NOTICE OF MEETING
HILLSIDE REVIEW BOARD
CITY OF ST. GEORGE
WASHINGTON COUNTY, UTAH

Public Notice

Notice is hereby given that the Hillside Review Board of the City of St. George, Washington County, Utah, will hold meetings at the referenced site on **Wednesday, August 23, 2023,** commencing on-site at approximately 8:30 a.m.

The estimated site times are in bold. The agenda for the meeting is as follows:

1. Consider a request for the development of five new lots within the medium and high rockfall hazard zone located within the Amended and Extended Twin Lakes Resort, Phase 1 final plat. The site is located on Twin Lakes Drive at approximately 840 North. The representative is Bob Hermandson. Case No. 2023-HS-007. **Meeting time is approx. 8:30 am**

2. Consider a request for the development of six new lots for the Chuckwalla subdivision. The representative is Bob Hermandson. Case No. 2023-HS-008.

3. Consider a Hillside Development Permit to allow disturbance of areas in the 20-30%, 30-40% and 40% and above slope areas. This application is a discussion item on a possible future project for commercial development of storage units. The representative is Tim Stewart. Case No. 2023-HS-009.

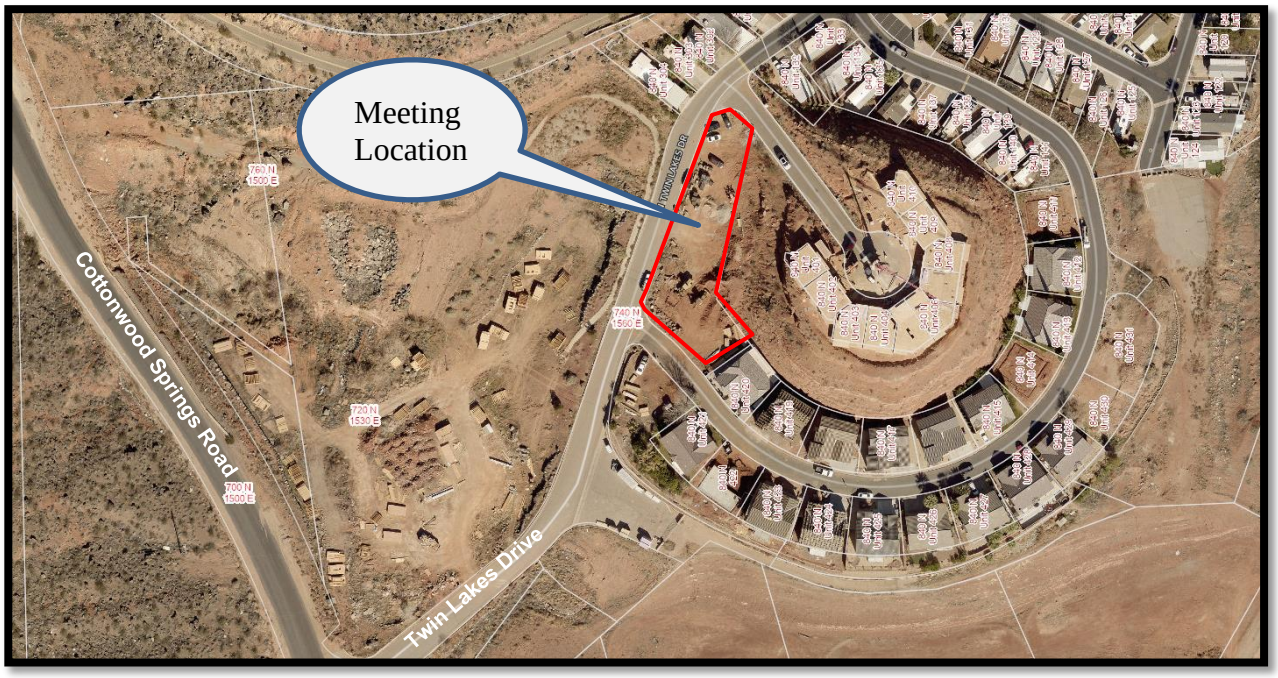
4. Consider approval of the meeting minutes from the **June 28, 2023**, meeting.

Carol Winner, AICP, CFM, CPM
Senior Planner
Development Services

Reasonable Accommodation: The City of St. George will make efforts to provide reasonable accommodations to disabled members of the public in accessing City programs. Please contact the City Human Resources Office at (435) 627-4674 at least 24 hours in advance if you have special needs.

Meeting Location

Item #1 – 840 North Twin Lakes Dr.



Item #2 – Parking Lot at 1145 W. Roadrunner Dr.



Item #3 – Along southeast-bound Dixie Dr., just south of Gap Canyon Dr.

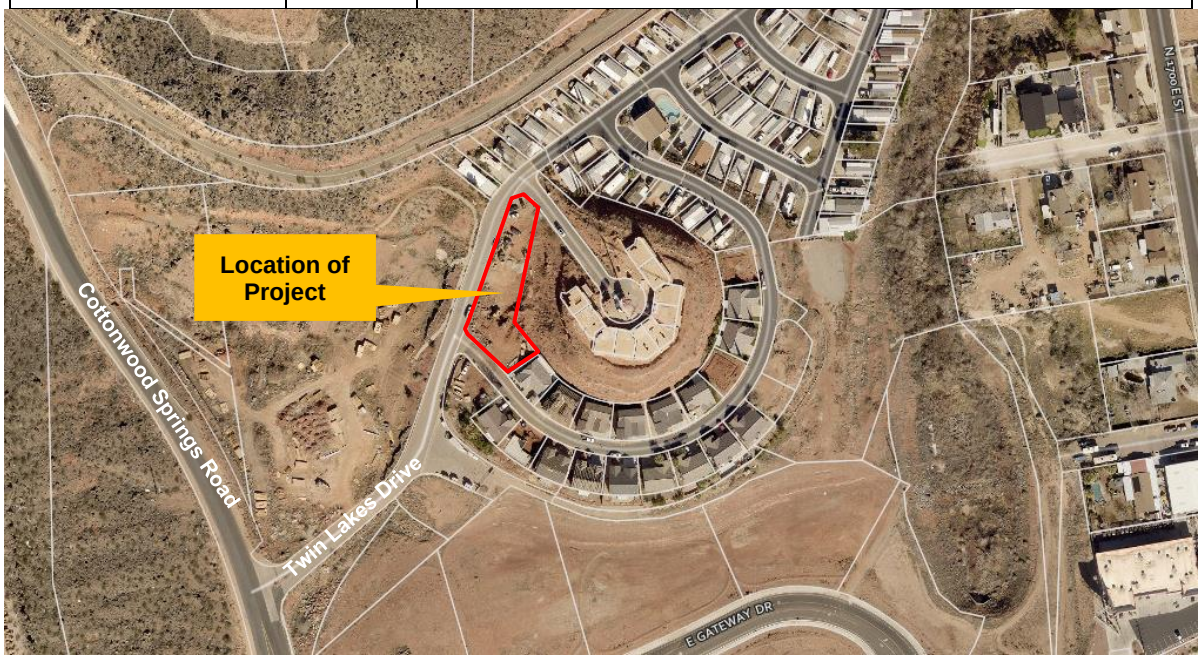


St.George
Community Development

ITEM 1
Hillside Permit

HILLSIDE REVIEW BOARD AGENDA REPORT: **08/23/2023**

Twin Lakes Hillside Hillside Development Permit (Case No. 2023-HS-007)		
Request:	Consider a request for the development of five new lots within the medium and high rockfall hazard zone located within the Amended and Extended Twin Lakes Resort, Phase 1 final plat.	
Applicant:	TCBH, LLC	
Representative:	Bob Hermandson	
Location:	Approximately located east of Twin Lakes Drive at 840 North.	
General Plan:	MDR (Medium Density Residential)	
Existing Zoning:	R-3, Multiple-Family Residential	
Surrounding Zoning:	North	MH (Mobile Home)
	South	R-3 (Multiple-Family Residential)
	East	R-3 (Multiple-Family Residential)
	West	PD-R (Planned Development Residential)



BACKGROUND

The applicant would like to add five new lots and a parking lot to the Twin Lakes Resort Phase 1 final plat. In preparing to add these lots to the Twin Lakes Resort Phase 1 final plat, the applicant was unable to get all the signatures; therefore, state law requires a public hearing to be held on the plat amendment. During the public hearing held on June 1, 2023, there were concerns from the public about the rockfall hazard at this location. A portion of this area being prepared for development, approximately .385 acres, falls within the Medium and High Rockfall layer. Before the Amended and Extended Twin Lakes Resort Phase 1 final plat can be recorded, the applicant has been asked to attend a Hillside Review Board meeting to mitigate the potential rockfall hazards for this new developable area.

EXHIBITS PROVIDED

1. Exhibit A – Maps
   "Exhibit A" in the packet shows the general plan land use map and the zoning map.

2. Exhibit B – Rockfall Map
   "Exhibit B" in the packet shows where this property falls within the rockfall zones.

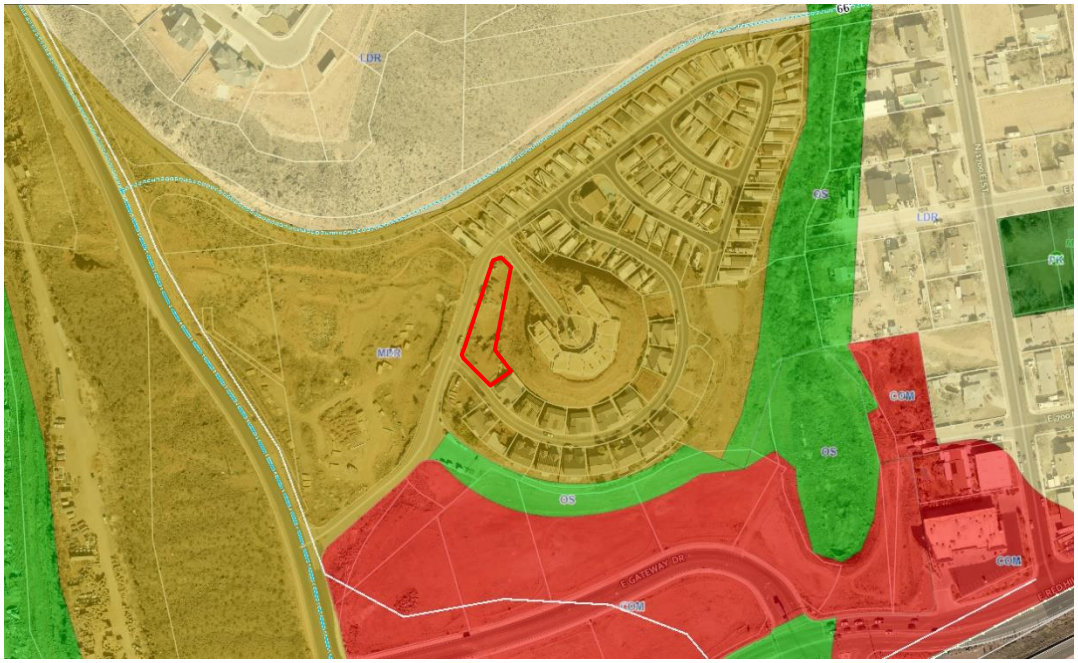
3. Exhibit C – Proposed Amended and Extended Twin Lakes Resort Phase 1 Final Plat
   "Exhibit C" in the packet shows the proposed Amended and Extended Twin Lakes Resort Phase 1 Final Plat, showing the location of the new development compared with the existing development.

4. Exhibit D – Rockfall Letter
   "Exhibit D" in the packet is a letter from AGEC concerning mitigation of the rockfall in this location.

5. Exhibit E – Applicable Ordinances
   "Exhibit E" in the packet lists the applicable zoning regulation that apply to this case found in Title 10, Chapter 13B.

Exhibit A
MAPS

General Plan - MDR



Zoning - R-3

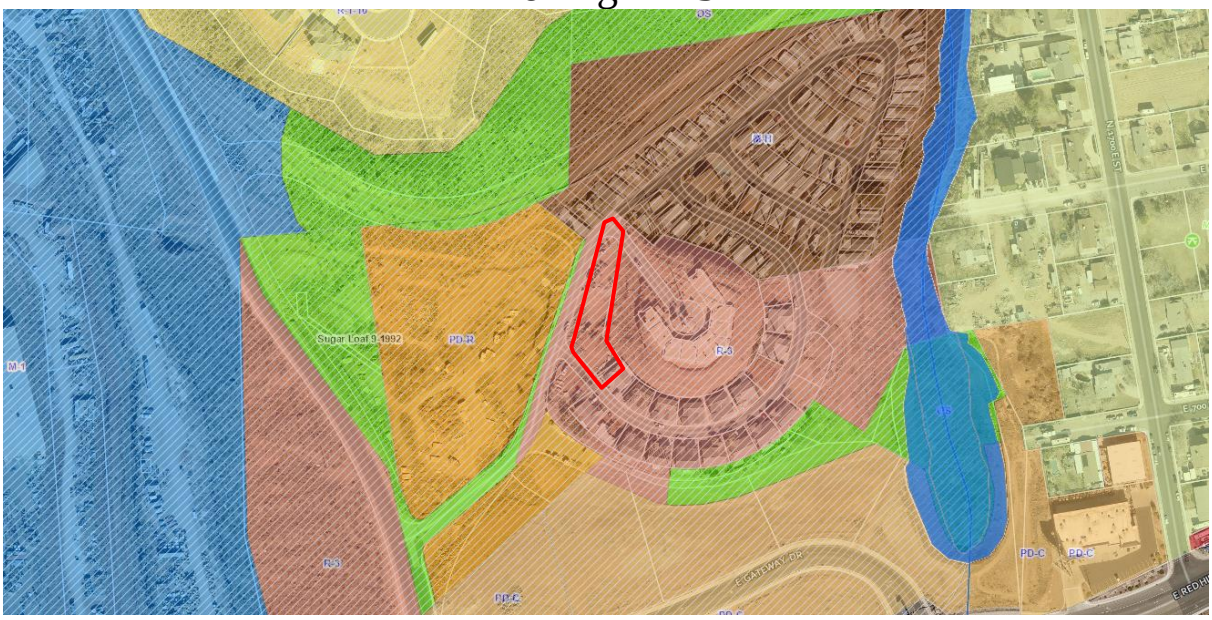


Exhibit B
Rockfall Map

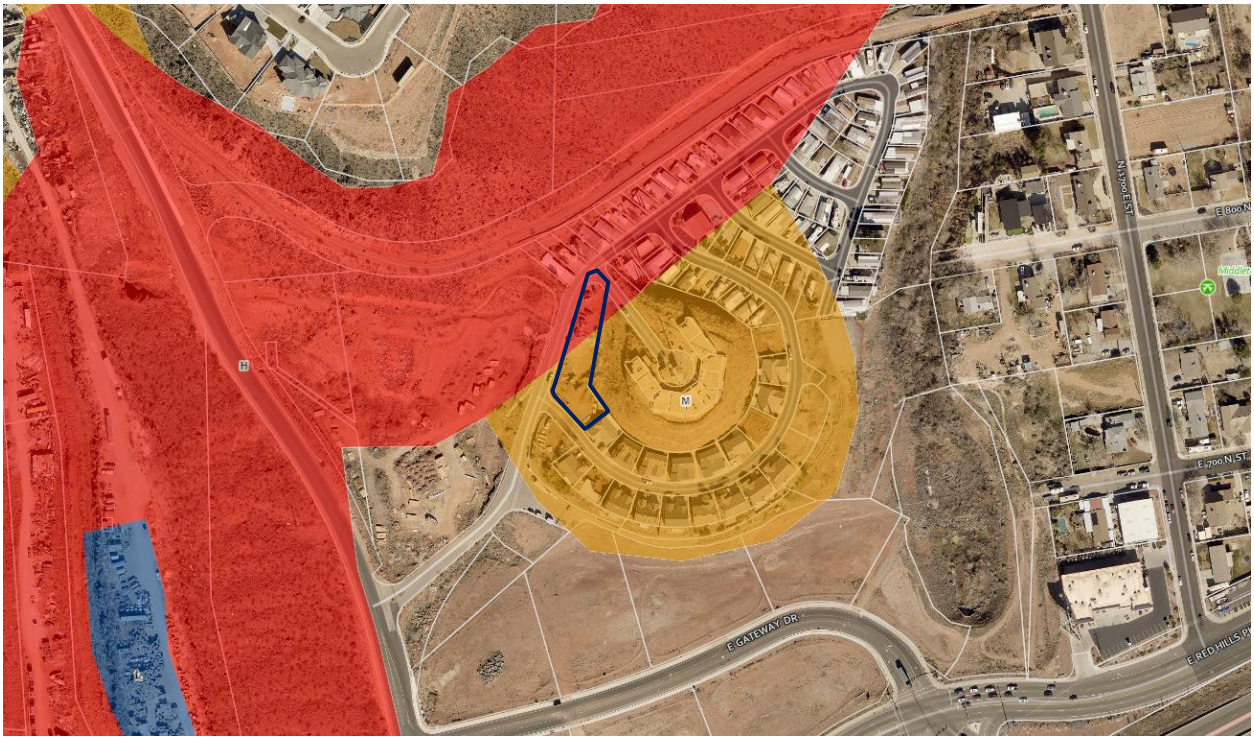


Exhibit C

Proposed Amended and Extended Twin Lakes Resort Phase 1 Final Plat

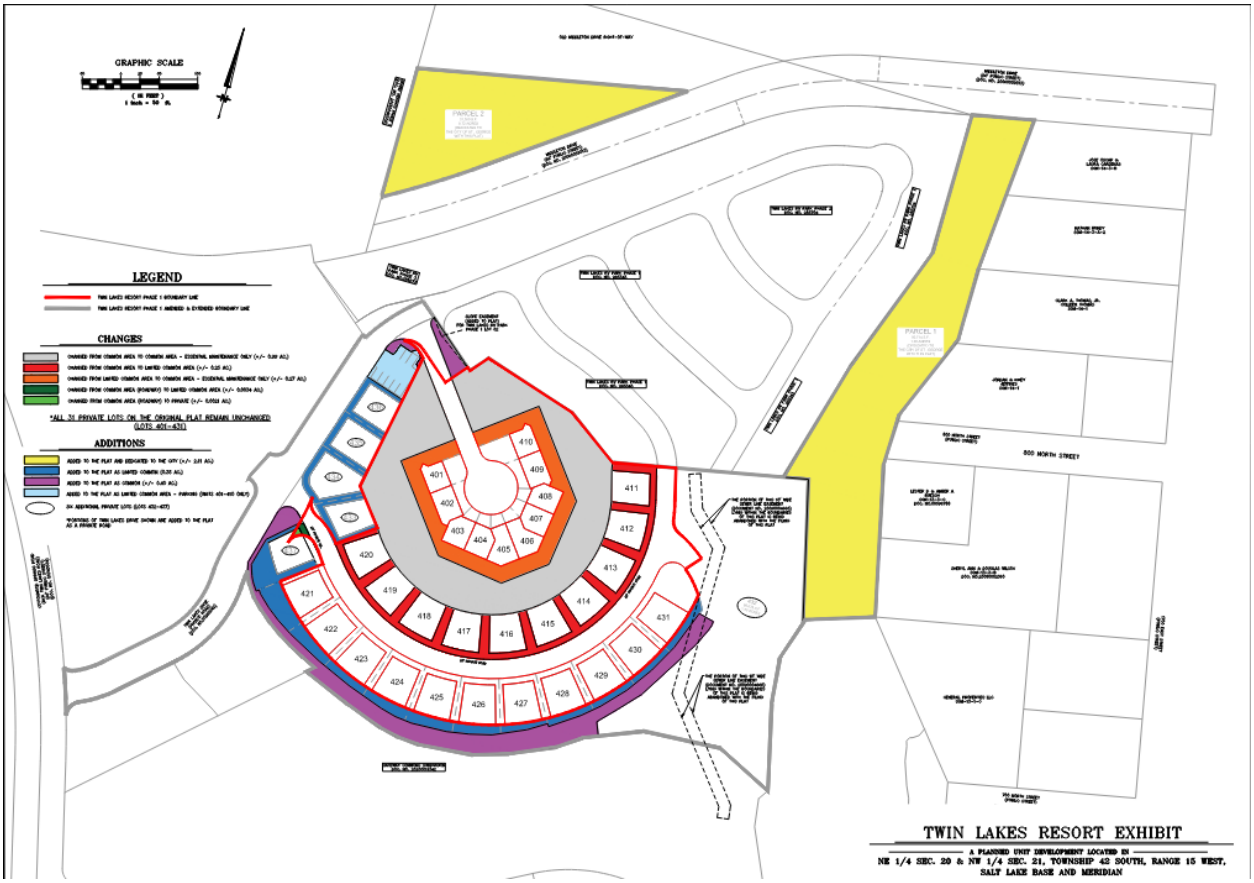


Exhibit D
Rockfall Letter

AGEC
Applied GeoTech

July 17, 2023

TW Holdings, LLC
205 East Tabernacle, Suite No. 4
St. George, Utah 84770

Attn: Bob Hermanson

Subject: Geotechnical Consultation
Twin Lakes Lots 433-437
St. George, Utah
AGEC Project No. 2231027

References:

1. Rockfall Hazard Assessment, by AGEC, Project No. 2211526.
2. Plan, by Bush & Gudgell Engineering, Inc., Dated May 28, 2022, Job No. 201053.

