



**PLANNING COMMISSION MEETING
OF THE CITY OF CEDAR HILLS
Tuesday, July 14, 2026 6:00 p.m.**

Notice is hereby given that the Planning Commission of the City of Cedar Hills, Utah, will hold a **Planning Commission Meeting on Tuesday, July 14, 2026 beginning at 6:00 p.m.** at the Civic Center, 3925 W Cedar Hills Drive, Cedar Hills, Utah. This is a public meeting, and anyone is invited to attend.

PLANNING COMMISSION MEETING

1. Call to Order
2. Public Comment: Time has been set aside for the public to express their ideas, concerns, and comments (comments limited to 3 minutes per person with a total of 30 minutes for this item)

SCHEDULED ITEMS & PUBLIC HEARINGS

3. Approval of the minutes from the June 23, 2026 Planning Commission meeting
4. Review/Recommendation and Public Hearing on amendments to Plat J2 in The Cedars at Cedar Hills Subdivision, located in the H-1 Hillside Development Zone
5. Review/Action and Public Hearing on a Preliminary Plan for The Cedars Townhomes Plat E Phase 5 located in the H-1 Hillside Development Zone

ADJOURNMENT

6. Adjourn.

Posted this 10th day of July, 2026

/s/ Colleen A. Mulvey, City Recorder

Supporting documentation for this agenda is posted on the city website at www.cedarhillsutah.gov.

In accordance with the Americans with Disabilities Act, the City of Cedar Hills will make reasonable accommodations to participate in the meeting. Requests for assistance can be made by contacting the City Recorder at 801-785-9668 at least 48 hours in advance of the meeting to be held.

The order of agenda items may change to accommodate the needs of the Planning Commission, the staff, and the public. This meeting may be held electronically to permit one or more of the commission members or staff to participate.



PUBLIC MEETING AND PUBLIC HEARING ETIQUETTE

Please remember all public meetings and public hearings are recorded

- All comments **must** be recognized by the Chairperson and addressed through the microphone.
- Please do not approach the Council/Commission dais without permission from the Chairperson.
- When speaking to the Council / 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, electronic devices 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 three minutes and group representatives may be limited to five minutes.
- Refrain from congregating near the doors or in the 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 v. Public Meeting:

If the agenda item 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.



The City of Cedar Hills

TO:	Planning Commission
FROM:	Sarah Sampson, Planning Associate
DATE:	July 14, 2026

Planning Commission Agenda Item

SUBJECT:	Review/Recommendation and Public Hearing on amendments to Plat J2 in The Cedars at Cedar Hills Subdivision, located in the H-1 Hillside Development Zone
APPLICANT PRESENTATION:	
STAFF PRESENTATION:	Sarah Sampson, Zoning/ Associate Planner
BACKGROUND AND FINDINGS: A resident, Gary Fullmer, who owns property on Colonial Drive, wishes to clean up property lines and formalize an encroachment through a property line adjustment. Mr. Fullmer owns both lots affected. The planning commission's role in recommending the plat to the City Council is to ensure that the new amended plat meets the zoning requirements of the underlying zone (H-1 Hillside) built as a PRD, planned residential development.	
PREVIOUS LEGISLATIVE ACTION:	
FISCAL IMPACT:	
SUPPORTING DOCUMENTS: Plat proposal	
RECOMMENDATION: To approve the proposed plat amendment to Plat J2 Amended Lots 5 and 6 in The Cedars at Cedar Hills Subdivision, located in the H-1 Hillside Development Zone	
MOTION: To recommend/not recommend amendments to Plat J2 Amended Lots 5 and 6 in The Cedars at Cedar Hills Subdivision, located in the H-1 Hillside Development Zone to the City council, with the following recommendations: {LIST ANY RECOMMENDATIONS FOR THE CITY COUNCIL TO CONSIDER}	



CITY OF CEDAR HILLS

TO:	Planning Commission
FROM:	Chandler Goodwin, City Manager
DATE:	7/14/2026

Planning Commission Agenda Item

SUBJECT:	Review/Action and Public Hearing on the Preliminary Plan for the Cedar Townhomes Plat E Phase 5 located in the H-1 Hillside Development Zone
APPLICANT PRESENTATION:	
STAFF PRESENTATION:	Chandler Goodwin, City Manager

BACKGROUND AND FINDINGS:

Cedars Townhomes Plat E Phase 5 received final approval on April 9, 2002, but was never developed. The developer has returned to the City seeking changes to the overall layout. Phase 5 is the final phase of the original Cedars development and, as proposed, would add fourteen townhomes to the Cedars Townhomes HOA. While the parcel is part of an approved master plan and the landowner holds development rights, the City is working with the developer to ensure the site is developed in a way that addresses geotechnical, landscaping, and utility concerns.

Geotechnical

Staff required a new geotechnical study with test pits at each building location and engineering recommendations for construction methods. The study has been submitted and is under joint review by the developer and City Engineer. It identifies multiple points during construction when the engineering firm must be on site to verify soils, compaction, and slope stability. A slope stability analysis under saturated conditions still needs to be provided. Additionally, the location of unit 501 needs to be addressed given its proximity to an existing storm water conveyance line and possible pressure issues created by the location of the building being above the storm water line.

Landscaping and Irrigation

The geotechnical report recommends against landscaping that requires supplemental irrigation, out of concern that a line break could undermine slope stability. This conflicts with Cedar Hills City Code 10-5-27, which requires landscaped yards. Staff has met with the development team to reaffirm that landscaping is required and must be designed to avoid stability risk, likely through xeriscaping or localscaping with the HOA to reduce water demand. Staff also notes that a culinary line break poses the same risk as an irrigation line break, and this needs to be addressed in a future addendum to the report.

Utilities (Sewer and Storm Drain)

Each unit is proposed to connect to sewer from the rear (west) side of the building into a single main tied to the City system. For storm water, the existing system is designed to capture and convey runoff for this portion of the project. However, the current proposal shows a private storm drain line collecting runoff from driveways and rooftops and connecting into the City's public storm water system — a type of connection the City does not currently allow. This will need to be resolved.

Misc. Issues

Other issues that need to be worked through but are less critical in nature include completing the redlines submitted by the City Engineer on the civil plan set. Any approval should be subject to final engineering, fire, building, and zoning review

PREVIOUS LEGISLATIVE ACTION:

Planning Commission last considered this in 2022.

FISCAL IMPACT:

N/A

SUPPORTING DOCUMENTS:

2025 CMT Geological and Geotechnical Study, Response Letter to City, Phase 5 Cedar Townhomes Civil Set, Phase 5 Drainage Report

RECOMMENDATION:

Review submission documents and make any recommendations necessary, staff will prepare their own recommendation for the meeting. Staff will come prepared to discuss the civil plan set, the Geotech report as well as any other supplemental material that has been provided as part of this plan approval submission.

MOTION:

Approve:

To approve the Preliminary Cedars Townhomes Phase 5 subdivision, subject to the following conditions: {LIST ANY CONDITIONS NECESSARY FOR APPROVAL}.

Not Approve:

To deny the Preliminary Cedars Townhomes Phase 5 subdivision, due to the following reasons: {LIST ALL CAUSES FOR DENIAL}

Table:

To table the Preliminary Cedars Townhomes Phase 5 subdivision, and direct the developer to address the following issues: {LIST ALL ITEMS NECESSARY FOR FURTHER CONSIDERATION}

civilsolutionsgroup inc.
 CACHE VALLEY | P. 435.213.3762
 SALT LAKE | P. 801.674.1432
 UTAH VALLEY | P. 801.674.1432
 info@civilsolutionsgroup.net
 www.civilsolutionsgroup.net



PROJECT CONTACTS

1. DEVELOPER

LEGEND PROPOSED

CLIMATE WATER LINE (SEE SHOW ON PLAN)	W	CLIMATE WATER LINE (SEE SHOW ON PLAN)
STORM SEWER LINE (SEE SHOW ON PLAN)	SD	STORM SEWER LINE (SEE SHOW ON PLAN)
STORM WATER LINE (SEE SHOW ON PLAN)	SR	STORM WATER LINE (SEE SHOW ON PLAN)
GAS LINE	G	GAS LINE
SANITARY SEWER LINE (SEE SHOW ON PLAN)	SS	SANITARY SEWER LINE (SEE SHOW ON PLAN)
BURIED POWER LINE	P	BURIED POWER LINE
BURIED COMMUNICATION LINE	C	BURIED COMMUNICATION LINE
CENTRAL MAJOR	###	CENTRAL MAJOR
CENTRAL MINOR	###	CENTRAL MINOR
ASPHALT	####	ASPHALT
CATCH CURB AND GUTTER	=====	CATCH CURB AND GUTTER
SPILL CURB AND GUTTER	=====	SPILL CURB AND GUTTER
CONCRETE SIDEWALK	=====	CONCRETE SIDEWALK
WALKING STICK	=====	WALKING STICK

- 1. CUBIC METER WATER VALVE
- 2. FIRE HYDRANT
- 3. CUBIC METER WATER METER
- 4. SECONDARY WATER VALVE
- 5. SECONDARY WATER METER
- 6. STONE DRAIN MANHOLE
- 7. STONE DRAIN BOX
- 8. STONE DRAIN CHISE INLET BOX
- 9. SEWER MANHOLE
- 10. SENSE CLEANOUT
- 11. ELECTRICAL BOX
- 12. COMMUNICATION BOX
- 13. GAS METER
- 14. STREET LIGHT

1. 2021 CITY OF CEDAR HILLS DESIGN STANDARDS AND PUBLIC IMPROVEMENT SPECIFICATIONS.
2. 2025 MANUAL OF STANDARD SPECIFICATIONS AND MANUAL OF STANDARD PLANS, UTAH CHAPTER, AMERICAN PUBLIC WORKS ASSOCIATION (APWA).
3. THE SPECIFICATIONS MENTIONED IN ITEMS ONE AND TWO SHALL SUPERSEDE ANY CONFLICTING SPECIFICATIONS CONTAINED WITHIN THESE PLANS.

THE IMPROVEMENTS FOR THIS PROJECT HAVE BEEN REVIEWED BY THE CITY ENGINEER FOR GENERAL CONFORMANCE WITH THE REQUIREMENTS OF THE CITY SUBDIVISION ORDINANCE. THIS SET OF CITY-APPROVED DRAWINGS SHALL BE USED FOR CONSTRUCTION OF THE REQUIRED IMPROVEMENTS. THE DEVELOPER'S ENGINEER (WHOSE WHOLE STAMP IS ON THESE DRAWINGS) IS RESPONSIBLE FOR THE ENGINEERING DESIGN, DATA, AND RELATED FIELD INFORMATION. THE CONSTRUCTION CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE, FABRICATION PROCESSES, AND TECHNIQUES OF CONSTRUCTION. COORDINATION OF HIS OR HER WORK WITH THAT OF ALL OTHER TRADES, AND THE SATISFACTORY PERFORMANCE OF HIS OR HER WORK.

BY _____ DATE _____

DESIGNING OUR FUTURE

THESE PLANS AND SPECIFICATIONS ARE PROPERTY OF CIVIL SOLUTIONS GROUP, INC. AND SHALL NOT BE PHOTOCOPIED, RE-DRAWN, OR USED ON ANY OTHER PROJECT OTHER THAN THE PROJECT SPECIFICALLY DESIGNED FOR, WITHOUT WRITTEN PERMISSION. THE OWNERS AND ENGINEERS OF CIVIL SOLUTIONS GROUP, INC. DISCLAIM ANY LIABILITY FOR ANY CHANGES OR MODIFICATIONS MADE TO THESE PLANS OR THE DESIGN THEREON WITHOUT THEIR CONSENT. THESE PLANS ARE DRAWN TO GOVERN THE CONSTRUCTION OF A 16' X 16' SHED OF PAVEMENT. THESE PLANS ARE PRODUCED IN COLOR AND SHOULD BE PLOTTED AS A3.

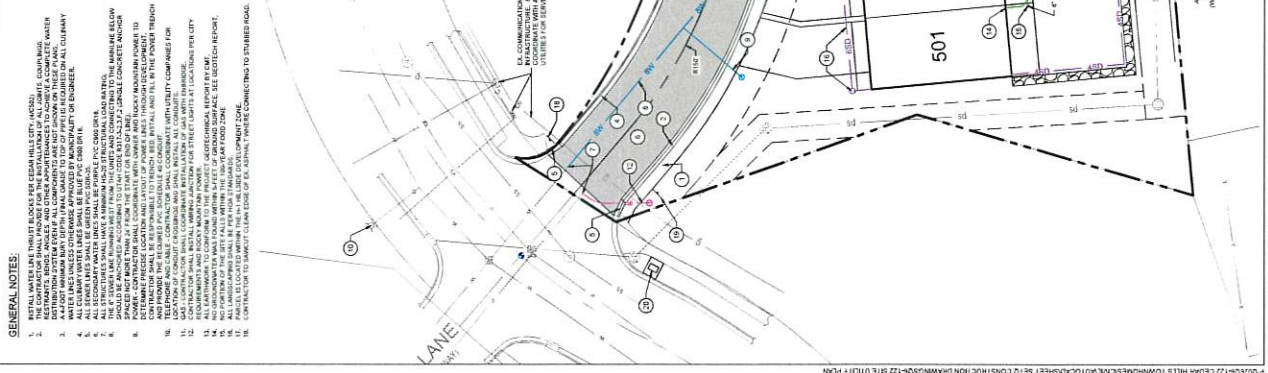
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PROJECT #	26-122
DRAWN BY	J. BLACK
PROJECT MANAGER	J. BLACK
ISSUED	06/27/2004

DRAFT

COVER

C001





THE CEDARS TOWNHOMES
PLAT E PHASE 5
10391 N MORGAN BLVD
CEDAR HILLS, UT 84062

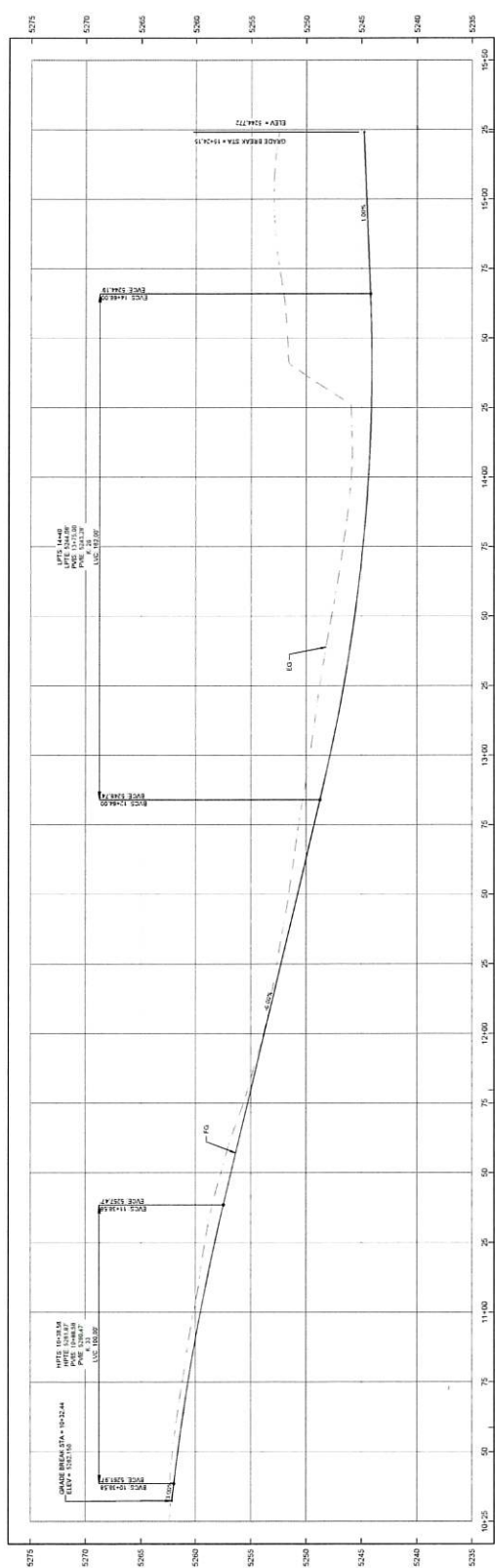
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PROJECT # 26-122
DRAWN BY J. BLACK
PROJECT MANAGER: J. BLACK
ISSUED 05/26/2028

