ALPINE CITY PLANNING COMMISSION MEETING

NOTICE is hereby given that the **PLANNING COMMISSION** of Alpine City, UT will hold a **Regular Meeting at Alpine City Hall,** 20 North Main, Alpine, Utah on **Tuesday, September 3, 2019 at 7:00 pm** as follows:

I. GENERAL BUSINESS

A. Welcome and Roll Call: David Fotheringham
B. Prayer/Opening Comments: Alan MacDonald
C. Pledge of Allegiance: By Invitation

II. PUBLIC COMMENT

Any person wishing to comment on any item not on the agenda may address the Planning Commission at this point by stepping to the microphone and giving his or her name and address for the record.

III. ACTION ITEMS

A. Public Hearing – Land Swap and Parking Exception – Paul Anderson
Planning Commission shall receive public comment and make a recommendation to City Council.

B. Public Hearing – Major Subdivision Concept Plan – Alpine Ridge Estates – David Gifford
Planning Commission shall receive public comment and make a recommendation to City Council.

IV. COMMUNICATIONS

V. APPROVAL OF PLANNING COMMISSION MINUTES: August 6, 2019

ADJOURN

Chairman David Fotheringham
September 3, 2019

THE PUBLIC IS INVITED TO ATTEND ALL PLANNING COMMISSION MEETINGS. If you need a special accommodation to participate in the meeting, please call the City Recorder's Office at 801-756-6347 ext. 5.

CERTIFICATION OF POSTING. The undersigned duly appointed recorder does hereby certify that the above agenda notice was posted at Alpine City Hall, 20 North Main, Alpine, UT. It was also sent by e-mail to The Daily Herald located in Provo, UT a local newspaper circulated in Alpine, UT. This agenda is also available on the City's web site at www.alpinecity.org and on the Utah Public Meeting Notices website at www.utah.gov/pmn/index.html.

PUBLIC MEETING AND PUBLIC HEARING ETIQUETTE

Please remember all public meetings and public hearings are now recorded.

- All comments **must** be recognized by the Chairperson and addressed through the microphone.
- When speaking to the Planning Commission, please stand, speak slowly and clearly into the microphone, and state your name and address for the recorded record.
- Be respectful to others and refrain from disruptions during the meeting. Please refrain from conversation with others in the audience as the microphones are very sensitive and can pick up whispers in the back of the room.
- Keep comments constructive and not disruptive.
- Avoid verbal approval or dissatisfaction of the ongoing discussion (i.e., booing or applauding).
- Exhibits (photos, petitions, etc.) given to the City become the property of the City.
- Please silence all cellular phones, beepers, pagers or other noise making devices.
- Be considerate of others who wish to speak by limiting your comments to a reasonable length, and avoiding repetition of what has already been said. Individuals may be limited to two minutes and group representatives may be limited to five minutes.
- Refrain from congregating near the doors or in the lobby area outside the council room to talk as it can be very noisy and disruptive. If you must carry on conversation in this area, please be as quiet as possible. (The doors must remain open during a public meeting/hearing.)

Public Hearing vs. Public Meeting

If the meeting is a **public hearing**, the public may participate during that time and may present opinions and evidence for the issue for which the hearing is being held. In a public hearing there may be some restrictions on participation such as time limits.

Anyone can observe a **public meeting**, but there is no right to speak or be heard there - the public participates in presenting opinions and evidence at the pleasure of the body conducting the meeting.

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Public Hearing – Land Swap and Parking Exception

FOR CONSIDERATION ON: 3 September 2019

PETITIONER: Paul Anderson

ACTION REQUESTED BY PETITIONER: Review and recommend approval of the proposed land swap and parking exception.

BACKGROUND INFORMATION:
Petitioner is seeking to exchange some of his property for publicly owned property. The proposed exchange would clean up the boundary line between public and private property. Also, the petitioner is seeking two parking spaces within the front setback of his property, which requires an exception to be recommended by the Planning Commission and approved by the City Council.

The Development Code states that the Planning Commission may grant exceptions to the parking requirements for the Business/Commercial and Gateway Historic Zone and recommend changes to public property:

Article 3.16.040.2

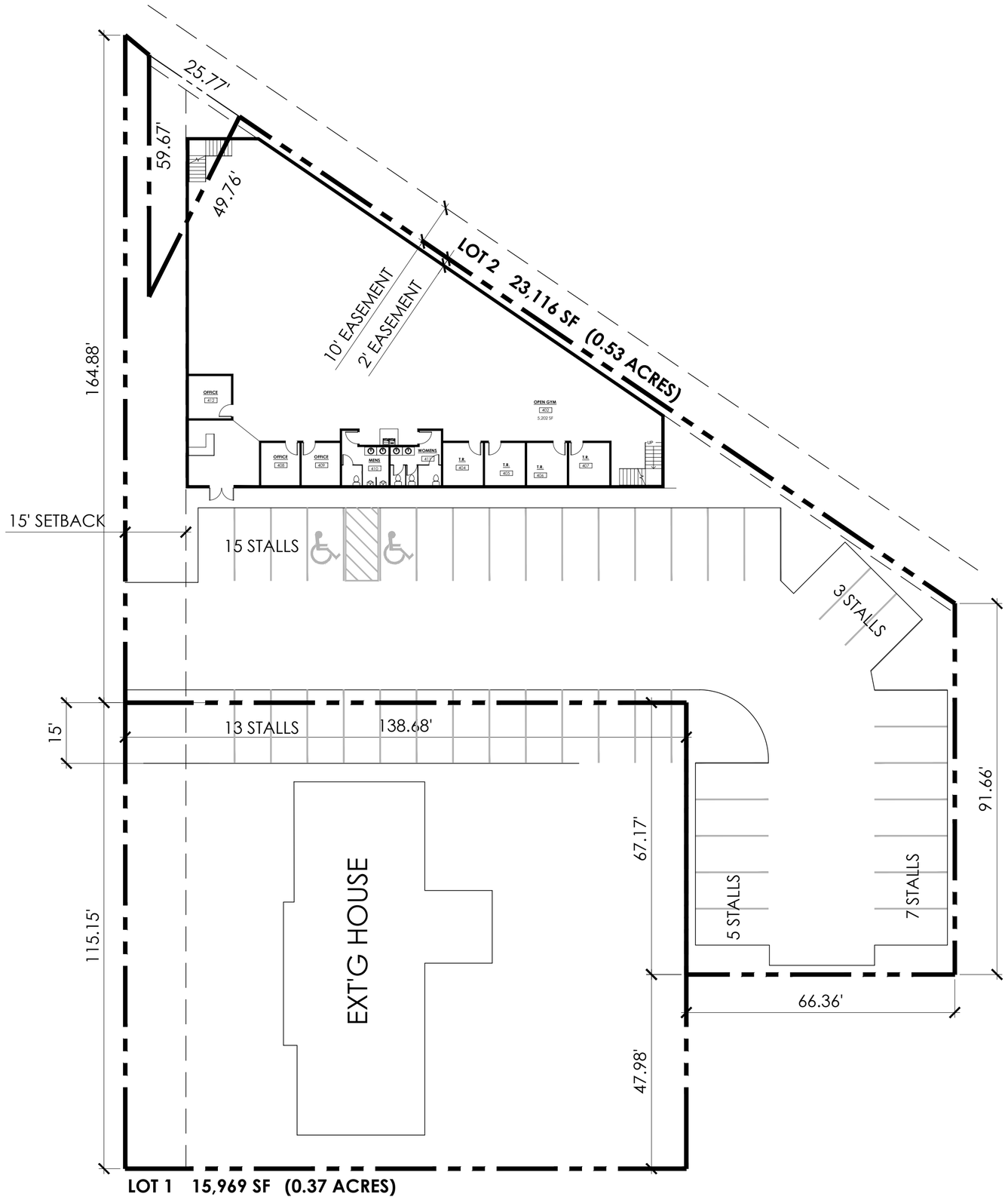
Land…shall not be materially changed, improved, altered, disposed of in any manner or used for any other purpose except after a recommendation of the Planning Commission following a public hearing and by a super majority vote of the City Council (4 positive votes out of 5 City Council members are required).

Article 3.24.050.2

No portion of the setback area adjacent to a street shall be used for off-street parking unless recommended by the Gateway Historic Committee and Planning Commission, and approved by the City Council.

Article 3.11.040.3.e

The Planning Commission may recommend exceptions to the Business Commercial Zone requirements regarding parking, building height, signage, setbacks and use if it finds that the plans proposed better implement the design guidelines to the City Council for approval.



aeurbia
architects and engineers

ALPINE PHYSICAL THERAPY
LAND SWAP EXHIBIT

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: **Public Hearing – Major Subdivision Concept Plan – Alpine Ridge Estates**

FOR CONSIDERATION ON: **3 September 2019**

PETITIONER: **David Gifford**

ACTION REQUESTED BY PETITIONER: **Recommend approval of the Alpine Ridge Estates Concept Plan.**

BACKGROUND INFORMATION:

Alpine Ridge Estates consists of 9 lots on 9.775 acres. The development is located at approximately 430 North 400 West, and in the CR 20,000 zone. The concept plan shows a connection to the Whitby Woodlands Subdivision on the east side of the property. The proposed concept and number of lots is based on bonus density that would be received from a Planned Residential Development (PRD). PRD status is dependent on a recommendation of from Planning Commission and approval by City Council.

STAFF RECOMMENDATION:

Review staff report and findings and make a recommendation, or decision to either approve or deny the proposed subdivision. Findings are outlined below.

SAMPLE MOTION TO APPROVE
I motion to recommend approval of the Alpine Ridge Estates concept plan with the following conditions:

- The Developer be granted an exception to the slope requirements for Buildable Area on Lots 3 through 5;
- Preliminary and Final plans for Alpine Ridge Estates must run together with the next phase of the Whitby Woodlands PRD Subdivision to ensure that lots 1 through 5 have access to and frontage on a compliant street.
- The Developer consider an alternative name for the subdivision to avoid confusion with other existing subdivisions.

SAMPLE MOTION TO DENY
I motion to recommend that the Alpine Ridge Estates concept plan be denied based on the following:

- The Developer provide a concept plan that meets the Open Space Ordinance without requiring exceptions to slope within lots;
- The Developer provide calculations showing the percentage of each lot containing 25% or greater slopes;
- The Developer provide rockfall, debris flow, and slide studies showing the lots are viable.

ALPINE CITY
STAFF REPORT
August 29, 2019

To: Alpine City Planning Commission & City Council

From: Staff

Prepared By: Austin Roy, City Planner
Planning & Zoning Department

Jed Muhlestein, City Engineer
Engineering & Public Works Department

Re: **Alpine Ridge Estates – CONCEPT**

Applicant:	Greg Wilding of Wilding Engineering, representing David Gifford
Project Location:	Approximately 430 North 400 West
Zoning:	CR-20,000 Zone
Acreage:	9.775 Acres
Lot Number & Size:	9 lots ranging from 0.31 acres to 0.50 acres
Request:	Recommend approval of the Concept Plan

SUMMARY

Alpine Ridge Estates consists of 9 lots on 9.775 acres. The development is located at approximately 430 North 400 West, and in the CR 20,000 zone. The concept plan shows a connection to the Whitby Woodlands Subdivision on the east side of the property. The proposed concept and number of lots is based on bonus density that would be received from a Planned Residential Development (PRD). PRD status is dependent on a recommendation of from Planning Commission and approval by City Council.

BACKGROUND

The property on which the Alpine Ridge Estates Subdivision is proposed is currently a one large lot with a single-family home on it. The property has been owned by the Marsh family for many years and was just recently sold to David Gifford, who is now seeking to subdivide the lot.

ANALYSIS

PRD Status and Requirements

"It shall be the City's sole discretion to decide if a project should be a PRD within the intent of the ordinance…the Planning Commission shall make a recommendation to the City Council and

the City Council shall make the final decision in deciding whether a project should be a PRD prior to a concept approval being given" (Article 3.09.010.2). To qualify as a PRD, a project must demonstrate that it will:

a) Recognize and incorporate natural conditions of site;
b) Efficiently utilize land resources and benefit the public in delivery of utilities and services;
c) Help to provide variety to style of dwelling available;
d) Preserve open space for recreational, scenic and public service needs;
e) Be consistent with objectives of underlying zone.

The developer has proposed to preserve the hillsides located on the property as open space. However, it is not specified on the plan whether this would be public or private open space. According to the PRD ordinance they would have to dedicate 25% of the overall property as open space. The concept plan shows 59.1% to be dedicated as open space.

This proposed plan ties into utilities off 400 West and Whitby Woodlands Drive, and this is covered further in the Engineering and Public Works Review.

By doing a PRD the developer would be allowed to have smaller lots than they would under the requirements of the CR-20,000 zone. This may allow for diversity of style for home in the area.

Developer has proposed to leave the hillsides as open space which could potentially be used for recreational or scenic purposes. Overall, the proposed concept seems to be consistent with the objectives of the underlying zone.

Planning Commission should review the above requirements for PRD and make recommendation, and City Council shall determine if the proposed subdivision qualifies as a PRD. Ultimately, the proposed plan only works as a PRD. If PRD status is not granted plans should be revised to meet the requirements of the underlying zone (CR-20,000).

Lot Width and Area

Lot width requirements for the CR-20,000 zone are 110 feet for a standard lot, and 80 feet for a cul-de-sac lot located on a curve. Lots located within a PRD shall have a width of not less than 90 feet (measured 30 feet back from the front property line) and the length of the front lot line abutting the City street shall not be less than 60 feet. The proposed lots appear to meet the lot with requirements for a PRD.

Lots in the CR-20,000 zone are required to be a minimum of 20,000 square feet in size. However, the Alpine Ridge Estates Subdivision is being proposed as a PRD, which grants density bonuses for the dedication of public and/or private open space. According to a slope analysis of the property (see attached), they have a base density of 8 lots. With the dedication of the appropriate amount of private open space density would increase to 9 lots, and with the dedication of the appropriate amount of public open space density would increase to 10 lots potentially. The proposed concept appears to meet the density requirements set forth in the PRD ordinance.

As mentioned under the PRD Status and Requirements section above, the developer needs to specify what type of opens space is being proposed (public or private). However, based on the plans showing 59.1% of the land to be dedicate as open space it would meet the 25% minimum for the zone.

Use
The developer is proposing that the lots be used for single-unit detached dwellings, which is consistent with the permitted uses for the CR-20,000 zone.

Sensitive Lands (Wildland Urban Interface)
The property is not located in the Wildland Urban Interface; however, it does have a lot of slope and natural vegetation. See the Engineering and Public Works, and the Lone Peak Fire Department Reviews below for further comments on sensitive lands requirements.

Trails
The City Trail Master Plan shows no trails within the development area, and there are no nor does it show any proposed trails, and thus trails would not be a requirement for this subdivision.

General Plan
As part of the City General Plan, the Street Master Plan, shows a proposed new local street running through the Alpine Ridge Estates property, connecting Whitby Woodlands Drive with 200 North street. The proposed concept plan has incorporated the proposed new local street from the street master plan, which connects earlier phases of the Whitby Woodlands PRD Subdivision to future phases of the Whitby Woodlands PRD Subdivision.

Lots 1 through 5, and thus the entire east side of this development, are only viable if the Alpine Ridge Estates Subdivision is able to coordinate and be integrated with the Whitby Woodlands PRD Subdivision. Lots 3, 4, and 5 all have frontage on Whitby Woodlands Circle, and lots 1, 2, and 3 fronting on Whitby Woodlands Drive with a temporary turnaround located south of the Alpine Ridge Estates property in a future phase of the Whitby Woodlands Subdivision. The road appears to have shifted slightly from what was previously approved for the Whitby Woodlands PRD Subdivision. Because of the change, that phase of the Whitby Woodlands development will need to re-apply for preliminary approval.

Staff recommends Preliminary and Final plans of the proposed Alpine Ridge Estates subdivision and the next phase of the Whitby Woodlands PRD Subdivision be processed together or the proposed lots 1 through 5 will not be legal lots since they will not have access to a compliant street.

Other
Alpine City already has a subdivision named Alpine Ridge Subdivision and another named The Ridge at Alpine. Though the proposed name is different (Alpine Ridge Estates), **staff would recommend that the owner consider an alternative name to avoid confusion with other subdivisions**.

REVIEWS

PLANNING AND ZONING DEPARTMENT REVIEW
The analysis section in the body of this report serves as the Planning and Zoning Department review.

ENGINEERING AND PUBLIC WORKS DEPARTMENT REVIEW

Streets
At Concept Engineering checks the streets for general compliance with the Street Master Plan. The plans shows a compliant cul-de-sac extending off 400 West (less than 450 feet), an extension of Whitby Woodlands Drive which terminates in a temporary turn-a-round, and shows a portion of roadway headed northward which appears to complete a future phase of a previously approved development, Whitby Woodlands PRD Subdivision, as mentioned in the Planners portion of the review letter. As previously mentioned, that phase of Whitby Woodlands would need to be approved and constructed at the same time of this development for this plan to be complaint with code. **Without the Whitby Woodlands PRD subdivision future phase running concurrent with this one, this subdivision would create a non-compliant partial width street** (see DC 4.07.040.8). At Preliminary and Final, both developments should be approved together and constructed together.

Lots
Every lot is required to show "Buildable Area" for a home. One of the requirements for Buildable Area is that "*The area contains no territory having a natural slope of twenty (20) percent or greater;*" (Section 3.01.110). Lots 3 through 5 have an existing/abandoned irrigation ditch that ran through the property which causes anomalies within the Buildable Area shown. **Staff would recommend an exception to the Buildable Area requirements on Lots 3 through 5 due to the topography being altered from the irrigation ditch.** If graded back to pre-irrigation grades, the area would clearly meet the ordinance.

If approved to be developed as a PRD, Development Code section 3.09.040.3 has strict requirements regarding open space. In general, this section states that all hazardous areas (rockfall, slide, flood, etc.) and all areas containing slopes greater than 25% must be included in the open space areas. Subsections of the same ordinance give allowances for lots to contain 25% slopes, but the applicant must show that they have first tried to follow the ordinance, and then show how their development would be better using the exception. A plan that meets ordinance without needing an exception to this ordinance was not submitted. **Staff would recommend the applicant bring a plan that meets the Open Space ordinance so the two concept plans can be compared. Staff has also not received data regarding the percentage of slopes greater than 25% are in each lot and would not recommend approval until the Planning Commission has seen this information.**

Utilities – All
The utilities will be discussed at length at Preliminary Review. At concept the overall ability of the City to serve the area is evaluated. In this situation, the necessary infrastructure to serve the area exists on both the east and west sides of the development. The development is well below

the 5,350-foot elevation, which is the highest elevation the existing water system can serve and still provide the minimum 40 psi required by ordinance. The master plans for all city utilities do account for the area.

Natural Hazards

The proposed development falls within the Geologic Hazards Overlay Zone which has areas identified as having the potential for rockfall, slide, and debris flows. Within these areas the Sensitive Lands Ordinance applies (DC 3.12). Section 3.12.090.4.e states *"Development shall not be allowed within fifty (50) feet of slopes in excess of forty (40) percent, areas subject to landsliding, or other high-hazard geologic areas as determined by a soils report and/or geology report produced pursuant to the requirements of item H-5 documentation."* Lots 3-5 and 7-9 would be affected by this ordinance and be required to show setbacks from the 40% and greater slopes at a minimum. A rockfall study, if more restrictive, would override that. Lot 9 would be impacted the most as the 50-foot setback extends deep into the lot. Slope stability is the concern when building on top of steep slopes. The added pressure of a structure could cause the slope to fail. **If the applicant can show, through a slope stability analysis, that the stability of Lot 9 would be safe if built to the regular zoning setbacks, then the 50-foot setback could be reduced to the typical setbacks of the zone.** If not, the Buildable Area for Lot 9 will be quite small. 10,000 square foot lots do not have a minimum size limit for Buildable Area, but with such a small one the lot could potentially be unbuildable. A geotechnical report was submitted which did show slope stability tests in three locations but there was no clear explanation of the results and one such test was not done near Lot 9.

Rockfall, debris flow, and slides were mentioned as not being within the scope of the study. Staff would recommend the applicant revise the study or have new studies performed to provide more information regarding these items.

Other

The property has existing buildings onsite. Prior to the recordation of any phase of development that contains existing buildings, the existing building(s) must be removed, existing services either re-used or cut/capped/removed; or a bond provided to ensure those things will happen prior to a building permit being issued on the affected lot(s).

LONE PEAK FIRE DEPARTMENT REVIEW

See the attached review from the Lone Peak Fire Department.

HORROCKS ENGINEER'S REVIEW

See the attached review from Horrocks Engineering.

NOTICING

Notice has been properly issued in the manner outlined in City and State Code

STAFF RECOMMENDATION

Review staff report and findings and make a recommendation, or decision to either approve or deny the proposed subdivision. Findings are outlined below.

Findings for a Positive Motion:

A. The streets and general layout appear to meet ordinance;
B. Proposed roadway construction appears to meet Alpine City design standards;
C. Frontage improvements are shown throughout the development;
D. Plan appears to comply with the General Plan and Street Master Plan, showing a local street running through the southeast corner of the property, connecting Whitby Woodlands Drive to future phases of the Whitby Woodlands PRD Subdivision.
E. The property appears to meet the requirements of a PRD, based on slope analysis, lot width, and density requirements, as well as the other requirements including:
    a. Recognize and incorporate natural conditions of site;
    b. Efficiently utilize land resources and benefit the public in delivery of utilities and services;
    c. Help to provide variety to style of dwelling available;
    d. Preserve open space for recreational, scenic and public service needs;
    e. Be consistent with objectives of underlying zone.

