

April 6, 2022

San Juan County
Attn: Lisa Adair, Planning Director
1360 Greene St
Silverton, Colorado 81433

Subject: Application for Improvement Permit – Sketch Plan Review

Proposed Riley Residence and Storage Shed located at 4728 County Rd 2, Lot 2 of the Cole Ranch Subdivision, located in part of the John H French Placer, near Middleton, San Juan County, Colorado.

Dear Lisa,

This submittal has been prepared to describe the proposed improvements on Lot 2 of the Cole Ranch Subdivision, owned by George W Riley III and Anna Riley. Cole Ranch is an approved Subdivision which was established for residential use in 2001.

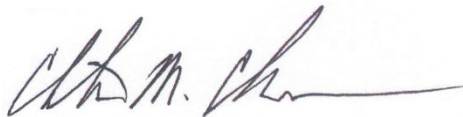
The attached documents have been prepared for a San Juan County Application for Improvement Permit as a "Sketch Plan Review". The Applicant requests Administrative Review of this project, and to consider approval contingent upon receiving supporting documentation from deferred items listed in the following Table of Contents.

A County Land Use Permit was approved for improvements to this property along with Lot 4 of Cole Ranch on November 18, 2021, with Conditions of Approval. This Application for Improvement Permit is meant to supplement the Land Use Permit to address these Conditions of Approval while also presenting updated information and requesting approval of the building improvements.

The proposed improvements consist of a single-family residence and storage shed structure with driveway access and utility improvements. The property is located within San Juan County's Future Land Use Plan "Economic Corridor", which is designated to be suitable for residential development because of its moderately sloping terrain and year-round access.

Please contact Mountain Grain, LLC if you have any questions.

Sincerely,



Christopher M. Clemmons
Mountain Grain, LLC

Application for Improvement Permit

Sketch Plan Submittal

Riley Family Cabin & Storage Shed

4728 County Rd 2, Silverton, Colorado 81433
Cole Ranch Subdivision – Lot 2
Part of the John H French Placer
Recorded Reception #141293



Applicant:

George W Riley III & Anna L Riley
5 Road 5221
Bloomfield, NM 87413
(505) 320-1145
georger@rileyindustrial.com

Prepared By:

Mountain Grain, LLC
801 Florida Rd Ste 12
Durango, Colorado 81301
(970) 515-7882
chris@mtngrain.com

Contractor:

Bob Smith, Buena Vista Builders, Inc.
(970) 382-0962
bob@buenavistabuilders.net

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20. Scenic Quality Report

Riley LUP, Lots 2-4 Cole Ranch, CR 2, San Juan County, CO, November 18, 2021, LMA.

Regarding: County Land Use Permit Application, Proposed Riley Improvements, Lots 2-4 Cole Ranch Subdivision, Cole Ranch Subdivision, County Road 2, San Juan County, Colorado.

The County Land Use Permit is hereby approved, with the following Conditions of Approval. The Applicant shall fulfill/comply with these Conditions Prior to Commencement of the Work. The Applicant shall acknowledge agreement to these Conditions by notarized signature.

1. Applicant shall submit proposed **fence** design/height drawing(s) as viewed from County Road 2.
2. Applicant shall submit San Juan Basin Public Health Department written **septic** system approval.
3. Applicant shall submit a “**geo-technical report**” as required in the Cole Ranch Subdivision Plat Notes.
4. Applicant shall submit a “grading and **drainage plan**” as required in the Cole Ranch Subdivision Plat Notes.
5. Applicant shall submit a “**wetlands investigation**” and/or written clearance from Army Corps of Engineers, as required in the Cole Ranch Subdivision Plat Notes.
6. Applicant shall submit an “**erosion control plan**” as required in the Cole Ranch Subdivision Deed Restrictions.
7. Regarding proposed utility extensions, shown within existing utility easements on **adjacent Lots 1 and 6**, Applicant shall be responsible for minimizing/restoring any disturbance on adjacent Lots 1 and 6 to the original condition, including survey monumentation, ground surface, and vegetation.
8. Regarding proposed utility extensions, shown within existing utility easements on adjacent Lots 1 and 6, the County recommends that the Applicant contacts the Lots 1 and 6 landowners, to notify them of the upcoming San Miguel Power Association electric tie-in work.
9. Applicant shall comply with any applicable County Historic Impact Review Committee requirements as stated in their attached 2006 letter.
10. Applicant shall resubmit the three Driveway Permit Application Forms to the Planning Department, which shall include the County Road and Bridge Department Supervisor’s written comments and/or requirements, at the bottom of each of the three forms. A copy of the Supervisor’s requirements/comments shall be retained by the applicant, and an additional copy of the Supervisor’s requirements/comments shall be provided to the Contractor(s), prior to commencement of the work. Applicants are required to provide “**clearance from County Roads Supervisor.**” Applicant shall comply with all forthcoming requirements from the County Road and Bridge Department Supervisor.
11. The Applicant shall comply with the CC&Rs, with the exception that, in the event that a conflict is found to exist between: (1) the 2001 and/or 2020 CC&Rs, and (2) the 2017 County Zoning and Land Use Regulations, 2001 Deed Restrictions, and/or the 2001 Subdivision Plat Notes, the requirements contained in the items listed above under (2) shall govern; and in the event of a conflict, the most stringent requirement shall apply.
12. San Juan County requires reseeded of any disturbed soil ground surface with certified weed free native seed. Reseeding shall comply with the San Juan County Zoning and Land Use Regulations.

Riley LUP, Lots 2-4 Cole Ranch, CR 2, San Juan County, CO, November 18, 2021, LMA.

13. A Licensed Surveyor shall mark/rope off the property line, and/or County Road edge-of easement, prior to excavation/construction, where there are adjacent proposed improvements within 30 feet of said property line/easement. The purpose is to clearly mark the property line/easement for all persons involved, maintain the minimum setback of 30 feet (and/or the setbacks per the Subdivision Plat/County regulations), and to prevent the excavator/improvements from crossing onto/being constructed on adjacent land(s)/easement(s).
14. Applicants are required to contact SJBPH and the septic designer prior to commencement of proposed septic system construction work. Applicants are required to use a SJBH Licensed Septic Installer for the proposed septic system construction work.
15. The Applicant hereby acknowledges that emergency services in San Juan County may not be available in a timely manner and may not be available at all.
16. The proposed improvements shall comply with the San Juan County Zoning and Land Use Regulations, which are posted on the County website, including but not limited to: Section 4-110 Design And Development Standards For All Improvement And Use Permits.
17. The violation of the San Juan County Zoning and Land Use Regulations shall cause this Permit to be void. If requirements differ, the most stringent shall apply.
18. All State/Federal permits are required, as a condition of this County permit, which shall be obtained prior to commencement of the work. Applicants are required to comply with all applicable State/Federal regulations. Failure to comply with State/Federal regulations shall void this County Permit.
19. The Applicant(s)/Owner(s) shall cause this List of Conditions of Approval to be signed in the presence of a Notary Public and shall file this document at the San Juan County Colorado Courthouse (County Clerk's Office 970-387-5671).

By signature the Applicant(s)/Owner(s) do/does hereby acknowledge and agree to the above listed County Land Use Permit Conditions of Approval.

Signature: George W Riley III

Print Name: George W Riley III

STATE OF New Mexico)

) ss.

County of San Juan)

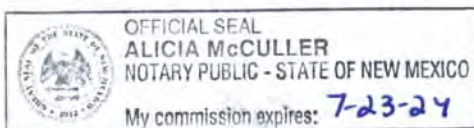
The foregoing document was acknowledged before me this 20th day of December, 20 21 by

Alicia McCuller / George W Riley III

Witness my hand and official seal. Alicia McCuller

Notary Public

My commission expires: 7-23-24



County Land Use Permit – Responses to Conditions of Approval

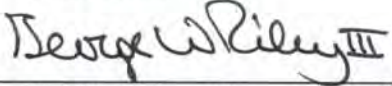
Re: Proposed Riley Improvements, Lots 2-4 of Cole Ranch Subdivision

The Applicant has provided the following items/responses to fulfill the Conditions of Approval for the County Land Use Permit, dated November 18, 2021, authored by Lisa M Adair PE, Town/County Planning Director, with numbers corresponding to the numbered conditions listed in the letter. **Additional documents requested in the Conditions of Approval have been integrated into the County Application for Improvement Permit submittal.**

1. The proposed fence design with dimensioned elevations as viewed from County Road 2 are included on the site plan, C1.01.
2. An approved septic system permit from San Juan Basin Health Department and engineered septic design is included in this submittal.
3. A letter from Trautner Geotech with comments on assumed subsurface soil conditions for Lot 2 is included with this submittal. This is a provisional letter until a field observation can be performed once conditions permit access to the property.
4. The grading and drainage plan is included with this submittal.
5. Wetlands investigation and/or written clearance from USACE will be provided as a deferred submittal. This has been initiated with the USACE, although wetlands are not presumed to be on site. Written confirmation, as required in the recorded plat notes, will be provided once a determination has been made.
6. Erosion control plan is included with this submittal.
7. Applicant acknowledges agreement per notarized signature included in this submittal.
8. Applicant acknowledges agreement per notarized signature included in this submittal.
9. None of the proposed improvements impact or cross over the historic Silverton Northern Railroad grade, nor are they within the set back from the railroad grade area, therefore the 2006 letter is not applicable.
10. Driveway Permit forms with requirements/comments from County Road and Bridge Department Supervisor are included in this submittal.
11. Applicant acknowledges agreement per notarized signature included in this submittal.
12. Applicant acknowledges agreement per notarized signature included in this submittal.

13. Applicant acknowledges agreement to have Licensed Surveyor mark proposed improvements within 30 feet of property line/easement per notarized signature included in this submittal.
14. San Juan Basin Health Department has approved and issued a permit. The septic system has been engineered by a SJBH Licensed Septic Installer. Both the permit and design are included with this submittal.
15. Applicant acknowledges agreement per notarized signature included in this submittal.
16. Applicant acknowledges agreement per notarized signature included in this submittal.
17. Applicant acknowledges agreement per notarized signature included in this submittal.
18. Applicant acknowledges agreement per notarized signature included in this submittal.
19. Applicant acknowledges agreement per notarized signature included in this submittal.

Application for Improvement Permit

		APPROVAL CHECKLIST	Initial	Date
Applicant:	Name	George W. Riley III		
	Address	5 Road 5221 Bloomfield, NM 87413 (505) 320-1145 Phone		
Owner	Name	George Waller Riley III and Anna Louise Riley Revocable Trust		
	Address	5 Road 5221 Bloomfield, NM 87413 Phone		
Contractor	Name	Buena Vista Builders - Bob Smith		
	Address			
		(970) 382-0962 Phone		
Legal Description of Property:		Road System Relationship		
Lot 2, Cole Ranch Subdivision located in part of the John H French Placer, recorded reception #141293, August 8, 2001 and on Map #176. Address: 4728 County Road 2, Silverton, CO 81433 Township 42 N, Range 6 W, Section 30		Zoning Compatibility		
		State Mining Permit		
		Owner Notification		
		Avalanche Hazard		
		Geologic Hazard		
		Floodplain Hazard		
		Wildfire Hazard		
		Mineral Resource Impact		
		Wildlife Impact		
		Historic Site Impact		
Nature of Improvement Planned: Proposed single-family cabin with attached garage, detached storage shed and associated site, access and utility improvements.		Watershed Gearance		
		County Building Inspector		
		Building Permit		
		State Electrical Inspector		
		Electrical Permit		
Land Use Zone: Mountain Zone		San Juan Basin Health Unit		
Applicant Signature 		Sewage Disposal: Test		
		Design		
Date Application Requested		Central Sewage Collection		
Date Submitted for Permit		State Division of Water Resources		
Date Permit Issued		Adequate Water Source		
Date Permit Denied		Well Permit		
Reason for Denial		Central Water Distribution		
		U.S. Forest Service/BLM		
		Access Approval		
		State Division of Highways		
Receipt		Driveway Permit		
FEE PAYMENT				
	Amount	Date		
Application				
Building Permit				
Subdivision/PUD				
Hearing Notice				
			Subdivision Variance	
			Subdivision Approval	
			PUD Approval	

State Documentary Fee
\$30.00 06-29-2021

153647
Page 1 of 1
SAN JUAN COUNTY, COLORADO
LADONNA L. JARAMILLO, RECORDER
06-29-2021 03:10 PM Recording Fee \$13

SPECIAL WARRANTY DEED

THIS DEED, Made this 28th Day of June, 2021

Between **DEREK WENDT and MEGAN WENDT**

of the County of Cheyenne and State of Colorado, grantor

and **GEORGE W. RILEY, III & ANNA LOUISE RILEY REVOCABLE TRUST**

whose legal address is #5 Road 5221
Bloomfield, NM 87413

of the County of San Juan and State of New Mexico, grantee

State Document Fee

Date: 06/29/2021

\$30.00

WITNESSETH, That the grantor for and in consideration of the sum of
-----TEN DOLLARS AND OTHER GOOD AND VALUABLE CONSIDERATION-----
the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents
does grant, bargain, sell, convey and confirm, unto the grantee, its successors and assigns forever, all the real property together
with improvements, if any, situate, lying and being in the County of San Juan and State of Colorado described as follows:

TRACT I:
Lot 2, AMENDED PLAT NO. 1-COLE RANCH SUBDIVISION, according to the plat thereof filed for
record March 14, 2014 as Reception No. 149440.

TRACT II:
Lot 3, COLE RANCH SUBDIVISION, according to the plat thereof filed for record August 8, 2001
as Reception No. 141293.

As known by street and number as: 4728 (Lot 2) and 4686 (Lot 3) County Rd 2
Silverton, CO 81433

TOGETHER with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining,
and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all the estate, right,
title, interest, claim and demand whatsoever of the grantor, either in law or equity, of, in and to the above bargained
premises, with the hereditaments and appurtenances

TO HAVE AND TO HOLD the said premises above bargained and described, with the appurtenances, unto the
grantee, its successors and assigns forever. The grantor, for himself, his heirs, personal representatives, successors does
covenant, and agree that the grantor shall and will WARRANT AND FOREVER DEFEND the above bargained premises in the
quiet and peaceable possession of the grantee, its successors and assigns, against all and every person or persons lawfully
claiming the whole or any part thereof, by, through or under the grantor, except: 2021 taxes due and payable in the
year 2022. Subject to Statutory Exceptions as defined in CRS § 38-30-113(5).

The singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all
genders

IN WITNESS WHEREOF, the grantor has executed this deed on the date set forth above

[Signature]
DEREK WENDT
[Signature]
MEGAN WENDT

STATE OF COLORADO
COUNTY OF Cheyenne

The foregoing instrument was acknowledged before me this 25 Day of June, 2021

By: **DEREK WENDT and MEGAN WENDT**

Patricia

My commission expires: Feb. 20, 23

PATRICIA A DAUGHERTY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 201540007448
MY COMMISSION EXPIRES FEB 20, 2023

[Signature]
Notary Public

SJ22102900



Map of Adjacent Landowners



List of Adjacent Landowners

Jack & Barbara Clark
PO Box 767
Silverton, CO 81433

Joseph Jepson
PO Box 729
Silverton, CO 81433

Silverton Holdings
2844 Hidden Harbour Ct
Ft Lauderdale, FL 33312

Elaine Hintz
4015 W 93 Terrace Apt 110
Prairie Village, KS 66207

Keefe Family Revocable Trust
6219 Saddletree Ln
Yorba Linda, CA 92886

School of the Ozarks
PO Box 17
Point Lookout, MO 65726-0017

Sunnyside Gold Corp
PO Box 177
Silverton, CO 81433

San Juan County
PO Box 466
Silverton, CO 81433

Todd & Julie Sams
PO Box 215
Oologah, OK 74053

San Juan Mountain Properties LLC
c/o Sandra Ippolite
7592 Aguila Dr
Sarasota, FL 34240

Riley Family Cabin
Cole Ranch Subdivision Lot 2

Matt Andres
408 E Pasora Drive
Phoenix, AZ 85085

Jay & Janet Scherer
230 River Front Rd
Durango, CO 81303

Dr Builders LLC
721 Pike Dr
Pagosa Springs, CO 81147

Jessica Lynn Park & Gary Darrell Jr Haggard
212 Orchard Ave
Grand Junction, CO 81501

Amended Plat No. 1 - Lots 1 & 2

Cole Ranch Subdivision

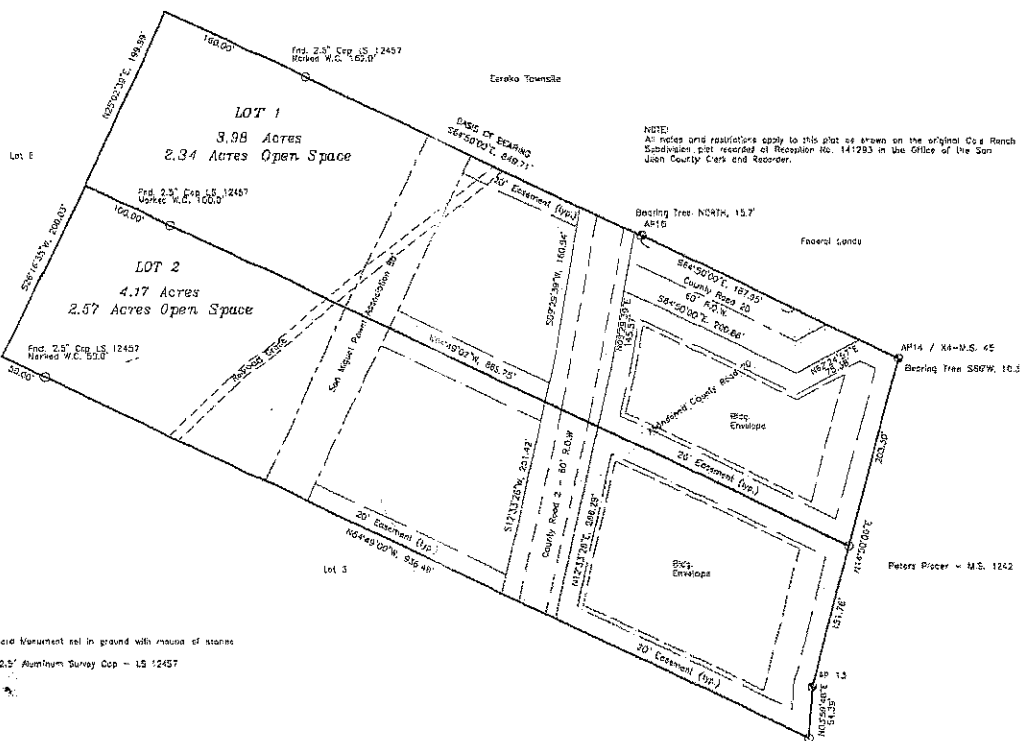
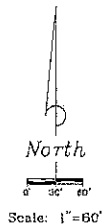
Located in Part of the John H. French Placer

Mineral Survey No. 45, Mining District No. 7

Suspended Sec. 30, T42N, R6W, N.M.P.M.

Eureka Mining District

San Juan County, Colorado



NOTE:
All lines and restrictions apply to this plat as shown on the original Cole Ranch Subdivision plat, recorded at Reception No. 141293 in the Office of the San Juan County Clerk and Recorder.

CERTIFICATE OF OWNERSHIP AND DEDICATION:
KNOW ALL MEN BY THESE PRESENTS, that the undersigned owners of Lots 1 and 2, Cole Ranch Subdivision, San Juan County, State of Colorado, and the County of San Juan, Colorado,
HAVE BY THESE PRESENTS, caused to be laid out, plotted, Amended Plat No. 1 of said Lots 1 and 2, as shown on this plat, specifically the reassignment of County Road 20 as shown herein.

Owners of Lot 1, Cole Ranch Subdivision:

By: _____

By: _____

Owners of Lot 2, Cole Ranch Subdivision:

By: _____

By: _____

San Juan County Board of County Commissioners:

By: _____

STATE OF _____

COUNTY OF _____

The foregoing signatures were acknowledged before me this ____ day of _____ A.D., 20____ by

My commission expires _____
Witness my hand and seal _____
Notary Public

APPROVAL OF BOARD OF COUNTY COMMISSIONERS
Approved by the San Juan County Board of County Commissioners this ____ day of _____ A.D., 20____

APPROVAL OF COUNTY ATTORNEY:
Approved for recording this ____ day of _____ A.D., 20____ by _____ County Attorney,

Attorney at Law Registration No. _____ Date _____

SURVEYOR'S CERTIFICATE:
I, Robert A. Larson, a Registered Land Surveyor in the State of Colorado, do hereby certify that this plat accurately represents to the best of my knowledge and information, a survey made by me or under my direct supervision, and that said survey conforms to all State laws and standards for property boundaries.

FOR COUNTY REVIEW

Robert A. Larson LS 31166 Date _____ SEAL

LEGEND

- 3-1/4" B.M. Standard Monument set in ground with chains of stones
- Fed. #5 Rebar & 2.5" Aluminum Survey Cap - LS 12457

NOTE: Legal description from the Cole Ranch Subdivision Plat recorded at Reception No. 141293 in the records of the San Juan County Clerk & Recorder's Office.

NOTE: According to Colorado Law you must commence any legal action upon any defect in this survey within three years after you first discovered such defect. In no event, may any action be based upon any defect in this survey be commenced more than ten years from the date of the certification shown herein.

CLASS OF RECORD:
The bearing between a 3-1/4" Standard Monument, marked AP10, and a Witness Corner for the northwest corner of Lot 1, Cole Ranch Subdivision, a 2-1/2" Aluminum Survey Cap, LS 12457, is assumed to be N65°50'00"W as shown on the Cole Ranch Subdivision Plat at Reception No. 141293 in the Office of the San Juan County Clerk and Recorder's Office.

RECORDER'S CERTIFICATE:
This plat was filed for record in the office of the Clerk and Recorder of San Juan County at _____, on the ____ day of _____ A.D., 20____, in Book ____ Page ____ Reception No. _____

Clerk & Recorder

Amended Plat	
Surveyed For Julie Soms	
APPROVED BY RAL	DATE 1/1/1
DRAWN BY T.A.P.	SCALE 1"=60'
MONADROCK MINERAL SERVICES 214 7th St., Suite 200-200-0112 TUCSON, AZ 85701	
RECORD NO. N13031	SHEET 1 of 1

Project Narrative

Applicant Name and Address:

George W Riley III and Anna L Riley
5 Road 5221
Bloomfield, NM 87413

Project Location:

4728 County Road 2
Cole Ranch Subdivision – Lot 2
Silverton, CO 81433

Legal Description:

Located in part of the John H. French Placer Mineral Survey No. 45, Mining District No. 7, Sec. 30, T 42 N, R 6 W, Eureka Mining District, San Juan County, CO.

Proposed Development:

A family cabin with attached garage, a detached storage shed, and associated access and utility improvements in the approved Subdivision which was established for residential use in 2001. The proposed cabin is located within the previously approved building envelope on the east side of CR 2. The proposed storage shed is located on the west side of CR 2.

Zoning:

Mountain Zoning District

Acreage:

4.17 acres

Water Service:

The Applicant plans to construct a new well near the southeast corner of the proposed cabin as shown on the included site plan. The proposed well will be an ordinary household use inside one single-family dwelling. The proposed well will be constructed by a Colorado licensed well driller in accordance with the Colorado Division of Water Resources regulations. The permit has been issued and is included in the application.

Sewer Service:

A septic system is proposed for the cabin and will be located as shown on the included site plan. The septic permit has been issued by San Juan Basin Public Health and the system has been engineered by a Colorado Licensed Professional Engineer in accordance with the San Juan Basin Health Department regulations. The permit and septic design have been included in this application.

Power:

The Applicant plans to tie into the existing transformer located in the easement on the east side of CR 2 adjacent to Lot 3, as shown on the site plan included with this submittal. The transformer will be updated by San Miguel Power. The proposed line will be an underground service line. This power has already been surveyed and approved by San Miguel Power. The application to San Miguel power is included in this application.

A propane tank and backup generator are proposed for the project as the backup power source and are located near the southeast corner of the cabin as shown on the included site plan. The generator will be located on a concrete slab and provided with covering/baffling as necessary to meet County Land Use Code requirements.

Phone:

The Applicant plans to tie into the nearby existing phone line located on the east side of CR 2. This phone service by CenturyLink is schedule for installation on April 26, 2022. The order confirmation is included in this submittal. During construction, the Applicant will also have a satellite phone inside the onsite office trailer for use as a secondary form of communication.

Access:

CR 2 provides access to both the cabin and storage shed. CR 2 runs north/south through the lot, with the cabin on the east side and storage shed on the west side. Two driveways are currently proposed. The first is on the east side of CR 2 which travels uphill to the cabin. The second is on the west side of CR 2 which travels downhill to the storage shed. Both driveways will be visible to a driver traveling north or south on CR 2, one on each side of the road either way. Both driveways will include a culvert and will comply with comments received by the CR and Bridge Department Supervisor pertaining to size of culvert, turning radius, and setbacks for snow removal. The two driveway permit forms with comments have been included with this application.

Heating:

The Applicant plans to use electric radiant heat as the primary source of heat for the cabin, with a wood stove as the supplemental heat. As a seasonal cabin to be used primarily in the summer months, the heat demand and electricity use should not be substantial. The Applicant also intends to use all electric appliances including the water heaters and hot tub. The storage shed will also use electric heating as the primary source of heat.

Exterior Lighting:

The Applicant will use minimal exterior lighting for safety and screened lighting under the north and west-facing deck, as well as at all exterior entrances and near the garage on the south side of the cabin. The storage shed will also use minimal exterior lighting near

all entrances. Exterior lighting will be in conformance with San Juan County Dark Sky requirements.

Solid Waste Management:

The Applicant will be responsible for bi-monthly trash disposal provided by Bruin Waste Management. On-site trash will be contained within the provided dumpster at all times until removal to the transfer station.

Landscaping:

Landscaping is to consist of raking and removal of combustible ground cover near the cabin and storage shed as recommended by the Colorado State Forest Service Firewise Practices, to develop adequate defensible space. Revegetation and screening will be provided by the Applicant in accordance with the requirements of San Juan County, including tree screening on both sides of CR 2 to limit visibility of the cabin and storage shed from drivers traveling on CR 2.

Surveying:

A survey plat for the Cole Ranch Subdivision was prepared by Earnest E Schaaf of E. Schaaf & Associates in 2001. A certified copy of this survey plat is included with this application. A second, uncertified amended survey plat was prepared to show the relocation of County Road 2D, which previously ran diagonally through the corner of Lot 2 but was relocated entirely inside Lot 1 along the north property line.

Subsurface Conditions:

Subsurface conditions are assumed to be similar to the results previously found by Trautner Engineering on adjacent properties Lot 1 and Lot 4, due to the consistencies between the test borings at both adjacent properties. The subsurface conditions will be observed/confirmed by Trautner Engineering once weather conditions permit access to the site and as excavation commences, and they will provide a report of their field observations.

Building Envelope and Siting:

The lot is divided by CR 2 running north/south through the property. The portion of the lot west of CR 2 contains a moderately sloped grassy meadow sloping towards the Animas River with sporadic pine, aspens and shrubs. The portion of the lot east of CR 2 is also moderately sloped, with steeper terrain and dense pine forest along the eastern-most portion of the property.

The proposed cabin is located within the original approved building envelope on the east side of CR 2 as shown on the recorded plat. The proposed siting within this envelope best utilizes the natural topography and the least vegetated area, which will require less tree removal and disturbance to the site. The proposed storage shed will be located on the west side of CR 2 approximately 185' from the edge of road. The proposed siting for

the storage shed requires minimal clearing and is setback from the road to minimize visual impact from CR 2.

County Avalanche Map:

The Sketch Plan for this project has been overlaid onto the County Avalanche Map which is included with this application submittal for your review. According to the County Avalanche Map, neither of the building sites appear to be within a potential avalanche area.

County Geohazards Map:

The Sketch Plan for this project has been overlaid onto the County Geohazards Map which is included with this application submittal for your review. According to the County Geohazards Map, the proposed building envelope appears to be in an area of debris flow (df), which represents colluvial debris fans. Other portions of the lot outside of the proposed building areas contain physiographic floodplain (pf), which is located along the banks of and within the Animas River and talus slope (ts), which is located on the eastern-most slope of the site. Further information of the soils at the structure location will be provided in the soils observation report by Trautner Geotech.

Foundation:

The foundation of the cabin will include concrete stem walls and spread footings that will extend below frost depth and 12" minimum below native grade if backfill is used at any locations. The cabin foundation will include a crawl space with the exception of the garage, which will be a slab on grade. The cabin deck will include posts with concrete spot footings that will extend below frost depth. The storage shed will be slab-on-grade with frost protected strip footings.

Elevation at Structure:

The floor elevation of the cabin is approximately 9,820 feet, which is below 11,000 feet elevation, where the County has limits on cabin square footage. The storage shed floor elevation is approximately 9,804 feet.

Cabin Size and Height:

The proposed cabin is one story with a generally rectangular footprint measuring 50'x86'. The conditioned home area is 3,685 sf, with 467 sf unconditioned garage and 841 sf covered deck.

The maximum height of the cabin, which is measured from the lowest adjacent native grade up to the ridge of the 6:12 primary gable roof, is approximately 29'-9", which is below the County height limit of 35 feet. That height measurement is located on the northwest corner of the structure, accounting for combined heights of the main level, deck post structure and the roof height. The average height of the structure above native grade will measure approximately 25 feet.

Garage Size and Height:

The proposed storage shed is one story with a rectangular footprint measuring 33'x45' with 1,485 sf unconditioned area. The maximum height of the 6:12 gable roof measures approximately 25'-9" above adjacent grade.

Building Plans:

Preliminary building plans for the proposed cabin and storage shed have been prepared for the Applicant by Mountain Grain, LLC. These floor plans meet the programming and functional needs of the Applicant, and only minor modifications are expected to arise if required for structural, grading & drainage and small aesthetic reasons.

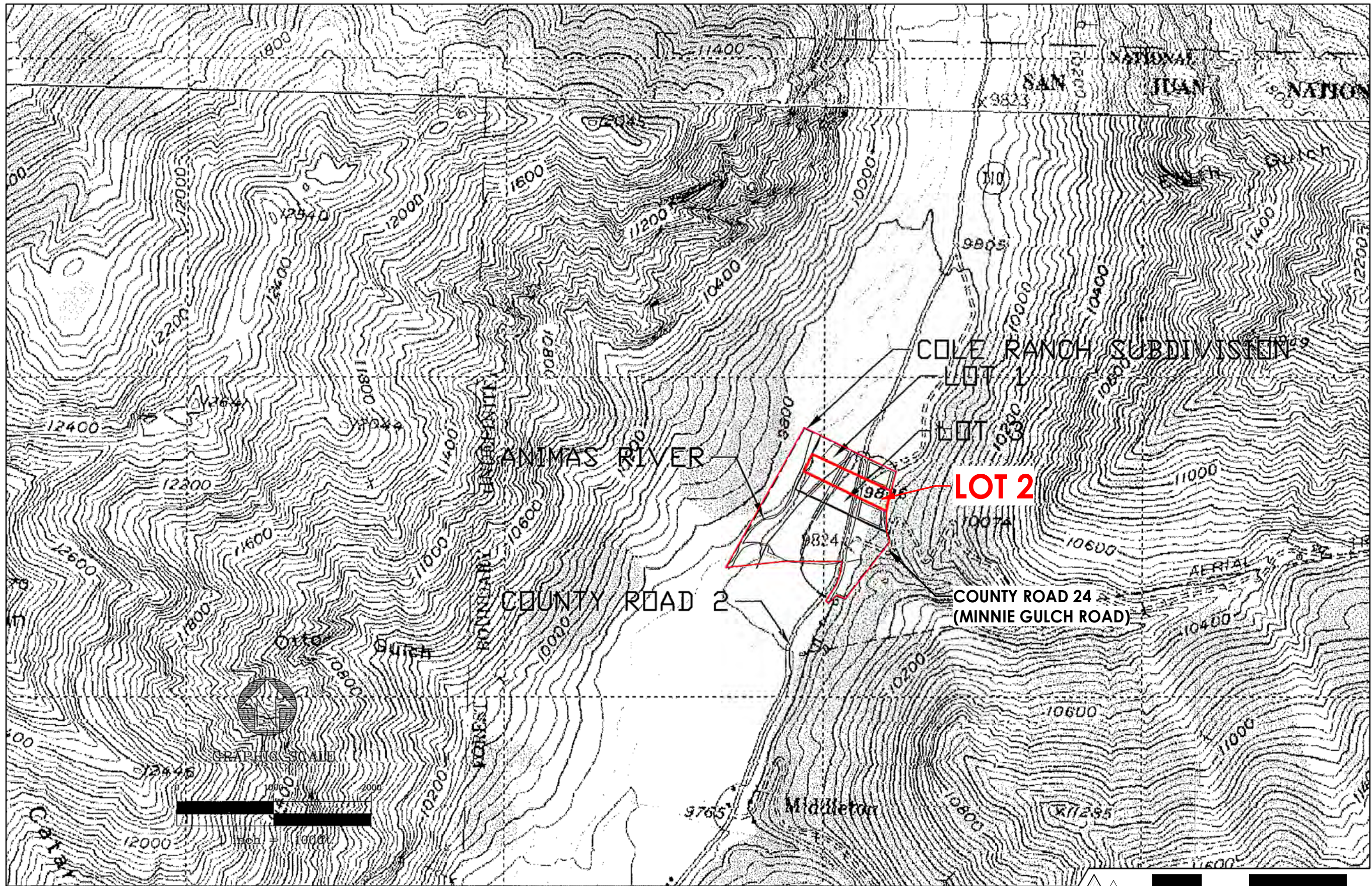
Cabin and Storage Shed Style:

The design of the two structures is meant to embody the mining history and vernacular of the area, which can be seen throughout the San Juan Mountains. The roof pitches, building materials and general aesthetic are used to reflect this history, while also being updated to modern standards of safety, functionality, and durability.

Building Materials:

Images of the proposed building materials and design vernacular are included with this application submittal for your review. The proposed materials consist of the following:

- Vintage metal siding. The Vintage metal provides a pre-aged aesthetic with a protective finish, resulting in little additional weathering and maintenance.
- Dark bronze metal roof with matching trim
- Dark bronze window sashes, frames and trim
- Mill finished steel exposed structure and accents
- Stacked river stone used as facing accents, such as at the outdoor fireplace.



MOUNTAIN grain
ARCHITECTURE
DURANGO, CO 81301
970 | 515 | 7882
info@mtngrain.com
mtngrain.com

PROJECT #:
21-12
ASSESSOR'S
PARCEL #:
47730300057000

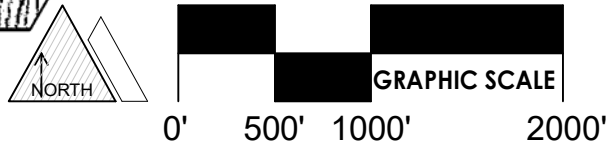
NEW CONSTRUCTION OF:
THE RILEY FAMILY CABIN

4728 COUNTY ROAD 2
SILVERTON, CO 81433

SHEET TITLE:
VICINITY MAP

SHEET #:
A

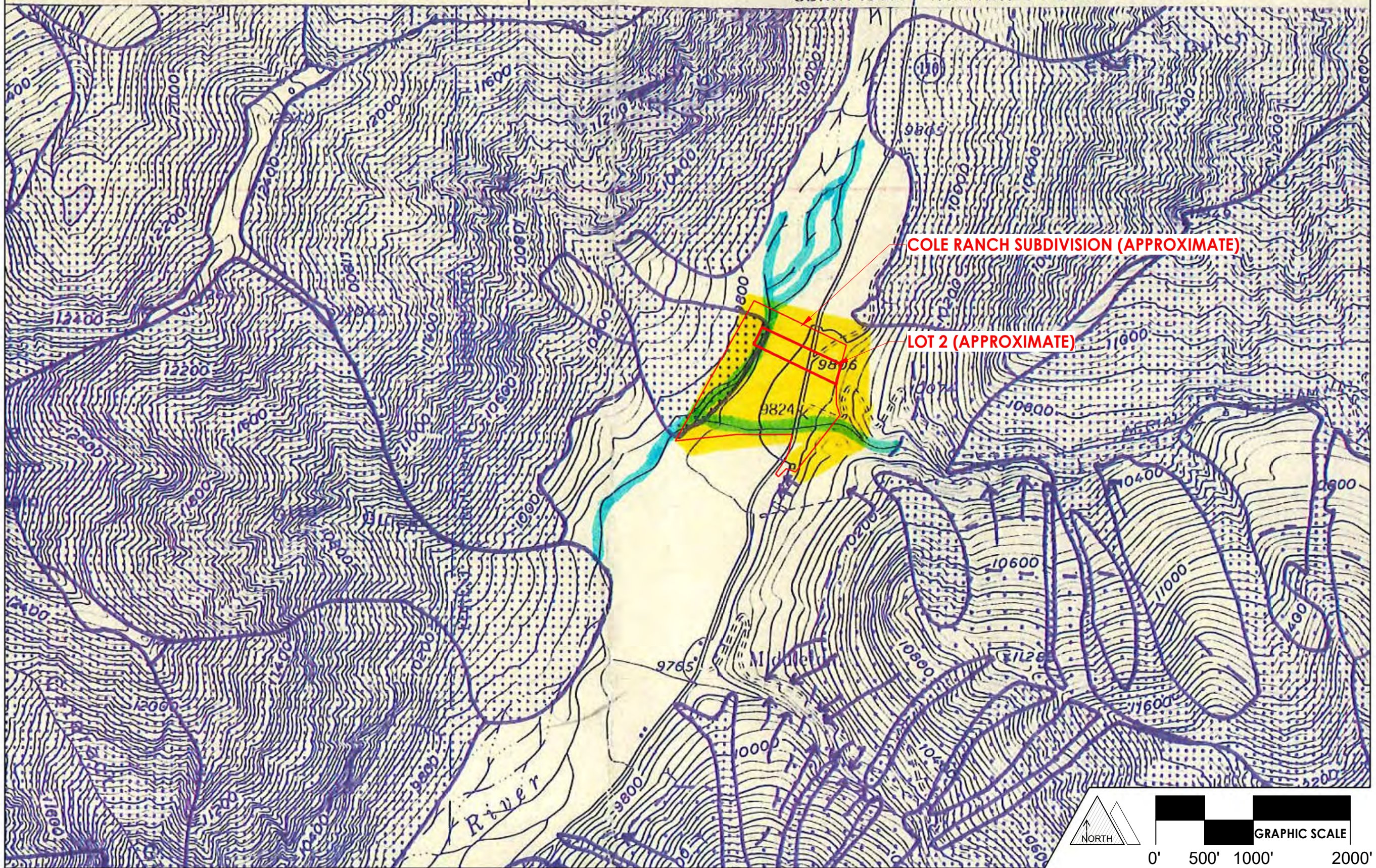
SCALE: 1" = 1000'



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COUNTY AVALANCHE HAZARD MAP

COLE RANCH
2/25/20 OYMA



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mtngrain.com

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21-12
ASSESSOR'S
PARCEL #:
47730300057000

THE RILEY FAMILY CABIN

4728 COUNTY ROAD 2
SILVERTON, CO 81433

NEW CONSTRUCTION OF:

SKETCH PLAN
WITH COUNTY
AVALANCHE
MAP

SHEET #:
B

SCALE: 1" = 1000'

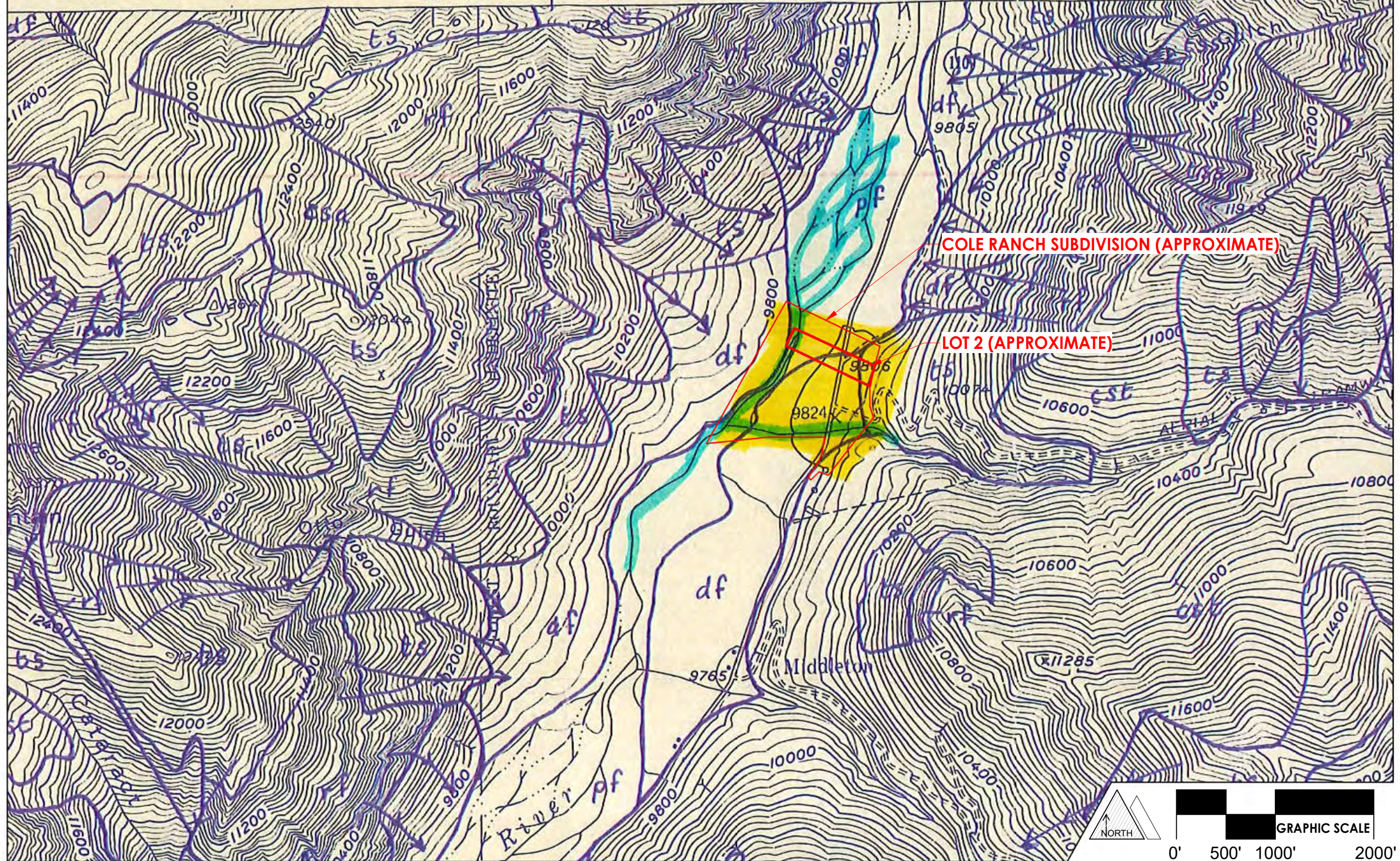
FOR IMPROVEMENT PERMIT | 04.06.2022

COUNTY GEOHAZARD MAP

COLE RANCH
2/25/20 sma

35'

OURAY 19 MI. (HANDIES PEAK)



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970 | 515 | 7882
info@mtngrain.com
mtngrain.com

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21-12
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THE RILEY FAMILY CABIN

