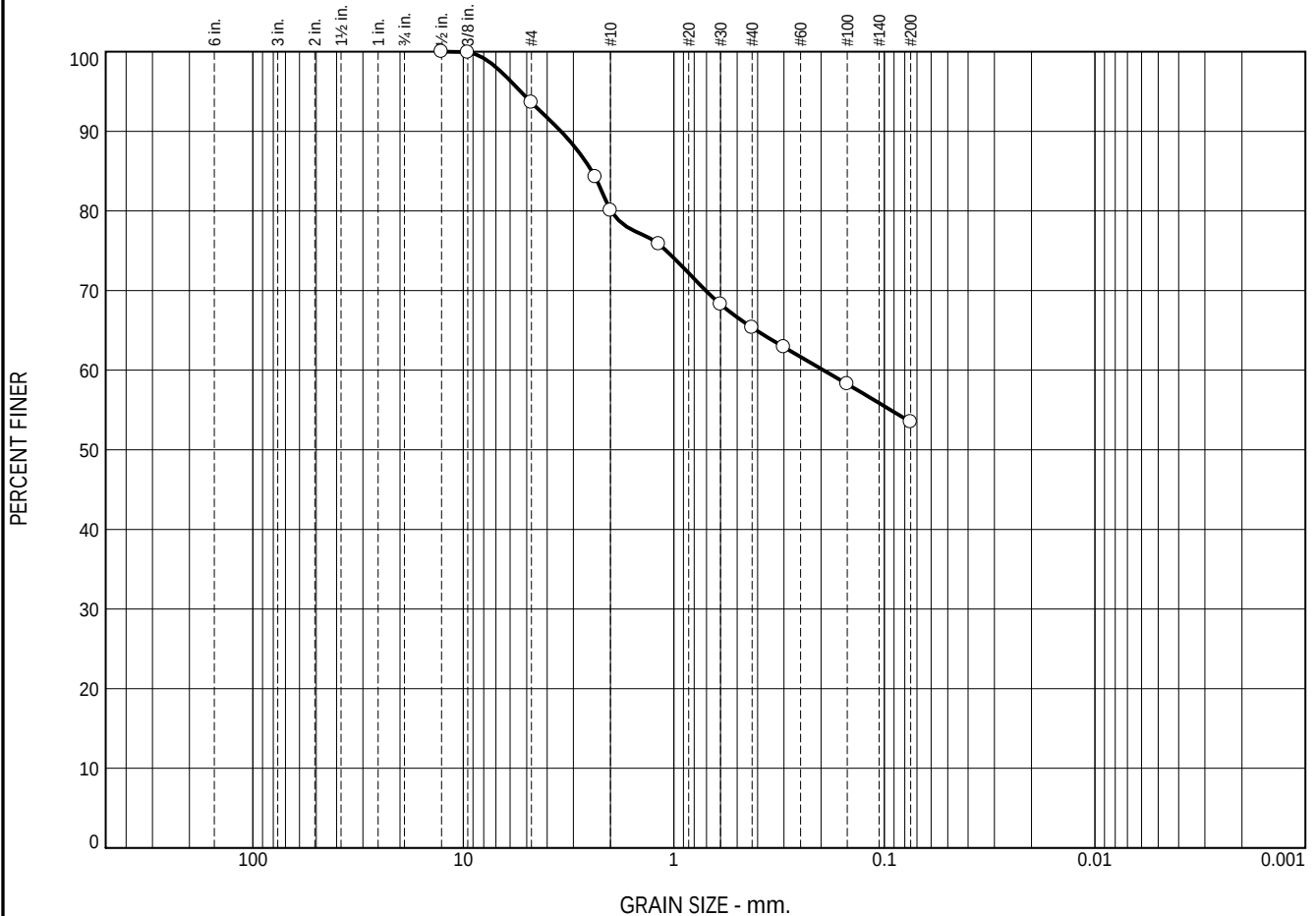
GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
○	0.0	0.0	15.2	11.3	11.1	15.2	47.2		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
○	39	21	4.8297	0.3115	0.0994				C _u