Applied Geotechnical Engineering Consultants, Inc. was requested to provide additional evaluation to determine the potential rockfall hazard for the additional lots to be developed. Figure 1 shows the approximate area of the additional lots.

After reviewing the area along with previous study conducted by AGEC for the rockfall hazard on the adjacent townhome project, there are two areas that are addressed below. (1) The affect hillside to the north that was previously evaluated (Ref No. 1) and (2) The cut slope on the east side of the property.

Based on our evaluation the following conclusions were found:

1. The area to the north has been evaluated and a mitigation plan provided and constructed during the mass grading. The rockfall runout line was determined during the previous evaluation and is shown on Figure 2. Based on the evaluation, the rockfall hazard from the adjacent hillside to the north will not adversely affect the proposed lots.

2. During our site visit, the hillside on the eastern side of the lots was partially graded by cutting into the lower portion of the hillside. Following the previous grading, there are several rocks that are located on the slope. The upper slope is an exposed natural rock face. Based on our observations and

evaluation, the natural rock slope at the top of the slope is competent with a very low hazard for potential rock fall. We recommend that the previously graded area be cleaned of rocks as a part of the project grading. (See Photo No. 2).

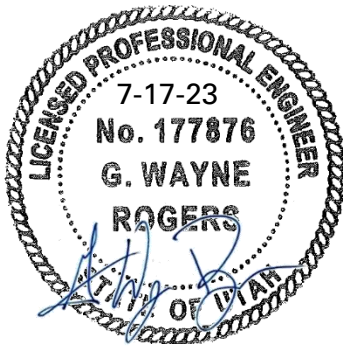
We also recommend that for purposes of erosion protection, a minimum 3 to 4 foot high, reinforced, concrete wall be constructed at the toe of the slope. The wall should only be partially backfilled allowing for potential eroded materials to be accumulated behind the wall. The material will likely need to be removed over time.

LIMITATIONS

The recommendations and conclusions within this report are based on our observations of the site conditions, understanding of the proposed construction at this time and the referenced documents. If during construction or further investigation, the conditions or proposed construction are found to be different, AGEC should be contacted to re-evaluate our conclusions and recommendations.

If you have any questions, or if we can be of further service, please call.

Sincerely,



APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

G. Wayne Rogers, P.E.

P:\2023 Project Files\2231000\2231027 - G - Twin Lakes Rockfall Evaluation\Letter for Rockfall.docx



Figure 1, approximate project area.

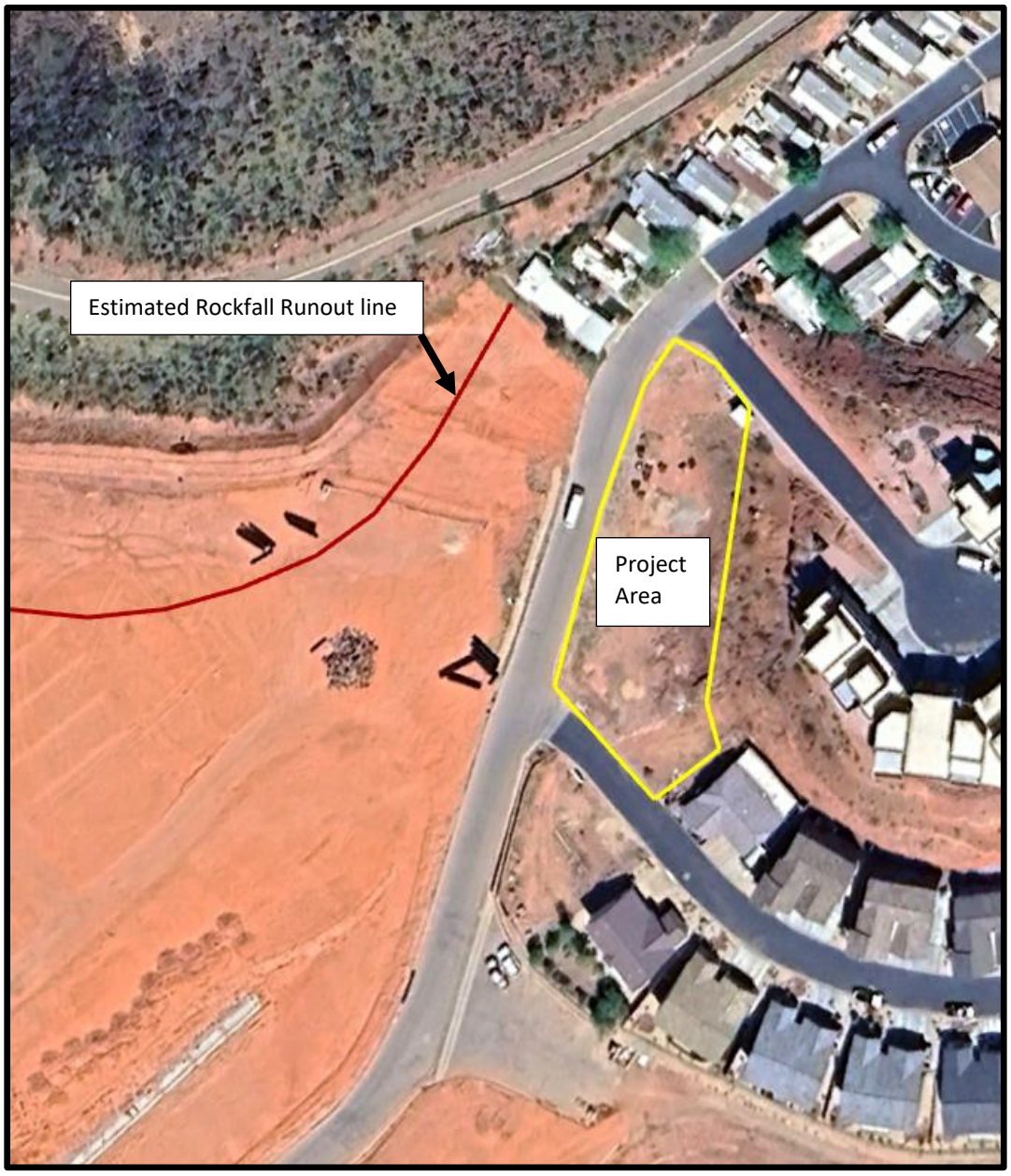


Figure 2, Illustrates rockfall runout line from previous study on the north hillside and its proximity to project area.



Photo No. 1, view of north slope looking north from northeast of project area.



Photo No. 2, view of hillside on east side of project area. Red arrows indicate rocks to be removed during project grading.

Exhibit E
APPLICABLE ORDINANCES

ARTICLE B. DEVELOPMENT IN GEOLOGIC HAZARD OR ADVERSE CONSTRUCTION CONDITION OVERLAY ZONE

10-13B-1:
GENERAL REQUIREMENTS:

A. *Overlay Areas with Geologic Hazards:* Development is not permitted in overlay areas with geologic hazards without compliance with all requirements in this chapter, and approval of the land use authority. Applications and development that do not meet the requirements of this chapter shall be denied. Geologic hazards include: surface fault rupture, earthquake ground shaking, liquefaction, landslide, and rockfall.

B. *Overlay Areas with Adverse Construction Conditions:* Development is not permitted in overlay areas with adverse construction conditions without compliance with all requirements in this chapter, and approval of the land use authority. Applications and development that do not meet the requirements of this chapter shall be denied. Adverse construction conditions include: expansive soil and rock, collapsible soil, gypsiferous soil and rock, shallow bedrock, caliche, wind-blown sand, breccia pipes and paleokarst, soil piping and erosion, and shallow ground water. The Federal Emergency Management Agency (FEMA), the Utah Department of Natural Resources (DNR) and its Utah Geological Survey (UGS) hazard maps for the St. George area, as amended, are adopted. (Ord. 2019-10-002, 10-10-2019)

10-13B-2:
DEVELOPMENT IN GEOLOGIC HAZARD AREAS (UGS 1 – 4):

A. *Geologic Hazard Areas (UGS 1 – 4: subsections A1 through A4 of this section):* For any development in the city with a geologic hazard listed below, applicant shall submit a report prepared by a qualified, licensed geologist specializing in engineering geology, or a licensed civil engineer, trained and experienced in the practice of geotechnical engineering. Development in the geologic hazard overlay for high category rockfall areas shall be reviewed by the hillside review board.
   1. Surface fault rupture and earthquake: well-defined Holocene, and well-defined fault areas, red and purple lines/categories (extending five hundred feet (500') on the downthrown side and two hundred fifty feet (250') on the upthrown side of each red/purple fault line).
   2. Liquifaction: Very High category.
   3. Landslide: Very High category.
   4. Rockfall: High category.

B. *General Requirements for Development in a Geologic Hazard Area:*
   1. Submit a site-specific report prepared by a qualified, licensed geologist specializing in engineering geology, or a licensed civil engineer, trained and

experienced in the practice of geotechnical engineering with the following minimum requirements:

a. Identify all geologic hazard areas (UGS 1 – 4: subsections A1 through A4 of this section);
b. Identify any other geologic hazards, not listed above (UGS 1 – 4: subsections A1 through A4 of this section), which present an unacceptable risk to development;
c. Demonstrate which areas of the development are suitable for the proposed use;
d. Recommend specific measures necessary to make the land suitable for the proposed use;
e. Recommend the optimal placement of all structures, roadways, utilities, trails and infrastructure in relation to the geologic hazard area;
f. Slope stability analysis: conclusions and recommendations concerning the effects of material removal, introduction of water, both on and off site, including, where applicable, on mesa tops, seismic activity, and erosion on slope stability;
g. Foundation investigation: conclusions and recommendations concerning the effects of soil conditions on foundation and structural stability, including bearing capacity, sheer strength, and shrink/swell potential of soils;
h. Spring location: the location and yield of springs and seeps which shall be shown on the site plan;
i. Structural features: structural features including any geological limitations;
j. Surface hazards: existence of surface hazards including potential for rockfalls and toppling failures to cliffs, slopes and overhangs above the subject property; and
k. Effect of geologic conditions: conclusions and recommendations regarding the effect of geologic conditions on the proposed development, together with recommendations identifying the means proposed to minimize any hazard to life or property, or adverse impact on the natural environment.

2. The city shall review the applicant's report. If the applicant's report is deemed adequate by the city engineer or designee, development may proceed if the report recommendations are followed. If the report is deemed incomplete or inadequate by the city engineer or designee, the development application shall be denied. If denied, the applicant may request an independent review, and the city engineer or designee may order a review by independent, qualified professionals. The professionals selected by the city shall review and prepare written findings and comments on the applicant's report. The cost of the independent, qualified professionals shall be paid to the city by applicant. Applicant may develop if the independent review and written findings and comments are implemented, in addition to any nonconflicting recommendations in the initial report of applicant. The city engineer or designee is the land use authority for the decision. The reports shall be specifically identified on the plat and available to all owners and interested parties.
3. All development shall be outside the geologic hazard areas in subsections A1 through A4 of this section, unless:

a. The city has accepted applicant's report, prepared by a qualified, licensed geologist specializing in engineering geology or a licensed professional engineer trained and practicing in the field of geotechnical engineering, and it recommends development, and shows hazards can be adequately mitigated for the proposed land use;
b. If the city has not accepted applicant's report, the applicant also adopts and implements the independent review and writing findings and comments, in addition to any nonconflicting recommendations in applicant's report;
c. All report recommendations, and HDOZ permit conditions (when required), are adopted by the city and are conditions of development.

4. Hold the city harmless from all claims resulting from any damage related to development within a geologic hazard area by executing a "geologic hazard disclaimer of liability and agreement" and by placing a "notice of hazard" on the final plat.
5. The applicant may appeal a decision in accordance with chapter 3 of this title.

C. *Compliance:* No structure or land shall be constructed, located, extended, converted or altered without full compliance with the terms of this chapter and other applicable regulations.

D. *Abrogation and Greater Restrictions:* This chapter is not intended to repeal, abrogate or impair any existing easement, covenant or deed restriction; however, where this chapter and another ordinance, easement, covenant or deed restriction conflict or overlap, the more stringent restriction shall prevail.

E. *Interpretation:* In the interpretation and application of this chapter, all provisions are minimum requirements in addition to applicable provisions of this title. (Ord. 2019-10-002, 10-10-2019; amd. Ord. 2020-11-011, 11-5-2020)

10-13B-3:
DEVELOPMENT IN ADVERSE CONSTRUCTION CONDITION AREAS:

For any development in the city in an overlay area with an adverse construction condition, applicant shall submit a site-specific report prepared by a qualified, licensed engineer trained and experienced in the practice of geotechnical engineering identifying all adverse construction conditions. The report shall recommend development-design mitigations to prevent damage due to the adverse construction conditions. The city shall review the applicant's report. If the applicant's report is deemed adequate by the city engineer or designee, development may proceed if the report recommendations are followed. If the report is deemed incomplete or inadequate by the city engineer or designee, the development application shall be denied. If denied, the applicant may request an independent review, and the city engineer or designee may order a review by independent, qualified professionals. The professionals selected by the city shall review and prepare written findings and comments on the applicant's report. The cost of the independent, qualified professionals shall be paid to the city by applicant. Applicant may develop if the independent review and written findings and comments are implemented, in addition to any nonconflicting recommendations in the initial report of applicant. The

city engineer or designee is the land use authority for the decision. The report shall be specifically identified on the plat and available to all owners and interested parties. (Ord. 2019-10-002, 10-10-2019)

St.George
Community Development

ITEM 2
Hillside Permit

HILLSIDE REVIEW BOARD AGENDA REPORT: **08/23/2023**

Chuckwalla Hillside Hillside Development Permit (Case No. 2023-HS-008)		
Request:	Consider a request for the development of six new lots for the Chuckwalla subdivision.	
Applicant:	SC Bluff, LLC	
Representative:	Bob Hermandson	
Location:	Located east of the existing Paradise Canyon subdivision.	
General Plan:	LDR (Low Density Residential)	
Existing Zoning:	R-1-10 (Single Family Residential 10,000 sq ft lot minimum)	
Surrounding Zoning:	North	R-1-10 (Single Family Residential 10,000 sq ft lot minimum).
	South	R-1-10 (Single Family Residential 10,000 sq ft lot minimum).
	East	R-1-10 (Single Family Residential 10,000 sq ft lot minimum).
	West	PD-R (Planned Development Residential)



BACKGROUND

The applicant would like to develop a six-lot subdivision. A portion of the area lies within the Hillside Overlay Zone (HOZ). The project will be completed in one phase. Desert landscaping will be used on the project and there will be minimal impact to the hillside areas on the site.

EXHIBITS PROVIDED

1. Exhibit A – Maps
   "Exhibit A" in the packet shows the general plan land use map and the zoning map.

2. Exhibit B – Slope Study/Slope Map
   "Exhibit B" in the packet is the slope study and slope map.

3. Exhibit C – Geotech Report
   "Exhibit C" in the packet is the proposed Geotech report.

4. Exhibit D – Preliminary Drainage Letter
   "Exhibit D" in the packet is a letter concerning the preliminary drainage for the Chuckwalla proposal.

5. Exhibit E – Preliminary Plat
   "Exhibit E" is the proposed preliminary plat.

6. Exhibit F – Applicable Ordinances
   "Exhibit F" in the packet lists the applicable zoning regulation that apply to this case found in Title 10, Chapter 13B.

Exhibit A
MAPS

General Plan - LDR



Zoning - R-1-10 (Single Family Residential 10,000 sq ft min lots)

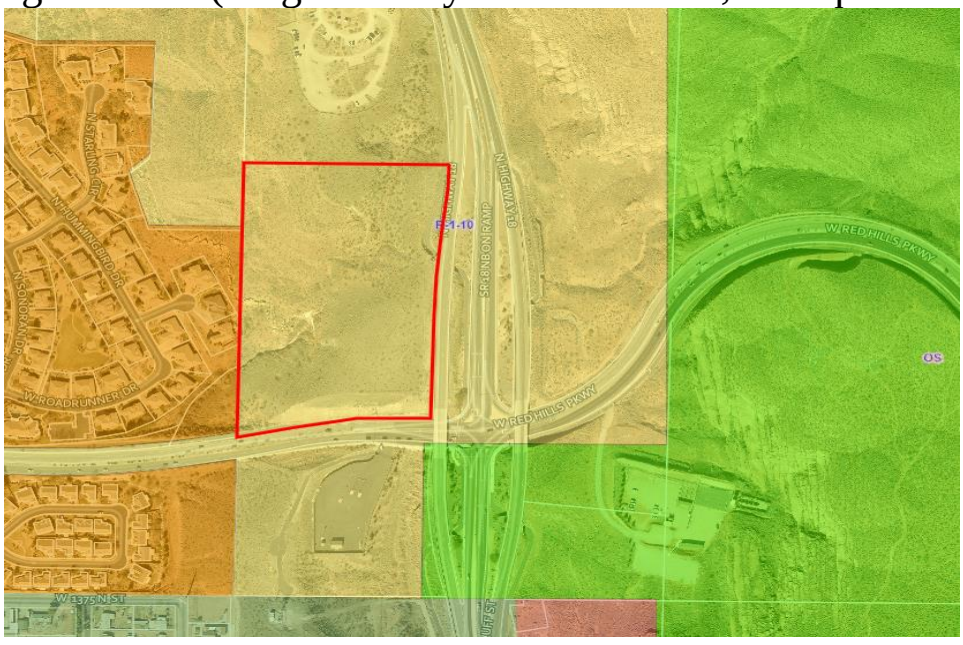


Exhibit B
Slope Study/Slope Map

Exhibit C
Geotech Report

Exhibit D
Preliminary Drainage Letter

Exhibit E
Preliminary Plat

Exhibit F
APPLICABLE ORDINANCES

ARTICLE B. DEVELOPMENT IN GEOLOGIC HAZARD OR ADVERSE CONSTRUCTION CONDITION OVERLAY ZONE

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10-13B-2:
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   4. Rockfall: High category.

B. *General Requirements for Development in a Geologic Hazard Area:*

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   b. Identify any other geologic hazards, not listed above (UGS 1 – 4: subsections A1 through A4 of this section), which present an unacceptable risk to development;
   c. Demonstrate which areas of the development are suitable for the proposed use;
   d. Recommend specific measures necessary to make the land suitable for the proposed use;
   e. Recommend the optimal placement of all structures, roadways, utilities, trails and infrastructure in relation to the geologic hazard area;
   f. Slope stability analysis: conclusions and recommendations concerning the effects of material removal, introduction of water, both on and off site, including, where applicable, on mesa tops, seismic activity, and erosion on slope stability;
   g. Foundation investigation: conclusions and recommendations concerning the effects of soil conditions on foundation and structural stability, including bearing capacity, sheer strength, and shrink/swell potential of soils;
   h. Spring location: the location and yield of springs and seeps which shall be shown on the site plan;
   i. Structural features: structural features including any geological limitations;
   j. Surface hazards: existence of surface hazards including potential for rockfalls and toppling failures to cliffs, slopes and overhangs above the subject property; and
   k. Effect of geologic conditions: conclusions and recommendations regarding the effect of geologic conditions on the proposed development, together with recommendations identifying the means proposed to minimize any hazard to life or property, or adverse impact on the natural environment.
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authority for the decision. The reports shall be specifically identified on the plat and available to all owners and interested parties.