DRAFT

PLAN AND
PROFILE

C301

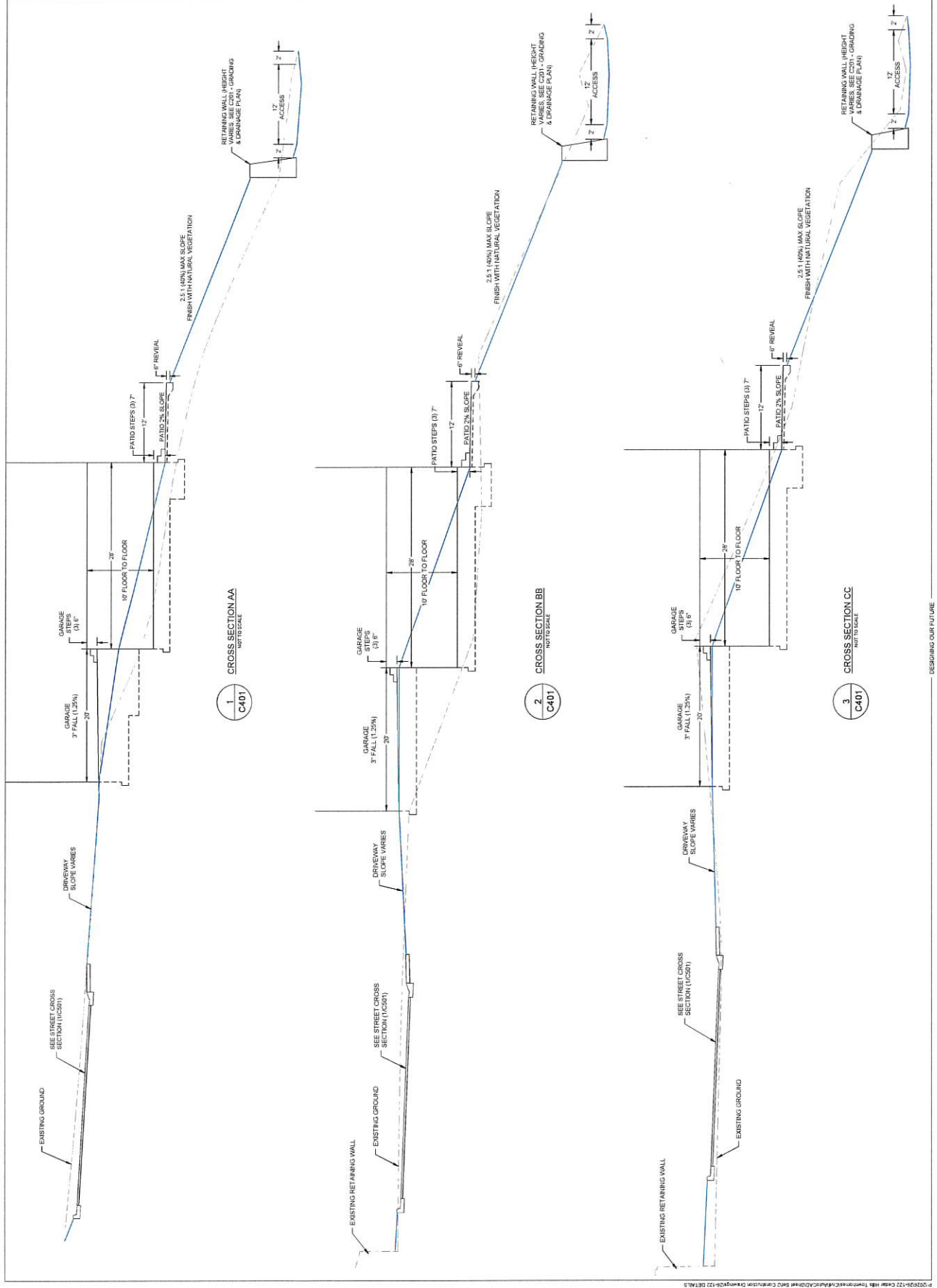


MARK	DATE	DESCRIPTION

PROJECT # 26122
 DRAWN BY J. BLACK
 PROJECT MANAGER J. BLACK
 ISSUED 05/26/2020

DRAFT

CROSS SECTIONS
C401



DESIGNING OUR FUTURE



DEPARTMENT OF THE ARMY

MARK	DATE	DESCRIPTION

PROJECT # 204122
 DRAWN BY J. BLACK
 PROJECT MANAGER J. BLACK
 ISSUED 05/09/2020

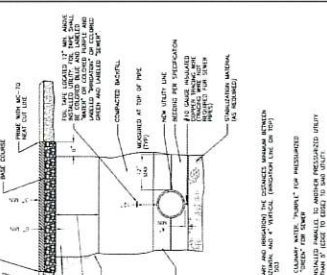
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DETAILS

C503


CEAR HILLS
 STANDARD
 DRAWING NO. 701.2
 DRAWING NO. 502

UTILITY INSTALLATION AND ROAD REPAIR



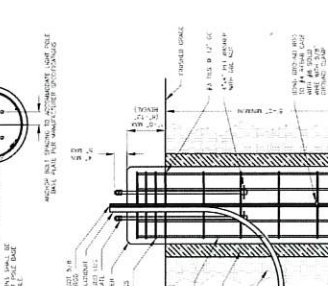
GENERAL NOTES:

- FOR ALL UTILITIES, EXISTING AND PROPOSED, THE DISTANCES BETWEEN UTILITIES SHALL BE MAINTAINED AS SHOWN ON THE PLAN.
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2 C503


CEAR HILLS
 STANDARD
 DRAWING NO. 701.2
 DRAWING NO. 503

STREET LIGHT FOUNDATION DETAIL



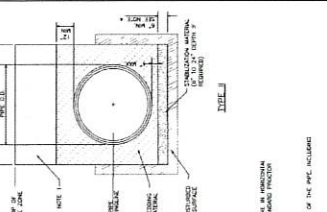
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CEAR HILLS
 STANDARD
 DRAWING NO. 701.1
 DRAWING NO. 501

PIPE BEDDING



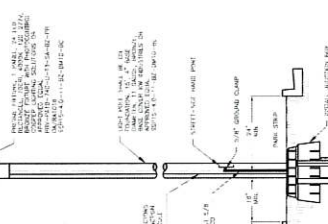
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CEAR HILLS
 STANDARD
 DRAWING NO. 701.1
 DRAWING NO. 504

STREET LIGHT DETAIL



GENERAL NOTES:

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The Cedars Townhomes Phase 5

Project Design Narrative

Project Overview

The proposed project is the fifth and final phase of The Cedars Townhomes Planned Unit Residential Development (PRUD), as defined in The Cedars Development Agreement approved in 2001. The 2.26-acre parcel is accessed from the existing intersection of Morgan Boulevard and Sage Vista Lane in Cedar Hills, Utah.

The proposal consists of extending the roadway and utilities currently stubbed to the site. The roadway is proposed as a publicly dedicated cul-de-sac street with a 100-foot diameter turnaround bulb. Fourteen townhome units are proposed in three separate buildings.

Per the City of Cedar Hills letter dated July 31, 2025, the parcel is zoned for townhome development, is vested for 14 units, and does not require additional water dedication for development.

Public Street

Through meetings and coordination with City staff, the proposed public street section consists of 28 feet of asphalt bordered by 2-foot curb and gutter on each side, for a total street ROW width of 32 feet.

A 4-foot sidewalk is proposed along the west side of the street only, because the townhomes front only this side of the street. The sidewalk will connect to the existing sidewalk at the intersection and will provide pedestrian access for the homes. A 14-foot sidewalk and public utility easement is proposed along the west side of the street for sidewalk use and typical utility systems, including water meters, gas, communications, and similar facilities.

The turnaround at the end of the street is proposed with a 100-foot diameter bulb. The length of the cul-de-sac street is less than 400 feet measured to the beginning of the bulb. The proposed maximum running slope of the street is 6 percent, which is less than the 8 percent maximum required by City code.

Due to the existing topography of the site, a continuous 4 percent cross-slope is proposed rather than a traditional crowned roadway section. This cross-slope also better matches the existing roadway connection at the intersection, where an existing continuous cross-slope of approximately 5 percent is present. The cross-slope transitions from the existing 5 percent to the proposed 4 percent within the first 20 feet. The maximum slope within the cul-de-sac bulb is 4 percent, consistent with City standards.

The street profile includes both a sag vertical curve and a crest vertical curve. Both vertical curves are a minimum of 100 feet long and meet or exceed the applicable AASHTO minimum K-values.

The proposed centerline radius of the only horizontal curve is 150 feet. Table 2-7 of the 2021 Cedar Hills Design Standards lists a minimum radius of 275 feet for major collectors, minor collectors, local streets, and rural streets. The City subdivision design checklist also lists a 250-foot minimum radius. A 150-foot radius is proposed for this site based on the following project-specific conditions:

1. Larger street classifications typically require larger horizontal curve radii, while lower-volume local streets are commonly permitted to use smaller radii. The Cedar Hills table applies the same radius to several street classifications, rather than scaling the radius by street type.
2. Adjacent cities allow smaller local-street radii. For example, Highland allows a 150-foot centerline radius, and Pleasant Grove allows a 100-foot radius measured at the inside edge, which is approximately equivalent to a 128-foot centerline radius.
3. The approved 2002 master plan uses a smaller radius, which influenced the parcel shape and the curved property line that the proposed street follows.

4. Phase 4 was approved and constructed with a townhome building in close proximity to the property line along which the Phase 5 street is planned. The closest unit is less than 10 feet from the property line, and its rear landscaping and fence extend into the Phase 5 parcel. A 150-foot radius allows the street to remain a safer and more comfortable distance from the existing structure while avoiding the existing fence and yard improvements.
5. Because the street is a low-speed, low-volume dead-end street, a 20 mph speed limit is proposed. Using a 20 mph design speed, a 0.27 side-friction factor, and the proposed 4 percent cross-slope, AASHTO calculations result in a minimum required radius of approximately 116 feet.

Retaining Walls

The overall layout and grading of the site follow the original vision of the master plan. This phase was partially mass graded during site preparation for the previous phases. An evident bench exists where the roadway was planned above the lower shelf where the homes would be located.

An existing retaining wall is located along the east property line adjacent to Phase 4, separating the Phase 4 home grades from the planned Phase 5 street grades. The proposed plans extend and continue this retaining wall to the end of the cul-de-sac. The wall begins at approximately 4 feet tall, tapers to approximately 1 foot tall at the end, and reaches a maximum height of approximately 11 feet near the middle.

Along the lower/western portion of the property, a second retaining wall is proposed to provide a drivable access road for City utility maintenance. This wall varies in height along its length, with an average height of approximately 6 feet and a maximum height of approximately 8 feet. The slope between the units and the lower retaining wall is proposed at a maximum slope of 2.5:1, consistent with Cedar Hills City Code Section 11-5-2(3)(B)(3)(f)-(g).

The walls are anticipated to be constructed of rockery and/or precast blocks. Typical wall drains will be installed and connected to the storm drain system. Final retaining wall engineering and detailing will be submitted with the final plat application.

Drainage

Runoff from the public street will be captured and conveyed by curb and gutter to a low point and curb inlet. Runoff from the majority of the driveways will flow into the street curb and gutter.

Due to the existing topography, the first four units have driveways that fall away from the street to a low point before sloping back upward to the garages. This is similar to the design of many driveways in previous phases of this development. The low point, or "valley," of each of these driveways will be sloped to the south side of the driveway, where runoff will be captured in localized yard drains and piped to the storm drain inlet in the cul-de-sac. Roof drainage from the buildings will also tie into this system.

Retaining wall drains will be piped and connected to the storm drainage system. The proposed drainage system ties into the existing storm drain system previously installed on the property within the proposed lower access road corridor.

Consistent with previous phases of this master-planned development, no onsite retention is anticipated. In addition, the geotechnical study discourages storage of stormwater on this site. No irrigation systems are proposed behind the units or near the slope. Limited irrigation will be used for shrubs within xeriscape areas along the street and driveways.

Utilities

The proposed culinary water system will connect to and extend from the stubbed 8-inch main at the intersection and will terminate with a fire hydrant at the turnaround. The proposed fire hydrant is less than 500 feet from the existing hydrant at the intersection.

Standard water service laterals and meters will serve each unit, with the meters placed in landscaped areas in front of the units. Because this project is part of the existing HOA, the common-area landscaping can be served by a single irrigation meter at the entrance of the project, from a service lateral connected to the existing stubbed mainline near the intersection.

Sewer laterals will exit the rear of the units on the downhill side and connect to a 6-inch sewer line paralleling the units before turning west and connecting to the existing 8-inch mainline in the lower access road. Cleanouts are proposed at the ends of the lines and between buildings.

The sewer segment running west and downhill to the existing main is proposed at an approximately 49 percent slope. To mitigate against axial and lateral displacement on steep sewers, Utah State code requires anchoring every 24 feet. Anchors will be provided in accordance with applicable code requirements, including an anchor at the midpoint of the approximately 40-foot line segment. All newly installed sewer beyond the existing 8-inch main will be privately owned and maintained.

Private utilities, including gas, power, and communications, have existing infrastructure at the project entrance and intersection for extension of service into the project. These designs will be coordinated with the applicable utility companies and constructed in accordance with their requirements.

The Cedars Townhomes Plat E Phase 5

Preliminary Plan

DRAINAGE ANALYSIS AND REPORT

May 26, 2026

Narrative

The hydrology and hydraulics for a proposed commercial development located in Cedar Hills, UT have been evaluated and based on the planned site layout, grading and proposed utilities. This drainage report is intended to summarize the surface hydrology and drainage hydraulics for the proposed site improvements. The overall hydrologic influence area has been determined based on existing topography, previous mapping and project plans and other pertinent reference material.

The proposed improvements will consist of the extension of a public street (Sage Vista Ln) into the site approximately 400 feet and terminating with a 100-foot diameter cul-de-sac bulb as the approved turn around. Three townhome buildings will be constructed along the western side of the extended roadway, with a total of 14 units. Standard 2-car driveways will connect the units to the public street. Retaining walls will be constructed where grading requires, including around the east side of the cul-de-sac bulb and along the utility access road at the bottom of the property.