MATERIAL DESCRIPTION							TEST DATE	USCS	NM
○ clayey sand with gravel							6/17/2026	SC	16.0

Project No. 2961 Client: CORESTONE ENGINEERING, INC. Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED ○ Source of Sample: 5146-01-1 TP-1 Depth: 4' Sample Number: A	Remarks: ○ RECEIVED ON 6/11/2026
	

Tested By: B.MILTON Checked By: K.HOUSE

Particle Size Distribution Report



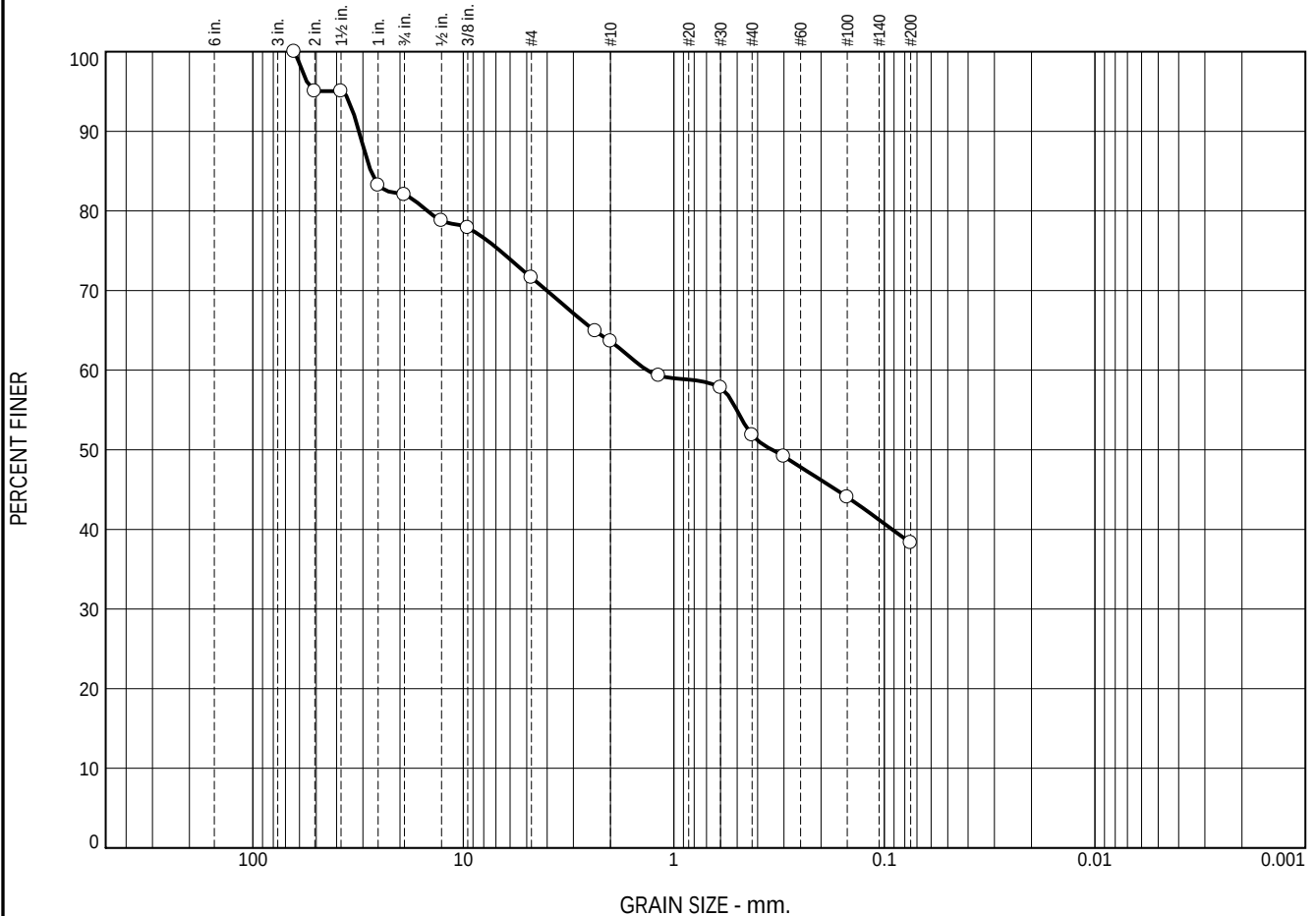
GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
0.0		0.0	6.4	13.5	14.7	11.9	53.5		
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
46	29	2.4514	0.1947						