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4. Hold the city harmless from all claims resulting from any damage related to development within a geologic hazard area by executing a "geologic hazard disclaimer of liability and agreement" and by placing a "notice of hazard" on the final plat.
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10-13B-3:
DEVELOPMENT IN ADVERSE CONSTRUCTION CONDITION AREAS:

For any development in the city in an overlay area with an adverse construction condition, applicant shall submit a site-specific report prepared by a qualified, licensed engineer trained and experienced in the practice of geotechnical engineering identifying all adverse construction conditions. The report shall recommend development-design mitigations to prevent damage due to the adverse construction conditions. The city shall review the applicant's report. If the applicant's report is deemed adequate by the city engineer or designee, development may proceed if the report recommendations are followed. If the report is deemed incomplete or inadequate by the city engineer or designee, the development application shall be denied. If denied, the applicant may request an independent review, and the city engineer or designee may order a review by independent, qualified professionals. The professionals selected by the city shall review

and prepare written findings and comments on the applicant's report. The cost of the independent, qualified professionals shall be paid to the city by applicant. Applicant may develop if the independent review and written findings and comments are implemented, in addition to any nonconflicting recommendations in the initial report of applicant. The city engineer or designee is the land use authority for the decision. The report shall be specifically identified on the plat and available to all owners and interested parties. (Ord. 2019-10-002, 10-10-2019)

LANDMARK
TESTING & ENGINEERING

November 12, 2020

Rize Up
Steve Barnhart
2 West St. George Blvd.
St. George, UT 84770

Subject: Slope Stability Analysis
Chuckwalla Development
St. George, Utah
Landmark Project No. 20814

Steve,

As requested, we have completed our slope stability analysis for the access road to the proposed Chuckwalla Development in St. George, Utah. Our services consisted of a site walk, the excavation of several test pits along the proposed road alignment, laboratory testing, data analysis, and the preparation of this report. A Concept Plan prepared by Kuma Engineering, dated August 2020 was provided for our use. At the time of our field investigation, the centerline of the road alignment had been staked at 100-foot intervals.

Field Investigation

To investigate the subsurface soils along the alignment, we excavated 2 test pits within the proposed right-of-way, near the stakes placed to mark the proposed centerline. Due to the exiting grades, and surface conditions, access with equipment was not practical north of the waterfall. Current grading along the roadway alignment was a safety hazard according to the operator (roll-over hazard), and traversing a safe path around the obstacles would have required walking the excavator through areas which were designated as open space on the Concept Plan.

The Test Pit 1 was excavated at approximately Station 1+75. Subsurface soils consisted of 3 feet of silty sand with gravel (SM), underlain by weathered sandstone to the maximum depth of exploration, 5.0 feet. Refusal in sandstone bedrock was met at 5.0 feet.

Test Pit 2 was excavated at Station 3+50. Subsurface soils consisted of various layers of silty sand with gravel (SM) to the maximum depth of exploration, 12.0 feet.

Soils from Station 4+00 to 5+00 consisted of several layers of slightly to moderately weathered, exposed sandstone bedrock were observed.

We excavated by hand in several locations between 5+00 and 6+00. The soils encountered consisted of sandstone cobbles in a silty sand with gravel matrix. Basalt cobbles and boulders were observed on the surface and within the locations excavated.

Slope Stability Analysis

The following material properties were based on laboratory testing and observations of the material. Properties were selected to be conservative.

Material	Moist Unit Weight (pcf)	Saturated Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
Silty Sand w/ gravel (SM)	115.0	135.0	32	0.0
Fill: Native	125.0	135.0	34	0.0
Sandstone	135.0	140.0	25	1500

A load of 0.11g horizontal and 0.05g vertical was used for seismic analysis. Groundwater was not encountered, and therefore not modeled. A 150 psf distributed live load was used for traffic loading as recommended by AASHTO and the NHI. Mirafi Miragrid 5XT was used for reinforcement of the rockery wall; 4 layers of 12-foot long grid were placed at 2-foot intervals.

Three cases were modeled: Shallow bedrock in roadway alignment, 10 feet of silty sand fill in roadway alignment, and cut slope above the roadway. The downhill side of the roadway was designed as a rockery wall retaining 10 feet of structural fill. STEDWin 2.88 using Stabl6h was used to model and analyze the slopes. Static and seismic cases being checked in each case.

Case 1: Shallow Bedrock

The Factor of Safety for the seismic case was 1.21, and for the static case it was 1.52. Both of which are above the generally accepted minimum values of 1.0 and 1.4. The model shows that, as expected, the minimum Factor of Safety (FS) failure surfaces in each case do not pass through the sandstone bedrock. This indicates that the overall stability of the section is dependent upon the depth of the soil above the bedrock, both in the vertical and horizontal directions. Deeper bedrock will not appreciably affect the FS, as the minimum values do not pass through the rock, and shallower bedrock would tend to increase the FS.

Case 2: Deep Bedrock

The Factor of Safety for the seismic case was 1.22, and for the static case it was 1.67. Both of which are above the generally accepted minimum values of 1.0 and 1.4. The model shows that, as expected, the minimum Factor of Safety (FS) failure surfaces in each case do not pass through the sandstone bedrock. This indicates that the overall stability of the section is dependent upon the depth to the bedrock, both in the vertical and horizontal directions. Deeper bedrock will not appreciably affect the FS, as the minimum value do not pass through the rock, and shallower bedrock would tend to increase the FS.

Case 3: Cut Slope

Models indicate that the slope cannot be cut at a grade steeper than 2 horizontal to 1 vertical (2H : 1V) without some form of reinforcement. Failure surfaces indicate that surface sloughing rather than deep seated failure is the mode of failure. The static FS at a 2:1 slope was 1.27, and the Seismic FS was 0.75, assuming deep soils within the slope. The existing slopes do not show

evidence of existing slope failures, indicating a stable existing static state., agreeing with our analysis.

Analysis of the upper slope with a rockery retaining wall was also conducted. An 8-foot rockery wall with 10 feet of geogrid was placed at the back of the curb on the uphill side of the road. The slope was excavated to the end of the geogrid, and replaced with structurally placed soils, as in the downhill side of the roadway. The structurally placed soils extended above the wall at a 2 horizontal to 1 vertical (2H : 1V) slope. The static FS was 1.42 and the seismic FS was 1.22. This assumes deep soils behind the reinforced section.

Details of our analysis are included as the attached Figure 2 through 9.

Findings

Based on our analysis, it appears that the proposed roadway can be constructed in a stable configuration. The roadway can be constructed along the proposed alignment. The following design and construction recommendations and suggestions are provided for the design of the project:

Recommendations

- Rockery retaining walls can be designed for retaining the cut faces and to support the proposed roadway.
- Rockery retaining walls should be designed for a maximum batter of 1 horizontal to 5 vertical (1H : 5V), but should be kept to 1 horizontal to 4 vertical (1H : 4V) if possible.
- Cut slopes in sandstone bedrock can be sloped to 1 horizontal to 2 vertical (1H : 2V). Steeper slopes my be possible based on the quality of the rock encountered in the cut faces.
- Cut slopes in the gravelly silty sands (SM) should be graded to a maximum grade of 2 horizontal to 1 vertical (2H : 1V). Cut slopes should be avoided where possible.
- Unreinforced fill slopes can be graded to a maximum of 1.5 horizontal to 1 vertical (1.5H : 1V). Reinforced fill slops can be graded to a maximum of 1 horizontal to 1 vertical (1H : 1V).

Suggestions

The surficial sands were found to be unstable at grades steeper than 2 horizontal to 1 vertical (2H : 1V). Due to the existing site grades, cut slopes above the roadway will "chase" the existing slope up the face of the slope, leading to long exposed cut faces. Rockery retaining walls will not reduce the cut faces to a great extend due to the slope of the existing hillside. Based on our understanding of the goals of the Hillside Review Board, large, exposed cut faces are strongly discouraged. Therefore, we make the following suggestions for civil design of the project.

- The alignment of the proposed roadway should be moved as far to the west as possible. While this will increase the height of the required rockery retaining walls, it will limit the amount of excavation and exposed area of the cut faces.
- The possibility of an increase in the allowable height of a single tiered rockery wall should be explored with the City of St. George. Rockery walls are typically allowed to have a maximum single wall retained height of 8 feet according to City Code. Higher walls are

feasible, even preferred in some instances, and can be used to offset the amount of exposed cut faces, but will require a variance by the City of St. George, which is difficult. The engineering department does not have authority to allow for this variance.

- The area of the waterfall appears to be a limiting factor in the placement of the roadway, and its attached sidewalk. We understand that the sidewalk may not be required to be directly attached to the pavement section. The possibility of a bridge to cross the wash in the vicinity of the waterfall should be explored, which will allow for a narrower roadway section,

Design level details for construction can be provided once civil design for the project has progressed.

Thank you for allowing us to assist you with this project. Please feel free to contact us if you have any questions or require additional information.