4728 COUNTY ROAD 2
SILVERTON, CO 81433

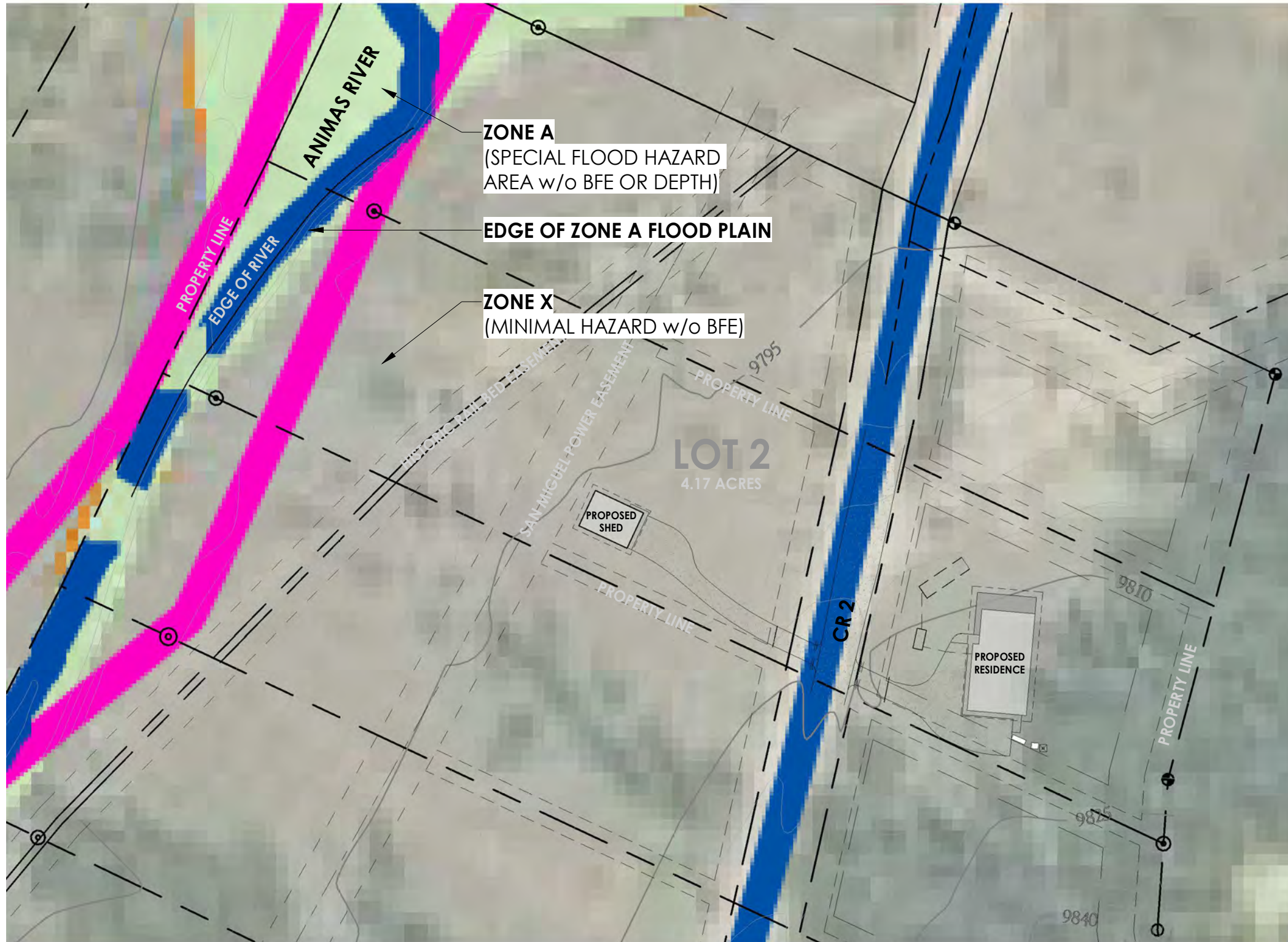
NEW CONSTRUCTION OF:

SKETCH PLAN
WITH COUNTY
GEOHAZARDS
MAP

SHEET #:
C

SCALE: 1" = 1000'

FOR IMPROVEMENT PERMIT | 04.06.2022



FLOOD HAZARD PROXIMITY PLAN

1" = 100'-0"



DURANGO, CO 81301
970 | 515 | 7882
info@mngrain.com
mngrain.com

PROJECT #:
21-12

ASSESSOR'S
PARCEL #:
47730300057000

NEW CONSTRUCTION OF:
THE RILEY FAMILY CABIN

4728 COUNTY ROAD 2
SILVERTON, CO 81433

SHEET TITLE:
SKETCH PLAN
WITH FLOOD
HAZARD MAP

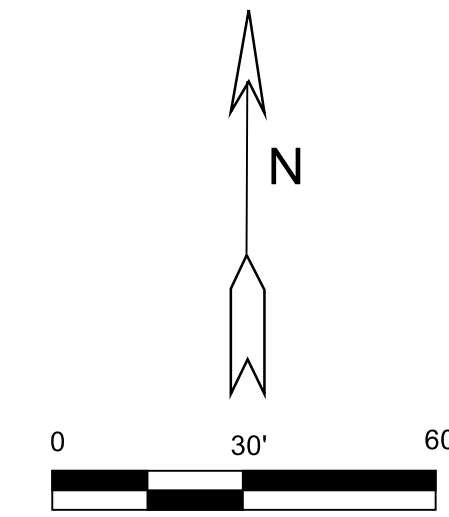
SHEET #:
D

SCALE: 1" = 100'-0"

FOR IMPROVEMENT PERMIT | 04.06.2022

Topographic Survey

Lot 2
Amended Plat No. 1 - Cole Ranch Subdivision
Suspended Sec. 30, T42N, R6W, N.M.P.M.
San Juan County, Colorado

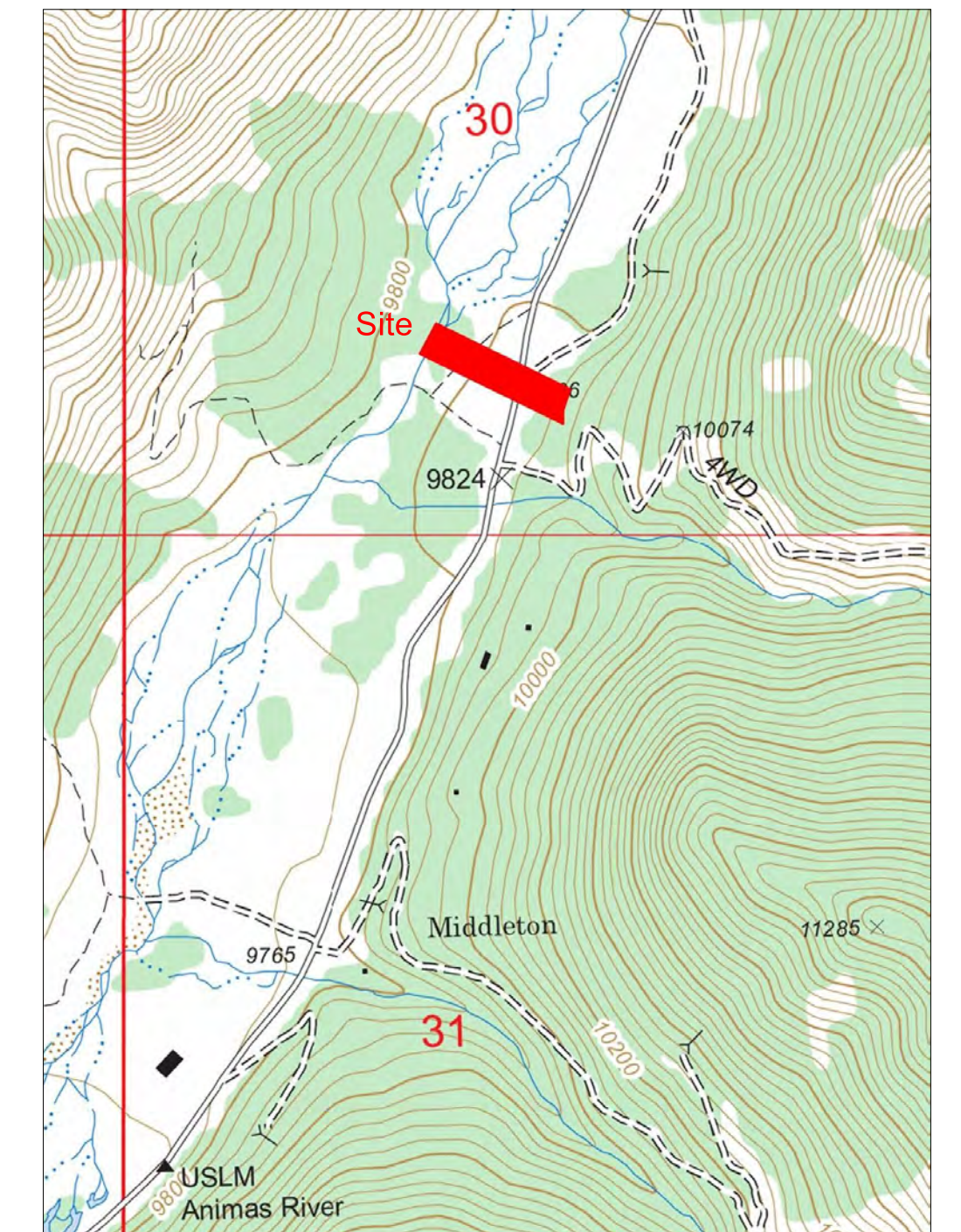


Scale: 30 Ft/In

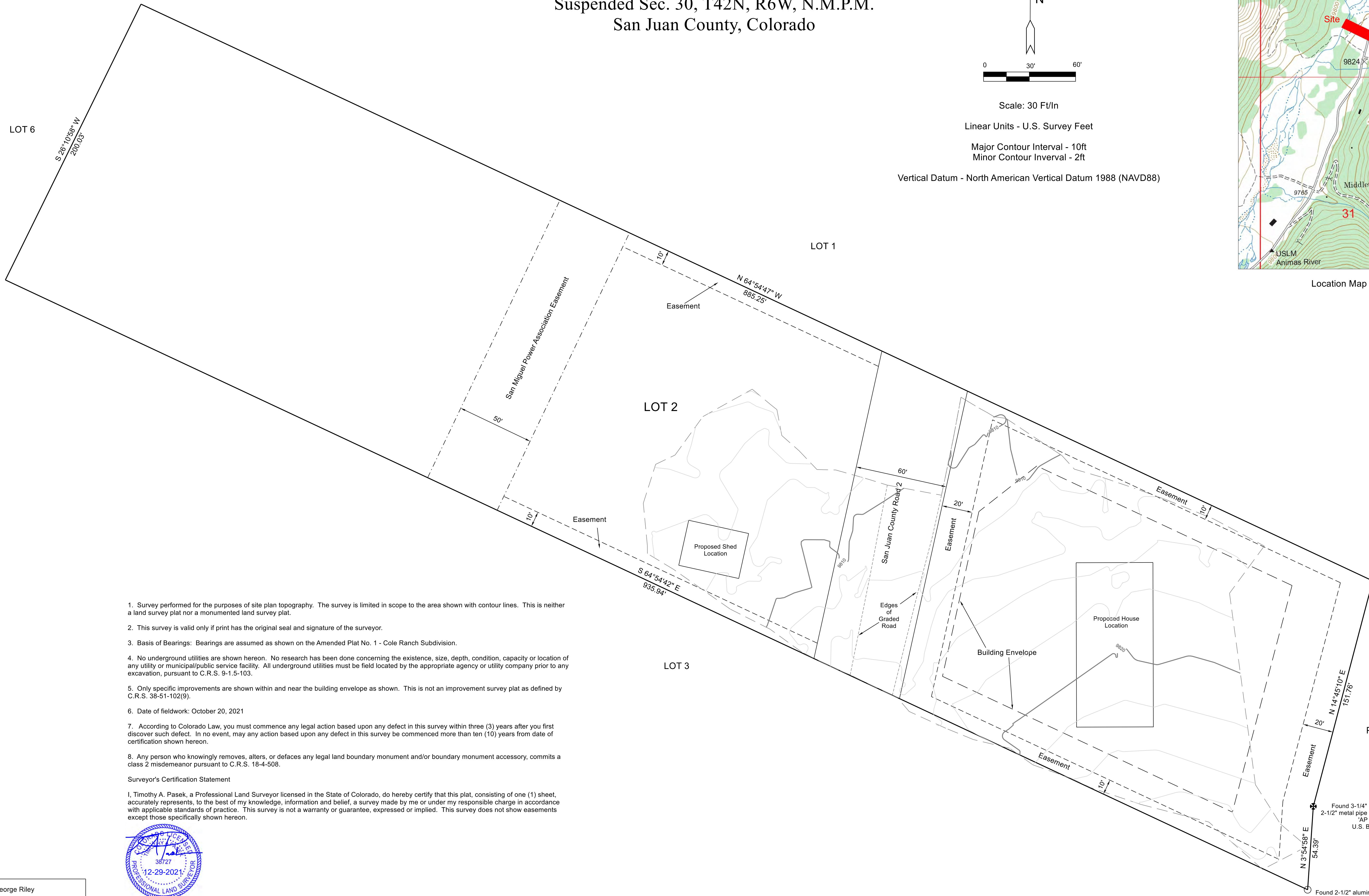
Linear Units - U.S. Survey Feet

Major Contour Interval - 10ft
Minor Contour Interval - 2ft

Vertical Datum - North American Vertical Datum 1988 (NAVD88)



Location Map - not to scale



1. Survey performed for the purposes of site plan topography. The survey is limited in scope to the area shown with contour lines. This is neither a land survey plat nor a monumented land survey plat.
2. This survey is valid only if print has the original seal and signature of the surveyor.
3. Basis of Bearings: Bearings are assumed as shown on the Amended Plat No. 1 - Cole Ranch Subdivision.
4. No underground utilities are shown hereon. No research has been done concerning the existence, size, depth, condition, capacity or location of any utility or municipal/public service facility. All underground utilities must be field located by the appropriate agency or utility company prior to any excavation, pursuant to C.R.S. 9-1.5-103.
5. Only specific improvements are shown within and near the building envelope as shown. This is not an improvement survey plat as defined by C.R.S. 38-51-102(9).
6. Date of fieldwork: October 20, 2021
7. According to Colorado Law, you must commence any legal action based upon any defect in this survey within three (3) years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten (10) years from date of certification shown hereon.
8. Any person who knowingly removes, alters, or defaces any legal land boundary monument and/or boundary monument accessory, commits a class 2 misdemeanor pursuant to C.R.S. 18-4-508.

Surveyor's Certification Statement

I, Timothy A. Pasek, a Professional Land Surveyor licensed in the State of Colorado, do hereby certify that this plat, consisting of one (1) sheet, accurately represents, to the best of my knowledge, information and belief, a survey made by me or under my responsible charge in accordance with applicable standards of practice. This survey is not a warranty or guarantee, expressed or implied. This survey does not show easements except those specifically shown hereon.



Timothy A. Pasek
Colorado P.L.S. 38727

George Riley
4728 County Road 2
Silverton, CO 81433

Metadreck Mineral Services LLC
P.O. Box 65 - 342 7th Ave
Duray, CO 81427

Job No. J21103	Sheet 1 of 1
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Found 2-1/2" aluminum survey cap
0.2' below grade - LS 12457

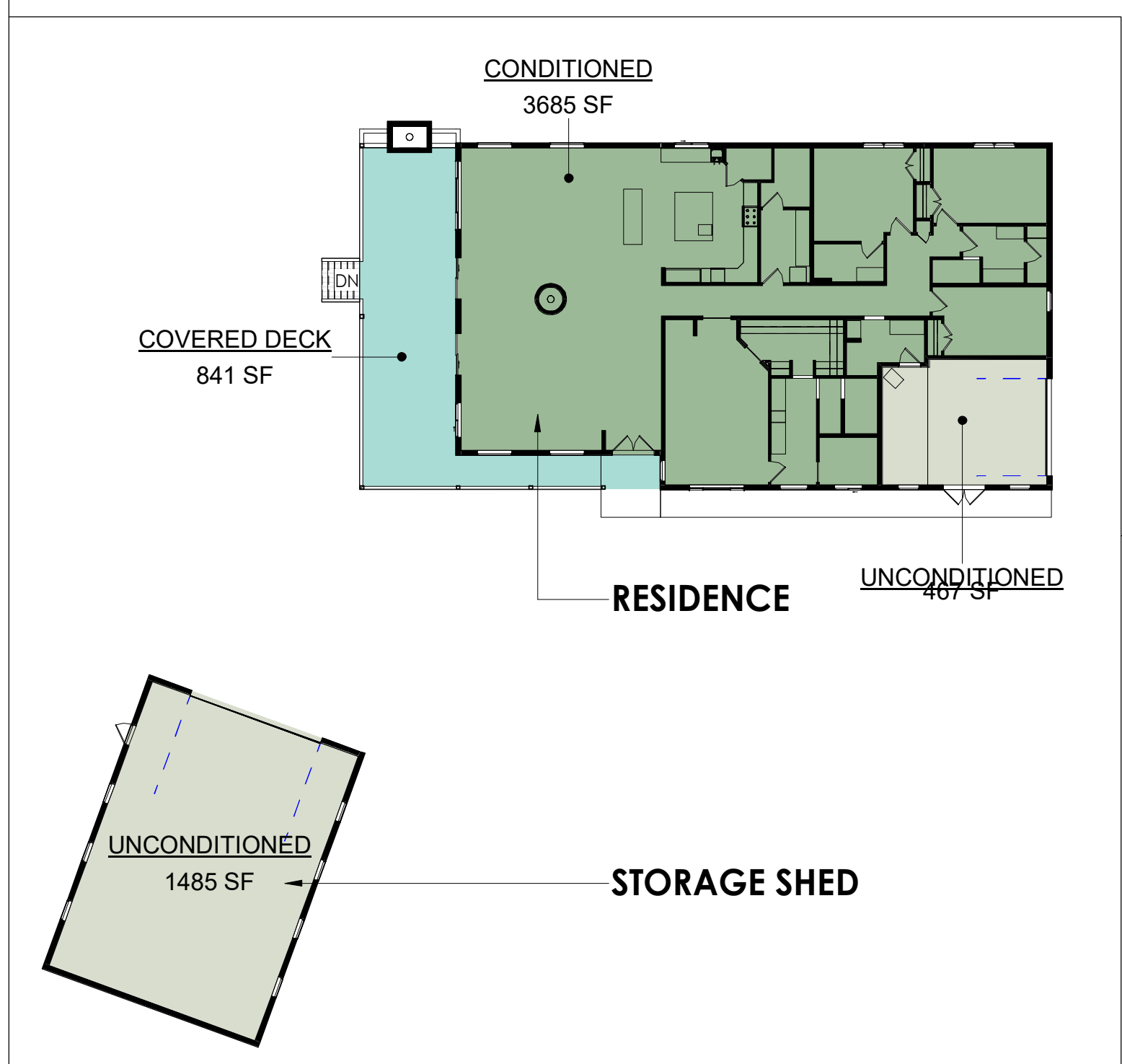
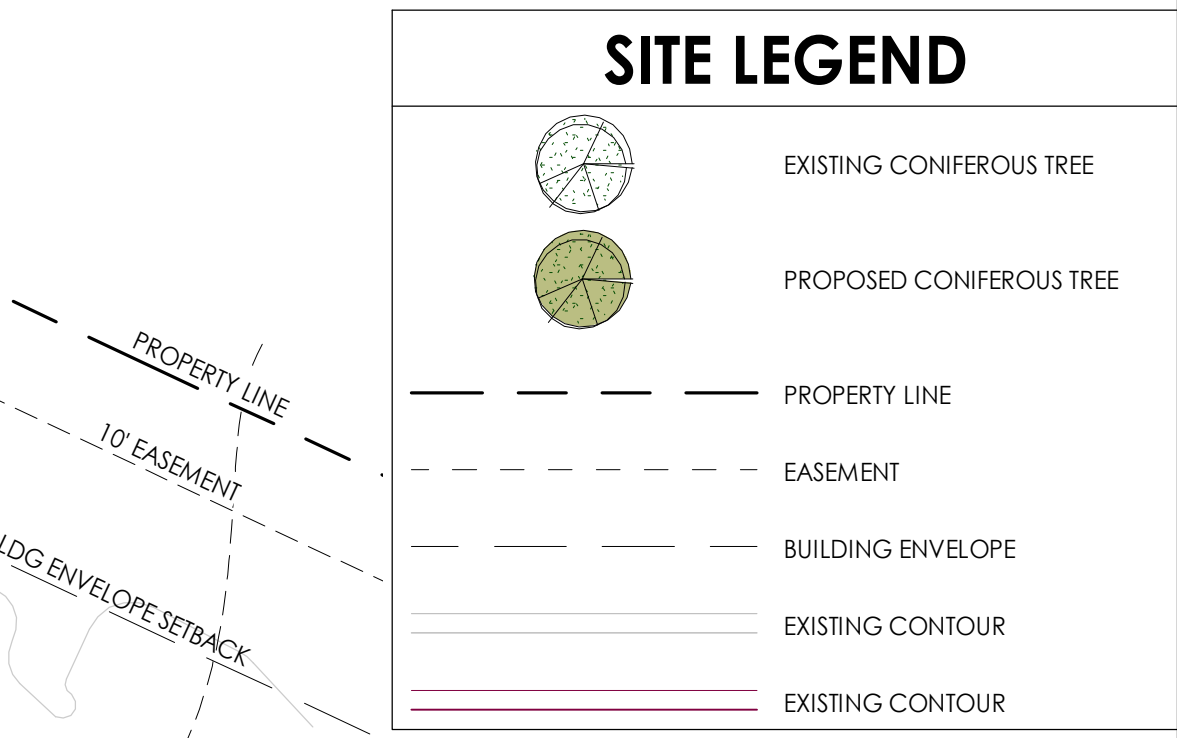
Peters Placer
M.S. 1242

Found 3-1/4" metal cap on
2-1/2" metal pipe 0.1' above grade
'AP 13'
U.S. B.L.M.

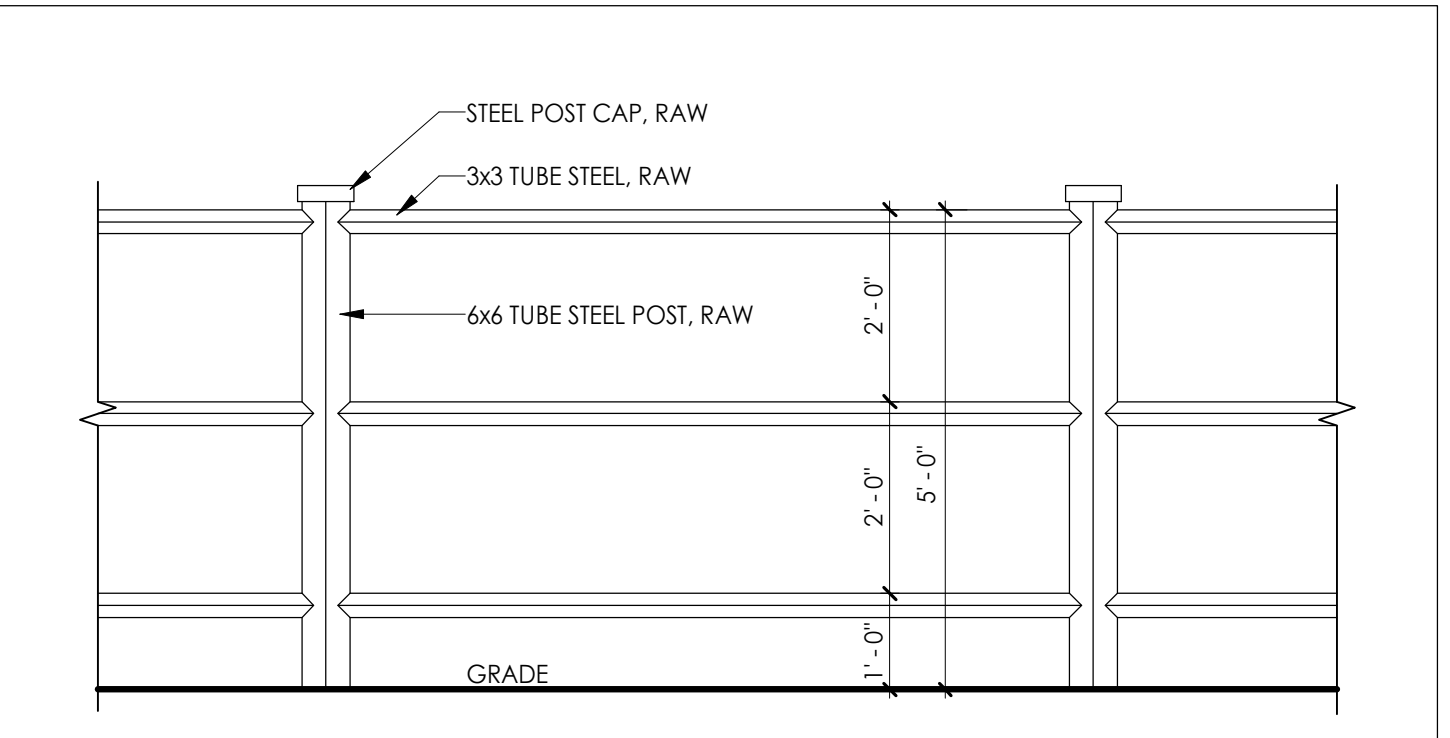
Found 2-1/2" aluminum survey cap
at grade - LS 12457



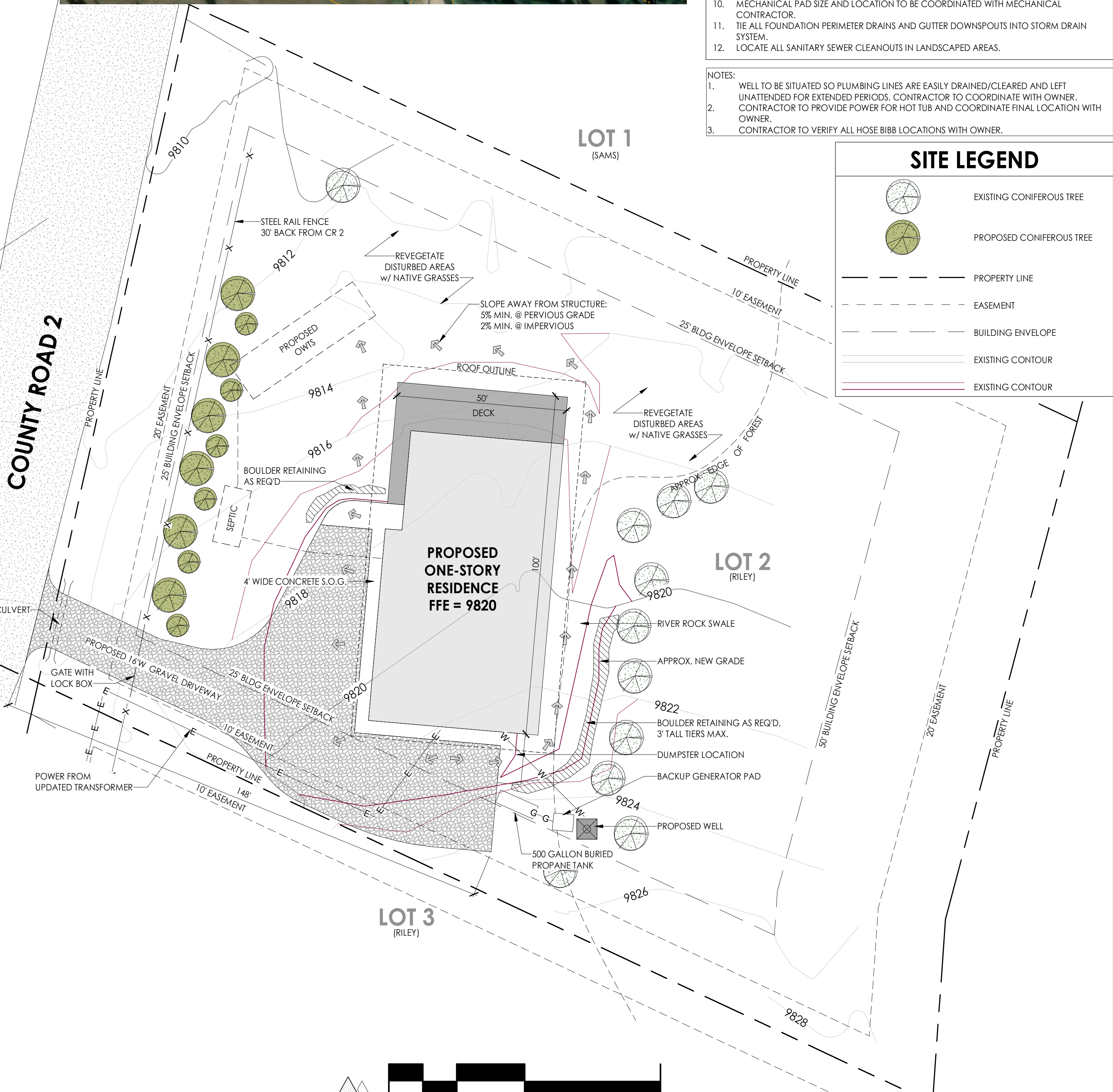
- ### SITE PLAN GENERAL NOTES
- CONTRACTOR SHALL VISIT THE JOBSITE AND VERIFY ALL SITE CONDITIONS AND COMPLIANCE WITH DIMENSIONS AND ELEVATIONS.
 - CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LINES WITH UTILITY COMPANIES PRIOR TO STARTING EXCAVATION.
 - CONTRACTOR SHOULD COORDINATE WITH ARCHITECT TO ESTABLISH A BENCHMARK AS A REFERENCE FOR ELEVATIONS AND TO BE USED AS OTHERWISE NECESSARY.
 - NOTIFY ARCHITECT IF FIELD CONDITIONS EXIST THAT ARE DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS OR THAT REQUIRES WORK THAT DEVIATES FROM THE PLANS. CONTRACTOR AND SUBCONTRACTORS ARE TO COORDINATE ALL WORK IN ORDER TO ACHIEVE COMPLETE COOPERATION BETWEEN TRADES.
 - IF DISCREPANCIES IN CONTRACT DRAWINGS OR SPECIFICATIONS ARE DISCOVERED THAT CONFLICT WITH ACTUAL FIELD CONDITIONS PRIOR TO PROCEEDING WITH WORK, THE ARCHITECT IS NOT RESPONSIBLE FOR WORK CONSTRUCTED AFTER A DISCREPANCY IS FOUND IN THE FIELD AND CONSTRUCTION WAS CONTINUED WITHOUT RECEIVING CLARIFICATION OR RECTIFICATION FROM THE ARCHITECT.
 - ALL UTILITIES ARE TO BE PLACED IN UTILITY TRENCHES UNLESS NOTED OTHERWISE. GENERAL CONTRACTOR SHALL DIRECTLY OVERSEE SUBCONTRACTORS TO ACCURATELY PLACE ALL NEW UTILITY TRENCHES PER UTILITY COMPANY'S SPECIFICATIONS FOR CORRECT BACKFILL DEPTH, EMBEDMENT, COMPACTION, AND SEPARATION OF UTILITY LINES IN ALL SPECIFIED MATERIALS. UTILITIES TO BE COORDINATED WITH OWNER, BUT TYPICALLY INCLUDE POWER, WATER, SEWER, PHONE, CABLE AND GAS. ALL LINES SHOULD BE MARKED WITH THE PROPER UTILITY TAPE AND INSTALLED WITH THE PROPER CONNECTION.
 - ALL FILL COMPACTION AND SPECIFICATIONS SHALL COINCIDE WITH AND CONFORM TO SOILS REPORT. THE CONTRACTOR AND OWNER ASSUME FULL RESPONSIBILITY FOR COMPACTION, FILL SPECIFICATIONS AND TESTING. ALL ISSUES DUE TO SETTLING SHALL BE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR.
 - TOP OF WALL (T.O.W.) ELEVATIONS ARE APPROXIMATE. VERIFY FIELD CONDITIONS AND NOTIFY ARCHITECT OF DISCREPANCIES.
 - THE DESIGN AND TESTING OF SITE RETAINING WALLS FOR THE BUILDING PAD, DRIVEWAY, AND SOIL RETENTION ARE THE RESPONSIBILITY OF THE CONTRACTOR AND OWNER. ALL NON-ENGINEERED BOULDER RETAINING WALLS SHALL USE BOULDERS WITH A THREE-FOOT MINIMUM DIAMETER. FOLLOW ALL LOCAL CODES FOR SAFE PLACEMENT OF BOULDERS AND EROSION CONTROL.
 - MECHANICAL PAD SIZE AND LOCATION TO BE COORDINATED WITH MECHANICAL CONTRACTOR.
 - TIE ALL FOUNDATION PERIMETER DRAINS AND GUTTER DOWNSPOUTS INTO STORM DRAIN SYSTEM.
 - LOCATE ALL SANITARY SEWER CLEANOUTS IN LANDSCAPED AREAS.
- NOTES:
- WELL TO BE SITUATED SO PLUMBING LINES ARE EASILY DRAINED/CLEARED AND LEFT UNATTENDED FOR EXTENDED PERIODS. CONTRACTOR TO COORDINATE WITH OWNER.
 - CONTRACTOR TO PROVIDE POWER FOR HOT TUB AND COORDINATE FINAL LOCATION WITH OWNER.
 - CONTRACTOR TO VERIFY ALL HOSE BIBB LOCATIONS WITH OWNER.



AREA PLAN
1" = 20'-0" (WHEN PRINTED FULL SCALE ON 24"x36")



STEEL RAIL FENCE ELEVATION
1/2" = 1'-0" (WHEN PRINTED FULL SCALE ON 24"x36")



ENLARGED SITE PLAN
1" = 20'-0" (WHEN PRINTED FULL SCALE ON 24"x36")

NOTE: SITE DESIGN IS CONCEPTUAL. CONTRACTOR TO RETAIN BOULDERS FOUND ON-SITE TO BE USED FOR LOW RETAINING WALLS AS REQUIRED (LESS THAN 4' IN HEIGHT).



801 FLORIDA RD | SUITE 12
DURANGO, CO 81301
970 | 515 | 7882

PROJECT #:
ASSESSOR'S PARCEL #:
2112
4773000057000

THE RILEY FAMILY CABIN
4728 COUNTY ROAD 2
SILVERTON, CO 81433

FOR IMPROVEMENT PERMIT | 04.06.2022

NEW CONSTRUCTION OF:

DESCRIPTION	DATE
LAND USE PERMIT APPLICATION	10/07/21

PRELIMINARY
NOT FOR CONSTRUCTION

SHEET TITLE:
SITE PLAN W/
GRADING AND
DETAILS
SHEET #:
C1.01
SCALE:
As indicated

CONSTRUCTION SEQUENCE

1. TREE REMOVAL
2. RETENTION AND EROSION CONTROLS PUT IN PLACE
3. SITE GRADING
4. GRAVEL ROAD LAID FOR MUD/TRACK RETENTION
5. BUILDING CONSTRUCTION
6. FINAL GRADING, LANDSCAPING, AND STABILIZATION
7. REMOVAL OF RETENTION AND EROSION CONTROLS

EROSION CONTROL NOTES

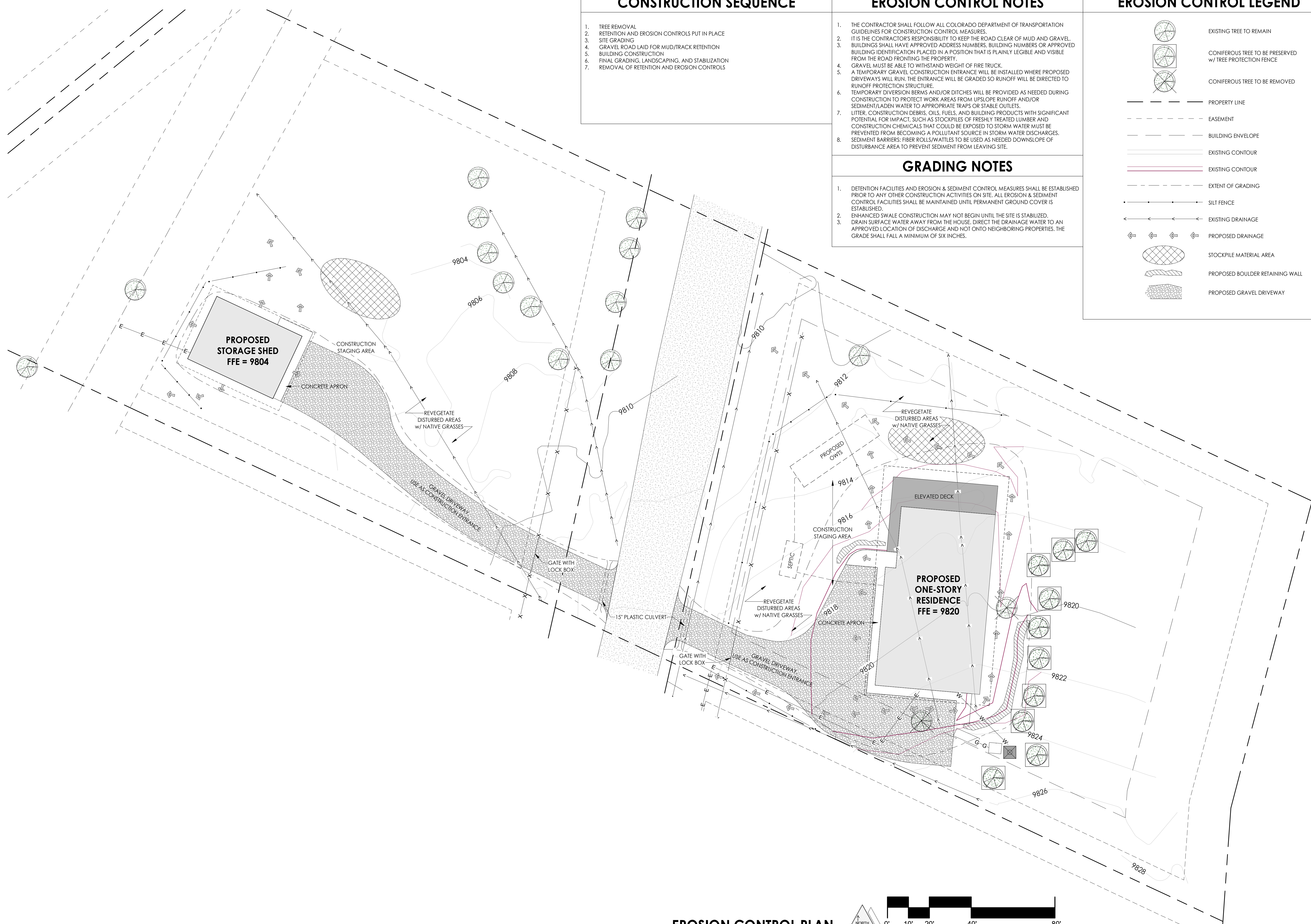
1. THE CONTRACTOR SHALL FOLLOW ALL COLORADO DEPARTMENT OF TRANSPORTATION GUIDELINES FOR CONSTRUCTION CONTROL MEASURES.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO KEEP THE ROAD CLEAR OF MUD AND GRAVEL. BUILDINGS SHALL HAVE APPROVED ADDRESS NUMBERS, BUILDING NUMBERS OR APPROVED BUILDING IDENTIFICATION PLACED IN A POSITION THAT IS PLAINLY LEGIBLE AND VISIBLE FROM THE ROAD FRONTING THE PROPERTY.
3. GRAVEL MUST BE ABLE TO WITHSTAND WEIGHT OF FIRE TRUCK.
4. A TEMPORARY GRAVEL CONSTRUCTION ENTRANCE WILL BE INSTALLED WHERE PROPOSED DRIVEWAYS WILL RUN. THE ENTRANCE WILL BE GRADED SO RUNOFF WILL BE DIRECTED TO RUNOFF PROTECTION STRUCTURE.
5. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR SEDIMENT/LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.
6. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT, SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.
7. SEDIMENT BARRIERS: FIBER ROLLS/WATTLES TO BE USED AS NEEDED DOWNSLOPE OF DISTURBANCE AREA TO PREVENT SEDIMENT FROM LEAVING SITE.

GRADING NOTES

1. DETENTION FACILITIES AND EROSION & SEDIMENT CONTROL MEASURES SHALL BE ESTABLISHED PRIOR TO ANY OTHER CONSTRUCTION ACTIVITIES ON SITE. ALL EROSION & SEDIMENT CONTROL FACILITIES SHALL BE MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
2. ENHANCED SWALE CONSTRUCTION MAY NOT BEGIN UNTIL THE SITE IS STABILIZED.
3. DRAIN SURFACE WATER AWAY FROM THE HOUSE. DIRECT THE DRAINAGE WATER TO AN APPROVED LOCATION OF DISCHARGE AND NOT ONTO NEIGHBORING PROPERTIES. THE GRADE SHALL FALL A MINIMUM OF SIX INCHES.

