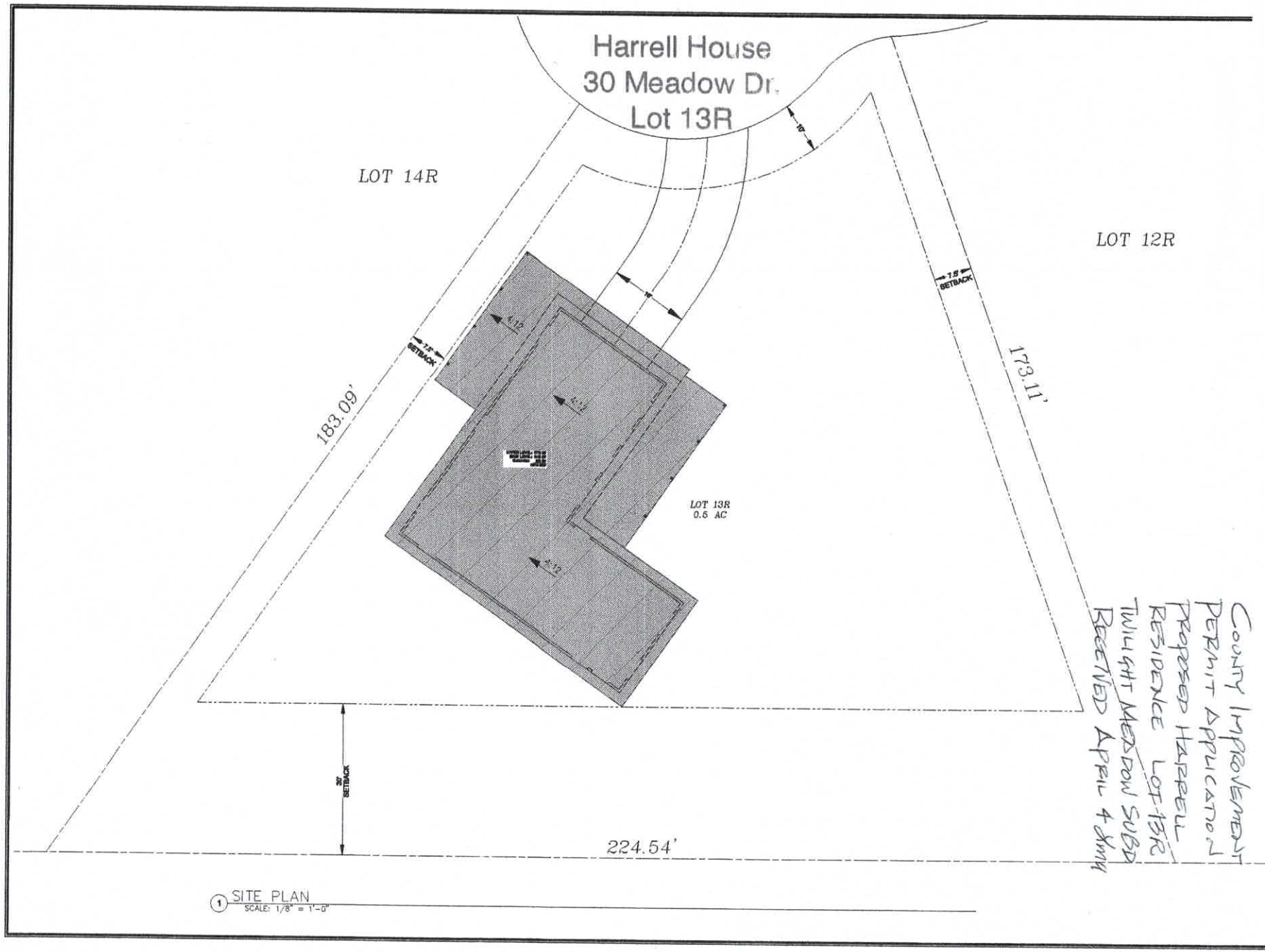


1 SITE PLAN
SCALE: 1/8" = 1'-0"

Building Permit Application

Proposal for single family house in Twilight Meadows lot 13R

Table of Contents

Letter of Intent

I intend on building a single-family house on lot 13R in the Twilight Meadows subdivision, which is part of the Cascade Village HOA. The lot has been pre approved for building by the county in 1981. The location of the building is outside of any debris flow area according to the county geohazard map. The proposed building is 3226 livable square feet, with a 690 square foot garage. The building is two stories with a ridge height of 24.5 ft. from the prepared site. This complies with the architectural guidelines for Cascade Village, section 3 letter A, which states that Lot 13R has a maximum height limit of 28 foot. The building location is placed in compliance with the designated setbacks for lot 13R according to the survey maps.

According to the geotechnical survey, an approximate 4-foot layer of expansive soil lies on top of an impenetrable rock layer throughout the buildings footprint. In compliance with P.E. Jess Pedersen's direction, we will place the footings on top of the rock layer. The stem walls will be built up above the native ground level enough to create positive drainage. The major mass of the soil from within the footprint of the building will be moved to the outside of the buildings perimeter to create the positive water drainage away from the building. The drainage from the roof will be directed towards the southern side of the property where an existing culvert on Lot 14R leads to the wetlands to the west. A culvert will also be installed under the proposed driveway to prevent any water from being trapped between the proposed house and existing house on 12R.

I hope to build this spring/summer if everything goes smoothly during the application process. I am very flexible and willing to comply with any request concerning this building., and I look forward to working with the San Juan county building department.

Thank you sincerely,
Parker Harrell
Parkerharrell@gmail.com
(970) 551-0708

Town of Silverton

Building Permit Application

*Address of Job Site: Lot 13R Twilight Meadows

*Class of Work:

NEW ☑ ADDITION ☐ ALTERATIONS ☐ REPAIR ☐ MOVE ☐ OTHER ☐

*Property Owner: Parker Harrell *Phone: 970-551-0708

*Mailing Address: 145 Cedar Ridge Way

*City: Durango *State: Co *Zip Code: 81301

*Email Address: ParkerHarrell@gmail.com

Contractor: Self Phone: 970-551-0708

Legal Description:

*LOT NO.(S): 13R *BLOCK: Twilight Meadow *ZONE: _____ *(If Applicable) ADDITION: _____

*Hazard: NONE ☐ FLOOD ☐ AVALANCHE ☐ SLOPE ☐

Structural Information:

**Req.if NEW Structure: **Survey Provided: YES ☐ NO ☐ **Plot Plan Provided: YES ☑ NO ☐

Designed By: Jess Petersen LICENSE PE# 9227772-2202

SQ.FT.: 3226 HEIGHT: _____ TOTAL UNITS: 1 TOTAL ROOMS: 5

*Describe All Work To Be Done:

*Printed Name: Parker Harrell

*Signature: [signature] *Date: 3-25-22

(Staff Use ONLY)

Total Estimated Valuation of Work: $_____ Estimated Permit Fee: $_____
(Including Labor and Materials)

*INDICATES MANDATORY FIELDS TO BE COMPLETED BEFORE THIS APPLICATION CAN BE SUBMITTED FOR CONSIDERATION.

DRAWING NUMBER
SEE REC.# 143570, 143571
143572

DRAWING NUMBER
RECEPTION # 136239
BK 240 PG 507

DRAWING NUMBER
RESUBDIVISION OF THE
TWILIGHT MEADOW SUBDIVISION

DRAWING NUMBER
MAP # 180

RESUBDIVISION OF THE TWILIGHT MEADOW SUBDIVISON AT CASCADE VILLAGE LOCATED IN SECTION 13, T39N, R9W, N.M.P.M. SAN JUAN COUNTY, COLORADO

CURVE DATA CHART

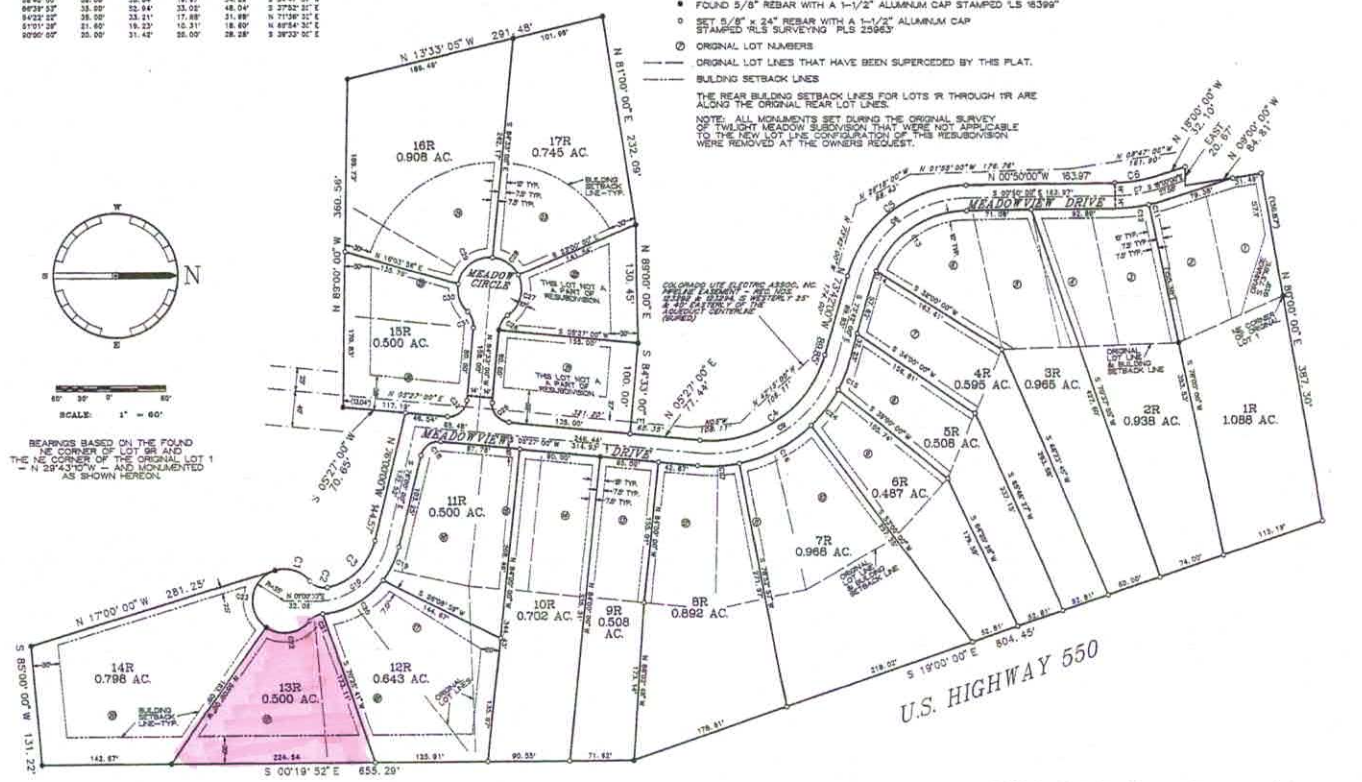
CURVE	DELTA ANGLE	RADIUS	ARC	TANGENT	CHORD	CHORD BEARING
C 1	68°21' 35"	35.00'	41.76'	23.77'	39.32'	N 17°10' 41" E
C 2	62°27' 02"	20.00'	21.80'	12.12'	20.74'	N 20°08' 04" E
C 3	64°54' 33"	69.05'	78.23'	43.91'	74.11'	N 42°32' 44" W
C 4	79°09' 00"	131.18'	181.22'	108.43'	167.15'	N 34°07' 30" W
C 5	72°52' 00"	139.00'	176.78'	102.60'	165.10'	N 37°16' 00" W
C 6	17°10' 00"	158.48'	47.48'	23.92'	47.31'	N 09°25' 00" W
C 7	17°10' 00"	172.48'	51.68'	26.03'	51.48'	S 09°25' 00" E
C 8	72°52' 00"	125.00'	158.97'	92.27'	148.47'	S 37°16' 00" E
C 9	79°09' 00"	145.18'	200.56'	120.00'	184.98'	S 34°07' 30" E
C 10	77°00' 00"	83.05'	111.61'	66.09'	103.40'	S 37°30' 00" E
C 11	05°40' 51"	186.48'	18.49'	9.25'	18.48'	S 15°09' 30" E
C 12	11°29' 09"	186.48'	37.39'	18.75'	37.32'	S 06°34' 30" E
C 13	65°25' 10"	111.00'	126.74'	71.29'	119.97'	S 33°32' 30" E
C 14	07°26' 50"	111.00'	14.43'	7.22'	14.42'	S 69°56' 32" E
C 15	11°48' 23"	159.18'	32.80'	16.46'	32.74'	S 67°47' 40" E
C 16	32°47' 34"	159.18'	91.10'	46.83'	89.86'	S 27°30' 40" E
C 17	16°34' 03"	159.18'	46.03'	23.18'	45.87'	S 02°50' 01" E
C 18	81°27' 00"	20.00'	28.43'	17.22'	26.10'	S 35°16' 30" E
C 19	24°16' 38"	97.09'	41.13'	20.88'	40.82'	S 63°01' 30" E
C 20	47°01' 30"	97.05'	79.66'	42.23'	77.44'	S 28°12' 01" E
C 21	46°53' 20"	20.00'	16.37'	8.67'	15.91'	S 28°07' 54" E
C 22	86°34' 07"	35.00'	52.88'	32.96'	47.99'	S 08°17' 31" E
C 23	128°00' 27"	35.00'	78.20'	71.77'	62.92'	N 81°00' 14" W
C 24	17°18' 10"	159.18'	49.97'	25.19'	49.76'	N 52°54' 00" W
C 25	90°00' 00"	20.00'	31.42'	20.00'	28.28'	S 50°27' 00" W
C 26	51°00' 43"	21.60'	19.23'	10.31'	18.60'	N 58°03' 00" W
C 27	82°20' 28"	35.00'	50.30'	30.61'	46.08'	N 74°42' 00" W
C 28	58°40' 00"	35.00'	35.84'	19.67'	34.29'	S 34°47' 31" W
C 29	86°39' 53"	35.00'	52.94'	33.02'	48.04'	S 37°52' 31" E
C 30	54°22' 22"	35.00'	33.21'	17.88'	31.98'	N 71°36' 30" E
C 31	51°01' 28"	21.60'	19.23'	10.31'	18.60'	N 69°54' 30" E
C 32	90°00' 00"	20.00'	31.42'	20.00'	28.28'	S 39°33' 00" E

LEGEND

- • FOUND 5/8" REBAR WITH A 1-1/2" ALUMINUM CAP STAMPED "LS 16399"
- ○ SET 5/8" x 24" REBAR WITH A 1-1/2" ALUMINUM CAP STAMPED "RLS SURVEYING PLS 25963"
- ⑦ ORIGINAL LOT NUMBERS
- ORIGINAL LOT LINES THAT HAVE BEEN SUPERCEDED BY THIS PLAT.
- BUILDING SETBACK LINES

THE REAR BUILDING SETBACK LINES FOR LOTS 1R THROUGH 11R ARE ALONG THE ORIGINAL REAR LOT LINES.

NOTE: ALL MONUMENTS SET DURING THE ORIGINAL SURVEY OF TWILIGHT MEADOW SUBDIVISION THAT WERE NOT APPLICABLE TO THE NEW LOT LINE CONFIGURATION OF THIS RESUBDIVISION WERE REMOVED AT THE OWNERS REQUEST.



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

KNOW ALL MEN BY THESE PRESENTS:
That Cascade Village Investment Venture, whose address is 50827 U.S. Highway 550, Durango, Colorado 81301, being the legal and recorded owner of the following described tract of land, to wit: A tract of land located in Section 13, T39N, R9W, N.M.P.M., San Juan County, Colorado, said tract being the TWILIGHT MEADOW SUBDIVISION AT CASCADE VILLAGE, as shown on the plat filed in the Office of the San Juan County, Colorado, Clerk and Recorder, under Reception Number 129609.

Have caused the same to be resubdivided, platted, and designated as the RESUBDIVISION OF THE TWILIGHT MEADOW SUBDIVISION AT CASCADE VILLAGE, furthermore:
1. This plat hereby supercedes that plat of THE TWILIGHT MEADOW SUBDIVISION AT CASCADE VILLAGE, less and except Lots 21 and 22.
2. The areas outside of the building setback lines, as shown hereon, are utility easement for the purpose of installation, maintenance, and replace of utility lines appurtenant to and for the benefit of all lands contained within the perimeter of CASCADE VILLAGE as it now exists, or as it may be enlarged in the future, and for the exclusive use of CASCADE VILLAGE.
3. Meadow Drive and Meadow Circle, as shown hereon, are easements for access and utility purposes for use by all of CASCADE VILLAGE and future phases of CASCADE VILLAGE.

THIS PLAT IS HEREBY EXECUTED BY THE FOLLOWING PARTIES:

CASCADE VILLAGE INVESTMENT VENTURE

By: [signature]
Mark Zemple, Partner

State of Colorado)
SS:
County of San Juan

This plat was acknowledged before me by Mark Zemple, Partner of Cascade Village Investment Venture, on this ____ day of July, 1993, for the aforementioned purposes.

My commission expires: Notary San Juan County Clerk

My address is: Silverton, Co.

This plat approved by the San Juan Regional Planning Commission on this 6TH day of JULY, 1993.

[signature]
Chairman

[signature]
Secretary

This plat approved by San Juan County this 6th day of July, 1993.

SAN JUAN COUNTY BOARD OF COUNTY COMMISSIONERS

[signature]
Chairman

[signature]
County Clerk

SURVEYOR'S STATEMENT:
I hereby state that this plat and the survey that it represents was prepared and performed by me or under my direct responsibility, supervision and checking, and that, in my professional opinion, they both meet the minimum standards of care of Professional Land Surveyors practicing in the State of Colorado.

Richard L. Sinkiewicz, PLS
Colorado Registration No. 25963

COLORADO REGISTERED PROFESSIONAL LAND SURVEYOR 6-30-93

RLS	SURVEYING & MAPPING 305 FIESTA CIRCLE DURANGO, COLORADO 81301	(303) 259-2587
RESUBDIVISON OF THE TWILIGHT MEADOW SUBDIVISION AT CASCADE VILLAGE LOCATED IN SECTION 13, T39N, R9W, N.M.P.M. SAN JUAN COUNTY, COLORADO		
DATE: APRIL 12, 1993	REVISED: JUNE 30, 1993	SCALE: 1" = 60 FEET
PREPARED BY: RLS	CHECKED BY: RLS	JOB NO. 93103

Dorothy A. Zanoni, Recorder

Grizzly Peak Water Sales and Distribution.