Findings for Negative Motion:

A. A concept plan that meets Open Space requirements was not submitted;
B. Rockfall, debris flow, and slide studies were not submitted showing the lots are buildable lots.

MODEL MOTIONS

SAMPLE MOTION TO APPROVE

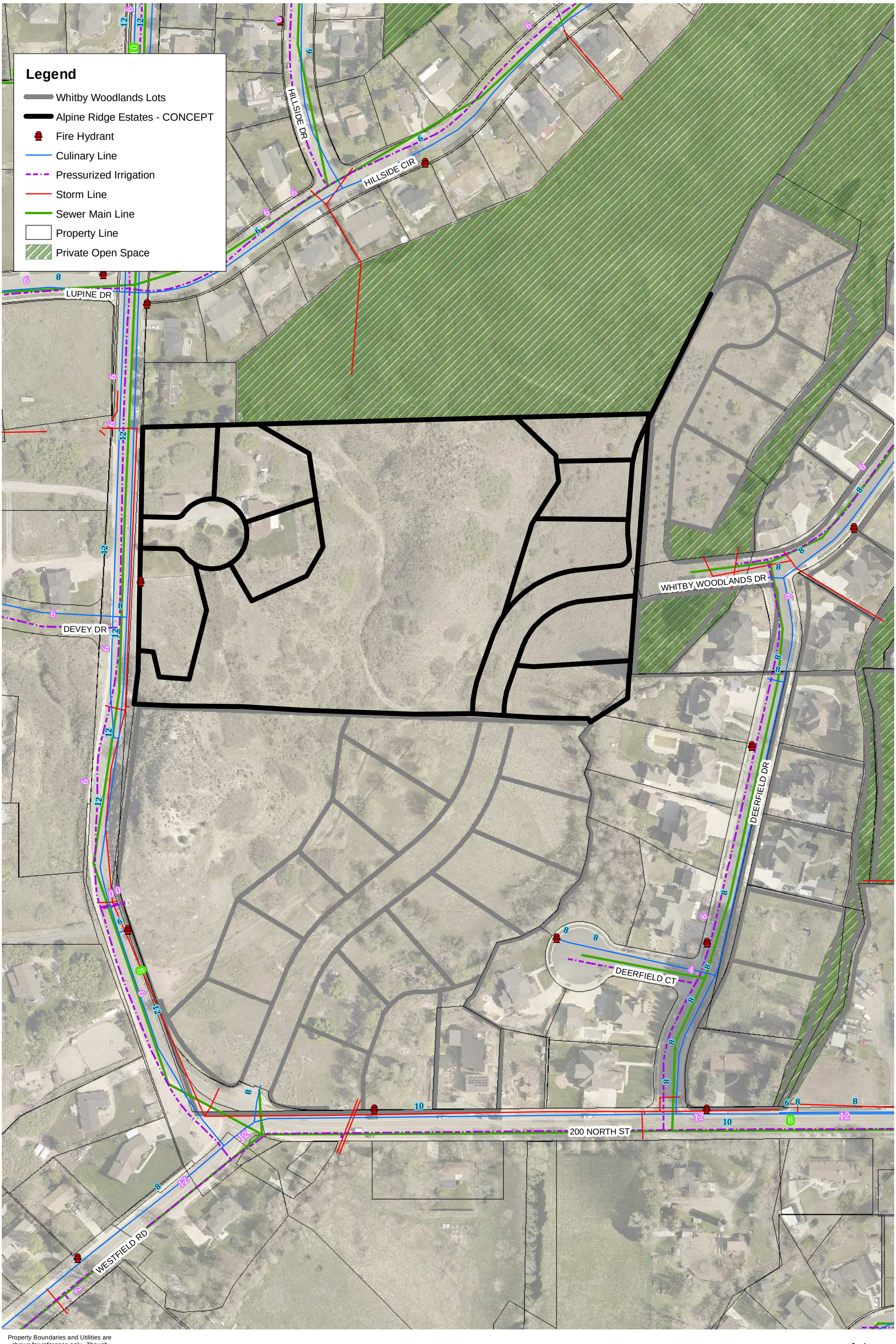
I motion to recommend approval of the Alpine Ridge Estates concept plan with the following conditions:

- The Developer be granted an exception to the slope requirements for Buildable Area on Lots 3 through 5;
- Preliminary and Final plans for Alpine Ridge Estates must run together with the next phase of the Whitby Woodlands PRD Subdivision to ensure that lots 1 through 5 have access to and frontage on a compliant street.
- The Developer consider an alternative name for the subdivision to avoid confusion with other existing subdivisions.

SAMPLE MOTION TO DENY

I motion to recommend that the Alpine Ridge Estates concept plan be denied based on the following:

- The Developer provide a concept plan that meets the Open Space Ordinance without requiring exceptions to slope within lots;
- The Developer provide calculations showing the percentage of each lot containing 25% or greater slopes;
- The Developer provide rockfall, debris flow, and slide studies showing the lots are viable.



Property Boundaries and Utilities are shown for reference only. Though shown generally close, a survey and Blue Stake should be done to locate both accurately.

ALPINE RIDGE ESTATES CONCEPT

1 inch = 150 feet

0 45 90 180 270 360 Feet

N

SLOPE ANALYSIS (BASED ON PRD FORMULA 3.9.5)

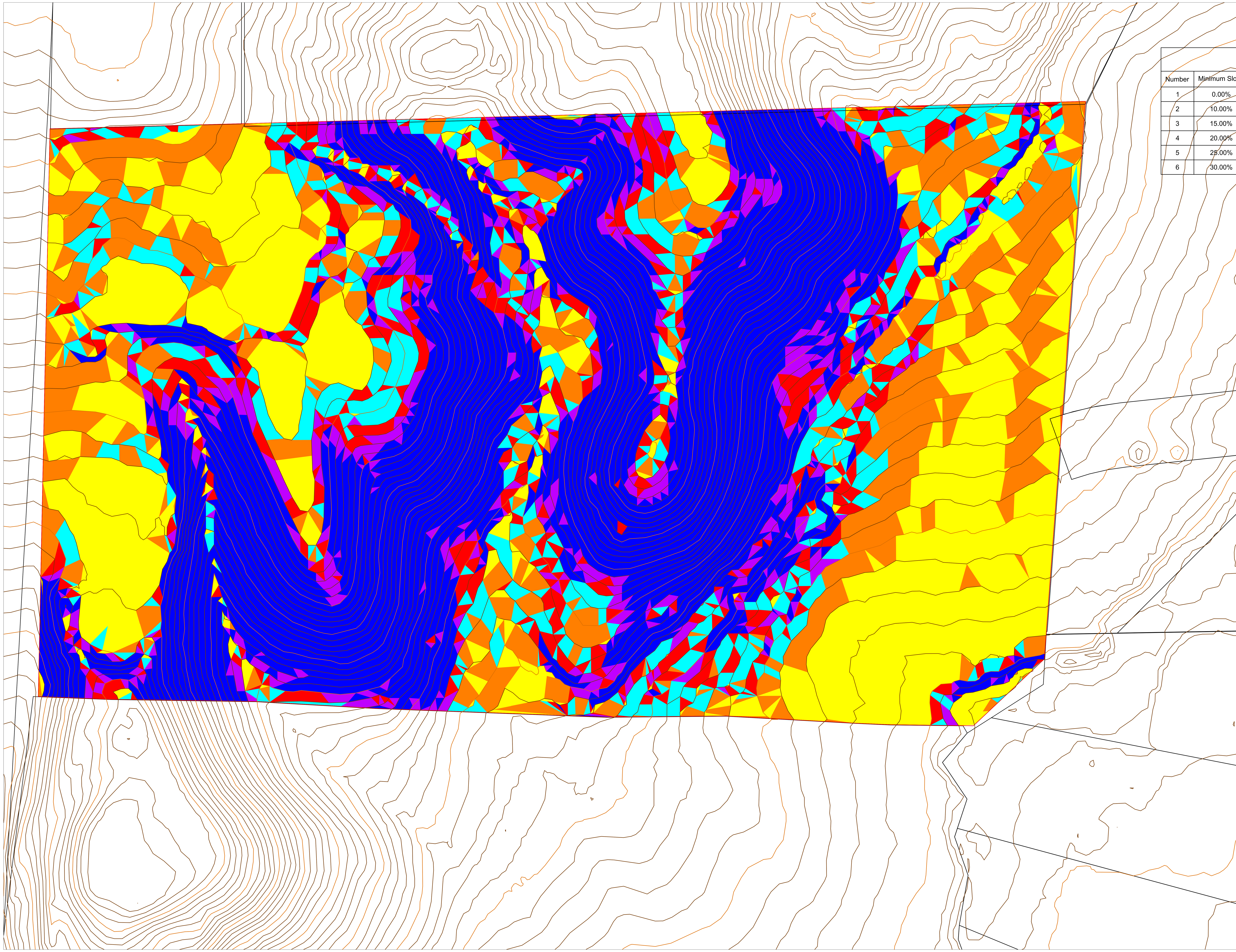
Name: Marsh Properties, 430 N 400 W
Date: September 12, 2018
Contours Used: 2013 Fall Lidar Contours

CR-20,000 Zone

Acreage	Acres	Total Square Feet
Property	9.76	425,152.22

Zone Total Acreage **9.76**

Slope Percentages	Percent Acres Within that range	SF within slope range	Acres within slope range	Required Acres per Lot	Allowed Lots for this range
0-9.99%	23.7%	100,557.05	2.31	0.58	3.98
10-14.99%	15.3%	65,150.00	1.50	0.86	1.74
15-19.99%	10.1%	42,873.90	0.98	1.15	0.86
20-24.99%	7.7%	32,754.74	0.75	1.72	0.44
25-29.99%	6.6%	28,150.09	0.65	2.30	0.28
30%+	36.6%	155,666.44	3.57	5.00	0.71
Totals	**100.0%**		**9.76**		
				Base Density	**8**
				Private Open Space (10% Bonus)	**9**
				Public Open Space (25% Max Bonus)	**10**



Slopes Table

Number	Minimum Slope	Maximum Slope	Area	Color
1	0.00%	10.00%	100557.05	
2	10.00%	15.00%	65150.00	
3	15.00%	20.00%	42873.90	
4	20.00%	25.00%	32754.74	
5	25.00%	30.00%	28150.09	
6	30.00%	189.90%	155666.44	

SCALE: 1" = 40' (24x36)

0 1"

WATER RESOURCES
PUBLIC SERVICES
STORM WATER
ENGINEERING

Alpine Public Works

REMARKS

Fall 2013 Lidar Contours used

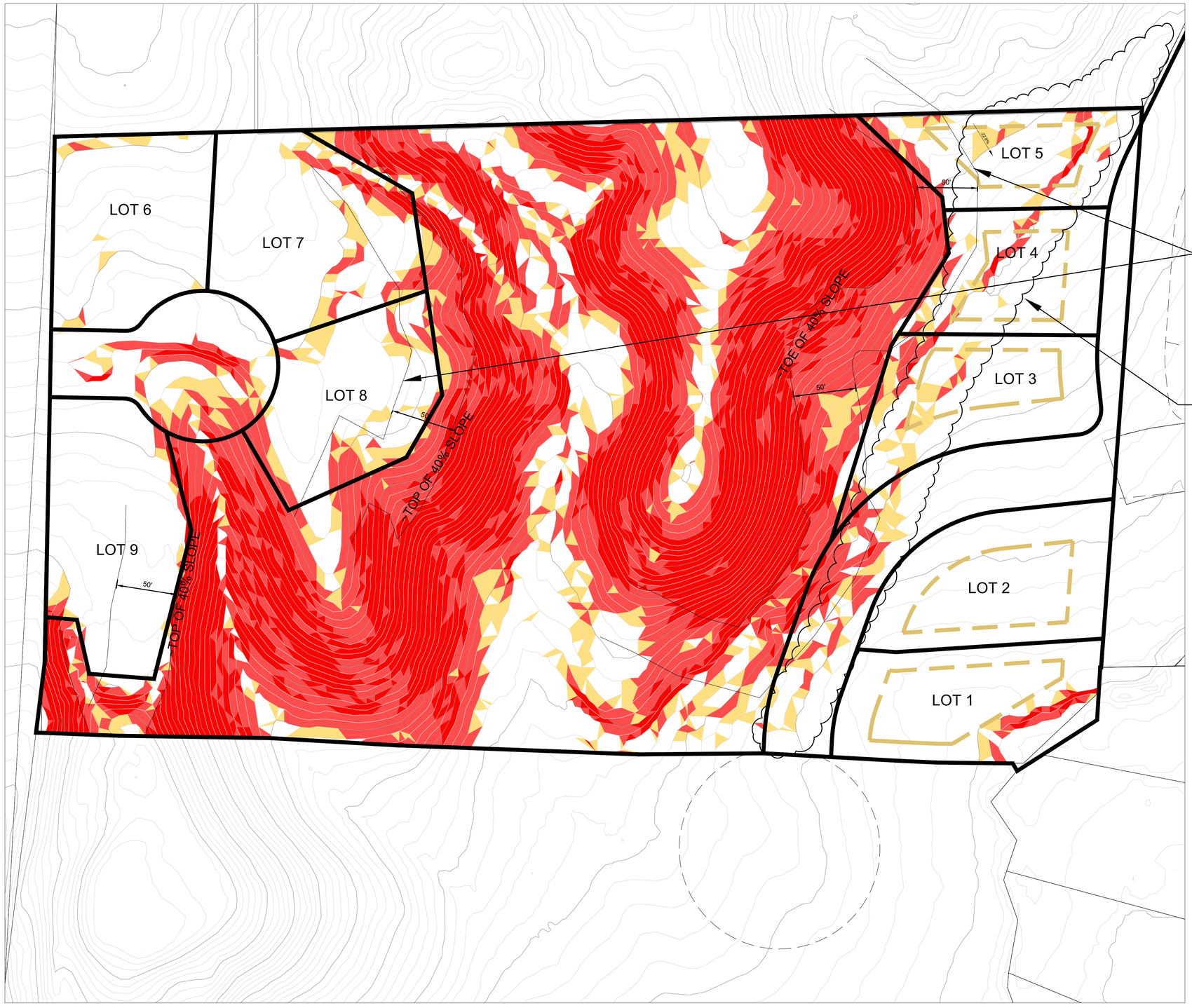
Marsh Properties
Slope Analysis
Based on PRD formula

PRD Slope Analysis

Engineering File Number:
-

Drawing: 1

Sheet: 1 of 1



Slopes Table				
Number	Minimum Slope	Maximum Slope	Area	Color
1	20.00%	25.00%	32754.74	
2	25.00%	40.00%	90329.06	
3	40.00%	143.67%	93487.47	

SCALE: 1" = 40' (24x36)

0 1"

Water Resources
Public Services
Storm Water
Engineering

Alpine Public Works

REMARKS

Fall 2013 Lidar Contours used

Alpine Ridge Estates - Concept
Slope Analysis
Based on PRD formula

PRD Slope Analysis

Engineering File Number:
-

Drawing: 1
Sheet: 1 of 1

HORROCKS ENGINEERS

To: **Jed Muhlestein**
Alpine City

From: **John E. Schiess, P.E.**

Date: Aug 28, 2019 **Memorandum**

Subject: **Alpine Ridge Hydraulic Modeling Results and Recommendations**

The proposed development consists of 9 single family home lots split between Hog Hollow Rd (4) and Whitby Woodlands Dr (5).

The development proposes 9 culinary ERC's, 2.3 irrigated acres, and 9 sanitary sewer ERU's. The current master plan anticipated 4 culinary ERC's, 6.2 irrigated acres, and 4 sanitary sewer ERU's. Proposed connections are slightly different than the master plan projected. 5 more culinary and sanitary sewer connection will not adversely affect operations of those systems. Less irrigated acreage will enhance buildout service in the PI system.

The proposed culinary water improvements have been modeled in both the current and buildout models. The proposed improvements fit well within the City's culinary water master plan and modeling shows them to be adequate.

The proposed pressurized irrigation improvements have been modeled in both the current and buildout models under both wet and dry year supply conditions. The proposed improvements fit well within the City's pressurized irrigation master plan and modeling shows them to be adequate.

The proposed sanitary sewer improvements have been modeled in both the current and buildout models. The proposed improvements fit well within the City's sanitary sewer master plan and modeling shows them to be adequate.

Recommendations:

1. None.

Comments:

2. Fire flow available in the area surrounding the proposed improvements should be over 2,500 gallons per minute at 20 psi for the proposed lines.

LONE PEAK FIRE DISTRICT
5582 PARKWAY WEST DRIVE
HIGHLAND, UTAH 84003
(801) 763-5365
WWW.LONEPEAKFIRE.COM

REED M. THOMPSON, FIRE CHIEF

MEMORANDUM

DATE: 30 August 2019

TO: Austin Roy, City Planner, Alpine City
Jed Muhlestein, City Engineer, Alpine City
CC: Shane Sorensen, City Administrator, Alpine City

FROM: Reed M. Thompson, Fire Chief

SUBJECT: ALPINE RIDGE ESTATES SUBDIVISION

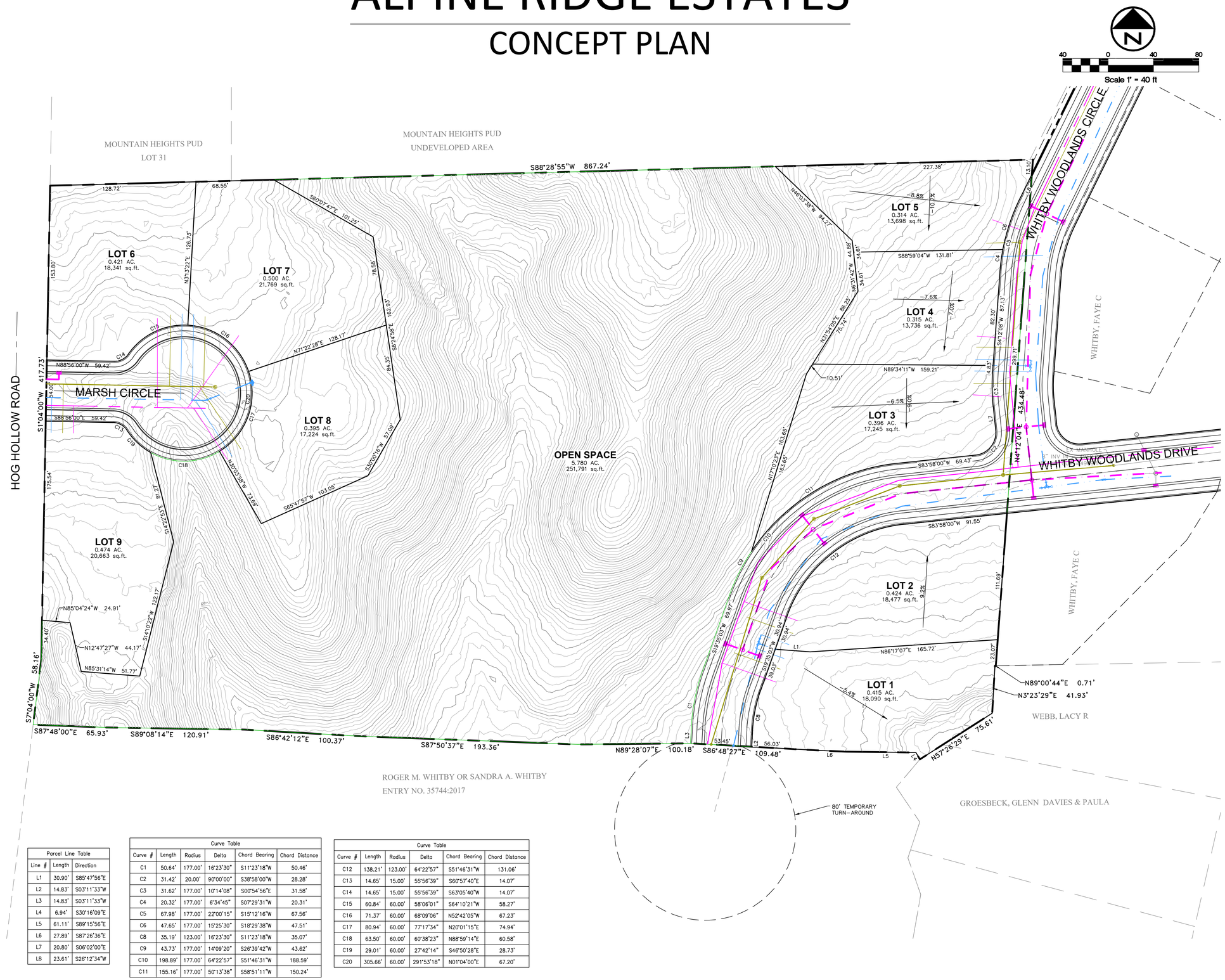
In review of the proposed concept plan for "Alpine Ridge Estates Subdivision", dated 12 August 2019, please note:

- In the cover page or construction notes on Sheet C101 language needs to identify that this project is within the Wildland Urban Interface Boundary and as such is subject to compliance with the Alpine City Sensitive Land Ordinance.
- The temporary turnaround on Whitby Woodlands Drive to the south of lot 1 shall be an all-weather access road capable of sustaining the weight limits of fire apparatus as required in the International Fire Code.
- The area designated as open space shall be cleared of all dead fall, leaf litter, and standing dead oak in an effort to address fire spread mitigation.
- No vertical construction shall commence until water lines are tested, streets are accessible including turnarounds.