MATERIAL DESCRIPTION						TEST DATE	USCS	NM
sandy silt						6/17/2026	ML	21.9

Project No. 2961 Client: CORESTONE ENGINEERING, INC. Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED Source of Sample: 5146-01-1 TP-2 Depth: 9' Sample Number: B	Remarks: RECEIVED ON 6/11/2026

Tested By: B.MILTON Checked By: K.HOUSE

Particle Size Distribution Report



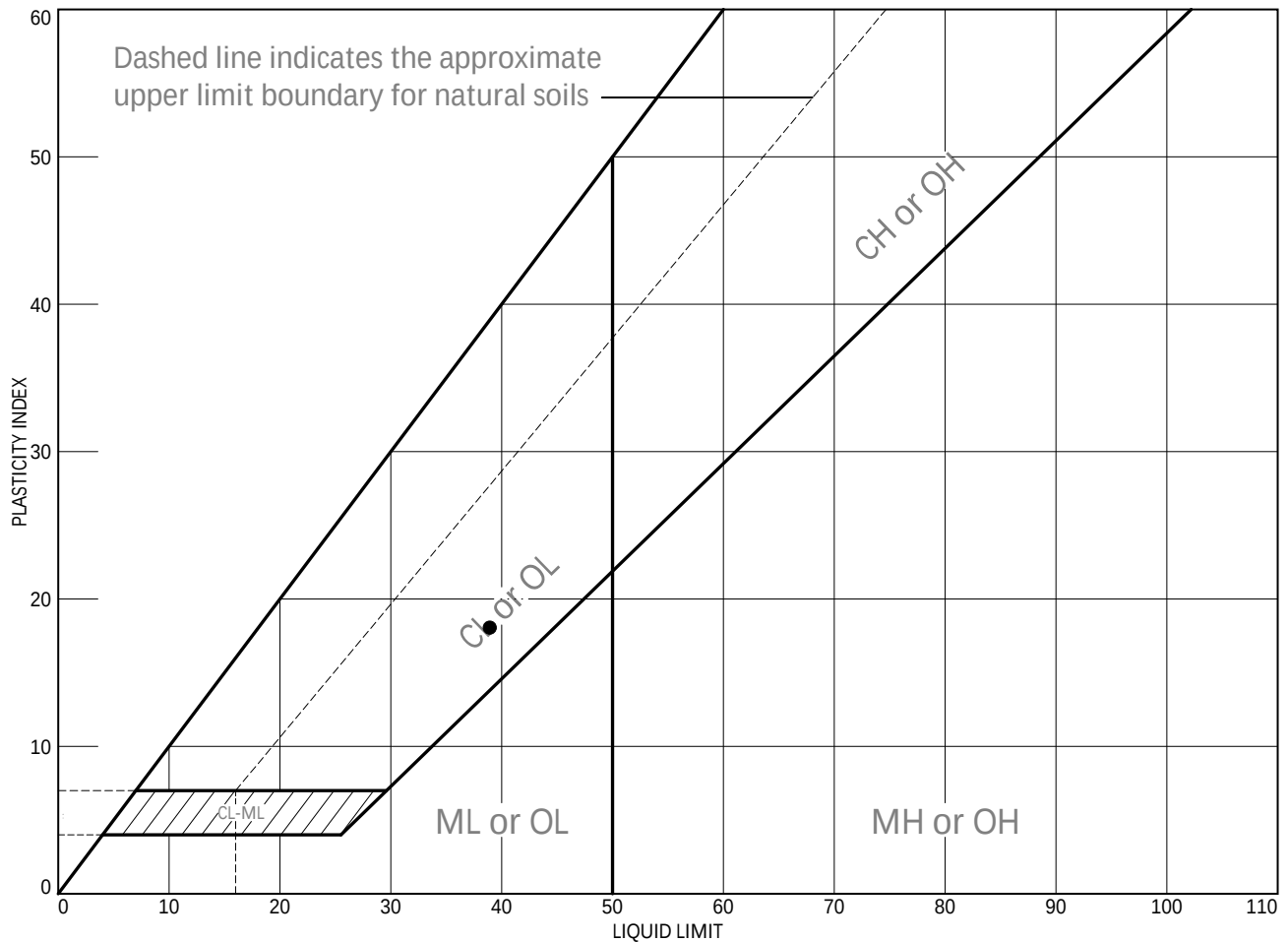
GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
○	0.0	18.0	10.4	8.0	11.8	13.5	38.3		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
○	34	16	27.5041	1.3386	0.3413				C _u