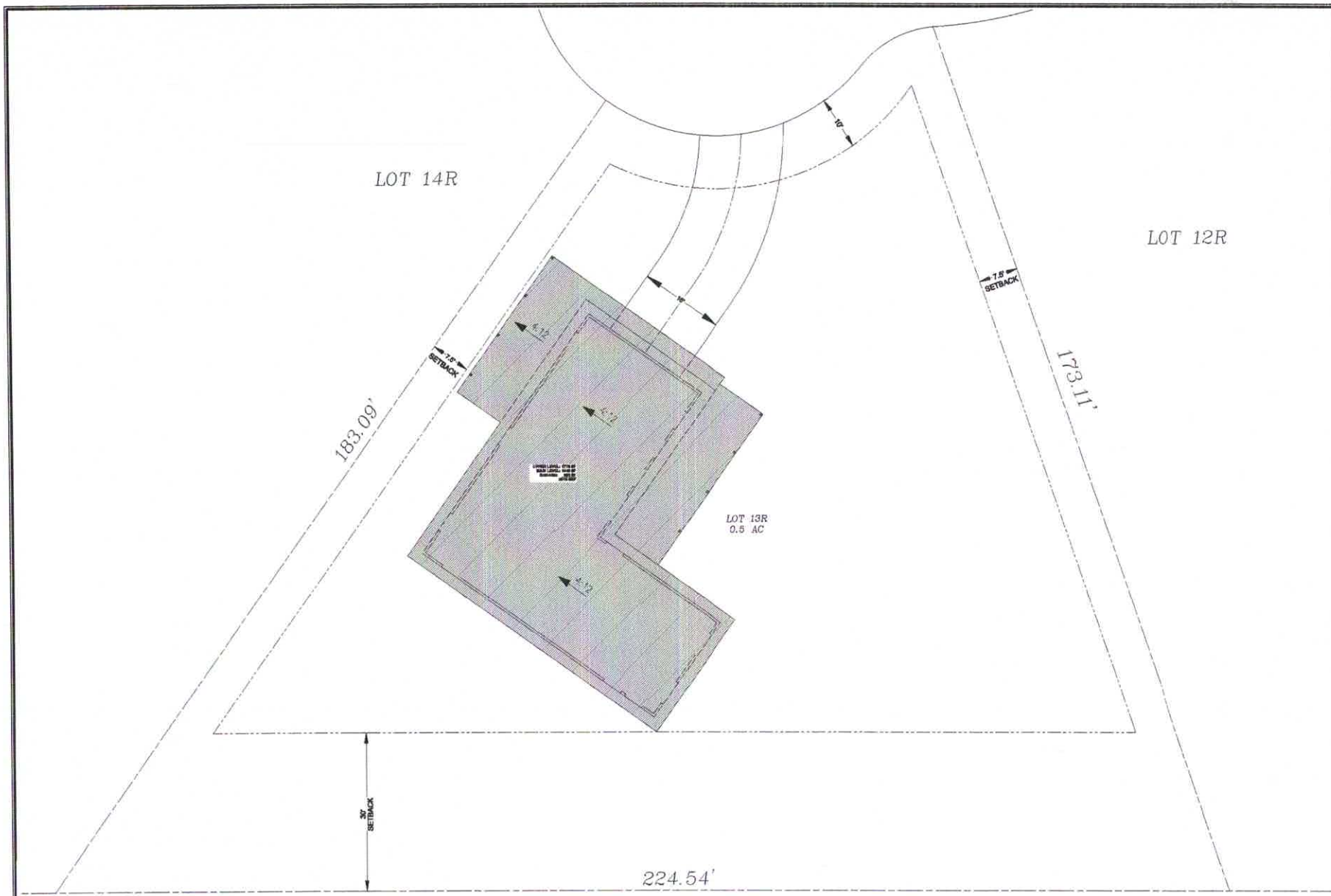
1355 Greenwood Cliff
Suite 150
Charlotte, NC 28204
704.362.2400

To whom this may concern,

This is a receipt to confirm the payment of tap fees to Grizzly Peak Water Sales and Distribution for Lot 13 R at Cascade Village. This receipt is for the sum of $16,000 from Parker Harrell received on 3/25/2022 with a check date of 3/17/2022.

Date: 3/28/2022

Nick Kraus, Controller



1 SITE PLAN
SCALE: 1/8" = 1'-0"

DATE
3-15-22

GRAYSILL
ENGINEERING
Durango, CO ~ (970)946-7925
web ~ www.graysill.com

REVISIONS
1.

DRAWN: JP
PROJECT #
GE22-027

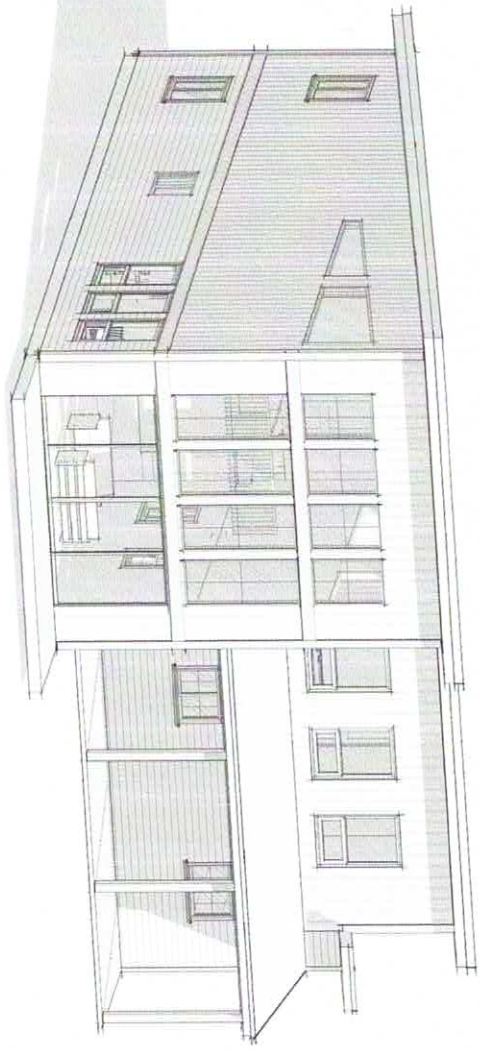
SCALE
1/8" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

SHEET TITLE:
SITE PLAN / BUILDING FOOTPRINT

PLAN SET:
FINAL

SHEET
A001



Sheet	A203	Project number	3D VIEWS
		Date	8/4/2021 12:41:13 PM
		Drawn by	Author
		Checked by	Checker

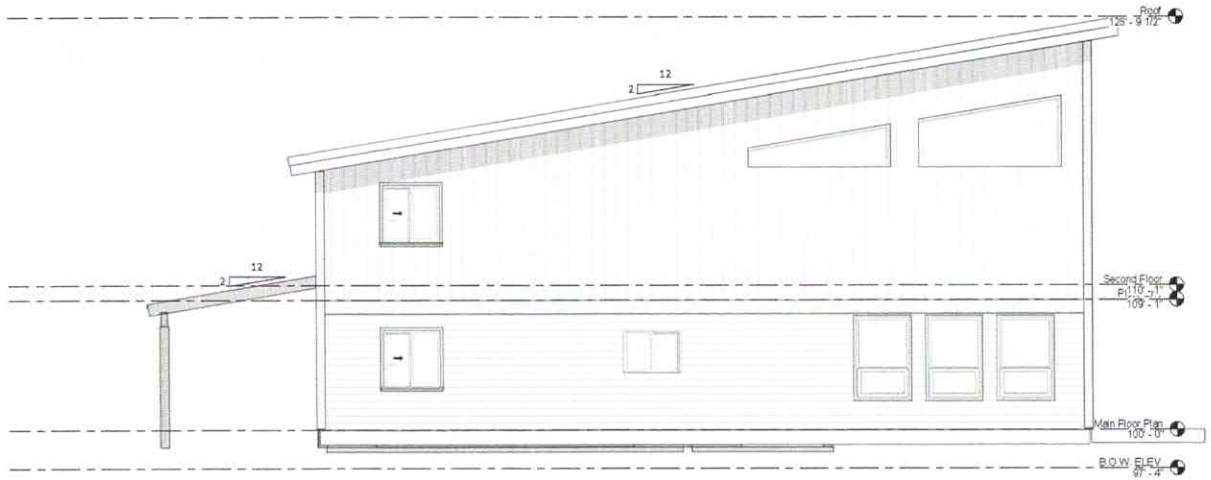
CUSTOM HOME FOR:

Revisions:

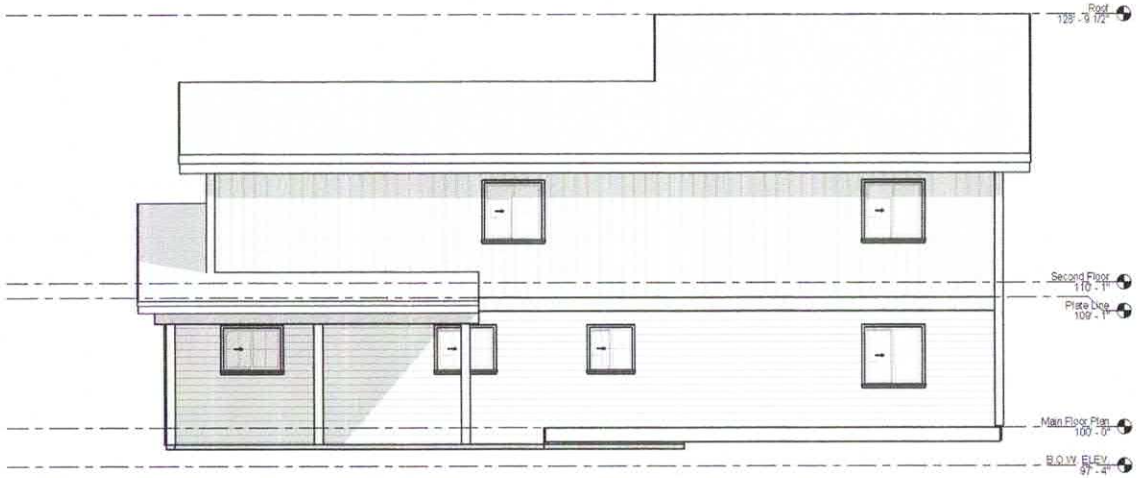
SUMMIT CONSTRUCTION + DESIGN

CHRISTIAN RHODES
PROJECT MANAGEMENT
PLANNING AND DESIGN
CUSTOM HOMES
PH: 970.946-1171
CHRISTIAN@SUMMITCD.COM

8/4/2021 12:41:13 PM



C A202 Elevation C
Scale: 1/4" = 1'-0"



D A202 Elevation D
Scale: 1/4" = 1'-0"

Graphic Scale: 1 inch = 4 feet
0 4' 8' 12' 16'

CHRISTIAN RINCON
PROJECT MANAGEMENT
PLANNING AND DESIGN
CUSTOM HOMES
PH: 970.946.1171
SUMMIT CONSTRUCTION + DESIGN

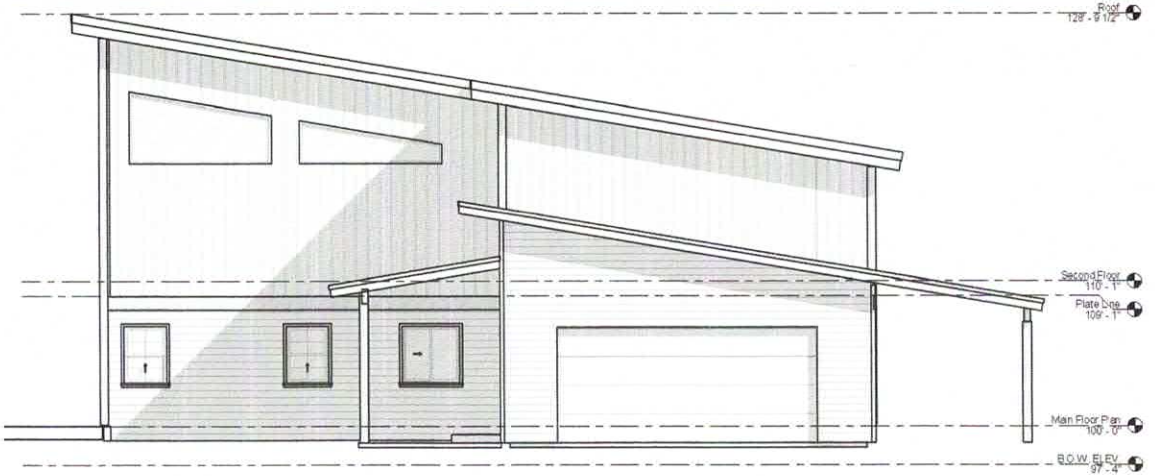
Revisions:

CUSTOM HOME FOR:

Elevations
Project number
Date 8/4/2021 12:41:11 PM
Drawn by CNR
Checked by CNR

A202

Scale 1/4" = 1'-0"



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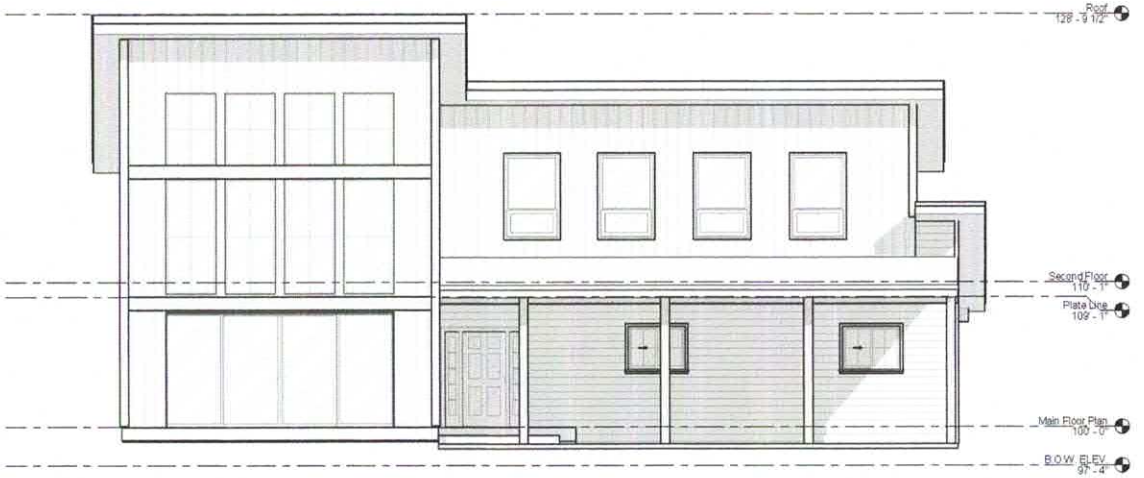


B A201 Elevation B
Scale: 1/4" = 1'-0"

Graphic Scale: 1 inch = 4 feet
0 4' 8' 12' 16'

CHRISTIAN RHODES
PROJECT MANAGEMENT
PLANNING AND DESIGN
CUSTOM HOMES
PH: 970.946.1171
SUMMIT CONSTRUCTION + DESIGN

Revisions:

CUSTOM HOME FOR:

Elevations

Project number

Date 9/4/2021 12:41:09 PM

Drawn by CNR

Checked by CNR

A201

Scale 1/4" = 1'-0"

1 MAIN LEVEL FLOOR PLAN
SCALE: 1/4" = 1'-0"

PRELIMINARY - NOT FOR CONSTRUCTION

DATE
3-15-22

GRAYSILL ENGINEERING
Durango, CO - (970)946-7935
web - www.graysill.com

REVISIONS
1.

DRAWN: JP
PROJECT #
GS22-027

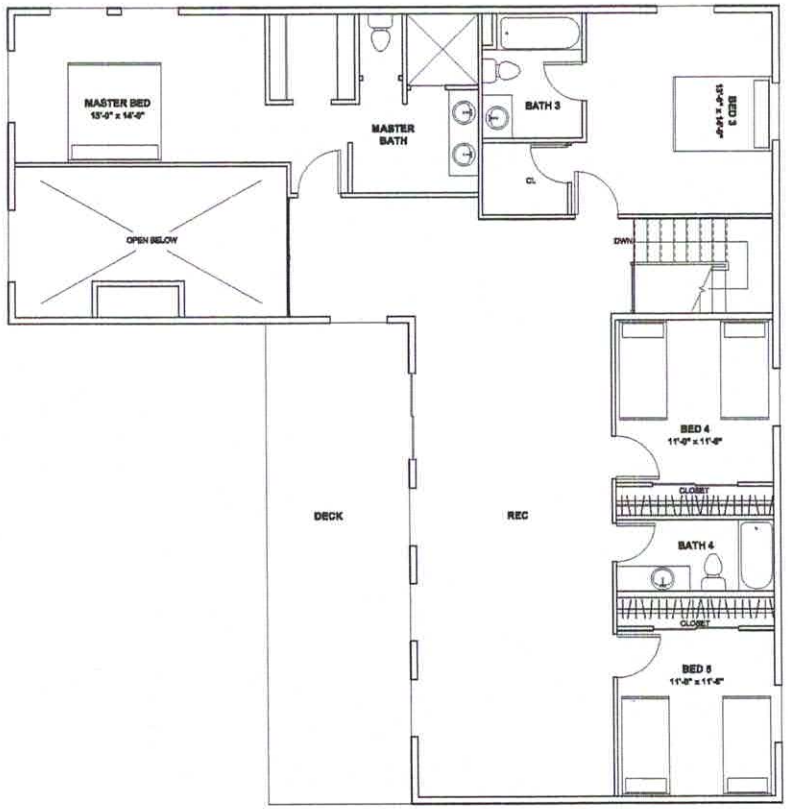
SCALE
1/4" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