LANDMARK TESTING & ENGINEERNG

John M. Anderson, P.E.
Project Engineer



Steven Wells, P.E.
Geotechnical Manager

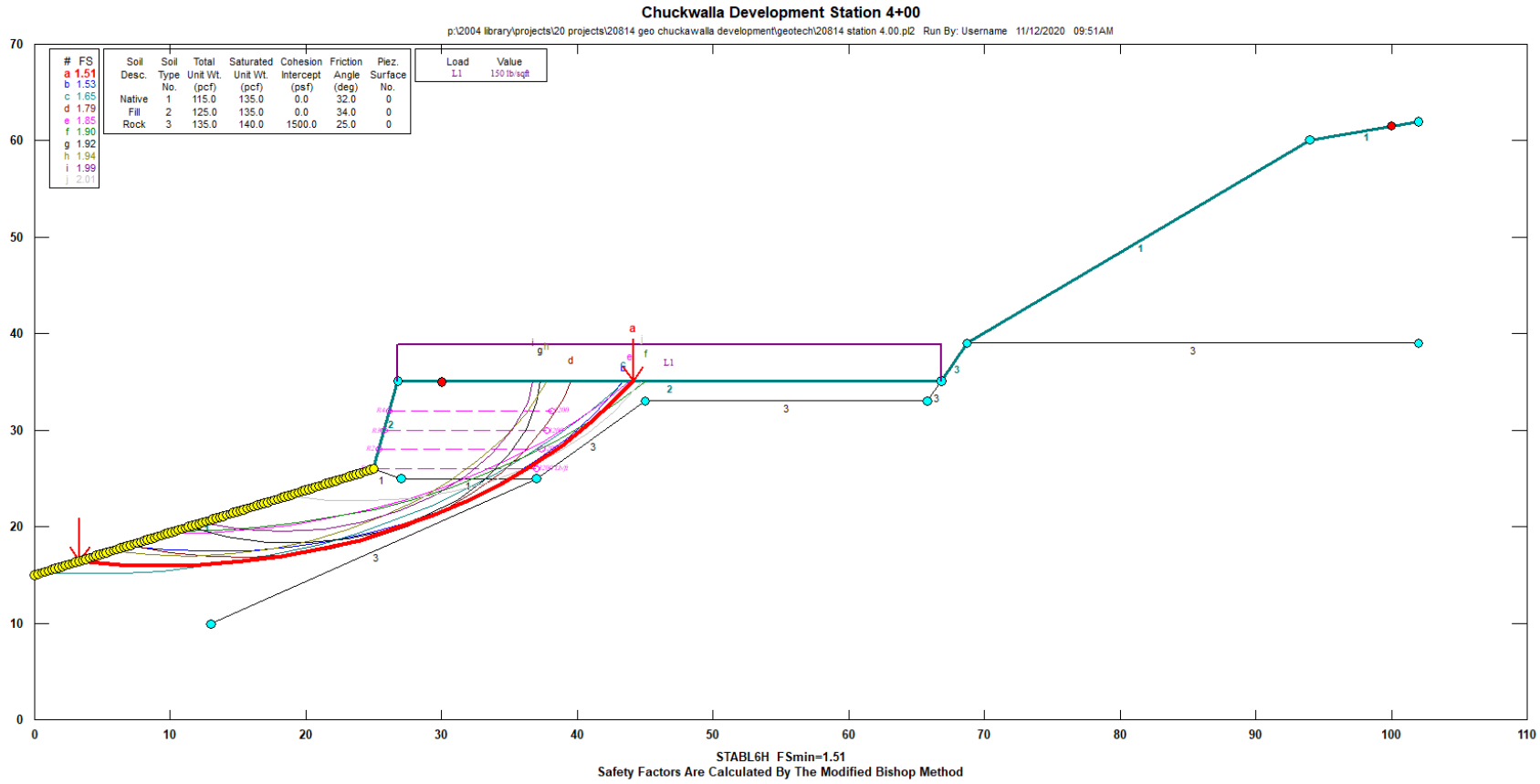


LANDMARK TESTING & ENGINEERING

Site Plan

Landmark Project No 20814

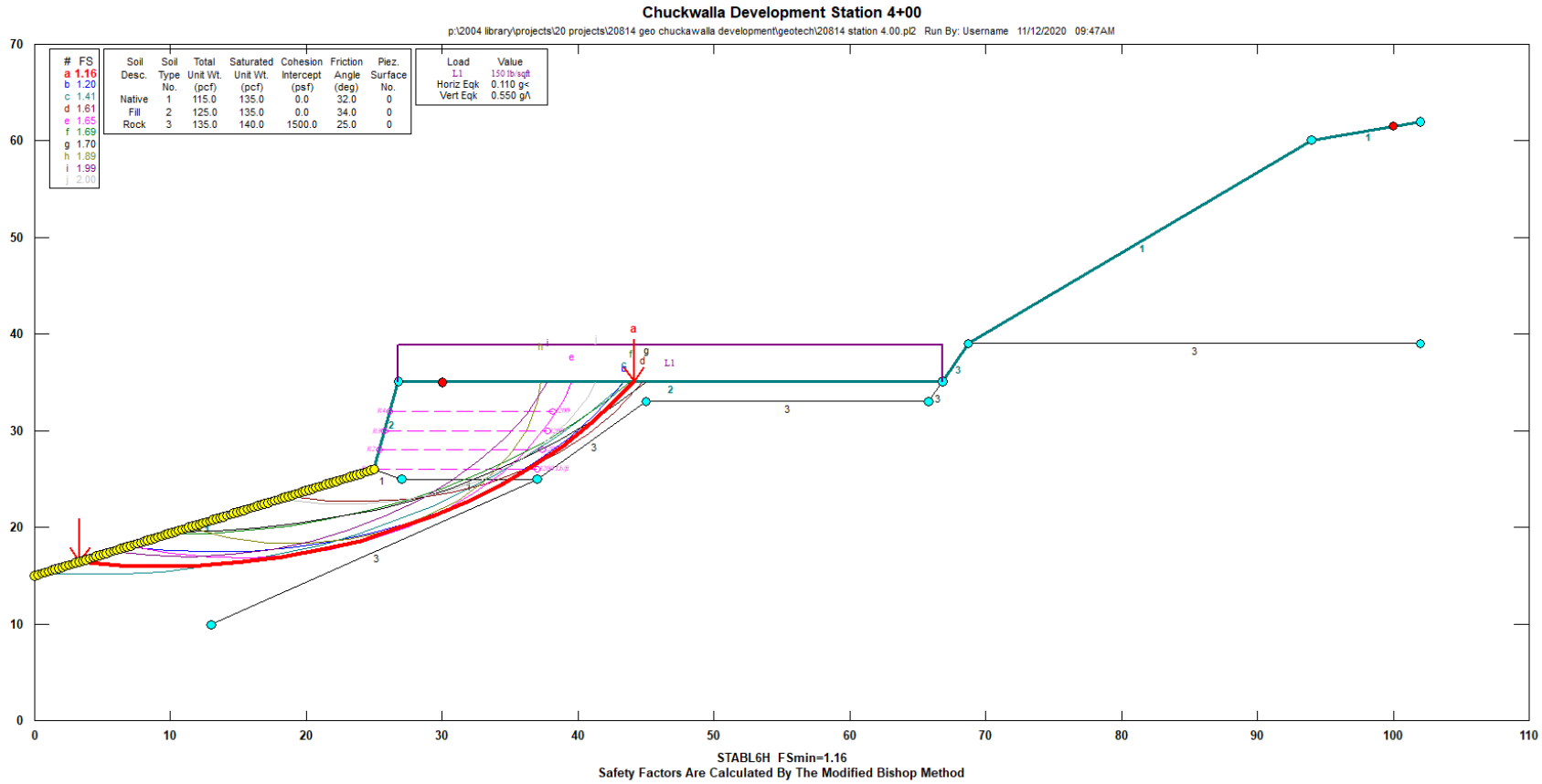
Figure 1



Shallow Bedrock - Static

Landmark Project No 20814

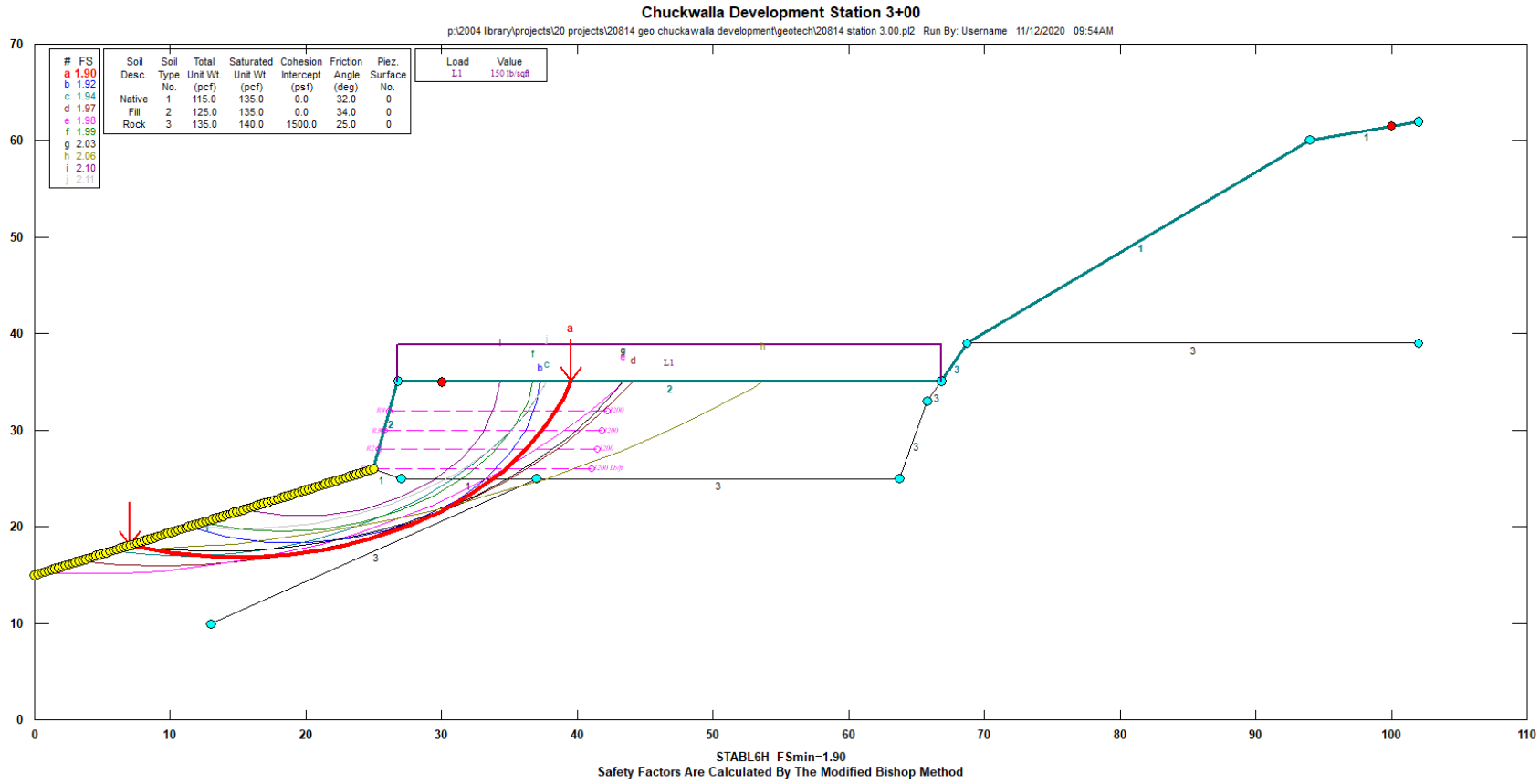
Figure 2



Shallow Bedrock -Seismic

Landmark Project No 20814

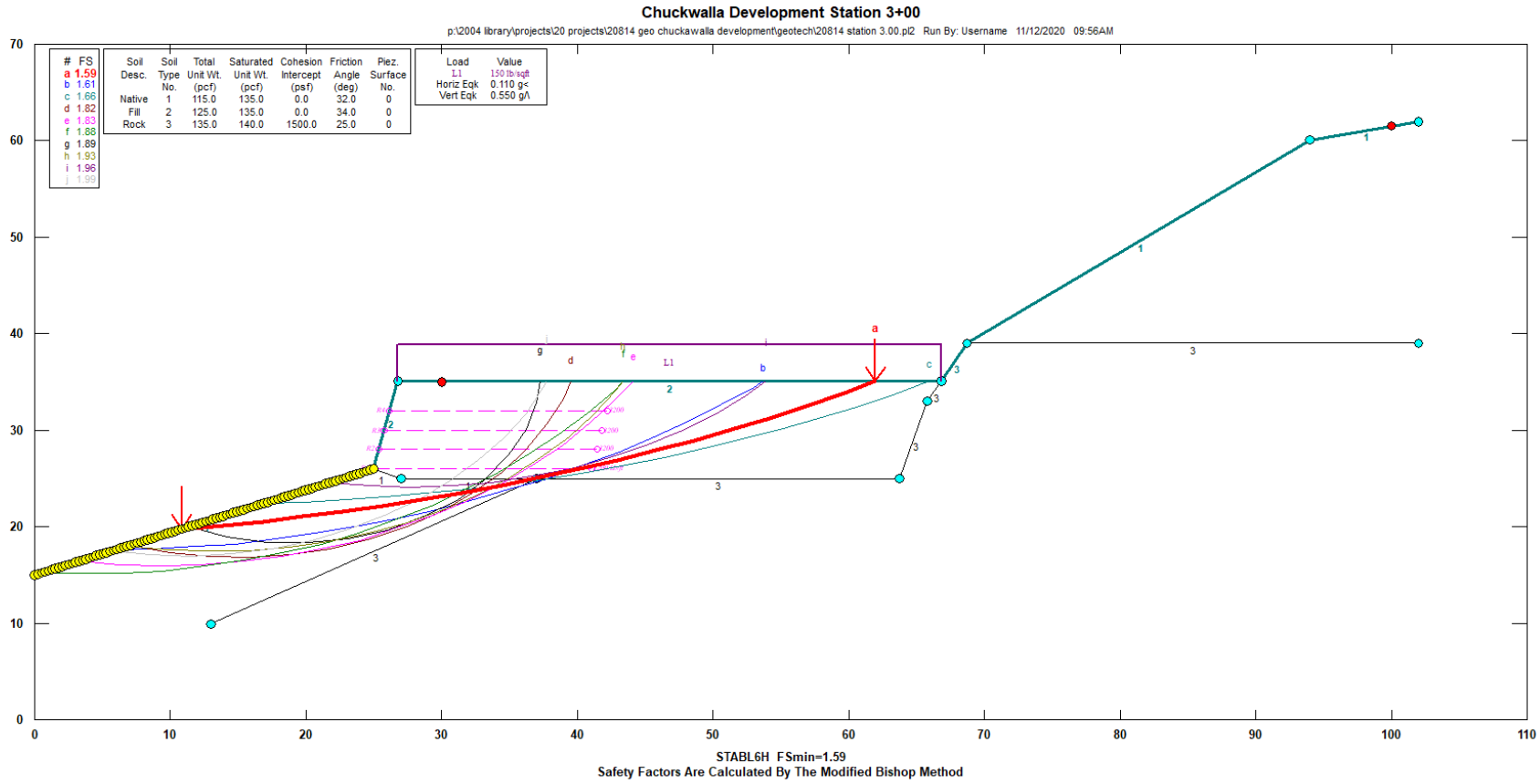
Figure 3



Deep Bedrock - Static

Landmark Project No 20814

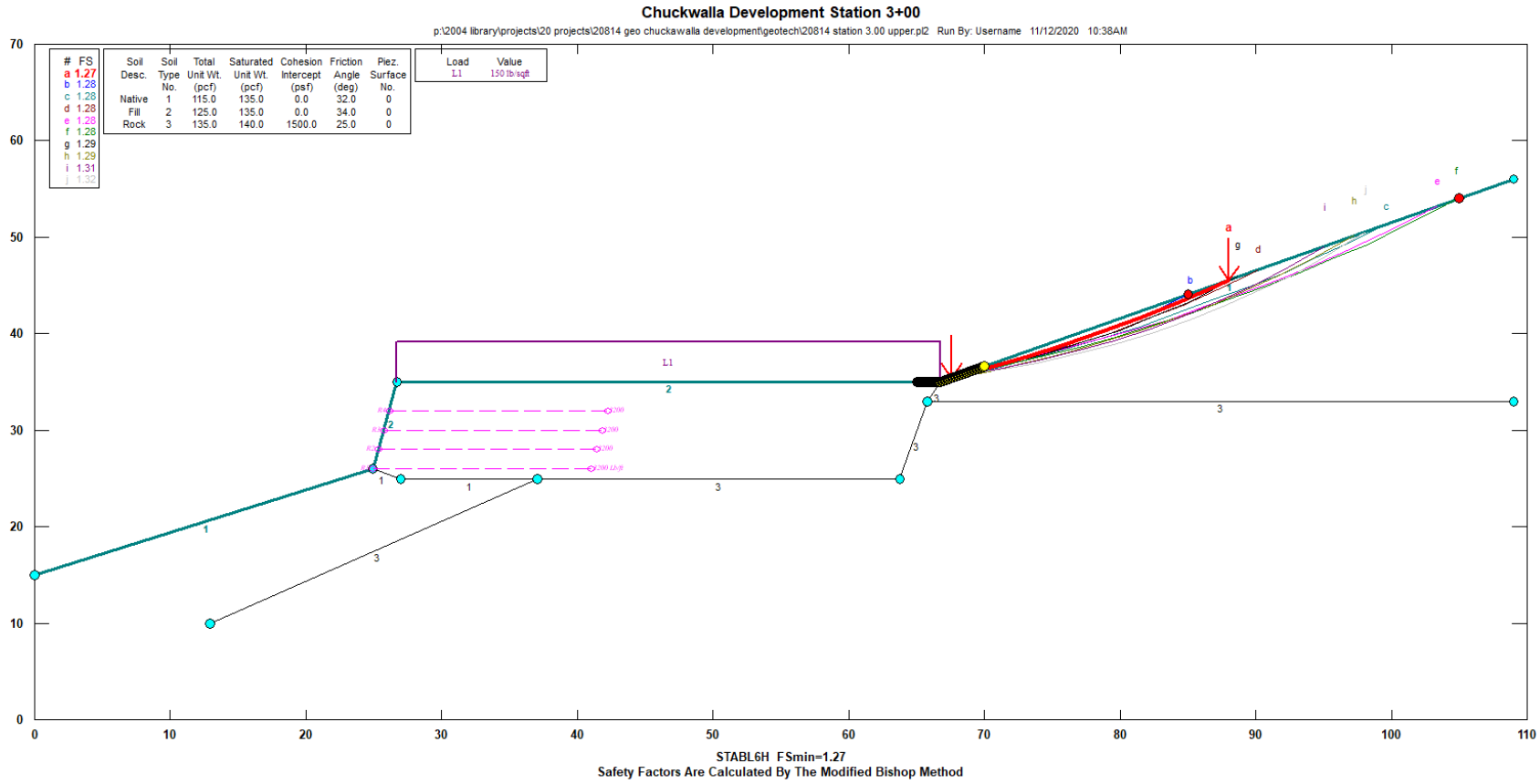
Figure 4



Deep Bedrock - Seismic

Landmark Project No 20814

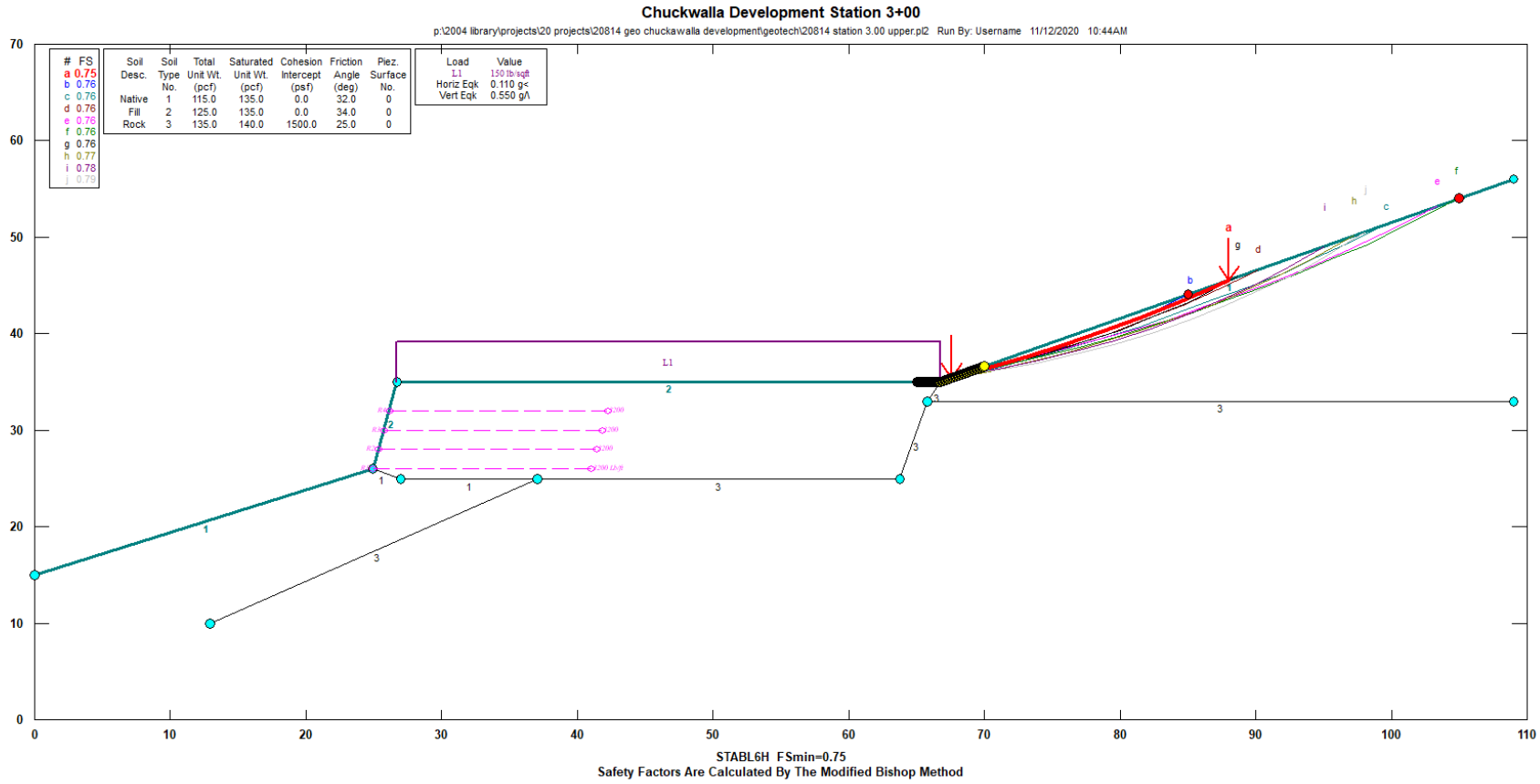
Figure 5



2H: 1V Slope - Static

Landmark Project No 20814

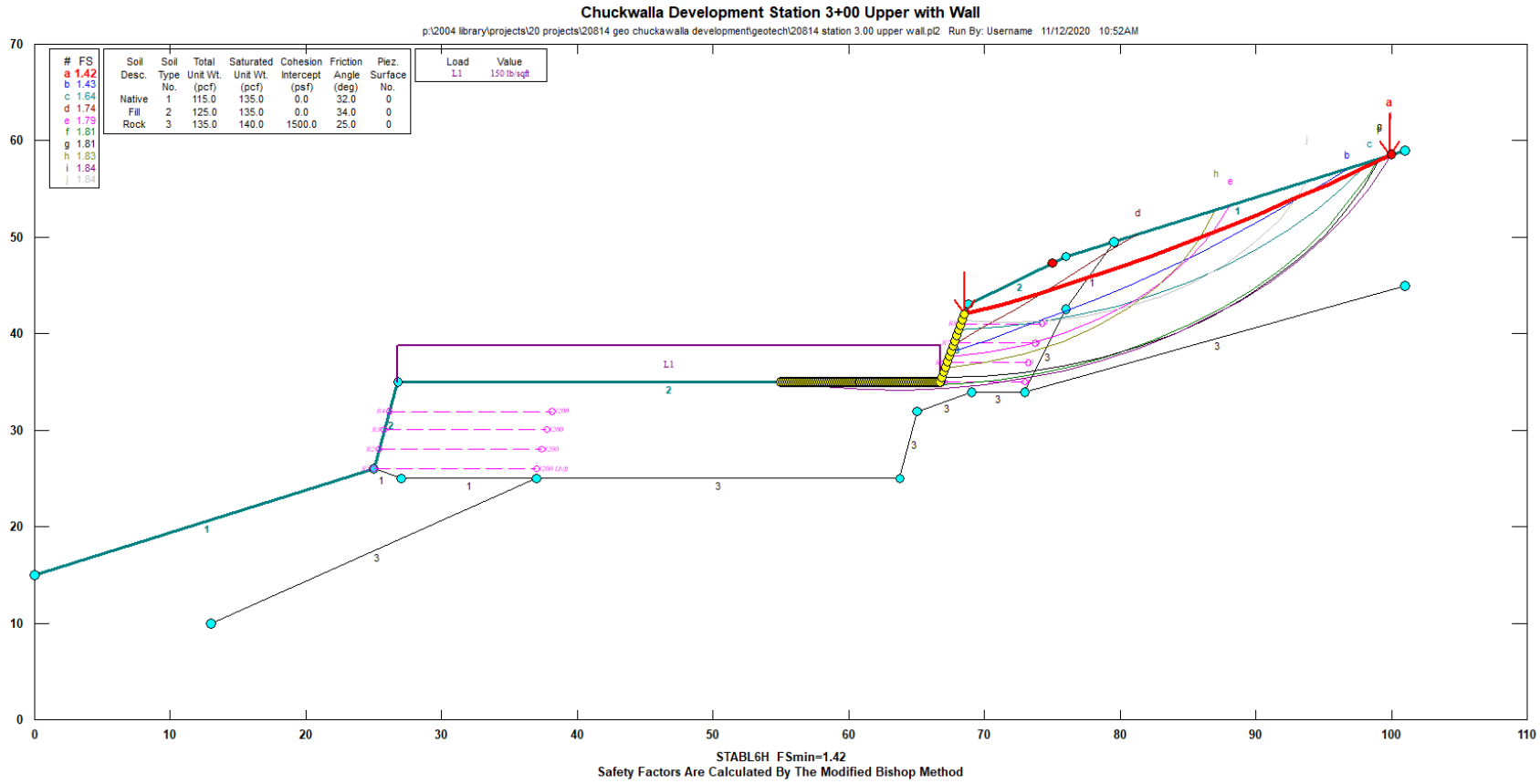
Figure 6



2H: 1V Slope - Seismic

Landmark Project No 20814

Figure 7

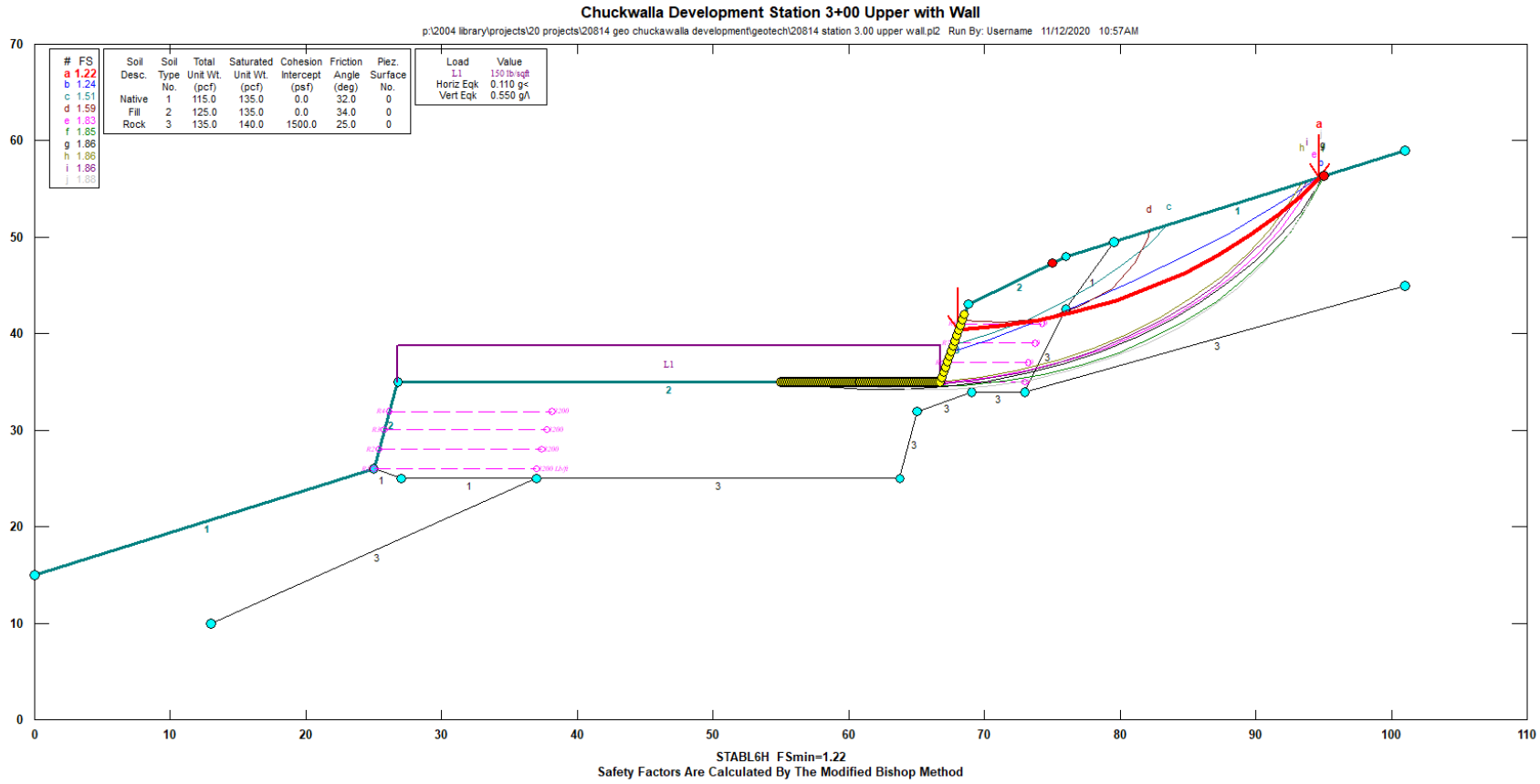


LANDMARK TESTING & ENGINEERING

Upper Wall - Static

Landmark Project No 20814

Figure 8



Upper Wall - Seismic

Landmark Project No 20814

Figure 9

4
27,259 S.F.
0.63 ACRES

5
16,225 S.F.
0.37 ACRES

6
12,514 S.F.
0.29 ACRES

3
20,764 S.F.
0.48 ACRES

2
16,112 S.F.
0.37 ACRES

1
19,001 S.F.
0.44 ACRES

ROAD
AREA 1

CONCRETE BLOCK OR
CONCRETE RETAINING WALLS

8'

7'

6.51'

3005

3006

3060 3040 3020 3000 2980 2960 2940 2920 2900 2880 2860 2840 2820 2800 2780 2760 2740 2720 2700 2680 2660 2640 2620 2600 2580 2560 2540 2520 2500 2480 2460 2440 2420 2400 2380 2360 2340 3064

Disturbed Area Slopes Table

TOTAL OVERALL 12.63 ACRES

Number	Minimum Slope	Maximum Slope	Area	Color	Hillside Allowable %	Developable	Total Proposed	Road Area 1
1	1.00%	19.99%	239336 SQ. FT.		SEE UNDERLYING ZONE		74995 SQ. FT.	451 SQ. FT.
2	20.00%	29.99%	85688 SQ. FT.		30% MAX DISTURBED	25706 SQ. FT.	14701 SQ. FT.	1196 SQ. FT.
3	30.00%	39.99%	58127 SQ. FT.		5% MAX DISTURBED	2906 SQ. FT.	1342 SQ. FT.	636 SQ. FT.
4	40.00%	99.99%	76151 SQ. FT.		NOT PERMITTED			274 SQ. FT.