The hydrology was evaluated utilizing a Rational Method model. Surface "C" values have been assumed based on the proposed development plan. The 10 Year event has been analyzed for pipe capacity.

The following discussions are intended to provide an overview of the site parameters assumed and utilized in the hydrology and hydraulic analyses performed. The analyses and input assumptions are based on the preliminary plans for this proposed development.

Existing Condition

Site Location

The image below provides a basic understanding of the physical location of the proposed development.



The parcel to be developed is more specifically described as Parcel 14:001:0063 and has an area of 2.25 acres. The existing parcel is bounded on the east, west, and partially on the north by existing homes, native undeveloped land on the south, and a public street stubbed into the site on the northeast.

Existing Ground Cover & Site Topography

The parcel sits at approximately 5,240 feet from sea level and has around 40 feet of relief from east to west. The parcel is undeveloped and contains native vegetation.

FEMA Flood Plain

The proposed site is not situated in an area mapped by FEMA as a flood risk hazard.

Proposed Site Hydrology & Hydraulics

Rainfall

Rainfall Intensities utilized in the hydrologic model have been referenced from ***F-2 Design Standards – updated*** document published on Cedar Hills City website. The tables below are from section 2.7.5.

The 10-year 15-minute design storm was used to analyze the proposed storm drainage pipe system.

7. Intensity-Duration-Frequency (IDF) Curve

The Intensity Duration Frequency (IDF) curve shown below shall be used for storm drainage calculations in Cedar Hills City.

Design Rainfall Depths (Inches) for the Given Duration

Duration	10 Year	25 Year	50 Year	100 Year
5 min	0.20	0.23	0.26	0.29
10 min	0.31	0.36	0.41	0.45
15 min	0.39	0.46	0.52	0.58
30 min	0.55	0.63	0.72	0.80
60 min	0.69	0.80	0.91	1.01
2 hours	0.84	0.98	1.11	1.24
3 hours	0.98	1.16	1.31	1.46
6 hours	1.33	1.59	1.80	2.00
12 hours	1.64	1.98	2.24	2.49
24 hours	1.97	2.38	2.69	2.99

Design Rainfall Intensities (inches per hour) for the Given Duration

Duration	10 Year	25 Year	50 Year	100 Year
5 min	2.40	2.76	3.12	3.48
10 min	1.86	2.16	2.46	2.70
15 min	1.56	1.84	2.08	2.32
30 min	1.10	1.26	1.44	1.60
60 min	0.69	0.80	0.91	1.01
2 hours	0.42	0.49	0.56	0.62
3 hours	0.33	0.39	0.44	0.49
6 hours	0.22	0.27	0.30	0.33
12 hours	0.14	0.17	0.19	0.21
24 hours	0.08	0.10	0.11	0.12

Sub-Basin Delineation & Hydraulics

The proposed site has been evaluated by two overall site sub-basins. The eastern area includes the proposed public street, small open space areas between the street and the east property line, driveways, front landscaping adjacent to driveways, and all roof drainage. The eastern area is 1.33 acres and was assigned a 0.85 runoff coefficient. This area will flow to the proposed curb inlet box in the cul-de-sac bulb via surface flow in the curb and gutters and yard drains that collect roof and yard runoff. The 10-year 15-minute flow has been calculated as 1.77 cfs. The 12" pipe connecting this inlet to the lower and existing system is sloped near 20% and has the capacity to convey the flow from the east area.

The western area includes the rear yards, slope down to the access lane, and the access lane itself. The western area is 0.63 acres and was assigned a 0.50 runoff coefficient. This area will flow into the proposed catch basin at the south end of the access lane. The 10-year 15-minute flow has been calculated as 0.50 cfs. The flow will combine with the east area's flow for a total of 2.26 cfs. The 12" pipe connecting the catch basin to the existing 15" storm drain system in the access road is sloped at 5.5% slope and has the capacity to convey the combined flows.

Sub Basin	Time of Concentration (min)	10-Yr Storm Intensity (in/hr)	Runoff Coefficient	Subbasin Area (ac)	Runoff Flow (cfs)
East Area	15	1.56	0.85	1.33	1.77
West Area	15	1.56	0.50	0.63	0.50

Pipe	Connections	Diameter (in)	Slope	Capacity	Demand	Test
1	Between SD #1 and SD #2	12	20.4%	17.43	1.77	OK
2	Between SD #2 and Ex SD #5	12	5.5%	9.05	2.26	OK

Phase 5 is the final phase of development related to The Cedars Townhomes PRUD. Consistent with all previous phases, no onsite storm drainage retention or detention systems are proposed. The collected storm water runoff will direct discharge into the previously designed, approved, and installed 24" drainage truckline that exists on the property. This existing line crosses the property from the intersection, down to the access road, and out to Avondale Dr.

We believe the intent of the The Cedars Townhomes drainage system was to avoid storage and infiltration of water on the hillside and to get it down to the lower and flatter areas where storage is feasible. As mentioned in the project geotechnical report by CMT, saturation of water on hillside developments is discouraged as it can be a large contributing factor to failed slopes.

All grading and drainage of the site is required to conform to the project geotechnical report. No grass lawns requiring sprinklers are proposed. The rear of the units will be finished as concrete patios and the small landscape areas along driveways will be finished with decorative rock and minimal shrubbery with drip irrigation.



ENGINEERING • GEOTECHNICAL • ENVIRONMENTAL (ESA I & II) •
MATERIALS TESTING • SPECIAL INSPECTIONS •
ORGANIC CHEMISTRY • PAVEMENT
DESIGN • GEOLOGY

GEOLOGIC HAZARDS & GEOTECHNICAL ENGINEERING STUDY

Cedar Hills Townhome Development

Sage Vista Lane and North Morgan Drive
Cedar Hills, Utah
CMT Project No. 104124

FOR:
Mr. Tanner Johnson
11273 South Pervenche Lane
South Jordan, Utah 84095

February 19, 2026 (Revised April 2, 2026)

CMT TECHNICAL SERVICES

February 19, 2026 (revised April 2, 2026)

Mr. Tanner Johnson
11273 South Pervenche Lane
South Jordan, Utah 84095

Subject: Geologic Hazards and Geotechnical Engineering Study
Cedar Hills Townhome Development
Sage Vista Lane and North Morgan Drive
Cedar Hills, Utah
CMT Project No. 104124

Mr. Johnson:

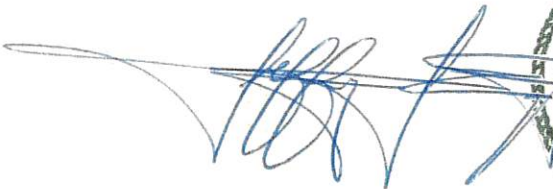
Submitted herewith is the report of our geologic hazards and geotechnical engineering study for the subject site. This report contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. It also contains recommendations to aid in the design and construction of the earth related phases of this project.

On December 17, 2025, a CMT Technical Services (CMT) staff professional was on-site and supervised the excavation of 3 test pits extending to depths of about 8 to 10 feet below the existing ground surface. We obtained soil samples during the field operations that we subsequently transported to our laboratory for further testing and observation.

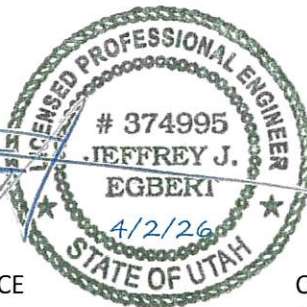
Conventional spread and/or continuous footings may be utilized to support the proposed residential structures, provided the recommendations in this report are followed. This report presents detailed discussions of design and construction criteria for this site.

We appreciate the opportunity to work with you at this stage of the project. CMT offers a full range of Geotechnical Engineering, Geological, Material Testing, Special Inspection services, and Phase I and II Environmental Site Assessments. With offices throughout Utah, Idaho, Arizona, Colorado and Texas, our staff is capable of efficiently serving your project needs. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-492-4132.

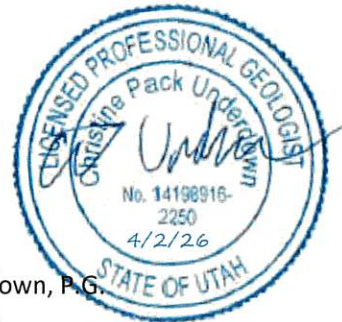
Sincerely,
CMT Technical Services



Jeffrey J. Egbert, P.E., LEED A.P., M. ASCE
Senior Geotechnical Engineer



Christine Underdown, P.G.
Project Geologist



WWW.CMTTECHNICALSERVICES.COM

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MANAGEMENT | INORGANIC CHEMISTRY | SPECIALTY LABS

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1.0 INTRODUCTION

1.1 General

This report presents the results of a geologic hazards and geotechnical engineering study for the proposed residential structures. The parcel is situated to the southwest of the intersection of Sage Vista Lane and North Morgan Drive in Cedar Hills, Utah, as shown in the **Vicinity Map** below.



FIGURE 1 – VICINITY MAP

1.2 Objectives, Scope and Authorization

The objectives and scope of our initial study were planned in discussions between Mr. Tanner Johnson, and Mr. Andy Harris of CMT Technical Services (CMT). CMT previously prepared a geotechnical report for the site, but we understand that additional geologic information and slope stability has been requested. In general, the objectives of this study were to provide supplemental geologic information and observations pertaining to geologic hazards and provide appropriate foundation, earthwork, slope stability and seismic recommendations to be utilized in the design and construction of the proposed townhomes.

In accomplishing these objectives, our scope of work included reviewing our previous field exploration and performing supplemental field exploration, which consisted of the excavating/logging/sampling of 3 test pits, reviewing previous laboratory testing results and performing supplemental laboratory testing on representative samples of the subsurface soils collected in the supplemental test pits, and conducting an office program, which consisted of correlating available data, performing geologic and engineering analyses, and preparing this summary report. This scope of work was authorized by returning a signed copy of our proposal dated November 11, 2025, and executed on November 13, 2025.

Our study was completed in accordance with the recommended guidelines in the Utah Geological Survey (UGS) Circular 128 (Bowman and Lund, 2020). The specific scope of work completed for this study included the following:

- A review and analysis of available, published geologic and topographic maps showing the location of the subject site and surrounding areas.
- A review and analysis of available aerial photographs and Lidar DEM models including the subject site and surrounding areas.
- A search of previous reports of similar studies in the area, as available.
- A field reconnaissance of the subject site and surrounding areas.
- A subsurface exploration consisting of excavating and logging three test pits on the lot.
- Completion of a site geologic map and geologic cross-section.
- Laboratory testing of selected soil samples obtained from the subsurface explorations to determine appropriate and applicable soil engineering properties.
- Engineering analysis, including slope stability.
- The preparation of this report summarizing our findings, conclusions, and recommendations.

1.3 Description of Proposed Construction

We understand that townhome residences will be constructed at the site that will likely be 1 to 2 stories high with walk-out basements. We anticipate maximum column loads will be 150,000 pounds, maximum wall loads will be 8,000 pounds per lineal foot, and maximum floor loads will be a uniform 100 psf. If the structural loading conditions are different than we have projected, please notify us so that any appropriate modifications to our conclusions and recommendations contained herein can be made.

Site development will require some earthwork in the form of cutting and filling. A site grading plan was not available at the time of this study, but we anticipate maximum cuts and fills will be on the order of 10 to 15 feet and less than 5 feet, respectively. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

1.4 Executive Summary

The most significant geological and geotechnical aspects regarding site development include the following:

1. The area outlined in red in **Figure 1** is not at risk from surface-fault-rupture, debris flow hazards, alluvial-fan or stream flooding, soil liquefaction or rock fall hazards. No mitigation measures in relation to these hazards are warranted.
2. Geologic observations, data, and analysis were used to produce the geologic cross-section (**Figure 9**) used in the slope stability modeling and other engineering analyses performed by the project geotechnical engineer. Geologic, stratigraphic, and hydrologic conditions identified during the course of this study, that could impact the stability of the slope at the site, were considered and are included in the geologic cross-sections and slope stability modelling, as identified and applicable.
3. The slope stability analysis performed for this study (**Section 8.0**) indicates the stability of the area proposed for development will meet static and seismic requirements, provided our recommendations are followed.
4. A CMT geotechnical engineer must assess that topsoil, non-engineered fills, and any debris, disturbed or otherwise unsuitable soils have been removed and natural soils/bedrock have been encountered prior to placing site grading fills, footings, slabs, and pavements.
5. Landscaping that requires supplemental irrigation is strongly discouraged within this development. Saturation from overwatering and/or a leaking sprinkler has resulted in landslides in the vicinity of this site.

In the following sections, detailed discussions pertaining to the site and subsurface descriptions, engineering geology, seismic setting, slope stability, earthwork, foundations, floor slabs, lateral resistance, and lateral pressure, and pavements are provided.

2.0 SITE CONDITIONS

The subject site is in the foothills on the northeast margin of Utah County within north-central Utah. The site lies to the west and south of the intersection of Morgan Boulevard and Sage Vista Lane in the city of Cedar Hills. The subject site slopes moderately downward to the west.

At the time the test pits were excavated the site consisted of a vacant lot vegetated with some grasses, weeds, and sage brush. Based upon aerial photos dating back to 1970 that are readily available on the internet, it appears the site was vacant range land up to 2002. Some grubbing and grading appears to have occurred on the site between 2003 and 2006. Overall, the site slopes moderately to steeply downward to the west. The site is bordered on the north, east, and west by residences, and on the south by vacant land (see **Vicinity Map** in **Section 1.1** above).

Topography at the site and adjacent areas are depicted in **Figure 2, Topographic Map**. Detailed slope conditions at the site and surrounding areas are depicted in **Figure 3, Lidar DEM**, and **Figure 4, Slope Map**.

3.0 OFFICE PROGRAM

3.1 Geologic and Tectonic Setting

The subject site is located on the southeast margin of Utah County in north-central Utah. Utah County generally is a deep, sediment-filled basin that is part of the Basin and Range Physiographic Province. The valley was formed by extensional tectonic processes during the Tertiary and Quaternary geologic time periods and is bordered by the Wasatch Mountain Range on the east and Antelope Island on the west.

Utah County is located within the Intermountain Seismic Belt, a zone of active tectonism and seismic activity extending from southwestern Montana to southwestern Utah. The active (evidence of movement within the past 10,000 years) Wasatch Fault Zone (WFZ) is part of the Intermountain Seismic Belt and extends from southeastern Idaho to central Utah along the western base of the Wasatch Mountain Range. The subject site lies within the Provo Segment of the Wasatch Fault Zone. DuRoss (2008) cites evidence of at least three ground-rupturing, large magnitude ($M \sim 6.5$ to 7.5) earthquakes on the Provo Segment during the last 10,000 years. The most recent of these events occurred 600 ± 350 years ago. DuRoss (2008) reports the mean vertical-displacement per each of these large magnitude earthquakes on the Provo Segment to be 2.9 meters (9.5 feet).