EROSION CONTROL LEGEND

- EXISTING TREE TO REMAIN
- CONIFEROUS TREE TO BE PRESERVED w/ TREE PROTECTION FENCE
- CONIFEROUS TREE TO BE REMOVED
- PROPERTY LINE
- EASEMENT
- BUILDING ENVELOPE
- EXISTING CONTOUR
- EXISTING CONTOUR
- EXTENT OF GRADING
- SILT FENCE
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- STOCKPILE MATERIAL AREA
- PROPOSED BOULDER RETAINING WALL
- PROPOSED GRAVEL DRIVEWAY



801 FLORIDA RD | SUITE 12
DURANGO, CO 81301
970 | 515 | 7882

PROJECT #: 21-12
ASSESSOR'S PARCEL #: 4773000057000

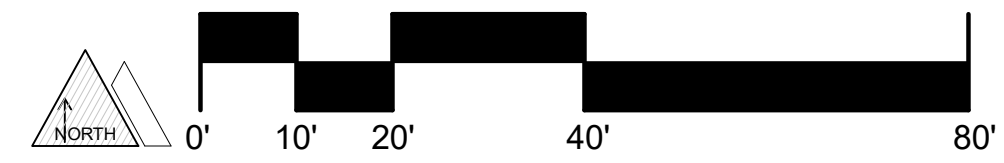
NEW CONSTRUCTION OF:
THE RILEY FAMILY CABIN
4728 COUNTY ROAD 2
SILVERTON, CO 81433
FOR IMPROVEMENT PERMIT | 04.06.2022

PROJECT DATES + REVISIONS	
DESCRIPTION	DATE
LAND USE PERMIT APPLICATION	10/07/21

PRELIMINARY
NOT FOR
CONSTRUCTION

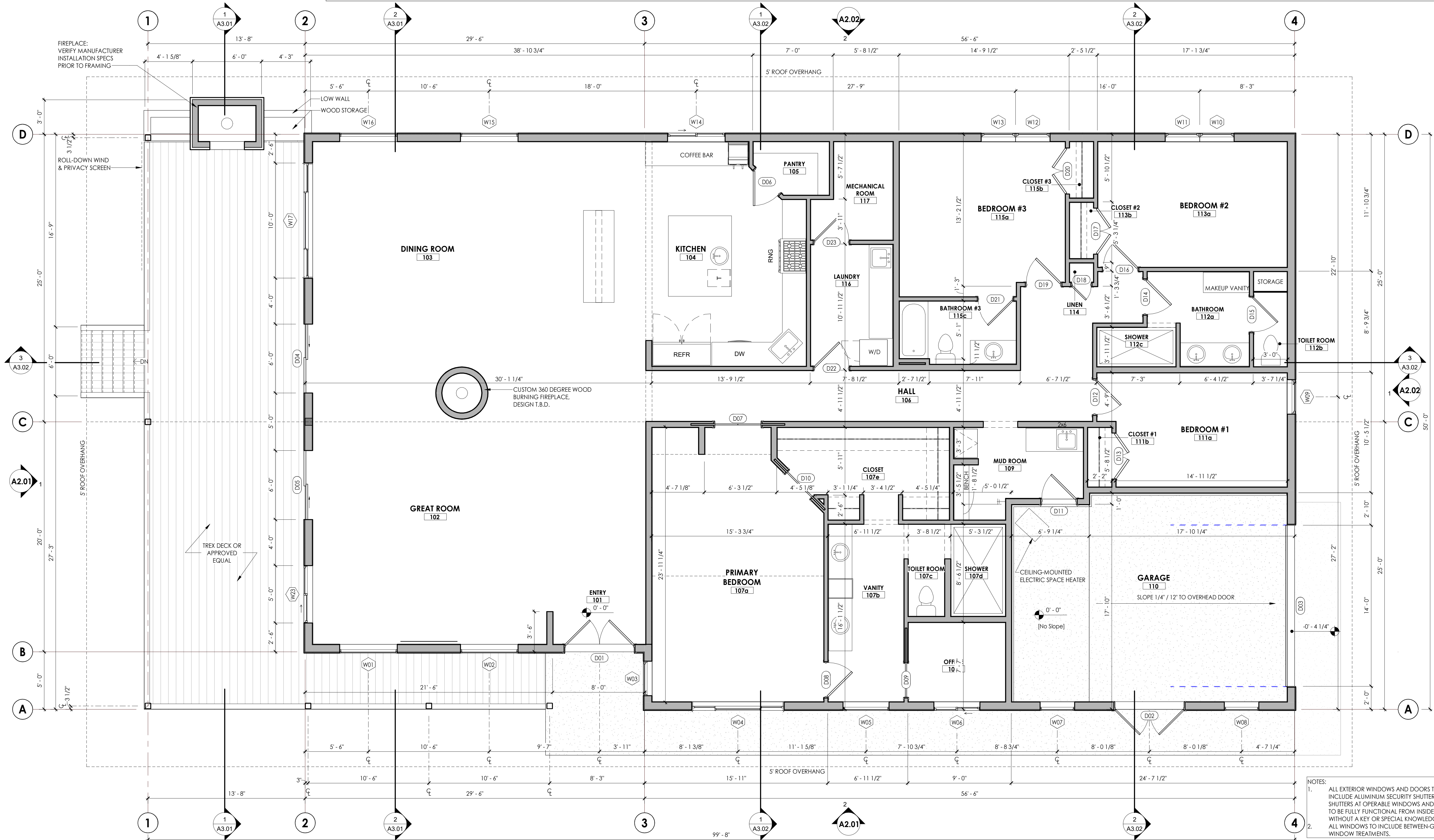
SHEET TITLE: DRAINAGE AND EROSION CONTROL PLAN
SHEET #: C1.02
SCALE: As indicated

EROSION CONTROL PLAN
1" = 20'-0" (WHEN PRINTED FULL SCALE ON 24"x36")



FLOOR PLAN GENERAL NOTES

- DIMENSIONS ARE TO FACE OF STUDS, CENTER OF COLUMNS, GRID LINES, AND FACE OF CONCRETE AND CMU WALLS, UNLESS NOTED OTHERWISE OR SPECIFICALLY INDICATED ON PLANS. CONCRETE STEM WALLS MAY BE ALIGNED TO INSIDE FACE OF EXTERIOR STUD WALLS OR HAVE A DIFFERENT ALIGNMENT WHERE INDICATED ON DRAWINGS.
- ALL DIMENSION DISCREPANCIES TO BE REPORTED TO THE ARCHITECT PRIOR TO PROCEEDING WITH CONSTRUCTION. THE ARCHITECT IS NOT RESPONSIBLE FOR THAT PORTION OF WORK THAT OCCURS IF CONTRACTOR, SUBCONTRACTOR, OR OWNER CONTINUES WITH CONSTRUCTION WITHOUT ARCHITECT CLARIFICATION AND APPROVAL.
- ALL EXTERIOR WALLS ARE CONSTRUCTED OF 2X8 STUDS @ 16" O.C. UNLESS NOTED OTHERWISE.
- ALL INTERIOR WALLS ARE 2X4 STUDS @ 16" O.C. UNLESS NOTED OTHERWISE.
- ALL INTERIOR GARAGE WALL CONSTRUCTION IS 2X6 STUDS @ 16" O.C. UNLESS NOTED OTHERWISE.
- ALL GARAGE WALL AND CEILING SURFACES TO HAVE ONE LAYER 5/8" TYPE 'X' GYP BD.
- SOUND ATTENUATION TO BE INSTALLED IN ALL WALLS, FLOORS AND CEILINGS SURROUNDING BEDROOMS AND BATHROOMS.
- VAPOR BARRIERS ARE TO BE INSTALLED IN THE FOLLOWING LOCATIONS:
 - CRAWL SPACE: INSTALL VAPOR BARRIER TO MEET CODE REQUIRED THICKNESS MIN.: 6" MIN. OVERLAP; SEAL OR TAPE OVERLAP; EXTEND 6" MIN. UP STEM WALL; ATTACH TO STEM WALL.
 - CEILING: INSTALL VAPOR BARRIER WITH 6" MIN. OVERLAP; SEAL OR TAPE OVERLAP; SEAL BARRIER TO HOUSEWRAP AT WALL TOP PLATE.
- CONTRACTOR TO OVERSEE RADON TESTING AS REQUIRED AND INSTALL MITIGATION SYSTEM AS NECESSARY TO ACHIEVE SAFE RADON LEVELS AND AS REQUESTED BY OWNER IF BEYOND WHAT IS REQUIRED.
- CONSULT AND COORDINATE WITH OWNER ALL SHOWER AND BATHTUB ROUGH-IN DIMENSIONS PRIOR TO FRAMING LAYOUT.
- CONSULT AND COORDINATE WITH OWNER ALL HANDRAIL DESIGNS AND MATERIALS AT STAIRS. TOP OF HANDRAILS TO BE LOCATED 34" ABOVE STEP NOSING. HANDRAILS TO MEET THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL CODE.
- CONSULT AND COORDINATE WITH OWNER ALL GUARDRAIL DESIGNS AND MATERIALS AT DECKS, LOFT AND ELSEWHERE. TOP OF GUARDRAILS TO BE LOCATED 36" ABOVE ADJACENT SURFACE. GUARDRAILS TO MEET THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL CODE. INSTALL SMOKE DETECTORS PER REQUIREMENTS OF SECTION 314 OF THE INTERNATIONAL RESIDENTIAL CODE.
- ALL COAT CLOSETS TO RECEIVE SHELF & ROD UNLESS NOTED OTHERWISE. CONSULT AND COORDINATE ALL CLOSET BUILT-IN LOCATIONS AND DESIGNS WITH OWNER.
- DOORS AND CURTAIN RODS TO BE INSTALLED AT ALL TUB/SHOWER LOCATIONS PER OWNER DIRECTION.
- ALL KITCHEN CASEWORK AND OTHER BUILT-INS TO BE DESIGNED BY OTHERS. SHOP DRAWINGS AND/OR SUBMITTALS TO BE PROVIDED TO ARCHITECT FOR APPROVAL.
- UNLESS DIRECTED OTHERWISE BY OWNER, GAS AND ELECTRICAL POWER CONNECTION FOR BOTH THE RANGE AND DRYER ARE TO BE PROVIDED. CONSULT WITH OWNER PRIOR TO CONFIGURATION.
- ALL PLUMBING FIXTURES TO BE SELECTED BY OWNER. CONTRACTOR TO COORDINATE ROUGH-IN REQUIREMENTS.
- ALL INTERIOR FINISHES TO BE SELECTED BY OWNER. ARCHITECT HAS PROVIDED GENERAL DIRECTION ONLY.
- WATER HEATER SIZE, LOCATION, AND CONFIGURATION TO BE SELECTED BY OWNER. THE TANK AND ALL REQUIRED COMPONENTS TO BE PROVIDED BY CONTRACTOR FOR COMPLETE INSTALLATION.
- CONTRACTOR TO COORDINATE FIREPLACE SIZE AND MODEL WITH OWNER PRIOR TO FRAMING AND NOTIFY ARCHITECT IF FRAMING DIMENSIONS NEED TO BE ADJUSTED. INSTALL PER CHAPTER 18 OF THE INTERNATIONAL RESIDENTIAL CODE AND PER MANUFACTURER REQUIREMENTS.
- CRAWLSPACES TO BE ENCAPSULATED AND CONDITIONED. CONTRACTOR TO PROVIDE ALL COMPONENTS FOR COMPLETE MOISTURE AND HUMIDITY CONTROL. NOT TO CONFLICT WITH RADON CONTROL SYSTEM.
- PROVIDE 2" IMPERMEABLE SPRAY FOAM INSULATION AT INSIDE OF WALL SHEATHING. FILL REMAINING CAVITY WITH INSULATION PER WALL DETAIL.
- EXTERIOR WALL DESIGN PER WALL TYPE DETAILS AND STRUCTURAL DRAWINGS.
- HEAT SYSTEM TO BE RADIANT HEAT HYDRONIC TUBING IN 1-1/2" GYP/CRETE. DESIGN AND ZONING TO BE COORDINATED BETWEEN CONTRACTOR AND OWNER.



FLOOR PLAN
1/4" = 1'-0" (WHEN PRINTED FULL SCALE ON 24"x36")



mountain grain
architecture + sustainable design studio

801 FLORIDA RD | SUITE 12
DURANGO, CO 81301
970 | 515 | 7882

PROJECT #: 21-12
ASSESSOR'S PARCEL #: 4773000057000

THE RILEY FAMILY CABIN
4728 COUNTY ROAD 2
SILVERTON, CO 81433

NEW CONSTRUCTION OF: **FOR IMPROVEMENT PERMIT | 04.06.2022**

PROJECT DATES + REVISIONS	
DESCRIPTION	DATE
LAND USE PERMIT APPLICATION	10/07/21

PRELIMINARY
NOT FOR CONSTRUCTION

SHEET TITLE: **FLOOR PLAN**
SHEET #: **A1.01**
SCALE: As indicated

NOTES:
1. ALL EXTERIOR WINDOWS AND DOORS TO INCLUDE ALUMINUM SECURITY SHUTTERS. ALL SHUTTERS AT OPERABLE WINDOWS AND DOORS TO BE FULLY FUNCTIONAL FROM INSIDE ROOM WITHOUT A KEY OR SPECIAL KNOWLEDGE.
2. ALL WINDOWS TO INCLUDE BETWEEN-GLASS WINDOW TREATMENTS.

FLOOR PLAN GENERAL NOTES

1. DIMENSIONS ARE TO FACE OF STUDS, CENTER OF COLUMNS, GRID LINES, AND FACE OF CONCRETE AND CMU WALLS, UNLESS NOTED OTHERWISE OR SPECIFICALLY INDICATED ON PLANS. CONCRETE STEM WALLS MAY BE ALIGNED TO INSIDE FACE OF EXTERIOR STUD WALLS OR HAVE A DIFFERENT ALIGNMENT WHERE INDICATED ON DRAWINGS.
2. ALL DIMENSION DISCREPANCIES TO BE REPORTED TO THE ARCHITECT PRIOR TO PROCEEDING WITH CONSTRUCTION. THE ARCHITECT IS NOT RESPONSIBLE FOR THAT PORTION OF WORK THAT OCCURS IF CONTRACTOR, SUBCONTRACTOR, OR OWNER CONTINUES WITH CONSTRUCTION WITHOUT ARCHITECT CLARIFICATION AND APPROVAL.
3. ALL EXTERIOR WALLS ARE CONSTRUCTED OF 2X8 STUDS @ 16" O.C., UNLESS NOTED OTHERWISE.
4. ALL INTERIOR WALLS ARE 2X4 STUDS @ 16" O.C., UNLESS NOTED OTHERWISE.
5. ALL INTERIOR GARAGE WALL CONSTRUCTION IS 2X6 STUDS @ 16" O.C., UNLESS NOTED OTHERWISE.
6. ALL GARAGE WALL AND CEILING SURFACES TO HAVE ONE LAYER 5/8" TYPE 'X' GYP BD.
7. SOUND ATTENUATION TO BE INSTALLED IN ALL WALLS, FLOORS AND CEILINGS SURROUNDING BEDROOMS AND BATHROOMS.
8. VAPOR BARRIERS ARE TO BE INSTALLED IN THE FOLLOWING LOCATIONS:
 - A. CRAWL SPACE: INSTALL VAPOR BARRIER TO MEET CODE REQUIRED THICKNESS MIN.: 6" MIN. OVERLAP; SEAL OR TAPE OVERLAP; EXTEND 6" MIN. UP STEM WALL; ATTACH TO STEM WALL.
 - B. CEILING: INSTALL VAPOR BARRIER WITH 6" MIN. OVERLAP; SEAL OR TAPE OVERLAP; SEAL BARRIER TO HOUSEWRAP AT WALL TOP PLATE.
9. CONTRACTOR TO OVERSEE RADON TESTING AS REQUIRED AND INSTALL MITIGATION SYSTEM AS NECESSARY TO ACHIEVE SAFE RADON LEVELS AND AS REQUESTED BY OWNER IF BEYOND WHAT IS REQUIRED.
10. CONSULT AND COORDINATE WITH OWNER ALL SHOWER AND BATHTUB ROUGH-IN DIMENSIONS PRIOR TO FRAMING LAYOUT.
11. CONSULT AND COORDINATE WITH OWNER ALL HANDRAIL DESIGNS AND MATERIALS AT STAIRS. TOP OF HANDRAILS TO BE LOCATED 34" ABOVE STEP NOSING. HANDRAILS TO MEET THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL CODE.
12. CONSULT AND COORDINATE WITH OWNER ALL GUARDRAIL DESIGNS AND MATERIALS AT DECKS, LOFT AND ELSEWHERE. TOP OF GUARDRAILS TO BE LOCATED 36" ABOVE ADJACENT SURFACE. GUARDRAILS TO MEET THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL CODE.
13. INSTALL SMOKE DETECTORS PER REQUIREMENTS OF SECTION 314 OF THE INTERNATIONAL RESIDENTIAL CODE.
14. ALL COAT CLOSETS TO RECEIVE SHELF & ROD UNLESS NOTED OTHERWISE. CONSULT AND COORDINATE ALL CLOSET BUILT-IN LOCATIONS AND DESIGNS WITH OWNER.
15. DOORS AND CURTAIN RODS TO BE INSTALLED AT ALL TUB/SHOWER LOCATIONS PER OWNER DIRECTION.
16. ALL KITCHEN CASEWORK AND OTHER BUILT-INS TO BE DESIGNED BY OTHERS. SHOP DRAWINGS AND/OR SUBMITTALS TO BE PROVIDED TO ARCHITECT FOR APPROVAL.
17. UNLESS DIRECTED OTHERWISE BY OWNER, GAS AND ELECTRICAL POWER CONNECTION FOR BOTH THE RANGE AND DRYER ARE TO BE PROVIDED. CONSULT WITH OWNER PRIOR TO CONFIGURATION.
18. ALL PLUMBING FIXTURES TO BE SELECTED BY OWNER. CONTRACTOR TO COORDINATE ROUGH-IN REQUIREMENTS.
19. ALL INTERIOR FINISHES TO BE SELECTED BY OWNER. ARCHITECT HAS PROVIDED GENERAL DIRECTION ONLY.
20. WATER HEATER SIZE, LOCATION, AND CONFIGURATION TO BE SELECTED BY OWNER. THE TANK AND ALL REQUIRED COMPONENTS TO BE PROVIDED BY CONTRACTOR FOR COMPLETE INSTALLATION.
21. CONTRACTOR TO COORDINATE FIREPLACE SIZE AND MODEL WITH OWNER PRIOR TO FRAMING AND NOTIFY ARCHITECT IF FRAMING DIMENSIONS NEED TO BE ADJUSTED. INSTALL PER CHAPTER 18 OF THE INTERNATIONAL RESIDENTIAL CODE AND PER MANUFACTURER REQUIREMENTS.
22. CRAWLSPACES TO BE ENCAPSULATED AND CONDITIONED. CONTRACTOR TO PROVIDE ALL COMPONENTS FOR COMPLETE MOISTURE AND HUMIDITY CONTROL. NOT TO CONFLICT WITH RADON CONTROL SYSTEM.
23. PROVIDE 2" IMPERMEABLE SPRAY FOAM INSULATION AT INSIDE OF WALL SHEATHING. FILL REMAINING CAVITY WITH INSULATION PER WALL DETAIL.
24. EXTERIOR WALL DESIGN PER WALL TYPE DETAILS AND STRUCTURAL DRAWINGS.
25. HEAT SYSTEM TO BE RADIANT HEAT HYDRONIC TUBING IN 1-1/2" GYPCRETE. DESIGN AND ZONING TO BE COORDINATED BETWEEN CONTRACTOR AND OWNER.



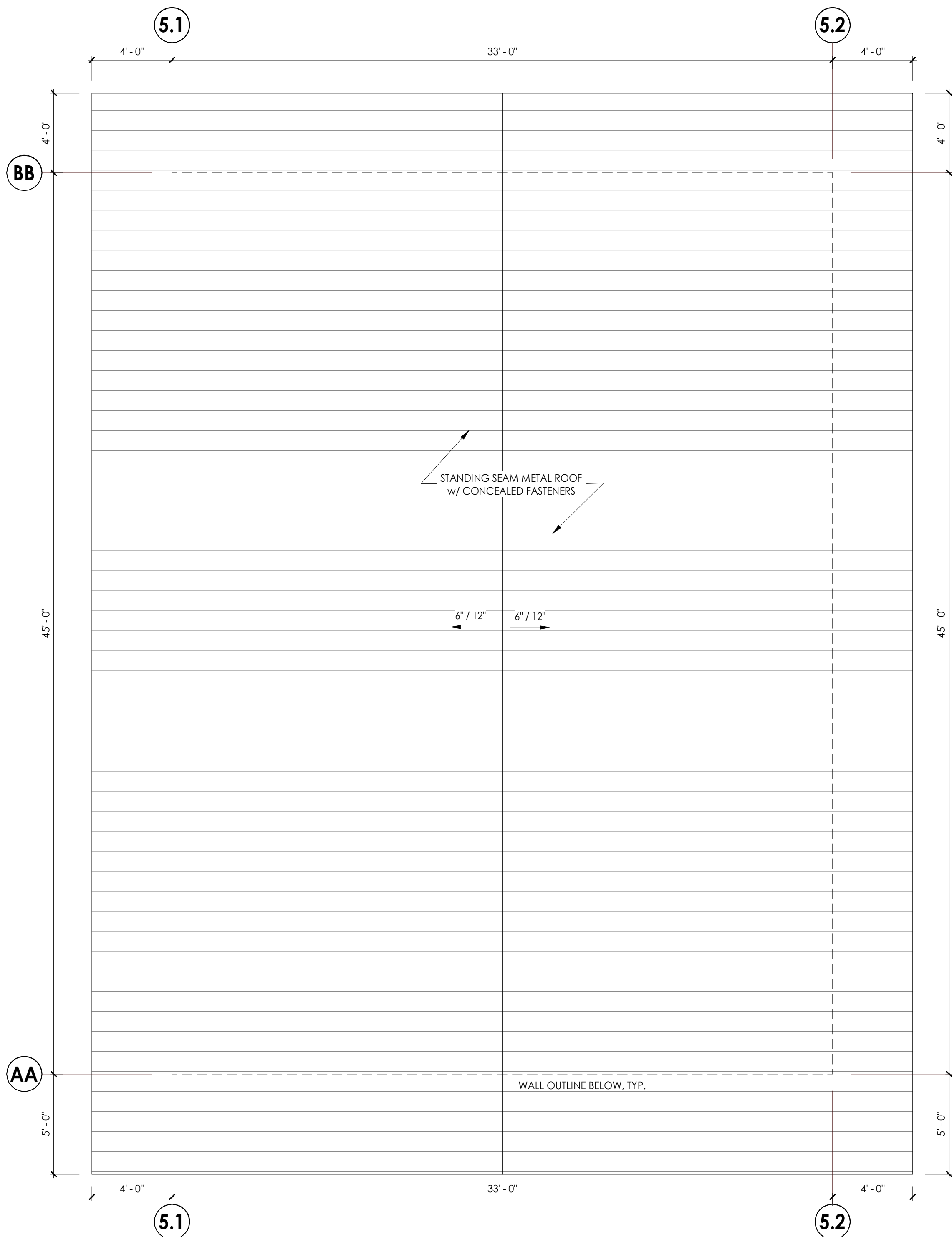
801 FLORIDA RD | SUITE 12
DURANGO, CO 81301
970 | 515 | 7882

RCP GENERAL NOTES

1. SEE SHEET A7.01 FOR FINISH SCHEDULE.
2. SEE ELECTRICAL NOTES FOR FURTHER INFORMATION ON LIGHTING AND ELECTRICAL ITEMS.
3. COORDINATE WITH MECHANICAL AND ELECTRICAL CONTRACTOR FOR TYPE AND PLACEMENT OF MECHANICAL, ELECTRICAL, AND LIGHTING COMPONENTS.
4. INSTALL SMOKE DETECTORS PER REQUIREMENTS OF SECTION 314 OF THE INTERNATIONAL RESIDENTIAL CODE.
5. ALL ELEVATIONS ARE APPROXIMATE. VERIFY HEIGHTS IN FIELD AND NOTIFY ARCHITECT IF CLARIFICATION IS NEEDED.

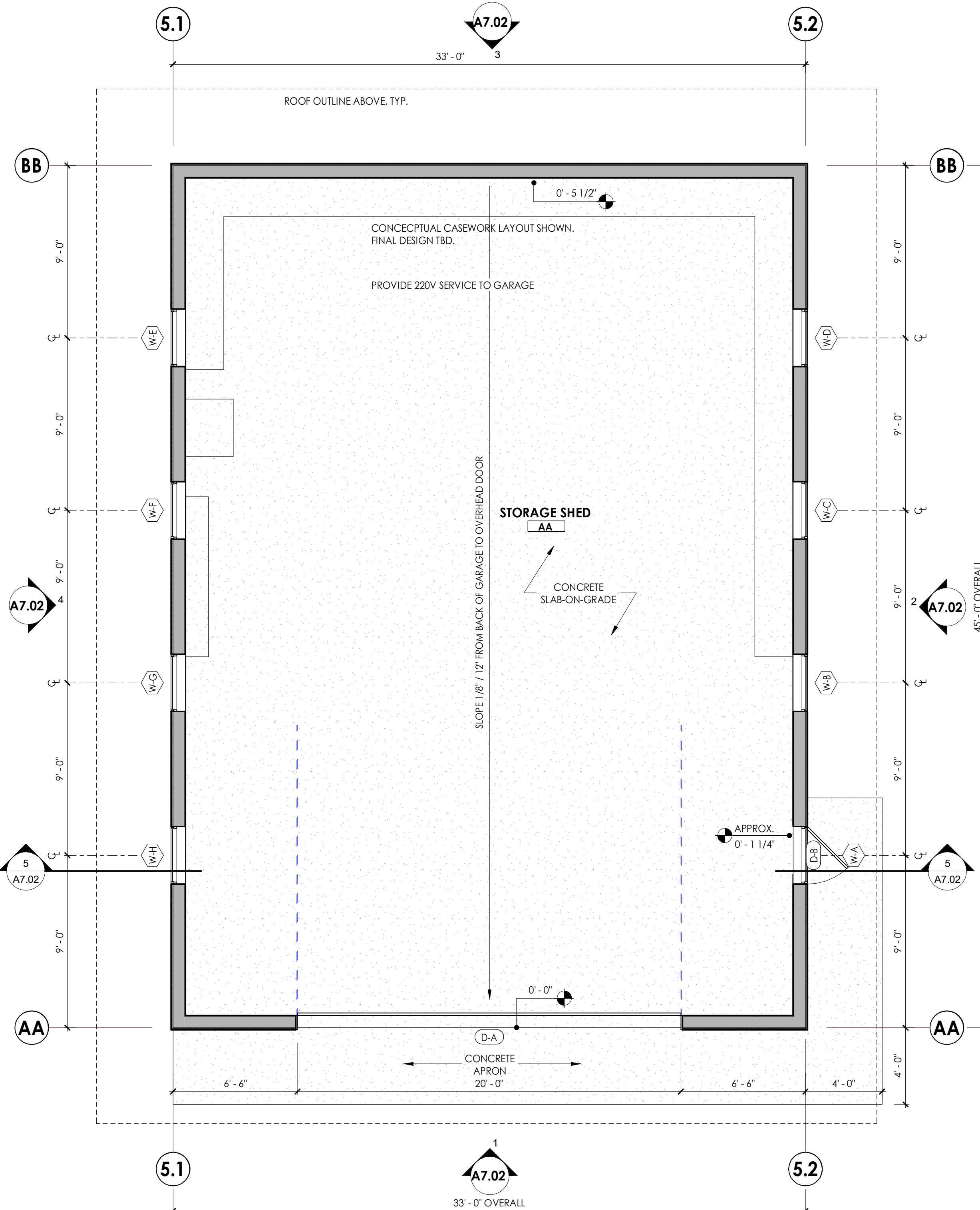
ELECTRICAL GENERAL NOTES

1. ALL ELECTRICAL & LIGHTING FIXTURES TO BE SELECTED BY OWNER. CONTRACTOR TO COORDINATE ROUGH-IN REQUIREMENTS.
2. SWITCHING LAYOUTS TO BE COORDINATED WITH OWNER PRIOR TO ROUGH-IN.
3. COORDINATE ALL APPLIANCE POWER REQUIREMENTS WITH GENERAL CONTRACTOR ONCE APPLIANCES HAVE BEEN SELECTED BY OWNER.
4. ALL ELECTRICAL FIXTURES, OUTLETS, SWITCHES AND ANY ADDITIONAL ITEMS TO COMPLY WITH THE NATIONAL ELECTRICAL CODE AND MINIMUM LOCATIONS PER THE INTERNATIONAL RESIDENTIAL CODE.
5. ALL OUTLETS, SWITCHES AND COVER PLATES TO BE SELECTED BY OWNER.
6. ALL ELECTRICAL FIXTURES AND RECEPTACLES LOCATED ON THE EXTERIOR TO BE RATED FOR A WET LOCATION.
7. ALL DATA CABLE TYPE AND RUNS TO BE COORDINATED WITH OWNER.
8. CRAWL SPACES AND ATTICS TO HAVE SWITCHED LIGHTING.
9. ALL ADDITIONAL ELECTRICAL ITEMS INCLUDING, BUT NOT LIMITED TO, PHONE, CABLE AND SECURITY SYSTEMS TO BE COORDINATED BETWEEN GENERAL CONTRACTOR, ELECTRICAL CONTRACTOR AND OWNER.
10. FOLLOW THE DARK SKY INTERNATIONAL WEBSITE AS A GUIDE FOR PROPER INSTALLATION OF EXTERIOR BUILDING LIGHTING. EXTERIOR LIGHT FIXTURES INSTALLED ON BUILDING SHALL BE OF A FULL-CUT-OFF DESIGN.
11. PROVIDE SWITCHING/POWER FOR GARAGE DOORS AS REQUIRED BY OWNER'S SELECTION OF DOORS.
12. CONTRACTOR TO COORDINATE WALL INSULATION AND POWER REQUIREMENTS AND LOCATIONS IN GARAGE WITH OWNER.



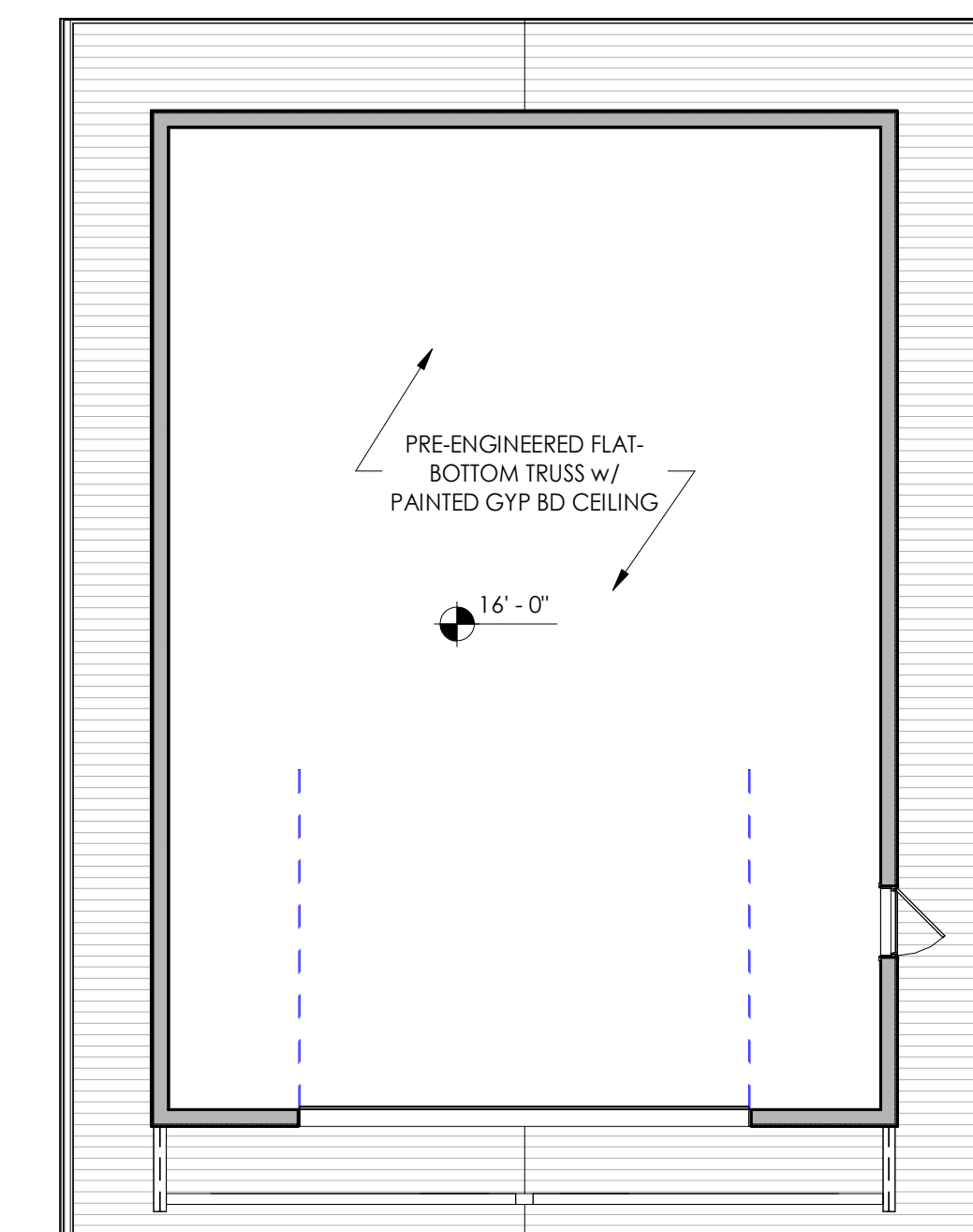
ROOF PLAN

1/4" = 1'-0" (WHEN PRINTED FULL SCALE ON 24"x36")



FLOOR PLAN

1/4" = 1'-0" (WHEN PRINTED FULL SCALE ON 24"x36")



REFLECTED CEILING PLAN

1/8" = 1'-0"

21-12
PROJECT #:
ASSESSOR'S PARCEL #:

4773000057000

THE RILEY FAMILY CABIN

4728 COUNTY ROAD 2
SILVERTON, CO 81433

FOR IMPROVEMENT PERMIT | 04.06.2022

PROJECT DATES + REVISIONS

DESCRIPTION	DATE
LAND USE PERMIT APPLICATION	10/07/21

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET TITLE: STORAGE SHED PLANS

SHEET #:
A7.01

SCALE: As indicated

Permit # 0530

Year 2021

APPLICATION to Construct, Alter, or Repair an On-site Wastewater Treatment System

Owner: George W Riley III Phone: (505) 320-1145

Site address: 4728 County Road 2, Silverton, CO 81433

Assessor's parcel # 47730300052000 Subdivision: Cole Ranch Lot#: 2

Lot size: 4.17 (acres) # of Dwellings: 1 # of Bedrooms: 4 Water supply: Well

I acknowledge: (1) This application does not guarantee that an On-site Wastewater Treatment System ("OWTS") can be installed or a building permit issued; (2) The issuance of the OWTS permit does not imply any warranty by San Juan Basin Public Health as to the operation of the OWTS; (3) The OWTS must be constructed in accordance with the San Juan Basin Public Health On-site Wastewater Treatment System Regulations; and (4) The owner of the property assumes the responsibility and liability for the proper maintenance of the OWTS.

Date: 10/05/21 Owner's signature: *George W Riley III*

Owner's mailing address: #5 Road 5221, Bloomfield, NM 87413

Owner's email address: georger@rileyindustrial.com

[DEPARTMENT USE ONLY]

Permit fee: \$ 23.00 Payment type: cc web Rec'd by: MP Date: 10/07/2021

Site Evaluation LTAR: _____ Limiting Zone: _____ Depth: _____

PERMIT to _____ an On-site Wastewater Treatment System

Septic tank(s): _____ Design flow: _____ (gal/day) Distribution: Gravity or Pressure siphon pump

Soil treatment area: _____

Design Specifications and Comments:

Authorization to begin Construction

Permit must be signed by EHS BEFORE construction begins

Environmental Health Specialist Date

Final Inspection The above system has been inspected and found to comply with the above requirements.

System Installed by (name, company, phone)

Environmental Health Specialist Date

System Designed by (name, company, phone)

ON-SITE WASTE WATER TREATMENT PERMIT

APPLICANT	PROPERTY OWNER	INSTALLER
GEORGE RILEY #5 RD 5221 BLOOMFIELD, NM 87413 (505) 320-1145	GEORGE RILEY #5 ROAD 5221 BLOOMFIELD, NM 87413 (505) 320-1145	LIC #: EXP:
ADDRESS: 4728 COUNTY RD 2, SILVERTON		PARCEL #: 47730300052000-S
PERMIT TYPE: CONSTRUCTION		SUBDIVISION: COLE RANCH
LOT #: 2		LOT SIZE (ACRES): 4.17
DWELLING UNITS: 1		BEDROOMS: 4
SITE EVAL LTAR: R-O using 1.0		LIMITING ZONE:
DEPTH:		WATER SUPPLY: Well
SEPTIC TANKS: 1500 gal - 3 chamber		
DESIGN FLOW: 525 GPD		
DISTRIBUTION: Pressure, Pump		
SOIL TREATMENT: Bed (x1) 12' x 44' 3' MIN - C33 washed concrete sand below eljen units. 3 - 1.5" pressure laterals w/ 3/16" orifice spaced 24" O.C. over 3 rows of 8 eljen unit each. Install pressure laterals inside 4" perforated pipe. Apply filter fabric over perforated pipe. Backfill 12" MIN loam material and mound to provide drainage away from field, Construct diversion swale above field to divert run-off.		
WORK DESCRIPTION: New OWTS for proposed 4 bd dwelling.		

SPECIAL CONDITIONS

- The system must meet pressure dosing requirements as defined in Regulation 43.10.E.3, including a distal operating head of 30-72 inches. A wet test of the dosing system is required at the time of construction inspection.
- Contact SJBPH for an initial excavation inspection to verify depth and dimensions of STA bed for application of sand media prior to backfill.
- Sand media gradation required on file prior to application.

AUTHORIZATION TO BEGIN CONSTRUCTION OR REPAIRS

The submitted design and above specifications are authorized for construction, subject to the above special conditions. All provisions of the SJBPH On-site Wastewater Treatment System regulations must be complied with whether specified herein or not. The granting of this permit does not give authority to violate or cancel any other state or local law or regulation governing construction or land use.

Nicola Pasquini
Authorized By

12/9/2021
Date

FINAL INSPECTION

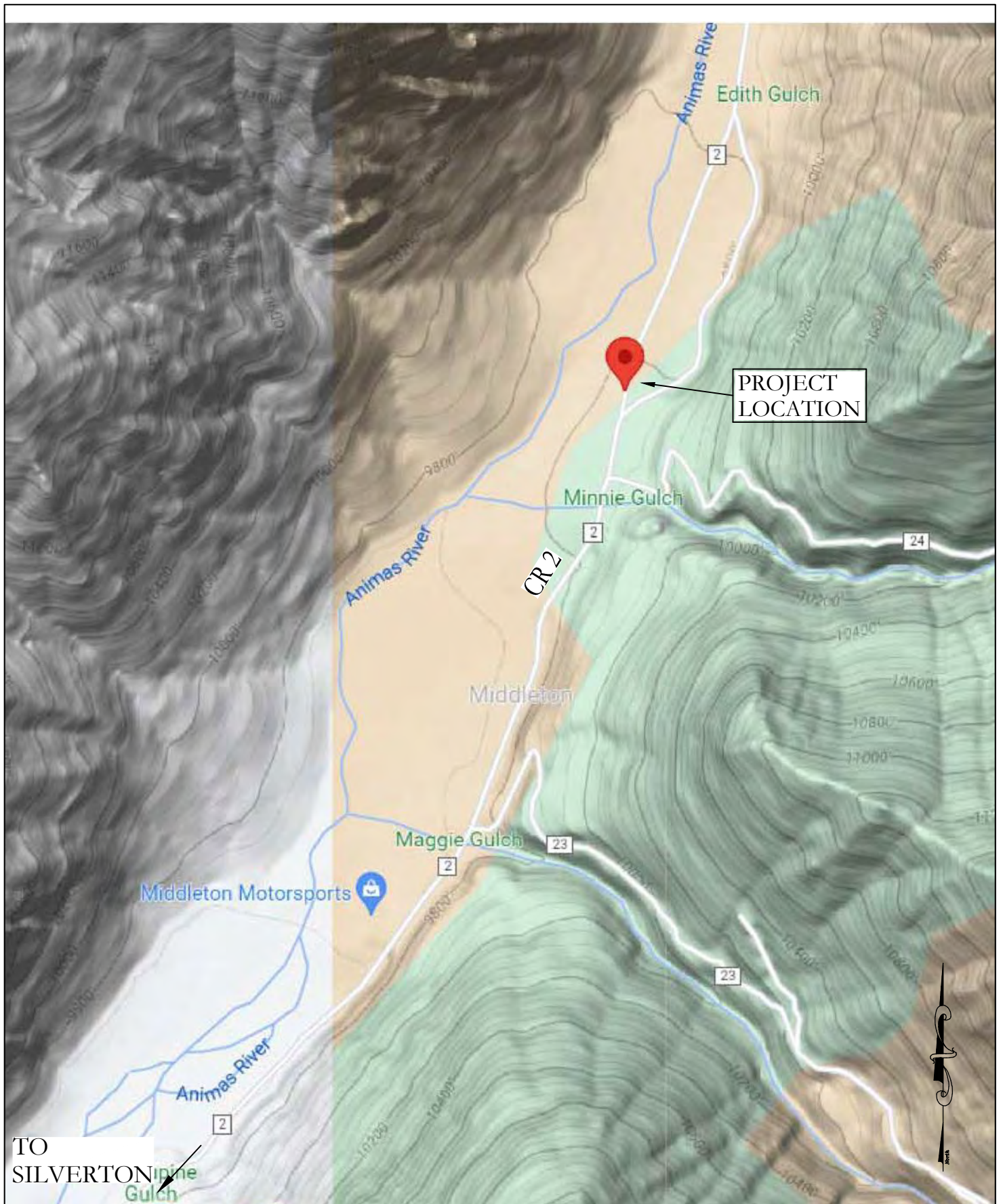
The above system has been inspected and found to comply with the requirements as described on the issued permit.

SITE DEVELOPMENT SOLUTIONS
C/O MICHAL VALENCIA
PO BOX 997
BAYFIELD, CO 81122

System Designed by (name, company, phone)

Finalized By

Date



TO
SILVERTON



PO Box 997
Bayfield, CO 81122
970-749-6767 ph.
sds@durango.net

Permit Number: WWP2021-0530
George W. Riley, III
4728 CR 2, Silverton, CO
San Juan County

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#1

DATE
11/22/21

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VICINITY MAP

PROPERTY INFORMATION:

A SITE EVALUATION WAS PERFORMED COLE RANCH LOT 2 IN SILVERTON, CO BY CHAD ENGELHARDT. TWO SOIL PROFILE PITS WERE EXCAVATED IN THE AREA OF THE PROPOSED SYSTEM. THE DESIGN IS FOR A PROPOSED 4-BEDROOM DWELLING THAT IS SERVED BY A WELL. THE SLOPE IN THE AREA OF THE SYSTEM IS APPROX. 6-8%.

SOIL CONDITIONS:

0-6" LOAM

6-72" LOAMY SAND/COBBLE (>35%); SINGLE GRAIN/STRUCTURELESS [SOIL TYPE R-0];

BEDROCK/ GROUNDWATER NOT ENCOUNTERED

SOIL PROFILE PIT (SPP) LOGS:

SPP#1

DEPTH: (FT.)	SOIL TYPE & DESCRIPTION
0 0-6"	LOAM-GRANULAR/ WEAK
2	
4 0.5-8'	LOAMY SAND WITH COBBLE (>35% ROCK) SINGLE GRAIN/ STRUCTURELESS SOIL TYPE R-0
6	
8	

SPP#2

DEPTH: (FT.)	SOIL TYPE & DESCRIPTION
0 0-6"	LOAM-GRANULAR/ WEAK
2	
4 0.5-8'	LOAMY SAND WITH COBBLE (>35% ROCK) SINGLE GRAIN/ STRUCTURELESS SOIL TYPE R-0
6	
8	

SOIL TYPE AND LONG-TERM ACCEPTANCE RATE:

SOIL TYPE R-0: SAND WITH >35% ROCK, MAXIMUM LTAR: 1.0 GAL/SF/DAY
TREATMENT LEVEL 1, MIN 3-FT DEEP UNLINED SAND FILTER WILL BE USED FOR DESIGN.