If you have further questions regarding this information, please contact me directly.

ALPINE RIDGE ESTATES

CONCEPT PLAN



Parcel Line Table		
Line #	Length	Direction
L1	30.90'	S85°47'56"E
L2	14.83'	S03°11'33"W
L3	14.83'	S03°11'33"W
L4	6.94'	S30°16'09"E
L5	61.11'	S89°15'56"E
L6	27.89'	S87°26'36"E
L7	20.80'	S06°02'00"E
L8	23.61'	S26°12'34"W

Curve Table					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Distance
C1	50.64'	177.00'	16°23'30"	S11°23'18"W	50.46'
C2	31.42'	20.00'	90°00'00"	S38°58'00"W	28.28'
C3	31.62'	177.00'	10°14'08"	S00°54'56"E	31.58'
C4	20.32'	177.00'	6°34'45"	S07°29'31"W	20.31'
C5	67.98'	177.00'	22°00'15"	S15°12'16"W	67.56'
C6	47.65'	177.00'	15°25'30"	S18°29'38"W	47.51'
C8	35.19'	123.00'	16°23'30"	S11°23'18"W	35.07'
C9	43.73'	177.00'	14°09'20"	S26°39'42"W	43.62'
C10	198.89'	177.00'	64°22'57"	S51°46'31"W	188.59'
C11	155.16'	177.00'	50°13'38"	S58°51'11"W	150.24'

Curve Table					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Distance
C12	138.21'	123.00'	64°22'57"	S51°46'31"W	131.06'
C13	14.65'	15.00'	55°56'39"	S60°57'40"E	14.07'
C14	14.65'	15.00'	55°56'39"	S63°05'40"W	14.07'
C15	60.84'	60.00'	58°06'01"	S64°10'21"W	58.27'
C16	71.37'	60.00'	68°09'06"	N52°42'05"W	67.23'
C17	80.94'	60.00'	77°17'34"	N20°01'15"E	74.94'
C18	63.50'	60.00'	60°38'23"	N88°59'14"E	60.58'
C19	29.01'	60.00'	27°42'14"	S46°50'28"E	28.73'
C20	305.66'	60.00'	291°53'18"	N01°04'00"E	67.20'

WILDING
ENGINEERING
14721 South Heritage Crest Way
Bluffdale, Utah 84065
801.553.8112
www.wildingengineering.com

DRAWING NOTES:

TOTAL ACREAGE = 9.775 (425,803 sf)
TOTAL NUMBER OF LOTS = 8

G:\DATA\19011 Olson Property\dwg\19011 Concept.dwg
PLOT DATE: Aug 12, 2019

LEGEND

- PROPOSED 8" WATER LINE
- PROPOSED 8" SEWER LINE
- PROPOSED 6" IRRIGATION
- PROPOSED 15" STORM DRAIN
- PROPOSED CATCH BASIN

NO.	REVISION	DATE

PROJECT INFORMATION

ALPINE RIDGE ESTATES

CONCEPT PLAN

ALPINE, UTAH

DRAWN	CHECKED	PROJECT #
TMS	-	19011

DATE 08/12/2019

SCALE 1" = 40'

SHEET C101

ENGINEER'S STAMP

ALPINE RIDGE ESTATES

VICINITY PLAN

N

40 0 40 80

Scale 1" = 40 ft

WILDING ENGINEERING

14721 South Heritage Crest Way
Bluffdale, Utah 84065
801.553.8112
www.wildingengineering.com

DRAWING NOTES:

1. TOTAL ACREAGE = 9.775 (425,803 sf)

G:\DATA\19011 Olson Property\dwg\19011 Concept 10k.dwg
PLOT DATE: May 10, 2019

NO.	REVISION	DATE

PROJECT INFORMATION

ALPINE RIDGE ESTATES

VICINITY PLAN

ALPINE, UTAH

DRAWN	CHECKED	PROJECT #
SWR	-	19011

DATE 08/12/2019

SCALE 1" = 40'

SHEET C102

ENGINEER'S STAMP

GEOTECHNICAL INVESTIGATION
MARSH ESTATES SUBDIVISION

PROPERTY LOCATION
410 N 400 W
ALPINE, UTAH

Project No.: 19011

Prepared For:
TODD AND JULENE OLSON
3274 W 14400 S, BLUFFDALE, UT 84065

APRIL 30, 2019

WILDING
ENGINEERING

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Bluffdale, Utah 84065

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Appendix A

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Appendix B

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Appendix C

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Appendix D

..... Seismic Values

Appendix E

..... Slope Stability Analysis

1 INTRODUCTION

This report presents the geotechnical investigation for the proposed residential development at 410 N 400 W, Alpine, Utah, as shown on the Site Vicinity Map in Appendix A (Figure A-1).

The field investigation consisted of seven (7) test pits. The test pits were excavated to depths of 11.5 to 12 feet below the existing ground surface. Detailed test pit logs can be found in Appendix B (Figures B-2 to B-8). Recommendations in this report are based upon information gathered from the field investigation, site observation, published geologic maps, laboratory testing, and engineering analysis.

2 PURPOSE AND SCOPE

The purpose of this investigation was to assess the suitability of on-site soils for the residential development with the associated utilities, landscaping, and roadway and provide geotechnical recommendations. The scope of work completed for this study included site reconnaissance, subsurface exploration, soil sampling, laboratory testing, engineering analyses, and preparation of this report.

3 SITE AND PROJECT INFORMATION

3.1 PROJECT DESCRIPTION

Based on our understanding of the project, the proposed development consist of 9 single family lots. No specific structural loading information is provided at the time of this report. However, we understand the proposed structures will be one- to two-story with typical wood framed walls and a basement, constructed on traditional continuous or spread footings.

3.2 EXISTING SITE CONDITIONS

At the time of our field investigation, there is an existing single family residence at the northwest corner of the property. The remaining property is undeveloped and covered with various weeds, grasses and sparse medium sized tress. The site can be accessed through the existing residence on the west side and from Whitby Woodlands Drive on the east side. The center portion of the property is a small valley set between two hilltops to the east and west with slopes that exceed 30%.

4 GEOLOGY RESEARCH AND REVIEW

4.1 SURFICIAL GEOLOGY

Based on the available geologic maps[1], the east portion of the project site is mapped within the Qafy zone, which is described as: *Younger alluvial-fan deposits (Holocene and upper Pleistocene) - Mostly sand, silt, and gravel that is poorly stratified and poorly sorted; deposited at drainage mouths; Qafy fans are mostly Holocene and cover Lake Bonneville deposits or deflect stream channels; generally less than 40 feet (12 m) thick.* The middle and west portions of the project site is mapped within the Qls zone, which is described as: *Lacustrine sand deposits (upper Pleistocene) - Sand and some silt and gravel deposited in beaches, typically in two settings that correspond to transgressive and regressive phases of Lake Bonneville: (1) deposited below the Provo shoreline while the lake was at and regressing from (below) this shoreline, possibly as parts of deltas from several canyons, grading downslope into Qlf; and (2) deposited between the Provo and Bonneville shorelines of Lake Bonneville as the lake transgressed to and was at the Bonneville shoreline; estimate up to 200 feet (60 m) thick in Orem quadrangle. Locally includes Holocene eolian deposits that cannot be mapped separately because they grade imperceptibly into sandy lacustrine deposits (Qls) that are reworked by wind, in particular near the former Geneva Steel plant; thickness less than 10 feet (3 m).*

4.2 LIQUEFACTION

Certain areas within the intermountain region possess a potential for liquefaction during seismic events. Liquefaction is a phenomenon whereby loose, saturated, non-cohesive soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Liquefaction can result in densification of such deposits, resulting in settlement of overlying layers. Three conditions must be present for liquefaction to occur in soils:

- The soil must be susceptible to liquefaction, i.e., granular layers with less than fifteen percent fines, existing below the groundwater table.
- The soil must be in a loose state.
- Ground shaking must be strong enough to cause liquefaction.

Based on the liquefaction hazard map, the site lies within an area designated as having a “very low” liquefaction probability[2]. A “very low” liquefaction potential indicates that there is probability of 5% or less of having a seismic event exceeding critical acceleration in 100 years[3]. A site-specific liquefaction study is not performed and is beyond our proposed scope of work.

---

1 Constenius, K., N., Clark, D., L., King, J., K. and Ehler, J., B., 2011, Interim Geologic Map Of The Provo 30' X 60' Quadrangle, Utah, Wasatch, and Salt Lake Counties, Utah, Utah Geological Survey Open-File Report 586DM

2 Christenson, G.E., Shaw, L.M., 2008, Liquefaction special study areas, Wasatch Front and nearby areas, Utah: Utah Geological Survey, Supplement map to Circular 106, scale 1:250,000

3 Anderson, L.R., Keaton, J.R., Bischoff, J.E., 1994, Liquefaction potential map for Utah County, Utah complete technical report: Utah Geological Survey, Contract Report 94-8, p. 22.

4.3 LANDSLIDES

Slope stability hazards such as landslides, slumps, and other mass movements can develop along moderate to steep slopes where a slope has been disturbed, the head of a slope is loaded, or where increased groundwater pore pressures result in driving forces within the slope exceeding restraining forces. Slopes exhibiting prior failures, and also deposits from large landslides, are particularly vulnerable to instability and reactivation. The project site is partially mapped within landslide special study areas[1]. A site-specific geologic study for landslide is beyond our scope of work.

4.4 DEBRIS FLOW

Debris flow hazards are typically associated with unconsolidated alluvial fan deposits at the mouths of large range-front drainages. The project site is partially mapped within debris-flow/alluvial-fan special study areas[2]. A site-specific geologic study for debris-flow/alluvial-fan is beyond our scope of work.

5 FIELD EXPLORATIONS

5.1 SUBSURFACE INVESTIGATION

Subsurface soil conditions at the project site were explored at the site by excavating seven (7) test pits at representative locations within the subject property. The test pits were excavated using a rubber-track mini-ex to depths of 11.5 to 12 feet below the existing site grades. Stratigraphy and classification of the soils were logged under the direction of the Geotechnical Engineer.

Disturbed and undisturbed samples were obtained at various depths. The samples were transported to our laboratory for testing. The test pits were backfilled to the ground surface with on-site soils. Sample types with depths are shown in detail in the Test Pit Logs found in Appendix B (Figures B-2 to B-8). A Key to Soil Symbols is presented on Figure B-1.

5.2 SUBSURFACE CONDITIONS

5.2.1 Soils

The soils encountered in the test pits consisted of up to 1 foot of topsoil at the ground surface except 1½-foot of undocumented fill in Test Pit 3. Below the topsoil/fill was mainly native sandy soils with various amount of clay, silt and some gravel which extended to the full depth of the test pits excavated for this investigation. More detailed description is presented in Test Pit Logs (Appendix B Figures B-2 to B-8). The stratification lines shown on the enclosed Test Pit Logs

1 Christenson, G.E., Shaw, L.M., 2008, Landslide special study areas, Wasatch Front and nearby areas, Utah: Utah Geological Survey, Supplement map to Circular 106, scale 1:200,000
2 Christenson, G.E., Shaw, L.M., 2008, Debris-flow/alluvial-fan special study areas, Wasatch Front and nearby areas, Utah: Utah Geological Survey, Supplement map to Circular 106, scale 1:200,000

represent the approximate boundary between soil types. The actual in-situ transition may be gradual. Due to the nature and depositional characteristics of native soils, care should be taken in interpolating subsurface conditions between and beyond the exploration locations.

5.2.2 Groundwater

Groundwater was not encountered within the test pits excavated for our field investigation at a maximum depth of 12 feet. It should be noted that it is possible for the groundwater levels to fluctuate during the year depending on the season and climate. Additionally, discontinuous zones of perched water may exist at various locations and depths beneath the ground surface. Therefore, groundwater conditions encountered during and/or after construction may differ from those encountered during our field investigation.

6 LABORATORY TESTING

Geotechnical laboratory tests were conducted on selected soil samples obtained during our field investigation. The laboratory testing program was designed to evaluate the engineering characteristics of onsite earth materials. Laboratory tests conducted during this investigation include: Grain Size Distribution Analysis, Atterberg Limits Test, Moisture Content of Soil by Mass, Direct Shear Test and soil corrosivity test.

The results of laboratory tests are presented on the test pit logs in Appendix B (Figures B-2 to B-8), the Summary of Laboratory Test Results table (Figure C-1), and on the test result figures presented in Appendix C (Figures C-2 through C-5).

7 RECOMMENDATIONS AND CONCLUSIONS

7.1 GENERAL CONCLUSIONS

Supporting data upon which the following recommendations are based have been presented in the previous sections of this report. The recommendations presented herein are governed by the engineering properties of the earth materials encountered and tested as part of our subsurface exploration and the anticipated design data discussed in *Section 3.1, Project Description*. If subsurface conditions other than those described herein are encountered during construction, and/or if design changes are initiated, Wilding Engineering must be informed in writing so that our recommendations can be reviewed and revised as changes or conditions may require.

7.2 EARTHWORK

7.2.1 Site Preparation and Grading

It is the contractor's responsibility to locate and protect all existing utility lines, whether shown on the drawings or not.

In general, up to 1 foot of topsoil (except 1½-foot of undocumented fill in Test Pit 3) was encountered during our investigation. All topsoil, undocumented fill, or any soil containing organic or deleterious materials shall be removed where structures, pavements, or concrete flatwork are to be placed. Topsoil may be stockpiled on site for subsequent use in landscape areas.

Upon completion of site grubbing and prior to placement of any fill, the exposed subgrade should be evaluated by Wilding Engineering. Proof rolling with loaded construction equipment may be a part of this evaluation. Soils that are observed to rut or deflect excessively (typically greater than 1-inch) under the moving load of a loaded rubber-tired truck or other suitable construction vehicle should be over-excavated down to firm undisturbed native soils and backfilled with properly placed and compacted structural fill *Sections 7.2.3 and 7.2.4*.

Excavations should be made using an excavator equipped with a smooth edge. If the subgrade is disturbed during construction, disturbed soils should be over-excavated to firm, undisturbed soil and backfilled with compacted structural fill.

For ease of construction and to increase the likelihood of favorable soil conditions, we recommend that site preparation, earthwork, and pavement subgrade preparation be accomplished during warmer, drier months.

7.2.2 Excavation Stability

All utility excavations shall be carefully supported, maintained, and protected during construction in accordance with OSHA Regulations. It is the responsibility of the contractor to maintain safe working conditions. Temporary construction excavations shall be properly sloped or shored, in compliance with current federal, state, and local requirements. Excavations are to be made to minimize subsequent filling. A trench box or shoring may be used. Coarse-grained material, soil with low fines content (material passing the No. 200 sieve) and wet soils can easily become unstable and in some areas where there could be toppling, cave-ins or sliding.

Wilding Engineering does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations. As stated in the OSHA regulations, "a competent person shall evaluate the soil exposed in the excavations as part of his/her safety procedures". In no case should slope height, slope inclination, or excavation depth, including utility trench excavations depth, exceed those specified in local, state, and federal safety regulations.

7.2.3 Structural Fill Material

All fill placed for support of structures, concrete flatwork, or pavements shall consist of structural fill. The contractor should have confidence that the anticipated method of compaction will be suitable for the type of structural fill used. All structural fill should be free of vegetation, debris or frozen material, and should contain no materials larger than 4 inches nominal size.

Imported structural fill shall consist of a well-graded, granular material with a maximum aggregate size of 4 inches, and less than 20% fines content (material passing the No.200 sieve). Fill material portion finer than the No.40 sieve shall have a liquid limit (LL) less than 30 and a plasticity index (PI) less than 10, see Table 7.1 below for material specifications. This material shall be free from organics, debris, frozen material, and other compressible or deleterious materials. Imported structural fill is preferred and it is usually easier for compaction. On-site native sandy and gravelly soils may also be used as structural fill provided it meets material specifications in Table 7.1 and materials larger than 4 inches are screened.

Table 7.1 Structural Fill Material Specifications

Grain Size	Percent Passing
4-inch	100
2-inch	85 to 100
No. 4	15 to 50
No. 200	< 20
Plastic Index (PI)	< 10
Liquid Limit (LL)	< 30

The contractor should anticipate testing all soils used as structural fill frequently to assess the maximum dry density, fines content, and moisture content, etc. Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

7.2.4 Structural Fill Placement and Compaction

All structural fill should be placed in maximum 6-inch loose lifts if compacted by small hand-operated compaction equipment, maximum 8-inch loose lifts if compacted by light-duty rollers, and maximum 12-inch loose lifts if compacted by heavy duty compaction equipment that is capable of efficiently compacting the entire thickness of the lift. We recommend that all structural fill be compacted on a horizontal plane, unless otherwise approved by the Geotechnical Engineer.

According to IBC Section J107.3, where existing grade is at a slope steeper than one unit vertical in five units horizontal (1V:5H) and the depth of the fill exceeds 5 feet, benching shall be provided in accordance with Figure 7.1 below. A key shall be provided that is not less than 10 feet in width and 5 feet in depth.

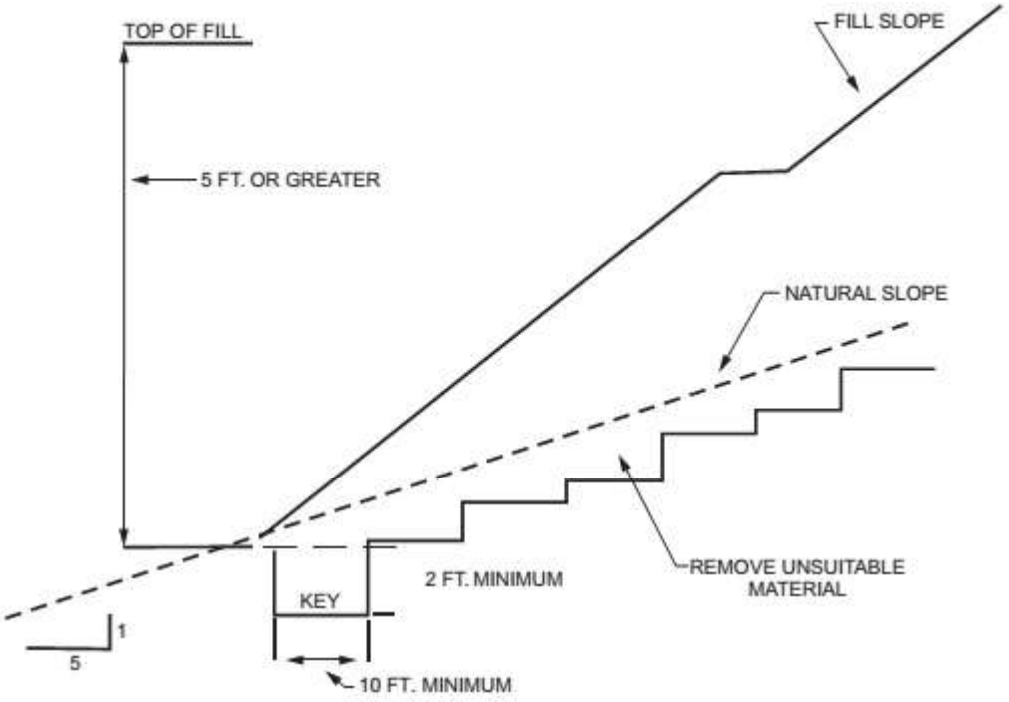


Figure 7.1 Benching Details

Structural fill placed for subgrade below load bearing areas including footings, concrete slabs and pavements should be compacted to at least 95% of the maximum dry density as determined by ASTM D1557. Structural fill placed in non-load bearing areas including landscape areas should be compacted to at least 90% of the maximum dry density (ASTM D1557). The moisture content should be at or slightly above the optimum moisture content at the time of placement and compaction. Wilding Engineering should be notified if structural fill thickness exceeds 5 feet so the compaction percentage requirement can be adjusted accordingly. Also, prior to placing any fill, the contractor should request Wilding Engineering to observe the excavations and evaluate if any unsuitable materials or loose soils have been removed. Proper grading should precede placement of fill, as described in *Section 7.2.1, Site Preparation and Grading*.

Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

7.2.5 Utility Trenches

Construction of the pipe bedding shall consist of preparing an acceptable pipe foundation, excavating the pipe groove in the prepared foundation, and backfilling from the foundation to 12

inches above the top of the pipe. All piping shall be protected from lateral displacement and possible damage resulting from impact or unbalanced loading during backfilling operations by being adequately bedded.

The soils in the utility pipe trenches are to meet the specified structural fill requirements in *Sections 7.2.3 and 7.2.4*.