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

X:\221000-221999\221190 - Chuckwalla Subdivision\Drawings\Hillside\221190 Chuckwalla Hillside Map.dwg

PROFESSIONAL ENGINEER
No.5567007
WILLIAM F. MEYER, JR.
07/31/2023
STATE OF UTAH

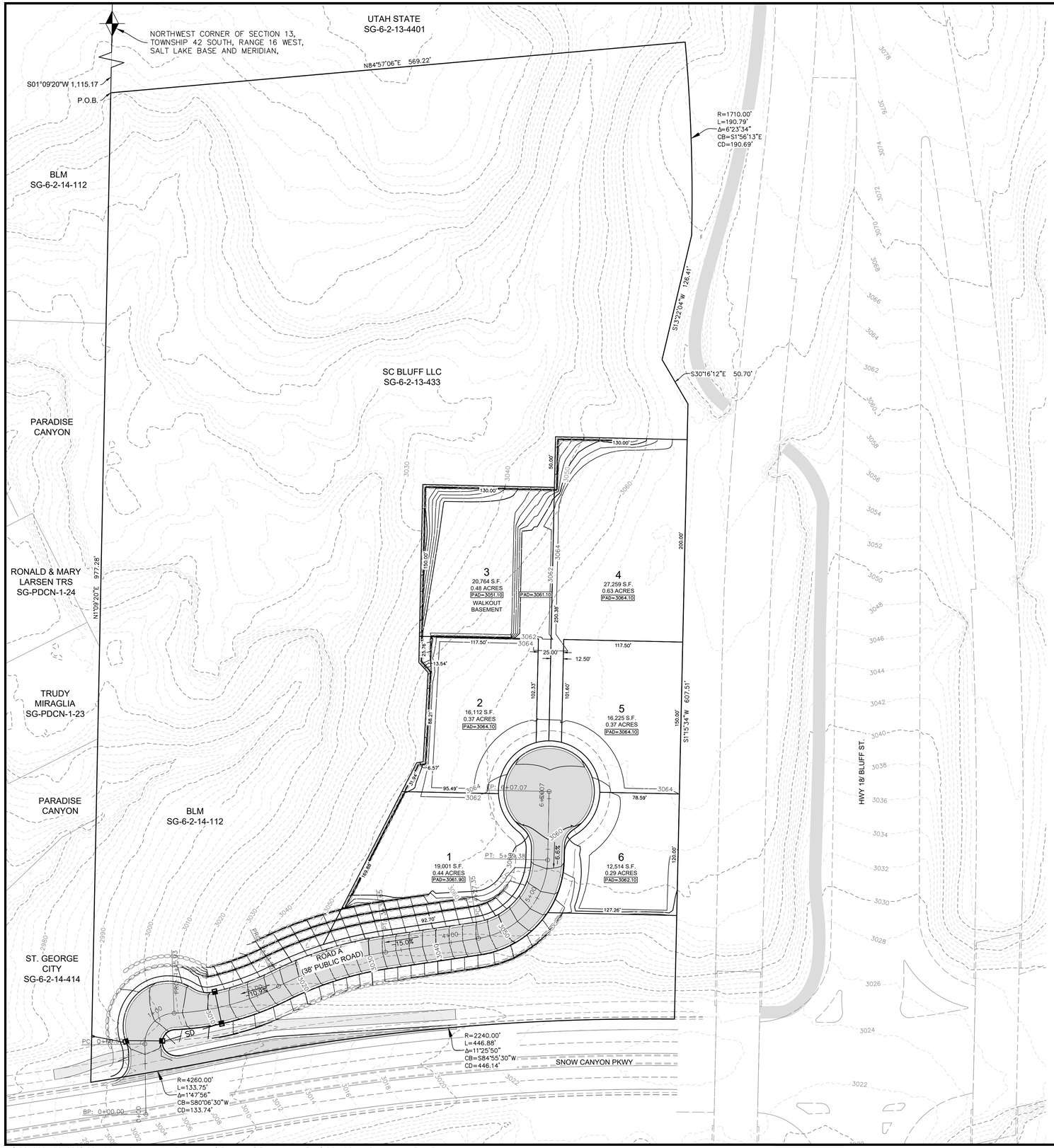
No.	Date	By	Revision

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

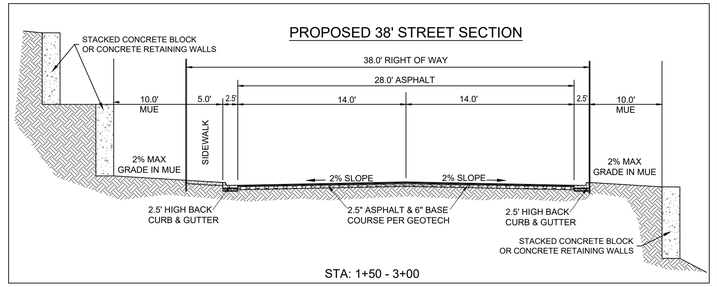
DATE JULY 2023
DRAWN CBW
APPROVED APPROVED
SCALE 1" = 40'
JOB NO. 221190

HILLSIDE MAP
CHUCKWALLA SUBDIVISION @ ST. GEORGE, UTAH

SHEET 1 OF 2 SHEETS
FILE: 221190

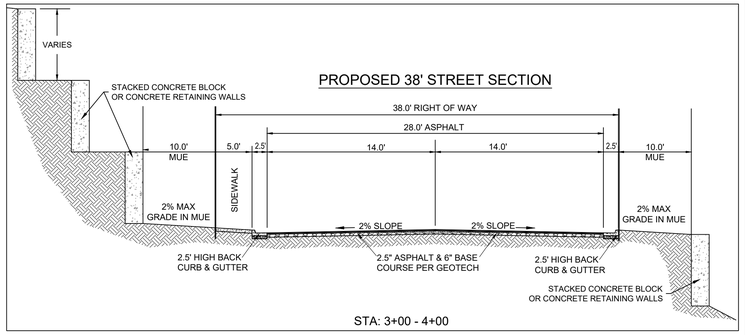


PROPOSED 38' STREET SECTION



STA: 1+50 - 3+00

PROPOSED 38' STREET SECTION



STA: 3+00 - 4+00

LEGEND

- EXISTING RIGHT OF WAY LINE
- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- PROPOSED CONCRETE BLOCK OR CONCRETE RETAINING WALL
- DRAINAGE CHANNEL FLOW LINE
- EXISTING FENCING
- EXISTING OVER HEAD POWER
- EXISTING SEWER
- PROPOSED SEWER
- EXISTING WATER
- PROPOSED WATER
- STOP / STREET SIGN
- END OF ROAD MARKERS
- DRAINAGE FLOW DIRECTION
- SECTIONAL MONUMENT (TYPE, LOCATION, ETC AS NOTED IN PLAT)
- PROPOSED ASPHALT
- DEDICATED TO CITY
- EXISTING GROUND CONTOUR
- FINISH GROUND CONTOUR
- DRAINAGE FLOW
- PAD= 00.0 FINISH PAD ELEVATION
- LOCATION ELEVATION SPOT ELEVATION
- SD STORM DRAIN
- (S) SINGLE CURB INLET PER CITY STD. DETAIL 205
- (D) DOUBLE CURB INLET PER CITY STD. DETAIL 205
- LOT LINE
- STORM DRAIN MAN HOLE

OWNER / DEVELOPER

SC BLUFF LLC

JERRY MYAHARA
(949) 279-6824
2 WEST
ST. GEORGE, UTAH 84770

ENGINEERING CONTACT

BUSH AND GUDGELL, INC.
205 EAST TABERNACLE #4
ST GEORGE, UT 84770
RICK MEYER - PROJECT MANAGER
(435)-673-2337

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.

No.5567007
WILLIAM F. MEYER, JR.
07/31/2023
STATE OF UTAH
PROFESSIONAL ENGINEER

No	Date	By	Revision

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

DATE: JULY 2023
DRAWN: GRW
APPROVED: WFM
SCALE: 1" = 50'
JOB NO. 221190

GRADING PLAN
CHUCKWALLA ESTATES
LOCATED IN ST GEORGE, UTAH

SHEET 2 OF 2 SHEETS
FILE: HILLSIDE

X:\221000-221999\221190 - Chuckwalla Subdivision\Drawings\Preliminary Plat\221190 - Chuckwalla Pre Plat.dwg

August 1, 2023

SC Bluff, LLC
2 West St. George, Blvd. #5H
St. George, Utah 84770

Attn: Jerry Miyahara
Email: jerry@rize-up.com

Subject: Hillside Review Consultation
Chuckwalla Subdivision
NWC Snow Canyon Parkway and SR-18
St. George, Utah
AGEC Project No. 2220872

References:

1. Preliminary Plat, prepared by Bush & Gudgell Engineering, dated June 2023, Job No. 221190.
2. Hillside Map, prepared by Bush & Gudgell Engineering, dated June 2023, Job No. 221190.
3. Slope Stability Analysis, prepared by Landmark Testing and Engineering, dated November 12, 2020. Project No. 20814.
4. Hillside Review and Geologic Hazard Assessment and Geotechnical Investigation, by AGEC, dated March 4, 2013, Project No. 2130115.
5. Interim Geologic Map of the Washington Quadrangle, Washington County, UGS-Open File Report-324, 1995, Willis, Higgins
6. Geologic Hazards and Adverse Construction Conditions, St. George-Hurricane Metropolitan Area, Washington County, Utah, Special Study 127, 2008. Lund, Knudsen, Vice and Shaw.

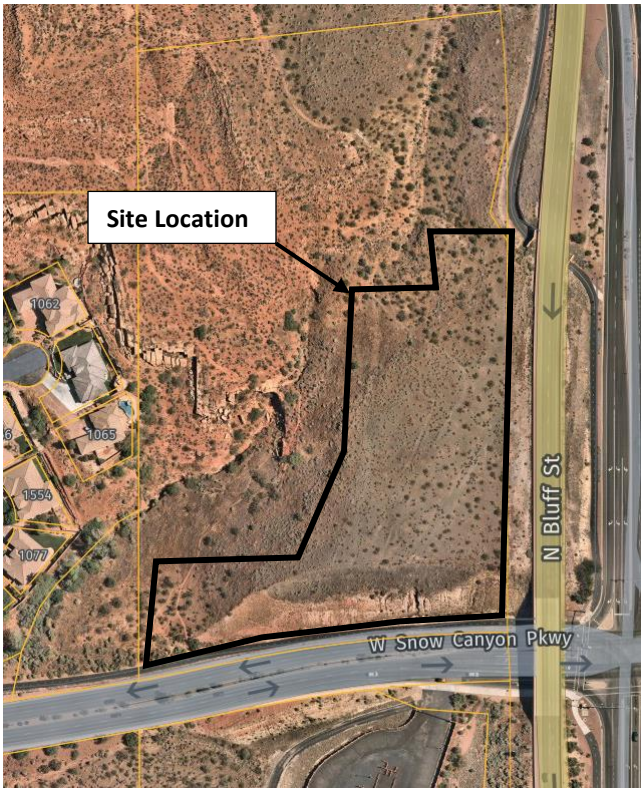
SCOPE OF WORK

AGEC was requested to review the proposed plans for the 6 lot subdivision to be located on the northwest corner (NWC) of Snow Canyon Parkway and SR-18. AGEC has met several times on site with engineers, owner/developer and city staff to discuss the proposed project. Subsequently, the site was designed for the subdivision shown on the

attached site plan. AGEC has reviewed a previous study for a different part of the property along the west side of the site (Ref No. 3) and has also observed the cut slope on Snow Canyon Parkway. AGEC also conducted the In addition, AGEC has reviewed the geologic literature for potential geologic hazards as a part of preparation of this report.

SITE/SUBSURFACE CONDITIONS

The property proposed for development is located on the northwest corner of Snow Canyon Parkway and SR-18 as shown on the map below.



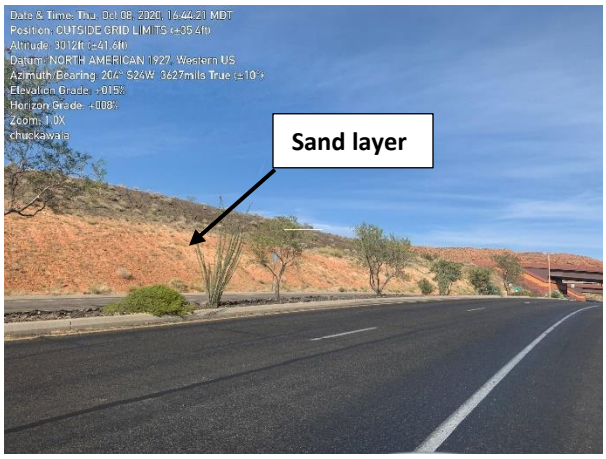
Site Location Map

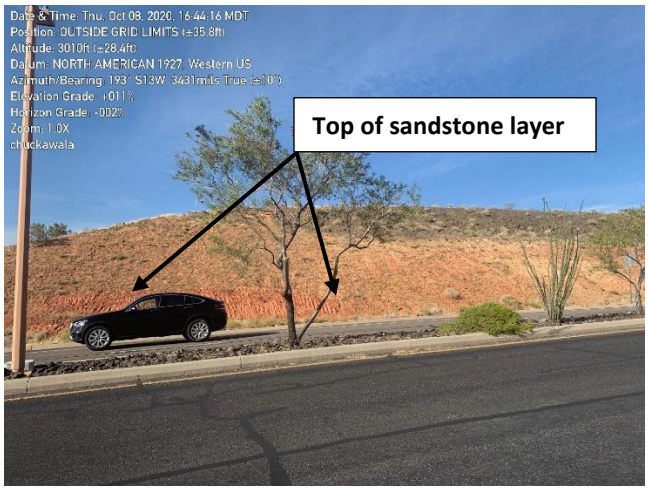
The site is located at the top of a ridge with a wash or gulley to the west and northwest. The site is level on the eastern portion with a downward slope to the northwest. The site is has approximately 30 feet of elevation change from the top of the ridge down to the northwest corner of Lot 3. See attached slope map.

The south edge of the site with a moderately steep cut slope that was created when Snow Canyon Parkway was graded. The slope is approximately 40 feet high with a slight bench

amount mid height or just below the basalt caprock. Several photos are shown below of the cut slope.







The lower portion of the slope is sand and sandstone bedrock (eastern portion) while the top of the slope is capped with basalt cap rock. The basalt is moderately fractured and granular. The sand is medium dense and slightly cemented. The sandstone bedrock is mostly on the eastern portion of the exposed slope as shown in the photos above.

The caprock is underlain by alluvial and colluvial sand deposits that will be underlain by Sandstone.

GEOLOGIC CONDITIONS/HAZARDS

Based on review of the geologic literature (Ref No. 5), the majority of the site is covered with basalt caprock of the Cedar Bench Lava Flow. The caprock is moderately fractured or granular. The thickness varies from approximately 10 to 15 feet on the site. The thickness decreases to the west. The edges of the site have exposed Kayenta Formation siltstone and sandstone.

Based on a review of the geologic hazards mapping (Ref No. 6) the following items are noted from our evaluation and site visit:

1. The eastern edge of the site is mapped as a low hazard for **rockfall.** Based on our field observations, there is not a significant source nor a development below the site that would be a concern.

2. The eastern edge of the site was also mapped as a low hazard for **landslides** or slope stability. Based on our observations and the anticipated grading along with the review of Ref No. 3, we do not anticipate a concern for slope instability. The proposed road access to the south will be retained with rock walls.

3. The mapping also indicates ridge top as a **shallow hard rock** condition and the slope on the west as buried or soft rock condition. Based on our experience during the grading of Snow Canyon Parkway and the Dominion Gas Substation to the south across Snow Canyon Parkway, blasting of the basalt caprock was necessary. The majority of the basalt is fractured and granular.

4. The **erosion and drainage** concerns are mainly along the south and west sides of the site. Bush and Gudgell Engineering has addressed the drainage concerns.

The remaining hazards within Ref no. 5 were reviewed and were not considered for this site to be further discussed or addressed.

PROPOSED CONSTRUCTION

Based on review of Reference No. 1, there are 6 lots as shown on the attached site plan. The access to the site will be along the south side of the property along the north edge of Snow Canyon Parkway as shown on the site plan. The road will require cutting into the slope and exposing approximately 10 to 20 high foot cut slope that will primarily extend the existing cut slope back into the hillside. There will also be a fill slope on the west end of the road of up to approximately 12-16 feet. The roadway will extend up the slope at 10-15 %. The existing trail along Snow Canyon Parkway will need to be slightly realigned.

We anticipate that the residences will be single story with the potential of basements.

The walls shown on the site plan will be of basalt type stacking rock and will be designed as a part of the construction drawings.

We anticipate additional details for the individual homes will be available at the time of construction. AGEC should review the proposed construction for each residence on an individual basis.

CONCLUSIONS

Based on the proposed construction, the anticipated subsurface conditions and our experience in the area, the following conclusions are provided:

1. The site is suitable for the proposed construction.

2. The existing hillside cut will extend deeper into the hillside and we anticipate similar conditions to those exposed at this time.

3. The proposed roadway cut will be retained and will be stable following grading and retaining.

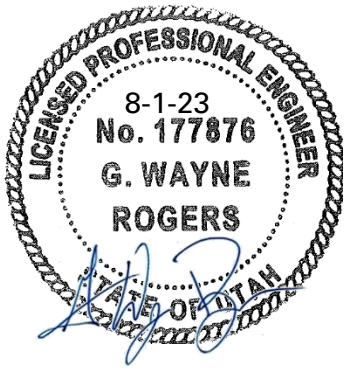
4. The proposed residences will likely be supported on conventional foundations. Additional design recommendations will be provided as we provide a geotechnical report prior to construction.

LIMITATIONS

The conclusions provided within this report are based on our observations of the site conditions, understanding of the proposed construction and our experience in the area. If during construction or further investigation, the conditions are found to be different, AGEC should be contacted to re-evaluate our conclusions and recommendations.

If you have any questions, or if we can be of further service, please call.