SOIL TREATMENT AREA CALCULATIONS:

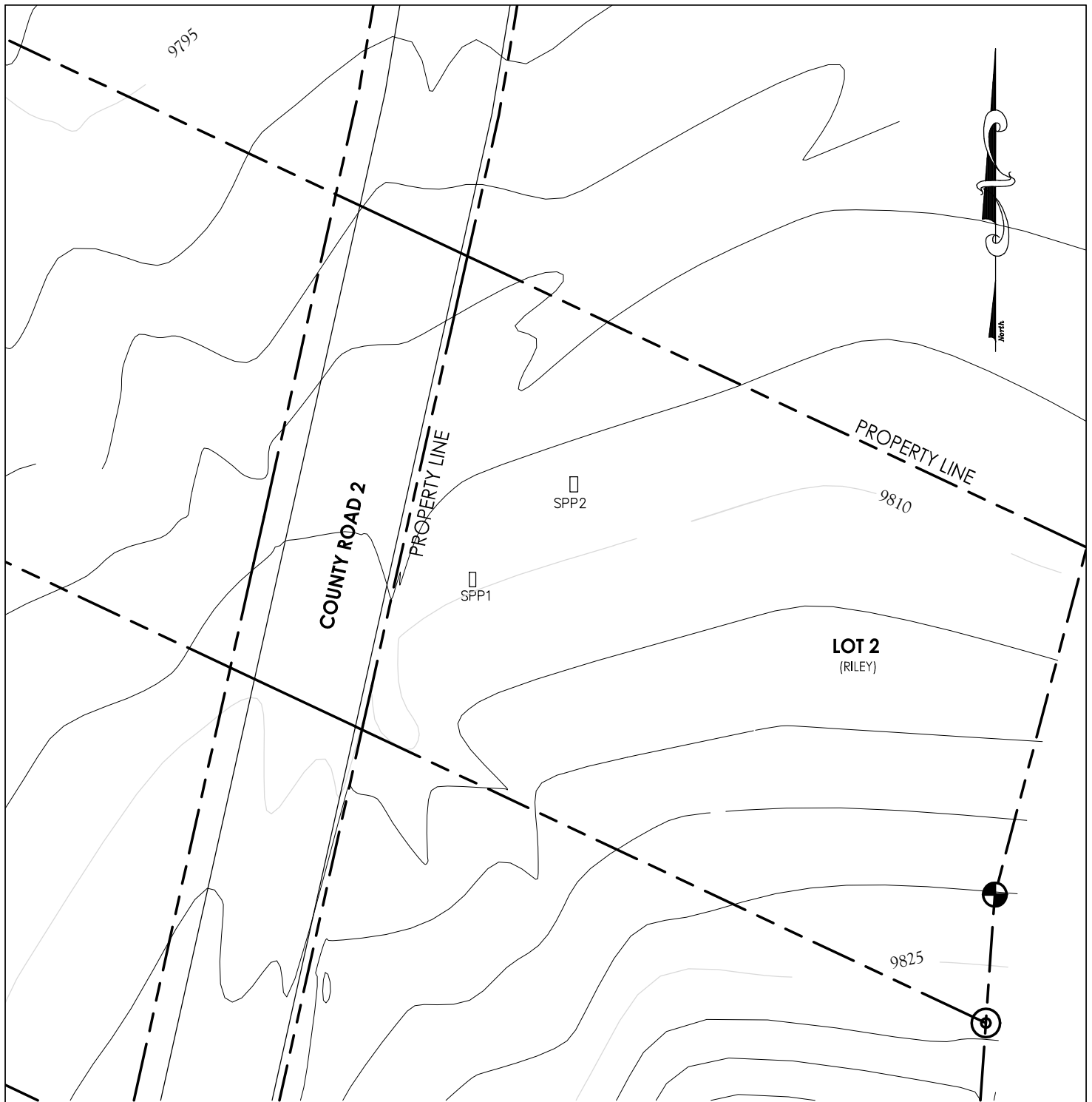
PER TABLE 6-1: 4 BEDROOMS => DESIGN FLOW = 525 GAL/DAY
 PER TABLE 10-1A: LTAR = 1.0 GAL/SF/DAY, THEREFORE: A = 525/1.0 = 525 SQ. FT.
 PER 43.11.C.2.h: NO SIZE ADJUSTMENT FACTORS MAY BE APPLIED. ONE BED, 12'X43.75'
 ELJEN GEOTEXTILE SAND FILTERS OVER 36" OF SAND SHALL BE USED.
 MIN ELJEN GSF MODULES REQUIRED: 525 SF / 24 SF/MOD = 22 MODULES OR
 6 PER BEDROOM: 4 BEDROOMS * 6 = 24 MODULES. THEREFORE USE 3 ROWS OF EIGHT MODULES.



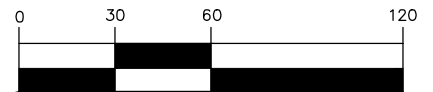
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 sds@durango.net

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GRAPHIC SCALE



(IN FEET)

1 inch = 60 ft.



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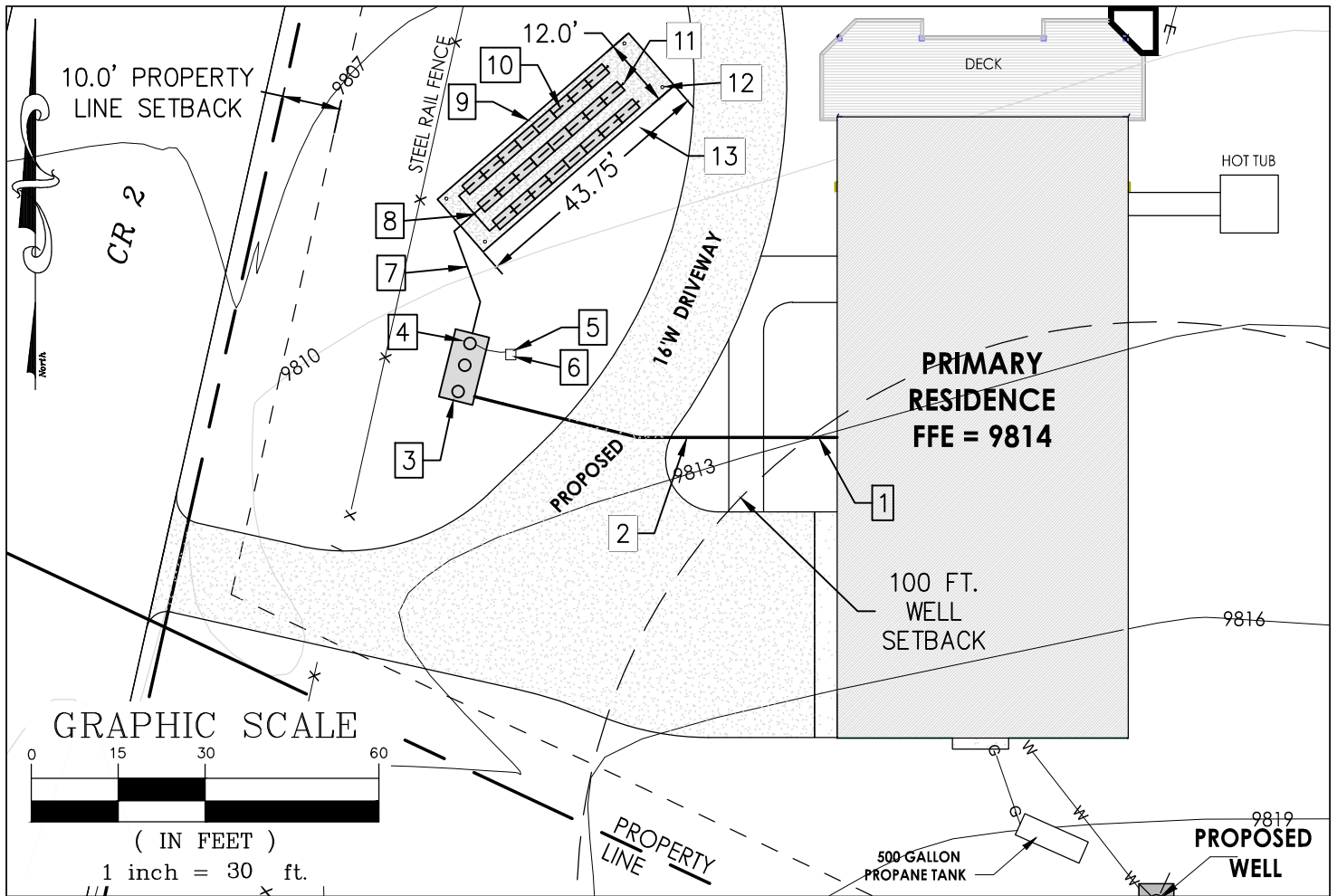
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EX. COND. &
 SPP LOCATIONS



KEYNOTES:

1. INSTALL 2-WAY CLEAN-OUT WITHIN 5 FEET OF DWELLING PER UPC.
2. GRAVITY SEWER SHALL BE 4" SCH. 40 PVC AT MINIMUM 2% SLOPE TO TANK.
3. SEPTIC TANK SHALL BE 1500 GALLON, 3 CHAMBER PUMP TANK WITH AN EFFLUENT FILTER. INSTALL RISERS & LIDS AT ALL ACCESSSES. (ALT. 1250 GAL 2 CHAMBER TANK AND 500 GAL PUMP TANK.)
4. PUMP SHALL BE INSTALLED IN 3RD CHAMBER OF TANK WITH 1/2 HP PUMP, AY MCDONALD MODEL 5050CUSJ15 OR EQUAL. SET FLOAT SWITCH TO TURN PUMP ON AT 11" MIN ABOVE OFF POSITION. CONSTRUCT FLOAT TREE. SET HIGH LEVEL ALARM FLOAT AT TANK INLET ELEVATION OR SLIGHTLY LOWER. SET PUMP BELOW TANK INLET ELEVATION. CONNECT PUMP WITH COUPLER FOR FUTURE REPLACEMENT.
5. HIGH LEVEL ALARM REQUIRED. PUMP AND HIGH LEVEL ALARM MUST BE WIRED ON SEPARATE CIRCUITS. ALARM SHALL BE AUDIBLE AND VISUAL. INSTALL ON POST OR BLDG. FINAL PLACEMENT PER OWNER.
6. DOSING CYCLE COUNTER REQUIRED. SET INSIDE TANK LID OR ON POST/HOUSE ALONG WITH PUMP ALARM.
7. FURNISH & INSTALL 2" SCH. 40 PVC FORCE MAIN TO NEW FIELD. WATERTIGHT SEAL AT TANK EXIT.
8. 2" X 1-1/2" MANIFOLD TO THREE LATERALS.
9. SOIL TREATMENT AREA (STA) 12'X43.75' SHALL HAVE THREE ROWS OF ELJENS, 24 TOTAL, CONSTRUCTED LEVEL OVER 36" ASTM C33 CONCRETE SAND. SEE SECTIONS ON PAGE 5.
10. 1-1/2" SOLID SCH. 40 PVC WITH 3/16" DIAMETER ORIFICES DRILLED EVERY 24" OVER ELJENS ONLY (48 TOTAL ORIFICES) ORIENTED AT 12 O'CLOCK POSITION, INSTALL INSIDE 4" PVC PERFORATED PIPE.
11. DRILL ONE 1/4" HOLE AT END OF EACH LATERAL PIPE AT 6 O'CLOCK POSITION FOR DRAIN AND LONG SWEEP 90° OR 2-45° UP TO CLEAN-OUT ABOVE GRADE WITH SCREW-ON CAP.
12. FOUR INSPECTION PORTS REQUIRED (4"Ø), ONE AT CORNERS OF BED. SEE SECTIONS & NOTES.
13. FIELD SHALL BE MOUNDED OR CROSS SLOPED AND AN UPHILL SWALE CONSTRUCTED TO ENSURE POSITIVE DRAINAGE AROUND AND AWAY FROM FIELD.

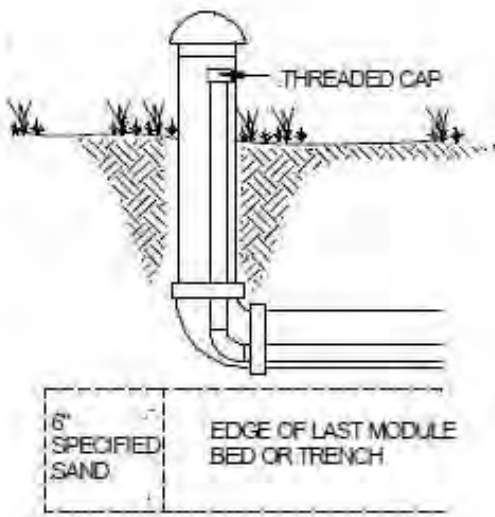


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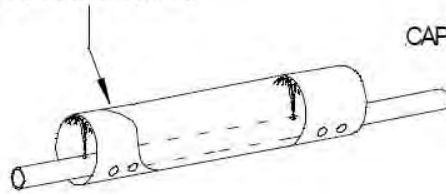
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PROPOSED
SITE LAYOUT

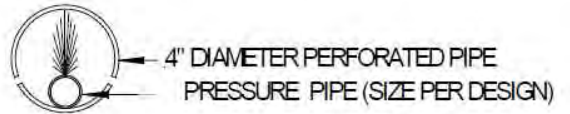


4" DIAMETER PERFORATED PIPE



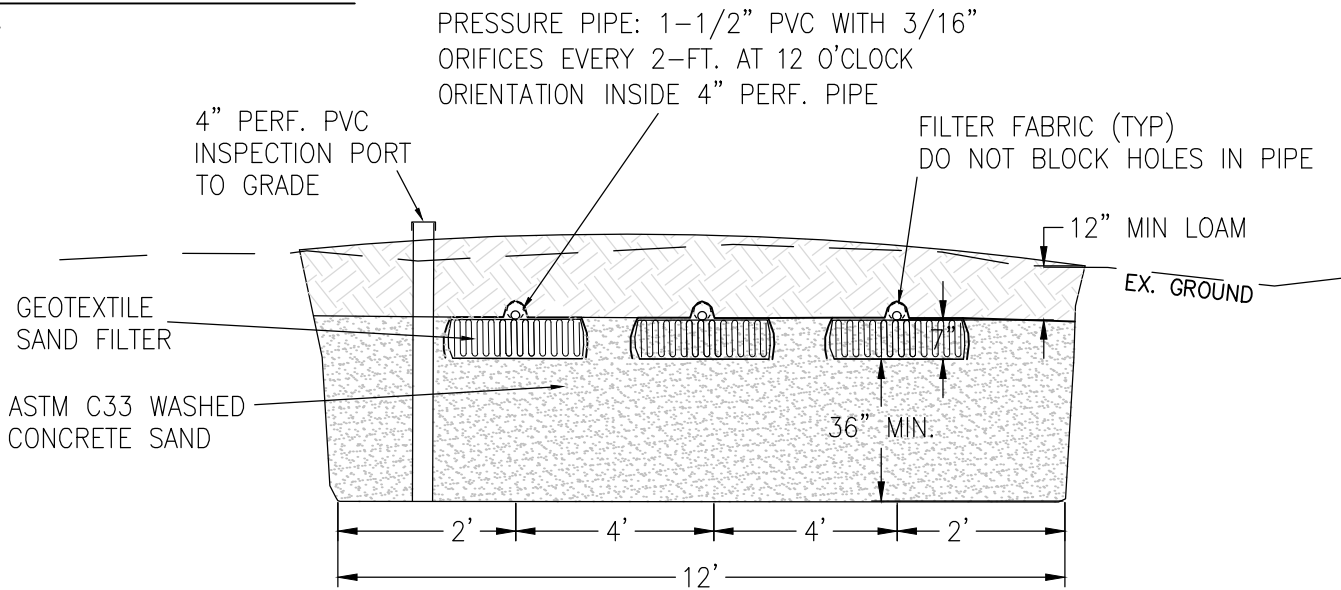
CAP END OF 4" PIPE

PRESSURE PIPE CROSS SECTION FOR ALL APPLICATIONS

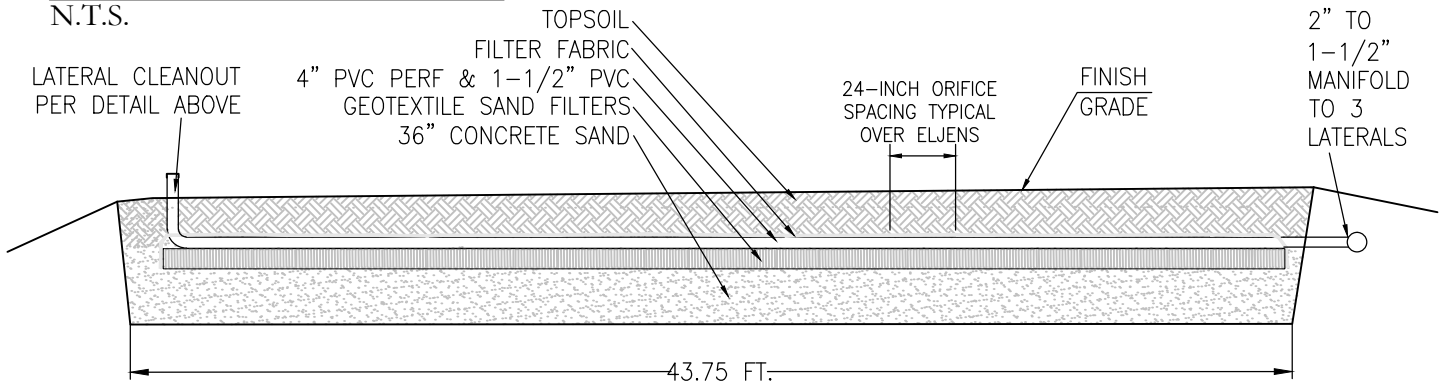


PRESSURE PIPE DETAIL
N.T.S.

LATERAL CLEAN OUT
N.T.S.



SAND FILTER SECTION
N.T.S.



LONGITUDINAL SECTION
N.T.S.



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SECTIONS

GENERAL NOTES:

THE COMPLETED FACILITY IS SUBJECT TO INSPECTION AND CERTIFICATION BY THE SAN JUAN BASIN HEALTH UNIT AND THE ENGINEER. ENGINEER INSPECTIONS ARE REQUIRED:

1. IMMEDIATELY PRIOR TO BACKFILL OPERATIONS, AFTER DISTRIBUTION SYSTEM HAS BEEN PLUMBED, AND INFILTRATORS INSTALLED. DISTRIBUTION BOX AND SEPTIC TANK TO BE LOCATED AND SWING-TIED FOR AS-BUILTS AND MARKERS INSTALLED AS REQUIRED.
2. AFTER SITE IS COMPLETED, INCLUDING SEEDING OF THE BED SITE.

CONTRACTOR SHALL HAVE AN APPROVED SET OF PLANS ON SITE AT ALL TIMES DURING CONSTRUCTION.

ALL EQUIPMENT, MATERIALS AND INSTALLATION SHALL BE CONSTRUCTED IN ACCORDANCE TO THIS PLAN AND SPECIFICATIONS, THE LATEST EDITION OF THE ON-SITE WASTEWATER SYSTEM REGULATIONS OF THE SAN JUAN BASIN HEALTH DEPARTMENT, AND MANUFACTURER'S GUIDELINES. IN THE EVENT A CONFLICT EXISTS BETWEEN THESE CRITERIA, THE MORE STRINGENT SPECIFICATION SHALL BE ADHERED TO.

MAINTAIN REQUIRED SETBACKS FROM BUILDINGS, WELLS, ETC., FOR ALL THE NECESSARY SEWER COMPONENTS.

MOTOR VEHICLE TRAFFIC IS PROHIBITED OVER THE ABSORPTION BED OR ABOVE SDR-35 PVC PIPING WITH LESS THAN 3 FT. OF COVER.

ALL CLEARING AND WASTING OF EXCAVATED MATERIAL SHALL BE COORDINATED WITH THE OWNER AND/OR THEIR REPRESENTATIVE.

THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL COMPONENTS PRIOR TO CONSTRUCTION. THE LOCATION OF THE COMPONENTS MAY BE CHANGED DUE TO ACTUAL FIELD CONDITIONS. THE ENGINEER AND SJBHD ARE TO BE NOTIFIED PRIOR TO MAKING ANY SUBSTANTIAL CHANGES AND THEIR APPROVAL OBTAINED.

NO LEGAL SURVEYS WERE PERFORMED AS A PART OF THIS DESIGN. VERIFY PROPERTY LINES PRIOR TO CONSTRUCTION.

THE BUILDING MUST USE LOW FLUSH TOILETS (<2 GAL/FLUSH).

IT IS NOT RECOMMENDED TO DISCHARGE A WATER SOFTENING DEVICE USING SODIUM CHLORIDE (SALT) INTO THE ONSITE WASTEWATER SYSTEM.

IT IS NOT RECOMMENDED TO DRAIN THE CONDENSATION FROM A FURNACE TO THE ONSITE WASTEWATER SYSTEM DUE TO POSSIBLE FREEZING PROBLEMS.

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY WORK BEING PERFORMED. ALL CLEARING SHALL BE COORDINATED WITH THE OWNERS OR THEIR REPRESENTATIVE.

WINTER CONSTRUCTION NOTES:

ET/SEEPAGE BEDS CONSTRUCTED DURING WINTER MONTHS SHALL BE STAGED TO PREVENT FREEZING OF FILL MATERIAL, IF THE BED CANNOT BE COMPLETED DURING ONE DAY. FILL MATERIAL SHALL NOT BE FROZEN OR SNOW COVERED.

TRENCHES AND EXCAVATIONS MAY NOT BE LEFT OPEN OVERNIGHT UNCOVERED. PROPER TARPING & BLANKETS MUST BE USED TO PREVENT INTERIOR OF BED FROM FREEZING.

TOPSOIL NOTES:

IF NATIVE LOAM MATERIAL IS AVAILABLE ONSITE AND IS TO BE USED AS FINISH SURFACE ON BED, THE LOAM MATERIAL SHALL BE STOCKPILED SEPARATELY FROM ANY CLAY EXCAVATED DURING CONSTRUCTION OF BED. CLAY SHALL NOT BE USED OR ACCEPTED AS FINISHED SURFACE ON BED.



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NOTES

VENT/INSPECTION PORT NOTES:

PIPING (4" PVC) MUST BE CONNECTED TO EACH ROW OF INFILTRATORS TO ALLOW DIRECT VISUAL INSPECTION OF GROUND SURFACE INSIDE INFILTRATORS. A MINIMUM OF TWO VENTS ARE REQUIRED ON EACH LATERAL FOR TRENCH SYSTEMS.

VENT RISERS MUST BE A MINIMUM OF 24-INCHES ABOVE FINISHED GRADE AND SHALL HAVE AN 180° RETURN WITH SCREENED END. DO NOT GLUE FITTINGS ON VENT RISER TO ALLOW FOR FUTURE INSPECTIONS. CAPS & PERFORATION OF PIPE ABOVE GROUND MAY BE USED IN LIEU OF 90'S. SCREENING REQUIRED.

SEPTIC TANK CONSTRUCTION NOTES:

SEPTIC TANK(S) SHALL CONFORM TO COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) REQUIREMENTS. METAL AND METAL COATED TANKS ARE NOT ACCEPTABLE.

THE TANK SHALL BE DESIGNED AND CONSTRUCTED TO THE REQUIREMENTS OF THE ON-SITE WASTEWATER SYSTEM REGULATIONS OF THE SAN JUAN BASIN HEALTH DEPARTMENT, MOST CURRENT VERSION.

TREATMENT UNIT(S) SHALL BE SET ON FIRM AND LEVEL BASE AND SHALL BE CAPABLE OF ACCOMMODATING FLOW WITH HYDRAULIC EFFICIENCY

BACKFILLING OPERATIONS SHALL BE ACCOMPLISHED IN A MANNER TO PREVENT SETTLEMENT OF THE STRUCTURE AND WHICH DOES NOT CAUSE EXCESSIVE STRESS ON THE INLET/OUTLET PLUMBING.

IN LOCATIONS WHERE GROUNDWATER MAY CAUSE INSTABILITY OF THE STRUCTURE, ANCHORAGE WILL BE REQUIRED TO PREVENT FLOTATION.

PIPE CONFORMING TO ASTM D-1785 SCHEDULE 40 SHALL EXTEND A MINIMUM OF FIVE FEET FROM INLET AND OUTLET OF THE STRUCTURE TO PREVENT DAMAGE CAUSED BY SETTLEMENT.

CLEANOUTS SHALL EXTEND 6" MIN. ABOVE FINISHED GRADE AND/OR PERMANENT MARKERS IDENTIFYING THEIR LOCATION SHALL BE INSTALLED.

THE SEPTIC TANK SHALL BE WATERTIGHT AND CONSTRUCTED TO WITHSTAND EARTH AND HYDROSTATIC PRESSURES WHEN FULL OR EMPTY.

SEPTIC TANK SHALL HAVE A MINIMUM LIQUID CAPACITY BASED UPON THE NUMBER OF BEDROOMS.

BED CONSTRUCTION NOTES:

MINIMUM SLOPE ON ALL DELIVERY LINES SHALL BE 1%. ALL PIPE BENDS SHALL BE 45 DEGREE ELLS OR LONGSWEEP QUARTERBENDS. CLEANOUTS BETWEEN HOUSE AND TANK SHALL BE PROVIDED AT INTERVALS OF NOT MORE THAN 100 FEET.

THE BED CONFIGURATION MAY ONLY CHANGE WITH ENGINEER & SJBHD APPROVAL.



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BED CONSTRUCTION NOTES CONTINUED:

TOPSOIL TO BE NATIVE LOAM MATERIAL. LARGE ROCKS, IF ENCOUNTERED, SHALL BE REMOVED. DRAINAGE TO BE PROVIDED BY CROSS SLOPING THE BED TO KEEP RAIN AND SNOW MELT RUNOFF FROM INFILTRATING THE BED.

ALL LINES AND FITTINGS SHALL HAVE ROCK FREE COMPACTED BEDDING MATERIAL PLACED AROUND THE LINES TO A DEPTH OF 12" ABOVE THE TOP OF THE PIPE. ABOVE THAT DEPTH, NATIVE MATERIAL MAY BE USED. NO ROCKS SHOULD BE PLACED IN THE TRENCH THAT ARE LARGER THAN 8"-12" IN SIZE, NOR SHOULD WOOD, ROOTS, OR OTHER DEBRIS BE PLACED IN TRENCHES. MOUND ALL TRENCHES TO PROVIDE FOR SETTLEMENT.

THE INFILTRATOR UNITS SHALL BE PLACED ON UN-COMPACTED NATIVE MATERIAL. 8" WIDE STRIPS OF GEOTEXTILE FABRIC MAY BE INSTALLED ONLY UNDER THE BASES OF THE CHAMBERS TO DETER SETTLEMENT IF CALLED FOR BY THE ENGINEER. CARE SHALL BE EXERCISED DURING BED EXCAVATION WORK TO AVOID COMPACTION OF THE EXISTING SOIL STRUCTURE.

THE BED SHALL BE EXCAVATED TRUE AND LEVEL TO THE DIMENSIONS SHOWN. THE BED BASE SHALL CONSIST OF SCARIFIED NATIVE MATERIAL.

AFTER BED(S) COMPLETION, BEDS SHALL BE REVEGETATED WITH NATIVE GRASSES AND ACCEPTABLE BUSHES & SHRUBS. NATIVE GRASS SEED MIXTURE SHALL BE APPLIED AT A RATE OF APPROX. 6 LBS. PER 1000 S.F. THE SEED SHALL BE RAKED INTO THE TOPSOIL WITH NEW LAWN FERTILIZER & MULCH APPLIED PER MANUFACTURER'S REQUIREMENTS. FLOWERS AND SHRUBS MAY BE PLACED AS DIRECTED BY OWNER.

<u>SETBACKS:</u>	<u>SEPTIC TANK</u>	<u>ABSORPTION BED</u>
SPRINGS, WELLS, SUCTION LINES	50	100
POTABLE WATER SUPPLY LINES	10	25
CISTERN	50	100
DWELLING OR OCCUPIED BUILDINGS	5	20
PROPERTY LINES	10	10
SUBSOIL DRAINS	10	25
LAKE, WATER COURSE, OR STREAM	50	50
SEASONAL LATERAL IRRIGATION DITCH	25	25
DRY GULCHES	10	25
SEPTIC TANK	-	10
STEEP SLOPE	10	25



PO Box 997
Bayfield, CO 81122
970-749-6767 ph.
sds@durango.net

Permit Number: WWP2021-0530
George W. Riley, III
4728 CR 2, Silverton, CO
San Juan County

ISSUE DATE
#1 11/22/21

RESIDENTIAL Note: Also use this form to apply for livestock watering

Water Well Permit Application

Review form instructions prior to completing form.
 Hand completed forms must be completed in black or blue ink or typed.

1. Applicant Information

Name(s)

George W Riley III

Mailing address

#5 Road 5221

City
Bloomfield

State
NM

Zip code
87413

Telephone (w/area code)
(505) 320-1145

E-mail
georger@rileyindustrial.com

2. Type Of Application (check applicable boxes)

- Construct new well
 Replace existing well
 Use existing well
 Change or increase use
- Change source (aquifer)
 Reapplication (expired permit)
 Rooftop precip. collection
 Other:

3. Refer To (if applicable)

Well permit #

Water Court case #

Designated Basin Determination #

Well name or #

4. Location Of Proposed Well (Important! See Instructions)

County

San Juan

SW 1/4 of the SE 1/4

Section

30

Township

42

N or S

N S

Range

6

E or W

E W

Principal Meridian

NM

Distance of well from section lines (section lines are typically not property lines)

Ft. from N S

Ft. from E W

For replacement wells only - distance and direction from old well to new well

feet

Direction

Well location address (Include City, State, Zip)

Check if well address is same as in Item 1.

Optional: GPS well location information in UTM format. GPS unit settings are as follows:

Format must be UTM

Zone 12 or Zone 13

Units must be Meters

Datum must be NAD83

Unit must be set to true north

Was GPS unit checked for above? YES

Easting:

Northing:

Remember to set Datum to NAD83

5. Parcel On Which Well Will Be Located

(You must attach a current deed for the subject parcel)

A. You must check and complete *one* of the following:

- Subdivision: Name Cole Ranch
 Lot 2 Block _____ Filing/Unit _____
- County exemption (attach copy of county approval & survey)
 Name/# _____ Lot # _____
- Parcel less than 35 acres, not in a subdivision attach a deed with metes & bounds description recorded prior to June 1, 1972, and current deed
- Mining claim (attach copy of deed or survey) Name/#: _____
- Square 40 acre parcel as described in Item 4
- Parcel of 35 or more acres (attach metes & bounds description or survey)
- Other: (attach metes & bounds description or survey)

B. # of acres in parcel

4.17

C. Are you the owner of this parcel?

YES NO

D. Will this be the only well on this parcel? YES NO (if no - list other wells)

E. State Parcel ID# (optional):

6. Use Of Well (check applicable boxes)

See instructions to determine use(s) for which you may qualify

- A. Ordinary household use in one single-family dwelling (no outside use)
- B. Ordinary household use in 1 to 3 single-family dwellings:
 Number of dwellings: _____
- Home garden/lawn irrigation, not to exceed one acre:
 area irrigated _____ sq. ft. acre
- Domestic animal watering - (non-commercial)
- C. Livestock watering (on farm/ranch/range/pasture)

7. Well Data (proposed)

Maximum pumping rate

15

gpm

Annual amount to be withdrawn

1/3

acre-feet

Total depth

feet

Aquifer

8. Water Supplier

Is this parcel within boundaries of a water service area? YES NO

If yes, provide name of supplier:

9. Type Of Sewage System

- Septic tank / absorption leach field
- Central system: District name: _____
- Vault: Location sewage to be hauled to: _____
- Other (explain) _____

10. Proposed Well Driller License #(optional):

11. Sign or Enter Name of Applicant(s) or Authorized Agent

The making of false statements herein constitutes perjury in the second degree, which is punishable as a class 1 misdemeanor pursuant to C.R.S. 24-4-104 (13)(a). I have read the statements herein, know the contents thereof and state that they are true to my knowledge.

Sign or enter name(s) of person(s) submitting application

Date (mm/dd/yyyy)

George W Riley III

7/27/21

If signing print name and title

George W Riley III

Office Use Only

USGS map name

DWR map no.

Surface elev.

Receipt area only

AQUAMAP

WE

WR

CWCB

TOPO

MYLAR

SB5

DIV ____ WD ____ BA ____ MD ____



Estimate

9/1/2021

DAK Drilling LLC
 PO Box 1577 Ignacio, CO 81137

Name/ Address
George Riley 505-320-1145 Cole Ranch Silverton, CO georger@rileyindustrial.com

Residential Well Estimate Silverton, CO

Estimate expires in 10 days.

Description		Initial Each Line
Mobilization	Lump Sum \$	1,500
Unconsolidated Formation Drilling (Sands & Gravels)		
Casing Advance Drilling - Setting steel casing	Foot \$	220
Drilling Shoe (one used with casing advance)	Each \$	2,500
Gravel Pack	Foot \$	21
Solid Formation Drilling	Foot \$	75
Airlift Development	Lump Sum \$	3,500

****\$ 11,500 is the minimum charge for a well. A \$10,500 deposit required with signed contract.****

This estimate is for well drilling only. DAK can provide a separate estimate for pump installation once the well has been complete if requested by the Customer.

Any additional time and materials not listed may result in additional cost and/or changes to the contract. agreement.

Quantities shown are estimates only. Actual quantities installed will be invoiced and may vary from those shown.

All agreements are contingent upon weather, accidents, conditions, and/or delays beyond our control.

DAK Drilling LLC is not responsible for the following:

- Existing damages to structures and/or landscaping.
- Quantity or Quality of water produced.
- Permitting of any kind for the work or access thereto
- Cuttings or fluid disposal, reclamation, traffic control, or any stormwater permitting

George W. Riley III
 Customer Signature

9/15/21
 Date

George W. Riley III
 Name (Please Print)

SAN MIGUEL POWER ASSOCIATION, INC.

NEW CONSTRUCTION/UPGRADE ENGINEERING REQUEST

ALL fields are required. The completed form must be returned to SMPA before an estimate can be provided

SMPA's Construction handbook can be viewed at www.smpa.com - Account Services

SECTION 1: CONTACT INFORMATION - Party Responsible for Estimate PAYMENT

NAME SR Investments LLC		DATE 10/7/21
MAILING ADDRESS #5 Road 5221 Bloomfield NM 87413		
HOME X	CELL 505-320-1145	FAX X
EMAIL george@wileyindustrial.com		
IF CONTACT IS A BUSINESS - CONTACT PERSON George W Riley		SEND ESTIMATE BY: <input type="checkbox"/> MAIL <input checked="" type="checkbox"/> E-MAIL <input type="checkbox"/> FAX
CONTRACTOR Buena Vista Builders Inc		CONTACT PERSON/PHONE NO. Bob Smith 970-749-8828
ELECTRICIAN CT Electric		CONTACT PERSON/PHONE NO. Chris Barger 970-560-7268

SECTION 2: SITE INFORMATION

SITE NAME/PROPERTY OWNER George W Riley and Anna Louise Riley Revocable Trust Lot 2		LOT/BLOCK/PARCEL NO.
SITE ADDRESS/LOCATION 4728 County Road 2 (Lot 2)		CITY Silverton
		COUNTY SAN JUAN
DEVELOPMENT TYPE: <input checked="" type="checkbox"/> SINGLE FAMILY HOME <input type="checkbox"/> CONDOMINIUM <input type="checkbox"/> APARTMENT BLDG		<input type="checkbox"/> URBAN
<input type="checkbox"/> MODULAR HOME <input type="checkbox"/> MOBILE HOME <input type="checkbox"/> OTHER(DESCRIBE)		<input checked="" type="checkbox"/> RURAL
LEGAL DESCRIPTION TOWNSHIP 42N RANGE 6W SECTION 30 SUBDIVISION Cole Ranch		
Has there ever been service to the property? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

SECTION 3: PROJECT INFORMATION - CHECK APPLICABLE

SERVICE REQUESTING <input checked="" type="checkbox"/> NEW SERVICE <input type="checkbox"/> SERVICE UPGRADE <input type="checkbox"/> RELOCATE FACILITIES <input type="checkbox"/> OTHER _____	
DESCRIBE	
SERVICE SIZE: <input type="checkbox"/> 1PH <input checked="" type="checkbox"/> 3PH	SERVICE TYPE: <input checked="" type="checkbox"/> RESIDENTIAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/> IRRIGATION
<input checked="" type="checkbox"/> UNDERGROUND <input type="checkbox"/> OVERHEAD <input type="checkbox"/> BOTH	
LOAD INFORMATION: <input checked="" type="checkbox"/> 200 AMPS <input type="checkbox"/> 400 AMPS <input type="checkbox"/> OTHER AMPS _____	PRIMARY HEAT SOURCE: <input type="checkbox"/> GAS <input checked="" type="checkbox"/> ELECTRIC <input type="checkbox"/> OTHER
SQ. FOOTAGE IF PROJECT IS A NEW BUILD: 4000	
DESCRIPTION OF PROJECT: Please include any additional loads (On Demand Water Heaters, Car Chargers, etc.) New home. 4000 sq ft. 4 bedrooms - electric heat / hot tub / electric water Electric stove / everything electric Additional Storage shed needs new service across City Rd 2 to West (See plot)	

SECTION 4: METER INFORMATION -

METER TYPE NEEDED: <input checked="" type="checkbox"/> SINGLE <input type="checkbox"/> DUAL <input type="checkbox"/> MULTIPLE <input checked="" type="checkbox"/> CONSTRUCTION TEMPORARY	NO. OF METERS 1
REMINDER To Check Construction Temp if you are going to need power for construction.	
*METER NUMBER OR ACCOUNT NUMBER If this is an ACTIVE account	NAME ON ACTIVE BILLING ACCOUNT

SECTION 5: AUTHORIZATION OF REQUEST

This request is an official notice to SMPA, INC to begin all the needed steps to provide you with electrical service. If any of the above information is changed you may be responsible for additional charges related to engineering, construction, or other aspects of providing service. Any costs associated with relocating facilities will be charged to the active account listed on this form. If there is a lack of progress or inactivity on your project and this project is canceled by you or by SMPA, you may be responsible for paying SMPA actual costs incurred up to the time of cancellation.

PRINT AUTHORIZED NAME George W Riley	AUTHORIZED SIGNATURE George W Riley	DATE 10/7/21
--	---	------------------------

PLEASE CONTINUE TO SECTION 6 ON THE BACK OF THIS FORM

SECTION 6: APPLICATION AND MEMBERSHIP - Billing Account Set Up

This section MUST be filled out for New Services - Construction Temp - Upgrades on Inactive Accounts

PRIMARY CONTACT : __ INDIVIDUAL <input checked="" type="checkbox"/> ORGANIZATION	NAME OR ORGANIZATION NAME : SR Investments LLC
--	--

MAILING ADDRESS #5 Road 5221 Bloomfield NM 87413	SPOUSE OR CO-APPLICANT:
---	-------------------------

IF PRIMARY CONTACT IS A ORGANIZATION : George W Riley	OWNER
---	-------

BUSINESS REP same	OWNER
--------------------------	-------

E-MAIL ADDRESS: george.r.w.riley@industrial.com

PHONE NUMBERS:	HOME <input checked="" type="checkbox"/>	BUSINESS <input checked="" type="checkbox"/>	MOBILE 505-320-1145	FAX <input checked="" type="checkbox"/>
----------------	--	--	----------------------------	---

DATE OF BIRTH: 10/04/1958	DRIVER'S LICENSE: 010586747	STATE: NM
-------------------------------------	---------------------------------------	---------------------

ADDITIONAL CONTACT: __ INDIVIDUAL __ ORGANIZATION	NAME OR ORGANIZATION NAME :
---	-----------------------------

DATE OF BIRTH:	DRIVER'S LICENSE:	STATE:
----------------	-------------------	--------

PHONE NUMBERS:	HOME	BUSINESS	MOBILE	FAX
----------------	------	----------	--------	-----

E-MAIL ADDRESS:

The Applicant(s) agree to be responsible for the electric charges at the location designated below until such time that the Applicant(s) request in writing a discontinuance of service. It is agreed that all bills will be paid by the appropriate due date and failure to do so may result in discontinuance of service. This application for electrical service shall constitute a service contract between the Applicant(s) and the Association. The Applicant(s) agree to be bound by the Rules and Regulations of the Association. In the event that this application is not signed, it is agreed that the Applicant(s) use of electric service shall constitute a service contract just as though the application were signed. Applicant(s) agree to pay court costs, reasonable attorney's fees, and all collection costs if in default of this agreement. Applicant(s) agree that a facsimile of the original will be considered as valid as the original. The Consumer assumes all responsibility on the Consumer's side of the point of delivery for service supplied or taken, as well as for the electrical installation and appliances used in connection with such service and will indemnify, save harmless and defend the Association against all claims, demands, cost or expense, for loss, damage to or injury to persons or property, in any manner directly or indirectly connected with, or growing out of, the transmission or use of electric service, by the Consumer, at or on the Consumer's side of the point of delivery. San Miguel Power Association is not liable for any damage to the Consumer's electronic equipment. Point of Use surge protection should be installed to protect these

SERVICE START DATE: 10/31/21	SIGNATURE: George W Riley <small>(All applicants must sign)</small>
--	--

SIGNATURE: <small>(All applicants must sign)</small>	SIGNATURE: <small>(All applicants must sign)</small>
---	---

If you would like to have your monthly bill automatically paid by either a Bank Draft or Credit Card Draft please contact your local office for details.



All new accounts are automatically enrolled in SMPA'S Green Cents Roundup Program. For information on the Green Cents Roundup program and/or to opt out of this program please contact our office.

MAILING OPTIONS : MAIL E-MAIL FAX	FOR SMPA USE ONLY	
SAN MIGUEL POWER ASSN. ATTN: TAMMI MAGALLON PO Box 817 Nucla, Co 81424 planning@smpa.com PH 970-864-7311 x116 FAX 970- 864-7984 Office Hrs: Mon - Thurs 7 AM - 5:30 PM	SVO #	FEES: ATC _____ FR _____ XFMR _____ CONNECT _____ DEPOSIT _____
	CUSTOMER #	
	SERVICE INFORMATION	
This institution is an equal opportunity provider and employer.		

Nucla Office
P.O. Box 817
Nucla, CO 81424
(970) 864-7311



Ridgway Office
P.O. Box 1150
Ridgway, CO 81432
(970) 626-5549

Office Hours: 7:00AM to 5:30PM, Monday thru Thursday

APPLICATION FOR ELECTRIC SERVICE AND MEMBERSHIP

PLEASE PROVIDE THE FOLLOWING INFORMATION. (PLEASE PRINT)

APPLICANT NAME (S): SR Investments LLC
(As you wish it to appear on the account)

IF APPLICANT IS A BUSINESS, PLEASE PROVIDE OWNER NAME: George W Riley
AND BUSINESS REPRESENTATIVE NAME: SAME

APPLICANT (S) Date Of Birth and/or DRIVERS LICENSE NUMBER: NM 010586747

MAILING ADDRESS: #5 Road 5221 Bloomfield NM 87418
Street or PO BOX City State Zip

PHONE #'S: X Home X Work 505-320-1145 Other

EMAIL: georget@rileyindustrial.com

SERVICE ADDRESS: 4728 County Rd 2 Silverton CO 81433
Street or PO BOX City State Zip

ARE YOU PURCHASING THIS PROPERTY? YES () NO

NOTE: Are you applying for service at a location that has an existing solar net meter system? () Yes No If yes, additional paperwork is needed.

IF RENTING, PROPERTY OWNER'S NAME: _____ PHONE #: _____

The Applicant(s) agree to be responsible for the electric charges at the location designated below until such time that the Applicant(s) request in writing a discontinuance of service. It is agreed that all bills will be paid by the appropriate due date and failure to do so may result in discontinuance of service. This application for electrical service shall constitute a service contract between the Applicant(s) and the Association. The Applicant(s) agree to be bound by the Rules and Regulations of the Association. In the event that this application is not signed, it is agreed that the Applicant(s) use of electric service shall constitute a service contract just as though the application were signed. Applicant(s) agree to pay court costs, reasonable attorney's fees, and all collection costs if in default of this agreement. Applicant(s) agree that a facsimile of the original will be considered as valid as the original. The Consumer assumes all responsibility on the Consumer's side of the point of delivery for service supplied or taken, as well as for the electrical installation and appliances used in connection with such service and will indemnify, save harmless and defend the Association against all claims, demands, cost or expense, for loss, damage to or injury to persons or property, in any manner directly or indirectly connected with, or growing out of, the transmission or use of electric service, by the Consumer, at or on the Consumer's side of the point of delivery. San Miguel Power Association is not liable for any damage to the Consumer's electronic equipment.