> **Pipe foundation:** shall consist of imported granular soils. Wherever the trench subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, the trench shall be excavated below the bottom of the pipe to such depth as may be necessary, and this additional excavation shall be filled with compacted well-graded, granular soil per *Sections 7.2.3 and 7.2.4*.
>
> **Pipe groove:** shall be excavated in the pipe foundation to receive the bottom quadrant of the pipe so that the installed pipe will be true to line and grade. Bell holes shall be dug after the trench bottom has been graded. Bell holes shall be excavated so that only the barrel of the pipe bears on the pipe foundation.
>
> **Pipe bedding:** (from pipe foundation to 12 inches above top of pipe) shall be deposited and compacted in layers not to exceed 9 inches in uncompacted depth. Placement and compaction of bedding materials shall be performed simultaneously and uniformly on both sides of the pipe. All bedding materials shall be placed in the trench in such a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses.

Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

7.2.6 Moisture Protection and Surface Drainage

Precautions should be taken during and after construction to eliminate saturation of foundation soils. Over wetting the soils prior to or during construction may result in increased softening and pumping, causing equipment mobility problems and difficulties in achieving compaction.

Moisture should not be allowed to infiltrate the soils in the vicinity of, or upslope from, the structures. It should be noted that there will be an increased risk of settlement if foundation soils become over-wetted. After the footings were constructed, the following recommendations for foundation moisture protection and drainage should be considered:

- Backfill around foundation walls should consist of fine-grained soils with low-permeability. Free-draining sandy and gravelly soils should not be used. The backfill should be placed in 12-inch lifts and compacted to at least 90% of the maximum dry density of the modified Proctor (ASTM D1557).
- The ground surface within 10 feet of the foundation walls should be sloped to drain away from structure with a minimum slope of 5% (2% if hardscaped).
- Roof runoff devices and downspouts should be installed around the entire perimeter of the structure to collect and discharge all roof runoff a minimum of 10 feet from the foundation

walls. The runoff should always be allowed to flow away as designed and not back flow against the foundation; pop-ups, direct drainage or other options may be considered. Rain gutters, downspouts, discharge pipes and pop-ups (if used) should be inspected and cleared frequently so they remain unclogged.

- Only hand watering or drip irrigation should be used within 5 feet of the foundation walls but xeriscaping or desert landscaping is preferred. Irrigation and/or water lines near the foundation walls should be maintained in good working order.

7.3 FOUNDATION RECOMMENDATIONS

The foundations for the proposed structures may consist of conventional strip and/or spread footings. Strip and spread footing footings should be a minimum of 20 and 36 inches wide, respectively, and exterior shallow footings should be embedded at least 30 inches below final grade for frost protection and confinement. Interior shallow footings not susceptible to frost conditions should be embedded at least 12 inches for confinement.

7.3.1 Installation and Bearing Material

Footings may be placed on undisturbed native soils or on structural fill which is bearing on undisturbed native soils. Footings should not be placed partially on native soils and partially on structural fill unless approval from Wilding Engineering is obtained. Structural fill should meet material recommendations and be placed and compacted as recommended in *Sections 7.2.3 and 7.2.4*.

If encountered, all topsoil, undocumented fill, soft areas, frozen material or other inappropriate material shall be removed from the footing zone to a depth recommended by Wilding Engineering. Footings placed on slopes shall be benched so that all footing bases are horizontal.

Footing excavations shall be observed by us prior to placement of structural fill, concrete, or reinforcement steel to assess their suitability for placement of footings.

7.3.2 Bearing Pressure

Conventional strip and spread footings constructed as described above may be proportioned for a maximum net allowable bearing pressure of **2,000 pounds per square foot (psf)**. The recommend net allowable bearing pressure refers to the total dead load and can be increased by 20% to include the sum of all loads including wind and seismic.

7.3.3 Settlement

Assuming no additional surcharge is applied, settlements of properly designed and constructed conventional footings, founded as described above, are anticipated to be less than 1 inch. Differential settlements should be on the order of half the total settlement or ½ inch over 30 feet.

7.3.4 Frost Protection

All exterior footings are to be constructed at least 30 inches below the ground surface for frost protection and confinement. This includes walk-out areas and may require fill to be placed around buildings. Interior footings not susceptible to frost conditions should be embedded at least 12 inches for confinement. If foundations are constructed through the winter months, all soils on which footings will bear shall be protected from freezing.

7.3.5 Foundations on or adjacent to slopes

The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal (33% slope) shall comply with 2018 International Building Code (IBC) Section 1808.7. The following figure should be followed.

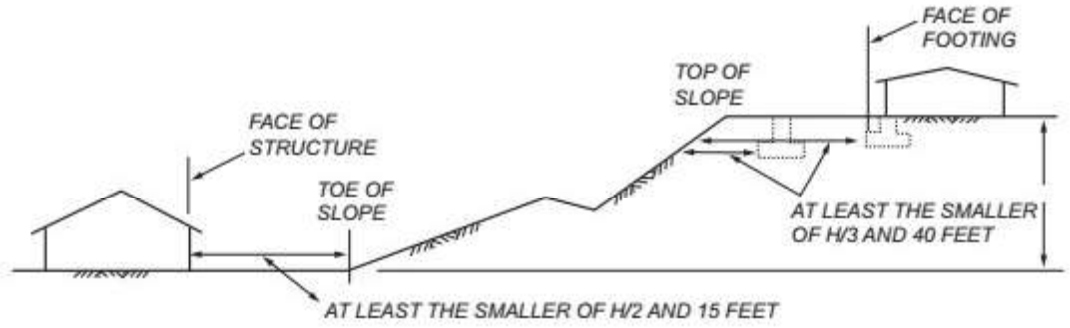


Figure 7.2 Foundation Clearances from Slopes

Based on the above figure and the most recent concept plan for the subdivision dated April 8, 2019, we estimate the foundation setbacks or building clearances to be as follows. The toe or top of slope may be measured from slopes equal or steeper than 30%.

Table 7.2 Foundation Setbacks or Building Clearances

Lot number	Foundation Setbacks or Building Clearances
Lots 1 through 5	15 feet minimum building clearance from toe of slope
Lot 6	Not Applicable
Lot 7	12 feet minimum foundation setback from top of slope
Lot 8	15 feet minimum foundation setback from top of slope
Lot 9	10 feet minimum foundation setback from top of slope

7.3.6 Construction Observation

Wilding Engineering shall periodically monitor excavations prior to installation of footings. Observation of soil before placement of structural fill or concrete is required to evaluate any field

conditions not encountered in the investigation which would alter the recommendations or this report. **All structural fill material shall be tested under the direction of the Geotechnical Engineer for material and compaction requirements.**

7.3.7 Foundation Drainage

Soils encountered in the subsurface explorations at elevations of proposed foundations consisted of both Group I soils and Group II soils according to 2018 International Residential Code (IRC) Section R405. We anticipate the majority of the foundation soils for homes with basement will consist of Group I soils. A drainage system is not required where the foundation is installed on Group I soils per IRC 2018. However, a drainage system is required where the foundation is installed on Group II soils per IRC 2018 if the foundations retain earth and enclose habitable or usable spaces located below grade. We should be on site for the foundation excavation for each individual lot to confirm if a drainage system is required. If required, the drainage system should designed according to IRC 2018 Section R405, which can be accessed at https://codes.iccsafe.org/public/document/IRC2018/chapter-4-foundations.

7.4 LATERAL FORCES

7.4.1 Resistance for Footings

Lateral forces imposed upon conventional foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and frictional resistance between the base of the footing and the supporting subgrade. In determining the frictional resistance, a coefficient of friction of 0.47 may be used for native granular soils against concrete.

7.4.2 Lateral Earth Pressures on Retaining/Foundation Walls

Ultimate lateral earth pressures from native *granular* soils acting against buried walls and structures may be computed from the lateral pressure coefficients or equivalent fluid densities presented in the following table:

Table 7.3 Lateral Earth Pressures – Granular Soils

Condition	Lateral Pressure Coefficient	Equivalent Fluid Density (pounds per cubic foot)
Active	0.24	29
At-rest	0.38	46
Passive	4.20	504

It should be noted that the above static and seismic coefficients and densities assume horizontal backfill and vertical wall face with no buildup of hydrostatic pressures. Hydrostatic and surcharge loadings, if any, should be added to the presented values. Over-compaction behind walls should be avoided. If sloping backfill is present, we should be consulted to provide more accurate lateral pressure parameters once the design geometry is established.

Walls and structures allowed to rotate slightly should use the active condition. If the element is constrained against rotation, the at-rest condition should be used. These values should be used with an appropriate factor of safety against overturning and sliding. Additionally, if passive resistance is calculated in conjunction with frictional resistance, the passive resistance should be reduced by ½. Resisting passive earth pressure from soils subject to frost or heave, or otherwise above prescribed minimum depths of embedment, should be neglected in design.

A section of granular soils should be used as backfill material behind retaining walls because of their high permeability. Using granular fills along with drainage systems including weep holes in the retaining walls or perforated pipes at the bottom of the granular fill directly behind the heel of the retaining walls help minimize the accumulation of hydrostatic pressures.

7.5 CONCRETE SLABS-ON-GRADE & MODULUS OF SUBGRADE REACTION

Concrete slabs-on-grade for interior floor slabs should be constructed on 4" of free draining gravel, overlying undisturbed native soils or a zone of structural fill that is at least 6 inches thick. The 4 inches of free draining gravel is recommended to provide a capillary break below the finish floor slab and underlying soils. The gravel should consist of a ¾ inch minus clean drain rock. The gravel should be compacted until tight and relatively unyielding.

Concrete slabs–on-grade for exterior flatwork should be constructed on firm undisturbed native soils or zone of structural fill that is at least 6 inches thick.

For all slab-on-grade construction the structural fill shall be consistent with *Sections 7.2.3 and 7.2.4*. The concrete slabs constructed on subgrade prepared in accordance with the preceding recommendations may be designed using a **modulus of subgrade reaction (k) of 140 psi/in** and should be designed with appropriately spaced, deep control joints to control the location of cracking as a result of shrinkage. Consideration should be given to reinforcing the slabs with welded wire, rebar, or fiber mesh.

7.6 SEISMIC INFORMATION

Based on the USGS Quaternary Fault and Fold Database of the United States, the project site is located approximately 1½ miles north, 2 miles west and 2 miles south of the Provo section of the Wasatch fault zone and approximately 500 to 1200 feet south of Traverse Mountain South Fault[1] (however, its existence in the area is uncertain according to the referenced geologic map).

Seismic values were obtained for the subject property utilizing the SEAOC & OSHPD Seismic Design Maps[2] as recommended on USGS website per the 2015 International Building Code (IBC) and ASCE 7-10 code. The ground motions values produced by the web tool are presented in Table 7.4 below based on the site coordinates of 40.4583°N, 111.7846°W. Based on our

1 Constenius, K., N., Clark, D., L., King, J., K. and Ehler, J., B., 2011, Interim Geologic Map Of The Provo 30' X 60' Quadrangle, Utah, Wasatch, and Salt Lake Counties, Utah, Utah Geological Survey Open-File Report 586DM
2 SEAOC & OSHPD Seismic Design Maps, https://seismicmaps.org/, accessed March 4, 2019.

geotechnical investigation, the on-site soils in the upper 12 feet meet the criteria of Stiff Soils (Site Class D) per ASCE 7-10 Table 20.3-1[1]. More Detailed information is presented in Appendix D.

Table 7.4 Seismic Ground Motion Parameters

Parameter	Acceleration (g)	
Mapped Acceleration - Site Class B	S_S = 1.245	S_1 = 0.458
MCE_R Spectral Response Acceleration - Site Class D	S_{MS} = 1.248	S_{M1} = 0.706
Design Spectral Response Acceleration - Site Class D	S_{DS} = 0.832	S_{D1} = 0.471
Peak Ground Acceleration, PGA - Site Class D	0.536	

7.7 PAVEMENT DESIGN AND CONSTRUCTION

Based on our field observation of on-site soils, we assumed a California Bearing Ratio (CBR) of 4 for design of pavements for the proposed development. We have prepared various pavement section options be used to support anticipated traffic loads for the subdivision interior roadways with equivalent single axle loads (ESALs) not exceeding 50,000 per year[2] and a twenty (20) year design life. The table below presents recommended pavement section thickness based on the above assumptions and the material descriptions provided in the following sections. These pavement section options are equivalent to each other and may be selected based on economic considerations.

1 The soils at deeper depths may have properties that meet criteria of other site classification. According to ASCE 7-10 Section 20.1, the site class shall be based on site-specific data to a depth of 100 feet. A geotechnical investigation to 100 feet is beyond our scope of work. Where the soil properties are not known in sufficient detail to determine the site class, Site Class D shall be used unless the authority having jurisdiction or geotechnical data determine Site Class E or F soils are present at the site (ASCE 7-10 Section 20.1).

2 If traffic conditions vary significantly from our stated assumptions, we should be contacted so we can modify our pavement design parameters accordingly. Specifically, if the traffic counts are significantly higher or lower, we should be contacted to revise the pavement section design if necessary. The pavement sections presented assume that the majority of construction traffic including cement trucks, cranes, loaded haulers, etc. has ceased. If a significant volume of construction traffic occurs after the pavement section has been constructed, a reduced life and increased maintenance in some areas should be anticipated.

Table 7.5 Pavement Design Recommended Thickness

Pavement Section Options	Asphalt Concrete (in.)	Untreated Base Course (in.)	Granular Borrow (in.)
Option 1	**3**	**6**	**6**
Option 2	**3.5**	**9**	**-**
Option 3	**4**	**8**	**-**

It is our experience that pavement in areas where vehicles frequently turn around, backup, or load and unload, including exit and entrance areas and round-a-bouts, often experience more distress. If the owner wishes to prolong the life of the pavement in these areas, consideration should be given to using a Portland cement concrete (rigid) pavement in these areas. For these conditions, the following rigid pavement section is recommended:

Table 7.6 - Rigid Pavement Section

Concrete (in.)	Untreated Base Course
5	**8**

Concrete should consist of a low slump, low water cement ratio mix with a minimum 28-day compressive strength of 4,000 psi.

7.7.1 Sub-grade Preparation

All topsoil, undocumented fill or other unsuitable materials must be removed below pavements. The sub-grade shall then be proof rolled with a loaded dump truck or other compaction equipment. Any unsuitable soils shall be removed and replaced with structural fill according to *Sections 7.2.3 and 7.2.4*.

7.7.2 Material Recommendations

All subgrade preparation and pavement section materials (asphalt concrete, untreated base course and granular borrow) should conform to the recommendations presented in this document and all applicable specifications from governing authorities such as cities and counties. Additionally, untreated base course should possess a minimum CBR value of 70, and the granular borrow should have a minimum CBR value of 30. The untreated base course and granular borrow should be placed and compacted in accordance with Sections 7.2.3 and 7.2.4 of this report. The asphalt should be compacted to a minimum of 96% of the Marshall (50 blow) maximum density. Specifications from governing authorities such as cities and special service districts having their own precedence should be followed where applicable.

7.7.3 Drainage and Maintenance

Drainage shall be designed to direct surface water away from proposed buildings and into proper discharge locations. Water shall not be allowed to puddle in low areas of the pavement. Pooling areas could decrease the design life of the asphalt and cause cracking or uplift. Periodic seasonal maintenance should be anticipated by sealing cracks and joints. IBC 2015 recommends that a minimum of five percent gradient for a ten feet distance away from any structures.

7.8 SLOPE STABILITY

Slope stability analysis was performed on three slope profiles. The locations of these profiles are presented in Figure A-2 in Appendix A. Soil strength parameters used in the analysis were based off the direct shear test results on Figure No. C-4 in Appendix C (to be conservative, the friction angle was reduced to 38 degrees and cohesion was reduced to half of the value). Table 7.7 below presents the minimum factor of safety for the modeled slope profiles for static and pseudo static (seismic) conditions. Half of the PGA was used in the seismic analysis. Minimum acceptable factor of safety conditions of 1.5 and 1.1, respectively, were considered in our analysis. More detailed results of our slope stability analysis are presented in Appendix E.

Table 7.7 Slope Stability Analysis – Factor of Safety

Slope Profiles	Static	Pseudo Static (Seismic)
A-A’	2.27	1.31
B-B’	2.46	1.42
C-C’	1.89	1.13

7.9 SOIL CORROSIVITY

One soil sample was tested for soil chemical reactivity by American West Analytical Laboratories. Chemical reactivity tests were performed to evaluate soil pH, resistivity, and concentrations of sulfate. Results from these tests are summarized below. More detailed results are presented in Appendix C (Figures C-7 and C-8).

Table 7.8 Summary of Results from Chemical Reactivity Tests

Location	Depth (ft)	Sulfate (ppm)	Resistivity (Ω-cm)	Soil pH @ 25° C
TP-6	5	<5.12	8,050	8.87

Based on soluble sulfate concentrations results and the American Concrete Institute (ACI) Building Code, there is a "*negligible*" degree of sulfate attack on concrete. Therefore, there is no special requirements on the concrete type selection for sulfate resistance.

Laboratory soil resistivity has a direct impact on the degree of corrosion in underground metals. A decrease in resistivity indicates an increase in corrosion activity. Based on the resistivity test results, the onsite native soils are considered to be "Moderately *Corrosive*"[1]. A qualified corrosion engineer should be consulted to provide a corrosion assessment and recommendations for any underground metals including water lines, reinforcing steel, valves, etc.

8 LIMITATIONS

The recommendations contained in this report are based on our limited field exploration, laboratory testing, and understanding of the proposed construction. The subsurface data used in the preparation of this report were obtained from the explorations made for this investigation. It is possible that variations in the soil and groundwater conditions could exist between and beyond the points explored or below the maximum depths of exploration. The nature and extent of variations may not be evident until construction occurs or after. If any conditions are encountered at this site that are different from those described in this report, we should be immediately notified so that we may make any necessary revisions to recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, Wilding Engineering should be notified.

This report was prepared in accordance with the generally accepted standard of practice in the project area at the time the report was written. No other warranty, expressed or implied, is made. The concept of risk is a significant consideration of geotechnical analyses. The analytical means and methods used in performing geotechnical analyses and development of resulting recommendations do not constitute an exact science. Analytical tools used by geotechnical engineers are based on limited data, empirical correlations, engineering judgment and experience. As such the solutions and resulting recommendations presented in this report cannot be considered risk-free and constitute our best professional opinions and recommendations based on the available data and other design information available at the time they were developed. The factor of safety results obtained by our slope stability analysis were based on limited data and shall not be solely relied on as the project site is partially mapped within landslide special study areas. To better understand the slope conditions, a site-specific geologic study for landslide should be performed by a qualified geologist.

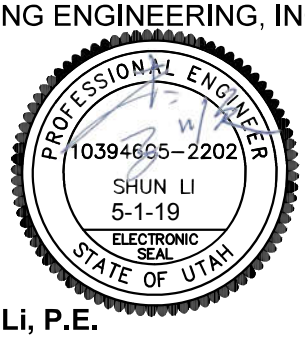
This report was prepared for our client's exclusive use on the project. It is the Client's responsibility to see that all parties to the project including the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

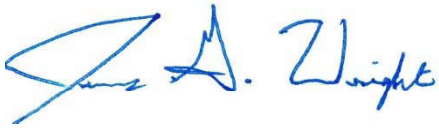
1 Roberge, P.R., 2000, Handbook of corrosion engineering: McGraw-Hill, p. 150.

We appreciate the opportunity of providing this service for you. If you have any questions concerning this report or require additional information or services please contact us at 801-553-8112.

Report prepared by:

WILDING ENGINEERING, INC.