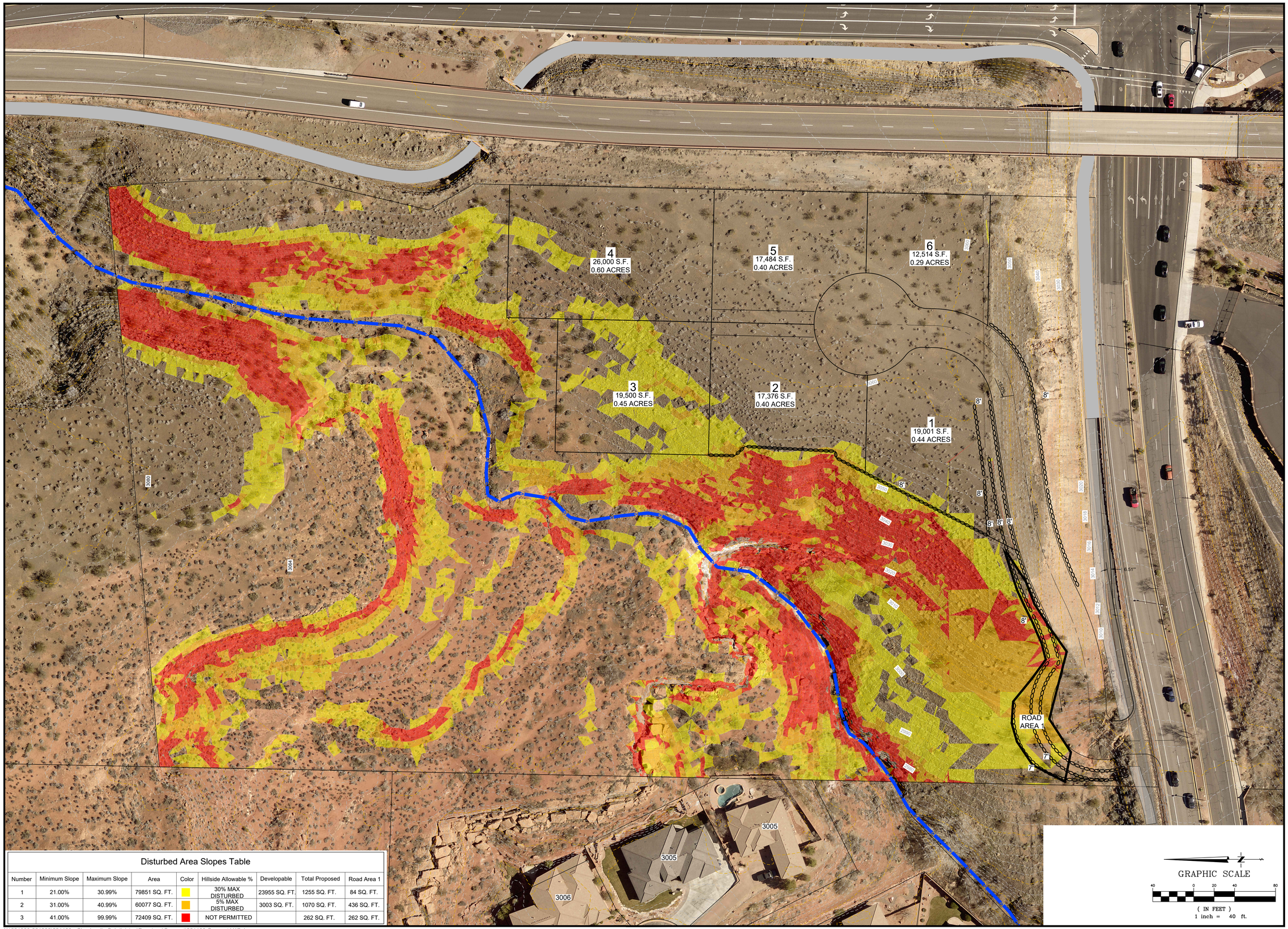
Sincerely,



APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

G. Wayne Rogers, P.E.

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Disturbed Area Slopes Table

Number	Minimum Slope	Maximum Slope	Area	Color	Hillside Allowable %	Developable	Total Proposed	Road Area 1
1	21.00%	30.99%	79851 SQ. FT.		30% MAX DISTURBED	23955 SQ. FT.	1255 SQ. FT.	84 SQ. FT.
2	31.00%	40.99%	60077 SQ. FT.		5% MAX DISTURBED	3003 SQ. FT.	1070 SQ. FT.	436 SQ. FT.
3	41.00%	99.99%	72409 SQ. FT.		NOT PERMITTED		262 SQ. FT.	262 SQ. FT.

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

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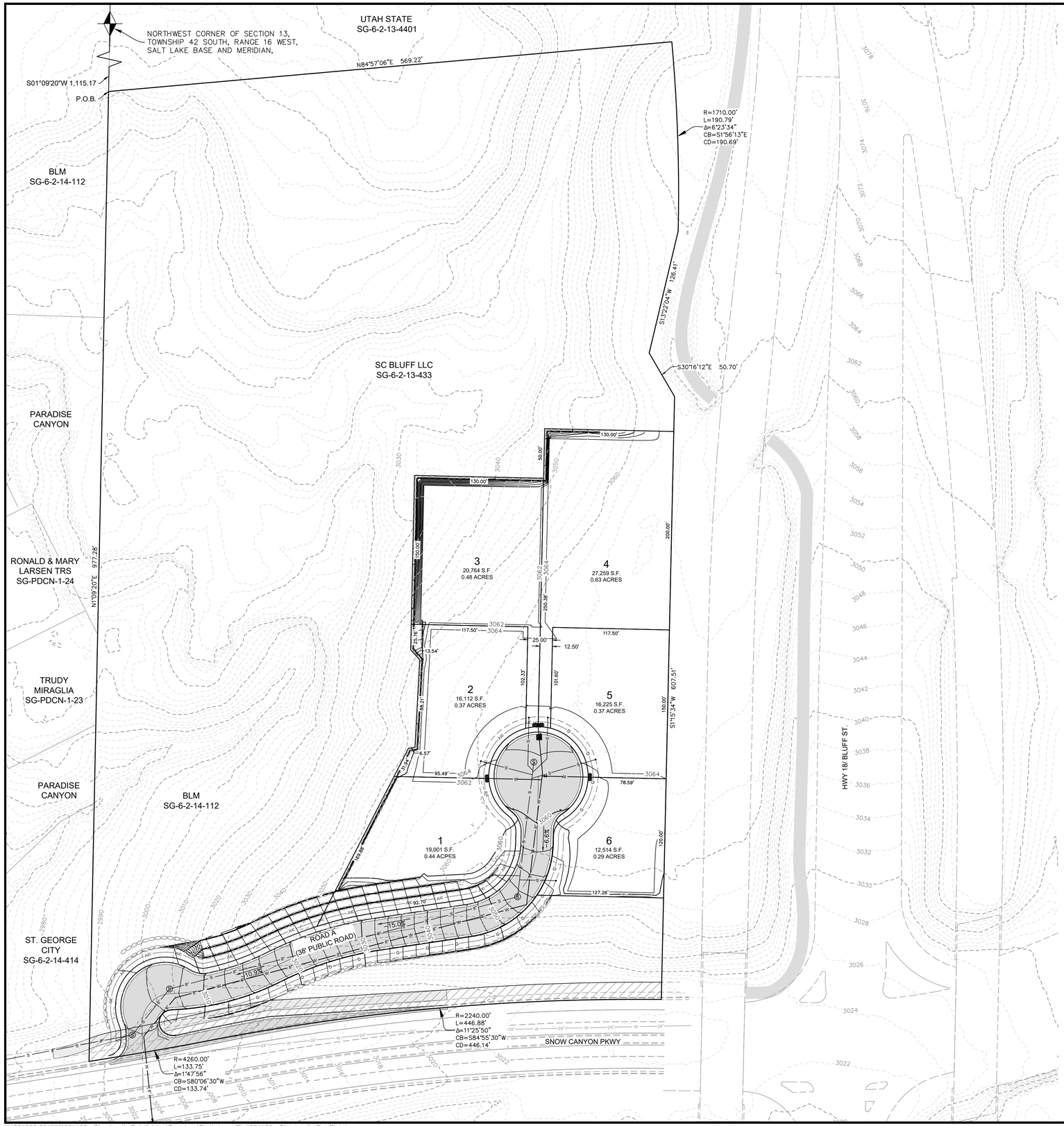
No	Date	By	Revision

BUSH & GUDGELL, INC.
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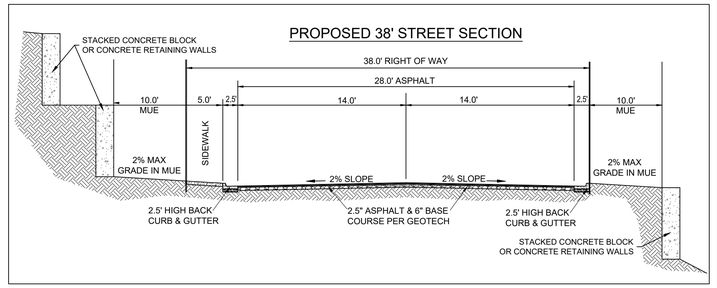
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DRAWN: RM
APPROVED: APPROVED
SCALE: 1" = 40'
JOB NO.: 221190

HILLSIDE MAP
CHUCKWALLA SUBDIVISION @ ST. GEORGE, UTAH

SHEET 1 OF 1 SHEETS
FILE: 221190



PROPOSED 38' STREET SECTION



LEGEND

- EXISTING RIGHT OF WAY LINE
- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- PROPOSED STACKED ROCK RETAINING WALL
- DRAINAGE CHANNEL FLOW LINE
- EXISTING FENCING
- OHP — EXISTING OVER HEAD POWER
- EXISTING SEWER
- PROPOSED SEWER
- EXISTING WATER
- PROPOSED WATER
- STOP / STREET SIGN
- END OF ROAD MARKERS
- DRAINAGE FLOW DIRECTION
- SECTIONAL MONUMENT (TYPE, LOCATION, ETC AS NOTED IN PLAT)
- PROPOSED ASPHALT
- DEDICATED TO CITY

PROJECT INFORMATION	
ZONING	R-1-10
GENERAL PLAN	LDR
TOTAL AREA	12.63 ACRES
TOTAL UNITS	6
DENSITY	2.11 D.U./ ACRE

OWNER / DEVELOPER

SC BLUFF LLC

JERRY MYAHARA
(949) 279-6824
2 WEST
ST. GEORGE, UTAH 84770

ENGINEERING CONTACT

BUSH AND GUDGELL, INC.
205 EAST TABERNACLE #4
ST GEORGE, UT 84770
RICK MEYER - PROJECT MANAGER
(435)-673-2337

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.

No	Date	By	Revision

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St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

DATE: JULY 2023 | DRAWN: CBW | APPROVED: WFM | SCALE: 1" = 50' | JOB NO.: 221190

SITE PLAN
CHUCKWALLA ESTATES
LOCATED IN ST GEORGE, UTAH

SHEET 2 OF 4 SHEETS

FILE: PRE PLAT

X:\221000-221999\221190 - Chuckwalla Subdivision\Drawings\Preliminary Plat\221190 - Chuckwalla Pre Plat.dwg

Bush and Gudgell, Inc.
Engineers • Planners • Surveyors
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July 31, 2023

Preliminary Drainage Memo
Chuckwalla residential subdivision

Chuckwalla is a proposed 6-lot residential subdivision at the northwest corner of Snow Canyon Parkway and State Route 18 (Bluff Street) in St George. It is located on parcel SG-6-2-13-433. The project includes 12.63 acres of land. The site will be accessed off Snow Canyon Parkway as a right-in, right-out approach.

The project has potential to generate stormwater runoff. The purpose of this letter is to identify the methods that will be used and the discharge location(s) of that runoff.

Site Considerations

A wash runs through the project that enters from the northeast and exits and the southwest corner of the site. This wash has a contributing area of approximately 200 acres. It is tributary to the Halfway Wash to the west of the project. All proposed development for the project will occur south and east of the wash, so no impacts to or wash crossings will be needed.

The site is part of FEMA panel 49053C0788G and is not encumbered by floodplain.

There is significant topographic relief to the property and the project will go through hillside review at the city.

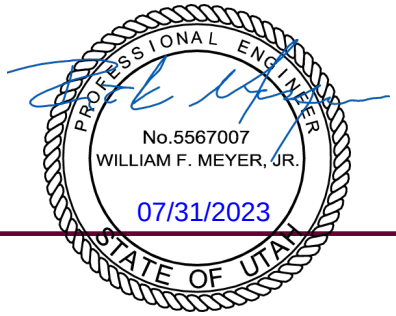
Offsite water entering the site at discrete points was addressed above. It is not anticipated that offsite water will enter the site at non-discrete points (sheet flow).

Methodology

The site hydrology will be analyzed using multiple design storms. The 10-year and 100-year storms will be analyzed using the Farmer-Fletcher distribution (3-hour). Also, the 100-year storm will be analyzed using the SCS Type II (24-hour) distribution. Using the hydrologic results of the analyses a hydraulic analysis will be performed to determine minimum pipe sizing and inlet capture rates in the street.

Conclusions

The proposed Chuckwalla development will comply with all local and state requirements for stormwater runoff. It is not anticipated that a detention pond will be required.



205 East Tabernacle #4
St. George, UT 84770
435-673-2337

B&G PROJECT NUMBER 221190

CHUCKWALLA ESTATES

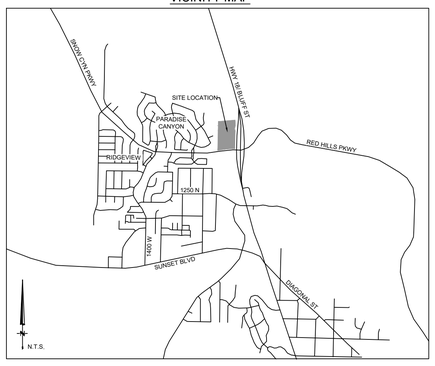
PRELIMINARY PLAT

LOCATED IN ST GEORGE, UTAH

NORTHWEST 1/4 OF SECTION 13, T 42 S, R 16 W, SLB&M

PARCEL # SG-6-2-13-433

VICINITY MAP



LEGAL DESCRIPTION

BEGINNING AT A POINT ON THE SECTION LINE, SAID POINT BEING SOUTH 01°09'20" WEST 1,115.17 FEET ALONG SAID SECTION LINE FROM THE NORTHWEST CORNER OF SECTION 13, TOWNSHIP 42 SOUTH, RANGE 16 WEST, SALT LAKE BASE & MERIDIAN, AND RUNNING; THENCE NORTH 84°57'06" EAST 569.22 FEET TO THE WESTERLY LINE OF STATE HIGHWAY 18; THENCE SOUTHERLY THE FOLLOWING (4) COURSES ALONG SAID WESTERLY LINE OF STATE HIGHWAY 18; THENCE SOUTHERLY 190.80 FEET ALONG AN ARC OF A 1,710.10 FOOT RADIUS CURVE TO THE RIGHT (CENTER BEARS SOUTH 84°52'00" WEST, LONG CHORD BEARS SOUTH 01°56'13" EAST 190.70 FEET WITH A CENTRAL ANGLE OF 06°23'34"); THENCE SOUTH 13°22'04" WEST 126.41 FEET; THENCE SOUTH 30°16'12" EAST 50.70 FEET; THENCE SOUTH 01°15'34" WEST 607.51 FEET TO THE NORTHERLY LINE OF SNOW CANYON PARKWAY; THENCE WESTERLY THE FOLLOWING (2) COURSES ALONG SAID NORTHERLY LINE OF SNOW CANYON PARKWAY; THENCE WESTERLY 446.88 FEET ALONG AN ARC OF A 2,240.00 FOOT RADIUS CURVE TO THE LEFT (CENTER BEARS SOUTH 00°38'25" WEST, LONG CHORD BEARS SOUTH 84°55'31" WEST 446.14 FEET WITH A CENTRAL ANGLE OF 11°25'50"); THENCE WESTERLY 133.75 FEET ALONG AN ARC OF A 4,260.00 FOOT RADIUS CURVE TO THE RIGHT (CENTER BEARS NORTH 10°47'26" WEST, LONG CHORD BEARS SOUTH 80°06'30" WEST 133.74 FEET WITH A CENTRAL ANGLE OF 01°47'56") TO THE SECTION LINE; THENCE NORTH 01°09'20" EAST 977.28 FEET ALONG SAID SECTION LINE TO THE POINT OF BEGINNING.

CONTAINS 12.63 ACRES

PROJECT INFORMATION	
ZONING	R-1-10
GENERAL PLAN	LDR
TOTAL AREA	12.63 ACRES
TOTAL UNITS	6
DENSITY	2.11 D.U./ ACRE

PROJECT MAP



GENERAL NOTES

1) CONTRACTOR IS RESPONSIBLE TO VERIFY LOCATIONS OF ALL UTILITIES PRIOR TO COMMENCEMENT OF WORK IN ANY ZONE.
2) ALL WORK AND MATERIALS SHALL COMPLY WITH ST. GEORGE CITY STANDARD SPECIFICATIONS.
3) PROJECTS SHALL INSTALL AN INFORMATIONAL SIGN ON SITE BEFORE CONSTRUCTION BEGINS. THIS SIGN WILL HAVE A MINIMUM SIZE, PLACEMENT LOCATION AND CONTENT INFORMATION WITH THE COMPANY NAME, PHONE CONTACT AND GRADING PERMIT NUMBER.
4) PROJECTS SHALL SUBMIT A DUST CONTROL PLAN WITH DETAILS ON EQUIPMENT, SCHEDULING AND REPORTING OF DUST CONTROL ACTIVITIES.
5) A MANDATORY PRE-CONSTRUCTION MEETING WILL BE REQUIRED ON ALL PROJECTS PRIOR TO ANY GRUBBING, GRADING OR CONSTRUCTION ACTIVITIES. THE PERMIT HOLDER WILL BE REQUIRED TO NOTIFY ALL DEVELOPMENT SERVICE INSPECTORS.
6) FOLLOW APPENDIX 'J' STANDARDS FOUND IN THE IBC.
7) ALL OBJECTS SHALL BE KEPT OUT OF THE SIGHT DISTANCE CORRIDORS THAT MAY OBSTRUCT THE DRIVER'S VIEW.

DUST CONTROL

THESE DUST CONTROL MEASURES MUST BE OBSERVED AT ALL TIMES:

EARTH MOVING ACTIVITIES:

1) APPLY WATER BY MEANS OF TRUCKS, HOSES AND/OR SPRINKLERS AT SUFFICIENT FREQUENCY AND QUANTITY, PRIOR TO CONDUCTING, DURING AND AFTER EARTHMOVING ACTIVITIES.
2) PRE-APPLY WATER TO THE DEPTH OF THE PROPOSED CUTS OR EQUIPMENT PENETRATION.
3) APPLY WATER AS NECESSARY AND PRIOR TO EXPECTED WIND EVENTS.
4) OPERATE HAUL VEHICLES APPROPRIATELY IN ORDER TO MINIMIZE FUGITIVE DUST AND APPLY WATER AS NECESSARY DURING LOADING OPERATIONS.

DISTURBED SURFACE AREAS OR INACTIVE CONSTRUCTION SITES:

1) WHEN ACTIVE CONSTRUCTION OPERATIONS HAVE CEASED, APPLY WATER AT SUFFICIENT FREQUENCY AND QUANTITY TO DEVELOP A SURFACE CRUST AND PRIOR TO EXPECTED WIND EVENTS.
2) INSTALL FENCE BARRIER AND/OR "NO TRESPASSING" SIGNS TO PREVENT ACCESS TO DISTURBED SURFACE AREAS.