REQUEST DATE FOR SERVICE 10/31/21

APPLICANT'S SIGNATURE George W Riley
(All applicants must sign)

APPLICANT'S SIGNATURE _____
(All applicants must sign)

APPLICANT'S SIGNATURE _____
(All applicants must sign)

If you would like to have your monthly bill automatically paid by either a Bank Draft or Credit Card Draft please contact your local office for details.



All new accounts are automatically enrolled in SMPA'S Green Cents Roundup Program.

For information on the Green Cents Roundup program and/or to opt out of this program please contact our office.

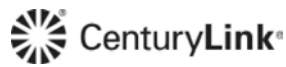
PLEASE RETURN APPLICATION TO: memberservice@smpa.com
OR
P.O. BOX 817, NUCLA, CO 81424, FAX (970)-864-7984
OR
P.O. BOX 1150, RIDGWAY, CO 81432, FAX (970)-626-5688

This institution is an equal opportunity provider and employer.

FOR SMPA USE ONLY

CONNECT FEE: _____ DEPOSIT FEE: _____ CUSTOMER #: _____ ACCT #: _____

NOTES: _____



Get Support

Sign In

This notification pertains to your account ending in: **5015**

Order confirmation #: **1010091678**

Dear George,

Thank you for choosing CenturyLink.

We're excited to have you as our customer! We will keep you informed about the status of your order.

Service(s) ordered:
CenturyLink Home Phone

Your account information is shown below for your reference. You'll need your telephone number when corresponding with us, so be sure to save this email.

Sincerely,
Your CenturyLink Team

Your Account

George Riley
4728 County Rd 2
Silverton, CO 81433

Your Telephone Number:
970-387-0589

We're here to help:

- Never worry about a missed payment again. Sign up for automatic payments today. Log into [My CenturyLink](#) to enroll in AutoPay.
- If you have any questions, please visit our [New Customer Welcome Center](#).



Service
Troubleshooter and
Outage check



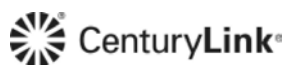
Where's My
Technician?



Service
Appointment
Manager



Manage
My Services



BOARD OF COUNTY COMMISSIONERS

San Juan County

P.O. Box 466

Silverton, Colorado 81433

970-387-5671

RELATIONSHIP OF PROPERTY TO COUNTY ROAD AND STATE HIGHWAY SYSTEMS

I, the undersigned, applicant engaged in the processing of Application for Improvement Permit No. _____, San Juan County, Colorado, do hereby acknowledge the following facts:

1. The real property' which is the subject of said application is on this date located approximately zero feet from County Road No. 2, the nearest designated and publicly maintained county road.
2. Said County Road No. 2 is on this date maintained on an year-round basis by San Juan County.
3. The real property which is the subject of said application is on this date located approximately 7 1/2 miles from Colorado State Highway No. 550, the nearest designated state or federal highway.
4. Said Colorado State Highway No. 550 is on this date maintained on a year-round basis by either San Juan County or the Colorado Division of Highways.
5. A Driveway Permit will be necessary for any private access or egress relating to said real property which intersects any designated Colorado State Highway or Federal Highway.

Signed and dated this 5th day of October, 2021.

ATTEST:

George W. Ridenour, III
Applicant

Position:

SAN JUAN COUNTY, COLORADO
DRIVEWAY AND ROAD ACCESS PERMIT

Improvement
Permit No. _____

Applicant: George W. Riley III
5 Road 5221
Bloomfield, NM 87413

#2

Location of Proposed Driveway or Access on County Road No. 2 _____:

The proposed driveway will be located on the east side of County Road 2 just north of
Minnie Gulch.

Description of Proposed Driveway or Access, including materials to be used:

The proposed driveway will serve the residence located on the east side of County Road 2.
The driveway will be approximately 16 feet wide, semi-circular in shape with two driveway access points
off County Road 2. It will consist of native gravel soils and have a culvert at both driveway entrances.

Comment and Recommendations of County Road Supervisor:

These driveways will need at least 4 sections plastic culvert 15" x 20' each.
No Fence or gate 40" from centerline of CR-2. ~~or~~ or further back to
accomodate snow removal.

Terms and Conditions of Issuance of Permit (or reason for denial):

Permit Approved _____ or Denied _____ Date: _____

Land Use Administrator: _____

SAN JUAN COUNTY, COLORADO
DRIVEWAY AND ROAD ACCESS PERMIT

Improvement
Permit No. _____

Applicant: George W. Riley III
5 Road 5221
Bloomfield, NM 87413

Location of Proposed Driveway or Access on County Road No. 2 :
The proposed driveway will be located on the west side of County Road 2 just north of
Minnie Gulch.

Description of Proposed Driveway or Access, including materials to be used:
The proposed driveway will serve the storage shed located on the west side of County Road 2.
The driveway will be approximately 20 feet wide, consist of native gravel soils, and a proposed culvert.

Comment and Recommendations of County Road Supervisor:
The access will need a 30' x 15" plastic culvert 70' for radius turn.
No gates - Fence within 40' of centerline of ROW for snow removal.
"The 30' from edge of CR-2 is OK for fence and gate."

Terms and Conditions of Issuance of Permit (or reason for denial):

Permit Approved _____ or Denied _____. Date: _____
Land Use Administrator: _____

Kevin Smith

December 9, 2021

George Riley
c/o Christopher Clemmons, RA, NCARB
Architect
Mountain Grain Architecture
970-515-7882
Durango, Colorado 81301

PN: 56083GE

Subject: Geotechnical Engineering Subsurface Soil Conditions Comments for the
Proposed Structure on Lot 2 Cole Ranch
Silverton, Colorado

Mr. Clemmons,

This letter presents our geotechnical engineering comments regarding the assumed subsurface soil conditions on Lot 2 Cole Ranch. We understand a new building is proposed to be built on Lot 2 Cole Ranch. We previously performed geotechnical engineering studies on both Lot 1 and Lot 4 Cole Ranch in July 2020, which included 5 test borings advanced on Lot 4 and 4 test borings advanced on Lot 1.

The subsurface soil conditions encountered in the test borings from our previous studies, consisted of poorly graded gravel and cobbles with silt and sand and few boulders (GP-GM). Practical auger drilling refusal was encountered on cobble/small boulder size material at depths ranging from 2.5 to 8 feet. Given the relatively consistent subsurface soil conditions encountered from our previous studies, we feel that the soil conditions on Lot 2 will be similar to the soil conditions we encountered on Lots 1 and 4.

We are available to perform a geotechnical engineering study for Lot 2 if desired. If a study is not desired, we should be contacted during construction to observe the soils exposed in the foundation excavation on Lot 2 to verify that the soil conditions are similar to the soil conditions encountered on Lots 1 and 4.

We have not previously performed a geotechnical engineering study for Lot 2. The comments contained in this letter are based on our previous studies and general experience in the area. Our services did not include subsurface exploration, laboratory testing or stability modeling for Lot 2. We make no warranty to these comments, either expressed or implied. We can provide a proposal for a geotechnical engineering evaluation, including subsurface exploration and testing, upon request. The results of a full geotechnical engineering evaluation may alter the comments provided above.

Please contact us if you have any questions, or if we may be of additional service.

Respectfully,
TRAUTNER GEOTECH



Tom R. Harrison, P.E.
Geotechnical Engineer

**649 TECH CENTER DR DURANGO, CO
970-259-5095**

**95 N HENRY ST, CORTEZ, CO
970-529-2020**

GEOTECHNICAL ENGINEERING STUDY

SAMS RESIDENCE

LOT 1 COLE RANCH

SILVERTON, COLORADO

JULY 9, 2020

PREPARED FOR:
Todd and Julie Sams
c/o Christopher Clemmons, RA, NCARB
Mountain Grain Architecture
PROJECT NO. 56082GE

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1.0 REPORT INTRODUCTION

This report presents our geotechnical engineering recommendations for the proposed Sams residence and shop structure located on Lot 1 Cole Ranch, Silverton, San Juan County, Colorado. This report was requested by Christopher Clemmons, RA, NCARB, Mountain Grain Architecture, on behalf of Todd and Julie Sams, and was prepared in accordance with our proposal dated May 22, 2020, Proposal No. 20128P.

As outlined within our proposal for services for this project the client is responsible for appropriate distribution of this report to other design professionals and/or governmental agencies unless specific arrangements have been made with us for distribution.

Geotechnical engineering is a discipline which provides insight into natural conditions and site characteristics such as; subsurface soil and water conditions, soil strength, swell (expansion) potential, consolidation (settlement) potential, and often slope stability considerations. The information provided by the geotechnical engineer is utilized by many people including the project owner, architect or designer, structural engineer, civil engineer, the project builder and others. The information is used to help develop a design and subsequently implement construction strategies that are appropriate for the subsurface soil and water conditions, and slope stability considerations. We are available to discuss any aspect of this report with those who are unfamiliar with the recommendations, concepts, and techniques provided below.

This geotechnical engineering report is the beginning of a process involving the geotechnical engineering consultant on any project. It is imperative that the geotechnical engineer be consulted throughout the design and construction process to verify the implementation of the geotechnical engineering recommendations provided in this report. Often the design has not been started or has only been initiated at the time of the preparation of the geotechnical engineering study. Changes in the proposed design must be communicated to the geotechnical engineer so that we have the opportunity to tailor our recommendations as needed based on the proposed site development and structure design.

The following outline provides a synopsis of the various portions of this report;

- ❖ Sections 1.0 provides an introduction and an establishment of our scope of service.
- ❖ Sections 2.0 and 3.0 of this report present our geotechnical engineering field and laboratory studies
- ❖ Sections 4.0 through 7.0 presents our geotechnical engineering design parameters and recommendations which are based on our engineering analysis of the data obtained.
- ❖ Section 8.0 provides a brief discussion of construction sequencing and strategies which may influence the geotechnical engineering characteristics of the site. Ancillary information such as some background information regarding soil corrosion and radon considerations is also presented as general reference.
- ❖ Section 9.0 provides our general construction monitoring and testing recommendations.
- ❖ Section 10.0 provides our conclusions and limitations.

The data used to generate our recommendations are presented throughout this report and in the attached figures.

All recommendations provided throughout within this report must be followed in order to achieve the intended performance of the foundation system and other components that are supported by the site soil.

1.1 Proposed Construction

We understand the proposed construction will consist of a new single-family residential structure and shop structure. We assume the proposed structures will likely be a wood framed structure supported by a steel reinforced concrete foundation system. Grading for the structure is assumed to be relatively minor with cuts of approximately 3 to 8 feet below the adjacent ground surface. We assume relatively light foundation loadings, typical of the proposed type of construction.

When final building location, grading and loading information have been developed, we should be notified to re-evaluate the recommendations presented in this report.

2.0 FIELD STUDY

2.1 Site Description and Geomorphology

The approximate 3.98 acre property is currently vacant. The ground surface is relatively flat within the proposed building locations. The Animas River borders the lot to the west and an old railroad easement and CR 2 and 2D transects and borders the property. Vegetation consists primarily of coniferous and deciduous trees and grasses.

2.2 Subsurface Soil and Water Conditions

We advanced a total of four test borings in the vicinity of the proposed structures. A schematic showing the approximate boring locations is provided below as Figure 1. The logs of the soils encountered in our test borings are presented in Appendix A.

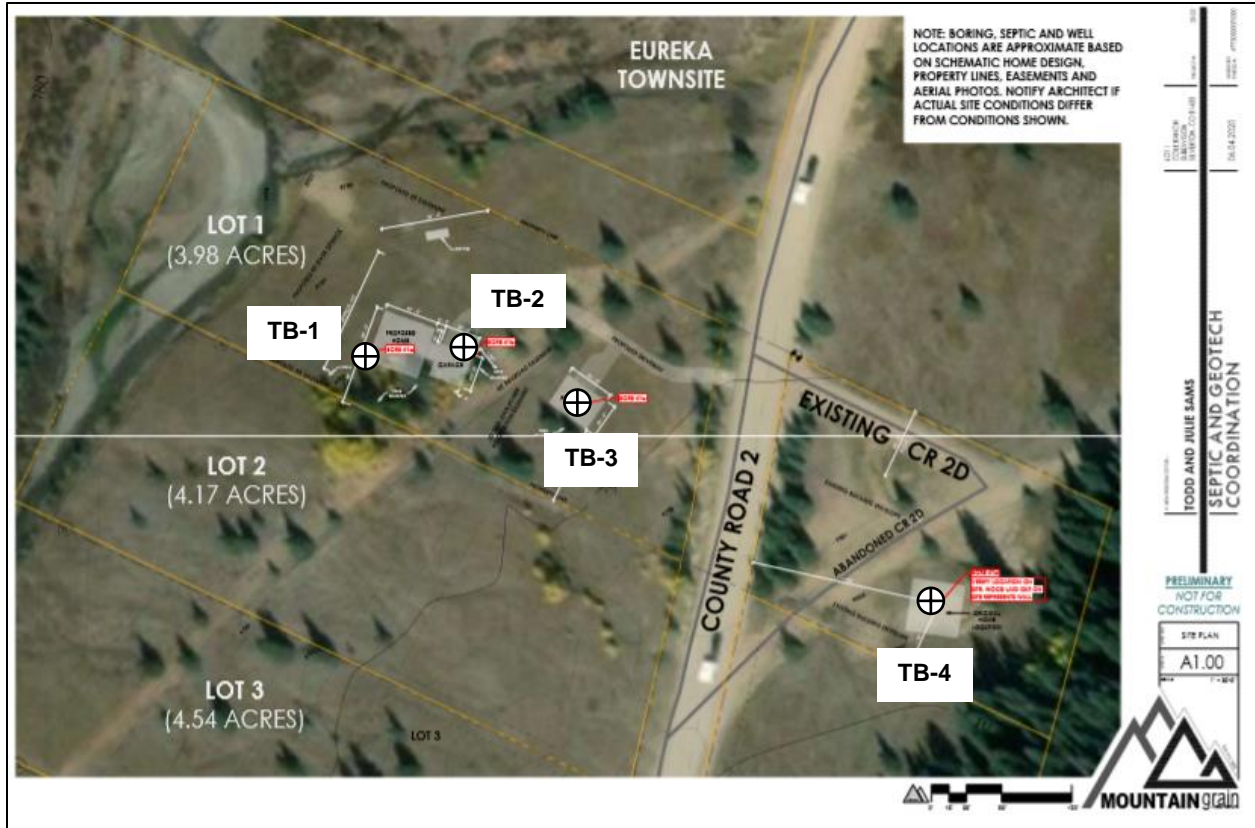


Figure 1: Locations of Exploratory Borings. Adapted from a Mountain Grain site plan dated June 4, 2020.

The schematic presented above was prepared using notes and field measurements obtained during our field exploration and is intended to show the approximate test boring locations for reference purposes only.

The subsurface conditions encountered in our test borings consisted of poorly graded gravel and cobbles with silt and sand and few boulders (GP-GM). Practical auger drilling refusal was encountered on cobble/small boulder size material at depths ranging from 3.5 to 5 feet.

We did not encounter free subsurface water in our test borings at the time of the advancement of our test borings at the project site. We suspect that the subsurface water elevation and soil moisture conditions will be influenced by snow melt and/or precipitation and local irrigation.

The logs of the subsurface soil conditions encountered in our test borings are presented in Appendix A. The logs present our interpretation of the subsurface conditions encountered exposed in the test borings at the time of our field work. Subsurface soil and water conditions are often variable across relatively short distances. It is likely that variable subsurface soil and water conditions will be encountered during construction. Laboratory soil classifications of samples obtained may differ from field classifications.

3.0 LABORATORY STUDY

The laboratory study included tests to estimate the strength, swell and consolidation potential of the soils tested. We performed the following tests on select samples obtained from the test

borings.

- Moisture Content and Dry Density
- Sieve Analysis (Gradation)
- Atterberg Limits, Liquid Limit, Plastic Limit and Plasticity Index
- Swell Consolidation Tests

A synopsis of some of our laboratory data for some of the samples tested is tabulated below.

Sample Designation	Percent Passing #200 Sieve	Atterberg Limits LL/PI	Moisture Content (percent)	Dry Density (PCF)	Measured Swell Pressure (PSF)	Swell or Consolidation Potential
TB-1 @ 0-4'	-	-	10.3	104.2	1,680*	0.8 (% under 500 psf load)
TB-2 @ 0-3 1/2'	5	34/8	4.1	-	-	-
TB-3 @ 2'	-	-	6.9	106.3	0*	-0.2% (% under 500 psf load)

***NOTES:**

1. We determine the swell pressure as measured in our laboratory using the constant volume method. The graphically estimated load-back swell pressure may be different from that measured in the laboratory.
2. * = Swell-Consolidation test performed on remolded sample due to rock content. Test results should be considered an estimate only of the swell or consolidation potential at the density and moisture content indicated.

4.0 FOUNDATION RECOMMENDATIONS

There are two general types of foundation system concepts, “deep” and “shallow”, with the designation being based on the depth of support of the system. We have provided a discussion viable foundation system concepts for this project below. The choice of the appropriate foundation system for the project is best made by the project structural engineer or project architect. We should be contacted once the design choice has been made to provide consultation regarding implementation of our design parameters.

Deep foundations will provide for the least likelihood of post-construction movement of the structure. Deep foundation system design concepts may be viable for this project; however, we anticipate that only a shallow foundation system design is being considered at this time. We are available to develop deep foundation design parameters if desired.

4.1 Shallow Foundation System Concepts

Subsurface data indicate that GP-GM soils will likely be encountered beneath shallow foundations. Based on the laboratory analysis, the soils encountered in our borings were found to have a low swell potential of 1,680 pounds per square foot (psf) and a magnitude of 0.8 percent under a 500 psf surcharge load and a low consolidation potential. The anticipated soils at the foundation level are considered good for shallow foundation support.

There are numerous types of shallow foundation systems and variants of each type. Shallow foundation system concepts discussed below include:

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- Spread Footings (continuous and isolated) and stem walls
- Mat or Raft Foundations

The integrity and long-term performance of each type of system is influenced by the quality of workmanship which is implemented during construction. It is imperative that all excavation and fill placement operations be conducted by qualified personnel using appropriate equipment and techniques to provide suitable support conditions for the foundation system.

4.1.1 Spread Footings

A spread footing foundation system consists of a footing which dissipates, or spreads, the loads imposed from the stem wall (or beam) from the structure above. We recommend that the footings be supported by a layer of moisture conditioned and compacted natural soil which is overlain by a layer of compacted structural fill material. This concept is outlined below:

- The foundation excavation should be excavated to at least six (6) inches below the proposed footing support elevation.
- The natural soils exposed in the bottom of the excavation should be scarified to a depth of about 6 to 8 inches
- The scarified soil should be thoroughly moisture conditioned to about 2 percent above the laboratory determined optimum moisture content and then compacted.
- After completion of the compaction of the moisture conditioned natural soil a six (6) inch thick layer of granular aggregate base course structural fill material should be placed, moisture conditioned and compacted.
- The moisture conditioned natural soil material and the granular soils should be compacted as discussed under the Compaction Recommendations portion of this report below.

Scattered boulders were encountered in our test borings and large boulders are known to be present throughout the vicinity. Due to the size of the boulders encountered in the vicinity, if encountered, they may be difficult to remove using conventional excavation techniques and equipment. Removal of large boulders can also create a void of loose soil beneath structural components, which may require additional removal of loose soil and replacement with structural fill. In some instances, it may be preferable to leave boulders in place. Reduction in the thickness of the recommended structural fill beneath footings and slabs may also be prudent to limit disturbance to the bearing soils. If large boulders are encountered in the building footprint, a representative of the geotechnical engineer can provide field observations and provide additional recommendations for subgrade preparation.

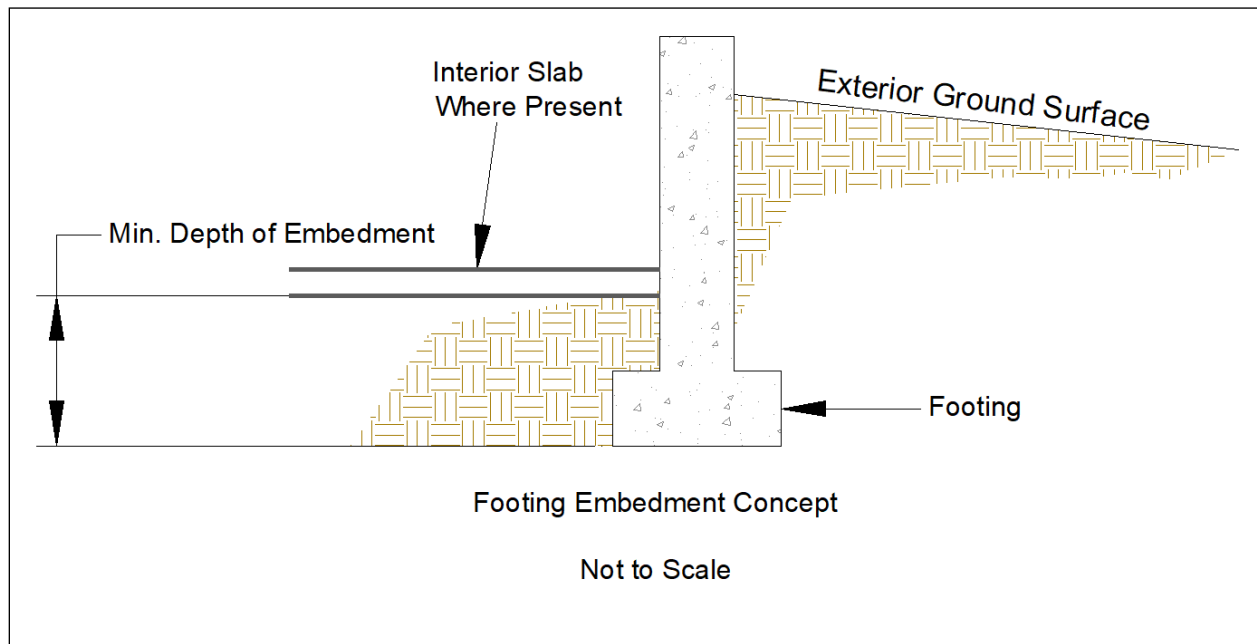
We recommend that particular attention and detail be given to the following aspects of the project construction for this lot;

- A subsurface drain system should be installed adjacent to the residential structure foundation system. Recommendations for a subsurface drain system concepts are presented in Section 5.0 of this report.
- The exterior foundation backfill must be well compacted and moisture conditioned to above optimum moisture content. Recommendations for exterior foundation backfill are provided later in this report.

We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain and wall drain system. Topographic conditions on the site may influence the ability to install a subsurface drain system which promotes water flow away from the foundation system. The subsurface drain system concept is discussed under the Subsurface Drain System section of this report below.

The footing embedment is a relatively critical, yet often overlooked, aspect of foundation construction. The embedment helps develop the soil bearing capacity, increases resistance of the footing to lateral movement and decreases the potential for rapid moisture changes in the footing support soils, particularly in crawl space areas. Interior footing embedment reduces the exposure of the crawl space support soils to dry crawl space air. Reduction in drying of the support soil helps reduce downward movement of interior footings due to soil shrinkage.

All footings should have a minimum depth of embedment of at least one 1 foot. The embedment concept is shown below.



Spread footings located away from sloped areas may be designed using the bearing capacity information tabulated below.

Minimum Depth of Embedment (Feet)	Continuous Footing Design Capacity (psf)	Isolated Footing Design Capacity (psf)
1	2,000	2,500
2	2,500	3,000
3	3,000	3,500

The bearing capacity values tabulated above may be increased by 20 percent for transient conditions associated with wind and seismic loads. Snow loads are not transient loads.

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The bearing capacity values above were based on footing placed directly on the natural soils and on a continuous spread footing width of 1 ½ feet and an isolated footing width of 3 ½ feet. Larger footings and/or footings placed on a blanket of compacted structural fill will have a higher design soil bearing capacity. Development of the final footing design width is usually an iterative process based on evaluation of design pressures, footing widths and the thickness of compacted structural fill beneath the footings. We should be contacted as the design process continues to re-evaluate the design capacities above based on the actual proposed footing geometry.

The settlement of the spread footing foundation system will be influenced by the footing size and the imposed loads. We estimated the total post construction settlement of the footings based on our laboratory consolidation data, the type and size of the footing. Our analysis below assumed that the highest bearing capacity value tabulated above was used in the design of the footings. The amount of post construction settlement may be reduced by placing the footings on a blanket of compacted structural fill material.

The estimated settlement for continuous footing with a nominal width of about 1½ to 2½ feet are tabulated below

Thickness of Compacted Structural Fill (feet)	Estimated Settlement (inches)
0	½ - ¾
B/2	¼ - ½
B	About ¼

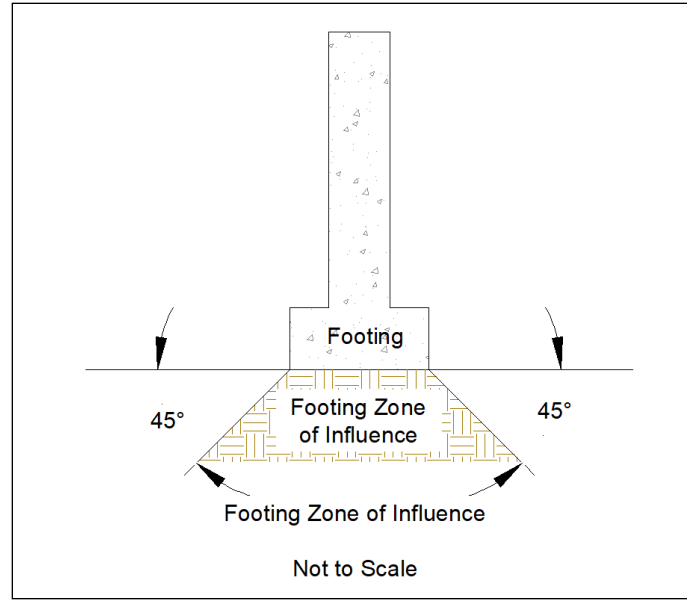
B is the footing width

The estimated settlement for isolated pad footings with a nominal square dimension of about 2 to 3 feet are tabulated below.

Thickness of Compacted Structural Fill (feet)	Estimated Settlement (inches)
0	¾ - 1
B/4	½ - ¾
B/2	¼ - ½
3B/4	About ¼

B is the footing width

The compacted structural fill should be placed and compacted as discussed in the Construction Considerations, “Fill Placement Recommendations” section of this report, below. The zone of influence of the footing (at elevations close to the bottom of the footing) is often approximated as being between two lines subtended at 45 degree angles from each bottom corner of the footing. The compacted structural fill should extend beyond the zone of influence of the footing as shown in the sketch below.



A general and simple rule to apply to the geometry of the compacted structural fill blanket is that it should extend beyond each edge of the footing a distance which is equal to the fill thickness.

We estimate that the differential settlement may be about ½ inch. We estimate that the footings designed and constructed above will have a total post construction settlement of less than 1 inch.

All footings should be support at an elevation deeper than the maximum depth of frost penetration for the area. This recommendation includes exterior isolated footings and column supports. Please contact the local building department for specific frost depth requirements.

The post construction differential settlement may be reduced by designing footings that will apply relatively uniform loads on the support soils. Concentrated loads should be supported by footings that have been designed to impose similar loads as those imposed by adjacent footings.

Under no circumstances should any footing be supported by more than 3 feet of compacted structural fill material unless we are contacted to review the specific conditions supporting these footing locations.

The design concepts and parameters presented above are based on the soil conditions encountered in our test borings. We should be contacted during the initial phases of the foundation excavation at the site to assess the soil support conditions and to verify our recommendations.

4.1.2 General Shallow Foundation Considerations

Some movement and settlement of any shallow foundation system will occur after construction. Movement associated with swelling soils also occurs occasionally. Utility line connections through and foundation or structural component should be appropriately sleeved to reduce the potential for damage to the utility line. Flexible utility line connections will further reduce the potential for damage associated with movement of the structure.

5.0 RETAINING STRUCTURES

We anticipate that laterally loaded walls may be needed for project design. Lateral loads will be imposed on the retaining structures by the adjacent soils and, in some cases, surcharge loads on the retained soils. The loads imposed by the soil are commonly referred to as lateral earth pressures. The magnitude of the lateral earth pressure forces is partially dependent on the soil strength characteristics, the geometry of the ground surface adjacent to the retaining structure, the subsurface water conditions and on surcharge loads.

The retaining structures may be designed using the values tabulated below.

Lateral Earth Pressure Values

Type of Lateral Earth Pressure	Level Native Soil Backfill (pounds per cubic foot/foot)*	Level Granular Soil Backfill (pounds per cubic foot/foot)
Active	45	35
At-rest	65	55
Passive	340	460
Allowable Coefficient of Friction	0.33	0.45

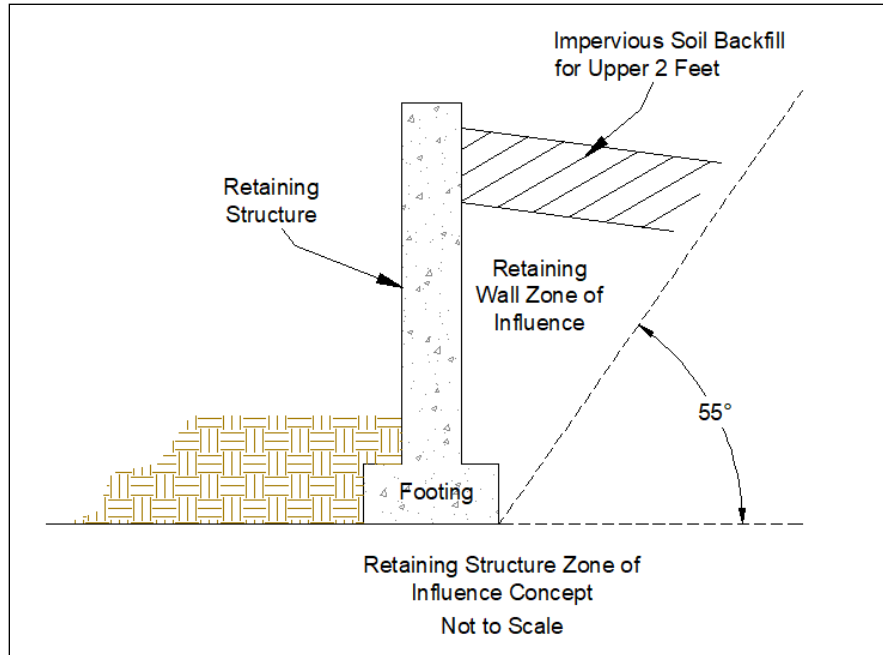
The site soils have a measured swell pressure of 1,680 pounds per square foot which may be exerted on the retaining wall should the backfill soils become moistened. If the site clay soils are used as backfill they must be moisture conditioned to above optimum moisture content during the backfill placement. The retaining wall should be designed to resist forces associated with swelling of the soils used as backfill adjacent to the retaining walls.

The site soils have a measured swell pressure of 1,680 pounds per square foot. A 1,680 pound per square foot swell pressure may exert approximately 13,440 pounds of force per lineal foot for a wall that retains eight (8) feet of soil. The forces from the swelling soil may be treated as a uniformly distributed load for structural design purposes.

The granular soil that is used for the retaining wall backfill may be permeable and may allow water migration to the foundation support soils. There are several options available to help reduce water migration to the foundation soils, two of which are discussed here. An impervious geotextile layer and shallow drain system may be incorporated into the backfill, as discussed in Section 9.5, Landscaping Considerations, below. A second option is to place a geotextile filter material on top of the granular soils and above that place about 1½ to 2 feet of moisture conditioned and compacted site clay soils. It should be noted that if the site clay soils are used volume changes may occur which will influence the performance of overlying concrete flatwork or structural components.

The values tabulated above are for well drained backfill soils. The values provided above do not include any forces due to adjacent surcharge loads or sloped soils. If the backfill soils become saturated the imposed lateral earth pressures will be significantly higher than those tabulated above.

The granular imported soil backfill values tabulated above are appropriate for material with an angle of internal friction of 35 degrees, or greater. The granular backfill must be placed within the retaining structure zone of influence as shown below in order for the lateral earth pressure values tabulated above for the granular material to be appropriate.



If an open graded, permeable, granular backfill is chosen it should not extend to the ground surface. Some granular soils allow ready water migration which may result in increased water access to the foundation soils. The upper few feet of the backfill should be constructed using an impervious soil such as silty-clay and clay soils from the project site, if these soils are available. The 55 degree angle shown in the figure above is approximately correct for most clay soils. The angle is defined by $45 + (\phi/2)$ where “ ϕ ” is the angle of internal friction of the soil.

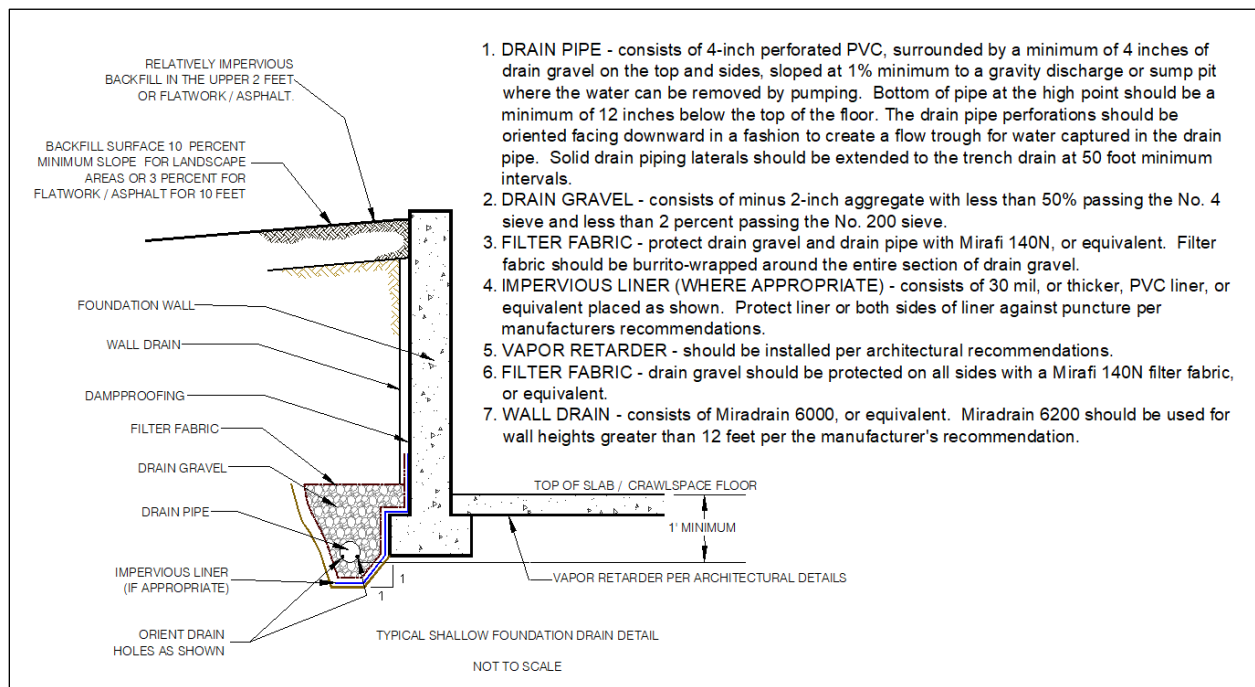
Backfill should not be placed and compacted behind the retaining structure unless approved by the project structural engineer. Backfill placed prior to construction of all appropriate structural members such as floors, or prior to appropriate curing of the retaining wall concrete, may result in severe damage and/or failure of the retaining structure.

6.0 SUBSURFACE DRAIN SYSTEM

We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain and wall drain system. Exterior retaining structures may be constructed with weep holes to allow subsurface water migration through the retaining structures. Topographic conditions on the site may influence the ability to install a subsurface drain system which promotes water flow away from the foundation system. The subsurface drain system concept is discussed under the Subsurface Drain System section of this report below.

A drain system constructed with a free draining aggregate material and a 4 inch minimum diameter perforated drain pipe should be constructed adjacent to retaining structures and/or adjacent to foundation walls. The drain pipe perforations should be oriented facing downward. The system should be protected from fine soil migration by a fabric-wrapped aggregate which surrounds a rigid perforated pipe. We do not recommend use of flexible corrugated perforated pipe since it is not possible to establish a uniform gradient of the flexible pipe throughout the drain system alignment. Corrugated drain tile is perforated throughout the entire circumference of the pipe and therefore water can escape from the perforations at undesirable locations after being collected. The nature of the perforations of the corrugated material further decreases its effectiveness as a subsurface drain conduit.

The drain should be placed at each level of excavation and at least 12 inches below lowest adjacent finish floor or crawlspace grade. The drain system pipe should be graded to surface outlets or a sump vault. The drain system should be sloped at a minimum gradient of about 2 percent, but site geometry and topography may influence the actual installed pipe gradient. Water must not be allowed to pool along any portion of the subsurface drain system. An improperly constructed subsurface drain system may promote water infiltration to undesirable locations. The drain system pipe should be surrounded by about 2 to 4 cubic feet per lineal foot of free draining aggregate. If a sump vault and pump are incorporated into the subsurface drain system, care should be taken so that the water pumped from the vault does not recirculate through pervious soils and obtain access to the basement or crawl space areas. An impervious membrane should be included in the drain construction for grade beam and pier systems or other foundation systems such as interrupted footings where a free pathway for water beneath the structure exists. A generalized subsurface drain system concept is shown below.



There are often aspects of each site and structure which require some tailoring of the subsurface drain system to meet the needs of individual projects. Drain systems that are placed adjacent to void forms must include provisions to protect and support the impervious liner adjacent to the void form. We are available to provide consultation for the subsurface drain system for this project, if desired.

Water often will migrate along utility trench excavations. If the utility trench extends from areas above the site, this trench may be a source for subsurface water within a crawl space or basement. We suggest that the utility trench backfill be thoroughly compacted to help reduce the amount of water migration. The subsurface drain system should be designed to collect subsurface water from the utility trench and fractures within the formational material and direct it to surface discharge points.

7.0 CONCRETE FLATWORK

We anticipate that both interior and exterior concrete flatwork will be considered in the project design. Concrete flatwork is typically lightly loaded and has a limited capability to resist shear forces associated with uplift from swelling soils and/or frost heave. It is prudent for the design and construction of concrete flatwork on this project to be able to accommodate some movement associated with swelling soil conditions, if possible.

The soil samples tested have a measured swell pressure of about 1,680 pounds per square foot and a magnitude swell potential of about 0.8 percent under a 500 pound per square foot surcharge load. Due to the measured swell potential and swell pressure, interior floors supported over a crawl space are less likely to experience movement than are concrete slabs support on grade. The following recommendations are appropriate for garage floor slabs and for interior floor slabs if the owner is willing to accept the risk of potential movement beyond normal tolerances.

7.1 Interior Concrete Slab-on-Grade Floors

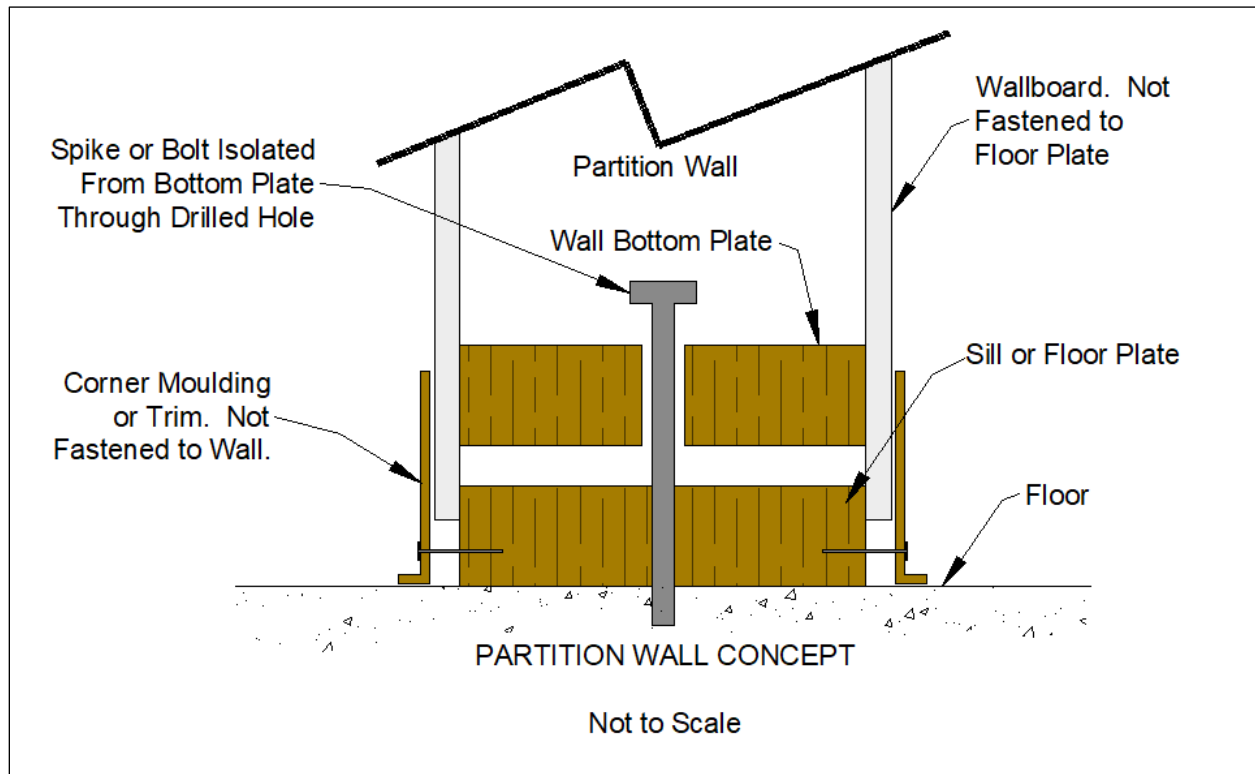
A primary goal in the design and construction of concrete slab-on-grade floors is to reduce the amount of post construction uplift associated with swelling soils, or downward movement due to consolidation of soft soils. A parallel goal is to reduce the potential for damage to the structure associated with any movement of the slab-on-grade which may occur. There are limited options available to help mitigate the influence of volume changes in the support soil for concrete slab-on-grade floors, these include:

- Preconstruction scarification, moisture conditioning and re-compaction of the natural soils in areas proposed for support of concrete flatwork, and/or,
- Placement and compaction of granular compacted structural fill material

Damage associated with movement of interior concrete slab-on-grade floor can be reduced by designing the floors as “floating” slabs. The concrete slabs should not be structurally tied to the foundations or the overlying structure. Interior walls or columns should not be supported on the interior floor slabs. Movement of interior walls or columns due to uplift of the floor slab can cause severe damage throughout the structure. Interior walls may be structurally supported from

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framing above the floor, or interior walls and support columns may be supported on interior portions of the foundation system. Partition walls should be designed and constructed with voids above, and/or below, to allow independent movement of the floor slab. This concept is shown below.



The sketch above provides a concept. If the plans include isolation of the partition walls from the floor slab, the project architect or structural engineer should be contacted to provide specific details and design of the desired system.

If the owner chooses to construct the residence with concrete slab-on-grade floors, the floors should be supported by a layer of granular structural fill overlying the processed, moisture conditioned and compacted natural soils. Interior concrete flatwork, or concrete slab-on-grade floors, should be underlain by 6 inch minimum layer of compacted structural fill that is placed and compacted as discussed in the Construction Considerations, “Fill Placement Recommendations” section of this report, below.