Shun Li, P.E.
Geotechnical Department Manager

Jeremy G. Wright, P.E.I.
Staff Engineer

APPENDIX A

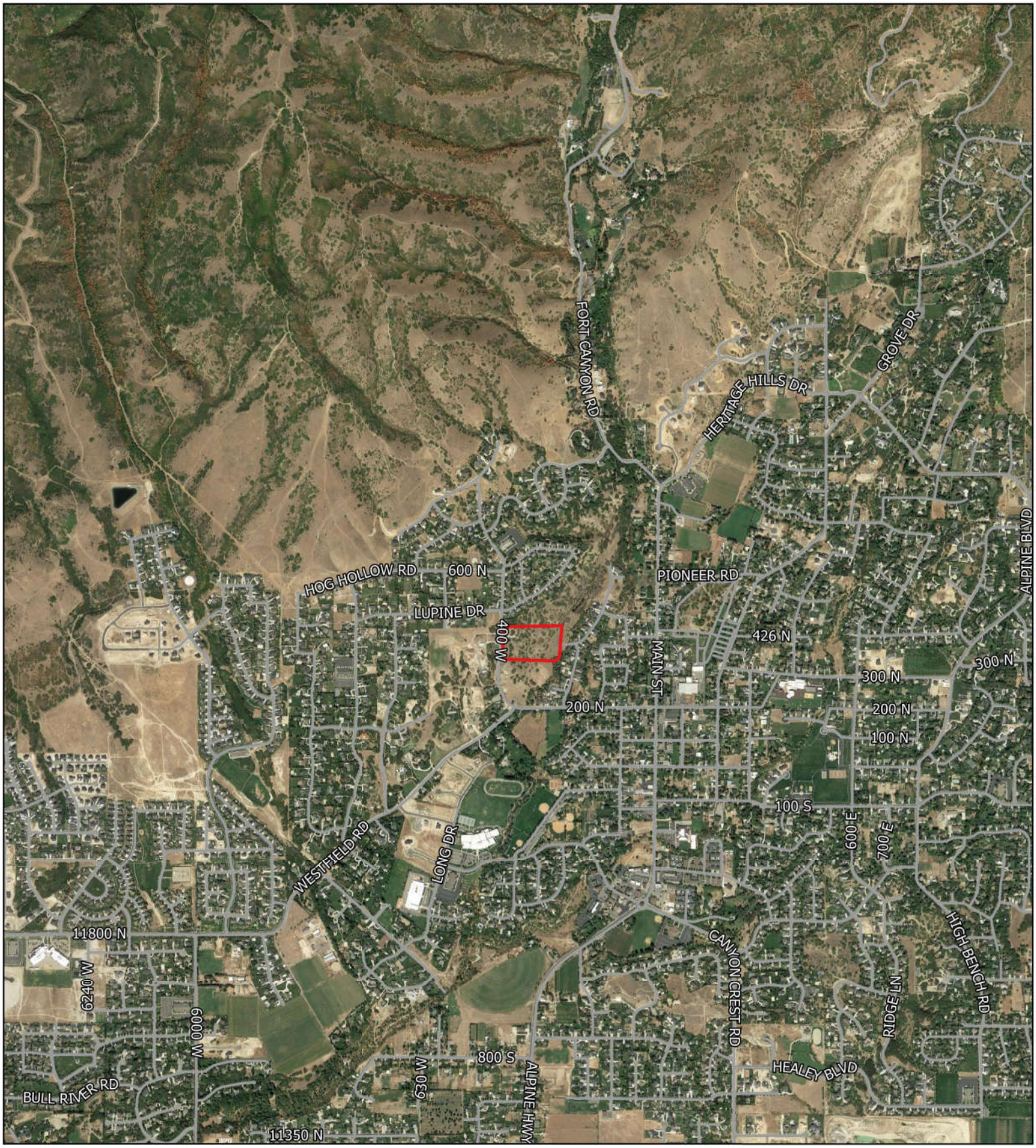


Image Reference:
Google Earth Imagery Dated 9/10/2018

1000 0 1000 2000 3000 4000 ft

1:22,400

WILDING ENGINEERING

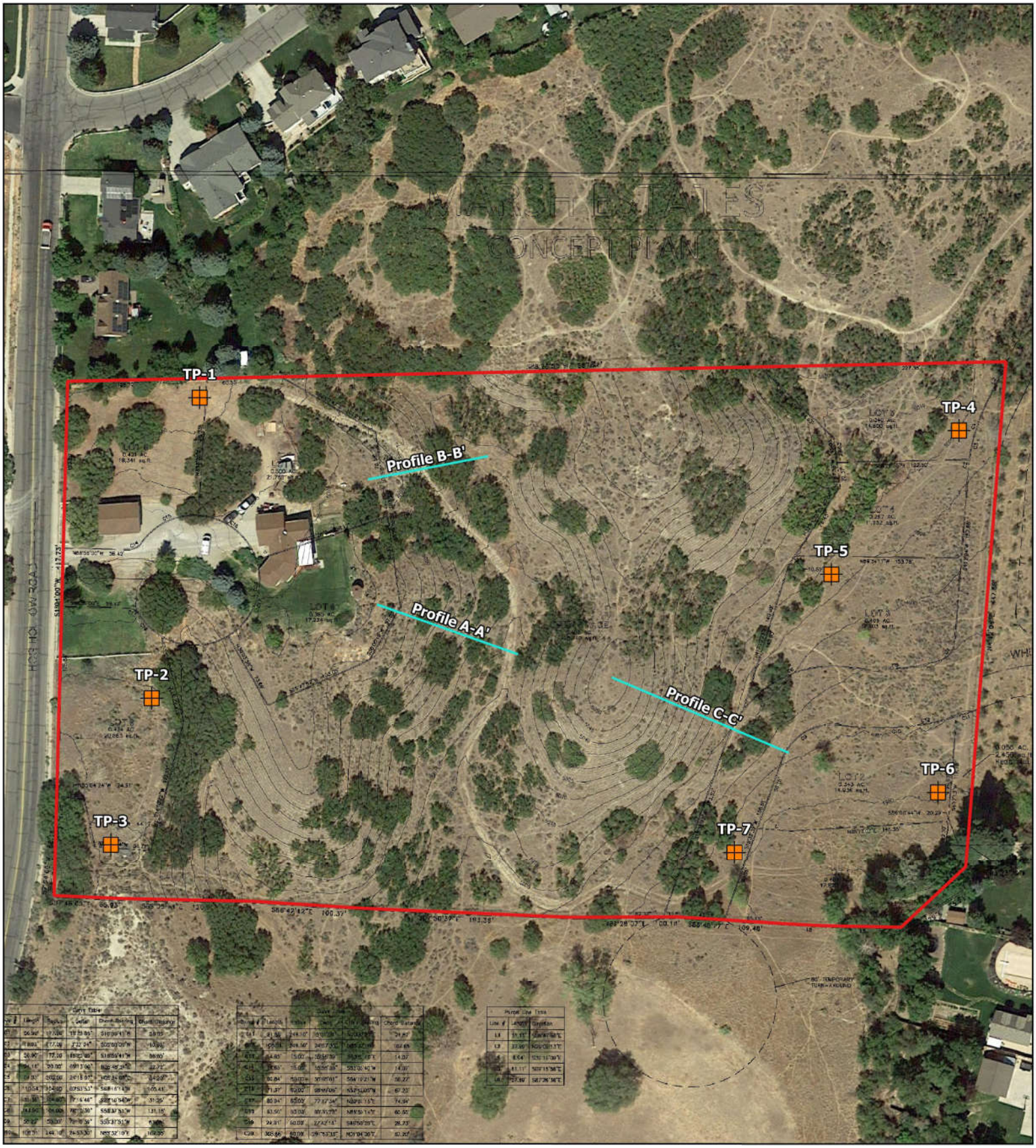
Legend

Approximate Site Boundary

Marsh Estates Subdivision
410 North 400 West
Alpine, UT
Project Number: 19011

Site Vicinity Map

Figure A-1



References:
Google Earth Imagery Dated 9/10/2018
Marsh Estates Concept Plan, Wilding Engineering, Alpine, Utah, Project No. 19011, Dated 04/08/2019

90 0 90 180 270 360 ft

1:1,400

Legend

- Approximate Site Boundary
- Approximate Test Pit Location
- Approximate Slope Profile

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Marsh Estates Subdivision
410 North 400 West
Alpine, UT
Project Number: 19011

Exploration Location Map

Figure A-2

APPENDIX B

KEY TO SYMBOLS

Wilding Engineering

CLIENT Todd Olson **PROJECT NAME** Marsh Property Subdivision

PROJECT NUMBER 19011 **PROJECT LOCATION** Alpine, Utah

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)

- CL: USCS Low Plasticity Clay
- FILL: Fill (made ground)
- SC: USCS Clayey Sand
- SC-SM: USCS Clayey Sand
- SM: USCS Silty Sand
- SP: USCS Poorly-graded Sand
- SP-SM: USCS Poorly-graded Sand with Silt
- TOPSOIL: Topsoil

SAMPLER SYMBOLS

- Hand Sample

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION

- Water Level at Time Drilling, or as Shown
- Water Level at End of Drilling, or as Shown
- Water Level After 24 Hours, or as Shown

Figure No.: B - 1

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-1

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			CL		**TOPSOIL - Lean CLAY with Sand:** soft, very moist, dark brown
	H 1		CL		**NATIVE - Lean CLAY:** medium stiff, moist, light brown
	H 2		SM		**Silty SAND:** loose, moist, light brown, fine sand
2.5			CL		**Lean CLAY:** medium stiff, moist, light brown
			SP-SM		**Poorly Graded SAND with Silt:** loose, dry, light brown, fine to medium grained sand
5.0	H 3				
7.5	H 4		SC-SM		**Silty, Clayey SAND:** medium dense, moist, light brown
10.0			SP		**Poorly Graded SAND:** loose, dry, light brown, fine to medium grained sand
	H 5	MC = 2% LL = NP PL = NP Fines = 4%			
		Groundwater was not encountered during exploration			Bottom of test pit at 11.5 feet.

0.5 1.5 2.5 3.0 7.5 9.0 11.5

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 3/8/19 15:21 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

Figure No.: B-2

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-2

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			CL		**TOPSOIL - Lean CLAY with Sand:** soft to medium stiff, moist, dark brown
				1.0	**Poorly Graded SAND with Gravel:** moist, medium dense, light brown, fine and medium grained sand, rounded and subrounded gravel, max particle size 2 inches
2.5	H 1		SP		
5.0	H 2	MC = 6% LL = NP PL = NP Fines = 4%			
7.5	H 3			8.0	**Poorly Graded SAND with Silt:** loose to medium dense, moist, light brown, fine and medium grained sand
10.0	H 4		SP-SM		
		Groundwater was not encountered during exploration		12.0	Bottom of test pit at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 3/8/19 15:21 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

Figure No.: B-3

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-3

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			SP-SM		**UNDOCUMENTED FILL - Poorly Graded SAND with Silt and Gravel:** medium dense, moist, light brown, with asphalt chunks up to 12"
				1.5	
					NATIVE - Poorly Graded SAND with Gravel: medium dense, moist, light brown, medium and coarse grained sand, subrounded gravel.
2.5	H 1		SP-SM		– with silt, fine and medium sand
5.0	H 2				
	H 3			6.5	
7.5			CL		**Lean CLAY with Sand:** stiff, moist, light brown
	H 4			8.5	
					Poorly Graded SAND with Silt and Gravel: medium dense, dry, light brown, fine and medium sand, rounded gravel
10.0	H 5	MC = 3%	SP-SM		
	H 6	Groundwater was not encountered during exploration		12.0	Bottom of test pit at 12.0 feet.

Figure No.: B-4

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-4

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			SC		**TOPSOIL - Clayey SAND:** loose, moist, dark brown, tree roots up to 6 feet
0.5					**Silty SAND:** moist, medium dense, light brown
2.5	H 1				
	H 2		SM		
5.0					
	H 3				
7.5					
8.0	H 4				**Silty SAND with Gravel:** moist, medium dense, light brown
10.0			SM		
	H 5	Groundwater was not encountered during exploration			
11.5					Bottom of test pit at 11.5 feet.

Figure No.: B-5

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-5

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			SC		**TOPSOIL - Clayey SAND:** loose, moist, dark brown
				0.5	**Clayey SAND:** moist, medium dense, brown
			SC		
2.5	H 1				
				3.0	**Silty SAND with Gravel:** moist, medium dense, light brown, trace cobbles
5.0	H 2				
			SM		– dry, increasing gravels
7.5	H 3				
10.0					
	H 4	Groundwater was not encountered during exploration		12.0	Bottom of test pit at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 3/8/19 15:21 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

Figure No.: B-6

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-6

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			CL		**TOPSOIL - Lean CLAY with SAND:** loose, moist, dark brown
	H 1				0.5 **NATIVE - Clayey SAND:** moist, medium dense, brown
2.5	H 2		SC		– dry, increasing gravels, weak cementation
5.0	H 3				
					6.0 **Silty SAND:** medium dense, moist, light brown, few gravels, with calcium carbonate deposits
7.5	H 4	MC = 4% LL = NP PL = NP Fines = 18%	SM		
10.0	H 5				
		Groundwater was not encountered during exploration			12.0 Bottom of test pit at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 3/8/19 15:21 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

Figure No.: B-7

Wilding Engineering
14721 S Heritage Crest Way
Bluffdale, Utah 84065
Telephone: 201-553-8112
Fax: 801-553-9108

TEST PIT NUMBER TP-7

CLIENT Todd Olson
PROJECT NAME Marsh Property Subdivision
PROJECT NUMBER 19011
PROJECT LOCATION Alpine, Utah
DATE STARTED 3/1/19 **COMPLETED** 3/1/19
GROUND ELEVATION _____ **TEST PIT SIZE** 64 inches
EXCAVATION CONTRACTOR G & R Lancaster
GROUND WATER LEVELS:
EXCAVATION METHOD Test Pit
AT TIME OF EXCAVATION —
LOGGED BY JGW **CHECKED BY** SL
AT END OF EXCAVATION —
NOTES
AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			CL		**TOPSOIL - Lean CLAY with SAND:** loose, moist, dark brown
	H 1				0.5 **NATIVE - Clayey SAND:** moist, medium dense, brown
2.5	H 2		SC		
5.0	H 3	MC = 8% LL = NP PL = NP Fines = 20%			
	H 4				6.0 **Silty SAND:** medium dense, moist, brown, few subrounded gravel up to 3 inches
7.5					– dry, light brown
	H 5	MC = 2%	SM		
10.0					
	H 6				
		Groundwater was not encountered during exploration			12.0 Bottom of test pit at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 3/8/19 15:21 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

Figure No.: B-8

APPENDIX C

SUMMARY OF LABORATORY TEST RESULTS

Wilding Engineering

CLIENT Todd Olson **PROJECT NAME** Marsh Property Subdivision

PROJECT NUMBER 19011 **PROJECT LOCATION** Alpine, Utah

Test Pit	Depth (ft)	Moisture (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plasticity Index	Gravel (%)	Sand (%)	Fines (%<#200 Sieve)	Classification
TP-1	11.0	1.9		NP	NP	NP	4	91	4	SP
TP-2	6.0	5.7		NP	NP	NP	39	56	4	SP
TP-3	10.0	2.9								
TP-6	8.0	4.2		NP	NP	NP	15	67	18	SM
TP-7	5.0	8.2		NP	NP	NP	13	67	20	SM
TP-7	8.0	1.6								

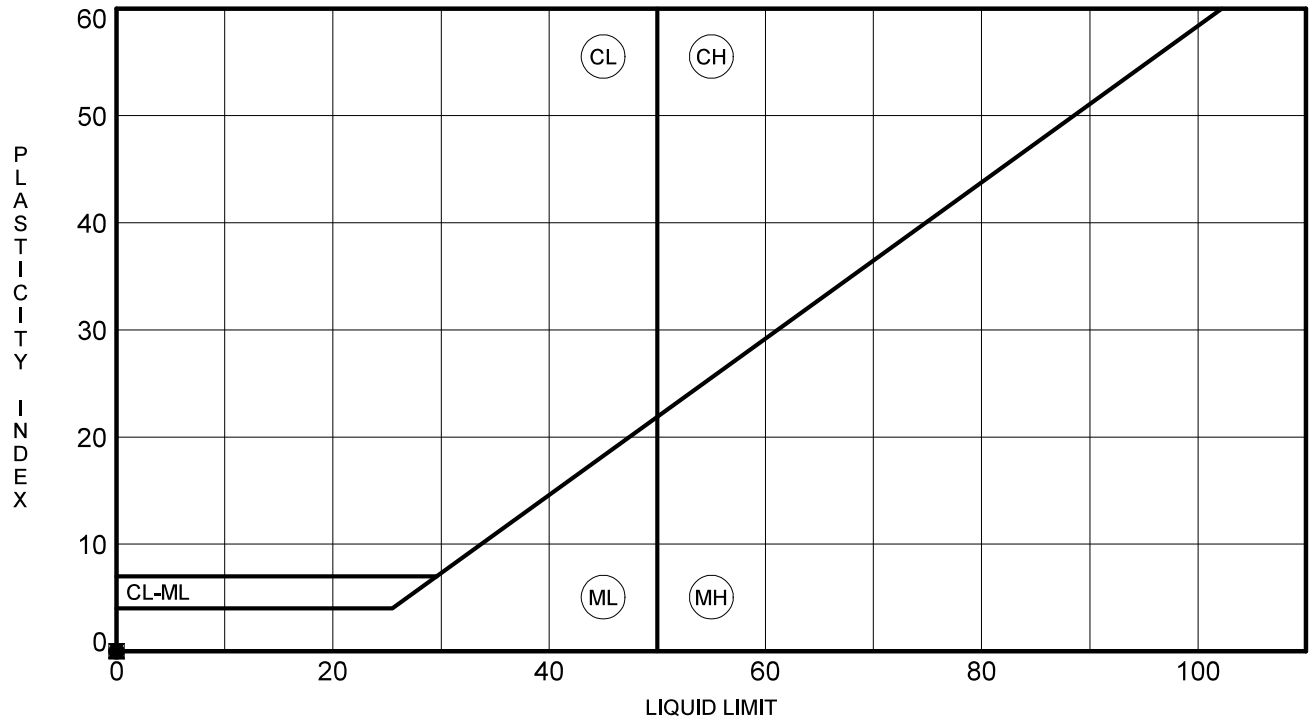
Figure No.: C - 1

ATTERBERG LIMITS' RESULTS

Wilding Engineering

CLIENT Todd Olson **PROJECT NAME** Marsh Property Subdivision

PROJECT NUMBER 19011 **PROJECT LOCATION** Alpine, Utah



	TEST PIT	DEPTH	LL	PL	PI	Fines	Classification
●	**TP-1**	**11.0**	**NP**	**NP**	**NP**	**4**	**POORLY GRADED SAND(SP)**
⧓	**TP-2**	**6.0**	**NP**	**NP**	**NP**	**4**	**POORLY GRADED SAND with GRAVEL(SP)**
▲	**TP-6**	**8.0**	**NP**	**NP**	**NP**	**18**	**SILTY SAND(SM)**
★	**TP-7**	**5.0**	**NP**	**NP**	**NP**	**20**	**SILTY SAND(SM)**

ATTERBERG LIMITS - GINT STD US LAB.GDT - 3/8/19 10:47 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

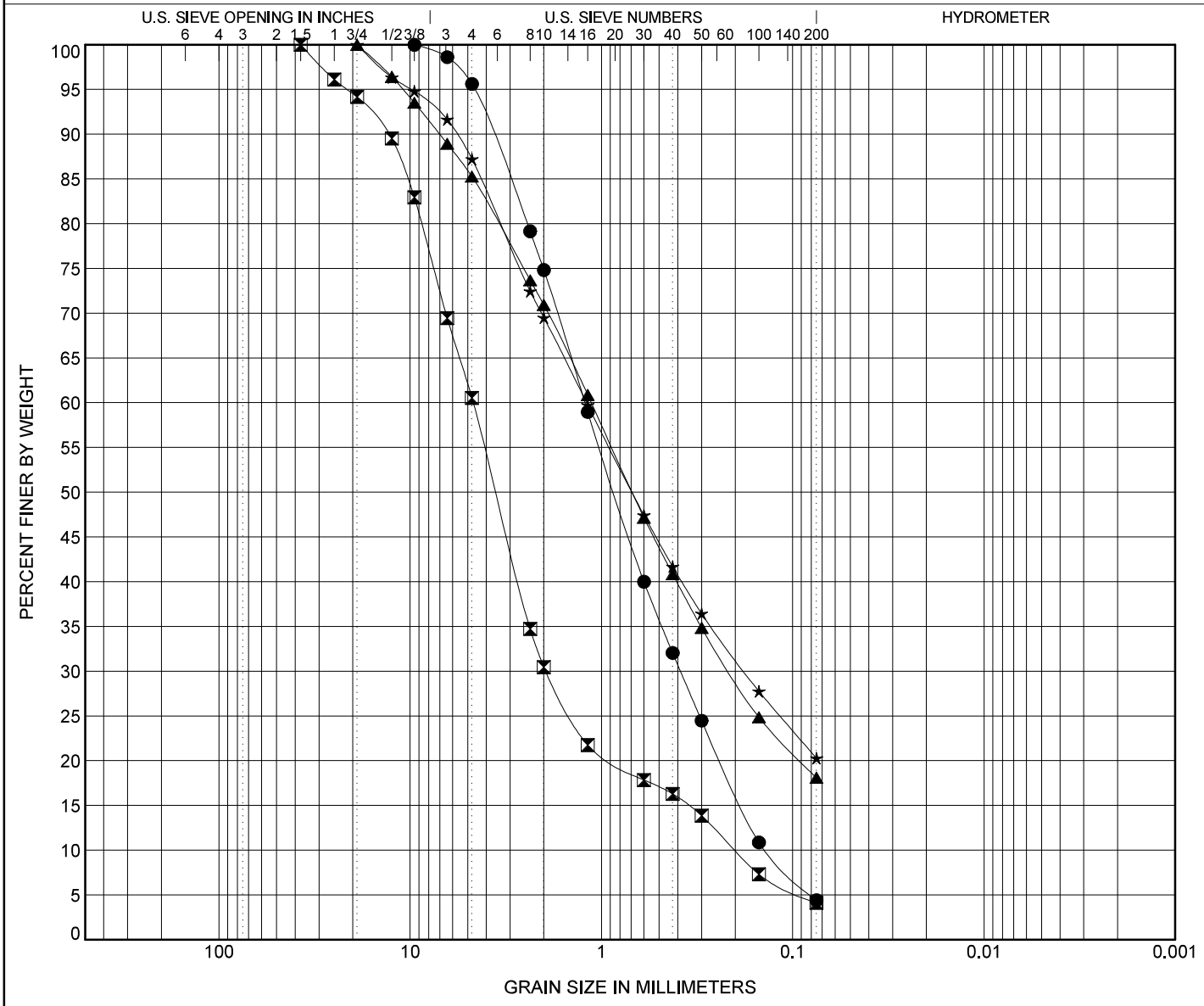
Figure No.: C - 2

GRAIN SIZE DISTRIBUTION

Wilding Engineering

CLIENT Todd Olson **PROJECT NAME** Marsh Property Subdivision

PROJECT NUMBER 19011 **PROJECT LOCATION** Alpine, Utah



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	TEST PIT	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	TP-1	11.0	POORLY GRADED SAND(SP)	NP	NP	NP	0.90	8.94
⊠	TP-2	6.0	POORLY GRADED SAND with GRAVEL(SP)	NP	NP	NP	4.04	23.46
▲	TP-6	8.0	SILTY SAND(SM)	NP	NP	NP		
★	TP-7	5.0	SILTY SAND(SM)	NP	NP	NP		