SHEET TITLE:
MAIN LEVEL FLOOR PLAN

PLAN SET:
FINAL

SHEET
A101



1 UPPER LEVEL FLOOR PLAN
SCALE: 1/4" = 1'-0"

PRELIMINARY - NOT FOR CONSTRUCTION

DATE
3-15-22

GRAYSILL ENGINEERING
Durango, CO - (970)946-7935
web - www.graysill.com

REVISIONS

DRAWN: JP
PROJECT #
GS22-027

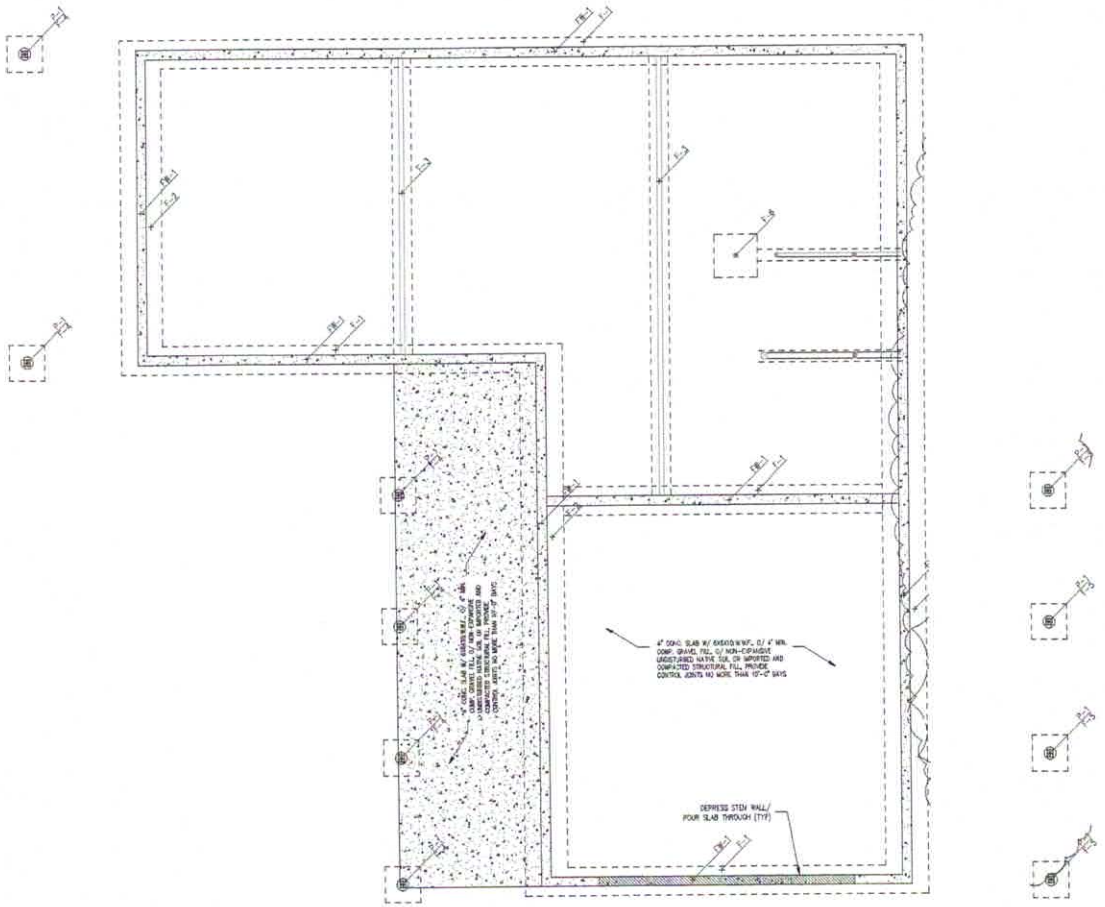
SCALE
1/4" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

SHEET TITLE:
UPPER LEVEL FLOOR PLAN

PLAN SET:
FINAL

SHEET
A102



1 FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

FOUNDATION WALL - LINTEL - PIER SCHEDULE

MARK	DIMENSION	VERTICAL REBAR	HORIZONTAL REBAR	COMMENTS
FW-1	8" x VAR. x VC VARIES	#4 @ 32" O.C.	#4 @ 16" O.C.	4' MIN VC STEM WALL
FW-2	8" x VAR. x VC VARIES	#4 @ 16" O.C.	#4 @ 16" O.C.	8'-0" MIN VC BASEMENT WALL
P-1	12" DIA. x 36" MIN EMBED DEPTH	(6) #5	#3 TIES @ 12" O.C.	(3) #5 TIES @ TOP 3"

NOTE: 2" COVER AT ALL REBAR IN CONCRETE CAST AGAINST THE EARTH

FOOTING SCHEDULE

MARK	DIMENSION	DEPTH	REBAR	SPACING
F-1	24" x CONT.	12"	3-#4 CONT.	EQUAL W/ 2" COVER
F-2	48" x CONT.	12"	3-#4 CONT.	EQUAL W/ 2" COVER
F-3	12" x CONT.	12"	3-#4 CONT.	EQUAL W/ 2" COVER
F-4	24" x 24"	12"	3-#4 EA.	EQUAL W/ 2" COVER
F-5	36" x 36"	12"	3-#4 EA.	EQUAL W/ 2" COVER

NOTE: 2" COVER AT ALL REBAR IN CONCRETE CAST AGAINST THE EARTH

HOLD DOWN SCHEDULE

MARK	DESCRIPTION	ADDITIONAL NOTES
H1	SIMPSON LTT20B5/PU	
H2	SIMPSON STHD10/PU	
H3	SIMPSON STHD14/PU	
H4	SIMPSON MTS12	

FOUNDATION & FOUNDATION NOTES

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW AND FOLLOW ALL EARTHWORK AND FOUNDATION RELATED RECOMMENDATIONS PRESENTED IN THE GEOTECHNICAL REPORT BY GRAYSILL.
2. FOUNDATION WALLS ARE NOT TO BE BACKFILLED UNTIL THE FLOOR SYSTEM HAS BEEN FULLY INSTALLED, BRACED, BLOCKING SHEATHED & NAILED.
3. CONTRACTOR IS TO NOTIFY THE E.O.R. IF OTHERWISE SOILS ARE ENCOUNTERED AT AND BELOW FOOTING BEARING DEPTH.

PRELIMINARY - NOT FOR CONSTRUCTION

DATE
3-15-22

GRAYSILL ENGINEERING LLC
Durango, CO - (970)946-7925
web - www.graysill.com

REVISIONS
1

DRAWN: JP
PROJECT #
GS22-027

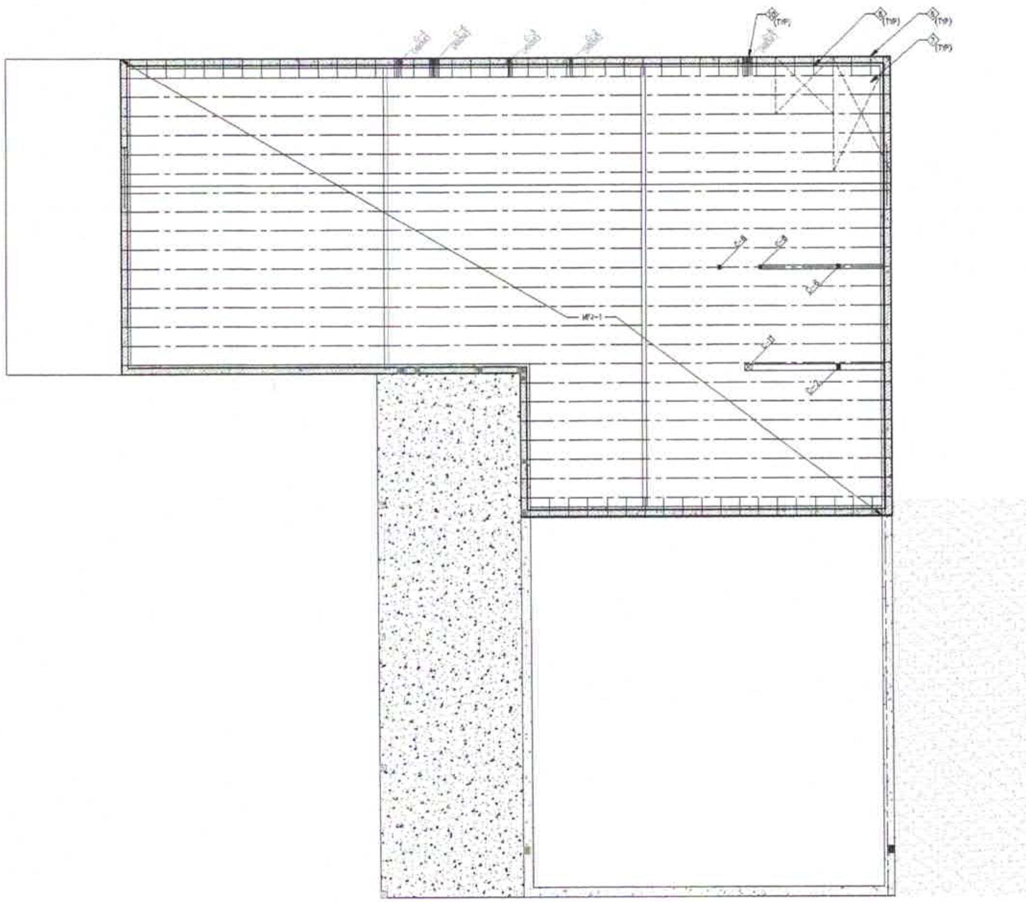
SCALE
1/4" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

SHEET TITLE:
FOUNDATION PLAN

PLAN SET:
FINAL

SHEET
S101



1 MAIN LEVEL FRAMING PLAN
SCALE: 1/4" = 1'-0"

MAIN FLOOR BEAM SCHEDULE			
MARK	BEAM SIZE	TYPE / GRADE	*BEAM OPTION / COMMENT
MFB-1	1-3/4"x14	LVL / 2.0 E	ITS1.56/14 HANGER WHERE APPLICABLE
MFB-2	(4) 1-3/4"x14"	LVL / 2.0 E	EACH LVL PLY TO BE SCREWED PER MANUFACTURER SPEC.
MFB-3	(2) 1-3/4"x9-1/2"	LVL / 2.0 E	
MFJ-1	2-1/16"x11 7/8"	I-JOIST / TJI 210	11 7/8" TJI 210 @ 16" O.C.
MFJ-1 *B	1-3/4"x14"	I-JOIST / TJI 110	14" TJI 110 @ 16" O.C. – ITS1.81/14 HANGER
MFJ-2	3-1/2"x14"	FLR. TRUSS / 2/4	*B FLOOR TRUSS OPTION: 2/4 SERIES TRIM JOIST @ 16" O.C.
MFJ-2 *B	2-1/16"x14"	I-JOIST / TJI 360	14" TJI 360 @ 16" O.C. – ITS2.37/14 HANGER
MFJ-3	1-3/4"x9-1/2"	I-JOIST / TJI 110	9-1/2" TJI 110 @ 16" O.C. – ITS1.81/9.5 HANGER
DB-1	6x10	DF #1	P.T. OR PRESERVATIVE TREATED LUMBER
DB-2	(3) 2x8	DF #2	P.T. OR PRESERVATIVE TREATED LUMBER
DB-3	(2) 2x10	DF #2	P.T. OR PRESERVATIVE TREATED LUMBER
DB-4	(3) 2x10	DF #2	P.T. OR PRESERVATIVE TREATED LUMBER
DB-4 *B	6x10	DF #1	*B TRUSS BEAM OPTION, TREATED LUMBER
DB-5	(3) 2x8	DF #2	P.T. OR PRESERVATIVE TREATED LUMBER
DJ-1	2x8	DF #2 / TREATED	2x8 @ 16" O.C. – SIMPSON LUS28 HANGER OR EQUIV.
DJ-2	2x10	DF #2 / TREATED	2x10 @ 16" O.C. – SIMPSON LUS210 HANGER OR EQUIV.
LEDG-1	2x10	DF #2 / TREATED	2x10 LEDGER W/ (2) 1/4"x3-1/2 SIMPSON SDS @ 16" O.C.

Douglas, other, or better grades of lumber may be substituted. Other substitutions must be approved by [illegible]
GLU-LAM BEAMS TO BE 24F – V4 GRADE, Fb=2,400 PSI

HEADER SCHEDULE			
MARK	BEAM SIZE	GRADE	*BEAM OPTION / COMMENT
HDR-1	(2) 2x8	DF #2	INTERIOR HEADER U.N.O.
HDR-2	(3) 2x8	DF #2	EXTERIOR HEADER U.N.O.
HDR-3	(3) 2x10	DF #2	
HDR-4	(3) 1-3/4"x11-7/8"	LVL 2.0E	
HDR-5	(2) 1-3/4"x9-1/2"	LVL 2.0E	
HDR-6	(3) 1-3/4"x14"	LVL 2.0E	
HDR-7	(2) 2x8	DF #2	
HDR-8	(3) 2x12	DF #2	

Douglas, other, or better grades of lumber may be substituted. Other substitutions must be approved by E.O.R.
GLU-LAM Beams to be 24F – V4 Grade, Fb=2,400 PSI

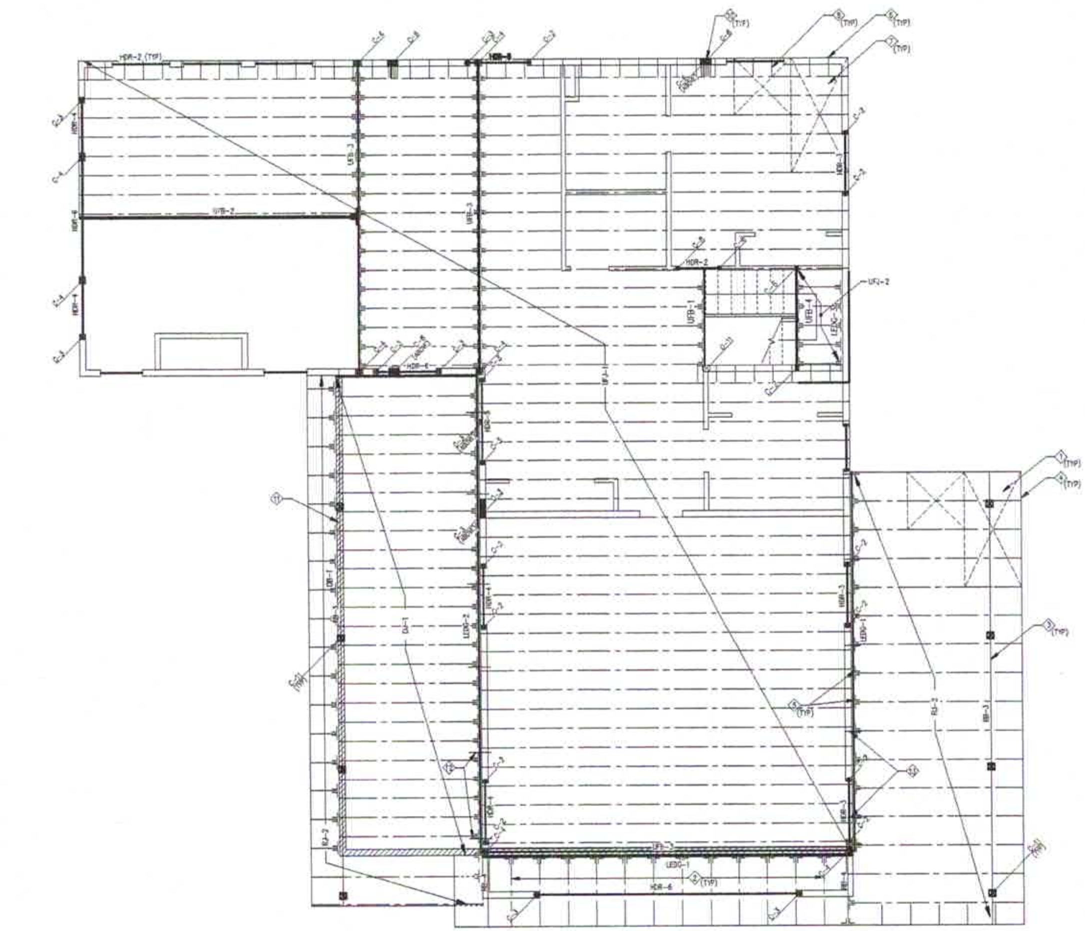
COLUMN SCHEDULE			
MARK	SIZE	GRADE	COMMENT
C-1	2x6	DF #2	TYP. EXT. TRIMMER U.N.O.
C-2	(2) 2x6	DF #2	
C-3	(3) 2x6	DF #2	
C-4	(4) 2x6	DF #2	
C-5	2x4	DF #2	TYP. INT. TRIMMER U.N.O.
C-6	(2) 2x4	DF #2	
C-7	(3) 2x4	DF #2	
C-8	(4) 2x4	DF #2	
C-9	6x6	DF #2	
C-10	8x8	DF #2	
C-11	10x10	DF #2	

KEYED NOTES

1. 1-3/4"x11-7/8" TIMBER STRAND RIM BD. (TYP)
2. 3/4" T&G OSB FLOOR SHEATHING GLUED & NAILED W/ 8d RINGSHANK NAILS @ 6" O.C. EDGES, 12" O.C. FIELD (TYP)
3. 1-3/4"x11-7/8" TJI SHR-WALL BLOCKING @ 16" O.C. (TYP)
4. 1-3/4"x11-7/8" TJI BLOCKING AT BEARING WALL ABOVE/BELOW LOCATIONS. (14" TJI OR TRIM JOIST BLOCKING @ 16" O.C. FOR PARALLEL CONDITION)
5. TRANSFER COLUMN LOADS THROUGH FLOOR SYSTEM W/ FULL HT. LVL BLOCKING (TYP)
6. SIMPSON DTT2Z-SDS2.5 DECK TIE (RE: DETAIL [illegible])
7. SIMPSON DTT2Z-SDS2.5 DECK TIE /W 5/8" DIA. LAG BOLT (RE: DETAIL [illegible])

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	3-16-22
GRAYSILL ENGINEERING LLC — Durango, CO – (970)946-7925 web – www.graysill.com	
REVISIONS	
DRAWN: JP	
PROJECT # GS22-027	
SCALE	1/4" = 1'-0"
PROJECT NAME:	HARRELL RESIDENCE
SHEET TITLE:	MAIN LEVEL FRAMING PLAN
PLAN SET: FINAL	SHEET S102



(1) UPPER LEVEL FRAMING PLAN
SCALE: 1/4 = 1'-0"

ROOF BEAM SCHEDULE			
MARK	BEAM SIZE	TYPE / GRADE	BEAM OPTION / COMMENT
RB-1	8 3/4"x22 1/2"	GLU-LAM	RE. S104
RB-2	10 3/4"x22 1/2"	GLU-LAM	RE. S104
RB-3	4x12	DF #1	
RB-4	(1) 1-3/4"x11-7/8"	LVL 2.0E	[illegible] LOOKOUT W/ INVERTED HGR. TO RECEIVE SUB-FASCIA
RJ-1	3-1/2"x24"	I-JOIST / TJI [illegible]	RE. S104
RJ-2	2-1/16"x11 7/8"	I-JOIST / TJI 210	11 7/8" TJI 210 @ 24" O.C. / HANGER [illegible]
LEDG-1	(1) 1-3/4"x11-7/8"	LVL 2.0E	(4) 1/4"x6" SIMPSON SDS @ 16" O.C.
Deeper, wider, or better grades of lumber may be substituted. Other substitutions must be approved by E.O.R. GLU-LAM Beams to be 24F - V4 Grade, Fb=2,400 PSI			