Much of northwestern Utah, including Utah County, was also previously covered by the Pleistocene age Lake Bonneville. Utah Lake, which currently occupies much of the western portion of the valley, is a remnant of this ancient freshwater lake. Lake Bonneville reached a high-stand elevation of approximately 5,092 feet above sea level at between 18,500 and 17,400 years ago. Approximately 17,400 years ago, the lake breached its basin in southeastern Idaho and quickly dropped by almost 300 feet as water drained into the Snake River. Following this catastrophic release, the lake level continued to drop slowly over time, primarily driven by drier climatic conditions, until reaching the current levels of Utah Lake and the larger Great Salt Lake to the north. Shoreline terraces formed at the high-stand elevation of the lake and several subsequent lower lake levels are visible in places on the mountain slopes surrounding the valley. Much of the sediment within Utah County was deposited as lacustrine sediments during both the transgressive (rise) and regressive (fall) phases of Lake Bonneville.

3.2 Geologic and Hazard Mapping

The geology of the UGS 30x60 Provo, Utah Quadrangle, including the location of the subject site, has been mapped by Constenius (2011). The surficial geology of the subject site and adjacent properties is mapped as "Younger Alluvial Fan" (Map Unit Qafy) dated to be Holocene to late Pleistocene and "Landslides" (Map Unit Qms) dated to be Holocene.

Unit Qafy is described in the referenced mapping as *"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."*

Unit Qms is described in the referenced mapping as *"Poorly sorted clay- to boulder-sized material; generally characterized by hummocky topography, main and internal scarps, and chaotic bedding in displaced bedrock; includes slump and flow deposits; morphology becomes subdued with age; bedrock units most susceptible to*

mass movements include the Tertiary Moroni Formation (Tm), Keetley Volcanics (Tk, Tkt), volcanoclastic rocks of Strawberry 5 Valley (Tvc), Uinta Formation (Tu and Tucg), Currant Creek Formation (TKc), clay-rich Mesozoic rocks (Kmv, TRa), Manning Canyon Shale (Mmc), and shaly strata in the Great Blue Limestone (Mgb)."

A portion of the geologic map completed by Constenius (2011), including the subject site and vicinity, is attached as **Figure 5, Regional Geologic Map**.

3.3 Aerial Photographs and LiDAR Imagery

Aerial photographs evaluated for this study UGS (2021b) are listed in the following table.

Table of Reviewed Aerial Photographs from Utah Geological Survey Collection (UGS, 2021b)

PHOTO	PROJECT	DATE	ROLL	LINE	FRAME	SCALE	SOURCE
WF-S 5-32	1970 WF-S	1970	5	2	32	1:6,000	Cluff et al., 1970
WF-S 4-121	1970 WF-S	1970	4	8	121	1:12,000	Cluff et al., 1970
598-48	614180	1998	598	25	48	1:15,840	USFS 1998

*UGMS – Utah Geological and Mineral Survey

The reviewed aerial photos listed in the table above were taken prior to the development of the Cedar Hills Townhome Subdivision. At the time of the photos, several unpaved roads crossed the foothill terrain in the vicinity of the subject lot, but the majority of the area, including the subject lot, was undeveloped. Findings from our evaluation of the listed aerial photos, viewed as stereo pairs where possible reveal a drainage ravine trending west-northwest just north of the lot. The ravine is well-incised adjacent to the site and extends from the steeper mountain slope to the east.

The aerial photos reveal no surface lineaments or other features (e.g. vegetation lines, linear slope breaks, escarpments, etc.) at, adjacent to, or projecting toward the subject site indicative of potential surface-faulting. A west-facing, north to northeast-trending scarp associated with surface rupture along the mapped (UGS, 2021a) fault trace about 450± feet to the east is clearly discernable in the reviewed photos.

The reviewed aerial photos reveal the presence of hummocky terrain and concave, lobate deposits in the general vicinity of the subject site, particularly up-slope to the northeast and east, which is indicative of past landside activity. No evidence of historical slope movement, including hummocky and stair-step terrain, grabens, head-scarps, pressure ridges, displaced landforms, lobate deposits, convex/concave surface morphology, etc., was discernable on or adjacent to the subject site.

The reviewed aerial photos reveal no evidence of past rock fall runout or deposition (e.g. boulders or rock debris) on or near the subject site. No evidence of active alluvial fan or debris flow processes (e.g. flow levees, lobate deposits, convex surface morphology, damage to vegetation, etc.) is discernable on or near the subject site.

Modern Lidar (Light Detection and Ranging) imagery¹ used to build digital elevation models (DEM) of the subject site and surrounding areas was also reviewed. A portion of the reviewed Lidar DEM image from the USGS National Map Viewer is included in **Figure 3**. In the image the darkest shades represent generally southeast-facing slopes while the lightest shades represent generally northwest-facing slopes.

3.4 Previous Reports

CMT previously completed a geotechnical report² for the subject lot, which is incorporated into this report and presents additional geologic information and slope stability analysis. We are not aware of other reports being completed for the subject site or immediate vicinity.

4.0 FIELD PROGRAM

4.1 Subsurface Exploration

On December 17, 2025, CMT representatives were on-site to oversee the excavation and logging of three test pits. The approximate location of the test pits is shown in **Figure 2, Topographic Map**, attached.

Representative soil samples were collected from the test pits by obtaining disturbed "grab" samples. The samples were sealed in plastic bags prior to transport to the laboratory.

The subsurface soils encountered in the test pits were classified in the field based upon visual and textural examination, logged and described in general accordance with ASTM³ D-2488. These field classifications were supplemented by subsequent examination and testing of select samples in our laboratory. Graphical representations of the subsurface conditions encountered are presented on each individual Test Pit Log, **Figures 6 and 7** included in the Appendix.

Upon completion of logging and sampling, the test pits were backfilled with the excavated soils. When backfilling, minimal to no effort was made to compact the backfill and no compaction testing was performed. Thus, the test pit backfill is considered undocumented fill and settlement of the backfill in the test pits over time should be anticipated.

4.2 Subsurface Soils

At the locations of the test pits, we encountered Silty-Clayey GRAVEL (GC-GM) with sand and Clayey GRAVEL (GC) with sand extending to the maximum depths explored of approximately 8 to 10 feet below the surface. The natural gravel soils were slightly moist to moist, tan to red-brown in color, weakly cemented and estimated

¹ From: State of Utah Acquired LiDAR Data – Wasatch Front (Raster) database through www.opentopography.org, and <https://apps.nationalmap.gov/viewer/>

² "Geotechnical Engineering Study, Cedar Hills Townhomes, Morgan Boulevard and Sage Vista Lane, Cedar Hills, Utah", CMT Project No. 16163, May 24, 2021.

³American Society for Testing and Materials

to be medium dense to hard. They are also projected to exhibit moderately high strength and low compressibility characteristics.

For a more descriptive interpretation of subsurface conditions, please refer to the test pit logs, **Figures 6 and 7**, which graphically represent the subsurface conditions encountered. The lines designating the interface between soil types on the logs generally represent approximate boundaries - in situ, the transition between soil types may be gradual.

4.3 Groundwater

We did not encounter groundwater at the time of our field explorations within the maximum depth explored of about 10 feet below the existing ground surface, and do not anticipate that groundwater will affect the proposed construction. Additionally, no springs or seeps were observed on the surface of the subject lot or adjacent properties.

Groundwater levels can fluctuate multiple feet seasonally. Numerous other factors such as heavy precipitation, landscaping irrigation, and other unforeseen factors may also influence ground water elevations at the site. The detailed evaluation of these and other factors, which may be responsible for ground water fluctuations, is beyond the scope of this study.

4.4 Site Subsurface Variations

Based on the results of the subsurface explorations and our experience, variations in the continuity and nature of subsurface conditions should be anticipated. Due to the heterogeneous characteristics of natural soils, care should be taken in interpolating or extrapolating subsurface conditions between or beyond the exploratory locations.

Also, after completing the logging and sampling, the test pits were backfilled with the excavated soils but minimal to no effort was made to compact these soils. Thus, the test pit backfill is considered undocumented fill and settlement of the backfill in the test pits over time should be anticipated.

5.0 GEOLOGIC HAZARDS

A site geologic map was prepared for the location of the subject lot and surrounding area based on the findings of this study as well as incorporating data from the mapping completed by Constenius and others (2011). The site geologic conditions are shown in **Figure 5, Regional Geologic Map**. A geologic cross-section depicting interpreted subsurface conditions along cross-section line A-A' at the location shown in **Figure 2** is included as **Figure 9, Geologic Cross-Section A-A'**. The geologic cross-section was used by the project geotechnical engineer in the slope stability analysis part of the study (see **Section 8.0**).

5.1 Surface-Fault-Rupture

No surface fault traces are shown on the referenced geologic map crossing or projecting toward the subject site. The nearest mapped active (Holocene) fault trace is the Provo segment of the Wasatch fault located about 450 feet east of the site. We conclude that the site is not at risk for fault rupture.

5.2 Landslides

Based on the geologic mapping by Constenius and others (2011), the alluvial-fan deposits at the site are interpreted to overlie landslide/megabreccia deposits followed by bedrock consisting of the lower Pennsylvanian? and upper Mississippian age Great Blue Limestone. Both the landslide/megabreccia deposits and the underlying limestone are known to be potentially unstable with regards to localized landslide reactivations and slope movements in the Cedar Hills area.

The near-surface alluvial-fan deposits exposed in the trench on the subject lot did not display evidence of slope movement including disturbed or convoluted bedding, shearing, or faults.

The geologic cross-section shown in **Figure 9** was utilized by the project geotechnical engineer in the slope stability analysis for the site and the proposed development thereon (**Section 8.0**). As shown in **Figure 9**, CMT interprets the native soils underlying the fill at the site to consist of alluvium (Qafy) overlying landslide deposits (Qms).

The slope stability analysis performed for this study indicates the stability of the area proposed for development will meet static and seismic requirements, provided our recommendations are followed.

5.3 Debris Flow

The test pits on the subject lot exposed alluvial-fan deposits; however, the subject lot is not located on an active alluvial-fan based on existing topography and drainage configurations in the vicinity. An unnamed drainage to the north draining the mountain slope to the east currently drains away from the subject lot to the north and northwest. Two smaller unnamed drainages to the south currently drain to the south and southwest, away from the lot. Based on these observations, the subject lot is not at risk from debris flow and alluvial-fan flooding hazards.

5.4 Stream or Fan Flooding

The subject site is not in a mapped flood zone (FEMA, 2025). The site is not on an active alluvial fan or within an active drainage channel. The subject lot is not located in, adjacent to, or at the mouth of a stream drainage and is not at risk from stream flooding.

5.5 Liquefaction

The site is located within an area designated by the Utah Geologic Survey (1994) as having "Very Low" liquefaction potential. Liquefaction is defined as the condition when saturated, loose, sandy soils lose their

support capabilities because of excessive pore water pressure which develops during a seismic event. Clayey soils, even if saturated, will generally not liquefy during a major seismic event.

Subsurface soils encountered consisted of medium dense to hard silty-clayey gravel with sand and cobbles soils, while groundwater was not encountered. These conditions indicate that liquefaction of these soils is not likely to occur.

5.6 Rock Fall

There are existing structures and no outcrops or potential rock fall sources uphill of the site. No obvious rock fall clasts were observed on the surface of the subject lot. In our opinion, the site is not at risk for rock fall hazards.

6.0 SEISMICITY

6.1 Site Class

Utah has adopted the International Building Code (IBC) 2021, which determines the seismic hazard for a site based upon 2014 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available based on latitude and longitude coordinates (grid points). For site class definitions, IBC 2021 Section 1613.2.2 refers to Chapter 20, Site Classification Procedure for Seismic Design, of ASCE⁴ 7-16, which stipulates that the average values of shear wave velocity, blow count and/or shear strength within the upper 100 feet (30 meters) be utilized to determine seismic site class. Based on average shear wave velocity data within the upper 30 meters ($V_{s,30}$) published by McDonald and Ashland⁵, the subject site is located within unit description QafoU, which was assigned a log-mean $V_{s,30}$ of 502 meters per second (1647 feet per second). Thus, it is our opinion the site best fits Site Class C – Very Dense Soil and Soft Rock, which we recommend for seismic structural design.

6.2 Seismic Design Category

The 2014 USGS mapping utilized by the IBC provides values of peak ground, short period and long period spectral accelerations for the Site Class B/C boundary and the Risk-Targeted Maximum Considered Earthquake (MCE_R). This Site Class B/C boundary represents average bedrock values for the Western United States and must be corrected for local soil conditions. The Seismic Design Categories in the International Residential Code (IRC 2021 Table R301.2.2.1.1) are based upon the Site Class as addressed in the previous section. For Site Class C at site grid coordinates of 40.4201 degrees north latitude and -111.7480 degrees west longitude, S_{DS} is 1.082 and the **Seismic Design Category** is D₂.

⁴American Society of Civil Engineers

⁵McDonald, G.N. and Ashland, F.X., 2008, "Earthquake Site-Conditions Map for the Wasatch Front Urban Corridor, Utah," Utah Geological Survey Special Study 125, 41 pp.

7.0 LABORATORY TESTING

Selected samples of the subsurface soils were subjected to various laboratory tests to assess pertinent engineering properties, as follows:

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Atterberg Limits, ASTM D-4318, Plasticity and workability
3. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis
4. Direct Shear Test, ASTM D-3080, Shear strength parameters

A direct shear test was performed on two representative samples of the soils encountered in the test pits. Due to the granular nature of the soil, the sample was screened through a No. 4 sieve and the portion passing that sieve was used for the direct shear test. For the direct shear test, the sample was evenly loaded/consolidated within the test ring and saturated immediately after the load was applied; after consolidation was completed, the sample was sheared horizontally while measuring the shearing force and the horizontal and vertical deformations of the sample. This process was repeated twice while increasing the normal load imposed on the sample. Detailed results of the tests are maintained within our files and can be transmitted to you, if so desired.

Laboratory test results are presented in the following **Lab Summary Table**:

LAB SUMMARY TABLE

TEST PIT	DEPTH (feet)	SOIL CLASS	SAMPLE TYPE	MOISTURE CONTENT(%)	GRADATION			DIRECT SHEAR phi (°), C (psf)
					GRAV.	SAND	FINES	
TP-2	8	GC	Bag	8	54	18	28	30.7, 725
TP-3	8	GC	Bag	10	34	29	37	42.3, 0

8.0 STABILITY

8.1 Stability Parameters

To provide shear strength parameters for stability analysis, direct shear testing was performed as described above. Note that both direct shear tests were performed on samples obtained from the landslide (Qms) deposit. Accordingly, we used the following parameters in the stability analyses:

MATERIAL	INTERNAL FRICTION ANGLE (deg)	APPARENT COHESION (psf)	UNIT WEIGHT (pcf)
Alluvial Material (Qafy)	30.7	725	140
Landslide Material (Qms)	30.7	0	140

For the seismic analysis, a modified peak horizontal ground acceleration (PGA_M) of $0.74g$ was obtained after adjusting for Site Class C at the site (see **Section 6.0**). The pseudostatic coefficient for the global seismic stability analyses was obtained using roughly half (0.37) of the PGA_M .

8.2 Analysis

Using the input parameters presented above, we evaluated the global stability of the site using limit equilibrium (Simplified Bishop) methods via the computer program *SLIDE2* (version 9). The configuration we analyzed consisted of geologic cross section A-A' (see **Figure 9**) through the site at the location shown on **Figure 2**. The cross section was produced by a CMT geologist using information obtained from the test pits, existing topographic conditions, and the referenced geologic mapping by McKean and Anderson (2024). Groundwater was not encountered and is anticipated to be greater than 20 feet below the ground surface, thus a phreatic surface was not incorporated in the stability analysis. A load of 2,000 psf was placed where the approximate proposed basement/structure location will be.