	TEST PIT	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TP-1	11.0	9.5	1.222	0.387	0.137	4	91	4.4	
⊠	TP-2	6.0	37.5	4.683	1.944	0.2	39	56	4.1	
▲	TP-6	8.0	19	1.132	0.214		15	67	18.1	
★	TP-7	5.0	19	1.198	0.179		13	67	20.3	

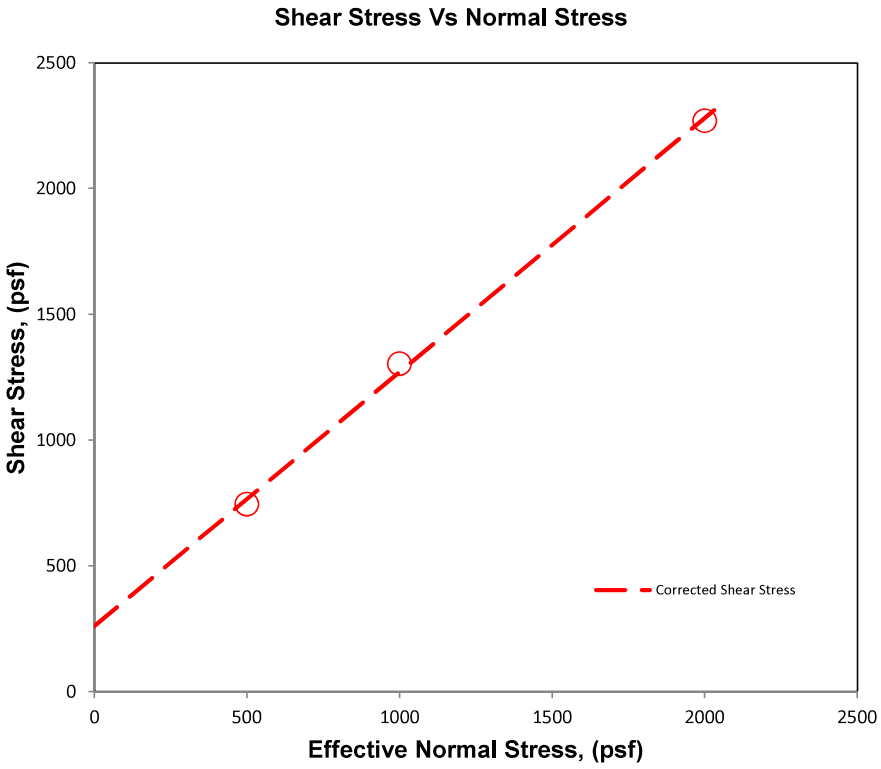
GRAIN SIZE - GINT STD US LAB.GDT - 3/8/19 10:48 - G:\DATA\19011 OLSON PROPERTY\SOILS\GINT\TEST PIT LOG.GPJ

Figure No.: C - 3

Wilding Engineering, Inc.

Direct Shear Test - ASTM D3080-11

Tested By	Jason Wright
Date	3/8/19
Computed By	Jeremy Wright PEI
Date	3/11/19
Checked By	Shun Li PE
Date	3/11/19



Mohr-Coulomb Stress Envelope			Parameter	Specimen A	B	C	D
Φ' and c' from Best-Fit Straight Line	Φ' (deg)	45	Initial Water Content (%)	5.7	5.7	5.7	N/A
	c' (psf)	260	Final Water Content (%)	17.8	17.0	17.6	N/A
	R^2	0.9987	Dry Density (psf)	113.6	113.6	113.6	N/A
	SSE	N/A	Diameter (in)	2.42			
Peak Φ' for c' = 0	Normal Stress	Ø' (deg)	Height (in)	1.00			
	500	56.1	Strain Rate (in/min)	0.0010			
	1000	52.5	LL/PL/PI	N/A			
	2000	48.6	Average T_{50} (min)	0.02			

		Data Points		
Project:	Marsh Estates Subdivision	Normal Stress	Corrected Shear Stress	
Project Number:	19011			
Boring Number:	TP-2			
Sample Number:	N/A	500	745	
Depth:	6 feet	1000	1303	
Sample Type:	Reconstituted	2000	2270	
Rel. Compaction:	100%			
Description:	Poorly Graded SAND with Gravel (SP)			
Remarks:	Sample remolded to 120 pcf at approximate in situ moisture.			

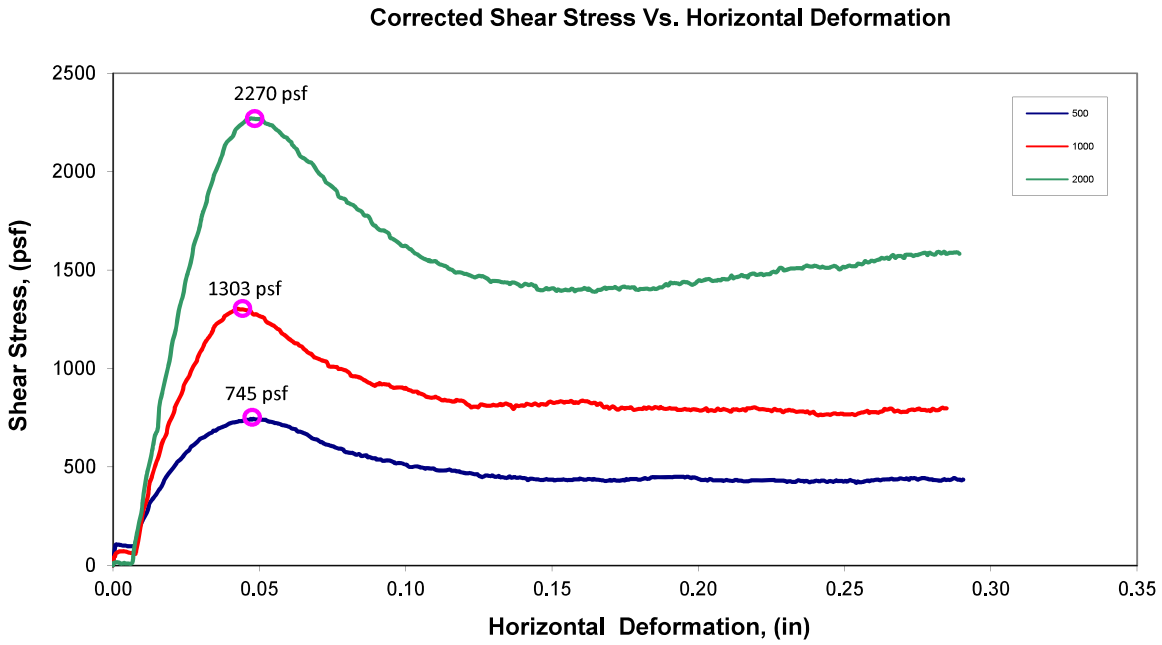
WILDING ENGINEERING
WWW.WILDINGENGINEERING.COM

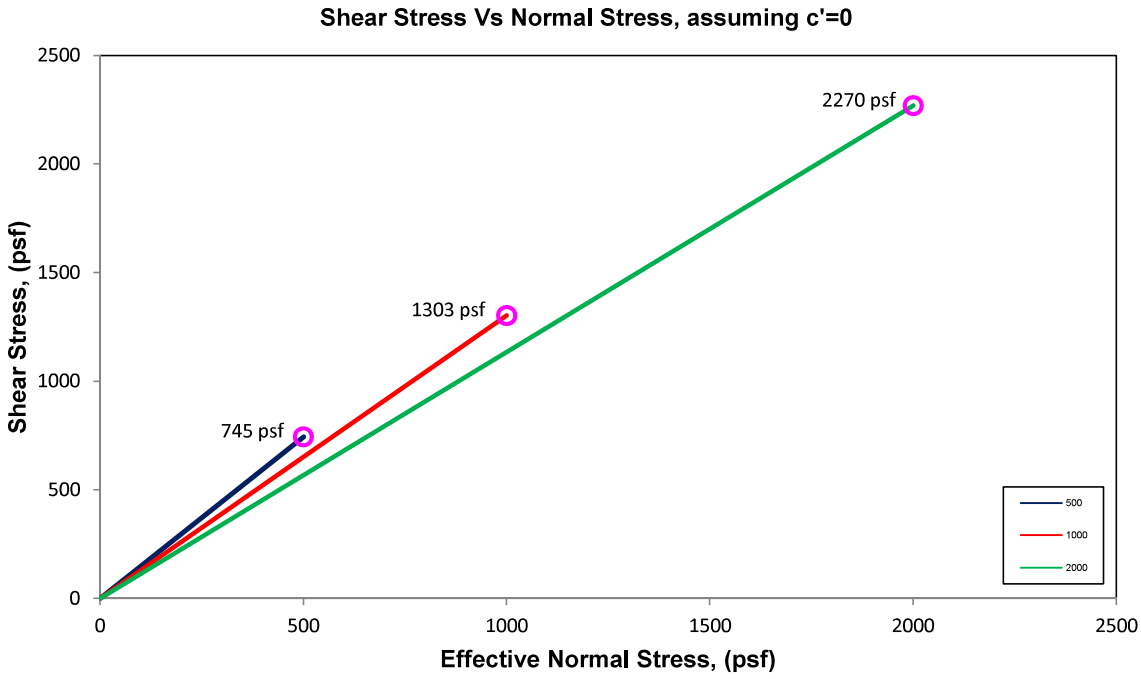
Figure No.: C-4a

Wilding Engineering, Inc.

Direct Shear Test - ASTM D3080-11

Tested By	Jason Wright
Date	3/8/19
Computed By	Jeremy Wright PEI
Date	3/11/19
Checked By	Shun Li PE
Date	3/11/19





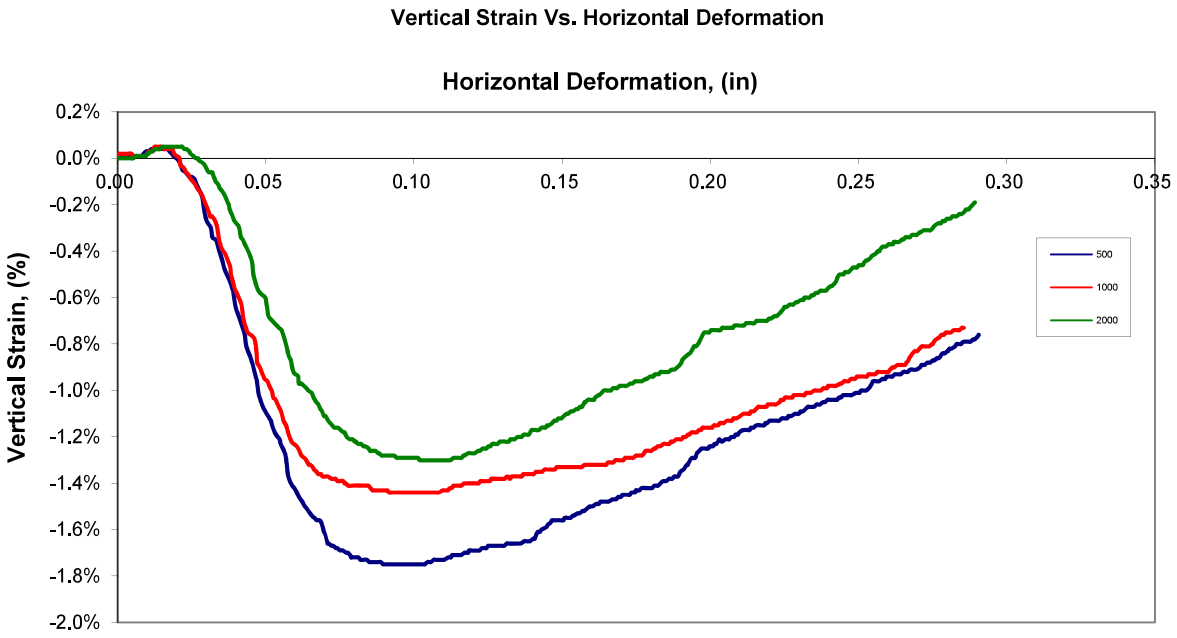
WILDING ENGINEERING
WWW.WILDINGENGINEERING.COM

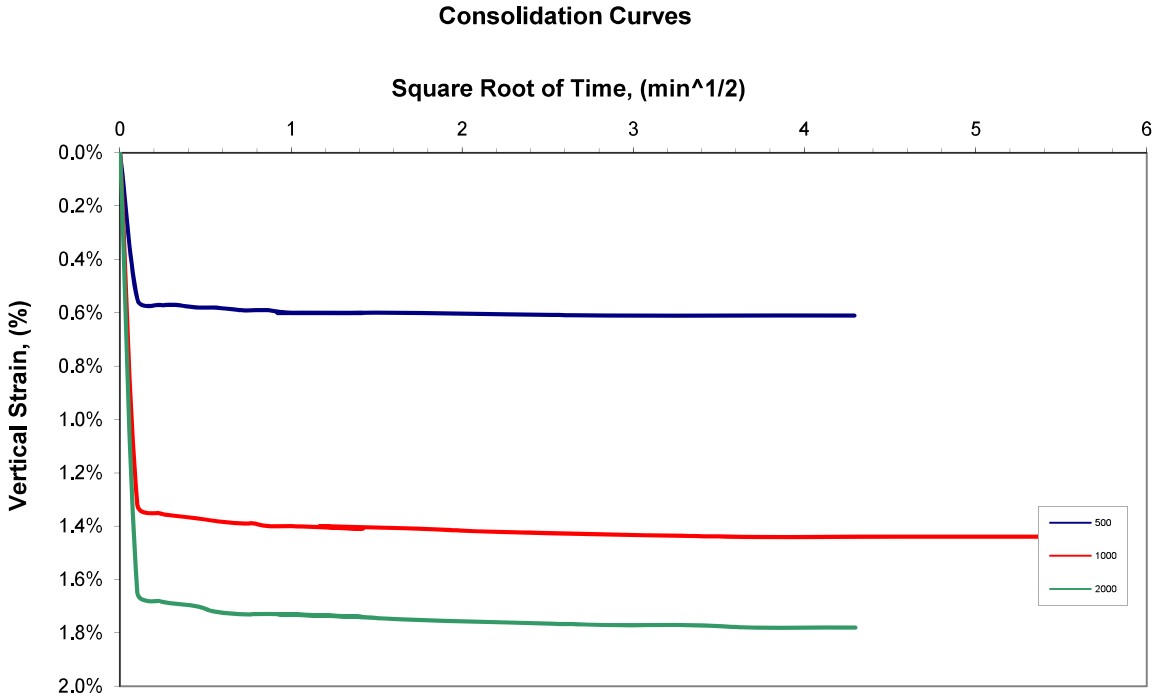
Figure No.: C-4b

Wilding Engineering, Inc.

Direct Shear Test - ASTM D3080-11

Tested By	Jason Wright	Date	3/8/19	Computed By	Jeremy Wright PEI	Date	3/11/19	Checked By	Shun Li PE	Date	3/11/19





WILDING ENGINEERING
WWW.WILDINGENGINEERING.COM

Figure No.: C-4c

Wilding Engineering, Inc

CLIENT Olson **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** Alpine, Utah

INORGANIC ANALYTICAL REPORT

Client: Wilding Engineering, Inc. **Contact:** Shun Li
Project: Olson Property / 19011
Lab Sample ID: 1903133-001
Client Sample ID: TP-6 @ 5'
Collection Date: 3/1/2019
Received Date: 3/6/2019 1524h

Analytical Results

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
pH @ 25° C	pH Units		3/6/2019 1615h	SW9045D	1.00	**8.87**	H
Resistivity	ohm-cm		3/7/2019 526h	SM2510B	10.0	**8,050**	&
Sulfate	mg/kg-dry		3/7/2019 756h	SM4500-SO4-E	5.12	< 5.12	&

& - Analysis is performed on a 1:1 DI water extract for soils.
H - Sample was received outside of the holding time.

3440 South 700 West
Salt Lake City, UT 84119

Phone: (801) 263-8686
Toll Free: (888) 263-8686
Fax: (801) 263-8687
e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

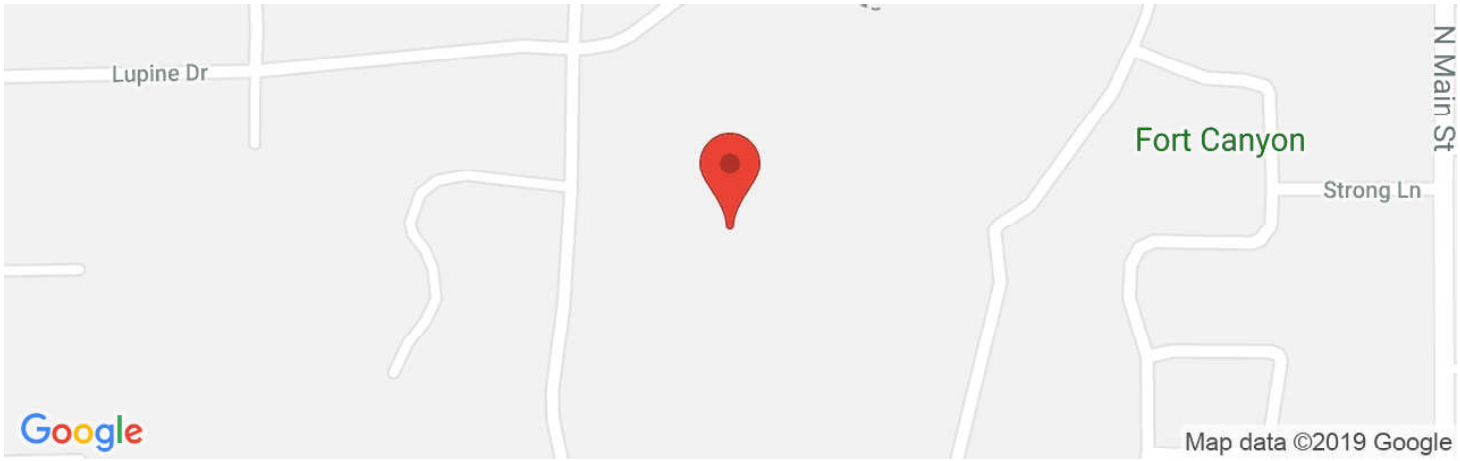
Jose Rocha
QA Officer

Figure No.: C-5

APPENDIX D

OSHPD

Latitude, Longitude: 40.458303, -111.784568

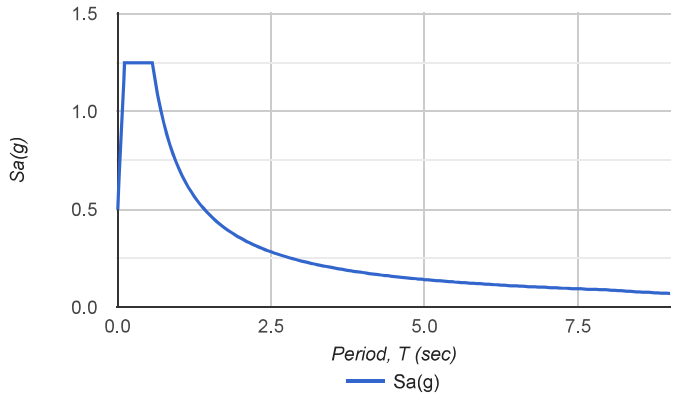


Date	3/20/2019, 9:55:30 AM
Design Code Reference Document	ASCE7-10
Risk Category	II
Site Class	D - Stiff Soil

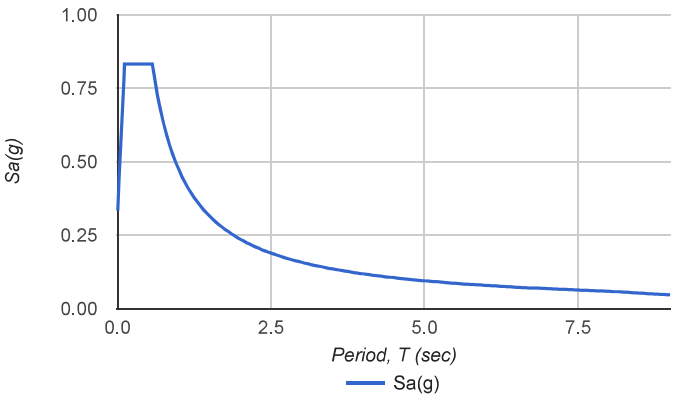
Type	Value	Description
S_S	1.245	MCE_R ground motion. (for 0.2 second period)
S_1	0.458	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.248	Site-modified spectral acceleration value
S_{M1}	0.706	Site-modified spectral acceleration value
S_{DS}	0.832	Numeric seismic design value at 0.2 second SA
S_{D1}	0.471	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.002	Site amplification factor at 0.2 second
F_v	1.542	Site amplification factor at 1.0 second
PGA	0.536	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.536	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.245	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.516	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.906	Factored deterministic acceleration value. (0.2 second)
S1RT	0.458	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.556	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.19	Factored deterministic acceleration value. (1.0 second)
PGAd	1.059	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.822	Mapped value of the risk coefficient at short periods
C_{R1}	0.824	Mapped value of the risk coefficient at a period of 1 s