UPPER FLOOR BEAM SCHEDULE			
MARK	BEAM SIZE	TYPE / GRADE	BEAM OPTION / COMMENT
UFB-1	(2) 1-3/4"x20"	LVL / 2.0 E	USE SIMPSON [illegible] HANGER WHERE APPLICABLE
UFB-2	(2) 1-3/4"x20"	LVL / 2.0 E	USE SIMPSON [illegible] HANGER WHERE APPLICABLE
UFB-3	(4) 1-3/4"x20"	LVL / 2.0 E	
UFB-4	(2) 1-3/4"x9-1/2"	LVL / 2.0 E	
UFJ-1	3-1/2"x20"	I-JOIST / TJI 560	20" TJI 560 @ 12" O.C. / HANGER [illegible]
UFJ-2	1-3/4"x9-1/2"	I-JOIST / TJI 110	9-1/2" TJI 110 @ 16" O.C. - [illegible] HANGER
LEDG-2	2x12	DF #2 / P.T.	(4) 1/4"x6" SIMPSON SDS @ 16" O.C.
LEDG-3	1-3/4"x9-1/2"	LVL / 2.0 E	(3) 1/4"x4-1/2" SIMPSON SDS @ 16" O.C.
DJ-1	2x12	DF #2 / P.T.	2x12 @ 16" O.C. - [illegible] HANGERS
Deeper, wider, or better grades of lumber may be substituted. Other substitutions must be approved by E.O.R. GLU-LAM BEAMS TO BE 24F - V4 GRADE, Fb=2,400 PSI			

HEADER SCHEDULE			
MARK	BEAM SIZE	GRADE	BEAM OPTION / COMMENT
HDR-1	(2) 2x8	DF #2	INTERIOR HEADER U.N.O.
HDR-2	(3) 2x8	DF #2	EXTERIOR HEADER U.N.O.
HDR-3	(3) 2x10	DF #2	
HDR-4	(2) 1-3/4"x9-1/2"	LVL 2.0E	
HDR-5	(3) 1-3/4"x11-7/8"	LVL 2.0E	NOT USED
HDR-6	(3) 1-3/4"x14"	LVL 2.0E	NOT USED
HDR-7	(2) 2x8	DF #2	NOT USED
HDR-8	(2) 2x10	DF #2	NOT USED
Deeper, wider, or better grades of lumber may be substituted. Other substitutions must be approved by E.O.R. GLU-LAM Beams to be 24F - V4 Grade, Fb=2,400 PSI			

COLUMN SCHEDULE			
MARK	SIZE	GRADE	COMMENT
C-1	2x6	DF #2	TYP. EXT. TRIMMER U.N.O.
C-2	(2) 2x6	DF #2	
C-3	(2) 2x6	DF #2	
C-4	(4) 2x6	DF #2	
C-5	(4) 2x6	DF #2	
C-6	(4) 2x6	DF #2	
C-7	2x4	DF #2	TYP. INT. TRIMMER U.N.O.
C-8	(2) 2x4	DF #2	
C-9	(3) 2x4	DF #2	
C-10	(4) 2x4	DF #2	
C-11	6x6	DF #2	TYP. EXT. R.S. POST
C-12	6x6	DF #2	
C-13	10x10	DF #2	

ROOF FRAMING KEYED NOTES

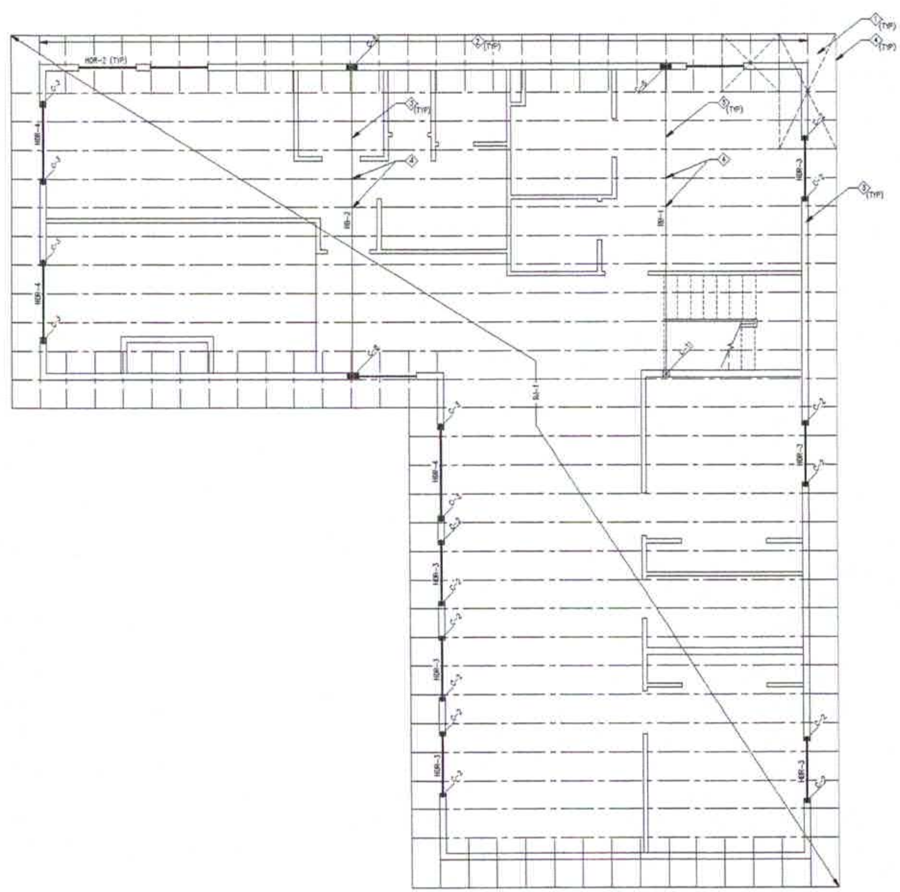
1. 5/8" OSB SHEATHING... [illegible] W/ 8d [illegible] NAILS @ 6" O.C. EDGES, 12" O.C. FIELD (TYP)
2. 1-3/4"x11-7/8" TJI LOOKOUTS @ 24" O.C.
3. FULL HT. TJ BLOCKING @ ALL BEARING LOCATIONS
4. 11-7/8" TIMBERSTRAND SUB-FASCIA (TYP)
5. [illegible] HANGERS (TYP)

FLOOR FRAMING KEYED NOTES

6. 20" TIMBER STRAND RIM BD. (TYP)
7. 3/4" T&G OSB FLOOR SHEATHING GLUED & NAILED W/ 8D [illegible] NAILS @ 6" O.C. EDGES, 12" O.C. FIELD (TYP)
8. 20" TJ [illegible] BLOCKING @ 48" O.C. (TYP)
9. FULL HT. TJ BLOCKING AT BEARING WALL ABOVE/BELOW LOCATIONS. (FULL HT. TJ BLOCKING @ 48" O.C. FOR PARALLEL CONDITION)
10. TRANSFER COLUMN LOADS THROUGH FLOOR SYSTEM W/ FULL HT. LVL BLOCKING (TYP)
11. 2x PONY WALL FRAMING
12. SIMPSON [illegible] DECK TIE @ 8' O.C. & @ [illegible] (RE. DETAIL [illegible])
13. SIMPSON [illegible] DECK TIE W/ 5/8" DIA. THRU BOLT (RE. DETAIL [illegible])

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	3-15-22
GRAYSILL ENGINEERING LLC	Durango, CO - (970)946-7925 web - www.graysill.com
REVISIONS	
DRAWN:	JJP
PROJECT #	GS22-027
SCALE	1/4" = 1'-0"
PROJECT NAME:	HARRELL RESIDENCE
SHEET TITLE:	UPPER LEVEL FRAMING PLAN
PLAN SET:	FINAL
SHEET	S103



1 ROOF FRAMING PLAN
SCALE: 1/4 = 1'-0"

ROOF BEAM SCHEDULE			
MARK	BEAM SIZE	TYPE / GRADE	BEAM OPTION / COMMENT
RB-1	5 1/8"x[illegible] 1/2"	GLU-LAM	
RB-2	[illegible] 1/2"	GLU-LAM	
RB-3	N/S	DF #[illegible]	[illegible]
RB-4	(3) 1-3/4"x11-7/8"	LVL 2.0E	
RJ-1	[illegible]	[illegible]	24" TJI [illegible] @ 24" O.C.
RJ-2	[illegible]	[illegible]	[illegible]
UDS-1	(3) 1-3/4"x11-7/8"	LVL 2.0E	[illegible]
Deeper, wider, or better grades of lumber may be substituted. Other substitutions must be approved by E.O.R. GLU-LAM Beams to be 24F - V4 Grade, Fb=2,400 PSI			

HEADER SCHEDULE			
MARK	BEAM SIZE	GRADE	BEAM OPTION / COMMENT
HDR-1	(2) 2x6	DF #2	INTERIOR HEADER U.N.O.
HDR-2	(2) 2x8	DF #2	EXTERIOR HEADER U.N.O.
HDR-3	(2) 2x10	DF #2	
HDR-4	(2) 1-3/4"x9-1/2"	LVL 2.0E	
HDR-5	(2) 1-3/4"x11-7/8"	LVL 2.0E	NOT USED
HDR-6	(2) 1-3/4"x[illegible]"	LVL 2.0E	NOT USED
HDR-7	(2) 2x8	DF #2	NOT USED
HDR-8	(2) 2x10	DF #2	NOT USED
Deeper, wider, or better grades of lumber may be substituted. Other substitutions must be approved by E.O.R. GLU-LAM Beams to be 24F - V4 Grade, Fb=2,400 PSI			

COLUMN SCHEDULE			
MARK	SIZE	GRADE	COMMENT
C-1	2x6	DF #2	TYP. EXT. TRIMMER U.N.O.
C-2	(2) 2x6	DF #2	
C-3	(3) 2x6	DF #2	
C-4	(4) 2x6	DF #2	
C-5	(5) 2x6	DF #2	
C-6	(6) 2x6	DF #2	
C-7	2x4	DF #2	TYP. INT. TRIMMER U.N.O.
C-8	(2) 2x4	DF #2	
C-9	(3) 2x4	DF #2	
C-10	(4) 2x4	DF #2	
C-11	6x6	DF #2	
C-12	6x6	DF #2	
C-13	[illegible]	DF #2	

KEYED NOTES - ROOF FRAMING

1. 5/8" CDX STAGGER JOINTS & FASTEN w/ 8d [illegible] NAILS @ 6" O.C. EDGES, 12" O.C. FIELD
2. 1-1/2"x[illegible]" TJI [illegible] @ 24" O.C.
3. FULL HT. TJI BLOCKING @ ALL BEARING LOCATIONS
4. 2x[illegible] [illegible] SUB-FASCIA (TYP)
5. SQUASH BLOCKING REQUIRED @ RJ-1 / ROOF BEAM BEARING

PRELIMINARY - NOT FOR CONSTRUCTION

DATE
3-15-22

GRAYSILL ENGINEERING LLC
Durango, CO - (970)946-7925
web - www.graysill.com

REVISIONS

DRAWN: JP
PROJECT #
GS22-027

SCALE
1/4" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

SHEET TITLE:
ROOF FRAMING PLAN

PLAN SET: FINAL
SHEET: S104

ANCHOR BOLT SCHEDULE					
** 5/8" DIAM x 12" w/ Standard Hook @ 32" o.c. unless noted otherwise per schedule.					
MARK	DESCRIPTION	SPACING	PLATE WASHER	SILL PLATE	STRENGTH (plf)
BP-1	5/8" Dia. X 12" w/ stnd. Hook	16"	3"x3"x1/4"	2x6	434
BP-2	5/8" Dia. X 12" w/ stnd. Hook	12"	3"x3"x1/4"	2x6	579
BP-3	5/8" Dia. X 12" w/ stnd. Hook	10"	5"x3"x1/4"	3x6 min.	772
BP-4	5/8" Dia. X 12" w/ stnd. Hook	12"	5"x5"x1/4"	3x6 min	1156
BP-5	1/2" Dia. Thru Bolt to Steel Below	32"	NA	2x6	410

NOTES:
1. A properly sized nut and washer shall be tightened on each anchor bolt to the plate per section R403.1.6 of the CRC

SHEAR WALL SCHEDULE						
	NAILING REQ.			Value	Value	SOLE PLATE NAILING
MARK	EDGE	FIELD	NOTES	SEISMIC	WIND (PLF)	
SW-1	6"	12"	1,2,3,4	255	357	16d COMMON @ 6" O.C.
SW-2	4"	12"	1,2,3,4,5	395	552	16d COMMON @ 4" O.C.
SW-3	3"	12"	1,2,3,4,5	505	707	16d COMMON @ 4" O.C.
SW-4	2"	12"	1,2,3,4,5	670	937	16d COMMON @ 3" O.C.
SW-5	WSW24X7 SIMPSON STRONG-WALL SHEARWALL, DOUBLE-WALL GARAGE PORTAL SYSTEM					
SW-5	WSW18X7 SIMPSON STRONG-WALL SHEARWALL, DOUBLE-WALL GARAGE PORTAL SYSTEM					

NOTE: SIMPSON STRONG-WALL WSW24X7 MUST BE TRIMMED FROM A WS24X8.

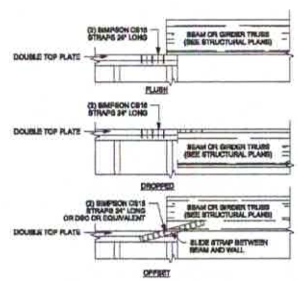
NOTES:
1. 16" o.c. max stud spacing (AWC SDPWS-2008 Note 2)
2. 7/16" APA rated OSB panel.
3. 8d common or galvanized box nailing. Provide hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper nails at preservative-treated and fire-retardant-treated wood locations.
4. Block all edges
5. 3" nominal framing at abutting panel edges (CBC Notes d & g)
*Refer to hold down schedule for post requirements. Most stringent applies.
6. Wind Capacities increased by 40% per CBC 2016 Section 2306.3
*CBC notes above refer to "Notes to Table 2306.3(1)" in 2016 CBC

HOLD DOWN SCHEDULE		
MARK	DESCRIPTION	ADDITIONAL NOTES
H1	SIMPSON STHD14	4x6 MIN. POST SIZE
H2	SIMPSON HDU11-SDS2.5	W/ SIMPSON SB1x30 ANCHOR BOLT, 8x8 MIN. POST SIZE
H3	SIMPSON HDU14-SDS2.5	W/ SIMPSON SB1x30 ANCHOR BOLT, 6x6 MIN. POST SIZE
H4	SIMPSON MSTC40	(2) 2x6 MIN. POST SIZE
H5	SIMPSON MSTC52	4x6 MIN. POST SIZE
H6	SIMPSON WSW ANCHOR	INSTALLED PER MANUF. SPECIFICATIONS

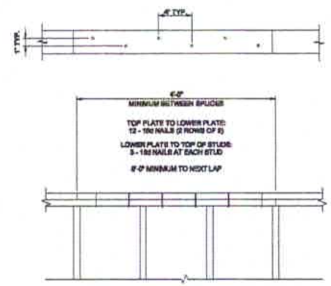
PENNY WEIGHT DESIGNATION	EQUIVALENT SPACING (INCHES)		
	COMMON NAIL	BOX NAIL	16 GAGE STAPLE
6d	4	4	3 1/2
	6	6	5
	8	8	5 1/2
	10	10	8 1/2
	12	12	10
8d	3	3	2
	4	4	2 1/2
	6	6	4
	8	8	5 1/2
	10	10	6 1/2
	12	12	8
10d	4	4	3
	6	6	3 1/2
	8	8	4 1/2
	10	10	5 1/2
	12	12	6 1/2

NOTES:
1. SPACING VALID FOR LATERAL LOAD ONLY. 7/16 STRUCTURAL I PLYWOOD OR OSB SHEATHING.
2. STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16 INCH.
3. CALIFORNIA BUILDING CODE (CBC) TABLE 2306.4.1.
4. ICC EVALUATION SERVICE REPORT NO. 1539, TABLE 14.
5. LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY RESEARCH REPORT NO. 25059, TABLE 1.
6. FASTENERS IN PRESERVATIVE-TREATED AND FIRE-RETARDANT-TREATED WOOD SHALL BE OF HOT DIPPED ZINC-COATED GALVANIZED STEEL, SILICON BRONZE OR COPPER (2016 CBC 2304.9.5).

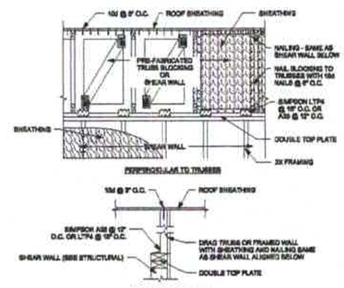
WOOD SHEATHING SHEAR WALL NOTES:
1. PROVIDE 1/4" X 3" X 0'-3" WASHER PLATES AT BOLTS. CONTRACTOR HAS OPTION TO PROVIDE A DIAGONAL SLOTTED HOLE WITH A WIDTH OF 1 UP TO 3/16" LARGER THAN THE BOLT DIAMETER AND A SLOT LENGTH OF UP TO 1 3/4", PROVIDED A STANDARD CUT WASHER IS PLACED BETWEEN THE PLATE WASHER AND THE NUT.
2. USE COMMON NAILS. AT SILL PLATE USE HOT DIPPED OR TUMBLED GALVANIZED.
3. ANCHOR BOLTS SHALL HAVE A 7" MINIMUM EMBEDMENT INTO CONCRETE AND TERMINATE WITH A 3" STANDARD 90 DEG. HOOK AND BE HOT-DIPPED GALVANIZED STEEL OR STAINLESS STEEL IN ACCORDANCE WITH CBC 2304.9E
4. WHERE STUDS ARE CUT FOR PLACEMENT OF ANCHOR BOLTS OR OTHER ELEMENTS, AN ADJACENT STUD SHALL BE ADDED.
5. WHERE WOOD SHEATHING IS APPLIED TO BOTH SIDES OF A WALL AND NAIL SPACING IS LESS THAN 6" O.C. ON EITHER SIDE, PANEL JOINTS SHALL BE OFFSET TO FALL ON DIFFERENT FRAMING MEMBERS, OR FRAMING MEMBER SHALL BE 3" OR THICKER AND NAILS ON EITHER SIDE SHALL BE STAGGERED.
6. PRE-DRILLED HOLE ARE REQUIRED AT 20d NAILS.
7. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



DIAPHRAGM – CHORD/COLLECTOR STRAP (105)
SCALE: N.T.S.