MATERIAL DESCRIPTION							TEST DATE	USCS	NM
○ clayey sand with gravel							6/17/2026	SC	8.0

Project No. 2961 Client: CORESTONE ENGINEERING, INC. Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED ○ Source of Sample: 5146-01-1 TP-3 Depth: 0' Sample Number: A	Remarks: ○ RECEIVED ON 6/11/2026

Tested By: B.MILTON Checked By: K.HOUSE

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	39	21	18	62.4	47.2	SC

Project No. 2961 Client: CORESTONE ENGINEERING, INC.
 Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED

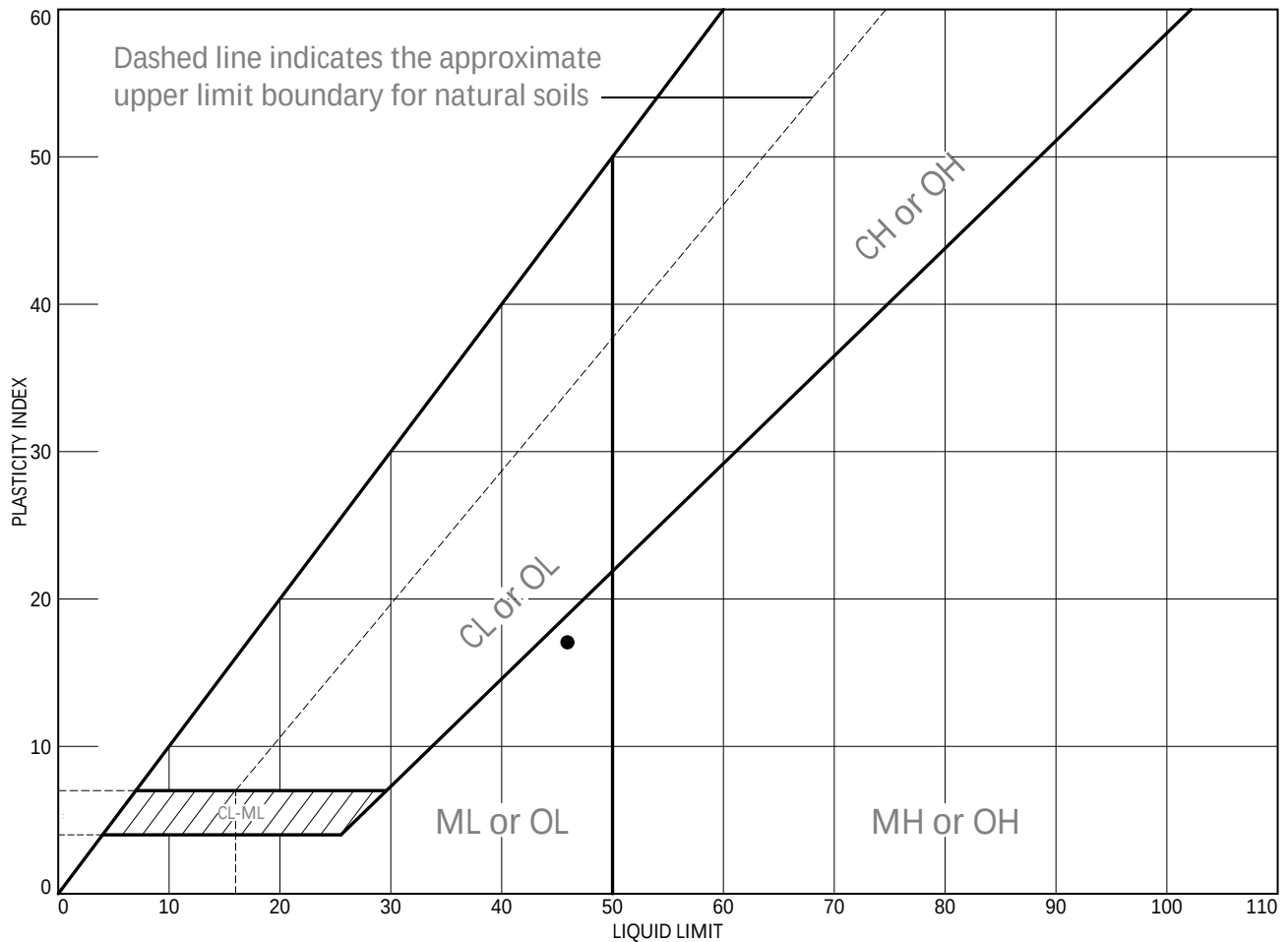
● Source of Sample: 5146-01-1 TP-1 Depth: 4' Sample Number: A