JULY 2023

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle #4
St. George, Utah 84770
Phone (435) 673-2337

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Call before you Dig
1-800-662-4111
BLUE STAKES LOCATION CENTER (UTAH)

OWNER / DEVELOPER
SC BLUFF LLC
JERRY MYAHARA
(949) 279-6824
2 WEST
ST. GEORGE, UTAH 84770

ENGINEERING CONTACT
BUSH AND GUDGELL, INC.
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ST GEORGE, UT 84770
RICK MEYER - PROJECT MANAGER
(435)-673-2337

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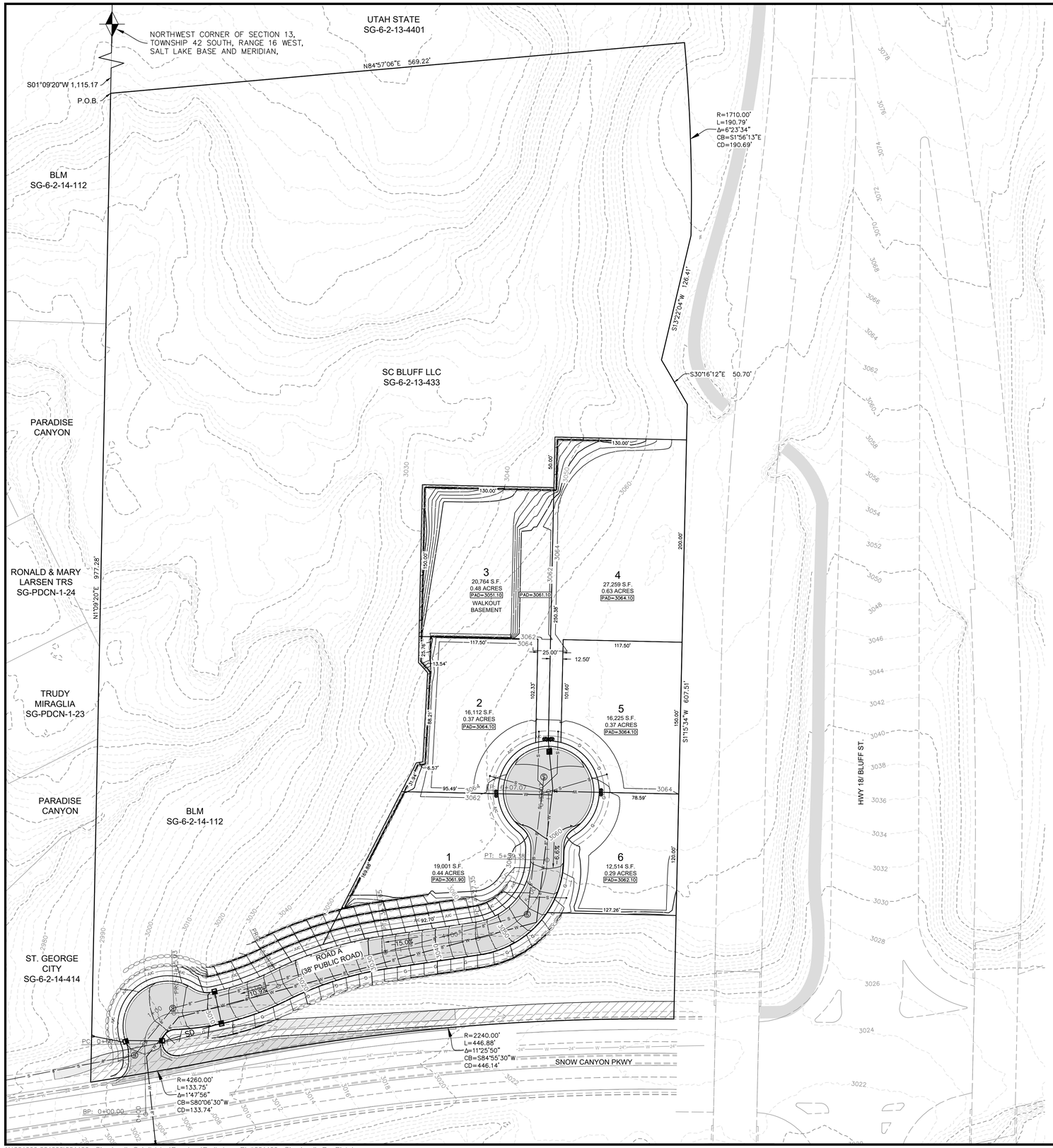
No.	Date	By	Revision

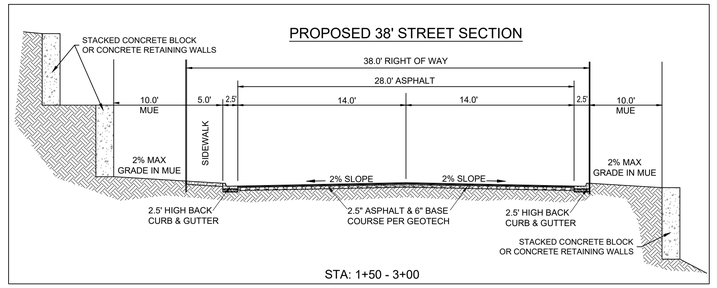
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DRAWN: CBW
APPROVED: WFM
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JOB NO.: 221190

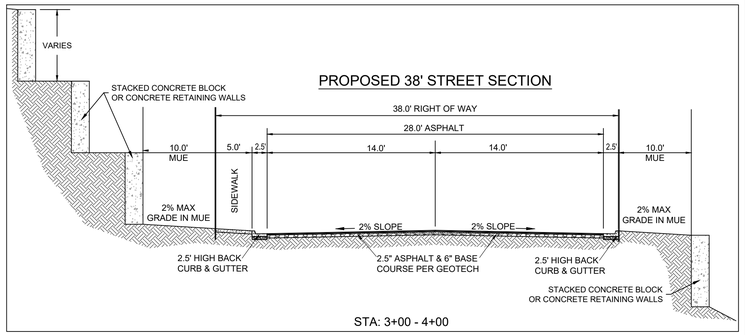
PRELIMINARY PLAT
CHUCKWALLA ESTATES
LOCATED IN ST GEORGE, UTAH

SHEET 1 OF 4 SHEETS
FILE: PRE PLAT

X:\221000-221999\221190 - Chuckwalla Subdivision\Drawings\Preliminary Plat\221190 - Chuckwalla Pre Plat.dwg







LEGEND

- EXISTING RIGHT OF WAY LINE
- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- PROPOSED CONCRETE BLOCK OR CONCRETE RETAINING WALL
- DRAINAGE CHANNEL FLOW LINE
- EXISTING FENCING
- OHP — EXISTING OVER HEAD POWER
- EXISTING SEWER
- PROPOSED SEWER
- EXISTING WATER
- PROPOSED WATER
- STOP / STREET SIGN
- END OF ROAD MARKERS
- DRAINAGE FLOW DIRECTION
- SECTIONAL MONUMENT (TYPE, LOCATION, ETC AS NOTED IN PLAT)
- PROPOSED ASPHALT
- DEDICATED TO CITY

PROJECT INFORMATION	
ZONING	R-1-10
GENERAL PLAN	LDR
TOTAL AREA	12.63 ACRES
TOTAL UNITS	6
DENSITY	2.11 D.U./ ACRE

OWNER / DEVELOPER
SC BLUFF LLC
JERRY MYAHARA
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2 WEST
ST. GEORGE, UTAH 84770

ENGINEERING CONTACT
BUSH AND GUDGELL, INC.
205 EAST TABERNACLE #4
ST GEORGE, UT 84770
RICK MEYER - PROJECT MANAGER
(435)-673-2337

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 inch = 50 ft.

No	Date	By	Revision

BUSH & GUDGELL, INC.
Engineers - Planners - Surveyors
205 East Tabernacle Suite #4
St. George, Utah 84770
Phone (435) 673-2337 / Fax (435) 673-3161
www.bushandgudgell.com

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SITE PLAN
CHUCKWALLA ESTATES
LOCATED IN ST GEORGE, UTAH

SHEET 2 OF 4 SHEETS

FILE: PRE PLAT

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BLM
SG-6-2-14-112

PARADISE
CANYON

RONALD & MARY
LARSEN TRS
SG-PDCN-1-24

TRUDY
MIRAGLIA
SG-PDCN-1-23

PARADISE
CANYON

BLM
SG-6-2-14-112

SC BLUFF LLC
SG-6-2-13-433

ST. GEORGE
CITY
SG-6-2-14-414

SNOW CANYON PKWY

ROAD A
(38' PUBLIC ROAD)

1

2

3

4

5

6

PC: 0+00.00

PT: 1+44.07

PT: 5+39.38

PRC: 1+00

BP: 0+00.00

SD

OWNER / DEVELOPER

SC BLUFF LLC

JERRY MYAHARA
(949) 279-6824
2 WEST
ST. GEORGE, UTAH 84770

ENGINEERING CONTACT

BUSH AND GUDGELL, INC.
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ST GEORGE, UT 84770
RICK MEYER ~ PROJECT MANAGER
(435)-673-2337

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.

LEGEND

- EXISTING RIGHT OF WAY LINE
- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- PROPOSED CONCRETE BLOCK OR CONCRETE RETAINING WALL
- DRAINAGE CHANNEL FLOW LINE
- EXISTING FENCING
- EXISTING OVER HEAD POWER
- EXISTING SEWER
- PROPOSED SEWER
- EXISTING WATER
- PROPOSED WATER
- STOP / STREET SIGN
- END OF ROAD MARKERS
- DRAINAGE FLOW DIRECTION
- SECTIONAL MONUMENT (TYPE, LOCATION, ETC AS NOTED IN PLAT)
- PROPOSED ASPHALT
- DEDICATED TO CITY

No	Date	By	Revision

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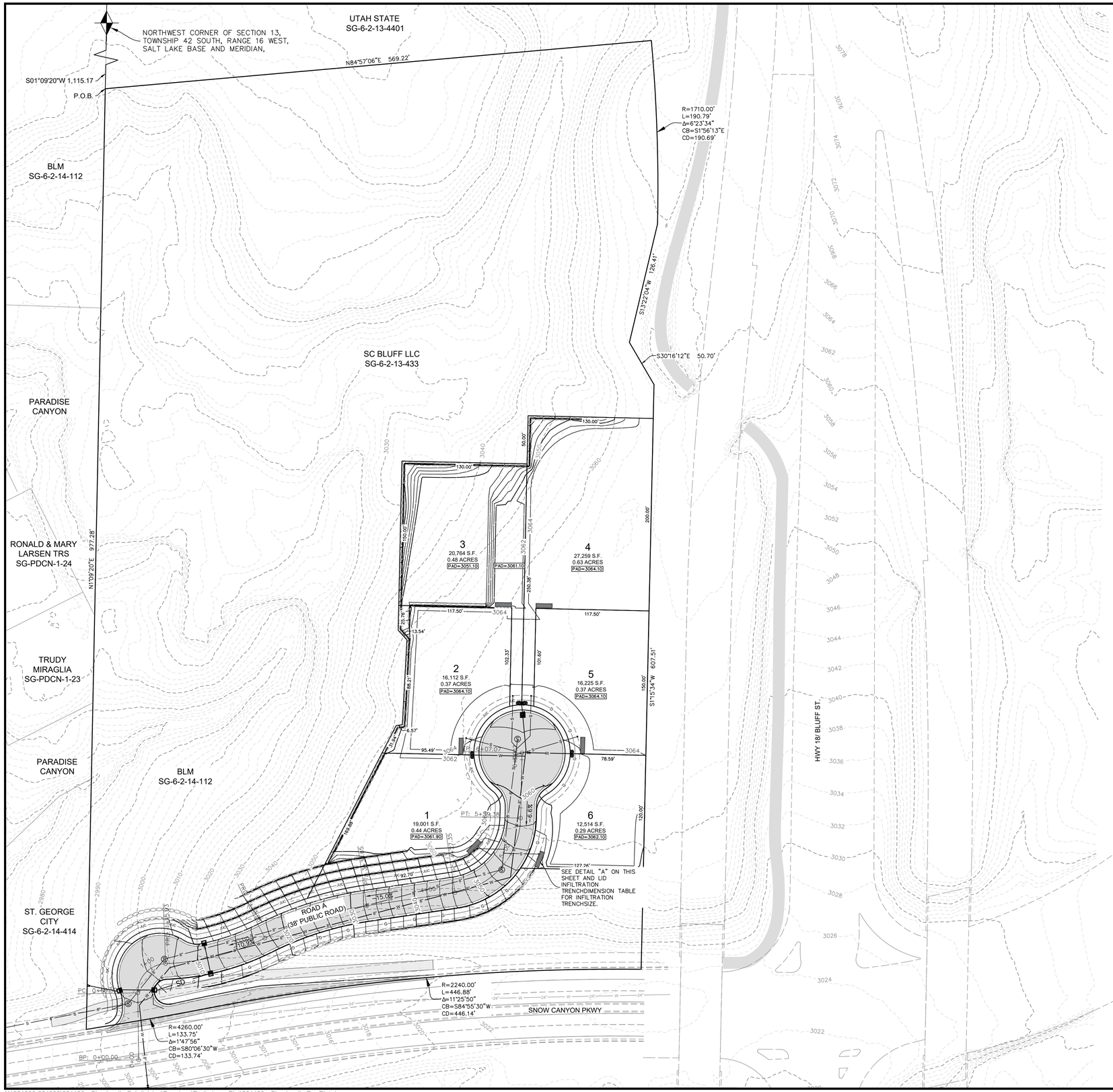
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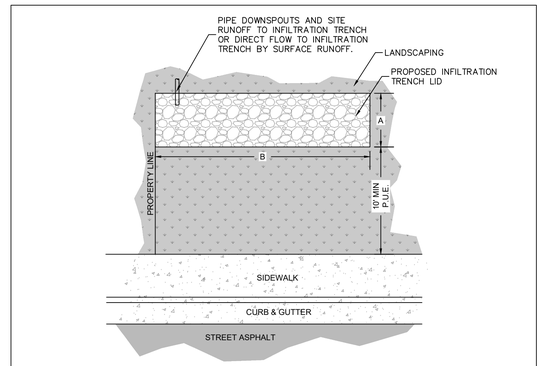
UTILITY PLAN
CHUCKWALLA ESTATES
LOCATED IN ST GEORGE, UTAH

SHEET 3 OF 4 SHEETS

FILE: PRE PLAT

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NOTES:
1. CONSTRUCT INFILTRATION TRENCH ON LOW SIDE OF LOT NEAR PROPERTY LINE, BEHIND SIDEWALK.

A LID INFILTRATION TRENCHDETAIL

NOT TO SCALE

LEGEND

- EXISTING GROUND CONTOUR
- FINISH GROUND CONTOUR
- DRAINAGE FLOW
- PAD= 00.0 FINISH PAD ELEVATION
- LOCATION ELEVATION SPOT ELEVATION
- SD STORM DRAIN
- (S) SINGLE CURB INLET PER CITY STD. DETAIL 205
- (D) DOUBLE CURB INLET PER CITY STD. DETAIL 205
- LOT LINE
- CURB & GUTTER
- EXISTING CURB & GUTTER
- FLOW LINE
- STORM DRAIN MAN HOLE

OWNER / DEVELOPER

SC BLUFF LLC

JERRY MYAHARA
(949) 279-6824
2 WEST
ST. GEORGE, UTAH 84770

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RICK MEYER - PROJECT MANAGER
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GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.

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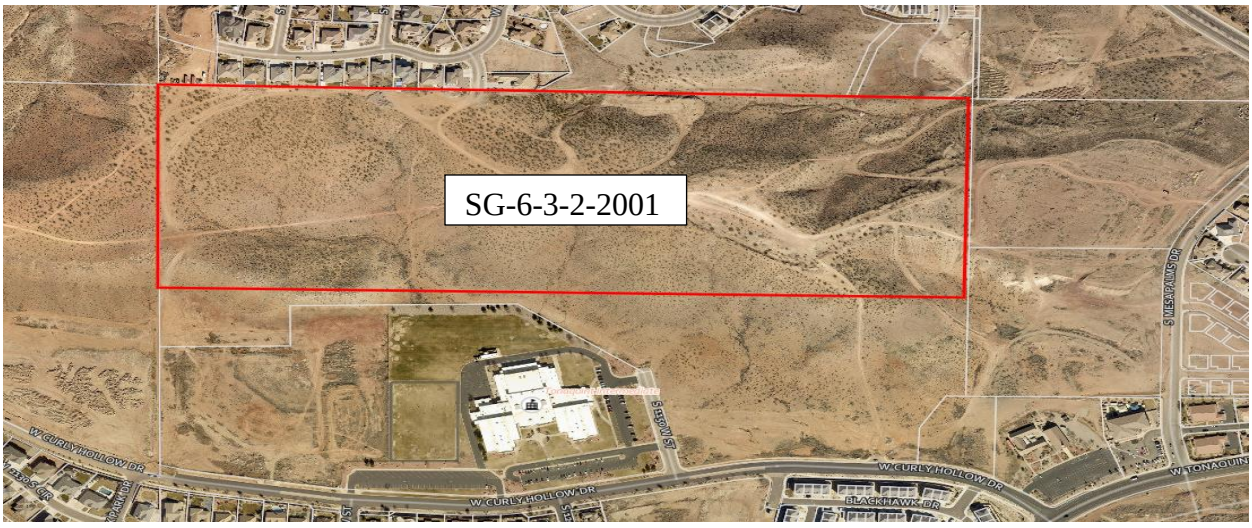
LID PLAN
CHUCKWALLA ESTATES
LOCATED IN ST GEORGE, UTAH

SHEET 4 OF 4 SHEETS
FILE: PRE PLAT

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HILLSIDE REVIEW BOARD AGENDA REPORT: **08/23/2023**

SG-6-3-2-2001 Hillside Development Permit (Case No. 2023-HS-009)		
Request:	Hillside Development Permit to allow disturbance of areas in the 20-30%, 30-40% and 40% and above slope areas. This application is a discussion item on a possible future project for commercial development of storage units.	
Applicant:	Tim Stewart	
Representative:	Tim Stewart	
Location:	North of the Tonaquint Intermediate School and Rosewood Townhomes.	
General Plan:	VLDR (Very Low Density Residential)	
Existing Zoning:	R-1-10 (Single Family Residential 10,000 sq ft lots), R-1-8 (Single Family Residential 8,000 sq ft lots).	
Surrounding Zoning:	North	PD-R (Planned Development Residential).
	South	R-1-8 (Single Family Residential 8,000 sq ft lots).
	East	R-1-10 (Single Family Residential 10,000 sq ft lots). PD-R (Planned Development Residential)
	West	M & G (Mining & Grazing).
Land Area:		



BACKGROUND

The applicant has contemplated a commercial development on the subject property. In order to pursue a commercial development, a general plan amendment would need to happen to a commercial designation. In order to not get too far down the road if the hillside factor was going to be an issue, a preliminary hillside analysis will accompany the general plan amendment. Any development on the property would require a full hillside review and analysis which would accompany a zone change request. This is simply a preliminary, first blush look at the project potential. Thus, no geotechnical investigation normally associated with a hillside permit review is part of this analysis. Staff acknowledges that this is a little different than previous requests, but it will allow the applicant to get a comfort level before pursuing full reports with their accompanying expenses. It appears from the slope analysis that there are some areas with considerable slope on the property. Much of the property is flatter with 20% or less slope than other areas.

APPLICABLE ORDINANCE(S) *(Selected portions)*

10-13A-1: Density and Disturbance Standards

A. The hillside development overlay zone (HDOZ) limits development densities and provides specific development incentives to transfer underlying zone densities from hillsides (sending areas) to less steep slopes or more safe development areas (receiving areas), within a development.

B. For those portions of a proposed development with natural slopes twenty percent (20%) or less, development density follows the density and development standards in the underlying zone.

C. For those portions of a proposed development with natural slopes from twenty-one percent (21%) to thirty percent (30%), development activity shall not disturb more than thirty percent (30%) of the parcel within this slope category.

D. For those portions of a proposed development with natural slopes from thirty-one percent (31%) to forty percent (40%), development activity shall not disturb more than five percent (5%) of the area within this slope category.

E. A proposed development may not disturb slopes in excess of forty percent (40%).

10-13A-2: Slope and Slope Areas Determined

A. Slope shall be determined for each significant portion of development parcel.

B. *Procedure:* The applicant shall map the location of the natural slope by using the following procedure:

1. *Preparation of Contour Maps:* The applicant shall submit an accurate, current contour map, prepared and certified by a licensed professional engineer or surveyor, which shows all land contours at intervals no

greater than five feet (5'), drawn at a one inch equals one hundred feet (1" = 100') scale maximum.

2. *Verification through Field Surveys:* The city engineer or designee may require the applicant to submit a field survey to verify the accuracy of the contour map.

C. *Determination of Slope Areas:* Using the contour map, natural slopes shall be calculated using points identified as natural slopes of twenty percent (20%), thirty percent (30%), and forty percent (40%), and shall be located on the contour map and connected by a continuous line. That area bounded by said lines and intersecting property lines shall be used for determining project density. Small washes or outcrops, which have slopes distinctly different from surrounding property, and are not part of the contiguous topography, may be excluded from the slope determination.

EXHIBITS PROVIDED

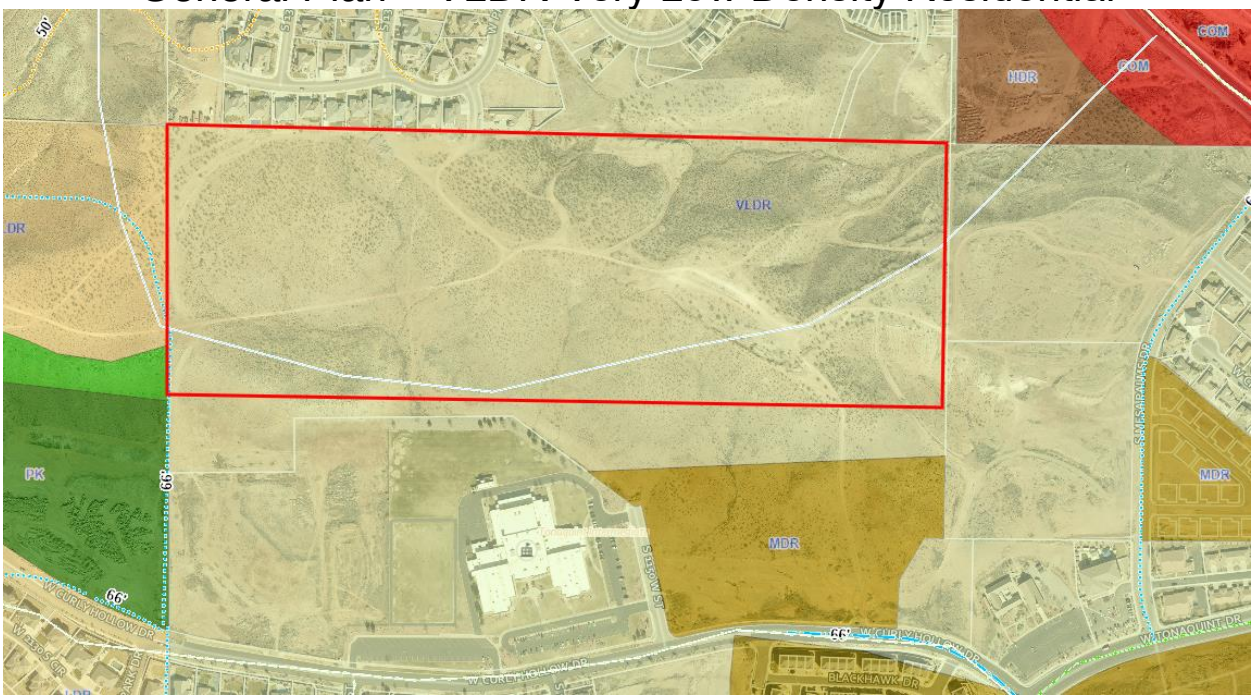
1. Exhibit A – Mass Grading Plan
   "Exhibit A" in the packet shows the grading plan.