MCER Response Spectrum



Design Response Spectrum



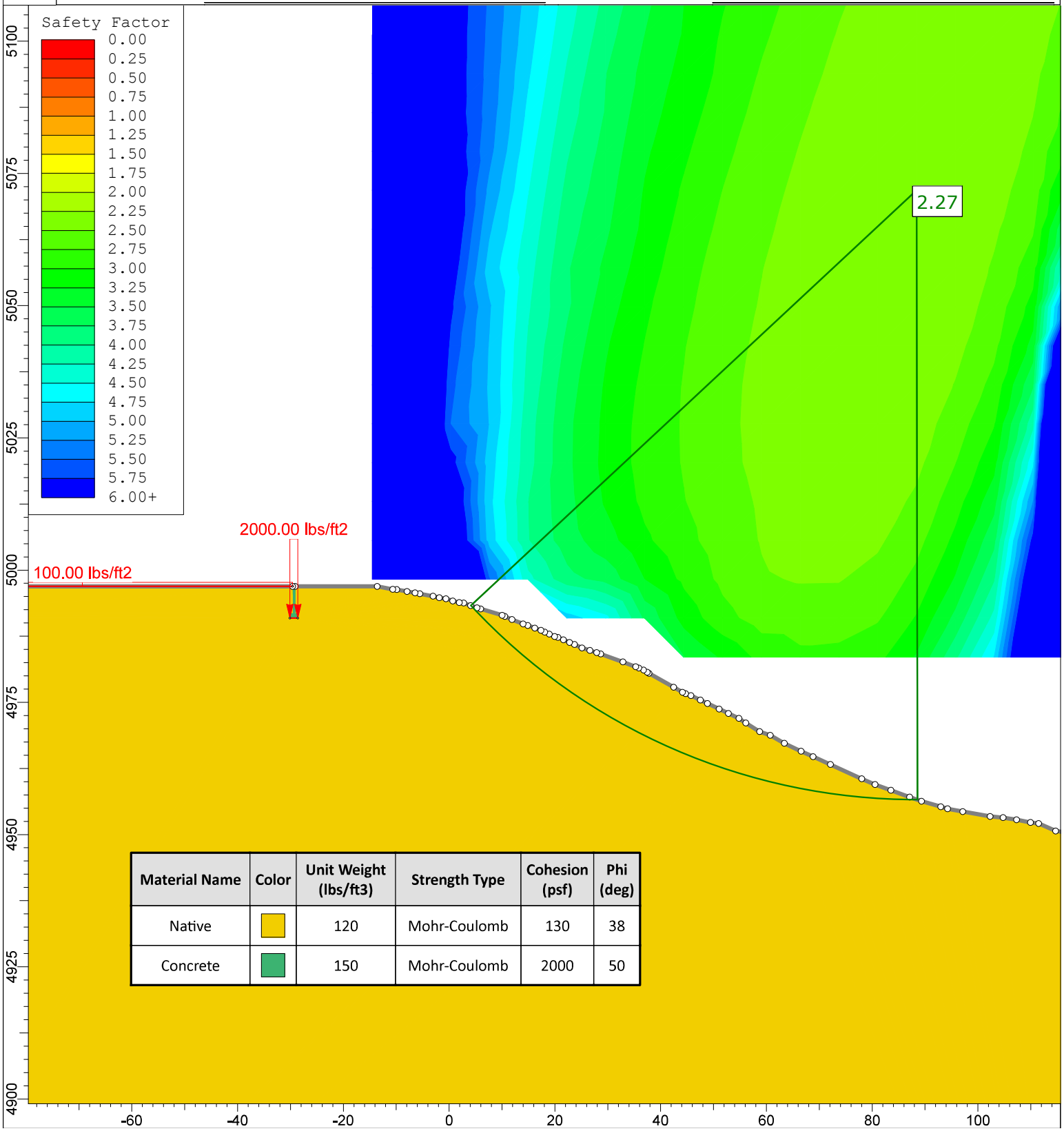
APPENDIX E

Slope Stability - Static - A-A'

Wilding Engineering, Inc

CLIENT _____ **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** _____



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Native		120	Mohr-Coulomb	130	38
Concrete		150	Mohr-Coulomb	2000	50

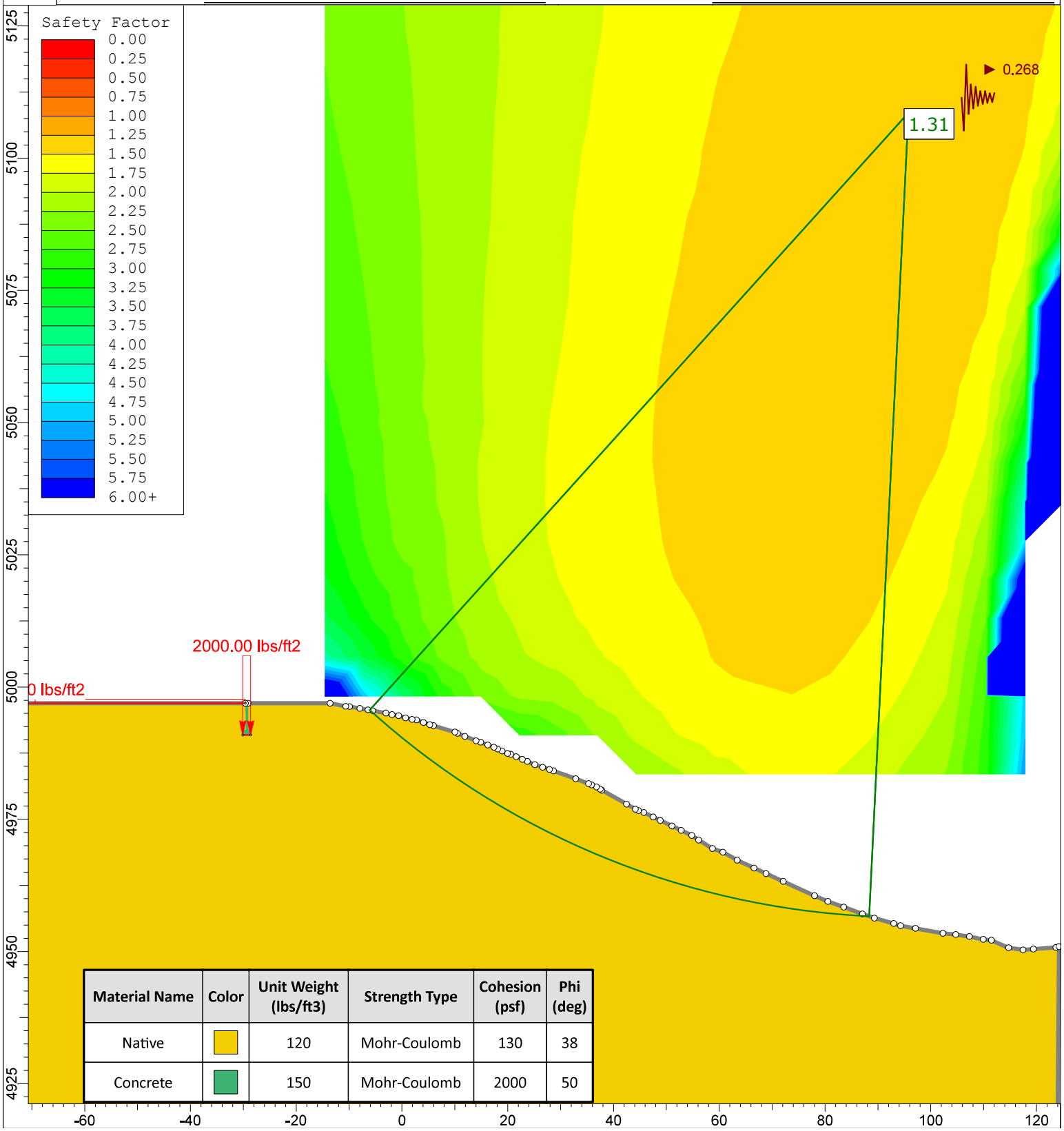
Figure No.:

Slope Stability - Seismic - A-A'

Wilding Engineering, Inc

CLIENT _____ **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** _____



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Native		120	Mohr-Coulomb	130	38
Concrete		150	Mohr-Coulomb	2000	50

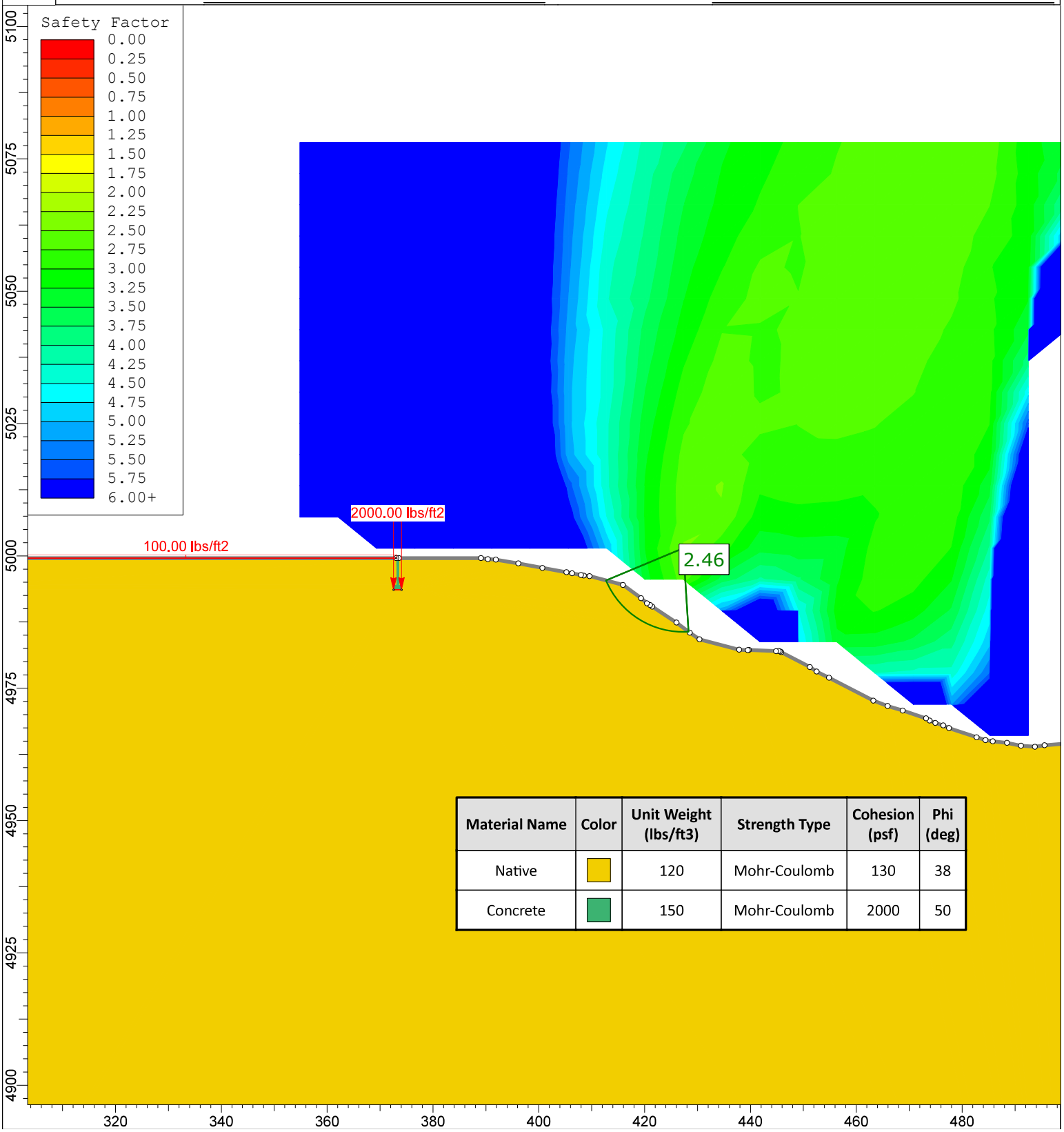
Figure No.:

Slope Stability - Static - B-B'

Wilding Engineering, Inc

CLIENT _____ **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** _____



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Native		120	Mohr-Coulomb	130	38
Concrete		150	Mohr-Coulomb	2000	50

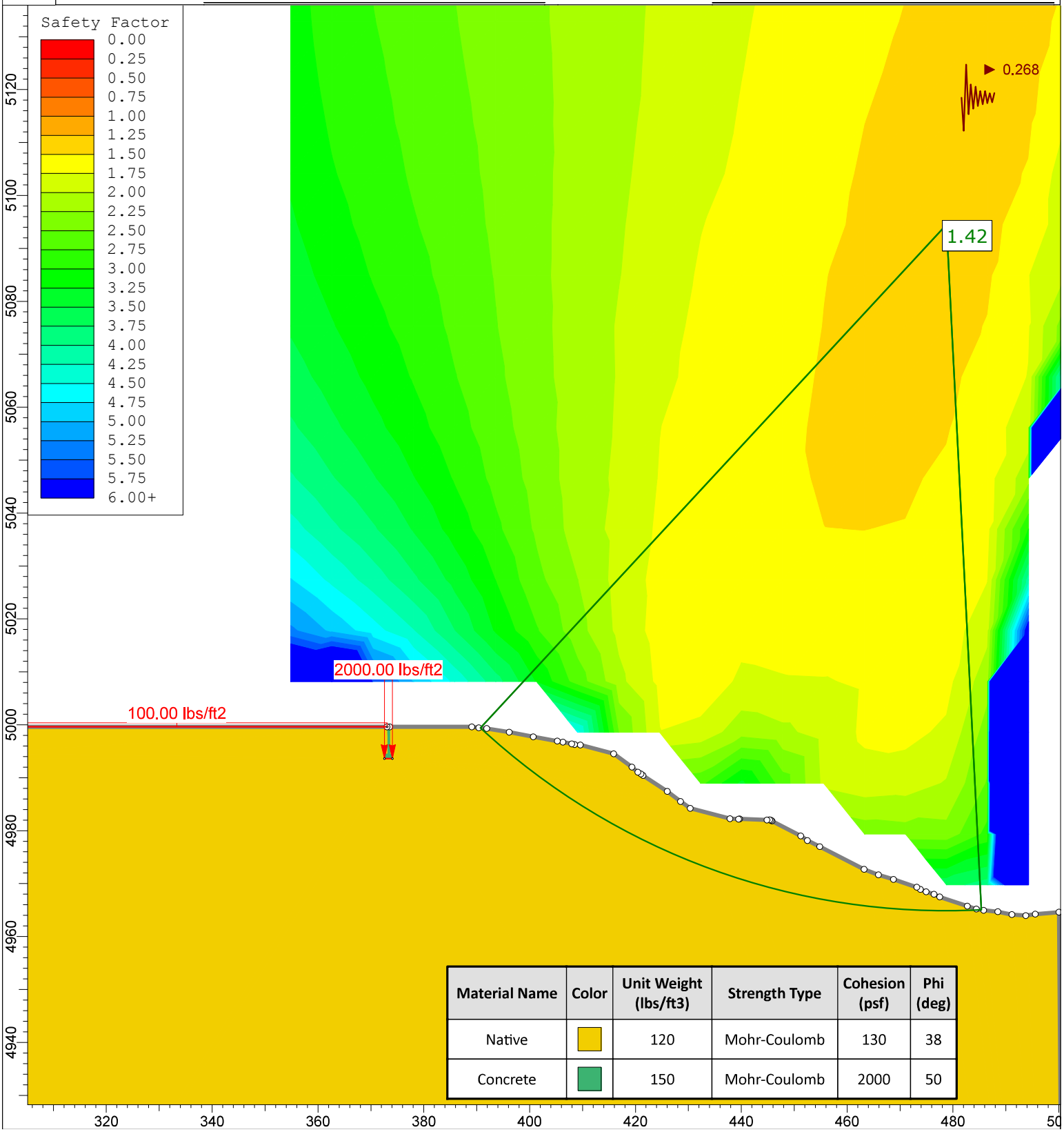
Figure No.:

Slope Stability - Seismic - B-B'

Wilding Engineering, Inc

CLIENT _____ **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** _____



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Native		120	Mohr-Coulomb	130	38
Concrete		150	Mohr-Coulomb	2000	50

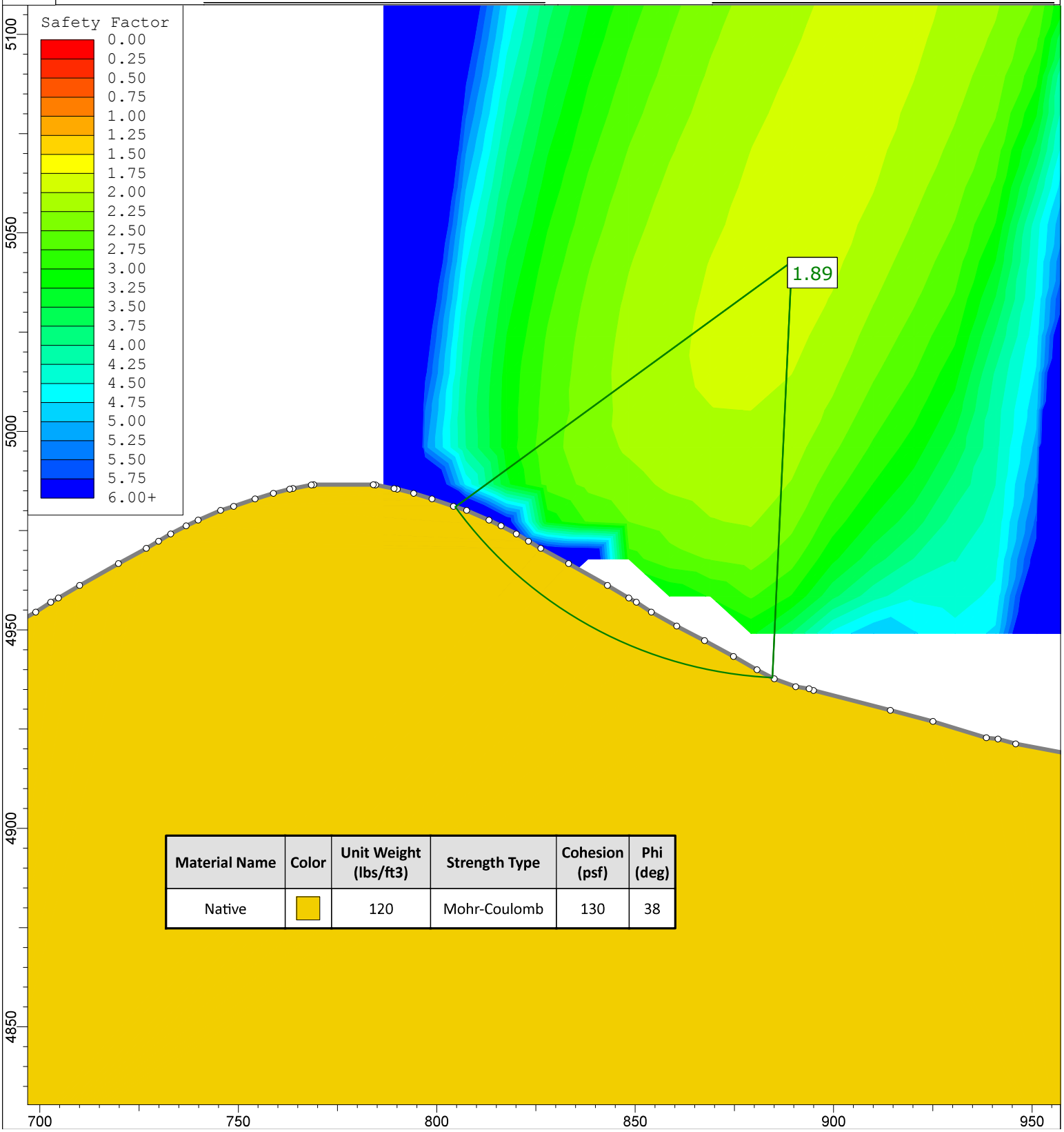
Figure No.:

Slope Stability - Static - C-C'

Wilding Engineering, Inc

CLIENT _____ **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** _____



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Native		120	Mohr-Coulomb	130	38