DIAPHRAGM– TOP PLATE SPLICE (110)
SCALE: N.T.S.



SHEAR WALL – ROOF DIAPHRAGM CONNECTION (115)
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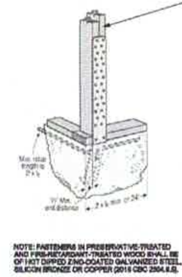
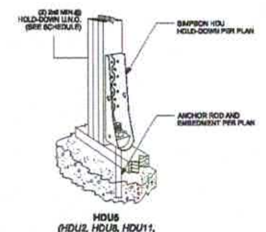
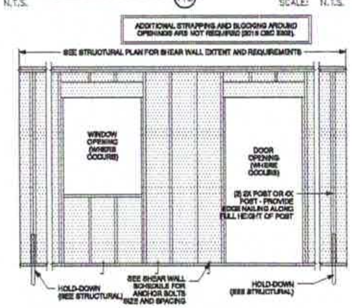


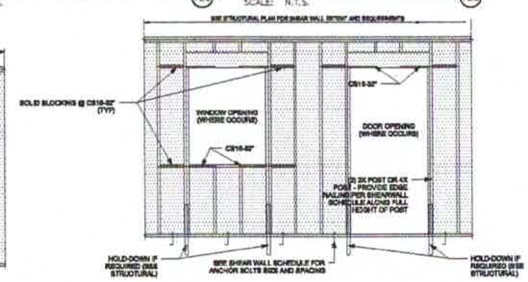
HOLD-DOWN BOTTOM PLATE / STEM WALL (120)
SCALE: N.T.S.



HOLD-DOWN SIMPSON HDU2 – HDU14 (125)
SCALE: N.T.S.



SHEAR WALL– PERFORATED (135)
SCALE: N.T.S.



SHEAR WALL – FORCE TRANSFER AROUND OPENINGS (140)
SCALE: N.T.S.

DATE
3-15-22

GRAYSILL ENGINEERING LLC
Durango, CO - (970)946-7925
web - www.graysill.com

REVISIONS
1.

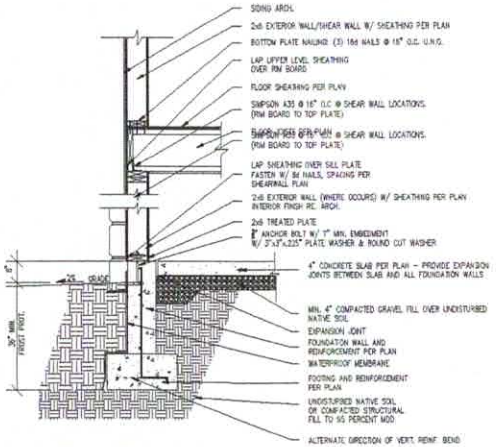
DRAWN: JP
PROJECT #
GS22-027

SCALE
N.T.S.

PROJECT NAME:
HARRELL RESIDENCE

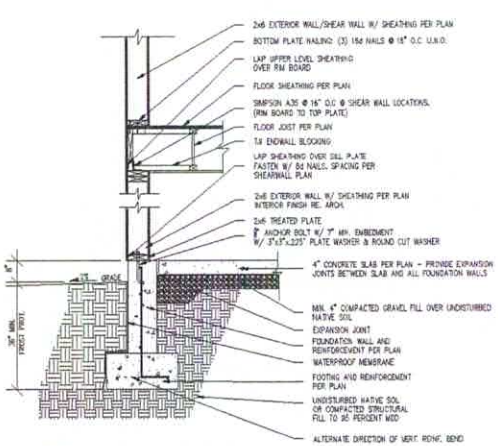
SHEET TITLE:
TYPICAL SHEAR WALL DETAILS

PLAN SET: FINAL
SHEET S501



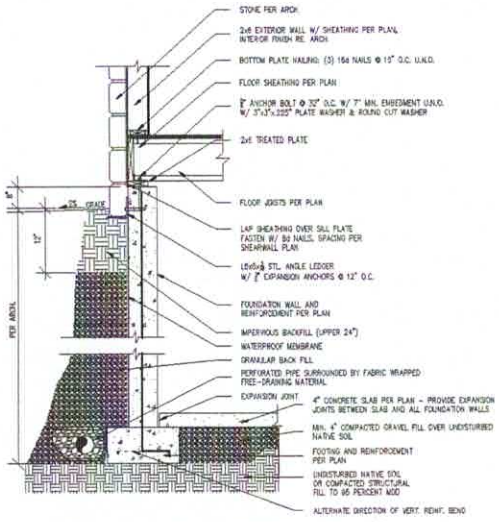
TYPICAL STEM WALL AT WALK-OUT & GARAGE / PERPENDICULAR FLOOR JOIST (205)

SCALE: 3/4"=1'-0"



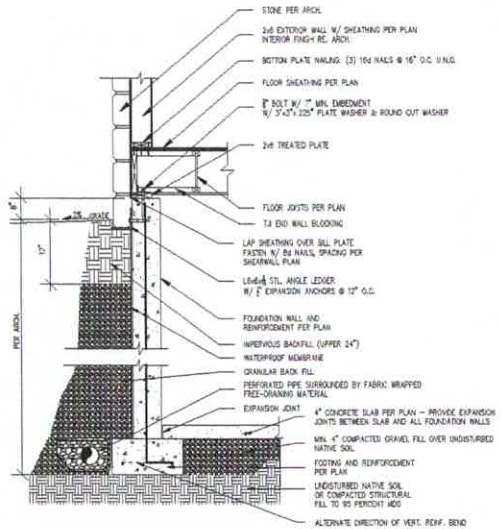
TYPICAL STEM WALL AT WALK-OUT & GARAGE / PARALLEL FLOOR JOIST (210)

SCALE: 3/4"=1'-0"



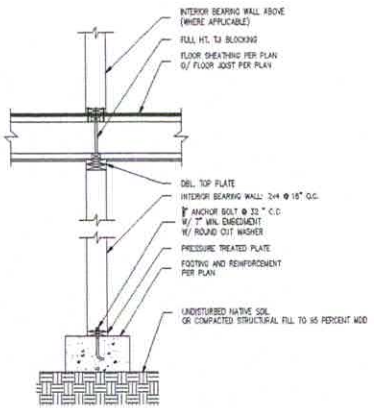
TYPICAL BASEMENT FOUNDATION WALL / FLOOR JOIST HUNG ON PLATE (215)

SCALE: 3/4"=1'-0"



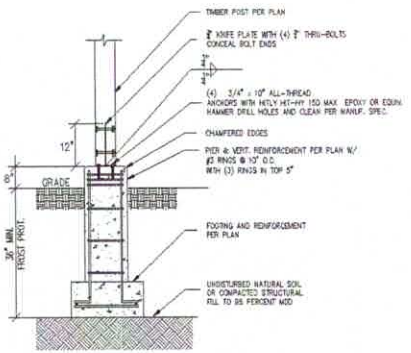
TYPICAL BASEMENT FOUNDATION WALL / FLOOR JOIST PARALLEL TO FND. WALL (220)

SCALE: 3/4"=1'-0"



INTERIOR BEARING WALL / SPREAD FOOTING (225)

SCALE: 3/4"=1'-0"



TIMBER POST / PIER (230)

SCALE: 3/4"=1'-0"

DATE
3-15-22

GRAYSILL ENGINEERING LLC
Durango, CO – (970)946-7925
web – www.graysill.com

REVISIONS
1.

DRAWN: JJP
PROJECT #
GS22-027

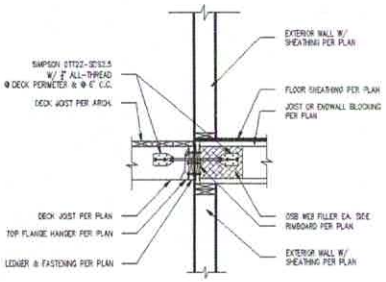
SCALE
3/4" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

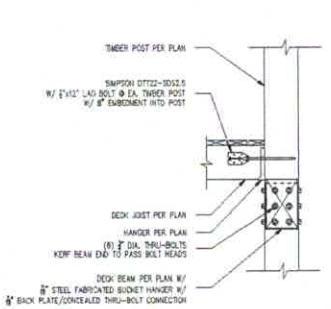
SHEET TITLE:
STRUCTURAL DETAILS

PLAN SET:
FINAL

SHEET
S502



DECK LEDGER / DECK TIE 310
SCALE: 3/4"=1'-0"



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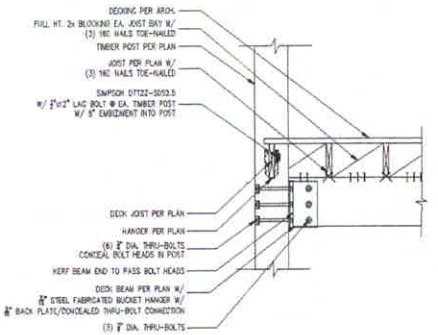

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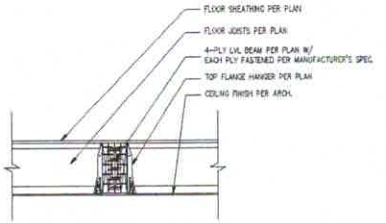

FLOOR BEAM / FLOOR JOIST HUNG 325
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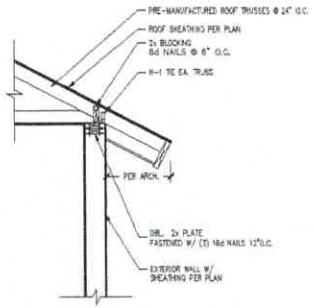

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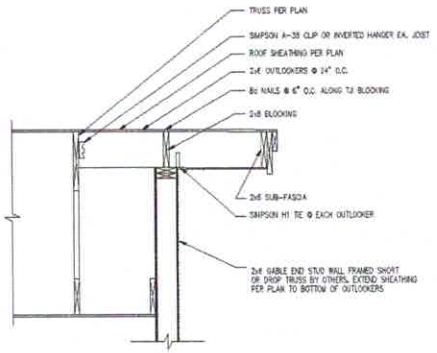

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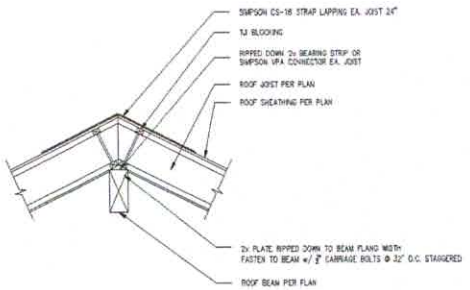

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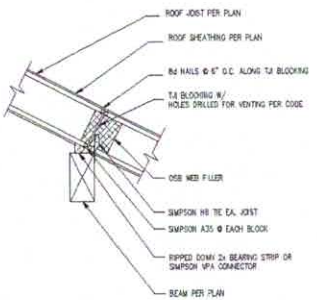

TJI ROOF JOIST / BEAM BEARING 420
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DATE
3-15-22

GRAYSILL DESIGN LLC
Durango, CO – (970)946-7935
web – www.graysill.com

REVISIONS
1.

DRAWN: JP
PROJECT #
GS22-027

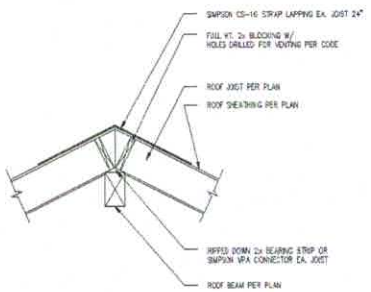
SCALE
3/4" = 1'-0"

PROJECT NAME:
HARRELL RESIDENCE

SHEET TITLE:
STRUCTURAL DETAILS

PLAN SET:
FINAL

SHEET
S503



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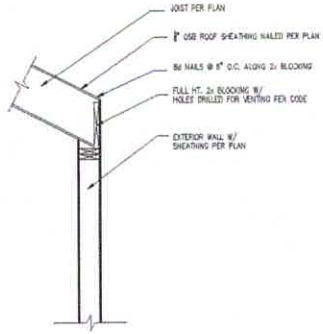

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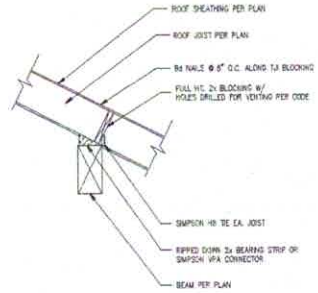

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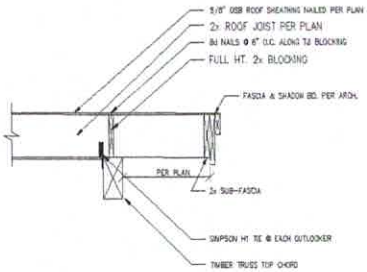

ROOF JOIST / TIMBER TRUSS TOP CHORD BEARING 445
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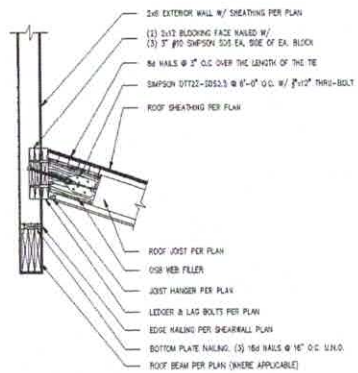


ROOF JOIST / LEDGER W/ EXT. WALL ABOVE 430
SCALE: 3/4"=1'-0"

DATE
3-15-22

GRAYSILL ENGINEERING
Durango, CO – (970)946-7925
web – www.graysill.com

REVISIONS
1.

DRAWN: RP
PROJECT #
GS22-027

SCALE
3/4" = 1'-0"

PROJECT NAME
HARRELL RESIDENCE

SHEET TITLE
STRUCTURAL DETAILS

PLAN SET
FINAL

SHEET
S504

Adjacent Land owner list

Lot 14R:
Owner(s)
SMITH JEREMY M & SHELLY S, 280 WHITNEY RD - BUDA, TX 78610-3008

Lot: 18R
Owner(s):
SMITH JEREMY M & SHELLY S, 280 WHITNEY RD - BUDA, TX 78610-3008

Lot 12R:
Owner(s)
TAFFE ROMAN C & CAROL R, 48540 142ND ST - BIG STONE CITY, SD 57216-8200

Lot: 11R
Owner(s):
GARFIELD KACY L & AARON B, 3210 CLEARWATER DR - PRESCOTT, AZ 86305-7160

ARCHITECTURAL RULES

FOR THE TWILIGHT MEADOW

AT CASCADE VILLAGE

The following Architectural Rules have been adopted by the Architectural Committee of Cascade Village Community Association (Master Association) to be effective commencing on the 26th day of September, 2018.

I. Purpose and Applicability.

Pursuant to the provisions of the recorded Declaration of Covenants, Conditions and Restrictions (the "Declaration") relating to Lots 1 through 25 (the "Lots")of the subdivision known as The Twilight Meadows at Cascade Village (the "Subdivision"), the Architectural Committee of the Cascade Village Community Association (the "Committee") has been given broad powers of architectural control with respect to any improvements to be made to the Lots. Such control has been granted to the Committee in order to assure that the character, design, exterior materials, roofs, proportions, elevations and siting's of all improvements to the Lots will be aesthetically and harmoniously compatible with the condominium project known as Cascade Village and also will be indigenous and naturally compatible with the area geography and topography. The Committee has adopted the rules and guidelines more fully set forth below to establish minimum standards and guidelines for all proposed improvements to be constructed upon any Lot and to guide them in granting approvals and disapprovals of proposed Lot improvements. These rules and guidelines are in addition to the restrictions and requirements set forth in the Declaration.

II. Submittal of Plans.

No residence, fence, wall or other building or structure or any landscaping shall be erected, improved, commenced, placed, made, done or maintained on any Lot unless or until final detailed construction plans and specifications (collectively the "Plans"), including plot plan, floor elevations with respect to natural terrain, floor plans and building elevations, foundation plan prepared by a structural engineer and or architect, exterior wall and roof color schemes have been submitted to and approved, in writing, by the Committee.

III. Guidelines.

In addition to other architectural and aesthetic considerations to be taken into account in reviewing all Plans submitted for Committee approval, except for extenuating circumstances or for sound architectural construction reasons (as determined solely by the Committee), the Committee shall not approve any Plans which do not comply with the following minimum standards:

(a) Setbacks and Permits. All improvements to be constructed upon any Lot must comply with all San Juan County regulations regarding setbacks, building requirements and health standards and no improvement may be located outside of the respective building envelopes as shown on the records plat for the subdivision.

(b) Siting and Architectural Style. The siting and architectural style and design of each residence to be constructed upon a Lot shall be compatible with the Cascade Village Condominium project and the natural terrain and environment of the area, as determined by the Committee. A-frames shall not be permitted.

(c) Living Area Under Roof. No residence shall be erected, used nor permitted to remain on an Lot if the interior of such residence contains less than 2000 square feet of living space with exception of Lot 9 with a minimum of 1800 square foot, exclusive of storage areas which are accessible only from the exterior of the residence, porches, patios, decks, carports and garages.

(d) Height. The maximum height of any point on the ridge line of a roof of a residence located on Lots 09, 11, shall not exceed 24 feet from the prepared site level; the maximum height of any point on the ridge line of a roof of a residence located on Lots 13 and 21 shall not exceed 28 feet from the prepared site level; and the maximum height of any point on the ridge level of a roof of a residence on any other Lot shall not exceed 30 feet from the prepared site level. The prepared site level for each Lot shall be subject to approval of the Committee.

(e) Garage. Each residence shall include an enclosed garage capable of parking at least one full-size automobile.

(f) Driveways. The garage of each residence shall be connected to the street adjoining the Lot by a driveway paved with either asphalt, concrete or other material approved by the Committee. This driveway must provide parking for at least one full-size automobile.

(g) Fences and Walls. No fences or walls shall be constructed on the rear portion of any Lot. Decorative walls not exceeding 3 feet in height and necessary retaining walls can be constructed in the front yard areas of the Lots subject to Committee approval of building materials, location and design.

(h) Roofs. Roofs for all residences shall be either brown tone metal pro-panel, copper, concrete shake tile or other type roofing material approved by the Committee. Asphalt shingles, aluminum or other metal roofing (other than those specifically identified in the preceding sentence) shall not be permitted.

(i) Chimneys. Chimneys shall be constructed of the same materials as permitted for exterior siding.