The above recommendations will not prevent slab heave if the expansive soils underlying slabs-on-grade become wet. However, the recommendations will reduce the effects if slab heave occurs. All plumbing lines should be pressure tested before backfilling to help reduce the potential for wetting. The only means to completely mitigate the influence of volume changes on the performance of interior floors is to structurally support the floors over a void space. Floors that are suspended by the foundation system will not be influenced by volume changes in the site soils. The suggestions and recommendations presented below are intended to help reduce the influence of swelling soils on the performance of the concrete slab-on-grade floors.

7.1.1 Capillary and Vapor Moisture Rise

Capillary and vapor moisture rise through the slab support soil may provide a source for moisture in the concrete slab-on-grade floor. This moisture may promote development of mold or mildew in poorly ventilated areas and may influence the performance of floor coverings and mastic placed directly on the floor slabs. The type of floor covering, adhesives used, and other considerations that are not related to the geotechnical engineering practice will influence the design. The architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of protection required for their products.

Comments for Reduction of Capillary Rise

One option to reduce the potential for capillary rise through the floor slab is to place a layer of clean aggregate material, such as washed concrete aggregate for the upper 4 to 6 inches of fill material supporting the concrete slabs.

Comments for Reduction of Vapor Rise

To reduce vapor rise through the floor slab, a moisture barrier such as a 6 mil (or thicker) plastic, or similar impervious geotextile material is often placed below the floor slab. The material used should be protected from punctures that will occur during the construction process.

There are proprietary barriers that are puncture resistant that may not need the underlying layer of protective material. Some of these barriers are robust material that may be placed below the compacted structural fill layer. We do not recommend placement of the concrete directly on a moisture barrier unless the concrete contractor has had previous experience with curing of concrete placed in this manner. As mentioned above, the architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of moisture and vapor protection required for their products.

7.1.2 Slab Reinforcement Considerations

The project structural engineer should be contacted to provide steel reinforcement design considerations for the proposed floor slabs. Any steel reinforcement placed in the slab should be placed at the appropriate elevations to allow for proper interaction of the reinforcement with tensile stresses in the slab. Reinforcement steel that is allowed to cure at the bottom of the slab will not provide adequate reinforcement.

7.2 Exterior Concrete Flatwork Considerations

Exterior concrete flatwork includes concrete driveway slabs, aprons, patios, and walkways. The desired performance of exterior flatwork typically varies depending on the proposed use of the site and each owner's individual expectations. As with interior flatwork, exterior flatwork is particularly prone to movement and potential damage due to movement of the support soils. This movement and associated damage may be reduced by following the recommendations discussed under interior flatwork, above. Unlike interior flatwork, exterior flatwork may be exposed to frost heave, particularly on sites where the bearing soils have a high silt content. It

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may be prudent to remove silt soils from exterior flatwork support areas where movement of exterior flatwork will adversely affect the project, such as near the interface between the driveway and the interior garage floor slab. If silt soils are encountered, they should be removed to the maximum depth of frost penetration for the area where movement of exterior flatwork is undesirable.

If some movement of exterior flatwork is acceptable, we suggest that the support areas be prepared by scarification, moisture conditioning and re-compaction of about 6 inches of the natural soils followed by placement of at least 6 inches of compacted granular fill material. The scarified material and granular fill materials should be placed as discussed under the Construction Considerations, "Fill Placement Recommendations" section of this report, below.

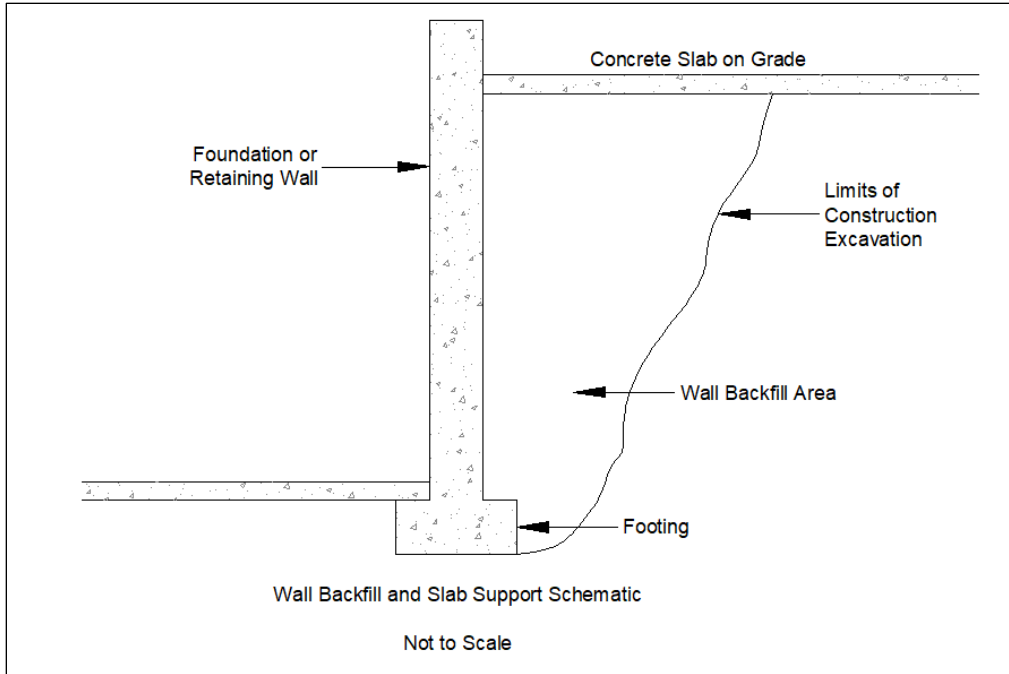
It is important that exterior flatwork be separated from exterior column supports, masonry veneer, finishes and siding. No support columns, for the structure or exterior decks, should be placed on exterior concrete unless movement of the columns will not adversely affect the supported structural components. Movement of exterior flatwork may cause damage if it is in contact with portions of the structure exterior.

It should be noted that silt and silty sand soils located near the ground surface are particularly prone to frost heave. Soils with high silt content have the ability to retain significant moisture. The ability for the soils to accumulate moisture combined with a relatively shallow source of subsurface water and the fact that the winter temperatures in the area often very cold all contribute to a high potential for frost heave of exterior structural components. We recommend that silty soils be removed from the support areas of exterior components that are sensitive to movement associated with frost heave. These soils should be replaced with a material that is not susceptible to frost heave. Aggregate road base and similar materials retain less water than fine-grained soils and are therefore less prone to frost heave. We are available to discuss this concept with you as the plans progress.

Exterior flatwork should not be placed on soils prepared for support of landscaping vegetation. Cultivated soils will not provide suitable support for concrete flatwork.

7.3 General Concrete Flatwork Comments

It is relatively common that both interior and exterior concrete flatwork is supported by areas of fill adjacent to either shallow foundation walls or basement retaining walls. A typical sketch of this condition is shown below.



Settlement of the backfill shown above will create a void and lack of soil support for the portions of the slab over the backfill. Settlement of the fill supporting the concrete flatwork is likely to cause damage to the slab-on-grade. Settlement and associated damage to the concrete flatwork may occur when the backfill is relatively deep, even if the backfill is compacted.

If this condition is likely to exist on this site it may be prudent to design the slab to be structurally supported on the retaining or foundation wall and designed to span to areas away from the backfill area as designed by the project structural engineer. We are available to discuss this with you upon request.

8.0 CONSTRUCTION CONSIDERATIONS

This section of the report provides comments, considerations and recommendations for aspects of the site construction which may influence, or be influenced by the geotechnical engineering considerations discussed above. The information presented below is not intended to discuss all aspects of the site construction conditions and considerations that may be encountered as the project progresses. If any questions arise as a result of our recommendations presented above, or if unexpected subsurface conditions are encountered during construction we should be contacted immediately.

8.1 Fill Placement Recommendations

There are several references throughout this report regarding both natural soil and compacted structural fill recommendations. The recommendations presented below are appropriate for the fill placement considerations discussed throughout the report above.

All areas to receive fill, structural components, or other site improvements should be properly prepared and grubbed at the initiation of the project construction. The grubbing operations should include scarification and removal of organic material and soil. No fill material or concrete should be placed in areas where existing vegetation or fill material exist.

8.1.1 Natural Soil Fill

Any natural soil used for any fill purpose should be free of all deleterious material, such as organic material and construction debris. Natural soil fill includes excavated and replaced material or in-place scarified material. Due to the expansive characteristics of the natural soil we do not recommend that it be used as fill material for direct support of structural components. The natural soils may be used to establish general site elevation. Our recommendations for placement of natural soil fill are provided below.

- The natural soils should be moisture conditioned, either by addition of water to dry soils, or by processing to allow drying of wet soils. The proposed fill materials should be moisture conditioned to between about optimum and about 2 percent above optimum soil moisture content. This moisture content can be estimated in the field by squeezing a sample of the soil in the palm of the hand. If the material easily makes a cast of soil which remains in-tact, and a minor amount of surface moisture develops on the cast, the material is close to the desired moisture content. Material testing during construction is the best means to assess the soil moisture content.
- Moisture conditioning of clay or silt soils may require many hours of processing. If possible, water should be added and thoroughly mixed into fine grained soil such as clay or silt the day prior to use of the material. This technique will allow for development of a more uniform moisture content and will allow for better compaction of the moisture conditioned materials.
- The moisture conditioned soil should be placed in lifts that do not exceed the capabilities of the compaction equipment used and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.
- We typically recommend a maximum fill lift thickness of 6 inches for hand operated equipment and 8 to 10 inches for larger equipment.
- Care should be exercised in placement of utility trench backfill so that the compaction operations do not damage underlying utilities.
- The maximum recommended lift thickness is about 6 to 8 inches; therefore, the maximum allowable rock size for natural soil fill is about 4 inches. If smaller compaction equipment is being used, such as walk behind compactors in trenches, the maximum rock size should be less than 3 inches. This may require on-site screening or crushing if larger rocks are present.

8.1.2 Granular Compacted Structural Fill

Granular compacted structural fill is referenced in numerous locations throughout the text of this report. Granular compacted structural fill should be constructed using an imported commercially produced rock product such as aggregate road base. Many products other than road base, such as clean aggregate or select crusher fines may be suitable, depending on the intended use. If a specification is needed by the design professional for development of project

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specifications, a material conforming to the Colorado Department of Transportation (CDOT) “Class 6” aggregate road base material can be specified. This specification can include an option for testing and approval in the event the contractor’s desired material does not conform to the Class 6 aggregate specifications. We have provided the CDOT Specifications for Class 6 material below

Grading of CDOT Class 6 Aggregate Base-Course Material	
Sieve Size	Percent Passing Each Sieve
¾ inch	100
#4	30 – 65
#8	25 – 55
#200	3 – 12

Liquid Limit less than 30

All compacted structural fill should be moisture conditioned and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test. Areas where the structural fill will support traffic loads under concrete slabs or asphalt concrete should be compacted to at least 95 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.

Although clean-screened or washed aggregate may be suitable for use as structural fill on sites with sand or non-expansive silt soils, or on sites where shallow subsurface water is present, clean aggregate materials must not be used on any site where expansive soils exist due to the potential for water to accumulate in the voids of the clean aggregate materials.

Clean aggregate fill, if appropriate for the site soil conditions, must not be placed in lifts exceeding 8 inches and each lift should be thoroughly vibrated, preferably with a plate-type vibratory compactor prior to placing overlying lifts of material or structural components. We should be contacted prior to the use of clean aggregate fill materials to evaluate their suitability for use on this project.

8.1.3 Deep Fill Considerations

Deep fills, in excess of approximately 3 feet, should be avoided where possible. Fill soils will settle over time, even when placed properly per the recommendations contained in this report. Natural soil fill or engineered structural fills placed to our minimum recommended requirements will tend to settle an estimated 1 to 3 percent; therefore, a 3 foot thick fill may settle up to approximately 1 inch over time. A 10 foot thick fill may settle up to approximately 3½ inches even when properly placed. Fill settlement will result in distress and damage to the structures they are intended to support. There are methods to reduce the effects of deep fill settlement such as surcharge loading and surveyed monitoring programs; however, there is a significant time period of monitoring required for this to be successful. A more reliable method is to support structural components with deep foundation systems bearing below the fill envelope. We can provide additional guidance regarding deep fills up on request.

8.2 Excavation Considerations

Unless a specific classification is performed, the site soils should be considered as an Occupational Safety and Health Administration (OSHA) Type C soil and should be sloped and/or benched according to the current OSHA regulations. Excavations should be sloped and benched to prevent wall collapse. Any soil can release suddenly and cave unexpectedly from excavation walls, particularly if the soils is very moist, or if fractures within the soil are present. Daily observations of the excavations should be conducted by OSHA competent site personnel to assess safety considerations.

Scattered boulders were encountered in our test borings and large boulders are known to be present throughout the vicinity. Due to the size of the boulders encountered in the vicinity, if encountered, they may be difficult to remove using conventional excavation techniques and equipment. Removal of large boulders can also create a void of loose soil beneath structural components, which may require additional removal of loose soil and replacement with structural fill. In some instances, it may be preferable to leave boulders in place. Reduction in the thickness of the recommended structural fill beneath footings and slabs may also be prudent to limit disturbance to the bearing soils. If large boulders are encountered in the building footprint, a representative of the geotechnical engineer can provide field observations and provide additional recommendations for subgrade preparation.

If possible, excavations should be constructed to allow for water flow from the excavation the event of precipitation during construction. If this is not possible it may be necessary to remove water from snowmelt or precipitation from the foundation excavations to help reduce the influence of this water on the soil support conditions and the site construction characteristics.

8.2.1 Excavation Cut Slopes

We anticipate that some permanent excavation cut slopes may be included in the site development. Temporary cut slopes should not exceed 5 feet in height and should not be steeper than about 1:1 (horizontal to vertical) for most soils. Permanent cut slopes greater than 5 feet or steeper than 2½:1 must be analyzed on a site specific basis.

We did not observe evidence of existing unstable slope areas influencing the site, but due to the steepness and extent of the slopes in the area we suggest that the magnitude of the proposed excavation slopes be minimized and/or supported by retaining structures.

8.3 Utility Considerations

Subsurface utility trenches will be constructed as part of the site development. Utility line backfill often becomes a conduit for post construction water migration. If utility line trenches approach the proposed project site from above, water migrating along the utility line and/or backfill may have direct access to the portions of the proposed structure where the utility line penetrations are made through the foundation system. The foundation soils in the vicinity of the utility line penetration may be influenced by the additional subsurface water. There are a few options to help mitigate water migration along utility line backfill. Backfill bulkheads constructed with high clay content soils and/or placement of subsurface drains to promote utility

line water discharge away from the foundation support soil.

Some movement of all structural components is normal and expected. The amount of movement may be greater on sites with problematic soil conditions. Utility line penetrations through any walls or floor slabs should be sleeved so that movement of the walls or slabs does not induce movement or stress in the utility line. Utility connections should be flexible to allow for some movement of the floor slab.

If utility line trenches are excavated using blasting techniques it is relatively common for surface and subsurface water to migrate along the fractures in the rock that may be created by blasting. If this water gains access to a utility line trench that has a gradient down toward the structure the water may gain access to the foundation support materials and/or subsurface portions of the proposed structure. Provisions should be made in the project construction plans to create an impervious barrier to prevent water from migrating into undesirable locations.

8.4 Exterior Grading and Drainage Comments

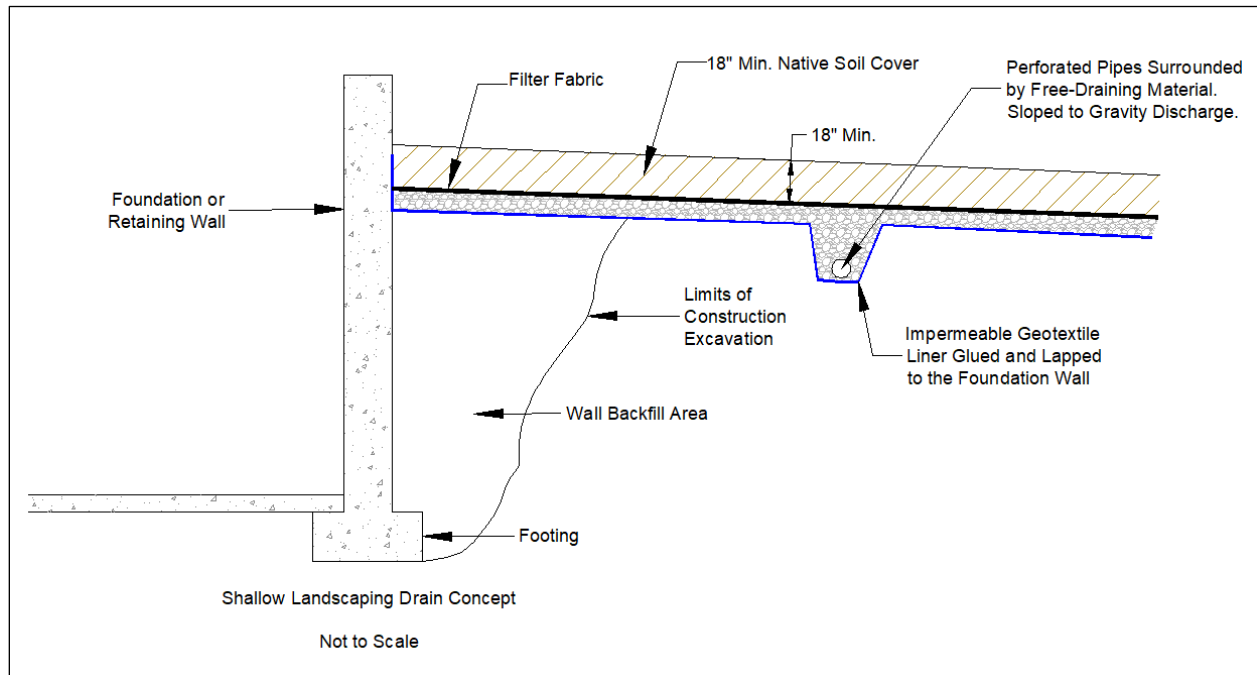
The following recommendations should be following during construction and maintained for the life of the structure with regards to exterior grading and surface drainage.

- The ground surface adjacent to the structure should be sloped to promote water flow away from the foundation system and flatwork.
- Snow storage areas should not be located in areas which will allow for snowmelt water access to support soils for the foundation system or flatwork.
- The project civil engineer, architect or builder should develop a drainage scheme for the site. We typically recommend the ground surface surrounding the exterior of the building be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 12 inches in the first 10 feet in unpaved areas and a minimum slope of 3 inches in the first 10 feet in paved areas.
- Water flow from the roof of the structure should be captured and directed away from the structure. If the roof water is collected in an eave gutter system, or similar, the discharge points of the system must be located away from areas where the water will have access to the foundation backfill or any structure support soils. If downspouts are used, provisions should be made to either collect or direct the water away from the structure.
- Care should be taken to not direct water onto adjacent property or to areas that would negatively influence existing structures or improvements.

8.5 Landscaping Considerations

We recommend against construction of landscaping which requires excessive irrigation. Generally landscaping which uses abundant water requires that the landscaping contractor install topsoil which will retain moisture. The topsoil is often placed in flattened areas near the structure to further trap water and reduce water migration from away from the landscaped areas. Unfortunately, almost all aspects of landscape construction and development of lush vegetation are contrary to the establishment of a relatively dry area adjacent to the foundation walls. Excess water from landscaped areas near the structure can migrate to the foundation system or flatwork support soils, which can result in volume changes in these soils.

A relatively common concept used to collect and subsequently reduce the amount of excess irrigation water is to glue or attach an impermeable geotextile fabric or heavy mill plastic to the foundation wall and extend it below the topsoil which is used to establish the landscape vegetation. A thin layer of sand can be placed on top of the geotextile material to both protect the geotextile from punctures and to serve as a medium to promote water migration to the collection trench and perforated pipe. The landscape architect or contractor should be contacted for additional information regarding specific construction considerations for this concept which is shown in the sketch below.



A free draining aggregate or sand may be placed in the collection trench around the perforated pipe. The perforated pipe should be graded to allow for positive flow of excess irrigation water away from the structure or other area where additional subsurface water is undesired. Preferably the geotextile material should extend at least 10 or more feet from the foundation system.

Care should be taken to not place exterior flatwork such as sidewalks or driveways on soils that have been tilled and prepared for landscaping. Tilled soils will settle which can cause damage to the overlying flatwork. Tilled soils placed on sloped areas often “creep” down-slope. Any structure or structural component placed on this material will move down-slope with the tilled soil and may become damaged.

The landscape drain system concept provided above is optional for this site and provided only if there is a desire to reduce the potential for subsurface water migration to below grade finished areas or crawl space areas. Often this concept is implemented only on the northern sides of structures and/or where snow may accumulate and melt water may migrate toward subsurface areas under the structure.

8.6 Soil Sulfate and Corrosion Issues

The requested scope of our services did not include assessment of the chemical constituents of corrosion potential of the site soils. Most soils in southwest Colorado are not typically corrosive to concrete. There has not been a history of damage to concrete due to sulfate corrosion in the area.

We are available to perform soluble sulfate content tests to assess the corrosion potential of the soils on concrete if desired.

8.7 Radon Issues

The requested scope of service of this report did not include assessment of the site soils for radon production. Many soils and formational materials in western Colorado produce Radon gas. The structure should be appropriately ventilated to reduce the accumulation of Radon gas in the structure. Several Federal Government agencies including the Environmental Protection Agency (EPA) have information and guidelines available for Radon considerations and home construction. If a radon survey of the site soils is desired, please contact us.

8.8 Mold and Other Biological Contaminants

Our services do not include determining the presence, prevention or possibility of mold or other biological contaminants developing in the future. If the client is concerned about mold or other biological contaminants, a professional in this special field of practice should be consulted.

9.0 CONSTRUCTION MONITORING AND TESTING

Engineering observation of subgrade bearing conditions, compaction testing of fill material and testing of foundation concrete are equally important tasks that should be performed by the geotechnical engineering consultant during construction. We should be contacted during the construction phase of the project and/or if any questions or comments arise as a result of the information presented below. It is common for unforeseen, or otherwise variable subsurface soil and water conditions to be encountered during construction. As discussed in our proposal for our services, it is imperative that we be contacted during the foundation excavation stage of the project to verify that the conditions encountered in our field exploration were representative of those encountered during construction. Our general recommendations for construction monitoring and testing are provided below.

- Consultation with design professionals during the design phases: This is important to ensure that the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.
- Grading Plan Review: A grading plan was not available for our review at the time of this report. A grading plan with finished floor elevations for the proposed construction should be prepared by a civil engineer licensed in the State of Colorado. Trautner Geotech should be provided with grading plans once they are complete to determine if

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our recommendations based on the assumed bearing elevations are appropriate.

- Observation and monitoring during construction: A representative of the Geotechnical engineer from our firm should observe the foundation excavation, earthwork, and foundation phases of the work to determine that subsurface conditions are compatible with those used in the analysis and design and our recommendations have been properly implemented. Placement of backfill should be observed and tested to judge whether the proper placement conditions have been achieved. Compaction tests should be performed on each lift of material placed in areas proposed for support of structural components.
- We recommend a representative of the geotechnical engineer observe the drain and dampproofing phases of the work to judge whether our recommendations have been properly implemented.
- If asphaltic concrete is placed for driveways or aprons near the structure, we are available to provide testing of these materials during placement.

10.0 CONCLUSIONS

While we feel that it is feasible to develop this site as planned using relatively conventional techniques to the area, we feel that it is prudent for us to be part of the continuing design of this project to review and provide consultation in regard to the proposed development scheme as the project progresses to aid in the proper interpretation and implementation of the recommendations presented in this report. This consultation should be incorporated in the project development prior to construction at the site.

We recommend that we be contacted during the design and construction phase of this project to aid in the implementation of our recommendations. Please contact us immediately if you have any questions, or if any of the information presented above is not appropriate for the proposed site construction.

11.0 LIMITATIONS

This study has been conducted based on the geotechnical engineering standards of care in this area at the time this report was prepared. We make no warranty as to the recommendations contained in this report, either expressed or implied. The information presented in this report is based on our understanding of the proposed construction that was provided to us and on the data obtained from our field and laboratory studies. Our recommendations are based on limited field and laboratory sampling and testing. Unexpected subsurface conditions encountered during construction may alter our recommendations. We should be contacted during construction to observe the exposed subsurface soil conditions to provide comments and verification of our recommendations.

The recommendations presented above are intended to be used only for this project site and the proposed construction which was provided to us. The recommendations presented above are not suitable for adjacent project sites, or for proposed construction that is different than that outlined for this study.

Project No. 56082GE

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This report provides geotechnical engineering design parameters, but does not provide foundation design or design of structure components. The project architect, designer or structural engineer must be contacted to provide a design based on the information presented in this report.

This report does not provide an environmental assessment nor does it provide environmental recommendations such as those relating to Radon or mold considerations. If recommendation relative to these or other environmental topics are needed and environmental specialist should be contacted.

The findings of this report are valid as of the present date. However, changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or the broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

We are available to review and tailor our recommendations as the project progresses and additional information which may influence our recommendations becomes available.

Please contact us if you have any questions, or if we may be of additional service.

Respectfully,
TRAUTNER GEOTECH



Tom R. Harrison, P.E.
Geotechnical Engineer

APPENDIX A

Field Study Results

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 4.5 feet
 Location : See Figure in Report

LOG OF BORING TB-1

Lot 1 Cole Ranch Silverton, Colorado
 Todd and Julie Sams
 Mountain Grain Architecture
 c/o Christopher Clemmons, RA, NCARB

Project Number: 56082 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	Mod. California Sampler Standard Split Spoon Bag Sample	Water Level During Drilling Water Level After Drilling						
0								
0 - 1			GM					Observed organics in top 6 inches.
1 - 2								
2 - 4.5			GP			5/6 12/6 22/6		
4.5								Auger refusal on cobble at 4.5 feet
5								

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 3.5 feet
 Location : See Figure in Report

LOG OF BORING TB-2

Lot 1 Cole Ranch Silverton, Colorado
 Todd and Julie Sams
 Mountain Grain Architecture
 c/o Christopher Clemmons, RA, NCARB

Project Number: 56082 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	Mod. California Sampler Standard Split Spoon Bag Sample	Water Level During Drilling Water Level After Drilling						
0								Organics observed in top 6".
0 - 3.5			GP-GM					
3.5								Auger refusal on cobble at 3.5 feet
4								

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 4.5 feet
 Location : See Figure in Report

LOG OF BORING TB-3

Lot 1 Cole Ranch Silverton, Colorado
 Todd and Julie Sams
 Mountain Grain Architecture
 c/o Christopher Clemmons, RA, NCARB

Project Number: 56082 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	<ul style="list-style-type: none"> Mod. California Sampler Standard Split Spoon Bag Sample 	<ul style="list-style-type: none"> Water Level During Drilling Water Level After Drilling 						
0								Observed organics in top 6 inches.
1								
2			GP-GM			8/6		
3						16/6		
4						10/4		Standard drive bounced on cobble.
4.5								Auger refusal on cobble at 4.5 feet
5								

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 5 feet
 Location : See Figure in Report

LOG OF BORING TB-4

Lot 1 Cole Ranch Silverton, Colorado
 Todd and Julie Sams
 Mountain Grain Architecture
 c/o Christopher Clemmons, RA, NCARB

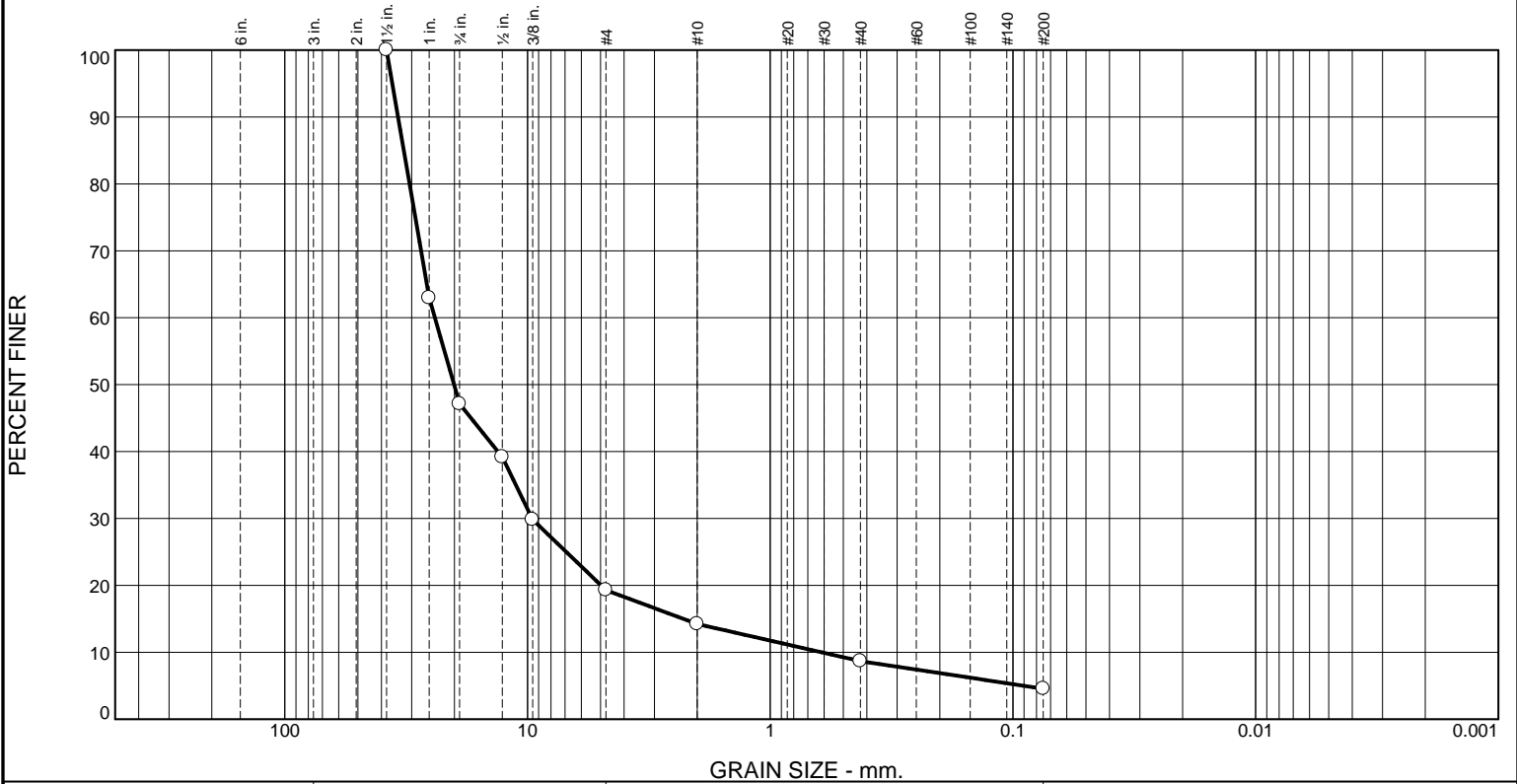
Project Number: 56082 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	Mod. California Sampler Standard Split Spoon Bag Sample	Water Level During Drilling Water Level After Drilling						
0								Observed organics in top 6 inches.
1								
2			GP-GM					
3								
4								
5								Auger refusal on cobble at 5 feet

APPENDIX B

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	53	28	5	5	4	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100		
1"	63		
3/4"	47		
1/2"	39		
3/8"	30		
#4	19		
#10	14		
#40	9		
#200	5		

Material Description

GP-GM-Poorly Graded Gravel with Silt and Sand

PL= 26	Atterberg Limits LL= 34	PI= 8
D ₉₀ = 34.1494	Coefficients D ₈₅ = 32.3305	D ₆₀ = 24.0693
D ₅₀ = 20.0694	D ₃₀ = 9.5732	D ₁₅ = 2.2799
D ₁₀ = 0.6137	C _u = 39.22	C _c = 6.20

USCS= GP-GM **Classification** AASHTO= A-2-4(0)

Remarks

* (no specification provided)

Location: Test Boring 2
Sample Number: 12405-B

Depth: 0'-3 1/2'

Date: 6-8-20



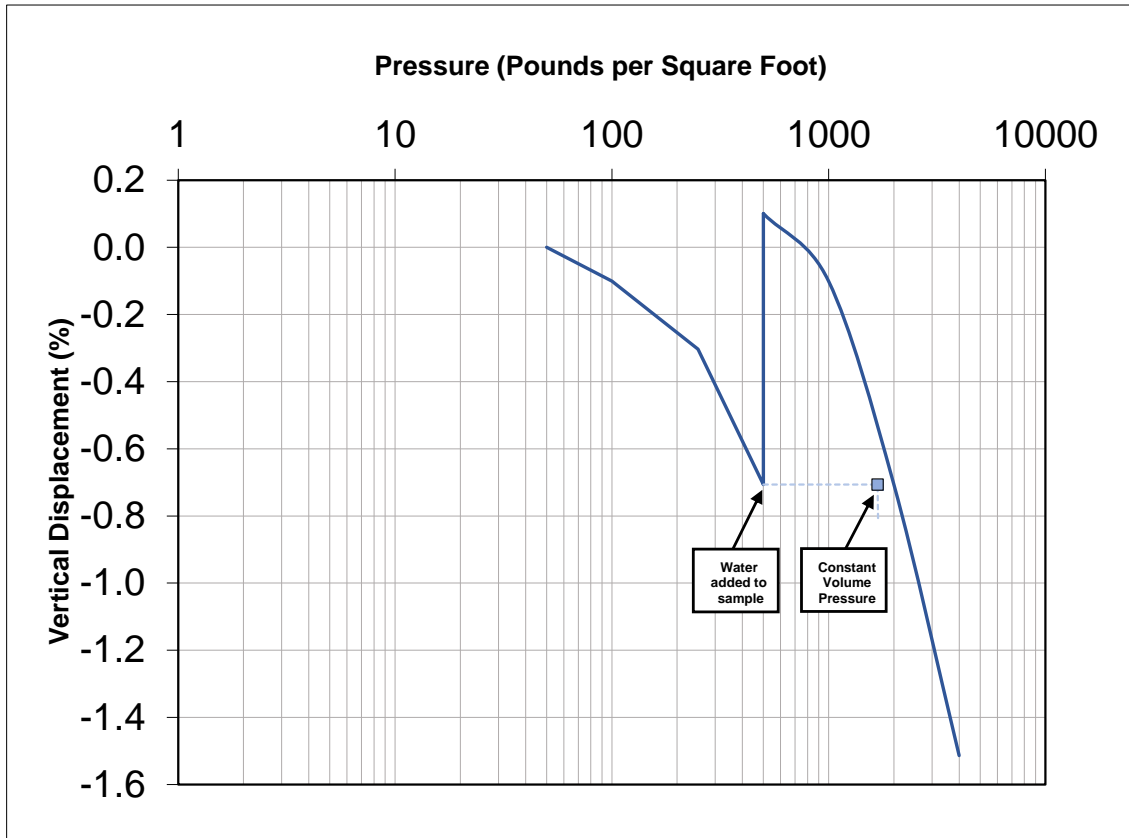
Client: Mr. Christopher Clemmons RA
Project: Lot 1 Cole Ranch, Silverton CO

Project No: 56082GE

Figure 4.1

Tested By: B. Kunz & G. Jadrych **Checked By:** C. DeLeon

SWELL - CONSOLIDATION TEST

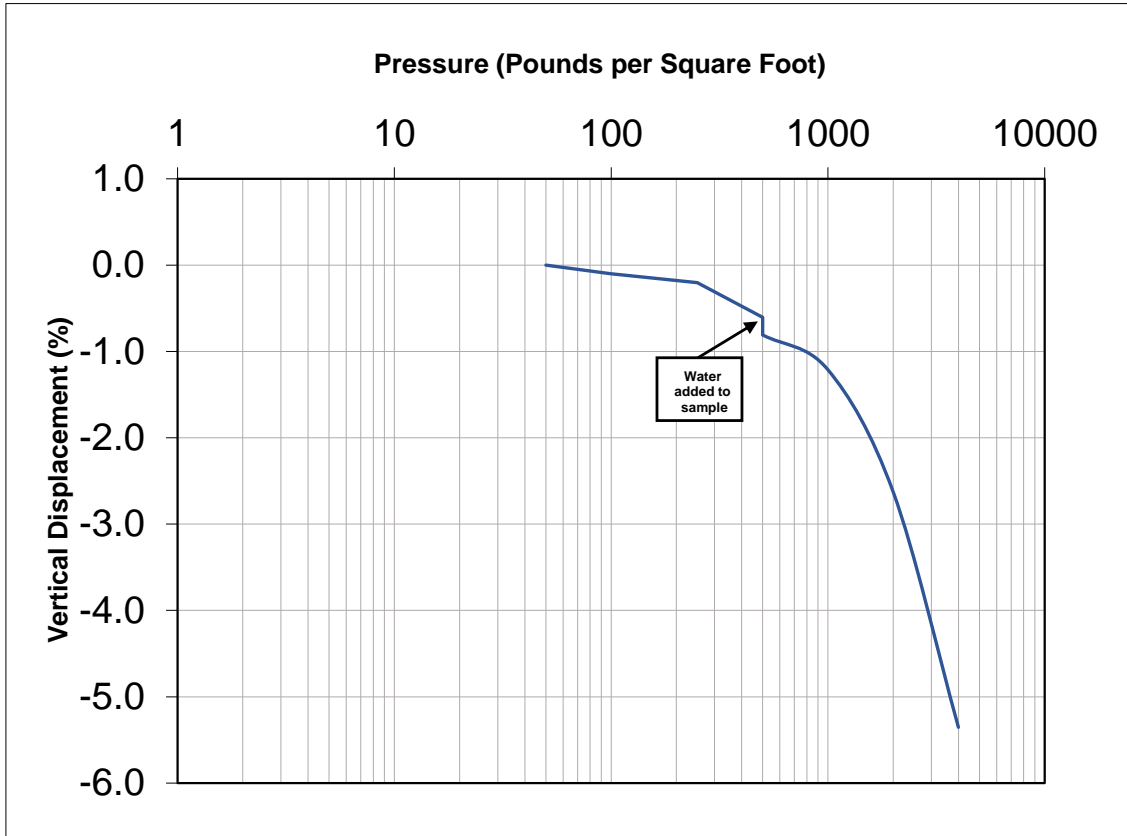


SUMMARY OF TEST RESULTS		
Sample Source:	TB-1 0'-4'	
Visual Soil Description:	GC	
Swell Potential (%)	0.8%	
Constant Volume Swell Pressure (lb/ft ²):	1,680	
	Initial	Final
Moisture Content (%):	10.3	21.0
Dry Density (lb/ft ³):	104.2	106.2
Height (in.):	0.991	0.976
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	56082 GE
Sample ID:	12405-A
Figure:	4.2

SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-3 @ 2'	
Visual Soil Description:	GC	
Swell Potential (%)	-0.2%	
Constant Volume Swell Pressure (lb/ft ²):	0	
	Initial	Final
Moisture Content (%):	6.9	20.6
Dry Density (lb/ft ³):	106.3	109.9
Height (in.):	0.990	0.937
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	56082GE
Sample ID:	12405-C
Figure:	4.3

GEOTECHNICAL ENGINEERING STUDY

RILEY RESIDENCE

LOT 4 COLE RANCH

SILVERTON, COLORADO

JULY 9, 2020

PREPARED FOR:

George Riley

c/o Christopher Clemmons, RA, NCARB

Mountain Grain Architecture

PROJECT NO. 56083GE

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1.0 REPORT INTRODUCTION

This report presents our geotechnical engineering recommendations for the proposed Riley residence and garage structure located on Lot 4 Cole Ranch, Silverton, San Juan County, Colorado. This report was requested by Christopher Clemmons, RA, NCARB, Mountain Grain Architecture, on behalf of George Riley, and was prepared in accordance with our proposal dated May 22, 2020, Proposal No. 20129P.

As outlined within our proposal for services for this project the client is responsible for appropriate distribution of this report to other design professionals and/or governmental agencies unless specific arrangements have been made with us for distribution.

Geotechnical engineering is a discipline which provides insight into natural conditions and site characteristics such as; subsurface soil and water conditions, soil strength, swell (expansion) potential, consolidation (settlement) potential, and often slope stability considerations. The information provided by the geotechnical engineer is utilized by many people including the project owner, architect or designer, structural engineer, civil engineer, the project builder and others. The information is used to help develop a design and subsequently implement construction strategies that are appropriate for the subsurface soil and water conditions, and slope stability considerations. We are available to discuss any aspect of this report with those who are unfamiliar with the recommendations, concepts, and techniques provided below.

This geotechnical engineering report is the beginning of a process involving the geotechnical engineering consultant on any project. It is imperative that the geotechnical engineer be consulted throughout the design and construction process to verify the implementation of the geotechnical engineering recommendations provided in this report. Often the design has not been started or has only been initiated at the time of the preparation of the geotechnical engineering study. Changes in the proposed design must be communicated to the geotechnical engineer so that we have the opportunity to tailor our recommendations as needed based on the proposed site development and structure design.

The following outline provides a synopsis of the various portions of this report;

- ❖ Sections 1.0 provides an introduction and an establishment of our scope of service.
- ❖ Sections 2.0 and 3.0 of this report present our geotechnical engineering field and laboratory studies
- ❖ Sections 4.0 through 7.0 presents our geotechnical engineering design parameters and recommendations which are based on our engineering analysis of the data obtained.
- ❖ Section 8.0 provides a brief discussion of construction sequencing and strategies which may influence the geotechnical engineering characteristics of the site. Ancillary information such as some background information regarding soil corrosion and radon considerations is also presented as general reference.
- ❖ Section 9.0 provides our general construction monitoring and testing recommendations.
- ❖ Section 10.0 provides our conclusions and limitations.

The data used to generate our recommendations are presented throughout this report and in the attached figures.

All recommendations provided throughout within this report must be followed in order to achieve the intended performance of the foundation system and other components that are supported by the site soil.

1.1 Proposed Construction

We understand the proposed construction will consist of a new single-family residential structure and shop structure. We assume the proposed structures will likely be a wood framed structure supported by a steel reinforced concrete foundation system. Grading for the structure is assumed to be relatively minor with cuts of approximately 3 to 8 feet below the adjacent ground surface. We assume relatively light foundation loadings, typical of the proposed type of construction.

When final building location, grading and loading information have been developed, we should be notified to re-evaluate the recommendations presented in this report.

2.0 FIELD STUDY

2.1 Site Description and Geomorphology

The approximate 4.97 acre property is currently vacant. The ground surface is relatively flat within the proposed building locations. The Animas River borders the lot to the west and an old railroad easement, CR 2, and Minnie Gulch Road (CR 24) transects the property. Minnie Gulch drainage is located to the south and east of the property. Vegetation consists primarily of coniferous and deciduous trees and grasses.

2.2 Subsurface Soil and Water Conditions

We advanced a total of five test borings in the vicinity of the proposed structures. A schematic showing the approximate boring locations is provided below as Figure 1. The logs of the soils encountered in our test borings are presented in Appendix A.