Remarks:
 ● RECEIVED ON 6/11/2026

CME CONSTRUCTION
 MATERIALS
 ENGINEERS, INC.

Tested By: M.SCHETTLER Checked By: K.HOUSE

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy silt	46	29	17	65.4	53.5	ML

Project No. 2961 Client: CORESTONE ENGINEERING, INC.
 Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED

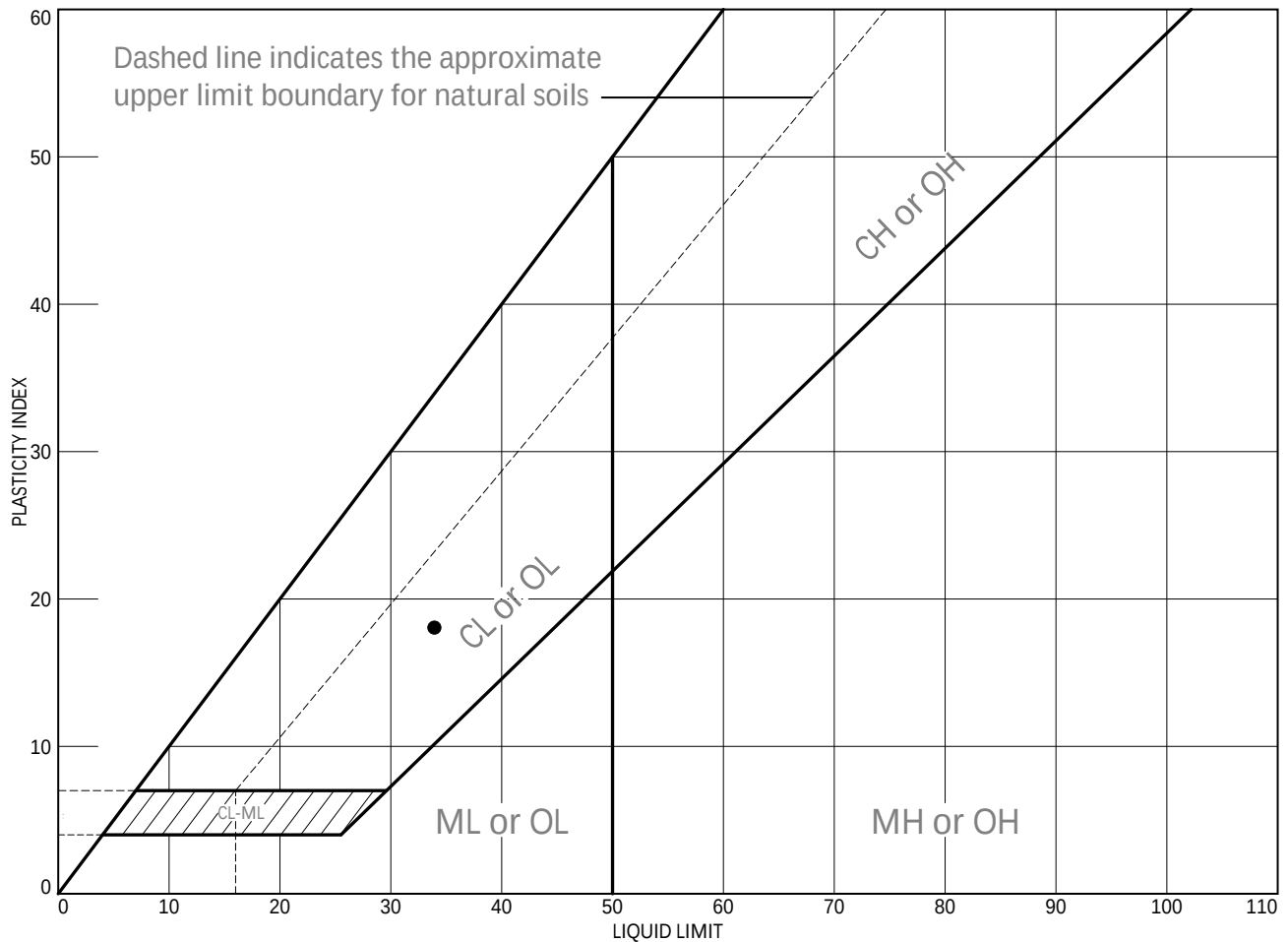
● Source of Sample: 5146-01-1 TP-2 Depth: 9' Sample Number: B

Remarks:
 ● RECEIVED ON 6/11/2026

CME CONSTRUCTION
 MATERIALS
 ENGINEERS, INC.

Tested By: M.SCHETTLER Checked By: K.HOUSE

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel	34	16	18	51.8	38.3	SC

Project No. 2961 Client: CORESTONE ENGINEERING, INC.
 Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED

● Source of Sample: 5146-01-1 TP-3 Depth: 0' Sample Number: A

Remarks:
 ● RECEIVED ON 6/11/2026

CME CONSTRUCTION
 MATERIALS
 ENGINEERS, INC.