(j) Exterior Building Materials. All exterior building materials shall be new and may consist of cedar siding or native stone. Brick and any other type of materials require approval of the Committee including stucco and Hardee Board.

(k) Colors. Exterior colors shall be subject to Committee approval. Earth tone and muted colors will be encouraged so that residences will blend into the surroundings. Bright and gaudy colors will not be approved nor will white.

(l) Windows. Window frames shall be constructed of wood or anodized aluminum. Non-reflective insulated glass shall be used in all windows.

(m) Detached Buildings. Without the written consent of the Committee, there shall be no detached abuilding or other improvements located upon a Lot separate from the residence, including, but not limited to, storage sheds and wood bins.

(n) Mechanical and Electronic Equipment. Equipment other than that required by applicable plumbing codes shall not be permitted on roofs unless completely concealed in a way that is harmonious with the basic architectural style and theme of the residence. In no event shall any such equipment project beyond the ridge line of the highest point of the roof. Solar Panels are allowed but placement must be approved by Architectural Committee. A/C may be installed if hidden by vegetation or a barrier approved by the Architectural Committee.

(o) Landscape. Those Lots with no existing trees must install a minimum of 6 trees at least 6 feet tall.

IV. Construction Requirements.

(a) Timelines for Construction. New Construction is to be fully completed within 18 months of start date.

(b) Impact Fees. $1,500.00 is due prior to start of construction. Said fee is payable to Cascade Village Community Association and is non-refundable. This fee is for the added infrastructure wear and tear. This fee is unrelated to specific damage that might be caused by the new construction. The responsible party causing damage will be responsible for said damages payable to Cascade Village Community Association within 30 days.

Each Owner/Builder will create a bond in the amount of $10,000.00. This bond will be available in cases of damage to HOA property or infractions of the rules noted below.

CVCA will have the authority to get repayment from damage within 30 days of notification to the builder/owner or can demand payment from the bond. Infractions of the rules will be assessed as follows:

1st infraction not involving damage to HOA property - $100.00
2nd infraction not involving damage to HOA property - $500.00
3rd and subsequent infraction not involving damage to HOA property - $2000.00
1st infraction involving damage to HOA property – damages plus $500.00
2nd infraction involving damage to HOA property – damages plus $2000.00
3rd and subsequent infraction to HOA property – damages plus $5000.00

(c) Insurance. All new construction must provide HOA with workmen's compensation insurance for all contractors working on property. Cascade Village Community Association will be named as additionally insured on liability insurance.

(d) Debris Removal/Site Maintenance.

Dumpster/Roll-off

i. Minimum 6-yard debris container required for all projects
ii. All dumpsters and roll-offs must be covered and secured.
iii. Dumpsters must be emptied as necessary
iv. Debris containers are for construction debris only.
v. HOA manager must approve location of container.

(e) Construction Materials.

i. Construction materials must be kept stacked, organized and safely away from public access.
ii. No materials may be kept/stored on any HOA common element space.
iii. Flammable and combustible materials must be stored in accordance with DFRA restrictions governing HAZMATs.
iv. Erosion control fences must be utilized to control run-off and surface grading.

(f) Equipment.

i. All equipment will be parked and locked when not in use
ii. No fuel will be stored on site.
iii. Equipment and vehicles cannot be parked on HOA common elements, roads or adjacent lots.
iv. Porta-johns must be placed in a non-public area of the site. Location must be approved by HOA manager.

(g) Site Cleanliness and Safety.

i. All debris must be picked up daily and deposited in debris containers.

ii. No debris/materials will be burned on-site.

iii. Site must be maintained in a safe manner at all time.

iv. Outside site(s) must be completely fenced in the evenings, weekends and holidays.

v. Contractors must adhere to all OSHA guidelines and procedures related to job site safely.

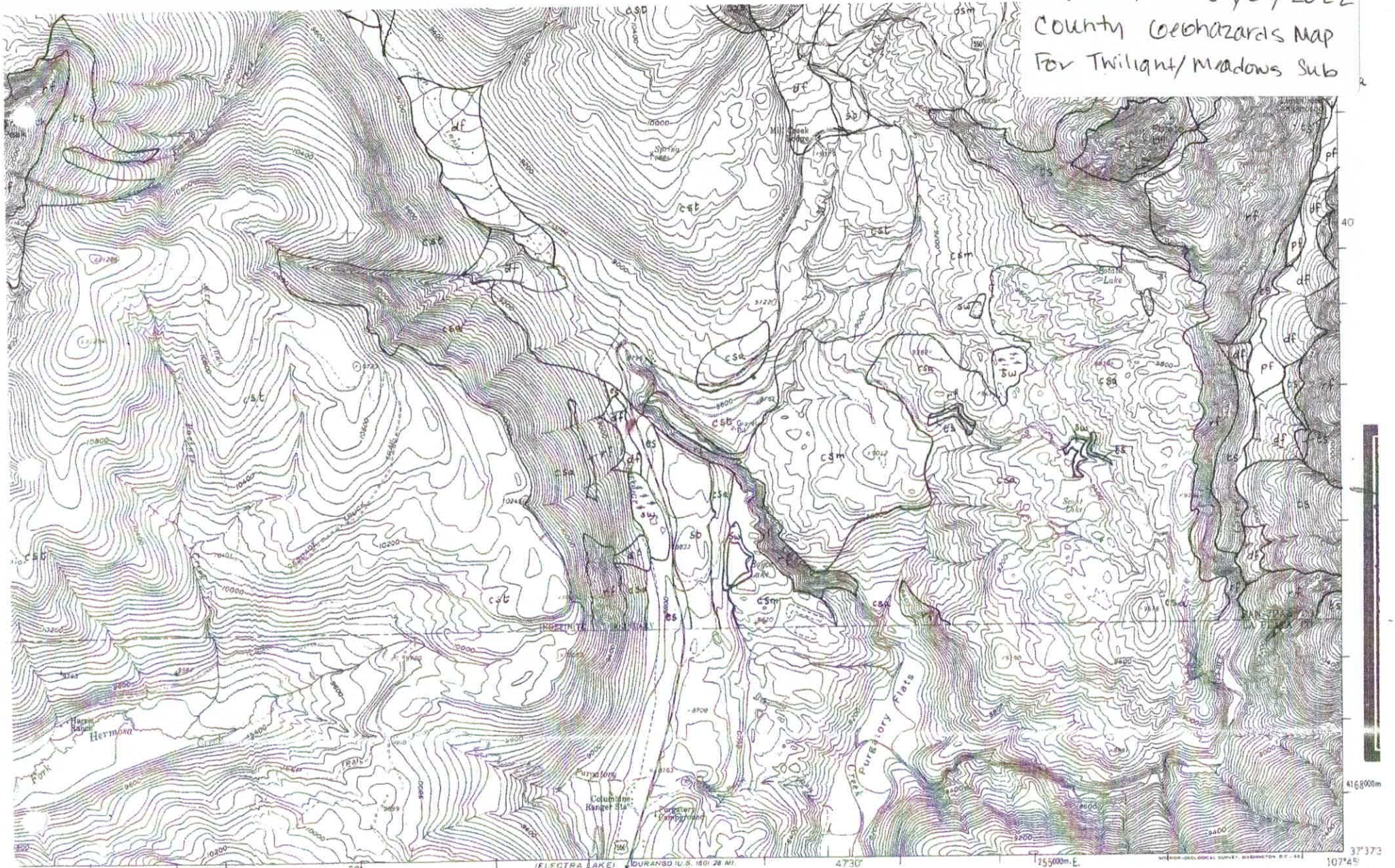
(h) Noise Reduction

The conduct of any activity that will disrupt/interfere with 'quiet enjoyment' of owners/guests at Cascade Village is not permitted to begin earlier that 8:00 am M-F and 10:00 am Sat-Sun. Such activity must terminate no later than 5:00 pm M-F and 3:00 pm Sat & Sun. Exceptions to this schedule may be allowed on a case-by-case basis by the HOA manager.

V. Miscellaneous.

Nothing set forth herein shall be interpreted to limit, restrict or waive any of the restrictions or limitations imposed upon any Lot or any lot owner pursuant to the provisions set forth in the Declaration. The Committee reserves the right to revoke, supplement and otherwise amend these rules at any future time. In the event of a conflict, the provisions of the Declaration shall control over the provisions of the Rules. Failure of the Committee to conform to the rules and guidelines set forth herein in one instance (whether by reason of oversight, neglect, variance or otherwise) shall not be deemed a waiver of the applicable rules or guideline and shall not require the Committee to thereafter ignore or cease applying the applicable rule or guideline.

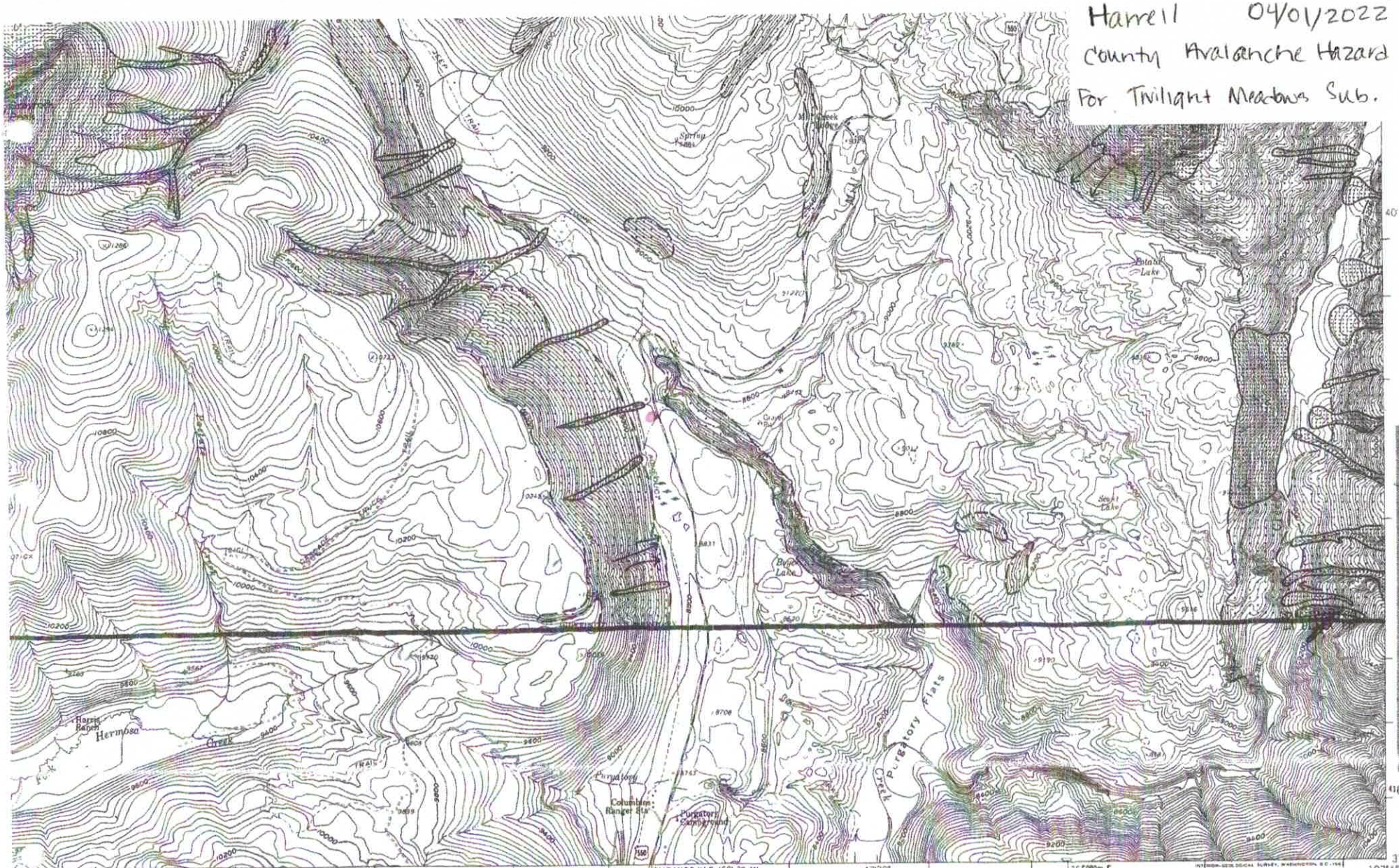
Harrell 04/01/2022
County Geohazards Map
For Twilight/Meadows Sub



the Geological Survey

ROAD CLASSIFICATION

Harrell 04/01/2022
County Avalanche Hazard
For Twilight Meadows Sub.



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TRAUTNER GEOTECH LLC
GEOTECHNICAL ENGINEERING, MATERIAL TESTING
AND ENGINEERING GEOLOGY

GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENCE
LOT 13R TWILIGHT MEADOWS
SAN JUAN COUNTY, COLORADO

August 25, 2021

PREPARED FOR:

Parker Harrell
parkerharrell@gmail.com
PROJECT NO. 56713GE

649 TECH CENTER DRIVE SUITE A • DURANGO, CO 81301 • 970/259-5095 • FAX 970/382-2515

Table of Contents

1.0 REPORT INTRODUCTION

This report presents our geotechnical engineering recommendations for the proposed residence to be located at Lot 13R Twilight Meadows Subdivision in San Juan County, Colorado. This report was requested by Mr. Parker Harrell and was prepared in accordance with our proposal dated April 29, 2021, Proposal No. 21192P.

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.
- Sections 10.0 and 11.0 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 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

Architectural details and grading plans were not available at the time of this report. We understand the proposed residence will likely be a one or two story structure supported by a steel reinforced concrete foundation system. The lower level and garage floors will be either structurally supported over a crawl space or concrete slab-on-grade. Grading for the structure is assumed to be relatively minor with cuts of approximately 4 to 5 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 0.4 acre project site is currently vacant. The ground surface slopes gently down from Meadowview Drive onto the property. There is a low depression that encompasses much of the western portion of the lot. We did not observe any standing water in the depression during our field exploration; however, we understand standing water was observed after spring snowmelt. Vegetation consists primarily of grasses and weeds. The property is bordered by residential properties to the north and south, Meadowview Drive to the west and open space to the east.

2.2 Subsurface Soil and Water Conditions

We advanced three test borings in the vicinity of the proposed structure. 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.

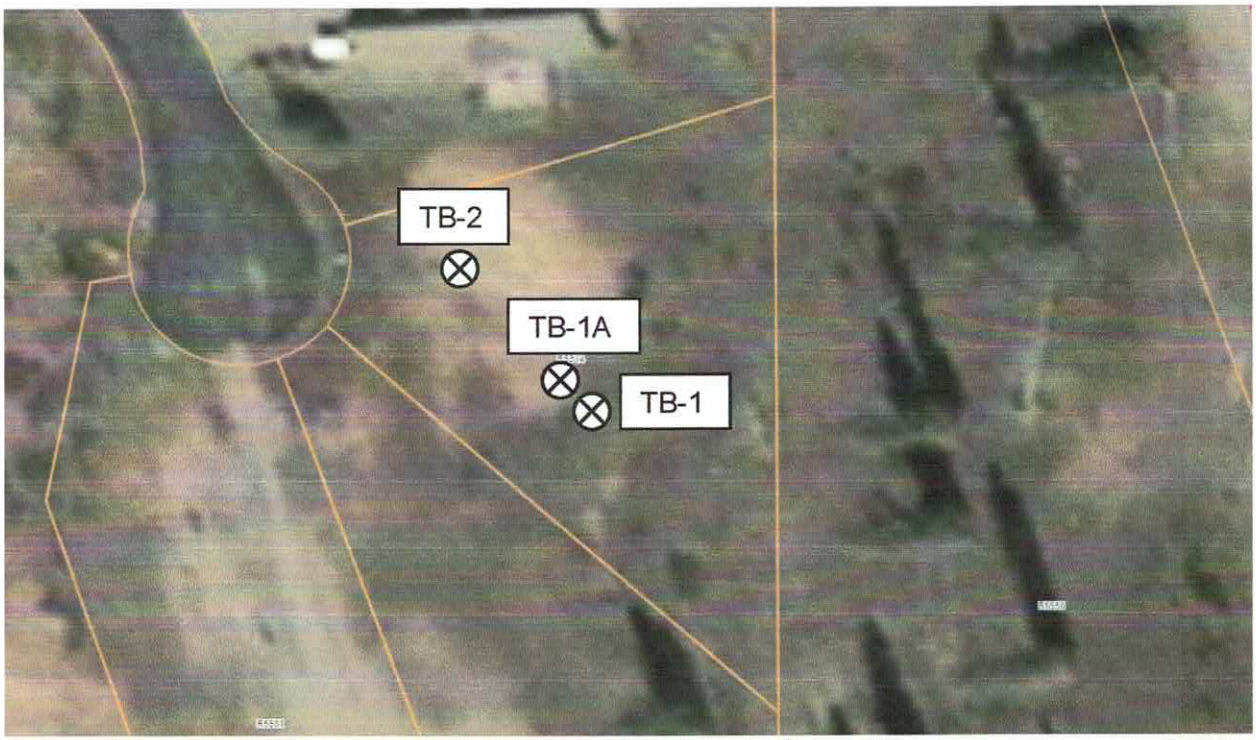


Figure 2.1: Locations of Exploratory Borings. Adapted from San Juan County GIS.

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 about 2 to 3 ½ feet of lean clay with sand and few gravels (CL) overlying clayey gravel with sand (GC) to a depth of about 4 ½ feet. Beneath the GC soils, very hard limestone formation was encountered until practical auger drilling refusal was encountered at 5 feet in all three borings.

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 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.

The laboratory test results are provided in Appendix B.

- 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'	-	-	11.3	113.1	3,150*	1.9 (% under 500 psf load)
TB-1 @ 0-4	50	39/20	11.2	-	-	-
TB-2 @ 2'	-	-	20.1	104.4	1,260	2.2 (% under 100 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 of 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 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 lean clay with sand, clayey gravel and limestone formation are at or near anticipated shallow foundation elevations. The surficial clay soils were found to have moderate to high swell pressures. Deep foundation system design concepts which include isolation of shallow components including floor systems from shallow soils are less likely to experience post-construction movement due to volume changes in the site soil.

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

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. The clay soils tested from our borings had a measured swell pressure of about 3,150 pounds per square foot and a swell potential magnitude of about 2.2 percent under a 100 or 500 pound per square foot surcharge load. The owner must understand that regardless of the expansive soil mitigation design concepts presented below, if the swell pressure generated by the expansive soil on this site exceeds the minimum dead load which is imposed by the spread footing or other structural components, and the expansive site soils become wetted, uplift of the foundation system and other structural components is highly likely. Drilled piers, or other deep foundation system design will provide the least likelihood of post construction movement associated with soil volume changes.