The minimum required factors of safety (FS) are 1.5 for static conditions, and 1.0 for seismic (pseudostatic) conditions. The results of our analysis indicate adequate static and seismic FS for the site, provided our recommendations are followed. The stability graphs and input/output data are attached.

9.0 SITE PREPARATION AND GRADING

9.1 General

All deleterious materials should be stripped from the site prior to commencement of construction activities. This includes vegetation, topsoil, loose and disturbed soils, etc. When stripping and grubbing, topsoil should be distinguished by the apparent organic content and not solely by color.

Approximately 2 feet of fill soil was encountered on the surface at the locations of test pits TP-2 and TP-3 and a few random soils piles were also observed. Based upon past aerial photos of the site there is likely fill soils of unknown depth and extent on other areas of the site. These soils should be considered undocumented/non-engineered and unsuitable for support of footings and floor slabs.

Following clearing and grubbing the subgrade should be observed by a CMT geotechnical engineer to assess that suitable natural soils have been exposed and any deleterious materials, loose and/or disturbed soils have been removed, prior to placing site grading fills, footings, slabs, and pavements.

Fill placed over large areas to raise overall site grades can induce settlements in the underlying natural soils. If more than 5 feet of site grading fill is anticipated over the natural ground surface, we should be notified to assess potential settlements and provide additional recommendations as needed. These recommendations may include placement of the site grading fill far in advance to allow potential settlements to occur prior to construction.

9.2 Temporary Excavations

Excavations deeper than 10 to 15 feet are not anticipated at the site. Groundwater was not encountered within the depths explored, approximately 8 to 10 feet at the time of our field explorations and thus is not anticipated to be encountered in excavations.

The natural soils encountered at this site predominantly consisted of gravel. For sandy/gravelly (cohesionless) soils, temporary construction excavations not exceeding 4 feet in depth should be no steeper than one-half horizontal to one vertical (0.5H:1V). For excavations up to 8 feet and above groundwater, side slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult to maintain, and will require very flat side slopes and/or shoring, bracing and dewatering.

All excavations must be inspected periodically by qualified personnel. If any signs of instability or excessive sloughing are noted, immediate remedial action must be initiated. All excavations should be made following OSHA safety guidelines.

9.3 Fill Material

Following are our recommendations for the various fill types we anticipate will be used at this site:

FILL MATERIAL TYPE	DESCRIPTION RECOMMENDED SPECIFICATION
Structural Fill	Placed below structures, flatwork and pavement. Well-graded sand/gravel mixture, with maximum particle size of 4 inches, a minimum 70% passing 3/4-inch sieve, a maximum 20% passing the No. 200 sieve, a maximum Liquid Limit of 30 and a maximum Plasticity Index of 10.
Site Grading Fill	Placed over larger areas to raise the site grade. Sandy to gravelly soil, with a maximum particle size of 6 inches, a minimum 70% passing 3/4-inch sieve, a maximum 50% passing No. 200 sieve, a maximum Liquid Limit of 35 and a maximum Plasticity Index of 15.
Non-Structural Fill	Placed below non-structural areas, such as landscaping. On-site soils or imported soils, with a maximum particle size of 8 inches, including silt/clay soils not containing excessive amounts of degradable/organic material (see discussion below).
Stabilization Fill	Placed to stabilize soft areas prior to placing structural fill and/or site grading fill. Coarse angular gravels and cobbles 1 inch to 8 inches in size. May also use 1.5- to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i, or equivalent (see Section 9.6).

On-site gravel soils may be suitable for use as structural fill, if processed to meet the requirements given above, and may also be used in site grading fill and non-structural fill situations.

All fill material should be approved by a CMT geotechnical engineer prior to placement.

9.4 Fill Placement and Compaction

The various types of compaction equipment available have their limitations as to the maximum lift thickness that can be compacted. For example, hand operated equipment is limited to lifts of about 4 inches and most

“trench compactors” have a maximum, consistent compaction depth of about 6 inches. Large rollers, depending on soil and moisture conditions, can achieve compaction at 8 to 12 inches. The full thickness of each lift should be compacted to at least the following percentages of the maximum dry density as determined by ASTM D-1557 (or AASHTO⁶ T-180) in accordance with the following recommendations:

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
Beneath an area extending at least 4 feet beyond the perimeter of structures, and below flatwork and pavement (applies to structural fill and site grading fill) extending at least 2 feet beyond the perimeter	0 to 5	95
	5 to 10	98
Site grading fill outside area defined above	0 to 5	92
	5 to 10	95
Utility trenches within structural areas	--	96
Roadbase and subbase	-	96
Non-structural fill	0 to 5	90
	5 to 10	92

Fills greater than 10 feet thick are not anticipated at the site. For best compaction results, we recommend that the moisture content for structural fill/backfill be within 2% of optimum. Field density tests should be performed on each lift as necessary to verify that proper compaction is being achieved.

9.5 Utility Trenches

For the bedding zone around the utility, we recommend utilizing sand bedding fill material that meets current APWA⁷ requirements.

All utility trench backfill material below structurally loaded facilities (foundations, floor slabs, flatwork, parking lots/drive areas, etc.) should be placed at the same density requirements established for structural fill in the previous section.

Most utility companies and local governments are requiring Type A-1a or A-1b (AASHTO Designation) soils (sand/gravel soils with limited fines) be used as backfill over utilities within public rights of way, and the backfill be compacted over the full depth above the bedding zone to at least 96% of the maximum dry density as determined by AASHTO T-180 (ASTM D-1557). The natural gravel soils at this site may meet these specifications.

Where the utility does not underlie structurally loaded facilities and public rights of way, on-site fill and natural soils may be utilized as trench backfill above the bedding layer, provided they are properly moisture conditioned and compacted to the minimum requirements stated above in **Section 9.4**.

⁶ American Association of State Highway and Transportation Officials

⁷ American Public Works Association

9.6 Stabilization

The likelihood of disturbance or rutting and/or pumping of the existing natural soils is a function of the load applied to the surface, as well as the frequency of the load. Consequently, rutting and pumping can be minimized by avoiding concentrated traffic, minimizing the load applied to the surface by using lighter equipment and/or partial loads, by working in drier times of the year, or by providing a working surface for the equipment. Rubber-tired equipment particularly, because of high pressures, promotes instability in moist/wet, soft soils.

If rutting or pumping occurs, traffic should be stopped and the disturbed soils should be removed and replaced with stabilization material. Typically, a minimum of 18 inches of the disturbed soils must be removed to be effective. However, deeper removal is sometimes required.

To stabilize soft subgrade conditions (if encountered), a mixture of coarse, clean, angular gravels and cobbles and/or 1.5- to 2.0-inch clean gravel should be utilized. This coarse material may be placed and worked into the soft soils until firm and non-yielding, or the soft soils may be removed an additional 18 inches (minimum) and backfilled with clean stabilizing angular gravels/cobbles. A test area should be implemented to achieve a proper stabilization strategy. Often the amount of gravelly material can be reduced with the use of a geotextile fabric such as Mirafi RS280i, or equivalent. Its use will also help avoid mixing of the subgrade soils with the gravelly material. After excavating the soft/disturbed soils, the fabric should be spread across the bottom of the excavation and up the sides a minimum of 18 inches. Otherwise, it should be placed in accordance with the manufacturer's recommendation, including proper overlaps. The gravel material can then be placed over the fabric in compacted lifts as described above.

10.0 FOUNDATION RECOMMENDATIONS

The following recommendations have been developed on the basis of the previously described project characteristics, the subsurface conditions observed in the field and the laboratory test data, as well as common geotechnical engineering practice.

10.1 Foundation Recommendations

Based on our geotechnical engineering analyses, the proposed structures may be supported upon conventional spread and/or continuous wall foundations placed on undisturbed natural gravel soils and/or on structural fill extending to natural gravel soils. Footings may be designed using a net bearing pressure of 2,500 psf. The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above lowest adjacent final grade, thus the weight of the footing and backfill to lowest adjacent final grade need not be considered. The allowable bearing pressure may be increased by 1/3 for temporary loads such as wind and seismic forces.

We also recommend the following:

1. Exterior footings subject to frost should be placed at least 30 inches below final grade.
2. Interior footings not subject to frost should be placed at least 12 inches below grade.
3. Continuous footing widths should be maintained at a minimum of 18 inches.
4. Isolated footings should be a minimum of 24 inches wide.

10.2 Installation

Under no circumstances shall foundations be placed on undocumented fill, topsoil with organics, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. If these or other unsuitable soils are encountered, they must be completely removed and replaced with properly compacted structural fill.

Deep, large roots may be encountered where trees and larger bushes are located or were previously located at the site; such large roots should be removed. The base of footing excavations should be observed by a CMT geotechnical engineer to assess if suitable bearing soils have been exposed.

All structural fill should meet the requirements for such and should be placed and compacted in accordance with **Section 9.4** above. The width of structural replacement fill below footings should be equal to the width of the footing plus 1 foot for each foot of fill thickness. For instance, if the footing width is 2 feet and the structural fill depth beneath the footing is 2 feet, the fill replacement width should be 4 feet, centered beneath the footing.

The minimum thickness of structural fill below footings should be equivalent to one-third the thickness of structural fill below any other portion of the foundations. For example, if the maximum depth of structural fill is 6 feet, all footings for the new structure should be underlain by a minimum 2 feet of structural fill.

10.3 Estimated Settlement

Foundations designed and constructed in accordance with our recommendations could experience settlement, but we anticipate that total settlements of footings founded as recommended above will not exceed 1 inch, with differential settlements on the order of 0.5 inches over a distance of 25 feet. We expect approximately 50% of the total settlement to initially take place during construction.

10.4 Lateral Resistance

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the supporting soils. In determining frictional resistance, a coefficient of 0.40 for natural gravel soils and structural fill may be utilized for design. Passive resistance provided by properly placed and compacted structural fill above the water table may be considered equivalent to a fluid with a density of 425 pcf. A combination of passive earth resistance and friction may be utilized if the passive resistance component of the total is divided by 1.5.

11.0 LATERAL EARTH PRESSURES

We project that basement walls up to 8 feet tall will be constructed at this site. The lateral earth pressure values given below are for a backfill material that will consist of drained sand/gravel placed and compacted in accordance with the recommendations presented herein. If other soil types will be used as backfill, we should be notified so that appropriate modifications to these values can be provided, as needed.

The lateral pressures imposed upon subgrade facilities will depend upon the relative rigidity and movement of the backfilled structure. Following are the recommended lateral pressure values, which also assume that the soil surface behind the wall is horizontal and that the backfill within 3 feet of the wall will be compacted with hand-operated compacting equipment.

CONDITION	STATIC (psf/ft)*	SEISMIC (psf/ft)**
Active Pressure (wall is allowed to yield, i.e. move away from the soil, with a minimum 0.001H movement/rotation at the top of the wall, where "H" is the total height of the wall)	35	40
At-Rest Pressure (wall is not allowed to yield)	55	N/A
Passive Pressure (wall moves into the soil)	425	255

*Equivalent Fluid Pressure (applied at 1/3 Height of Wall)

**Equivalent Fluid Pressure (added to static and applied at 1/3 Height of Wall)

12.0 FLOOR SLABS

Properly engineered floor slabs should be established upon uniform, compacted bearing soils comprised of undisturbed uniform natural gravel soils or on structural fill extending to undisturbed natural gravel soils (similar to foundations). Under no circumstances shall floor slabs be established directly on any topsoil, undocumented fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. Floor slabs should be properly designed by a structural engineer to accommodate anticipated loads.

To facilitate curing of the concrete, we recommend that floor slabs be directly underlain by at least 4 inches of moist aggregate base or bedding material, or "free-draining" fill such as "pea" gravel or 3/4-inch to 1-inch minus, clean, gap-graded gravel. To help control normal shrinkage and stress cracking, the floor slab thickness and joint layout should be designed by a qualified engineer. Design provisions should address the following items:

1. Adequate reinforcement for the anticipated floor loads;
2. Using smooth bar reinforcement for load transfer through interior floor joints;
3. Portland cement concrete mix design selection to minimize shrinkage concerns;
4. Joint layout and spacing in accordance with ACI⁸ or other local standards; and
5. Properly isolate floor slabs from foundations and other structural elements per recommendations provided by ACI 302 (Guide to Concrete Floor and Slab Construction).

13.0 DRAINAGE RECOMMENDATIONS

13.1 Surface Drainage

It is critically important to the long-term performance of foundations and floor slabs, and maintaining slope stability, that water not be allowed to collect near the foundation walls and infiltrate into the underlying soils. We recommend the following:

1. All areas around each structure should be sloped to provide drainage away from the foundations. We recommend a minimum slope of 4 inches in the first 10 feet away from the structure. This slope should be maintained throughout the lifetime of the structure.
2. All roof drainage should be collected in rain gutters with downspouts designed to discharge at least 10 feet from the foundation walls or well beyond the backfill limits, whichever is greater.
3. Adequate compaction of the foundation backfill should be provided. We suggest a minimum of 90% of the maximum laboratory density as determined by ASTM D-1557. Water consolidation methods should not be used under any circumstances.
4. The use of landscaping that requires supplemental irrigation is strongly discouraged. Overwatering and/or a broken or leaking sprinkler has resulted in landslides in the vicinity of this site.
5. Surface drainage should be controlled and not allowed to discharge onto neighboring property or cause erosion of the existing slope.
6. Other precautions that may become evident during construction.

13.2 Foundation Subdrains

The soils encountered at this site primarily consisted of gravel (GC), while groundwater was not encountered and is anticipated to be deeper than 20 feet below the site. Thus, it is our opinion that perimeter foundation subdrains are not needed.

⁸ American Concrete Institute

14.0 PAVEMENTS

The pavement area must be prepared as discussed above in **Section 9.1**. Under no circumstances shall pavements be established over topsoil, unprepared undocumented fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

Proper preparation of undocumented fill and disturbed soils beneath pavement areas shall consist of removing the upper 12 inches for asphalt pavement, scarifying the exposed surface to a minimum depth of 8 inches, moisture conditioning as needed, and recompacting the scarified soils in place to the requirements for structural fill. The removed soils, if free of debris, organics, or other deleterious materials may then be replaced and similarly compacted.

Prior to placement of pavement materials the exposed subgrade must then be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or loose soils are encountered, they must be removed (up to a maximum depth of 2 feet) and replaced with structural fill.

We anticipate the on-site gravel soils will exhibit fair pavement support characteristics when saturated or nearly saturated. Based on our laboratory testing experience with similar soils, our pavement design is based upon a California Bearing Ratio (CBR) of 10 for the on-site gravel soils.

Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for approximately 4 ESAL's (18-kip equivalent single-axle loads) per day:

MATERIAL	PAVEMENT SECTION THICKNESS (inches)	
Asphalt	3	3
Road-Base (UTBC)	8	4
Subbase	0	5
Total Thickness	11	12

Untreated base course (UTBC), typically known as road-base, should conform to APWA specifications, or to 1.5-inch-minus UDOT specifications for A-1-a/NP, and have a minimum CBR value of 70%. Subbase should be a granular material having a minimum CBR value of 40%. Road base and subbase material should be compacted as recommended above in **Section 6.4**. Asphalt material generally should conform to APWA requirements, having a ½-inch maximum aggregate size, a 75-gyraton Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder.