2. Exhibit B – Slope Analysis
   "Exhibit B" in the packet is an analysis of the slope.

RECOMMENDATION

Section 10-13A-8(B)(1) of the "Hillside Review Board Powers and Duties" states that the hillside board can make recommendations to "adopt, modify or reject a proposal" to the Planning Commission (PC).

General Plan – VLDR-Very Low Density Residential



Zoning – R-1-10-(Single Family Residential 10,000 sq ft lots) & R-1-1-8 (Single Family Residential 8,000 sq ft lots.)

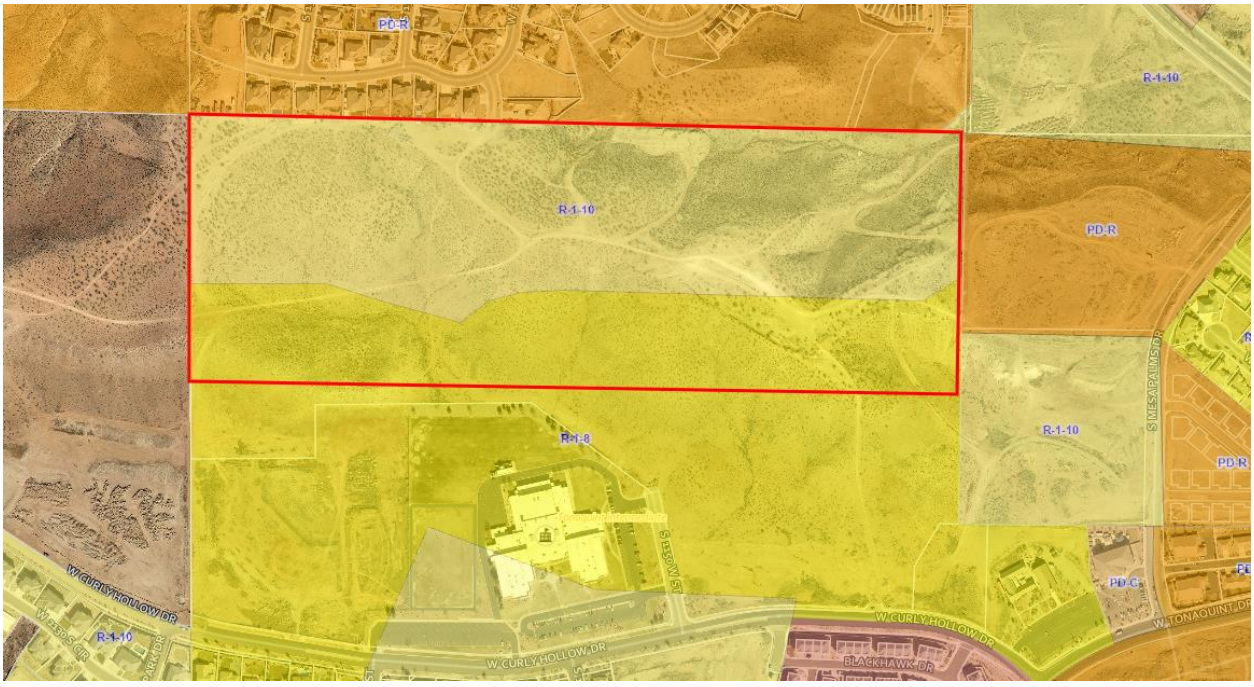


EXHIBIT A
Mass Grading Plan

EXHIBIT B
Slope Analysis Map

LEGEND

EXISTING CONT-MJR
EXISTING CONT-MNR
PROPOSED CONT-MJR
PROPOSED CONT-MNR

TUSCAN HILLS OWNERS ASSOCIATION
SG-6-3-2-1221

UTAH RESOURCES INTERNATIONAL INC
SG-6-3-2-113

BAY VIEW HEIGHTS L C
SG-6-3-2-121

RIVERSTONE APARTMENTS LLC
SG-6-3-1-4431

UNDEF

106,545 SQ. FT.
2.45 ACRES
28,201 CU. YD FILL

PAD AREA: 139,938 SQ. FT.
3.21 ACRES

259,493 SQ. FT.
5.77 ACRES
114,570 CU. YD FILL

TONAQUINT INC
SG-6-3-2-2001

ST GEORGE VENTURES LLC
SG-6-3-1-4021

0 50' 100'
SCALE: 1"=50'

DATE: 7/21/23
JOB NO.: 13214-22-002
DESIGNED BY: DMH
CHECKED BY: JWB
DWG: PAD LAYOUT 2

REVISIONS DATE

ROSENBERG ASSOCIATES
CIVIL ENGINEERS • LAND SURVEYORS
352 East Riverside Drive, Suite A-2
St. George, Utah 84790
Ph (435) 673-8586 Fx (435) 673-8397
www.racivil.com

EXHIBIT MAP
FOR
PARCEL SG-6-3-2-2001 MASS GRADING PLAN
ST. GEORGE
UTAH

SHEET
1
1 OF 3 SHEETS

LEGEND

- EXISTING CONT-MJR
- EXISTING CONT-MNR
- PROPOSED CONT-MJR
- PROPOSED CONT-MNR



0 50' 100'

SCALE: 1"=50'

DATE: 7/21/23
JOB NO.: 13214-22-002
DESIGNED BY: DMH
CHECKED BY: JWB
DWG: PAD LAYOUT 2

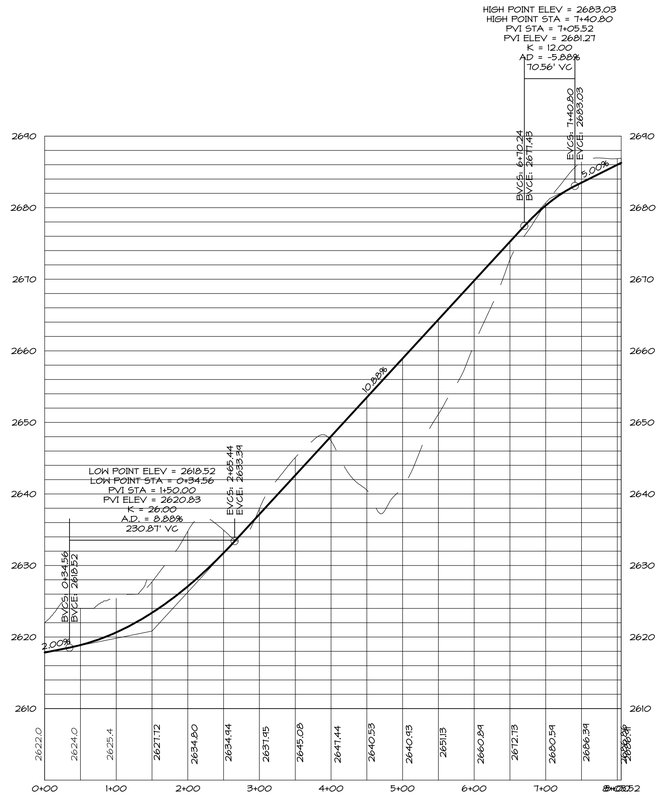
REVISIONS DATE

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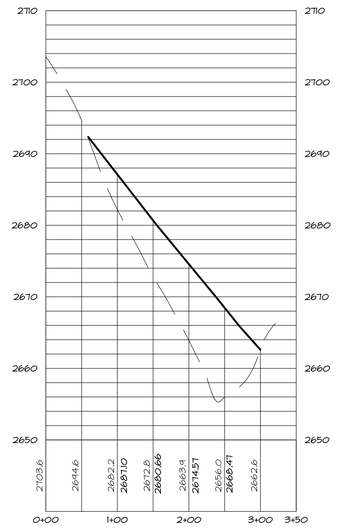
EXHIBIT MAP
FOR
PARCEL SG-6-3-2-2001 MASS GRADING PLAN
ST. GEORGE
UTAH

SHEET
2
2 OF 3 SHEETS



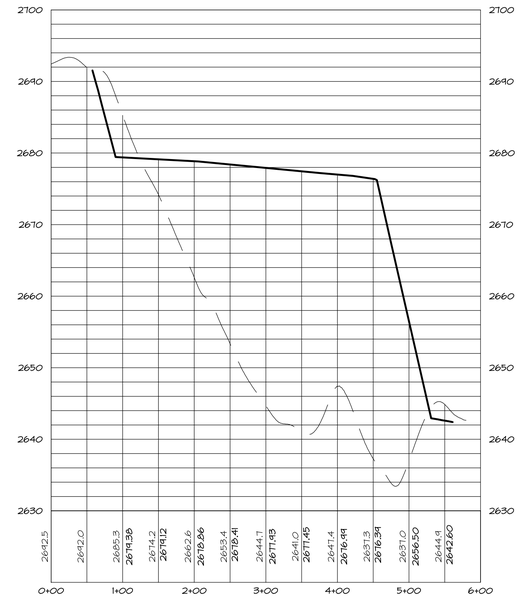
ACCESS ROAD

HORIZ. SCALE = 1" = 10'
VER. SCALE = 1" = 10'



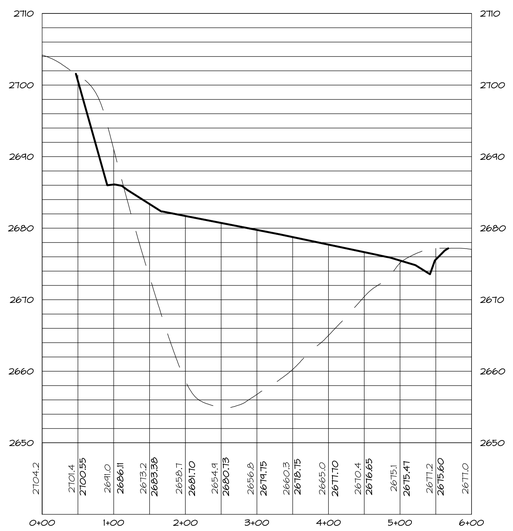
SECTION A-A

HORIZ. SCALE = 1" = 10'
VER. SCALE = 1" = 10'



SECTION B-B

HORIZ. SCALE = 1" = 10'
VER. SCALE = 1" = 10'



SECTION C-C

HORIZ. SCALE = 1" = 10'
VER. SCALE = 1" = 10'

DATE: 7/21/23
JOB NO.: 13214-22-002
DESIGNED BY: DMH
CHECKED BY: JWB
DWG: PAD LAYOUT 2

REVISIONS
DATE

ROSENBERG ASSOCIATES
CIVIL ENGINEERS • LAND SURVEYORS
352 East Riverside Drive, Suite A-2
St. George, Utah 84790
Ph (435) 673-8586 Fx (435) 673-8397
www.racivil.com

CROSS SECTIONS & ACCESS ROAD PROFILE
FOR
PARCEL SG-6-3-2-2001 MASS GRADING PLAN
ST. GEORGE
UTAH

SHEET
3
3 OF 3 SHEETS

PARCEL SG-TUNH-2-221

PARCEL SG-TUNH-2-222

PARCEL SG-6-3-2-1221

PARCEL SG-6-3-2-121

PARCEL SG-6-3-1-4431

PARCEL SG-6-3-2-113

PARCEL SG-6-3-1-4021

PARCEL SG-6-3-2-2001

PARCEL SG-6-3-2-1203

BLM

LEGEND			
	PERCENT SLOPE	AREA (ACRES)	PERCENT OF PROPERTY
	0 - 20	21.6	78.4
	21 - 30	4.3	15.6
	31 - 40	1.3	4.7
	>40	0.3	1.3
TOTAL PROJECT AREA		27.5	

3500 MAJOR CONTOUR LINES (10')

MINOR CONTOUR LINES (2')

PROPERTY BOUNDARIES

0 50' 100'

SCALE: 1"=50'

DATE: 08/03/2023
JOB NO.: 13214-22
DESIGNED BY: WJP
CHECKED BY: JWB
DWG: SLOPE

REVISIONS
DATE

ROSENBERG ASSOCIATES
CIVIL ENGINEERS • LAND SURVEYORS

352 East Riverside Drive, Suite A-2
St. George, Utah 84790
Ph (435) 673-8586 Fx (435) 673-8397
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SLOPE ANALYSIS
FOR
PARCEL SG-6-3-2-2001
WASHINGTON COUNTY
UTAH

SHEET
1
OF SHEETS

NOTICE OF MEETING
HILLSIDE REVIEW BOARD
CITY OF ST. GEORGE
WASHINGTON COUNTY, UTAH

Public Notice

Notice is hereby given that the Hillside Review Board of the City of St. George, Washington County, Utah, will hold meetings at the referenced site on **Wednesday, June 28, 2023,** commencing on-site at approximately 8:30 a.m.

PRESENT:
Dave Black
Jeff Mathis
James Dotson
Russ Owens

EXCUSED:
James Sullivan

CITY STAFF:
Assistant Public Works Director, Wes Jenkins
Planner III, Carol Davidson
Planner III, Michael Hadley
Development Office Supervisor, Brenda Hatch

The agenda for the meeting is as follows:

1. Consider a request for a preliminary hillside development review. This review would accompany a future general plan amendment and is a preliminary review of the hillside for a future commercial project. The property is currently zoned PD-R (Planned Development Residential). The site is located on the east side of Riverside Drive at approximately 700 South, south of Foremaster Drive. The applicant is Dave Nasal. Case No. 2023-HS-006.

   James Dotson called the meeting to order.

   Eric McFadden – The thought was to come up this gulch right here at the maximum 15% and then get to a pad elevation that splits the property the best. Which would essentially leave the cut along Riverside Drive. This hill would get pushed into that valley. You can see the old stakes over there from the adjacent property, which is the same owners. We are basically tying in at the same location. Then we will have a connection to the north. I believe I am going to be doing the engineering on that as well. On the commercial piece, so we can tie them together at the same time.

   Dave Nasal – Not a full hillside application at this point, this is more of a discussion. We are looking to be able to knock this down, fill in the valleys and export some of it. Can we

make it work inside of hillside? Or do we pull it out of hillside? My personal feeling is that this stuff isn't the kind of stuff hillside is trying to protect.

Dave Black – I think there is a variety of things to protect. Natural features, rock outcroppings, natural hillside, and natural slope. The other problem as you know, dealing with the blue clay cuts, there is not a lot you can do with them. They are ugly, there is a lot of unravelling. You might cut back to a certain slope, but they are going to unravel to another slope. You can see that occurring down the hill and you leave a big scar. There are a variety of things to consider other than being in the overlay zone. You have the steep slopes and the ridge on top.

Eric McFadden – We haven't poked any holes in here yet Geotech wise to know if this is all clay or not. I know we hit rock on that little knoll there on the adjacent property. Wayne hasn't done anything here. That was kind of the idea of coming up here and flattening, so that any kind of cut we had would be hidden because you already have a 35 ft climb right off the road. With the buildings up here, I think it would hide anything that we have cut on this backside. You wouldn't necessarily see it from the road.

Dave Black – Historically, a long time ago they considered cutting this and Rosenberg did a design on this, one of the first simulations that we had to do was what the actual hill looked like and what the views were from the road coming off of Foremaster. The two major concerns was the blue clay and the sandstone back there to the northeast, so you are probably dealing with all blue clay. So, there are potentially slope stability issues. Your cut slopes will have to be looked at really close by AGEC. This is classified as a high potential hazard for slope stability and so their stability analysis might get kicked out of hillside and get a 3rd party review like we have done in the past. What they do here is pretty critical because they have a new development going in up above. With the plan that you submitted, it looks like some of your cuts go to the top.

Eric McFadden – Yes, that's if we stay at the 2:1, that was just throwing a 2:1 in there. If we did any kind of retaining down at the bottom, we could probably shorten that up a little bit. But like you said, retaining on blue clay probably isn't the best idea either. It's kind of the happy medium of where we picked the pad grades and the west had mentioned maybe something about coming off of Riverside and lowering the whole thing. We could look at doing something like that, I think it will just increase our cut on the backside. We could look into that scenario as well.

Discussion on matching the other site's grades.

Russ Owens – Instead of tying everything together, what is the chance of making individual pads, so you don't have quite so much cut and fill?

Eric McFadden – I think the issue is the climb off of Riverside. There might be a spot for it in this little ridge here, but I'm thinking of the climb.

Russ Owens – I don't know of anything that stays below 3:1 in the clay. By the time you do that you are so much into the top.

Jeff Mathis – So you think you would drop this hill 20 ft?

Dave Black – It's a tough one.

Eric McFadden – It's a rough site.

Russ Owens – Where would you take drainage?

Eric McFadden – We haven't even looked at that yet, it would have to be probably an underground system in the parking lot then out to Riverside.

Russ Owens – If you're in the clay then an underground system…

Eric McFadden – We wouldn't let it infiltrate; we would contain it.

Dave Black – So if you did something up here, would the City want you to do improvements along that road?

Wes Jenkins – They will have to do their portion.

Dan Boles – There are also landscaping requirements that will become an issue as well.

Dave Black – I think you will have to limit the landscaping because of the blue clay issues, that water is really problematic. There needs to be some type of waiver on that.

Dan Boles – If we got to the point where we had some type of full application then we would need to discuss that because it is in the code. It is something to keep in mind.

Russ Owens – Will the City require a new turning lane here? If so then the slope will be way cut back anyway.

James Dotson – I don't have any issue with this being disturbed here, it's the run, it's the catch all the way up the hill to the ridgeline.

Jeff Mathis – It's not beautiful, but there are some features. In the code you can't disturb over 40%. Unless it's noncontiguous or whatever.

Eric McFadden – So there's no issue with getting rid of the slope against the road?

Dan Boles – If I can jump in, your discussion today will accompany a general plan amendment that will go to the Planning Commission and City Council. If you could give your thoughts clearly organized so that we can present that to the Planning Commission and City Council so that they know what the Hillside Review Board thought about this project.

Dave Black – I think we could say that our concern would be limiting the amount of scarring and disturbance up the hill. And try not to exceed the amount of disturbance that has been recommended for approval on the adjacent properties. We met on that commercial piece and this piece, and the amount of disturbance should match or not exceed that. Not that it has to be continuous, but that it doesn't exceed that. That could be a goal or a guideline. I think again they really will need to get their geotechnical engineer

involved to address the geologic constraints with the site. The stable cut slopes, the blue clay issues and how they are going to address those. The potential of rockfall will need to be addressed as well. There are other issues, I don't know that we would have a concern with disturbing or extending the existing cuts back. Russ brought up if there is a way to cluster in pods or something, maybe look at that option.

James Dotson – I don't know how we make a recommendation based on the current layout because we don't want it to go up the hill to the top.

Dave Nasal – I think the General Plan Amendment is more for it to go to commercial. From PD-R.

Dave Black – Does that actually help it become more flexible or buildable?

Jeff Mathis – I think commercial is a better situation for this property than houses would be.

Eric McFadden – I think if we can get the General Plan recommendation for commercial then we just go back to the drawing boards to see if we can get some kind of design with less cut and some kind of rock stability walls or something.

Wes Jenkins – So you guys approve of them going to commercial on the General Plan change?

Dave Black, Jeff Mathis, Russ Owens, James Dotson – Yes.

2. Consider approval of the meeting minutes from the **April 26**, 2023, meeting.

MOTION: Dave Black made a motion to approve the minutes from the last meeting. SECOND: Jeff Mathis AYES (4) Dave Black Jeff Mathis Russ Owens James Dotson NAYS (0) Motion carries

James Dotson adjourned the meeting.