Tested By: M.MAGEE Checked By: K.HOUSE

APPENDIX B

CHEMICAL TEST RESULTS



SGS North America, Inc.
1135 Financial Blvd
Reno, NV 89502
(775) 857-2400
www.SGS.com

Analytical Report

Workorder#: 26060533

Date Reported: 6/30/2026

Client: Corestone Engineering, Inc.

Sampled By: Vimal

Project Name: 5146-01-1; TP-3 A 0'

PO #:

Laboratory Accreditation Number: NV930/CA3029

Laboratory ID	Client Sample ID	Date/Time Sampled	Date Received
26060533-01	5146-01-1; TP-3 A 0'	06/11/2026 11:00	6/12/2026

Parameter	Method	Result	Units	PQL	Analyst	Date/Time Analyzed	Data Flag
Oxidation-Reduction Potential	SM 2580 B	447	mV	1	LJ	06/29/2026 10:21	
pH	SW-846 9045D	6.26	pH Units		LJ	06/22/2026 14:22	
Resistivity #	NDOT T235 B	8450	Ohms-cm	0	KR	06/19/2026 8:09	
Sulfate	EPA 9056A	5.91	mg/Kg	1.996	JG	06/19/2026 1:17	
Sulfide #	AWWA C105	POS	POS/NEG		LJ	06/30/2026 10:03	

Original