15.0 QUALITY CONTROL

We recommend that CMT be retained as part of a comprehensive quality control testing and observation program. With CMT onsite we can help facilitate implementation of our recommendations and address, in a timely manner, any subsurface conditions encountered which vary from those described in this report. Without such a program CMT cannot be responsible for application of our recommendations to subsurface conditions

which may vary from those described herein. This program may include, but not necessarily be limited to, the following:

15.1 Field Observations

Observations should be completed during all phases of construction such as site preparation, foundation excavation, structural fill placement and concrete placement.

15.2 Fill Compaction

Compaction testing by CMT is required for all structural supporting fill materials. Maximum Dry Density (Modified Proctor, ASTM D-1557) tests should be requested by the contractor immediately after delivery of any fill materials. The maximum density information should then be used for field density tests on each lift as necessary to ensure that the required compaction is being achieved.

15.3 Excavations

All excavation procedures and processes should be observed by a geotechnical engineer from CMT or his representative. In addition, for the recommendations in this report to be valid, all backfill and structural fill placed in trenches and all pavements should be density tested by CMT. We recommend that freshly mixed concrete be tested by CMT in accordance with ASTM designations.

16.0 GEOLOGIC CONCLUSIONS

Based on the findings of this study we conclude:

1. The area outlined in red in **Figure 9** is not at risk from surface-fault-rupture, landslide hazards, debris flow hazards, alluvial-fan or stream flooding, soil liquefaction or rock fall hazards. No mitigation measures in relation to these hazards are warranted.
2. The slope stability analysis performed for this study (**Section 8.0**) using the geologic, stratigraphic, and hydrologic conditions shown in **Figure 10**, where identified and applicable, indicates adequate stability of the site.
3. The area of the subject lot outlined in red in **Figure 9** is suitable for the proposed development in regard to geologic hazards and geotechnical engineering perspectives. The outlined portion of the site can be developed with an acceptable and reasonable risk, provided all recommendations provided by CMT herein are followed and implemented at the site.

17.0 LIMITATIONS

The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground water conditions may differ from conditions encountered at the actual exploration locations. The nature and extent of any variation in the explorations may not become evident until during the course of construction. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

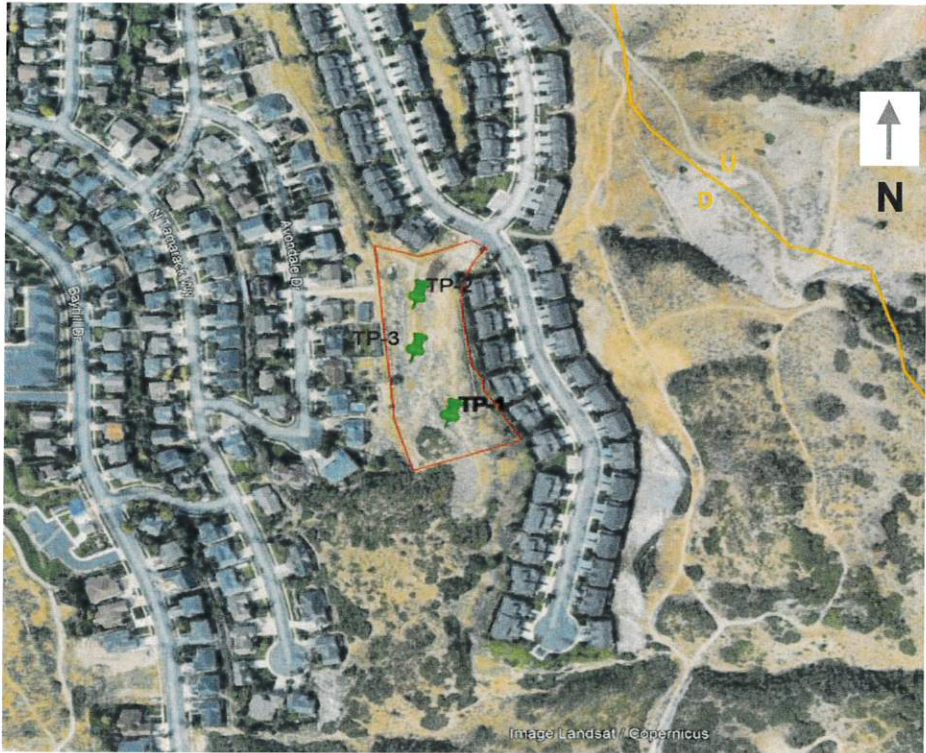
We appreciate the opportunity to be of service to you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at (801) 492-4132. To schedule materials testing, please call (801) 381-5141.

18.0 REFERENCES CITED

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APPENDIX

SUPPORTING DOCUMENTATION



Subject Lot Boundaries



Faults Mapped by Utah Geological Survey

U - Upthrown Side
D - Downthrown Side



Test Pits

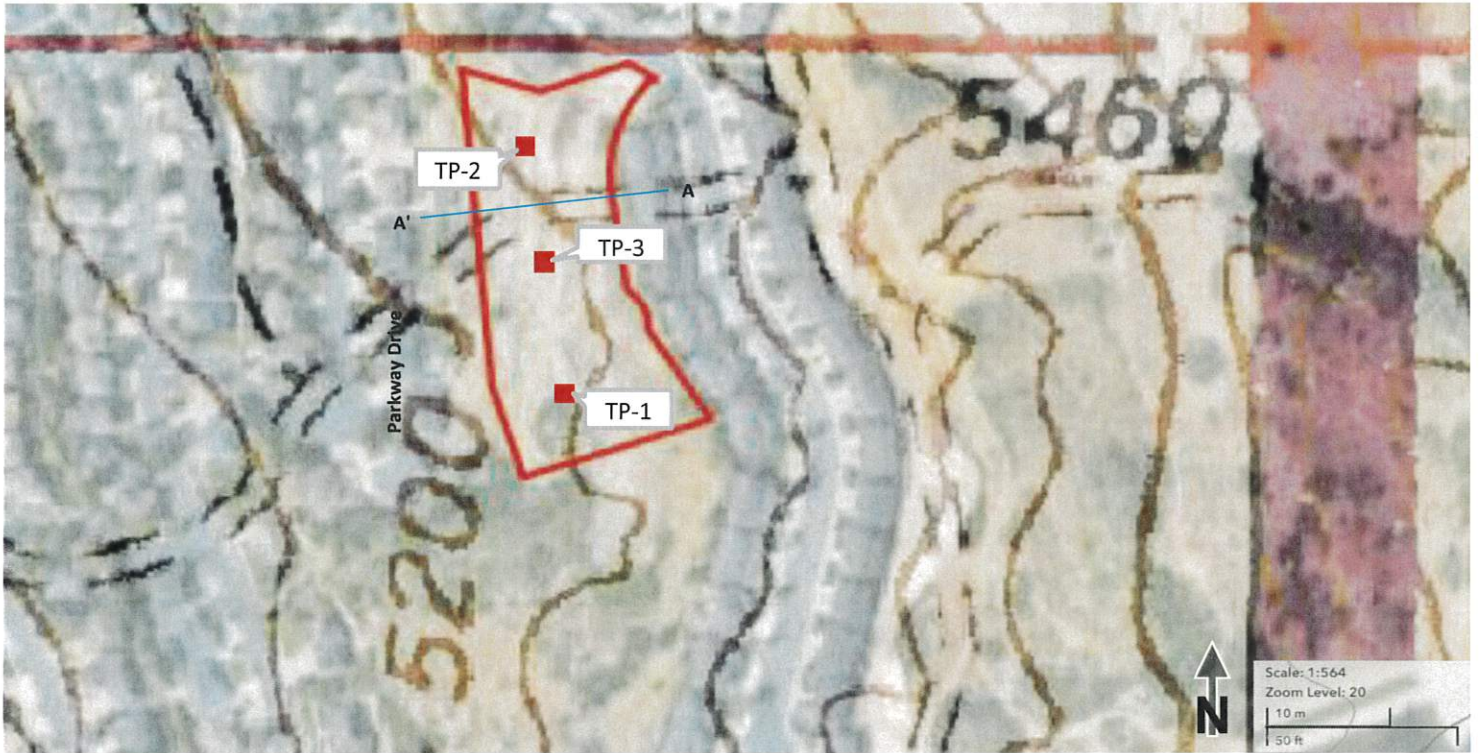
CMT TECHNICAL
SERVICES

Cedar Hills Townhome Development
Sage Vista Ln. & N. Morgan Dr., Cedar Hills, Utah

Site Map

Date:	1/21/2026
CMT No.:	104124

Figure:
1



Topographic Data from: U.S. Geological Survey Lidar Data
[\(https://apps.nationalmap.gov/3depdem/\)](https://apps.nationalmap.gov/3depdem/)

CMT TECHNICAL
 SERVICES

Cedar Hills Townhome Development
 Sage Vista Ln. & N. Morgan Dr., Cedar Hills, Utah

**Topographic
 Map**

Date: 21-Jan-2026
 CMT No.: 104124

Figure:
2



Image From: <https://apps.nationalmap.gov/lidar-explorer/#/>
Lidar Data: USGS, 1-Meter, 4/7/2020

CMT TECHNICAL SERVICES	Cedar Hills Townhome Development Sage Vista Ln. & N. Morgan Dr., Cedar Hills, Utah	Lidar DEM	Date:	1/21/2026	Figure: 3
			CMT No.:	104124	



0-14%
gray

15-24%
yellow

25% +
red

Image From: <https://apps.nationalmap.gov/lidar-explorer/#/>

Lidar Data: USGS, 1-Meter, 4/7/2020

Cedar Hills Townhome Development

Sage Vista Ln. & N. Morgan Dr., Cedar Hills, Utah

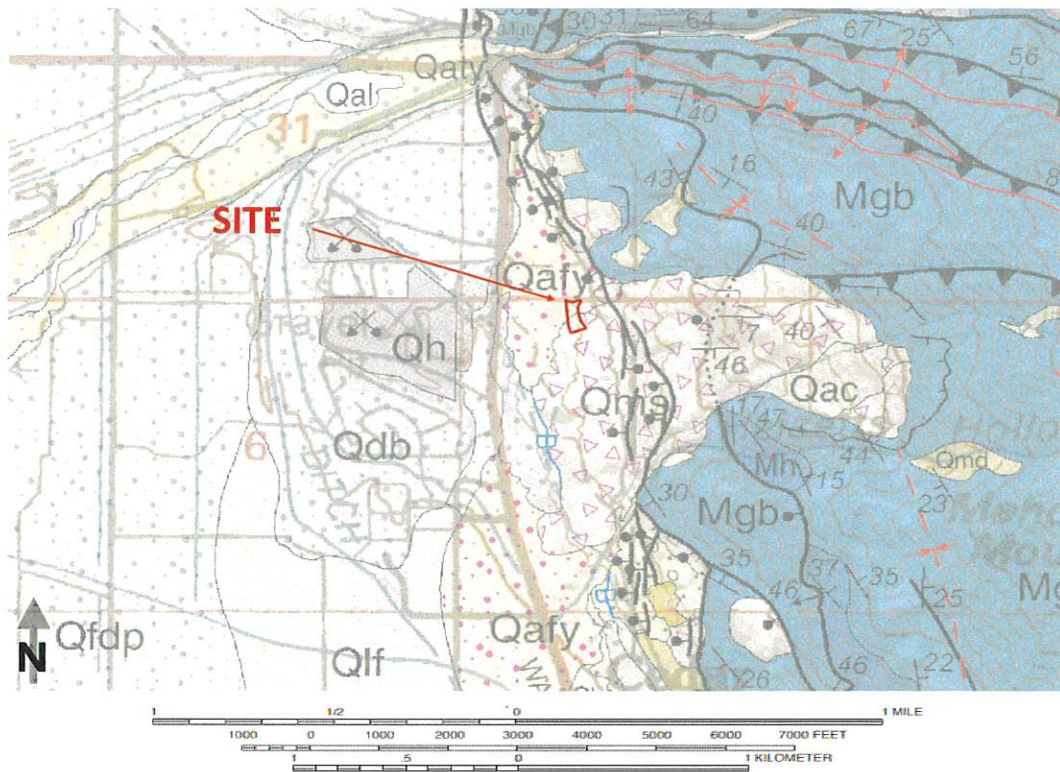
CMT TECHNICAL
SERVICES

Slope Map

Date:	21-Jan-26
Job #	104124

Figure:

4



Geologic Units in Site Vicinity

- Qh** - Human Disturbance (Historical)
- Qdb** - Deltaic Deposits near Bonneville shoreline (uppermost Pleistocene)
- Qfy** - Younger alluvial-fan deposits, undivided (Holocene to late Pleistocene?)
- Qac** - Alluvial and colluvial deposits, undivided (Holocene to middle Pleistocene?)
- Qms** - Landslide (Quaternary)
- Qlf** - Fine-grained lacustrine deposits (upper Pleistocene)
- Qat** - Stream terrace alluvium (Holocene and Upper Pleistocene)
- Mgb** - Great Blue Limestone, undivided (Upper Mississippian, Chesterian? - Meramecian)

Normal Fault - Dashed where approximated, dotted where concealed and approximately located; query indicates uncertain presence; bar and ball on down-dropped side where known.

Figure enlarged from Constenius and others (2011), which is intended for use at scale of 1:62,000, only. Enlarged herein for ease of viewing. Line thickness of geologic contacts and symbols on the enlargement erroneously implies more precision than intended or warranted due to magnification beyond UGS intended scale.

Contour Interval = 20 feet

CMT TECHNICAL SERVICES

Cedar Hills Townhome Development
901 South Parkway Drive, North Salt Lake, Utah

**Regional
Geologic Map**

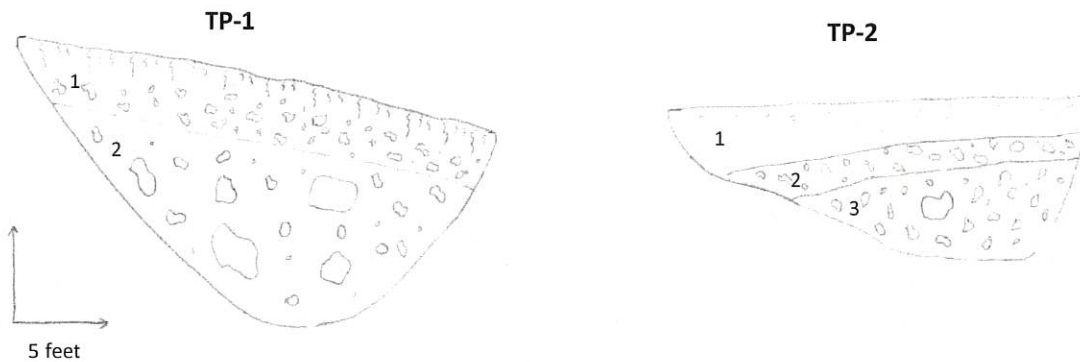
Date: 21-Jan-2026
CMT No.: 104124

Figure:
5

Log Scale: 1:60

TP Orientation:
S 228° W

Test Pit Log, TP-1 and TP-2
Cedar Hills Townhomes, Cedar Hills, UT
Logged by: Christine Underdown, P.G.
December 17, 2025



Soils in TP-1

1. **Alluvial-fan deposits (Qafy)** – Holocene to upper Pleistocene; (estimated based on stratigraphic relationships and mapping by Solomon and Others (2010). Silty-Clayey GRAVEL (GC-GM) with sand, dense, weakly cemented, gravel and cobble to 8", angular to sub-angular, dry. Light gray. Pedogenic soil A and B horizon forming approx. 18" thick.
2. **Landslide (Qms)** – Holocene to upper Pleistocene Clay and gravel (GC) with silt, approximately 30% angular to subangular limestone clasts up to about 36" in longest dimension, roots, weakly cemented, stiff, dry, tan.