It is not recommended to place shallow foundations on different materials due to potential of differential performance. Due to the variability of the soil conditions encountered, we recommend extending footings down to the hard limestone formational material to reduce the potential for differential performance of the foundation system. The footings may be supported directly by the clean, competent formational material or on a blanket of compacted structural fill which is supported by the formational material. Footings supported directly on the formational material may be designed using a bearing capacity of 5,000 pounds per square foot. Footings supported by a blanket of compacted structural fill placed on the formational material may be designed using a soil bearing capacity of 3,000 pounds per square foot with a minimum depth of embedment of at least 1 foot. The bearing capacity may be increased by 20 percent due to transient loads.

A concept for placement of footings on a blanket of structural fill overlying the hard limestone formational material is provided below.

- The foundation excavation should be excavated down to the hard formational material.
- Loose or other deleterious material should be removed from the surface of the formation.
- A 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.
- In the absence of structural engineering design and for general geotechnical engineering purposes, we recommend the stem walls be designed to act as beams and reinforced with continuous steel reinforcement, 4 reinforcement bars, 2 top and 2 bottom. Taller walls may require additional reinforcement bar.
- The structural engineer should be contacted to provide the appropriate reinforcement bar diameter and locations.

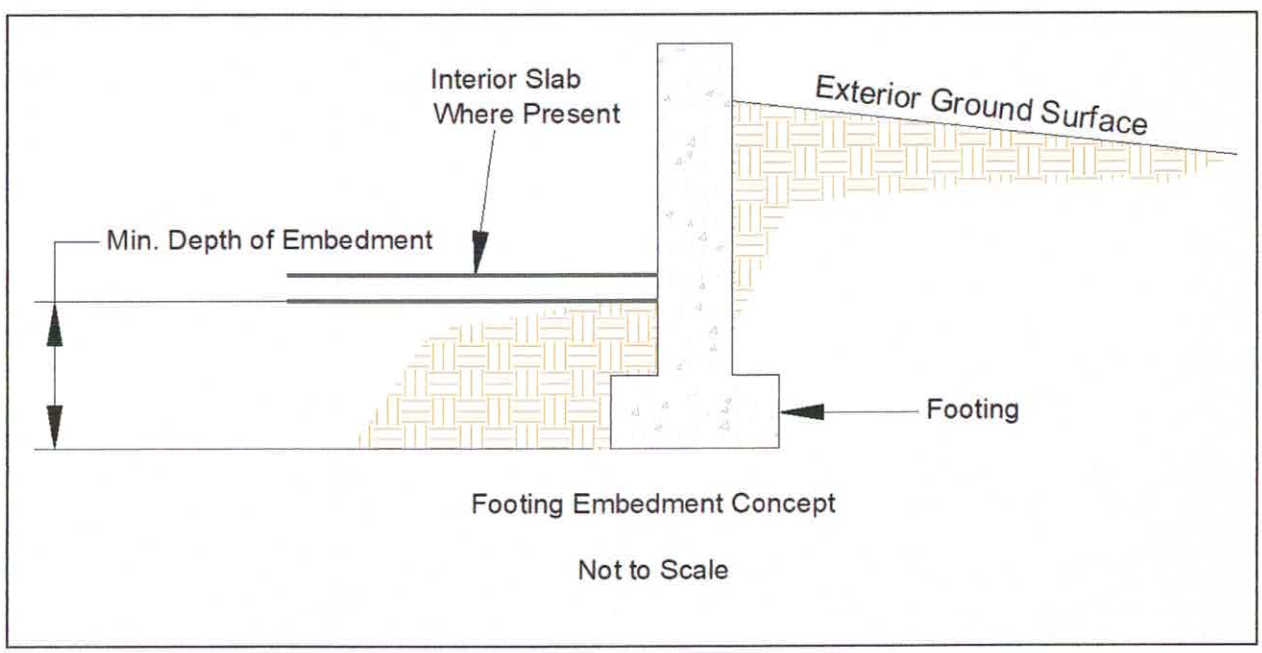
We recommend that particular attention and detail be given to the following aspects of the project construction for this lot;

- 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 landscaping drainage concept provided in Section 8.5 below is imperative for this site to limit the moisture available to the foundation bearing soils.
- 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.

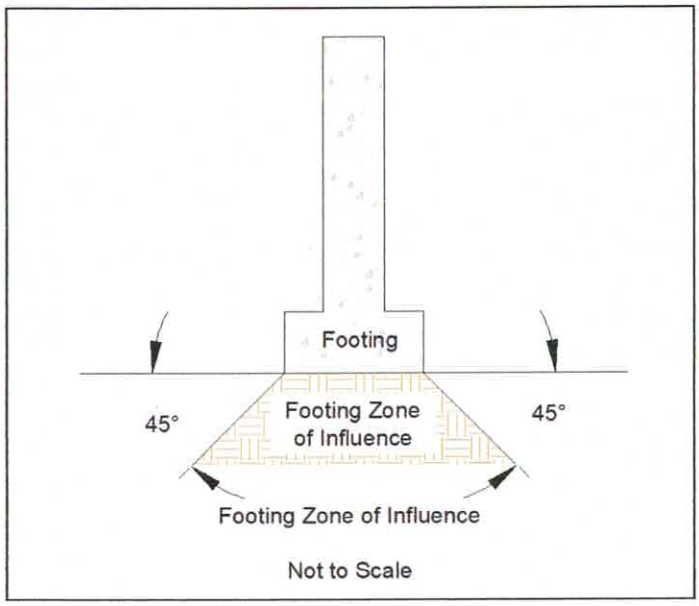
All footings should have a minimum depth of embedment of at least one 1 foot. The embedment concept is shown below.



Footing Embedment Concept

Not to Scale

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 footings designed and constructed above will have a total post construction settlement of about 1 inch or less.

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 understand that laterally loaded walls will be constructed as part of this site development. Lateral loads will be imposed on the retaining structures by the adjacent soils and, in some cases, additional surcharge loads will be imposed on the retained soils from vehicles or adjacent structures. 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.

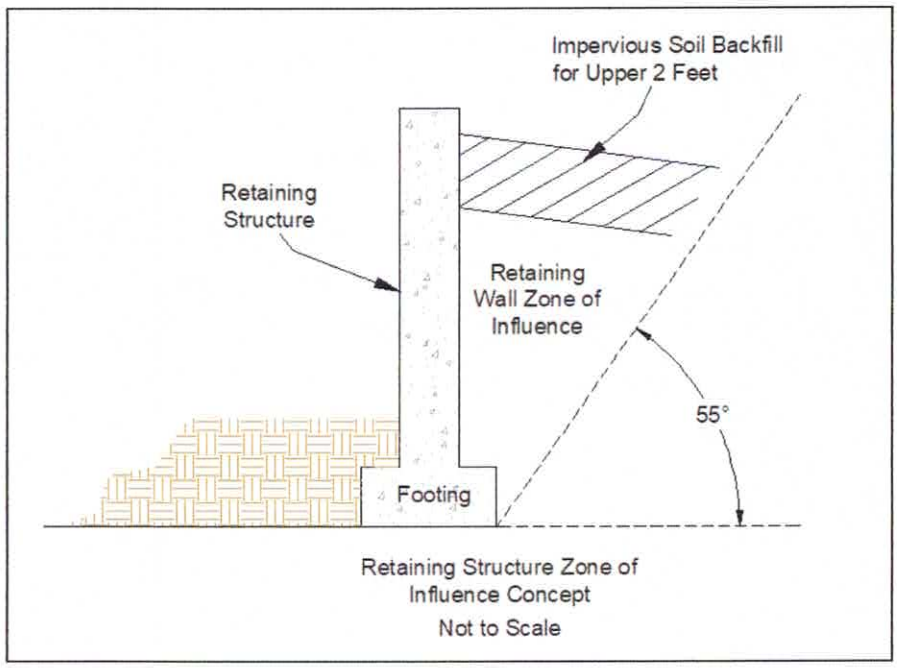
The site soils have a measured swell pressure of 3,150 pounds per square foot. A 3,150 pound per square foot swell pressure will exert approximately 25,200 pounds of force per lineal foot for a wall that retains 8 feet of soil. Due to the expansive nature of the site soils we do not recommend that the natural clay soils be used for retaining wall backfill. The retaining walls may be designed using the lateral earth pressure values for imported granular soil that are tabulated below.

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

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.



Retaining Structure Zone of Influence Concept
Not to Scale

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 $45 + (\varphi/2)$ where "φ" if the angle of internal friction of the soil.

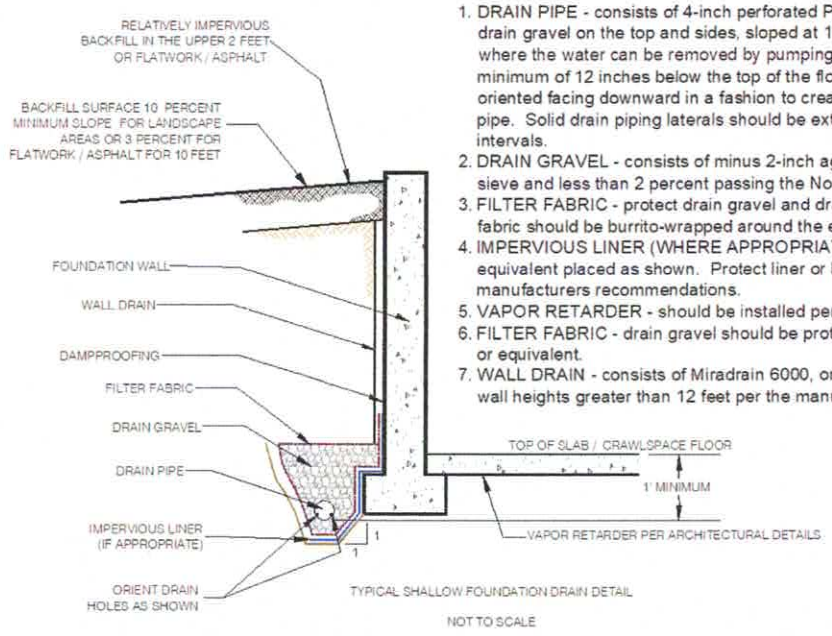
Backfill should not be placed and compacted behind the retaining structure unless approved by the project structural engineer. Backfill placed prior to construction of all appropriate structural members such as floors, or prior to appropriate curing of the retaining wall concrete, may result in severe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



1. DRAIN PIPE - consists of 4-inch perforated PVC, surrounded by a minimum of 4 inches of drain gravel on the top and sides, sloped at 1% minimum to a gravity discharge or sump pit where the water can be removed by pumping. Bottom of pipe at the high point should be a minimum of 12 inches below the top of the floor. The drain pipe perforations should be oriented facing downward in a fashion to create a flow trough for water captured in the drain pipe. Solid drain piping laterals should be extended to the trench drain at 50 foot minimum intervals.
2. DRAIN GRAVEL - consists of minus 2-inch aggregate with less than 50% passing the No. 4 sieve and less than 2 percent passing the No. 200 sieve.
3. FILTER FABRIC - protect drain gravel and drain pipe with Mirafi 140N, or equivalent. Filter fabric should be burrito-wrapped around the entire section of drain gravel.
4. IMPERVIOUS LINER (WHERE APPROPRIATE) - consists of 30 mil, or thicker, PVC liner, or equivalent placed as shown. Protect liner or both sides of liner against puncture per manufacturers recommendations.
5. VAPOR RETARDER - should be installed per architectural recommendations.
6. FILTER FABRIC - drain gravel should be protected on all sides with a Mirafi 140N filter fabric, or equivalent.
7. WALL DRAIN - consists of Miradrain 6000, or equivalent. Miradrain 6200 should be used for wall heights greater than 12 feet per the manufacturer's recommendation.

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 the proposed basement or crawl space. 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 3,150 pounds per square foot and a magnitude swell potential of about 2.2 percent under a 100 or 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

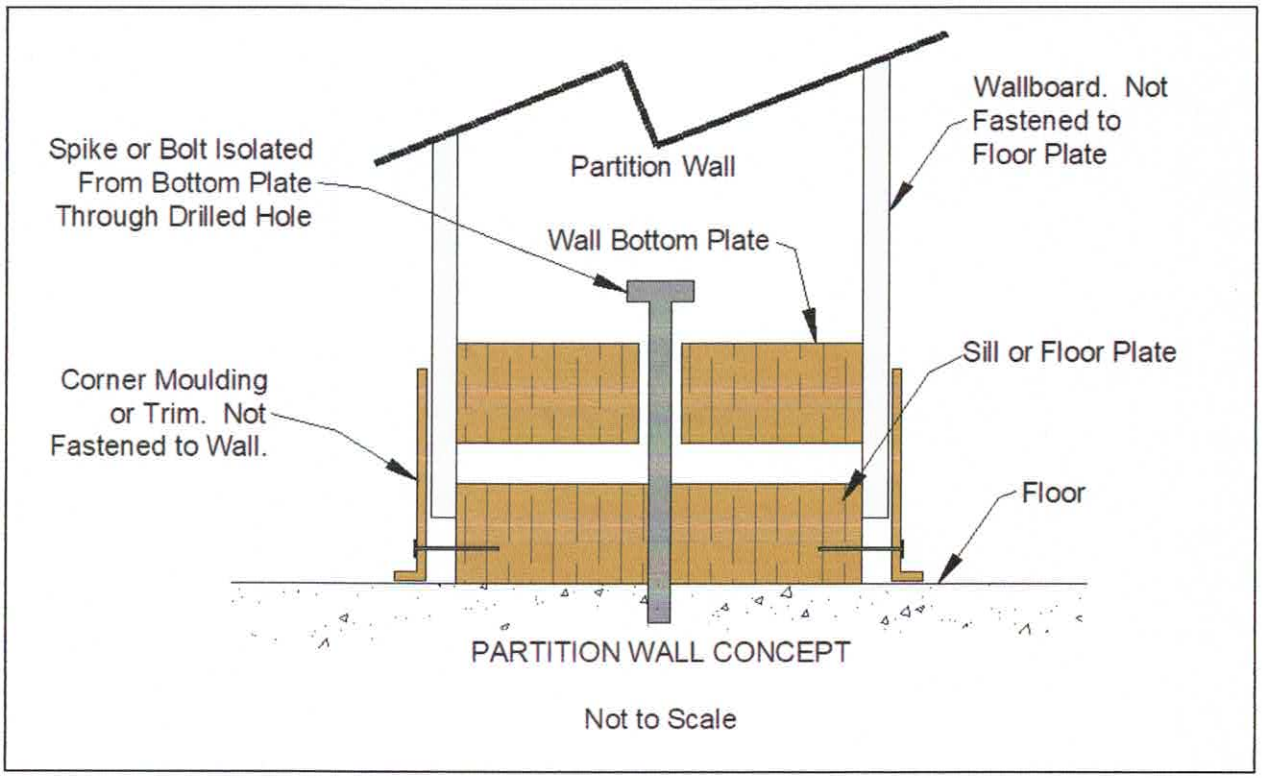
Due to the high swell potential of the shallow site soils interior floor slabs should be avoided if possible. Development of sites with walk-out style basements typically utilize the basement floor concrete slab-on-grade to help resolve lateral loads imposed on the basement walls. There are techniques, such as placement of grade beams below a structurally supported floor system to help resolve these loads to allow for construction of a crawl space below the lower level floor. The structural engineer should be contacted to provide these recommendations, if they are feasible for the development of this site. We do not recommend slab-on-grade floors for interior finished areas; however, if a floor slab is chosen for the lower level floor it is imperative that interior walls are isolated from the lower level floor slab so that movement of the slab associated with swelling soils does not cause uplift of the interior walls and subsequently upper potions of the structure.

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.

Due to the highly expansive nature of the soils tested we do not recommend that interior floor slabs in finished areas be considered unless the owner thoroughly understands the implications of movement of these structural components. The recommendation provided below provides a soil conditioning strategy if the owner wishes to pursue construction of concrete floor slabs.

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 natural soils. Interior concrete flatwork, or concrete slab-on-grade floors, should be underlain by scarification, moisture conditioning and compaction of about 6 inches of the natural soils followed by placement of at least 18 inches of compacted granular structural fill material 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 in this section 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 be 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 12 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.

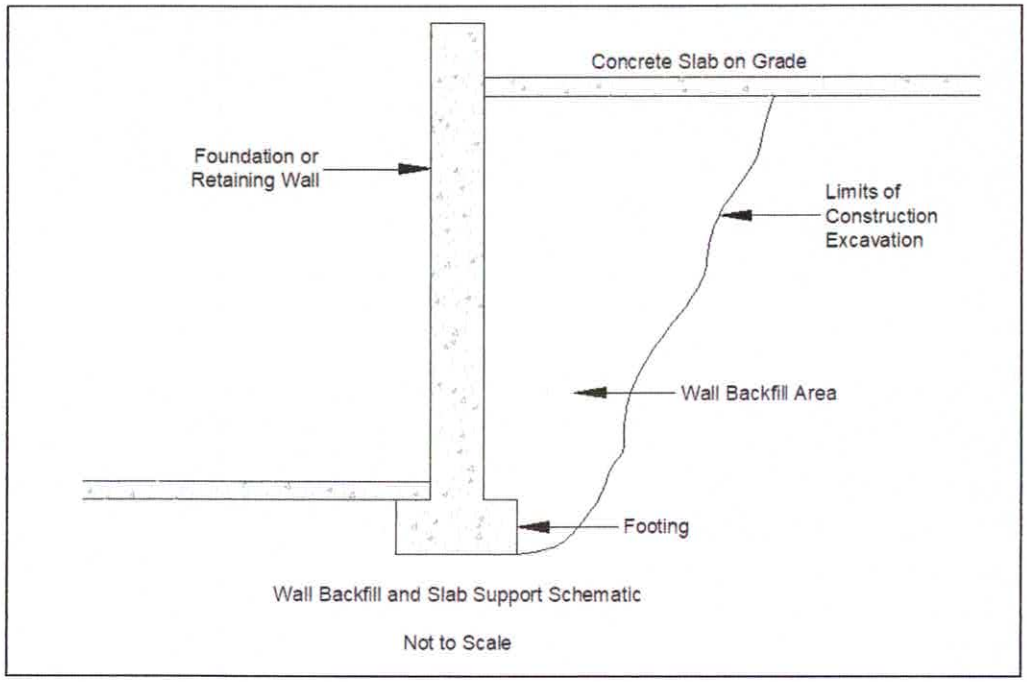
Landscaping and landscaping irrigation often provide additional moisture to the soil supporting exterior flatwork. Excessive moisture will promote heave of the flatwork either due to expansive

soil, or due to frost action. If movement of exterior slabs is undesirable, we recommend against placement of landscaping that requires irrigation. The ground surfaces near exterior flatwork must be sloped away from flatwork to reduce surface water migration to the support soil.