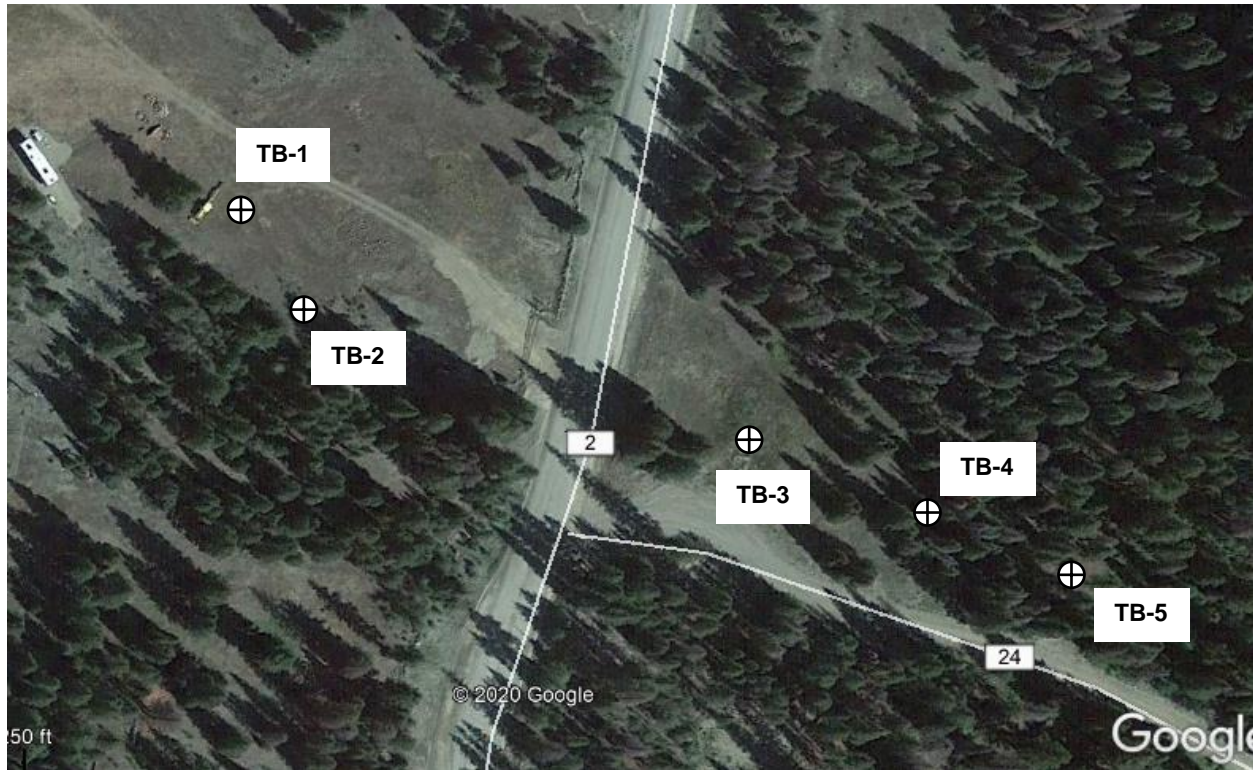


Figure 1: Locations of Exploratory Borings. Adapted from Google Earth imagery date 9/11/2019.

The schematic presented above was prepared using notes and field measurements obtained during our field exploration and is intended to show the approximate test boring locations for reference purposes only.

The subsurface conditions encountered in our test borings consisted of poorly graded gravel and cobbles with silt and sand and few boulders (GP-GM). Practical auger drilling refusal was encountered on cobble/small boulder size material at depths ranging from 2.5 to 8 feet.

We did not encounter free subsurface water in our test borings at the time of the advancement of our test borings at the project site. We suspect that the subsurface water elevation and soil moisture conditions will be influenced by snow melt and/or precipitation and local irrigation.

The logs of the subsurface soil conditions encountered in our test borings are presented in Appendix A. The logs present our interpretation of the subsurface conditions encountered exposed in the test borings at the time of our field work. Subsurface soil and water conditions are often variable across relatively short distances. It is likely that variable subsurface soil and water conditions will be encountered during construction. Laboratory soil classifications of samples obtained may differ from field classifications.

3.0 LABORATORY STUDY

The laboratory study included tests to estimate the strength, swell and consolidation potential of the soils tested. We performed the following tests on select samples obtained from the test borings.

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- Moisture Content and Dry Density
- Sieve Analysis (Gradation)
- Atterberg Limits, Liquid Limit, Plastic Limit and Plasticity Index
- Swell Consolidation Tests

A synopsis of some of our laboratory data for some of the samples tested is tabulated below.

Sample Designation	Percent Passing #200 Sieve	Atterberg Limits LL/PI	Moisture Content (percent)	Dry Density (PCF)	Measured Swell Pressure (PSF)	Swell or Consolidation Potential
TB-1 @ 2'	-	-	7.0	114.0	0*	0.0 (% under 500 psf load)
TB-2 @ 0-2 ½'	4	39/7	4.0	-	-	-
TB-5 @ 2'	-	-	7.6	110.5	0*	0.0% (% under 500 psf load)

***NOTES:**

1. We determine the swell pressure as measured in our laboratory using the constant volume method. The graphically estimated load-back swell pressure may be different from that measured in the laboratory.
2. * = Swell-Consolidation test performed on remolded sample due to rock content. Test results should be considered an estimate only of the swell or consolidation potential at the density and moisture content indicated.

4.0 FOUNDATION RECOMMENDATIONS

There are two general types of foundation system concepts, “deep” and “shallow”, with the designation being based on the depth of support of the system. We have provided a discussion viable foundation system concepts for this project below. The choice of the appropriate foundation system for the project is best made by the project structural engineer or project architect. We should be contacted once the design choice has been made to provide consultation regarding implementation of our design parameters.

Deep foundations will provide for the least likelihood of post-construction movement of the structure. Deep foundation system design concepts may be viable for this project; however, we anticipate that only a shallow foundation system design is being considered at this time. We are available to develop deep foundation design parameters if desired.

4.1 Shallow Foundation System Concepts

Subsurface data indicate that GP-GM soils will likely be encountered beneath shallow foundations. Based on the laboratory analysis, the soils encountered in our borings were found to have a no swell potential and low consolidation potential. The anticipated soils at the foundation level are considered good for shallow foundation support.

There are numerous types of shallow foundation systems and variants of each type. Shallow foundation system concepts discussed below include:

- Spread Footings (continuous and isolated) and stem walls
- Mat or Raft Foundations

The integrity and long-term performance of each type of system is influenced by the quality of workmanship which is implemented during construction. It is imperative that all excavation and fill placement operations be conducted by qualified personnel using appropriate equipment and techniques to provide suitable support conditions for the foundation system.

4.1.1 Spread Footings

A spread footing foundation system consists of a footing which dissipates, or spreads, the loads imposed from the stem wall (or beam) from the structure above. We recommend that the footings be supported by a layer of moisture conditioned and compacted natural soil which is overlain by a layer of compacted structural fill material. This concept is outlined below:

- The foundation excavation should be excavated to at least six (6) inches below the proposed footing support elevation.
- The natural soils exposed in the bottom of the excavation should be scarified to a depth of about 6 to 8 inches
- The scarified soil should be thoroughly moisture conditioned to about 2 percent above the laboratory determined optimum moisture content and then compacted.
- After completion of the compaction of the moisture conditioned natural soil a six (6) inch thick layer of granular aggregate base course structural fill material should be placed, moisture conditioned and compacted.
- The moisture conditioned natural soil material and the granular soils should be compacted as discussed under the Compaction Recommendations portion of this report below.

Scattered boulders were encountered in our test borings and large boulders are known to be present throughout the vicinity. Due to the size of the boulders encountered in the vicinity, if encountered, they may be difficult to remove using conventional excavation techniques and equipment. Removal of large boulders can also create a void of loose soil beneath structural components, which may require additional removal of loose soil and replacement with structural fill. In some instances, it may be preferable to leave boulders in place. Reduction in the thickness of the recommended structural fill beneath footings and slabs may also be prudent to limit disturbance to the bearing soils. If large boulders are encountered in the building footprint, a representative of the geotechnical engineer can provide field observations and provide additional recommendations for subgrade preparation.

We recommend that particular attention and detail be given to the following aspects of the project construction for this lot;

- A subsurface drain system should be installed adjacent to the residential structure foundation system. Recommendations for a subsurface drain system concepts are presented in Section 5.0 of this report.
- The exterior foundation backfill must be well compacted and moisture conditioned to above optimum moisture content. Recommendations for exterior foundation backfill are provided later in this report.

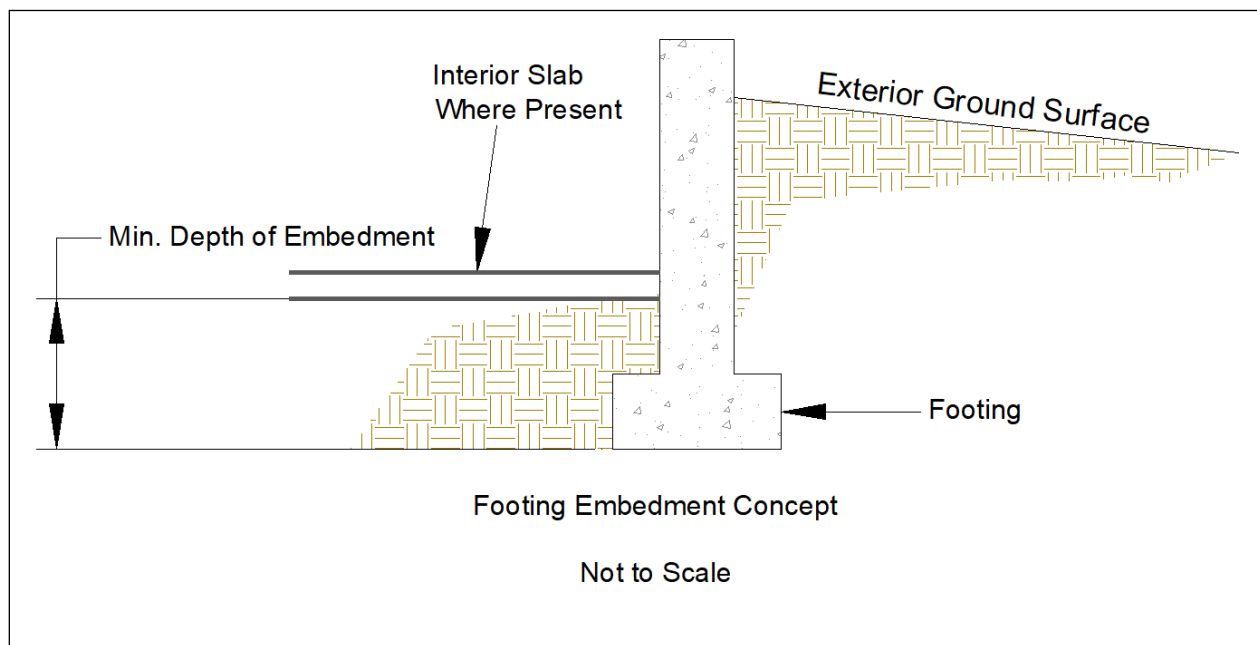
We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain and wall drain

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system. Topographic conditions on the site may influence the ability to install a subsurface drain system which promotes water flow away from the foundation system. The subsurface drain system concept is discussed under the Subsurface Drain System section of this report below.

The footing embedment is a relatively critical, yet often overlooked, aspect of foundation construction. The embedment helps develop the soil bearing capacity, increases resistance of the footing to lateral movement and decreases the potential for rapid moisture changes in the footing support soils, particularly in crawl space areas. Interior footing embedment reduces the exposure of the crawl space support soils to dry crawl space air. Reduction in drying of the support soil helps reduce downward movement of interior footings due to soil shrinkage.

All footings should have a minimum depth of embedment of at least one 1 foot. The embedment concept is shown below.



Spread footings located away from sloped areas may be designed using the bearing capacity information tabulated below.

Minimum Depth of Embedment (Feet)	Continuous Footing Design Capacity (psf)	Isolated Footing Design Capacity (psf)
1	2,000	2,500
2	2,500	3,000
3	3,000	3,500

The bearing capacity values tabulated above may be increased by 20 percent for transient conditions associated with wind and seismic loads. Snow loads are not transient loads.

The bearing capacity values above were based on footing placed directly on the natural soils and on a continuous spread footing width of 1 ½ feet and an isolated footing width of 3 ½ feet. Larger

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footings and/or footings placed on a blanket of compacted structural fill will have a higher design soil bearing capacity. Development of the final footing design width is usually an iterative process based on evaluation of design pressures, footing widths and the thickness of compacted structural fill beneath the footings. We should be contacted as the design process continues to re-evaluate the design capacities above based on the actual proposed footing geometry.

The settlement of the spread footing foundation system will be influenced by the footing size and the imposed loads. We estimated the total post construction settlement of the footings based on our laboratory consolidation data, the type and size of the footing. Our analysis below assumed that the highest bearing capacity value tabulated above was used in the design of the footings. The amount of post construction settlement may be reduced by placing the footings on a blanket of compacted structural fill material.

The estimated settlement for continuous footing with a nominal width of about 1½ to 2½ feet are tabulated below

Thickness of Compacted Structural Fill (feet)	Estimated Settlement (inches)
0	½ - ¾
B/2	¼ - ½
B	About ¼

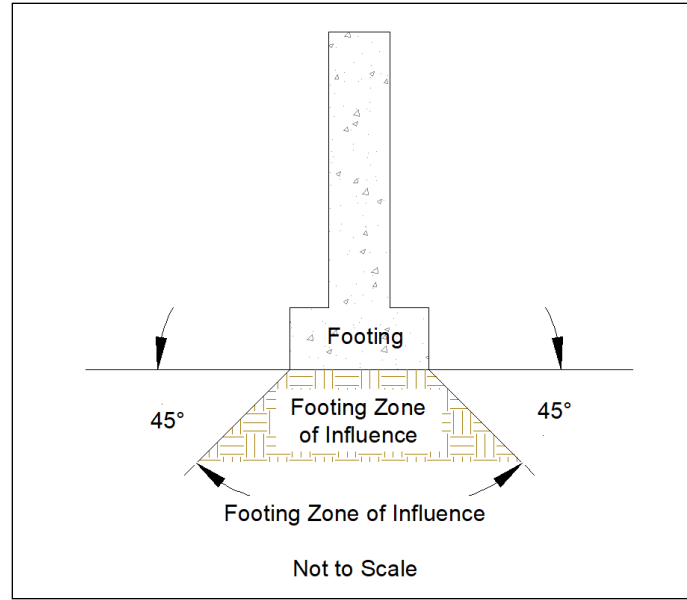
B is the footing width

The estimated settlement for isolated pad footings with a nominal square dimension of about 2 to 3 feet are tabulated below.

Thickness of Compacted Structural Fill (feet)	Estimated Settlement (inches)
0	¾ - 1
B/4	½ - ¾
B/2	¼ - ½
3B/4	About ¼

B is the footing width

The compacted structural fill should be placed and compacted as discussed in the Construction Considerations, “Fill Placement Recommendations” section of this report, below. The zone of influence of the footing (at elevations close to the bottom of the footing) is often approximated as being between two lines subtended at 45 degree angles from each bottom corner of the footing. The compacted structural fill should extend beyond the zone of influence of the footing as shown in the sketch below.



A general and simple rule to apply to the geometry of the compacted structural fill blanket is that it should extend beyond each edge of the footing a distance which is equal to the fill thickness.

We estimate that the differential settlement may be about ½ inch. We estimate that the footings designed and constructed above will have a total post construction settlement of less than 1 inch.

All footings should be support at an elevation deeper than the maximum depth of frost penetration for the area. This recommendation includes exterior isolated footings and column supports. Please contact the local building department for specific frost depth requirements.

The post construction differential settlement may be reduced by designing footings that will apply relatively uniform loads on the support soils. Concentrated loads should be supported by footings that have been designed to impose similar loads as those imposed by adjacent footings.

Under no circumstances should any footing be supported by more than 3 feet of compacted structural fill material unless we are contacted to review the specific conditions supporting these footing locations.

The design concepts and parameters presented above are based on the soil conditions encountered in our test borings. We should be contacted during the initial phases of the foundation excavation at the site to assess the soil support conditions and to verify our recommendations.

4.1.2 General Shallow Foundation Considerations

Some movement and settlement of any shallow foundation system will occur after construction. Movement associated with swelling soils also occurs occasionally. Utility line connections through and foundation or structural component should be appropriately sleeved to reduce the potential for damage to the utility line. Flexible utility line connections will further reduce the potential for damage associated with movement of the structure.

5.0 RETAINING STRUCTURES

We anticipate that laterally loaded walls may be needed for project design. Lateral loads will be imposed on the retaining structures by the adjacent soils and, in some cases, surcharge loads on the retained soils. The loads imposed by the soil are commonly referred to as lateral earth pressures. The magnitude of the lateral earth pressure forces is partially dependent on the soil strength characteristics, the geometry of the ground surface adjacent to the retaining structure, the subsurface water conditions and on surcharge loads.

The retaining structures may be designed using the values tabulated below.

Lateral Earth Pressure Values

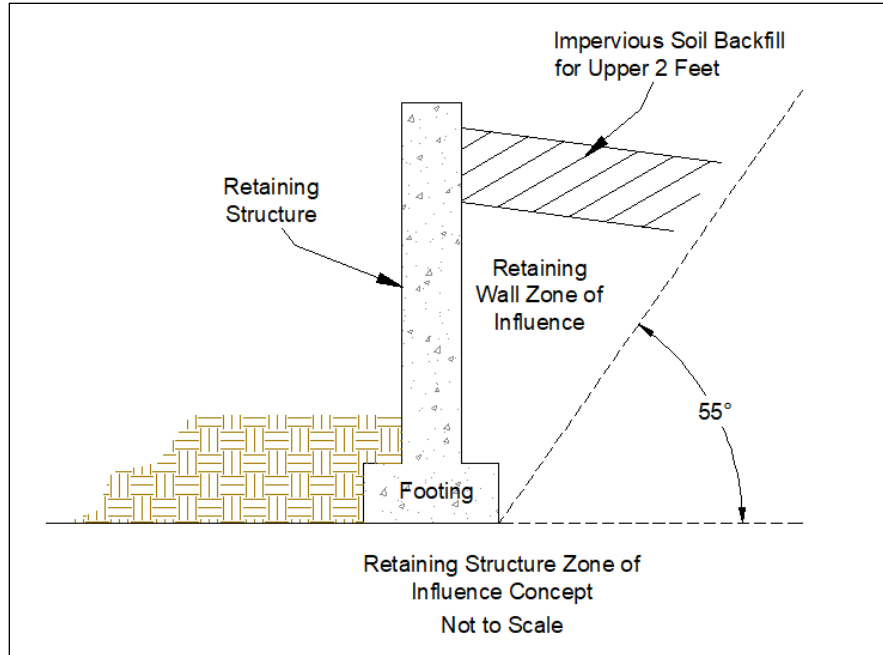
Type of Lateral Earth Pressure	Level Native Soil Backfill (pounds per cubic foot/foot)*	Level Granular Soil Backfill (pounds per cubic foot/foot)
Active	45	35
At-rest	65	55
Passive	340	460
Allowable Coefficient of Friction	0.33	0.45

If the site soils are used as backfill they must be moisture conditioned to above optimum moisture content during the backfill placement.

The granular soil that is used for the retaining wall backfill may be permeable and may allow water migration to the foundation support soils. There are several options available to help reduce water migration to the foundation soils, two of which are discussed here. An impervious geotextile layer and shallow drain system may be incorporated into the backfill, as discussed in Section 9.5, Landscaping Considerations, below. A second option is to place a geotextile filter material on top of the granular soils and above that place about 1½ to 2 feet of moisture conditioned and compacted site clay soils. It should be noted that if the site clay soils are used volume changes may occur which will influence the performance of overlying concrete flatwork or structural components.

The values tabulated above are for well drained backfill soils. The values provided above do not include any forces due to adjacent surcharge loads or sloped soils. If the backfill soils become saturated the imposed lateral earth pressures will be significantly higher than those tabulated above.

The granular imported soil backfill values tabulated above are appropriate for material with an angle of internal friction of 35 degrees, or greater. The granular backfill must be placed within the retaining structure zone of influence as shown below in order for the lateral earth pressure values tabulated above for the granular material to be appropriate.



If an open graded, permeable, granular backfill is chosen it should not extend to the ground surface. Some granular soils allow ready water migration which may result in increased water access to the foundation soils. The upper few feet of the backfill should be constructed using an impervious soil such as silty-clay and clay soils from the project site, if these soils are available. The 55 degree angle shown in the figure above is approximately correct for most clay soils. The angle is defined by $45 + (\phi/2)$ where “ ϕ ” is the angle of internal friction of the soil.

Backfill should not be placed and compacted behind the retaining structure unless approved by the project structural engineer. Backfill placed prior to construction of all appropriate structural members such as floors, or prior to appropriate curing of the retaining wall concrete, may result in severe damage and/or failure of the retaining structure.

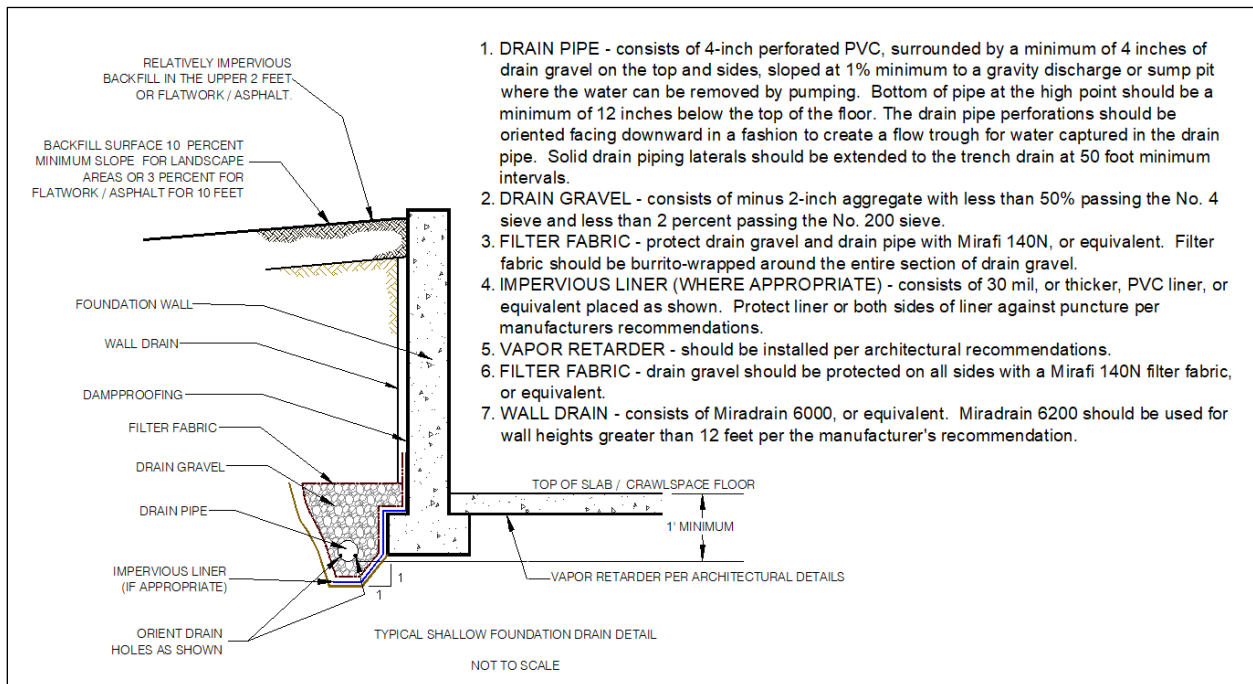
6.0 SUBSURFACE DRAIN SYSTEM

We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain and wall drain system. Exterior retaining structures may be constructed with weep holes to allow subsurface water migration through the retaining structures. Topographic conditions on the site may influence the ability to install a subsurface drain system which promotes water flow away from the foundation system. The subsurface drain system concept is discussed under the Subsurface Drain System section of this report below.

A drain system constructed with a free draining aggregate material and a 4 inch minimum diameter perforated drain pipe should be constructed adjacent to retaining structures and/or adjacent to foundation walls. The drain pipe perforations should be oriented facing downward. The system should be protected from fine soil migration by a fabric-wrapped aggregate which surrounds a rigid perforated pipe. We do not recommend use of flexible corrugated perforated pipe since it is not possible to establish a uniform gradient of the flexible pipe throughout the

drain system alignment. Corrugated drain tile is perforated throughout the entire circumference of the pipe and therefore water can escape from the perforations at undesirable locations after being collected. The nature of the perforations of the corrugated material further decreases its effectiveness as a subsurface drain conduit.

The drain should be placed at each level of excavation and at least 12 inches below lowest adjacent finish floor or crawlspace grade. The drain system pipe should be graded to surface outlets or a sump vault. The drain system should be sloped at a minimum gradient of about 2 percent, but site geometry and topography may influence the actual installed pipe gradient. Water must not be allowed to pool along any portion of the subsurface drain system. An improperly constructed subsurface drain system may promote water infiltration to undesirable locations. The drain system pipe should be surrounded by about 2 to 4 cubic feet per lineal foot of free draining aggregate. If a sump vault and pump are incorporated into the subsurface drain system, care should be taken so that the water pumped from the vault does not recirculate through pervious soils and obtain access to the basement or crawl space areas. An impervious membrane should be included in the drain construction for grade beam and pier systems or other foundation systems such as interrupted footings where a free pathway for water beneath the structure exists. A generalized subsurface drain system concept is shown below.



There are often aspects of each site and structure which require some tailoring of the subsurface drain system to meet the needs of individual projects. Drain systems that are placed adjacent to void forms must include provisions to protect and support the impervious liner adjacent to the void form. We are available to provide consultation for the subsurface drain system for this project, if desired.

Water often will migrate along utility trench excavations. If the utility trench extends from areas above the site, this trench may be a source for subsurface water within a crawl space or basement. We suggest that the utility trench backfill be thoroughly compacted to help reduce the amount of water migration. The subsurface drain system should be designed to collect subsurface water from the utility trench and fractures within the formational material and direct it to surface discharge points.

7.0 CONCRETE FLATWORK

We anticipate that both interior and exterior concrete flatwork will be considered in the project design. Concrete flatwork is typically lightly loaded and has a limited capability to resist shear forces associated with uplift from swelling soils and/or frost heave. It is prudent for the design and construction of concrete flatwork on this project to be able to accommodate some movement associated with swelling soil conditions, if possible.

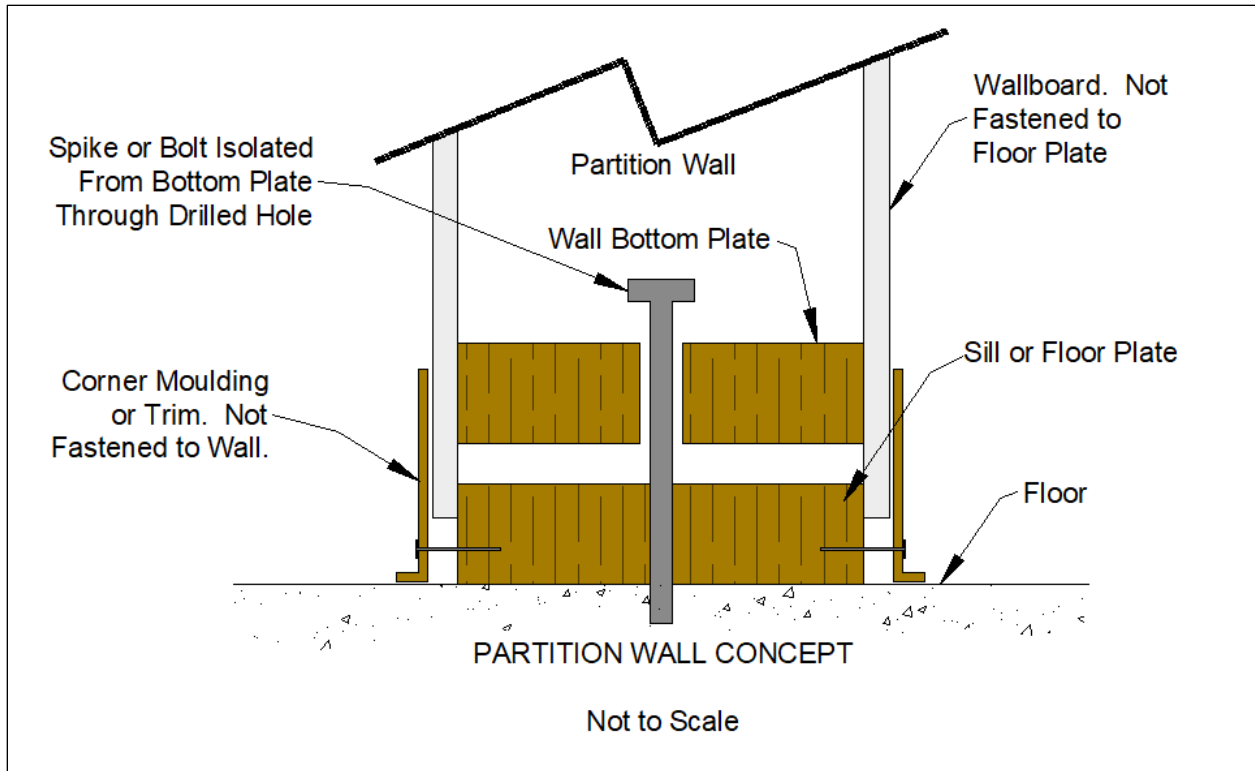
Interior floors supported over a crawl space are less likely to experience movement than are concrete slabs support on grade. The following recommendations are appropriate for garage floor slabs and for interior floor slabs if the owner is willing to accept the risk of potential movement beyond normal tolerances.

7.1 Interior Concrete Slab-on-Grade Floors

A primary goal in the design and construction of concrete slab-on-grade floors is to reduce the amount of post construction uplift associated with swelling soils, or downward movement due to consolidation of soft soils. A parallel goal is to reduce the potential for damage to the structure associated with any movement of the slab-on-grade which may occur. There are limited options available to help mitigate the influence of volume changes in the support soil for concrete slab-on-grade floors, these include:

- Preconstruction scarification, moisture conditioning and re-compaction of the natural soils in areas proposed for support of concrete flatwork, and/or,
- Placement and compaction of granular compacted structural fill material

Damage associated with movement of interior concrete slab-on-grade floor can be reduced by designing the floors as “floating” slabs. The concrete slabs should not be structurally tied to the foundations or the overlying structure. Interior walls or columns should not be supported on the interior floor slabs. Movement of interior walls or columns due to uplift of the floor slab can cause severe damage throughout the structure. Interior walls may be structurally supported from framing above the floor, or interior walls and support columns may be supported on interior portions of the foundation system. Partition walls should be designed and constructed with voids above, and/or below, to allow independent movement of the floor slab. This concept is shown below.



The sketch above provides a concept. If the plans include isolation of the partition walls from the floor slab, the project architect or structural engineer should be contacted to provide specific details and design of the desired system.

If the owner chooses to construct the residence with concrete slab-on-grade floors, the floors should be supported by a layer of granular structural fill overlying the processed, moisture conditioned and compacted natural soils. Interior concrete flatwork, or concrete slab-on-grade floors, should be underlain by 6 inch minimum layer of compacted structural fill that is placed and compacted as discussed in the Construction Considerations, “Fill Placement Recommendations” section of this report, below.

The above recommendations will not prevent slab heave if the expansive soils underlying slabs-on-grade become wet. However, the recommendations will reduce the effects if slab heave occurs. All plumbing lines should be pressure tested before backfilling to help reduce the potential for wetting. The only means to completely mitigate the influence of volume changes on the performance of interior floors is to structurally support the floors over a void space. Floors that are suspended by the foundation system will not be influenced by volume changes in the site soils. The suggestions and recommendations presented below are intended to help reduce the influence of swelling soils on the performance of the concrete slab-on-grade floors.

7.1.1 Capillary and Vapor Moisture Rise

Capillary and vapor moisture rise through the slab support soil may provide a source for moisture in the concrete slab-on-grade floor. This moisture may promote development of mold or mildew in poorly ventilated areas and may influence the performance of floor coverings and mastic placed directly on the floor slabs. The type of floor covering, adhesives used, and other

considerations that are not related to the geotechnical engineering practice will influence the design. The architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of protection required for their products.

Comments for Reduction of Capillary Rise

One option to reduce the potential for capillary rise through the floor slab is to place a layer of clean aggregate material, such as washed concrete aggregate for the upper 4 to 6 inches of fill material supporting the concrete slabs.

Comments for Reduction of Vapor Rise

To reduce vapor rise through the floor slab, a moisture barrier such as a 6 mil (or thicker) plastic, or similar impervious geotextile material is often placed below the floor slab. The material used should be protected from punctures that will occur during the construction process.

There are proprietary barriers that are puncture resistant that may not need the underlying layer of protective material. Some of these barriers are robust material that may be placed below the compacted structural fill layer. We do not recommend placement of the concrete directly on a moisture barrier unless the concrete contractor has had previous experience with curing of concrete placed in this manner. As mentioned above, the architect, builder and particularly the floor covering/adhesive manufacturer should be contacted regarding the appropriate level of moisture and vapor protection required for their products.

7.1.2 Slab Reinforcement Considerations

The project structural engineer should be contacted to provide steel reinforcement design considerations for the proposed floor slabs. Any steel reinforcement placed in the slab should be placed at the appropriate elevations to allow for proper interaction of the reinforcement with tensile stresses in the slab. Reinforcement steel that is allowed to cure at the bottom of the slab will not provide adequate reinforcement.

7.2 Exterior Concrete Flatwork Considerations

Exterior concrete flatwork includes concrete driveway slabs, aprons, patios, and walkways. The desired performance of exterior flatwork typically varies depending on the proposed use of the site and each owner's individual expectations. As with interior flatwork, exterior flatwork is particularly prone to movement and potential damage due to movement of the support soils. This movement and associated damage may be reduced by following the recommendations discussed under interior flatwork, above. Unlike interior flatwork, exterior flatwork may be exposed to frost heave, particularly on sites where the bearing soils have a high silt content. It may be prudent to remove silt soils from exterior flatwork support areas where movement of exterior flatwork will adversely affect the project, such as near the interface between the driveway and the interior garage floor slab. If silt soils are encountered, they should be removed to the maximum depth of frost penetration for the area where movement of exterior flatwork is undesirable.

If some movement of exterior flatwork is acceptable, we suggest that the support areas be prepared by scarification, moisture conditioning and re-compaction of about 6 inches of the natural soils followed by placement of at least 6 inches of compacted granular fill material. The scarified material and granular fill materials should be placed as discussed under the Construction Considerations, “Fill Placement Recommendations” section of this report, below.

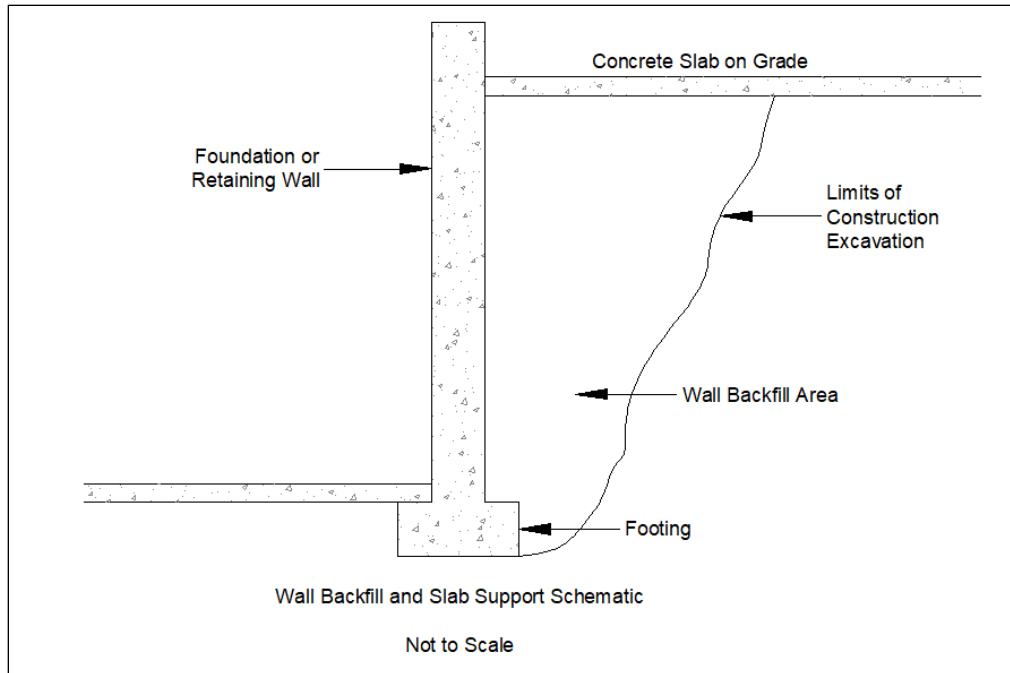
It is important that exterior flatwork be separated from exterior column supports, masonry veneer, finishes and siding. No support columns, for the structure or exterior decks, should be placed on exterior concrete unless movement of the columns will not adversely affect the supported structural components. Movement of exterior flatwork may cause damage if it is in contact with portions of the structure exterior.

It should be noted that silt and silty sand soils located near the ground surface are particularly prone to frost heave. Soils with high silt content have the ability to retain significant moisture. The ability for the soils to accumulate moisture combined with a relatively shallow source of subsurface water and the fact that the winter temperatures in the area often very cold all contribute to a high potential for frost heave of exterior structural components. We recommend that silty soils be removed from the support areas of exterior components that are sensitive to movement associated with frost heave. These soils should be replaced with a material that is not susceptible to frost heave. Aggregate road base and similar materials retain less water than fine-grained soils and are therefore less prone to frost heave. We are available to discuss this concept with you as the plans progress.

Exterior flatwork should not be placed on soils prepared for support of landscaping vegetation. Cultivated soils will not provide suitable support for concrete flatwork.

7.3 General Concrete Flatwork Comments

It is relatively common that both interior and exterior concrete flatwork is supported by areas of fill adjacent to either shallow foundation walls or basement retaining walls. A typical sketch of this condition is shown below.



Settlement of the backfill shown above will create a void and lack of soil support for the portions of the slab over the backfill. Settlement of the fill supporting the concrete flatwork is likely to cause damage to the slab-on-grade. Settlement and associated damage to the concrete flatwork may occur when the backfill is relatively deep, even if the backfill is compacted.

If this condition is likely to exist on this site it may be prudent to design the slab to be structurally supported on the retaining or foundation wall and designed to span to areas away from the backfill area as designed by the project structural engineer. We are available to discuss this with you upon request.

8.0 CONSTRUCTION CONSIDERATIONS

This section of the report provides comments, considerations and recommendations for aspects of the site construction which may influence, or be influenced by the geotechnical engineering considerations discussed above. The information presented below is not intended to discuss all aspects of the site construction conditions and considerations that may be encountered as the project progresses. If any questions arise as a result of our recommendations presented above, or if unexpected subsurface conditions are encountered during construction we should be contacted immediately.

8.1 Fill Placement Recommendations

There are several references throughout this report regarding both natural soil and compacted structural fill recommendations. The recommendations presented below are appropriate for the fill placement considerations discussed throughout the report above.

All areas to receive fill, structural components, or other site improvements should be properly prepared and grubbed at the initiation of the project construction. The grubbing operations

should include scarification and removal of organic material and soil. No fill material or concrete should be placed in areas where existing vegetation or fill material exist.

8.1.1 Natural Soil Fill

Any natural soil used for any fill purpose should be free of all deleterious material, such as organic material and construction debris. Natural soil fill includes excavated and replaced material or in-place scarified material. Our recommendations for placement of natural soil fill are provided below.

- The natural soils should be moisture conditioned, either by addition of water to dry soils, or by processing to allow drying of wet soils. The proposed fill materials should be moisture conditioned to between about optimum and about 2 percent above optimum soil moisture content. This moisture content can be estimated in the field by squeezing a sample of the soil in the palm of the hand. If the material easily makes a cast of soil which remains in-tact, and a minor amount of surface moisture develops on the cast, the material is close to the desired moisture content. Material testing during construction is the best means to assess the soil moisture content.
- Moisture conditioning of clay or silt soils may require many hours of processing. If possible, water should be added and thoroughly mixed into fine grained soil such as clay or silt the day prior to use of the material. This technique will allow for development of a more uniform moisture content and will allow for better compaction of the moisture conditioned materials.
- The moisture conditioned soil should be placed in lifts that do not exceed the capabilities of the compaction equipment used and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.
- We typically recommend a maximum fill lift thickness of 6 inches for hand operated equipment and 8 to 10 inches for larger equipment.
- Care should be exercised in placement of utility trench backfill so that the compaction operations do not damage underlying utilities.
- The maximum recommended lift thickness is about 6 to 8 inches; therefore, the maximum allowable rock size for natural soil fill is about 4 inches. If smaller compaction equipment is being used, such as walk behind compactors in trenches, the maximum rock size should be less than 3 inches. This may require on-site screening or crushing if larger rocks are present.

8.1.2 Granular Compacted Structural Fill

Granular compacted structural fill is referenced in numerous locations throughout the text of this report. Granular compacted structural fill should be constructed using an imported commercially produced rock product such as aggregate road base. Many products other than road base, such as clean aggregate or select crusher fines may be suitable, depending on the intended use. If a specification is needed by the design professional for development of project specifications, a material conforming to the Colorado Department of Transportation (CDOT) "Class 6" aggregate road base material can be specified. This specification can include an option for testing and approval in the event the contractor's desired material does not conform to the Class 6 aggregate specifications. We have provided the CDOT Specifications for Class 6

material below

Grading of CDOT Class 6 Aggregate Base-Course Material	
Sieve Size	Percent Passing Each Sieve
¾ inch	100
#4	30 – 65
#8	25 – 55
#200	3 – 12

Liquid Limit less than 30

All compacted structural fill should be moisture conditioned and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor test. Areas where the structural fill will support traffic loads under concrete slabs or asphalt concrete should be compacted to at least 95 percent of maximum dry density as defined by ASTM D1557, modified Proctor test.

Although clean-screened or washed aggregate may be suitable for use as structural fill on sites with sand or non-expansive silt soils, or on sites where shallow subsurface water is present, clean aggregate materials must not be used on any site where expansive soils exist due to the potential for water to accumulate in the voids of the clean aggregate materials.

Clean aggregate fill, if appropriate for the site soil conditions, must not be placed in lifts exceeding 8 inches and each lift should be thoroughly vibrated, preferably with a plate-type vibratory compactor prior to placing overlying lifts of material or structural components. We should be contacted prior to the use of clean aggregate fill materials to evaluate their suitability for use on this project.

8.1.3 Deep Fill Considerations

Deep fills, in excess of approximately 3 feet, should be avoided where possible. Fill soils will settle over time, even when placed properly per the recommendations contained in this report. Natural soil fill or engineered structural fills placed to our minimum recommended requirements will tend to settle an estimated 1 to 3 percent; therefore, a 3 foot thick fill may settle up to approximately 1 inch over time. A 10 foot thick fill may settle up to approximately 3½ inches even when properly placed. Fill settlement will result in distress and damage to the structures they are intended to support. There are methods to reduce the effects of deep fill settlement such as surcharge loading and surveyed monitoring programs; however, there is a significant time period of monitoring required for this to be successful. A more reliable method is to support structural components with deep foundation systems bearing below the fill envelope. We can provide additional guidance regarding deep fills up on request.

8.2 Excavation Considerations

Unless a specific classification is performed, the site soils should be considered as an Occupational Safety and Health Administration (OSHA) Type C soil and should be sloped and/or benched according to the current OSHA regulations. Excavations should be sloped and benched to prevent wall collapse. Any soil can release suddenly and cave unexpectedly from

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excavation walls, particularly if the soils is very moist, or if fractures within the soil are present. Daily observations of the excavations should be conducted by OSHA competent site personnel to assess safety considerations.