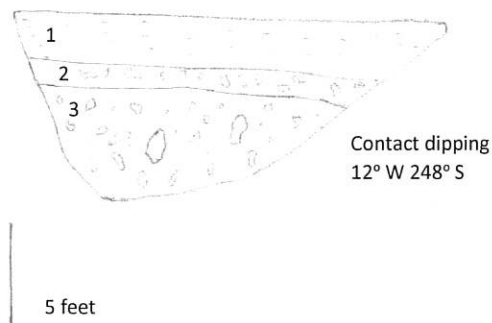
Soils in TP-2

1. **Fill** – Historic; Derived from native alluvial fan deposits, likely placed during previous phases of development; silty to clayey sand and gravel, light gray, loose
2. **Alluvial-fan deposits (Qafy)** – Holocene to upper Pleistocene; (estimated based on stratigraphic relationships and mapping by Solomon and Others (2010). Silty-Clayey gravel (GC-GM) with sand, dense, weakly cemented, gravel and cobble to 8", angular to sub-angular, dry. Light gray. Pedogenic soil A and B horizon forming approx. 18" thick.
3. **Landslide (Qms)** – Holocene to upper Pleistocene Clay and gravel (GC) with silt, approximately 30% angular to subangular limestone clasts up to about 36" in longest dimension, roots, weakly cemented, stiff, dry, tan.

Log Scale: 1:60

TP Orientation:
SW 248° S

Test Pit Log, TP-3
Cedar Hills Townhomes, Cedar Hills, UT
Logged by: Christine Underdown, P.G.
December 17, 2025



Soils in TP-3

1. **Fill** – Historic; Derived from native alluvial fan deposits, likely placed during previous phases of development; silty to clayey sand and gravel, light gray, loose
2. **Alluvial-fan deposits (Qafy)** – Holocene to upper Pleistocene; (estimated based on stratigraphic relationships and mapping by Solomon and Others (2010). Silty-Clayey gravel (GC-GM) with sand, dense, weakly cemented, gravel and cobble to 8", angular to sub-angular, dry. Light gray. Pedogenic soil A and B horizon forming approx. 18" thick.
3. **Landslide (Qms)** – Holocene to upper Pleistocene Clay and gravel (GC) with silt, approximately 30% angular to subangular limestone clasts up to about 36" in longest dimension, roots, weakly cemented, stiff, dry, tan.

CMT TECHNICAL
SERVICES

Figure 7
CMT Project No.: 104124



Geology

Qafy/Qms - Younger alluvial fan deposits overlying Landslide deposits (Late Pleistocene)

Base Map From: Davis County Web Portal, <https://webportal.daviscountyutah.gov/App/PropertySearch/esri/map>

Subject Lot Boundaries & Buildable Area with Respect to Habitable Structures

— Geologic Cross-Section A-A'

CMT TECHNICAL
SERVICES

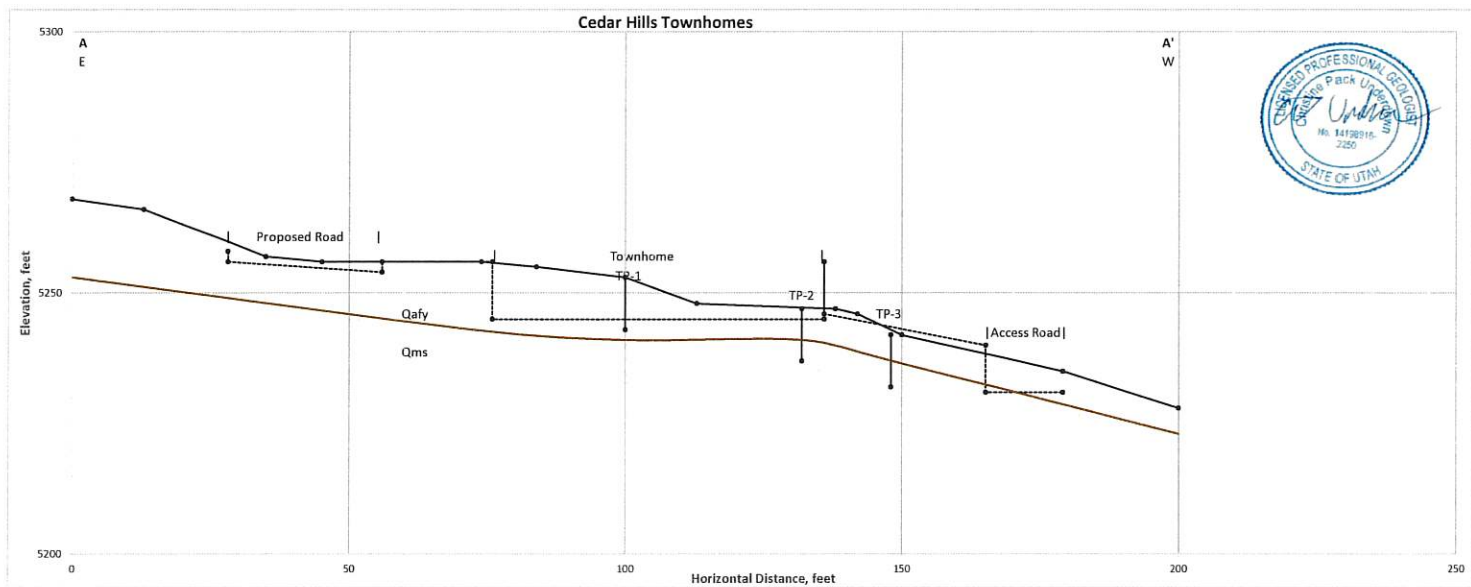
Cedar Hills Townhome Development
Sage Vista Dr. & N. Morgan Ln., Cedar Hills, Utah

Site Geologic Map

Date:	1/21/2026
CMT No.:	104124

Figure:

8



CMT TECHNICAL
SERVICES

Cedar Hills Townhome Development
901 South Parkway Drive, North Salt Lake, Utah

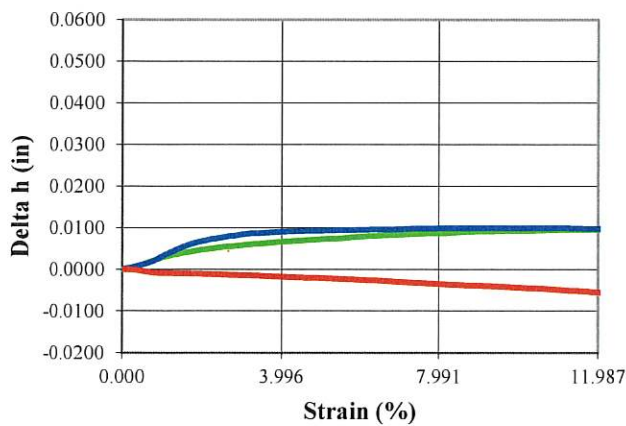
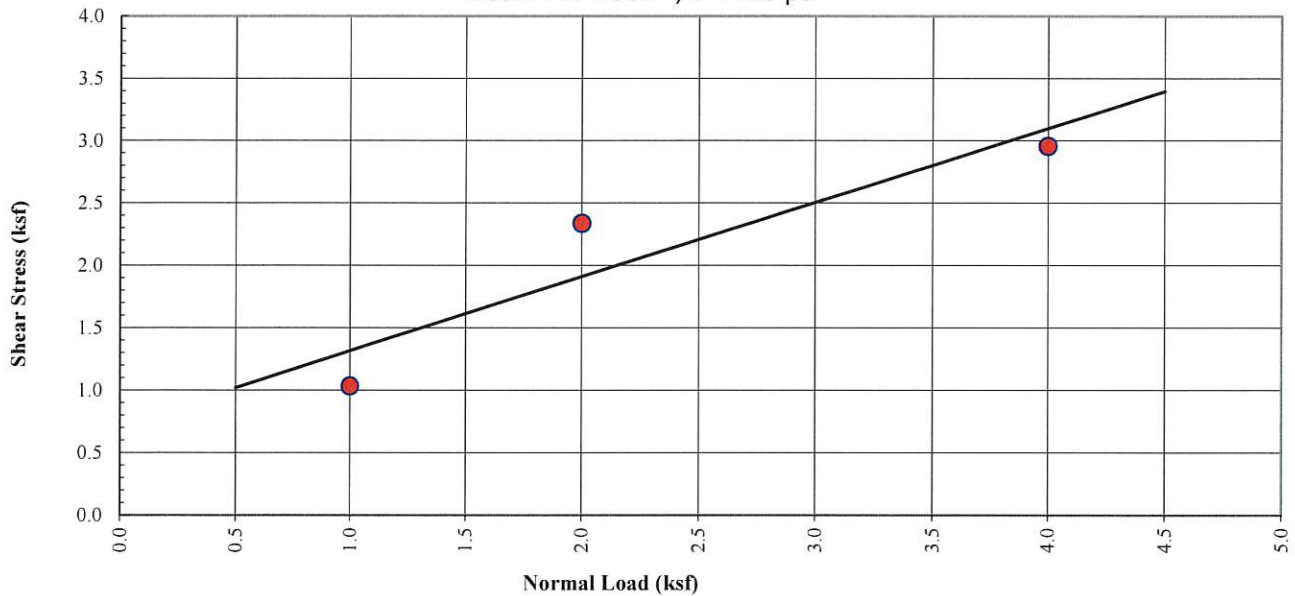
Geologic
Section A-A'

Date: 1/21/2026
CMT No.: 104124

Figure:
9

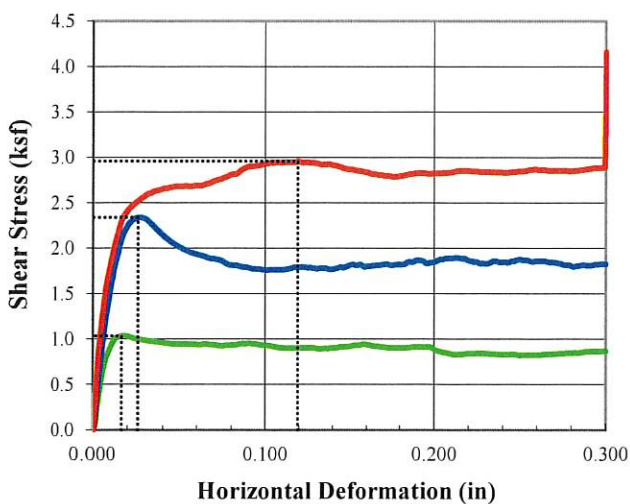
Direct Shear Test (ASTM D3080)

Peak: $\Phi = 30.7^\circ$, $c = 725$ psf



Specimen			
Initial	A	B	C
Moisture (%)	8.00	8.00	8.00
Dry Density (pcf)	130.00	130.00	130.00
Void Ratio	0.27	0.27	0.27
Saturation (%)	77.97	77.97	77.97
Diameter (in)	2.42	2.42	2.42
Height (in)	1.00	1.00	1.00

Final	A	B	C
Moisture (%)	19.63	19.63	19.63
Dry Density (pcf)	132.45	128.09	127.32
Void Ratio	0.25	0.29	0.30
Saturation (%)	100.0	100.0	100.0
Diameter (in)	2.42	2.42	2.42
Height (in)	1.06	0.96	1.05
Normal Load (ksf)	1.00	2.00	4.00
Shear Stress (ksf)(@Peak)	1.03	2.34	2.96
Peak Strain (%)	0.68	1.07	4.92
Rate (in/min)	0.0024	0.0024	0.0024
Peak Deformation (in.)	0.017	0.026	0.119



Sample Information	
Test Pit Number:	TP-2
Sample Number:	-
Depth:	8 ft
Sample Type:	Remolded
Description:	Clayey Gravel w/sand (GC)
Test Type:	Consolidated - Drained

Cedar Hills Townhomes Development

Sage Vista Lane and North Morgan Drive, Cedar Hills, Utah

CMT TECHNICAL SERVICES

Lab Data

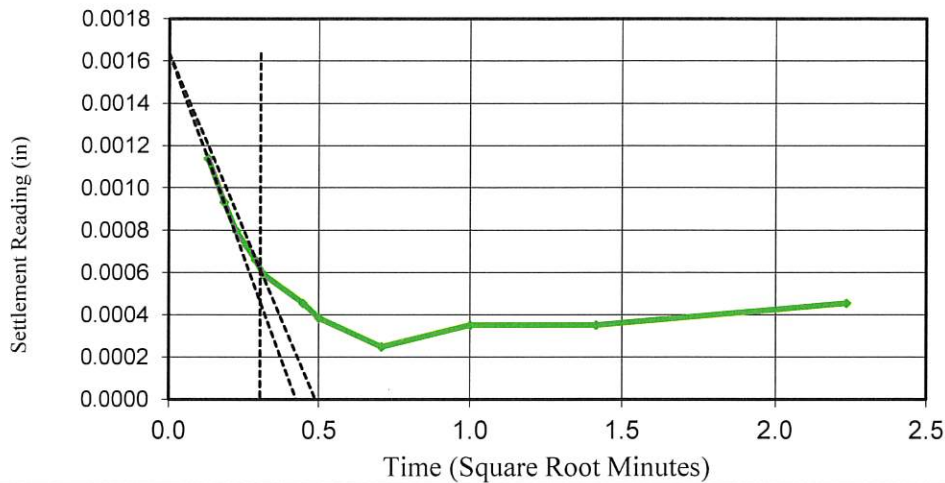
Date: 18-Feb-26
Job # 104124

Figure:

10A

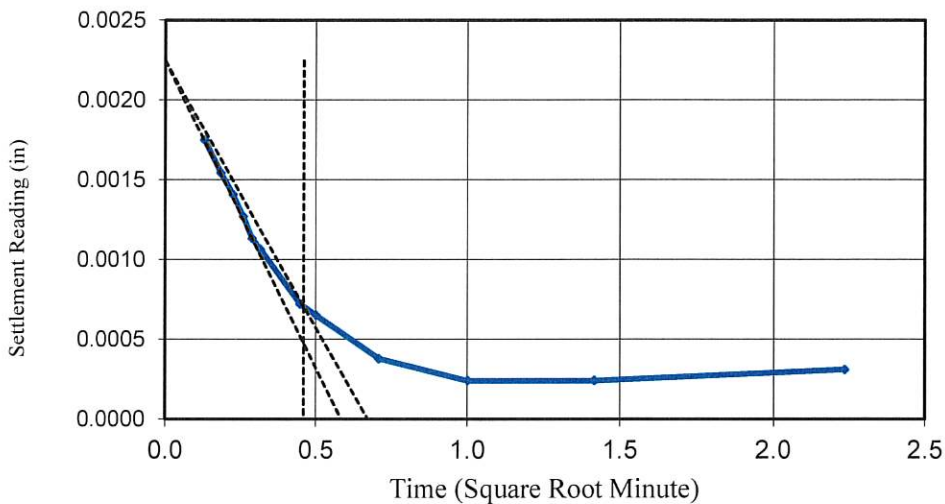
Direct Shear Test (ASTM D3080)