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. The maximum recommended rock size for natural soil fill is about 3 inches. This may require on-site screening or crushing if larger rocks are present. We must be contacted if it is desired to utilize rock greater than 3 inches for fill materials.

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
1 inch	100
¾ inch	95-100
#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.

We did not encounter free subsurface water in our test borings. If water is encountered during construction, it may be necessary to dewater excavations to provide for suitable working conditions.

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.

8.3 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.

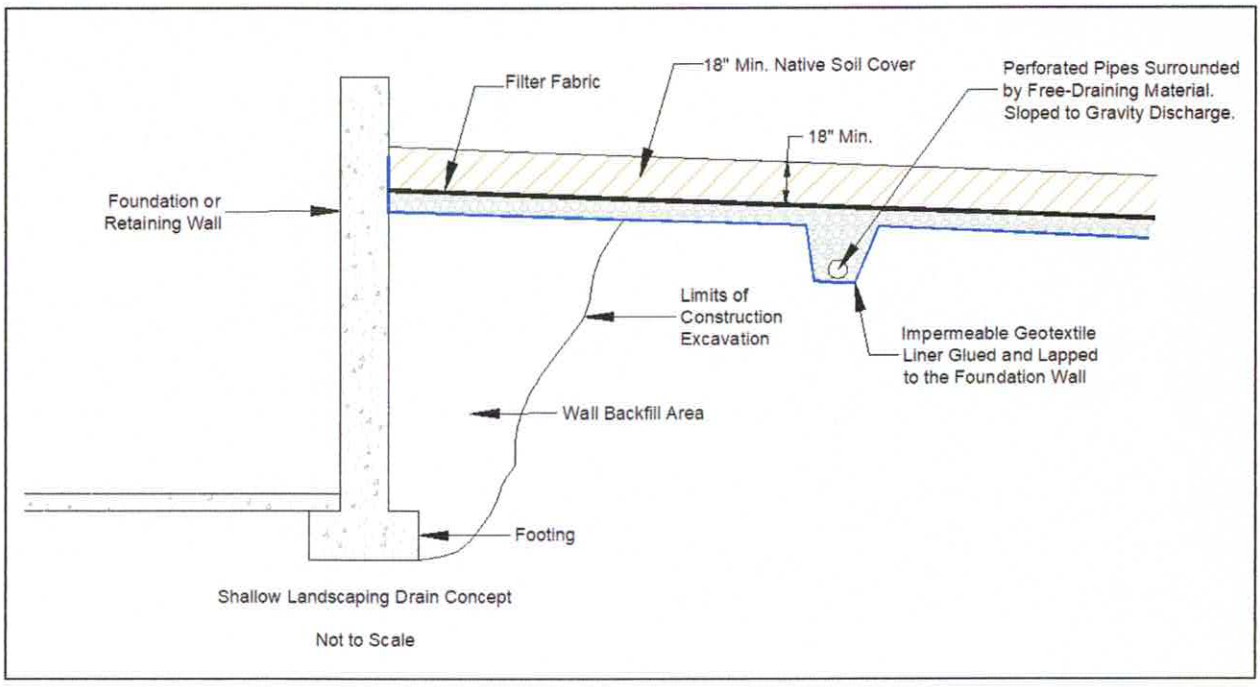
- The ground surface adjacent to the structure should be sloped to promote water flow away from the foundation system and flatwork.
- Snow storage areas should not be located in areas which will allow for snowmelt water access to support soils for the foundation system or flatwork.
- The project civil 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.

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.
- 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

This site has shallow expansive clay soils overlying hard limestone formation. We recommend shallow foundation extend down to the underlying hard limestone. We feel that it is feasible to develop this site as planned using relatively conventional techniques; however, 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.

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.

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

Jason A. Deem, P.G.
Engineering Geologist

Reviewed by,

COLORADO LICENSED
THOMAS RICHARD HARRISON
PE0047810
08-25-21
PROFESSIONAL ENGINEER

Tom R. Harrison P.E.
Geotechnical Engineer

APPENDIX A

Field Study Results

TRAUTNER GEOTECH LLC

Field Engineer	: S. Chiarito
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 07/12/2021
Total Depth (approx.)	: 5 feet
Location	: See Figure in Report

LOG OF BORING TB-1

Lot 13R Twilight Meadows
Mr. Parker Harrell

Project Number: 56713GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	LEAN CLAY WITH SAND, few gravels, stiff, moist, brown	CL					
2	CLAYEY GRAVEL WITH SAND, dense to very dense, slighty moist to moist, brown	GC			25/3		
4	FORMATIONAL MATERIAL, limestone, very dense, slightly moist, reddish tan	LS			10/0		No sample recovered from drive taken at 4.5 feet.
5	Auger refusal on formational material at 5 feet						

08-23-2021 C:\...schiarito\Desktop\BORE LOG.bor

TRAUTNER GEOTECH LLC

Field Engineer	: S. Chiarito
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 07/12/2021
Total Depth (approx.)	: 5
Location	: See Figure in Report

LOG OF BORING TB-1A

Lot 13R Twilight Meadows
Mr. Parker Harrell

Project Number: 56713GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	LEAN CLAY WITH SAND, few gravels, stiff, moist, brown	CL					
4	CLAYEY GRAVEL WITH SAND, dense to very dense, slightly moist to moist, brown	GC			28/5 10/0		
5	FORMATIONAL MATERIAL, limestone, very dense, slightly moist, reddish tan	LS					
	Auger refusal on formational material at 5 feet						

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TRAUTNER GEOTECH LLC

Field Engineer	: S. Chiarito
Hole Diameter	: 4" Solid
Drilling Method	: Continuous Flight Auger
Sampling Method	: Mod. California Sampler
Date Drilled	: 07/12/2021
Total Depth (approx.)	: 5 feet
Location	: See Figure in Report

LOG OF BORING TB-2

Lot 13R Twilight Meadows
Mr. Parker Harrell

Project Number: 56713GE

Sample Type
- Mod. California Sampler
- Standard Split Spoon
- Bag Sample

Water Level
- Water Level During Drilling
- Water Level After Drilling

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Water Level	REMARKS
0	LEAN CLAY WITH SAND, few gravels, stiff, moist, brown	CL			5/6 10/0		Partial sample obtained from drive taken at 2 feet.
4	CLAYEY GRAVEL WITH SAND, very dense, slightly moist, brown	GC					
5	FORMATIONAL MATERIAL, limestone, very dense, slightly moist, reddish tan	LS					
	Auger refusal on formational material at 5 feet						

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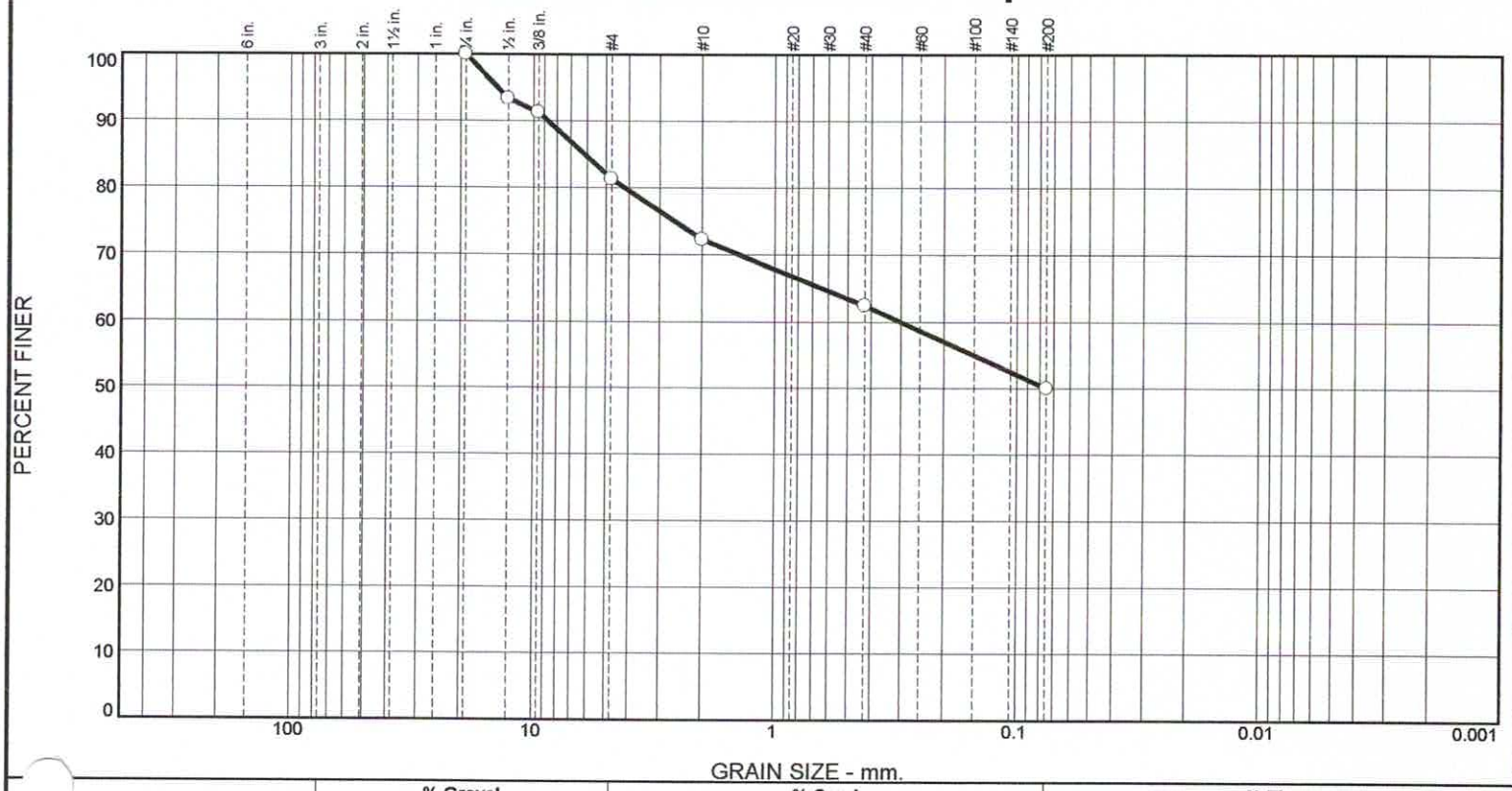
APPENDIX B

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	19	9	9	13	50	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100		
.50	93		
.375	91		
#4	81		
#10	72		
#40	63		
#200	50		

* (no specification provided)

Material Description

Cl-Sandy Lean Clay with Gravel

Atterberg Limits

PL= 19 LL= 39 PI= 20

Coefficients

D_{90}= 8.6954 D_{85}= 6.1405 D_{60}= 0.2997
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

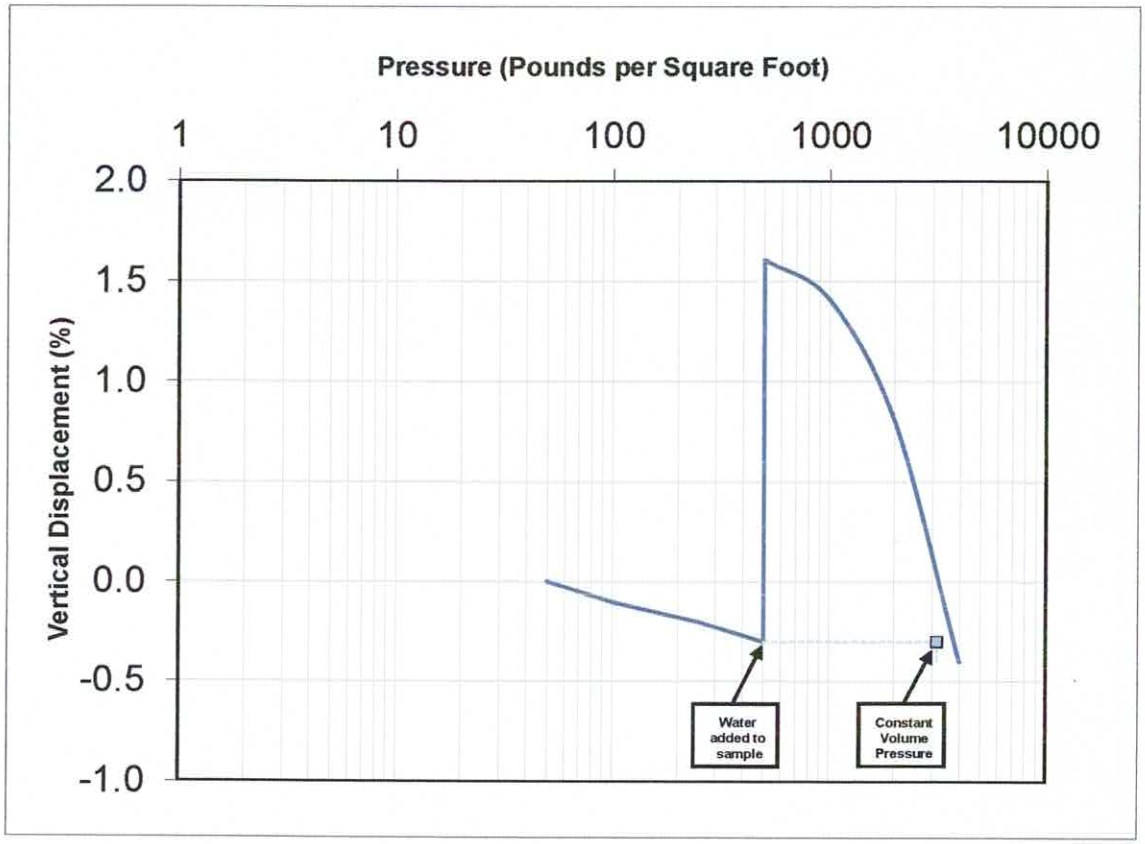
Location: Test Boring 1
Sample Number: 12677-A **Depth:** 0'-4' **Date:** 7-12-21

TRAUTNER GEOTECH LLC

Client: Parker Harrell
Project: Lot 13 R Twilight Meadows Subdivision
Project No: 56713GE **Figure** B.1

Tested By: J. Koch **Checked By:** N. Winiecki

SWELL - CONSOLIDATION TEST

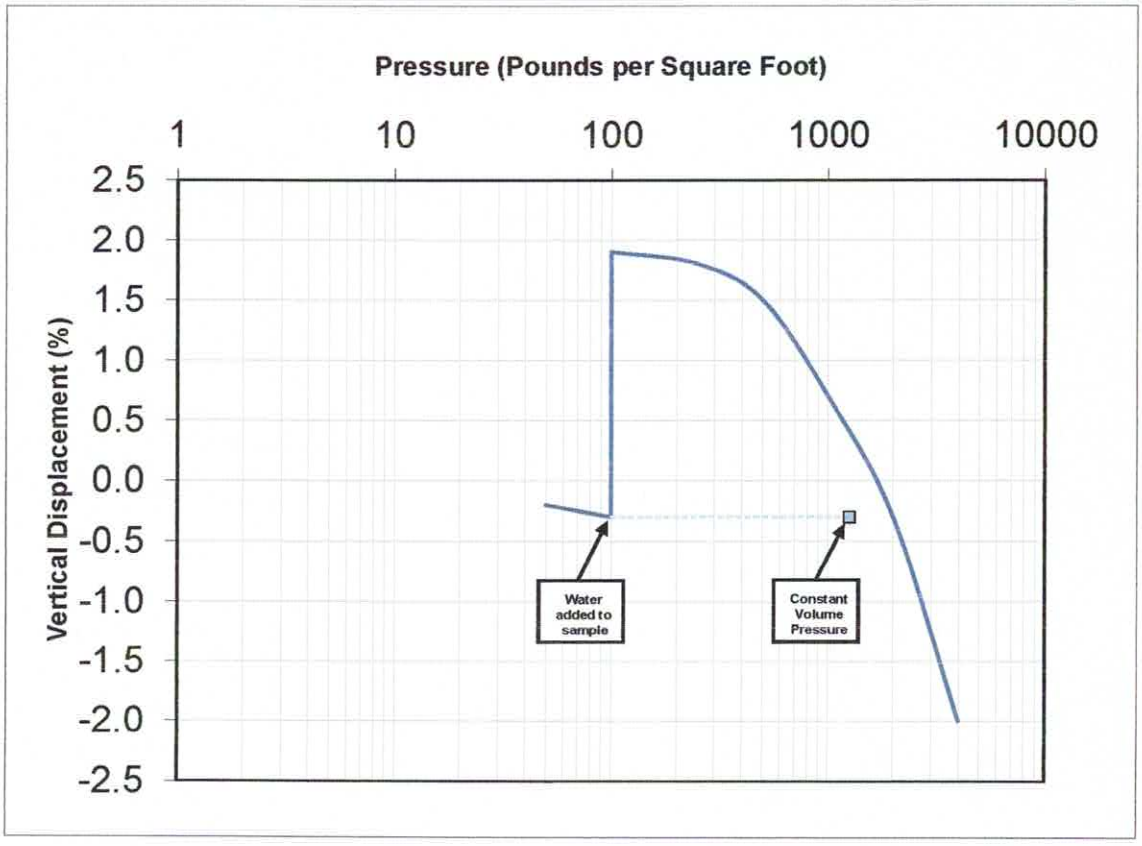


SUMMARY OF TEST RESULTS		
Sample Source:	TB-1 0'-4'	
Visual Soil Description:	GC	
Swell Potential (%)	1.9%	
Constant Volume Swell Pressure (lb/ft^2):	3,150	
	Initial	**Final**
Moisture Content (%):	11.3	18.1
Dry Density (lb/ft^3):	113.1	113.0
Height (in.):	0.996	0.992
Diameter (in.):	1.94	1.94

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:	56713GE
Sample ID:	12677-A
Figure:	B.2

SWELL - CONSOLIDATION TEST



SUMMARY OF TEST RESULTS		
Sample Source:	TB-2 @ 2'	
Visual Soil Description:	CL-ML	
Swell Potential (%)	2.2%	
Constant Volume Swell Pressure (lb/ft^2):	1,260	
	Initial	**Final**
Moisture Content (%):	20.1	19.3
Dry Density (lb/ft^3):	104.4	110.4
Height (in.):	1.000	0.980
Diameter (in.):	1.94	1.94

Project Number:	56713GE
Sample ID:	12677-E
Figure:	B.3