Scattered boulders were encountered in our test borings and large boulders are known to be present throughout the vicinity. Due to the size of the boulders encountered in the vicinity, if encountered, they may be difficult to remove using conventional excavation techniques and equipment. Removal of large boulders can also create a void of loose soil beneath structural components, which may require additional removal of loose soil and replacement with structural fill. In some instances, it may be preferable to leave boulders in place. Reduction in the thickness of the recommended structural fill beneath footings and slabs may also be prudent to limit disturbance to the bearing soils. If large boulders are encountered in the building footprint, a representative of the geotechnical engineer can provide field observations and provide additional recommendations for subgrade preparation.

If possible, excavations should be constructed to allow for water flow from the excavation the event of precipitation during construction. If this is not possible it may be necessary to remove water from snowmelt or precipitation from the foundation excavations to help reduce the influence of this water on the soil support conditions and the site construction characteristics.

8.2.1 Excavation Cut Slopes

We anticipate that some permanent excavation cut slopes may be included in the site development. Temporary cut slopes should not exceed 5 feet in height and should not be steeper than about 1:1 (horizontal to vertical) for most soils. Permanent cut slopes greater than 5 feet or steeper than 2½:1 must be analyzed on a site specific basis.

We did not observe evidence of existing unstable slope areas influencing the site, but due to the steepness and extent of the slopes in the area we suggest that the magnitude of the proposed excavation slopes be minimized and/or supported by retaining structures.

8.3 Utility Considerations

Subsurface utility trenches will be constructed as part of the site development. Utility line backfill often becomes a conduit for post construction water migration. If utility line trenches approach the proposed project site from above, water migrating along the utility line and/or backfill may have direct access to the portions of the proposed structure where the utility line penetrations are made through the foundation system. The foundation soils in the vicinity of the utility line penetration may be influenced by the additional subsurface water. There are a few options to help mitigate water migration along utility line backfill. Backfill bulkheads constructed with high clay content soils and/or placement of subsurface drains to promote utility line water discharge away from the foundation support soil.

Some movement of all structural components is normal and expected. The amount of movement may be greater on sites with problematic soil conditions. Utility line penetrations through any walls or floor slabs should be sleeved so that movement of the walls or slabs does not induce movement or stress in the utility line. Utility connections should be flexible to allow

for some movement of the floor slab.

If utility line trenches are excavated using blasting techniques it is relatively common for surface and subsurface water to migrate along the fractures in the rock that may be created by blasting. If this water gains access to a utility line trench that has a gradient down toward the structure the water may gain access to the foundation support materials and/or subsurface portions of the proposed structure. Provisions should be made in the project construction plans to create an impervious barrier to prevent water from migrating into undesirable locations.

8.4 Exterior Grading and Drainage Comments

The following recommendations should be following during construction and maintained for the life of the structure with regards to exterior grading and surface drainage.

- The ground surface adjacent to the structure should be sloped to promote water flow away from the foundation system and flatwork.
- Snow storage areas should not be located in areas which will allow for snowmelt water access to support soils for the foundation system or flatwork.
- The project civil engineer, architect or builder should develop a drainage scheme for the site. We typically recommend the ground surface surrounding the exterior of the building be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 12 inches in the first 10 feet in unpaved areas and a minimum slope of 3 inches in the first 10 feet in paved areas.
- Water flow from the roof of the structure should be captured and directed away from the structure. If the roof water is collected in an eave gutter system, or similar, the discharge points of the system must be located away from areas where the water will have access to the foundation backfill or any structure support soils. If downspouts are used, provisions should be made to either collect or direct the water away from the structure.
- Care should be taken to not direct water onto adjacent property or to areas that would negatively influence existing structures or improvements.

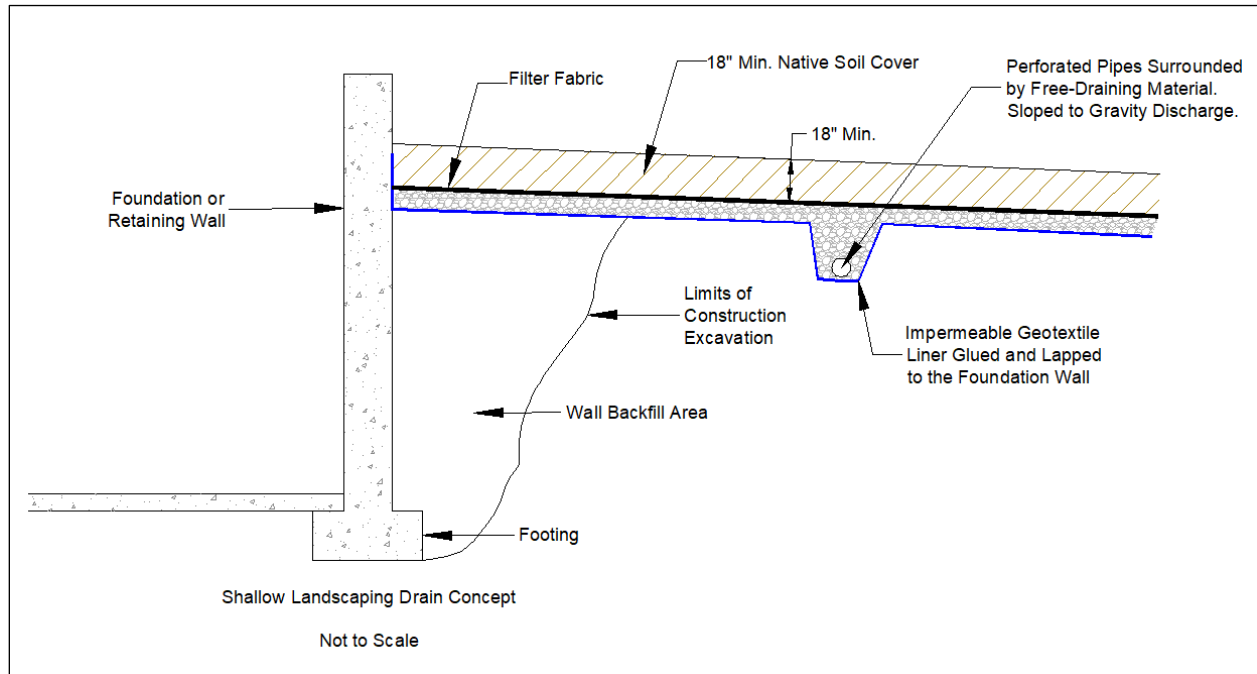
8.5 Landscaping Considerations

We recommend against construction of landscaping which requires excessive irrigation. Generally landscaping which uses abundant water requires that the landscaping contractor install topsoil which will retain moisture. The topsoil is often placed in flattened areas near the structure to further trap water and reduce water migration from away from the landscaped areas. Unfortunately, almost all aspects of landscape construction and development of lush vegetation are contrary to the establishment of a relatively dry area adjacent to the foundation walls. Excess water from landscaped areas near the structure can migrate to the foundation system or flatwork support soils, which can result in volume changes in these soils.

A relatively common concept used to collect and subsequently reduce the amount of excess irrigation water is to glue or attach an impermeable geotextile fabric or heavy mill plastic to the foundation wall and extend it below the topsoil which is used to establish the landscape vegetation. A thin layer of sand can be placed on top of the geotextile material to both protect the geotextile from punctures and to serve as a medium to promote water migration to the

July 9, 2020

collection trench and perforated pipe. The landscape architect or contractor should be contacted for additional information regarding specific construction considerations for this concept which is shown in the sketch below.



A free draining aggregate or sand may be placed in the collection trench around the perforated pipe. The perforated pipe should be graded to allow for positive flow of excess irrigation water away from the structure or other area where additional subsurface water is undesired. Preferably the geotextile material should extend at least 10 or more feet from the foundation system.

Care should be taken to not place exterior flatwork such as sidewalks or driveways on soils that have been tilled and prepared for landscaping. Tilled soils will settle which can cause damage to the overlying flatwork. Tilled soils placed on sloped areas often “creep” down-slope. Any structure or structural component placed on this material will move down-slope with the tilled soil and may become damaged.

The landscape drain system concept provided above is optional for this site and provided only if there is a desire to reduce the potential for subsurface water migration to below grade finished areas or crawl space areas. Often this concept is implemented only on the northern sides of structures and/or where snow may accumulate and melt water may migrate toward subsurface areas under the structure.

8.6 Soil Sulfate and Corrosion Issues

The requested scope of our services did not include assessment of the chemical constituents of corrosion potential of the site soils. Most soils in southwest Colorado are not typically corrosive to concrete. There has not been a history of damage to concrete due to sulfate corrosion in the area.

We are available to perform soluble sulfate content tests to assess the corrosion potential of the soils on concrete if desired.

8.7 Radon Issues

The requested scope of service of this report did not include assessment of the site soils for radon production. Many soils and formational materials in western Colorado produce Radon gas. The structure should be appropriately ventilated to reduce the accumulation of Radon gas in the structure. Several Federal Government agencies including the Environmental Protection Agency (EPA) have information and guidelines available for Radon considerations and home construction. If a radon survey of the site soils is desired, please contact us.

8.8 Mold and Other Biological Contaminants

Our services do not include determining the presence, prevention or possibility of mold or other biological contaminants developing in the future. If the client is concerned about mold or other biological contaminants, a professional in this special field of practice should be consulted.

9.0 CONSTRUCTION MONITORING AND TESTING

Engineering observation of subgrade bearing conditions, compaction testing of fill material and testing of foundation concrete are equally important tasks that should be performed by the geotechnical engineering consultant during construction. We should be contacted during the construction phase of the project and/or if any questions or comments arise as a result of the information presented below. It is common for unforeseen, or otherwise variable subsurface soil and water conditions to be encountered during construction. As discussed in our proposal for our services, it is imperative that we be contacted during the foundation excavation stage of the project to verify that the conditions encountered in our field exploration were representative of those encountered during construction. Our general recommendations for construction monitoring and testing are provided below.

- Consultation with design professionals during the design phases: This is important to ensure that the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.
- Grading Plan Review: A grading plan was not available for our review at the time of this report. A grading plan with finished floor elevations for the proposed construction should be prepared by a civil engineer licensed in the State of Colorado. Trautner Geotech should be provided with grading plans once they are complete to determine if our recommendations based on the assumed bearing elevations are appropriate.
- Observation and monitoring during construction: A representative of the Geotechnical engineer from our firm should observe the foundation excavation, earthwork, and foundation phases of the work to determine that subsurface conditions are compatible with those used in the analysis and design and our recommendations have been properly implemented. Placement of backfill should be observed and tested to judge whether the proper placement conditions have been achieved. Compaction tests should be performed on each lift of material placed in areas proposed for support of structural components.

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- We recommend a representative of the geotechnical engineer observe the drain and dampproofing phases of the work to judge whether our recommendations have been properly implemented.
- If asphaltic concrete is placed for driveways or aprons near the structure, we are available to provide testing of these materials during placement.

10.0 CONCLUSIONS

While we feel that it is feasible to develop this site as planned using relatively conventional techniques to the area, we feel that it is prudent for us to be part of the continuing design of this project to review and provide consultation in regard to the proposed development scheme as the project progresses to aid in the proper interpretation and implementation of the recommendations presented in this report. This consultation should be incorporated in the project development prior to construction at the site.

We recommend that we be contacted during the design and construction phase of this project to aid in the implementation of our recommendations. Please contact us immediately if you have any questions, or if any of the information presented above is not appropriate for the proposed site construction.

11.0 LIMITATIONS

This study has been conducted based on the geotechnical engineering standards of care in this area at the time this report was prepared. We make no warranty as to the recommendations contained in this report, either expressed or implied. The information presented in this report is based on our understanding of the proposed construction that was provided to us and on the data obtained from our field and laboratory studies. Our recommendations are based on limited field and laboratory sampling and testing. Unexpected subsurface conditions encountered during construction may alter our recommendations. We should be contacted during construction to observe the exposed subsurface soil conditions to provide comments and verification of our recommendations.

The recommendations presented above are intended to be used only for this project site and the proposed construction which was provided to us. The recommendations presented above are not suitable for adjacent project sites, or for proposed construction that is different than that outlined for this study.

This report provides geotechnical engineering design parameters, but does not provide foundation design or design of structure components. The project architect, designer or structural engineer must be contacted to provide a design based on the information presented in this report.

This report does not provide an environmental assessment nor does it provide environmental recommendations such as those relating to Radon or mold considerations. If recommendation relative to these or other environmental topics are needed and environmental specialist should be contacted.

Project No. 56083GE
July 9, 2020

The findings of this report are valid as of the present date. However, changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or the broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

We are available to review and tailor our recommendations as the project progresses and additional information which may influence our recommendations becomes available.

Please contact us if you have any questions, or if we may be of additional service.

Respectfully,
TRAUTNER GEOTECH



Tom R. Harrison, P.E.
Geotechnical Engineer


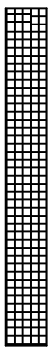
APPENDIX A

Field Study Results

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 3.5 feet
 Location : See Figure in Report

LOG OF BORING TB-1

Lot 4 Cole Ranch
 Mr. George Riley
 C/O Mr. Christopher Clemmons
 Mountain Grain Architecture
 Project Number: 56083 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	■ Mod. California Sampler ▣ Standard Split Spoon ▨ Bag Sample	▼ Water Level During Drilling ▽ Water Level After Drilling						
0								
1								
2			GP-GM			12/6 23/6		
3						10/1 bounce		
4								Auger refusal on cobble/boulder at 3.5 feet

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 2.5 feet
 Location : See Figure in Report

LOG OF BORING TB-2

Lot 4 Cole Ranch
 Mr. George Riley
 C/O Mr. Christopher Clemmons
 Mountain Grain Architecture
 Project Number: 56083 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	Mod. California Sampler Standard Split Spoon Bag Sample	Water Level During Drilling Water Level After Drilling						
0			GP-GM					
1								
2								
2.5								Auger refusal on cobble/boulder at 2.5 feet
3								

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 5.5 feet
 Location : See Figure in Report

LOG OF BORING TB-3

Lot 4 Cole Ranch
 Mr. George Riley
 C/O Mr. Christopher Clemmons
 Mountain Grain Architecture
 Project Number: 56083 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	■ Mod. California Sampler ▣ Standard Split Spoon ▨ Bag Sample	▼ Water Level During Drilling ▽ Water Level After Drilling						
0								Organics in top 6 inches.
1								
2						4/6		
3			GP-GM			8/6		Bag sample taken from 2 to 4 feet.
4						12/6		
5								
6								Auger refusal on cobble/boulder at 5.5 feet

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 8 feet
 Location : See Figure in Report

LOG OF BORING TB-4

Lot 4 Cole Ranch
 Mr. George Riley
 C/O Mr. Christopher Clemmons
 Mountain Grain Architecture

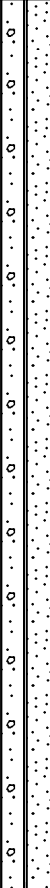
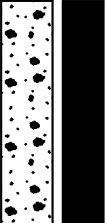
Project Number: 56083 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	Mod. California Sampler Standard Split Spoon Bag Sample	Water Level During Drilling Water Level After Drilling						
0								
0 - 3			GM					
3 - 8			GP					
8								Auger refusal on cobble/boulder at 8 feet

Field Engineer : T. Harrison
 Hole Diameter : 4" Solid
 Drilling Method : Continuous Flight Auger
 Sampling Method : Mod. California Sampler
 Date Drilled : 06/08/2020
 Total Depth (approx.) : 2.5 feet
 Location : See Figure in Report

LOG OF BORING TB-5

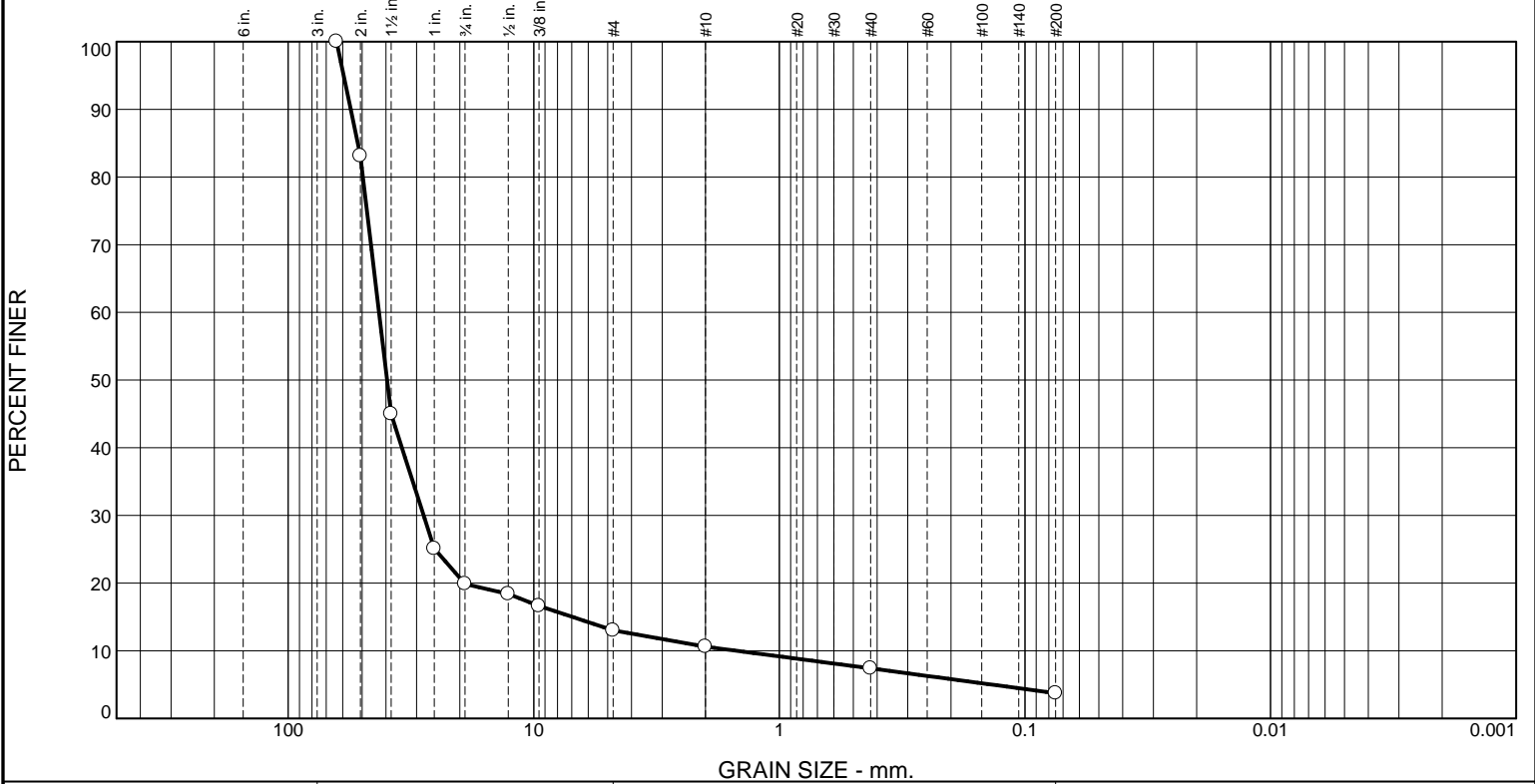
Lot 4 Cole Ranch
 Mr. George Riley
 C/O Mr. Christopher Clemmons
 Mountain Grain Architecture
 Project Number: 56083 GE

Depth in feet	Sample Type	Water Level	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
	Mod. California Sampler Standard Split Spoon Bag Sample	Water Level During Drilling Water Level After Drilling						
0								
1			GM-SM					
2			GP		2/5 bounce			Organics down to 2 feet.
2.5								Auger refusal on cobble/boulder at 2.5 feet
3								

APPENDIX B

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	80	7	2	4	3	4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100		
2	83		
1.5	45		
1	25		
.75	20		
.5	18		
.375	17		
#4	13		
#10	11		
#40	7		
#200	4		

Material Description

GP-Poorly Graded Gravel

PL= 32	Atterberg Limits LL= 39	PI= 7
--------	-----------------------------------	-------

Coefficients D ₉₀ = 55.6412	D ₈₅ = 52.0844	D ₆₀ = 42.6690
D ₅₀ = 39.5671	D ₃₀ = 28.0714	D ₁₅ = 6.9531
D ₁₀ = 1.4923	C _u = 28.59	C _c = 12.38

USCS= GP	Classification AASHTO=	A-2-4(0)
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Remarks

* (no specification provided)

Location: Test Boring 2
Sample Number: 12406-B

Depth: 0'-2 1/2'

Date: 6-8-20



Client: Mr. Christopher Clemmons RA
Project: Lot 4 Cole Ranch, Silverton, CO

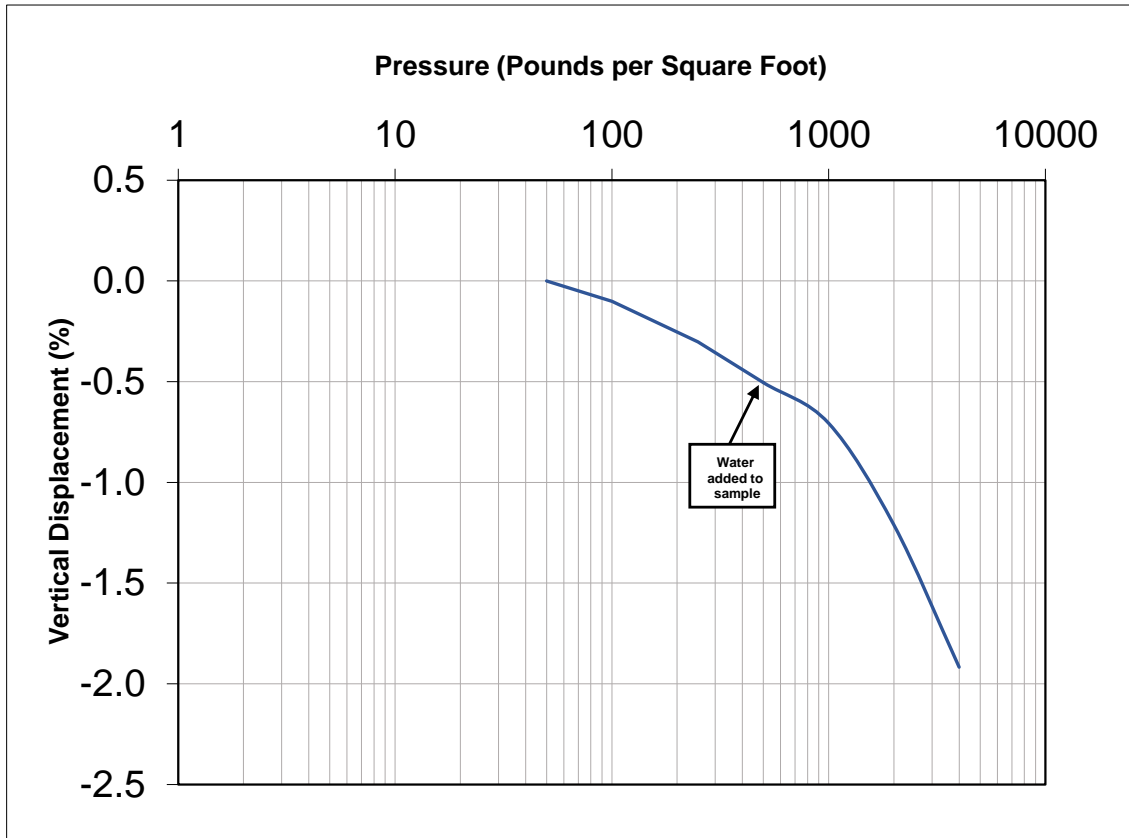
Project No: 56083GE

Figure 4.1

Tested By: N. Winiacki

Checked By: C. DeLeon

SWELL - CONSOLIDATION TEST

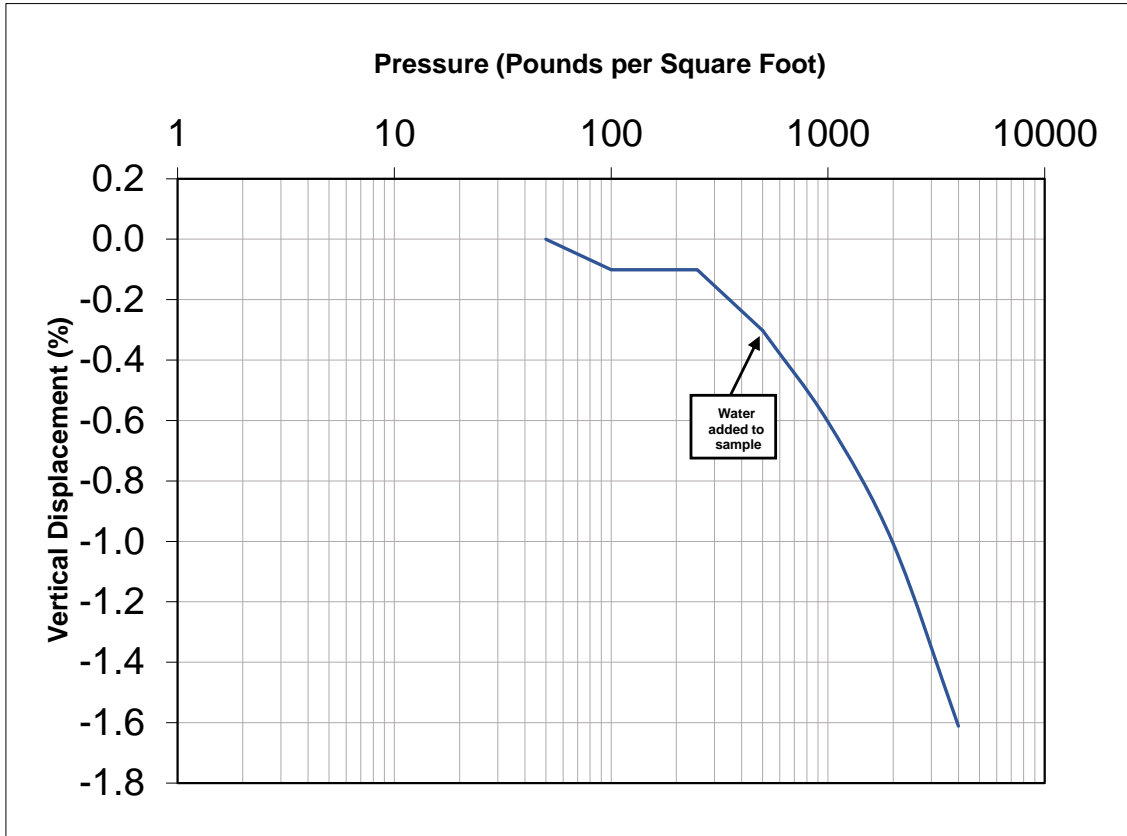


SUMMARY OF TEST RESULTS		
Sample Source:	TB-1 @ 2'	
Visual Soil Description:	GC	
Swell Potential (%)	0.0%	
Constant Volume Swell Pressure (lb/ft ²):	Consolidation	
	Initial	Final
Moisture Content (%):	7.0	15.8
Dry Density (lb/ft ³):	114.0	116.3
Height (in.):	0.991	0.972
Diameter (in.):	1.94	1.94

Note: Remolded Sample; Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	56083 GE
Sample ID:	12406-A
Figure:	4.2

SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-5 @ 2'	
Visual Soil Description:	GP-GC	
Swell Potential (%)	0.0%	
Constant Volume Swell Pressure (lb/ft ²):	0	
	Initial	Final
Moisture Content (%):	7.6	17.9
Dry Density (lb/ft ³):	110.5	112.0
Height (in.):	0.993	0.977
Diameter (in.):	1.94	1.94

Note: Remolded Sample: Molded from the portion of sample passing a #10 sieve. Consolidated under 500 PSF prior to initiating load sequence and wetting. Initial values represent the conditions under 50 PSF following the pre-consolidation under 500 PSF.

Project Number:	56083GE
Sample ID:	12406-G
Figure:	4.3

Wetlands Setbacks

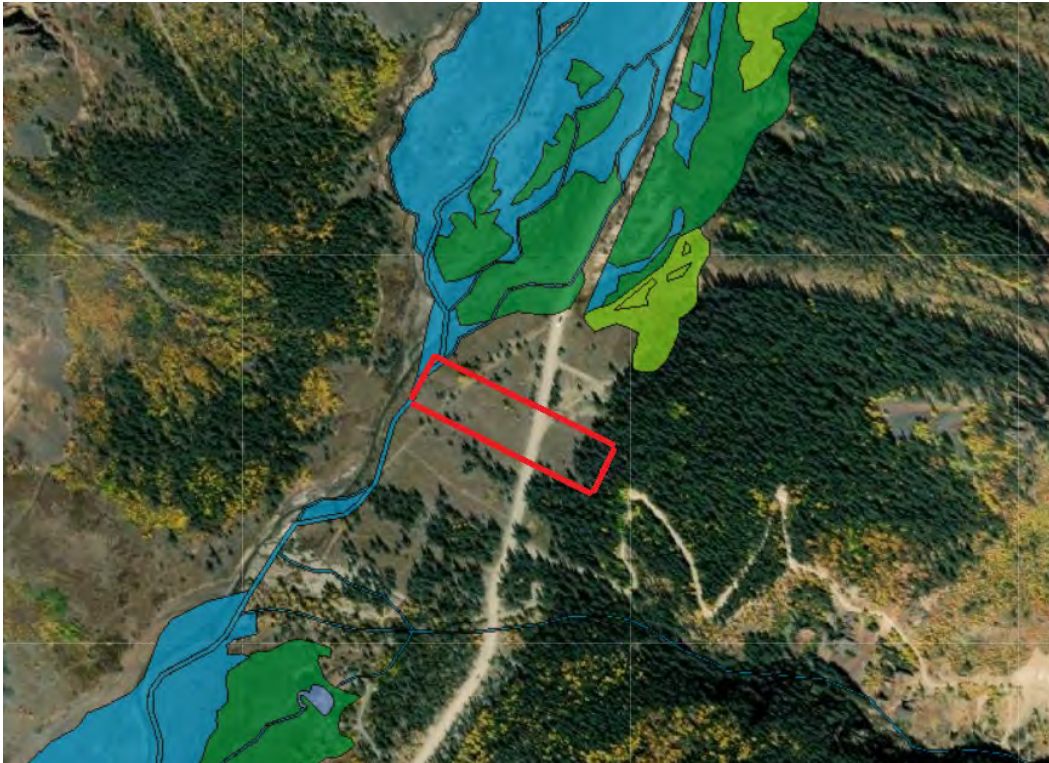
The Applicant acknowledges the required minimum setbacks between proposed improvements and any wetlands present on the property, however no wetlands appear to be on the property. Although no specified required setback is identified for a wetland, we will assume the most stringent setback of 40 feet applies. Per section 4-110.2 of the County Land Use Code:

Areas subject to hazardous conditions, such as avalanche, flood, land slide, rock fall, mud flow, open mine shaft, corrosive water, etc., shall be identified and shall not be built upon or used until satisfactory plans have been approved by the County for eliminating or appropriately mitigating such hazards. The provisions of Chapters 8, 9, 10 and 11 shall govern the evaluation of those natural hazards. Natural features such as riparian areas, wetlands, fens, tarns, springs, streams, rivers, ponds, lakes shall be protected from development with adequate setbacks for any building and other site improvements; minimum required setbacks are:

Rivers and Streams: 40 feet for residential development.

Fens: 30 feet for all development.

Below is a map from the **National Wetlands Inventory** with the property outlined (approximately) in red. The location of proposed improvements far exceeds the minimum required setback for a residential development from rivers/streams of 40 feet. No wetlands appear to be on the property.



Scenic Quality Report

1. Introduction and Site Location

San Juan County regulations state the following:

All residential development shall be required to submit a Scenic Quality Report at the time of sketch plan submittal.

The following is a Scenic Quality Report for the proposed Riley Family Cabin and storage shed located on Lot 2 of the Cole Ranch Subdivision. Cole Ranch is an approved Subdivision which was established for residential use in 2001. This subdivision is located between Middleton and Eureka. The project site is accessed by CR 2 which runs north/south through the lot, continuing north towards Eureka and south to Silverton from the property.

The project site is located within San Juan County's Future Land Use Plan "Economic Corridor". These economic corridors are suitable for residential development because of their moderately sloping terrain and year-round access.

A Vicinity Map showing the general project location is included in this submittal for your reference.

2. Project Site and Proposed Cabin and Storage Shed Location

County regulations require that this Scenic Quality Report adhere to the following:

The designated view sheds shall include natural and historic features as seen from and toward the site. Provide written descriptions of these view sheds and how they will be preserved. Existing site photos and graphic depictions of the proposed development shall be submitted so that staff, the Planning Commission and the Board of County Commissioners can assess the visual impacts of the project on the view shed and the effectiveness of proposed mitigation measures.

The project site, Lot 2 of Cole Ranch Subdivision, consists of 4.17 acres with 2.57 acres being open space. The lot is divided by CR 2, which runs north/south through the lot, splitting it into an east and west portion. The majority of Lot 2 is located on the west side of CR 2, which consists of a gently sloping grassy meadow with sporadic pine, aspen, and shrubs. The portion of the lot east of CR 2 is also moderately sloped, with steeper terrain and dense pine forest along the eastern-most portion of the property.

The approximate elevation of the cabin site is 9,820 ft, and the storage shed is approximately 9,804 feet. The slope of the building areas varies between approximately 5% and 9%. The Animas River runs along the westernmost edge of the property.

The proposed siting for the cabin is within the original approved building envelope on the east side of CR 2 as shown on the recorded plat. This siting best utilizes the natural topography and least vegetated area, which will require less tree removal and disturbance to the site. The proposed storage shed will be located on the west side of CR 2 and requires minimal site clearing due to its siting on the property. Both proposed buildings will be accessed with new driveways from CR 2.

3. Visibility of the Cabin and Storage Shed from CR 2

CR 2 passes through Lot 2 running north/south and provides access between Silverton and Eureka.

The proposed cabin will be visible looking east from CR 2 while a driver is traveling in either direction. The Applicant plans to plant screening trees consisting of mainly evergreen and aspens between the cabin and CR 2 to provide privacy to the occupants as well as block visibility from drivers on CR 2.

The proposed storage shed will be visible looking west from CR 2 while a driver is traveling in either direction. Since the proposed siting for the storage shed is setback from CR 2 approximately 185', it will be less visible to a driver traveling on CR 2 in either direction. The Applicant plans to plant screening trees consisting of evergreens and aspens to provide additional privacy and block visibility from drivers traveling on CR 2.

To provide further security and a visual depth layering for drivers traveling on CR 2, the Applicant is also proposing a 5' tall steel rail fence that runs along both the east and west side of CR 2.

The images on the two following pages shows the proposed cabin and storage shed superimposed onto the site to show approximate scale and visibility from CR 2. Additional screening trees are shown as the Applicant intends to vegetate the area between the home and CR 2.

4. Views from the Proposed Cabin

In the County Scenic Quality Report regulations, it is requested that information about the view from the cabin is provided. Photos are included on sheets following the Rendering Sheets 3D-1 and 3D-2, which show views from the proposed cabin looking approximately towards the north, south, east and west.



PERSPECTIVE VIEW OF **PROPOSED CABIN** AS SEEN LOOKING EAST FROM COUNTY ROAD 2

**MOUNTAIN
grain**
ARCHITECTURE
DURANGO, CO 81301
970|515|7882

NEW CONSTRUCTION OF::	PROJECT #:	21-12
	ASSESSOR'S PARCEL #:	47730300057000
THE RILEY FAMILY CABIN		
4728 COUNTY ROAD 2 SILVERTON, CO 81433		
FOR IMPROVEMENT PERMIT 04.06.2022		

SHEET TITLE:	CABIN RENDERING
SHEET:	3D-1
SCALE:	



PERSPECTIVE VIEW OF **PROPOSED STORAGE SHED** AS SEEN LOOKING WEST FROM COUNTY ROAD 2



MOUNTAIN
grain
ARCHITECTURE
DURANGO, CO 81301
970|515|7882

PROJECT #: 21-12	ASSESSOR'S PARCEL #: 47730300057000	NEW CONSTRUCTION OF: THE RILEY FAMILY CABIN	4728 COUNTY ROAD 2 SILVERTON, CO 81433	FOR IMPROVEMENT PERMIT 04.06.2022

SHEET TITLE:	STORAGE SHED RENDERING
SHEET:	3D-2
SCALE:	

Riley Family Cabin
Cole Ranch Subdivision Lot 2
Scenic Quality Report



VIEW NORTH



VIEW EAST

Riley Family Cabin
Cole Ranch Subdivision Lot 2
Scenic Quality Report



VIEW SOUTH



VIEW WEST

5. Views from the Proposed Storage Shed

Photos are included below that show views from the proposed storage shed looking approximately towards the north, south, east and west.



VIEW NORTH



VIEW EAST

Riley Family Cabin
Cole Ranch Subdivision Lot 2
Scenic Quality Report



VIEW SOUTH



VIEW WEST

6. Minimizing Visibility from Public Lands and Existing Trails

The County Scenic Quality regulations require the following information:

Evidence shall be provided to show that the location of the structure is designed to minimize the visual impacts and that it does not detract from the scenic quality of adjacent public lands, existing trails or historic resources.

The location of the cabin, which is the larger of the two proposed structures, was selected to balance views, site accessibility and the restrictions outlined by the Cole Ranch subdivision. The property is bordered almost entirely by other private lots within Cole Ranch Subdivision, as well as private forest land bordering the east property line. The Applicant plans to plant screening trees along CR 2 to minimize the visibility from travelers on CR 2.

The storage shed is approximately 185' from CR 2 and at lower elevation than the road, which helps reduce the visibility of the structure of a person traveling on CR 2. The Applicant plans to plant screening trees to minimize visibility from travelers on CR 2 as shown on the site plan included with this application. The scenic quality as viewed from public lands, trails, or historic resources has been preserved to the best of the applicant's and designer's ability and knowledge.

7. Building Design and the Natural Topography and Vegetation

County regulations require that the Scenic Quality Report includes information regarding the following:

Evidence to demonstrate that the site improvements are designed and/or oriented in ways that allow them to blend in with and utilize the natural topography and vegetation. The report shall include, but not be limited to, site photos, perspective sketches, photo-simulations and/or three-dimensional models at an appropriate scale.

As stated previously in this report, the proposed cabin is sited within the original approved building envelope on the east side of CR 2. This siting best utilizes the natural topography and least vegetated area within the regulated building envelope, which will require less tree removal and disturbance to the site. The elevation at the cabin is approximately 9,820 feet, which is six feet higher than CR 2 at the proposed driveway access at 9,814 feet. The proposed storage shed will be located on the west side of CR 2 and requires minimal site clearing due to its siting on the property. The floor elevation of the storage shed at 9,804 feet is approximately 10 feet lower than CR 2. The proposed cabin and storage shed designs are shown on the Applicant's draft building plans included with this application.

8. Topsoil, Utilities, Lighting and Driveways

This section of the Scenic Report describes design features associated with topsoil, location of utilities, exterior lighting and proposed driveways.

a) Topsoil

County regulations require that the project should include the following:

Plans to remove and save topsoil, prior to any grading or excavation, and how it will be replaced and reused for re-grading and re-vegetation purposes.

Most of the topsoil removed at the cabin area during construction will likely be used as backfill on the west side of the building's foundation in order to create better frost protection. Similar to the cabin, the storage shed will also use topsoil as backfill on the west side of the building's foundation. Any additional topsoil found will be separately stockpiled on-site, to be used for future landscaping.

b) Utilities

County regulations require that the project should include the following:

Location and installation of utilities in ways that will minimize impacts to the view shed and natural environment.

The project includes the following proposed utilities: an underground septic system leach field, an underground propane tank, and an underground water well and associated piping. The Applicant plans to tie into the existing pad transformer and construct an underground electric service. The septic system location was selected based on the regulations and setbacks of San Juan Basin Public Health Department and San Juan County and is shown on the site plan included with this application. The Applicant plans to tie into the existing phone line located on the east side of CR 2. The primary heat source is proposed to be electric radiant heat with supplemental wood stove, neither of which are anticipated to have significant impact to the natural environment. All the utilities will be installed with the least amount of disturbance possible to the natural environment, including vegetation preservation and using existing utilities where possible.

c) Exterior Lighting

County regulations require that the project should include the following:

Exterior lighting shall preserve the Dark Sky environment and view of the stars. Provisions requiring shielding of exterior lighting to prevent direct visibility of light bulbs from off-site, directing of all exterior lighting toward either the ground or the surface of a building and prohibiting high intensity sodium vapor or similar lighting.

The proposed exterior lighting for the project will preserve the Dark Sky environment and will be in conformance with the exterior lighting requirements of San Juan County. The exterior lighting proposed will provide necessary lighting to safely access the cabin, as well as additional screened down-lighting at the north-facing patio. All exterior lighting will be fully shielded, utilize LED bulbs, will be compatible with the rural mountain character of the area.

d) Driveways

County regulations require that the project should include the following:

Design and construction plans for roads and associated structures that bear a logical relationship to existing topography to minimize the need for cuts and fills.

There are currently two proposed driveways for this project. The primary driveway to access the cabin is located off the east side of CR 2. This driveway has a starting elevation of approximate 9,814 and ascends 6-feet to the cabin elevation of 9,820. The secondary driveway to access the storage shed is located off the west side of CR 2, aligned with and directly across the road from the primary driveway. This driveway has a starting elevation of approximately 9,814 and descends to 9,804. Both driveways will maintain a similar slope to the adjacent undisturbed land, minimizing cut and fill and controlling erosion. A low retaining wall will be constructed as necessary on the east side of the cabin driveway.

9. Building Materials

County regulations require that the Scenic Quality Report includes information regarding the following:

Provide written descriptions and photos of the proposed building materials, colors and textures. Utilizing and integrating elements, colors and textures found naturally in the landscape and prohibition of reflective materials, such as highly reflective glass or metals.

The proposed materials, colors and textures of the cabin, garage and storage shed are proposed to consist of the following:

- Vintage metal siding. The Vintage metal provides a pre-aged aesthetic with a protective finish, resulting in little additional weathering and maintenance.
- Dark bronze metal roof with matching trim

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- Dark bronze window sashes, frames and trim
- Mill finished steel exposed structure and accents
- Stacked river stone used as facing accents, such as at the outdoor fireplace.

The following photos are examples of the proposed building materials selected by the Applicant:



10. Conclusion

The proposed project outlined in this report aims to conform to the San Juan County Scenic Quality Regulations as summarized below:

- The proposed cabin is situated within the original approved building envelope on the east side of CR 2, which abides by the Subdivision requirements and avoids steep topography for the building site. Additional screening trees will be provided along CR 2 as shown on the site plan and as required by the County.
- The proposed storage shed is single story and is downhill from CR 2, which helps to minimize the overall and perceived height. Additional screening trees will be provided along CR 2 as shown on the site plan and as required by the County.
- The proposed driveways to the cabin and storage shed will balance cut and fill and minimize impact to the natural landscape. Applicant will revegetate as necessary to reestablish native vegetation.
- All exterior lighting will comply with the Dark Sky regulations of San Juan County.
- The material palette chosen for the cabin and storage shed combines subtle, vintage, weathered metals, and natural stone which will mesh well with the natural surroundings and nod to the mining history of San Juan County.

Thank you for your review and consideration of the proposed Riley Family Cabin at Cole Ranch. If you have any questions or need additional information, please contact Mountain Grain, LLC at (970) 515-7882 or George Riley at (505) 320-1145.