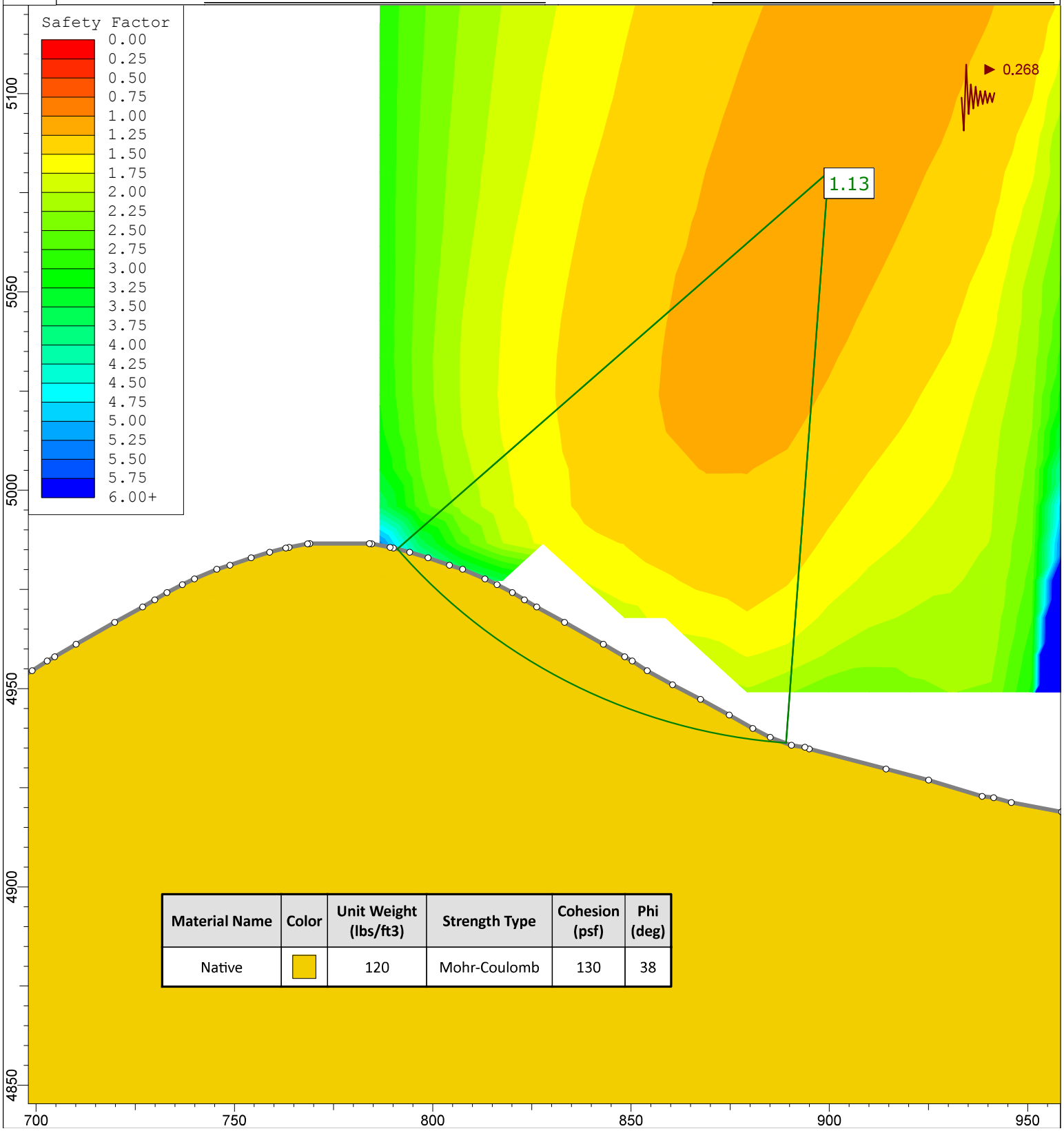
Figure No.:

Slope Stability - Seismic - C-C'

Wilding Engineering, Inc

CLIENT _____ **PROJECT NAME** Marsh Estates

PROJECT NUMBER 19011 **PROJECT LOCATION** _____



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Native		120	Mohr-Coulomb	130	38

Figure No.:

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Planning Commission Minutes August 6, 2019

FOR CONSIDERATION ON: 3 September 2019

PETITIONER: Staff

ACTION REQUESTED BY PETITIONER: Approve Minutes

BACKGROUND INFORMATION:

Minutes from the August 6, 2019 Planning Commission Meeting.

STAFF RECOMMENDATION:

Review and approve the Planning Commission Minutes.

ALPINE CITY PLANNING COMMISSION MEETING

Alpine City Hall, 20 North Main, Alpine, UT
August 6, 2019

I. GENERAL BUSINESS

A. Welcome and Roll Call: The meeting was called to order at 7:00 pm by Chairman David Fotheringham. The following were present and constituted a quorum:

Chairman: David Fotheringham
Commission Members: Bryce Higbee, Jane Griener, Alan MacDonald, John MacKay, Jessica Smuin, Sylvia Christiansen
Excused: Bryce Higbee, Alan MacDonald
Staff: Austin Roy, Jed Muhlestein, Marla Fox, Fire Chief Reed Thompson

Others: Gale Rudolph, Robert Kutin, Debra Callister, Anthony Marcello, amber Marcello, Michael Adams, Steve Birchall, Vickie Birchall, Kevin Hale, Carol Hale, Valerie Myers, Cathy Farr, Breezy Anson, Nathan Birchall, Lorainne Scott, Catherine Marchant, Scott Butler, Joy Atkinson, David McMillan, Lon Nield, Sherman Myers

B. Prayer/Opening Comments: Jessica Smuin
C. Pledge of Allegiance: Nate Birchall

II. PUBLIC COMMENT

Debra Callister, 655 Elbert Circle, expressed her concerns about a home being built on the corner of Westfield Road and Sunrise. The home had been under construction for a long time, and the lot was overrun with weeds. She asked if the City could get the owner to take care of the weeds.

Austin Roy explained that the owner had received permits for the project, and he was building the home on his own, which was why it was taking some time. He would bring up the weed concerns with the Code Enforcer.

Mrs. Callister also expressed concerns with flooding on her property due to the new subdivision next to her property. Jed Muhlestein said that the City would look into this issue.

III. ACTION ITEMS

A. The Ridge at Alpine – Final Plat Phase 2 – Paul Kroff

Austin Roy explained that the proposed final plat for Phase 2 of The Ridge at Alpine Subdivision included 12 lots ranging in size from 0.69 acres to 1.02 acres, and the overall site was approximately 12.7 acres. The site was located in the CR-40,000 zone. All of the trails had been approved as part of Phase 1. He noted that the development was a PRD, which meant that they were allowed to have smaller lots. The property was located within the Wildland Interface, which included additional requirement regarding wildfire protection.

Jed Muhlestein presented a map of the entire subdivision and identified the different phases and how the roadways connect. As part of this subdivision, the City would gain a new secondary water system in the area. There was a concern that a portion of the right-of-way on Catherine Way was not included on the plans, so staff included a condition of approval that this needed to be included on the final plat. Jed

Muhlestein identified a stub street on the plans and noted that the applicant would be required to include a turnaround because the road was quite long. The Fire Chief had reviewed the plans and approved the location of the fire hydrants. The sewer system would be gravity fed. All phases of the development must be able to stand on their own with a storm drain system, and the developer was required to pipe an additional ditch to take water from the Schoolhouse Spring and provide a maintenance easement. Jed Muhlestein addressed the conditions of approval listed in the staff report and noted that a rock fall study had been provided by the developer.

MOTION: John MacKay moved to recommend approval of The Ridge at Alpine Final Plat Phase 2, as written, with the following conditions:

1. The Developer provide a temporary turn-a-round at the end of Elk Ridge Lane.
2. The Developer include the right of way improvements at the intersection of Grove Drive and Catherine Way.
3. The Developer provide storm water calculations that show adequate capacity for Phase 2storm water runoff in the temporary pond constructed with Phase 1.
4. The Developer provide a flood mitigation plan for the existing home below Catherine Way, to be reviewed by the City Engineer prior City Council Approval.
5. The Developer provide maintenance easements for the 30-inch storm water pipe, to be recorded along with the plat of Phase 2.
6. The Developer submit a rock fall study for the westerly lots prior to City Council approval.
7. The Developer either remove existing buildings or provide a bond for the removal of them prior to recording the plat.
8. The Developer include the property south of Catherine Way on the plat, shown as dedicated right-of-way.
9. The Developer place "No Access" labels on the east sides of lots 40 and 41 on the plat.
10. The Developer address redlines on the plat and plans.
11. The Developer submit a cost estimate.
12. Lots 34 and 35 will have 30 feet on the back property line reflected on the plat before recording.

Jane Griener seconded the motion. There were 5 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

B. Setback Exception – Proposed Site Plan in Business/Commercial Zone – Paul Anderson

Austin Roy stated that the petitioner was seeking two exceptions to the setback requirements for a commercial structure in the Business/Commercial Zone. The property was an oddly shaped lot adjacent to Dry Creek and the Main Street Bridge. The first exception would allow for a front year setback of 10 feet from the property line along Main Street, and the second would allow a zero side yard setback on the north boundary. The petitioner had indicated that it would be difficult to place a building on the oddly shaped lot without these exceptions. Austin Roy noted that the applicant already received an exception for the front setback, but he was back to request a smaller front yard setback than before.

David Fotheringham asked if the City had granted any other development a ten-foot front setback. Austin Roy couldn't recall an instance where that exception was granted. There were existing buildings with that setback, but they were built before the current code was adopted. The current requirement was 30 feet.

Austin Roy explained that there were other issues with the property that made development difficult including easements, an old gas line, and a portion of the property owned by UDOT. In order to develop around these obstacles, the building needed to be as close to Main Street as possible. The applicant felt that he needed a 10-foot setback to make the project work. He noted that the setback measurement was from the back of sidewalk. The applicant had already done quite a bit of work cleaning up this property.

Jessica Smuin said she wasn't comfortable with allowing a setback less than 15 feet. David Fotheringham was also uncomfortable with this, but he also wanted to find a way to make development on this property work.

MOTION: Jane Griener moved to DENY the setbacks as proposed because it was less than fifty percent of the required setback. Sylvia Christiansen seconded the motion.

Paul Anderson, the applicant, said that he had tried to acquire the UDOT property to incorporate into the subject property, but there were a lot of obstacles. He described his efforts to clean up the property, and the money he had spent doing it. He had tried to show good faith to the City by maintaining the property, even though it wasn't under his ownership. He was asking for the additional setback exception to help reduce construction costs.

The Commission asked Mr. Anderson if he could shift the building to the south, because that would give him the setback needed on the front while avoiding the utility easement. Mr. Anderson said that he still needed room for parking on the south. There was continued discussion regarding this option, and the Planning Commission found no reason why this could not work.

A vote was taken. There were 5 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

C. Public Hearing – Zone Change – CR-40,000 to CR-20,000 Zone, Lupine Drive & 400 West – Nate Birchall

Austin Roy explained that the applicant was requesting a zone change for three properties fronting Lupine Drive and 400 West. The properties were currently zoned CR-40,000, and he requested a zone change to CR-20,000. The Planning Commission would make a recommendation to the City Council for approval or denial of the request. The purpose of the rezone was to keep these three lots more consistent with the other lots located on 400 West, which were half-acre lots.

Nate Birchall, the applicant, noted that the lots would meet the requirements of the CR-20,000 Zone. The zone change would make the corner lots more consistent with the surrounding homes, and it would give two other homeowners the opportunity to live in the neighborhood. The smaller lots would also provide a nice buffer between the quarter-acre lots and the one-acre lots. Mr. Birchall had met with the City Engineer and he confirmed that these two new lots would not be a burden to the existing infrastructure. He gave examples of similar zone changes that were recently granted by the City Council.

David Fotheringham opened the Public Hearing.

Lorainne Scott, 557 North 400 West, said that she was the owner of the upper lot in the neighborhood. She had no intention of splitting or putting further development on her property.

Anthony Marcello, 465 West 600 North, expressed his opposition to the rezone request, and he had collected 23 signatures from other neighbors who were in opposition. His view would be affected by the proposed homes, and he was sure that his property value would decrease. The CC&Rs of the subdivision clearly state that lots could not be subdivided, so this application was a violation of that contract. Mr. Marcello was concerned that the applicant didn't even live in Alpine, so his only motivation was money.

Mike Adams, 720 West Lupine, said that this change would impact the entire area. The roadway would need to be cut to make sewer connections for the new homes. He didn't see any benefit to the City by rezoning the property.

David Atkinson, 445 West 600 North, questioned why the applicant felt the lot needed to be subdivided. He thought that the neighborhood should remain unchanged.

Amber Marcello, 465 West 600 North, objected to the way this was being presented. Staff and the applicant had made it seem like the subject property was surrounded by half- and quarter-acre lots, but it wasn't. All of the properties behind were acre lots. They were trying to persuade the City that the smaller lots were normal for this area, but they weren't. The neighborhood should maintain acre lots.

Catherine Marchant, 554 Lakeview Drive, requested that the City follow the General Plan and deny this proposal.

Scott Butler, 544 Lupine Drive, was concerned that allowing this rezone would set precedent for the area, and it would inspire other owners to create smaller lots.

Cathy Farr, 595 North 400 West, noted that someone else in the subdivision had attempted to split their lot recently, and that request was denied. That was a better precedent to follow than the examples provided by the applicant.

Joy Atkinson, a resident, noted that all homes in the neighborhood are required to have a side garage, and it didn't seem that the proposed lots could accommodate that. Adding more homes would destroy the look of the neighborhood.

Natalie Birchall Dally, 80 West 120 South, said that she was the sister of the applicant and she had been a resident of Alpine for 44 years. She spoke about the history of these properties and how much they had changed over time. She thought that this proposal would be a good way to bring a few new neighbors into the subdivision.

Gale Rudolph, a resident of International Way, didn't agreed with the applicant's claim that these would create a buffer between larger and smaller lots. She was concerned about traffic being brought into Alpine from Draper. She encouraged the Commission to consider how this and other developments would affect the traffic five or ten years down the road.

Valerie Myers, 553 Blue Spruce Road, said that the CC&Rs were in place for a reason, and the applicant agreed to abide by those. She moved to Alpine from California to get away from smaller lots. If this rezone was granted, it would set precedent for other properties in her neighborhood.

Lon Nield, a resident, said that he was in favor of half-acre lots, but it was a tough sell in an existing subdivision. Alpine City needed smaller lots, he just wasn't sure that this was the right location for them.

Sherman Myers, 554 Lakeview Drive, said that there were smaller lots all over the City. The General Plan didn't show any smaller lots in this area.

Steve Birchall, a resident, said that he had welcomed many new people to Alpine in the 45 years he had lived there. Some people wanted larger lots, and some wanted smaller lots, but they were all welcome here.

Nate Birchall, the applicant, explained that the two lots being discussed were unique because they had the required frontage. None of the other properties along Lupine had enough frontage to subdivide, and they weren't adjacent to other lots zoned CR-20,000. He didn't believe that this application would set precedent for the neighborhood. He also felt it was unfair to say that he was only interested in money.

Bob Kutin, 446 Lupine Drive, said that traffic and garages weren't the issue with this application. He encouraged the Planning Commission to consider the facts rather than the emotional hyperbole of those in attendance.

David Fotheringham closed the Public Hearing.

Jessica Smuin asked if the application met all the requirement for a zone change, and Austin Roy answered affirmatively. Jane Griener noted that a zone change was legislative in nature, so the final decision would fall on the City Council.

MOTION: Jane Griener moved to recommend DENIAL the proposed Zone Change from CR-40,000 to CR-20,000 at Lupine and 400 West. John MacKay seconded the motion.

Jane Griener stated that the Planning Commission was not supposed to consider precedent. They also supported half-acre lots, but it was also important the people purchasing property in Alpine with confidence in what they bought. If the City was constantly allowing change, it wouldn't be fair to the residents as a whole. She wished that Alpine could be everything to everyone, but it couldn't. This was why they considered different types of lots for different areas of the City.

Jessica Smuin said that one of the goals of Land Use Elements in the General Plan was to preserve the quality of life and existing atmosphere of the City, and that included maintaining lower density neighborhood with traditional single-family residences.

A vote was taken. There were 5 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

D. Public Hearing – Parking Plan – Healey Heights

Austin Roy explained that the City would like to expand the parking area for Healey Heights Park, and include a restroom. They were proposing to put in 54 parking stalls and move the restrooms from Smooth Canyon to this parking lot. There was a greater need for restrooms at this location because of the location of the soccer fields. He gave a brief history of similar proposals and the negative responses from the residents.

David Fotheringham opened the Public Hearing.

Fire Chief Reed Thompson asked about the distance between the road and the restrooms, and Jed Muhelstein said it was about 300 feet. Chief Thompson stated that this didn't meet Fire Code requirements. They could construct the restrooms with noncombustible materials to increase safety. Jed Muhlestein said that the plan was to build the restrooms with concrete block.

David Fotheringham closed the Public Hearing.

MOTION: Sylvia Christiansen moved to recommend the Parking Plan at Healey Heights as proposed.

Jessica Smuin seconded the motion. There were 5 Ayes and 0 Nay (recorded below). The motion passed.

Ayes:	**Nays:**
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

E. Public Hearing – Parking Plan – Smooth Canyon Park

Austin Roy explained that the City wanted to expand the parking and upgrade the restrooms at Smooth Canyon Park. The plan essentially reflected the plans for Healey Heights Park. This item was returning to the Planning Commission after the City Council requested revisions to the previous proposal. They asked that staff use the goal of 50 parking spaces as a guideline for the new design.

Jed Muhlestein added that the new parking plan would keep parking off the street in and in the neighborhood.

David Fotheringham opened the Public Hearing.

Chief Thompson requested that the plan also provide a proper turnaround radius for fire trucks.

David Fotheringham closed the Public Hearing.

MOTION: Jessica Smuin moved to recommend approval of the Parking Plan at Smooth Canyon as proposed.

Jane Griener seconded the motion. There were 5 Ayes and 0 Nays. (recorded below) The motion passed.

Ayes:	**Nays:**
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

F. Public Hearing – Amendment to Development Code – Street Classifications

Jed Muhlestein reported that staff had been asked by the City Council to add a Secondary Access street classification to the Street Mater Plan and Map. This classification would cover roads that were in the

system but weren't currently shown on the Streets Master Plan. They currently classified and showed arterial roads, collector roads, and residential roads. The ordinance did mention secondary access roads, but they weren't defined. In order to create the Secondary Access classification, staff looked at the following documents:

- Development Code. Section 4.7.4.15 mentions secondary access roads but sections 4.7.4.5 & 6 do not specify right-of-way, width, and surface specifications;
- Street Master Plan. The current Street Master Plan (aka – SMP) lists three road classifications (arterial, collector, and minor/local) but also mentions "miscellaneous roads." Secondary access roads would fall under the "miscellaneous" category and therefore the main body of the SMP would not need updated, just the SMP Map which shows the road classifications and alignments;
- Alpine City Standard Details.

Jed Muhlestein explained that the City Attorney requested language to match the Fire Code, as follows:

e. Secondary Access: At least the minimum width and improvements required by the Utah State Fire Code, or its successor code, for emergency access along with such other improvements such as surface type, curb and gutter, and gating at the discretion of the City Council and upon recommendation of the Planning Commission and City Engineer.

David Fotheringham opened the Public Hearing. There were no public comments. David Fotheringham closed the Public Hearing.

Jessica Smuin expressed concern about the emergency road from Moyle Park to Box Elder, which the judge declared as emergency access only. She felt that this road should have specific classification in the Street Master Plan and Map. It didn't seem right to lump this special road in with all other secondary access roads. Jed Muhlestein said that the Attorney didn't want to single out this road because all secondary access roads were for emergency access. Jessica Smuin was concerned that the proposed language took control out of the hands of the City Council, and staff stated that the Council still had the ability to make regulations for roadways owned by the City.

MOTION: Jessica Smuin moved to recommend the Amendment to Development Code for Ordinance 2019-17 and Street Master Plan Map be denied based on the following:

1. Proposal does not include a classification that defines emergency access roads.

Jane Griener seconded the motion. There were 3 Ayes and 2 Nays. (recorded below) The motion failed.

Ayes:	**Nays:**
Jane Griener	Sylvia Christiansen
David Fotheringham	John MacKay
Jessica Smuin	

Jane Griener asked if the City Attorney could review the language again before the item went to the City Council. The intent of allowing the City to maintain the roadways was there, but the language didn't reflect that clearly.

MOTION: Sylvia Christiansen moved to recommend approval of the proposed Ordinance 2019-17 and Street Master Plan Map with the addition of a classification for emergency access roads.

Jane Griener seconded the motion. There were 4 Ayes and 1 Nay. (recorded below). The motion passed.

Ayes:	Nays:
Jane Griener	Jessica Smuin
David Fotheringham	
John MacKay	
Sylvia Christiansen	

G. Public Hearing – Amendment to Development Code – International Fire Code

Austin Roy explained that staff was proposing an update to the Development Code to replace all references of the "Uniform Fire Code" with "International Fire Code. They would also replace the term "Urban/Wildlife Interface" with "Wildland Urban Interface". These changes were being made so that the City Code was more consistent with the terminology in the International Fire Code.

David Fotheringham opened the Public Hearing. There were no public comments. David Fotheringham closed the Public Hearing.

MOTION: Sylvia Christiansen moved to recommend approval of Amendment to Development Code – International Fire Code, as proposed.

John MacKay seconded the motion. There were 5 Ayes and 0 Nays. (recorded below) The motion passed.

Ayes:	Nays:
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

IV. Communications

Austin Roy reported that there would be no meeting on August 20, 2019.

V. APPROVAL OF PLANNING COMMISSION MINUTES: July 16, 2019

MOTION: Sylvia Christiansen moved to approve the minutes for July 16, 2019, with the changes requested.

Jane Griener seconded the motion. There were 5 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	Nays:
Jane Griener	None
John MacKay	
David Fotheringham	
Jessica Smuin	
Sylvia Christiansen	

The meeting was adjourned at 10:10 pm.