Consolidation Graph Specimen A



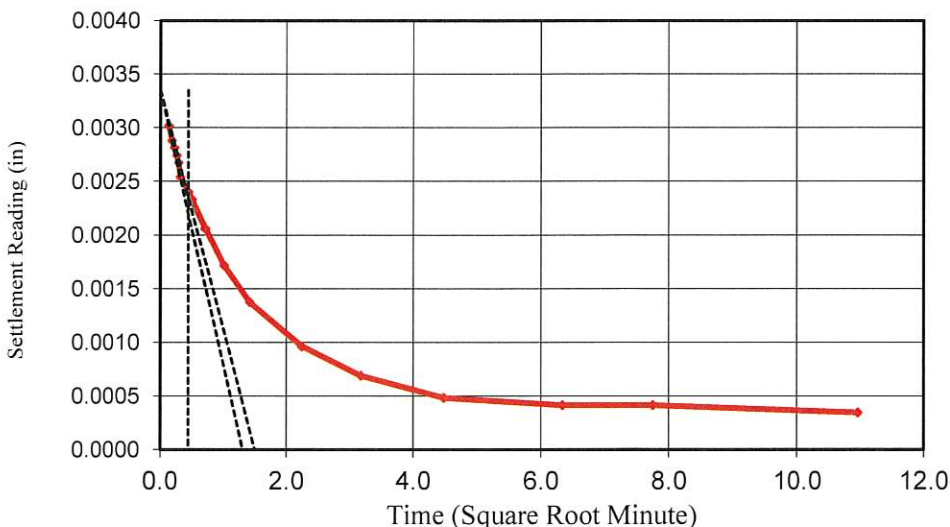
$\sqrt{t_{90}} = 0.305$
 $t_{90} = 0.1$ min.
 $t_f = 50 t_{90} / 4.28 = 1.1$ min.
 $\max d_r = 0.5 / t_f = 0.4601$ in./min.
 $\text{selected } d_r = 0.0024$ in./min.
 condition = Drained

Consolidation Graph Specimen B



$\sqrt{t_{90}} = 0.46$
 $t_{90} = 0.2$ min.
 $t_f = 50 t_{90} / 4.28 = 2.5$ min.
 $\max d_r = 0.5 / t_f = 0.2023$ in./min.
 $\text{selected } d_r = 0.0024$ in./min.
 condition = Drained

Consolidation Graph Specimen C



$\sqrt{t_{90}} = 0.45$
 $t_{90} = 0.2$ min.
 $t_f = 50 t_{90} / 4.28 = 2.4$ min.
 $\max d_r = 0.5 / t_f = 0.2114$ in./min.
 $\text{selected } d_r = 0.0024$ in./min.
 condition = Drained

Cedar Hills Townhomes Development

Sage Vista Lane and North Morgan Drive, Cedar Hills, Utah

CMT TECHNICAL SERVICES

Lab Data

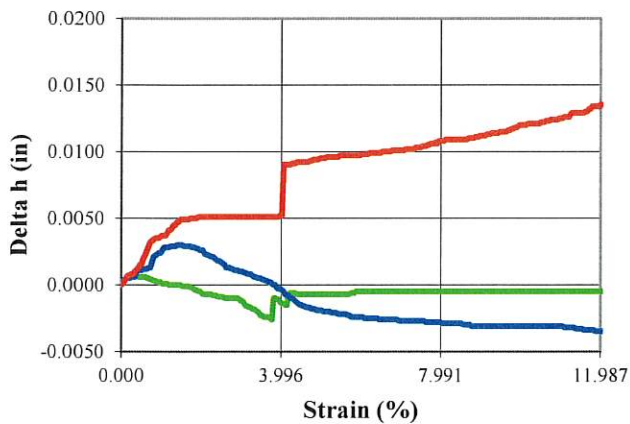
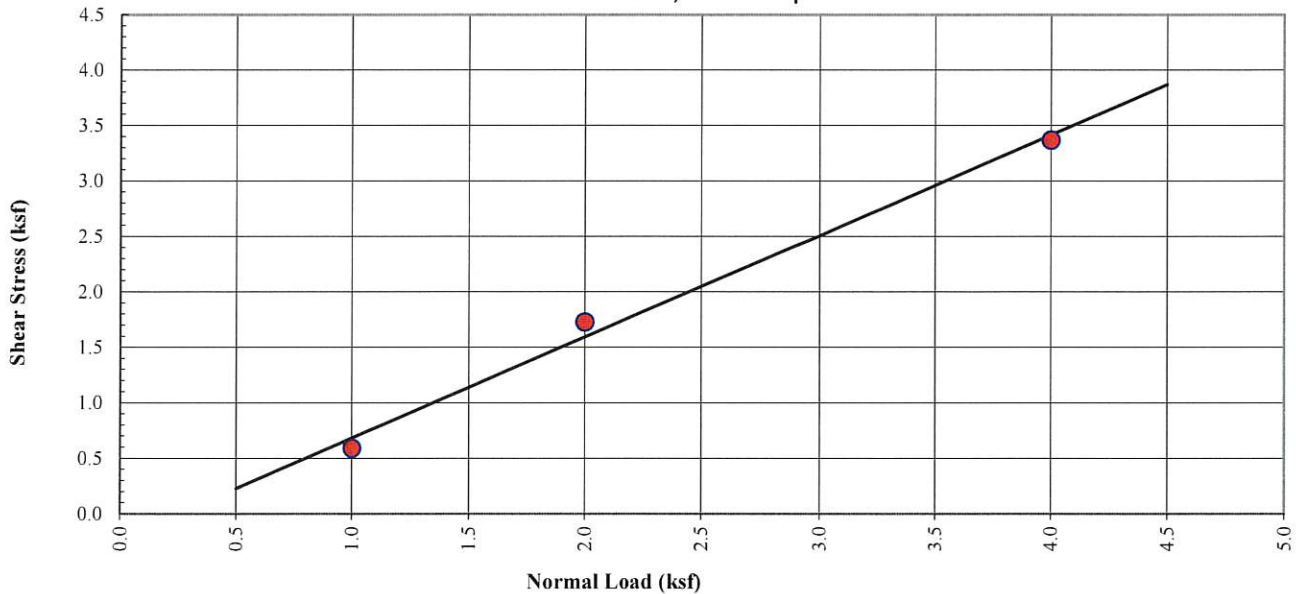
Date: 18-Feb-26
Job # 104124

Figure:

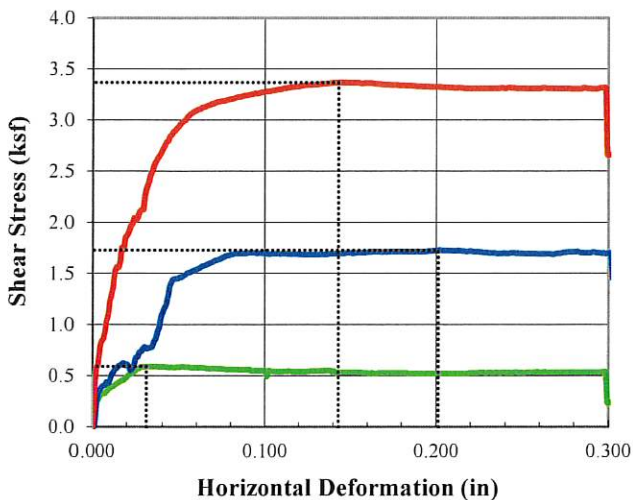
10B

Direct Shear Test (ASTM D3080)

Peak: $\Phi = 42.3^\circ$, $c = -229$ psf



— Specimen A — Specimen B — Specimen C



Specimen			
Initial	A	B	C
Moisture (%)	8.00	8.00	8.00
Dry Density (pcf)	130.00	130.00	130.00
Void Ratio	0.27	0.27	0.27
Saturation (%)	77.97	77.97	77.97
Diameter (in)	2.42	2.42	2.42
Height (in)	1.00	1.00	1.00

Final			
	A	B	C
Moisture (%)	21.07	21.07	21.07
Dry Density (pcf)	133.61	129.64	130.94
Void Ratio	0.24	0.28	0.26
Saturation (%)	100.0	100.0	100.0
Diameter (in)	2.42	2.42	2.42
Height (in)	1.00	1.00	1.00
Normal Load (ksf)	1.00	2.00	4.00
Shear Stress (ksf)(@Peak)	0.59	1.73	3.37
Peak Strain (%)	1.28	8.31	5.91
Rate (in/min)	0.0024	0.0024	0.0024
Peak Deformation (in.)	0.031	0.201	0.143

Sample Information	
Test Pit Number:	TP-3
Sample Number:	-
Depth:	8 ft
Sample Type:	Remolded
Description:	Silty Gravel w/sand (GM)
Test Type:	Consolidated - Drained

Cedar Hills Townhomes Dev. - Additional Work

Sage Vista Lane and North Morgan Drive, Cedar Hills, Utah

CMT TECHNICAL SERVICES

Lab Data

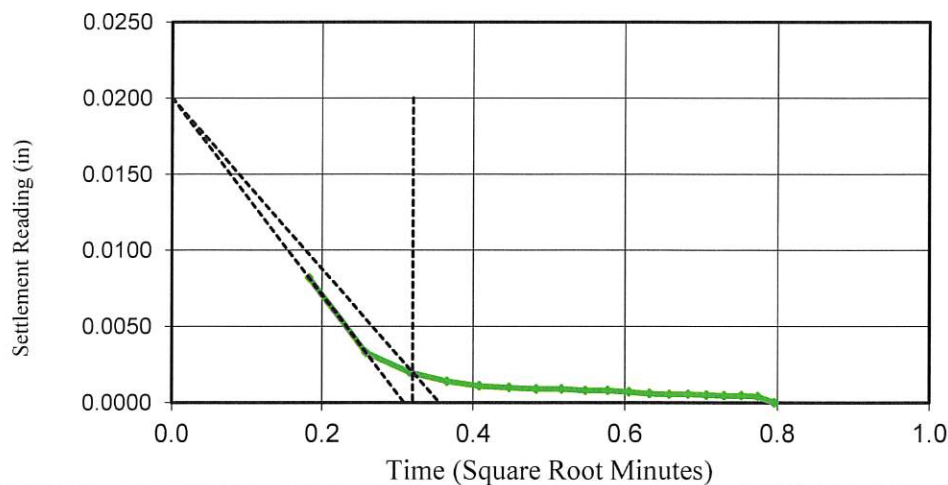
Date: 18-Feb-26
Job # 104124

Figure:

11A

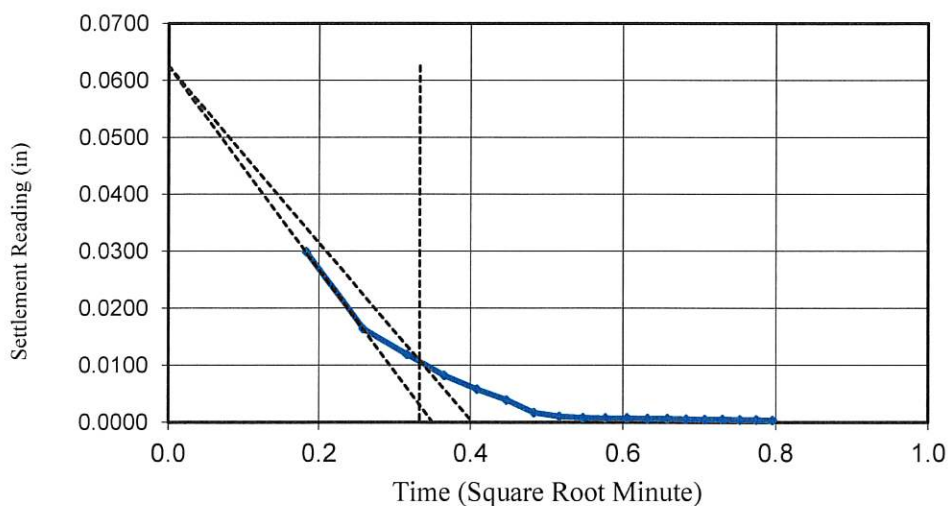
Direct Shear Test (ASTM D3080)

Consolidation Graph Specimen A



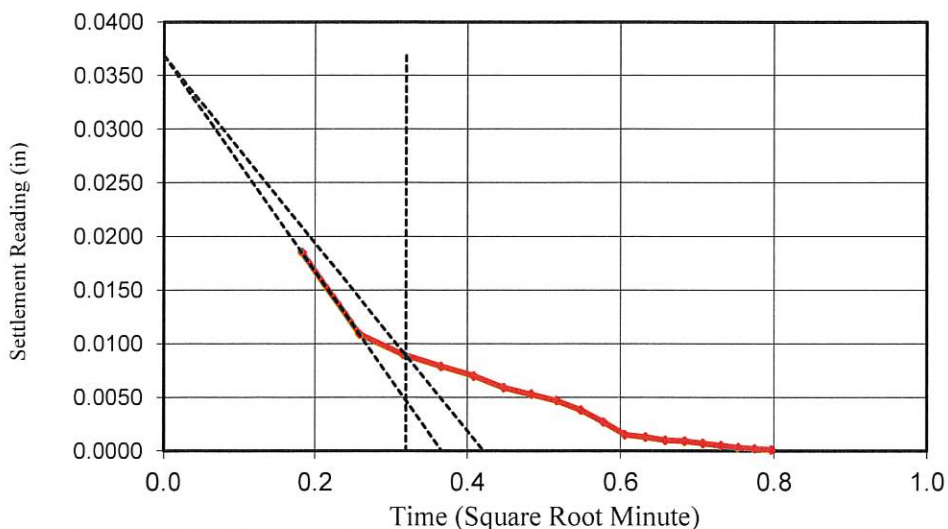
$\sqrt{t_{90}} = 0.32$
 $t_{90} = 0.1 \text{ min.}$
 $t_f = 50 t_{90} / 4.28 = 1.2 \text{ min.}$
 $\max d_r = 0.5 / t_f = 0.4180 \text{ in./min.}$
 $\text{selected } d_r = 0.0024 \text{ in./min.}$
 $\text{condition} = \text{Drained}$

Consolidation Graph Specimen B



$\sqrt{t_{90}} = 0.333$
 $t_{90} = 0.1 \text{ min.}$
 $t_f = 50 t_{90} / 4.28 = 1.3 \text{ min.}$
 $\max d_r = 0.5 / t_f = 0.3860 \text{ in./min.}$
 $\text{selected } d_r = 0.0024 \text{ in./min.}$
 $\text{condition} = \text{Drained}$

Consolidation Graph Specimen C



$\sqrt{t_{90}} = 0.32$
 $t_{90} = 0.1 \text{ min.}$
 $t_f = 50 t_{90} / 4.28 = 1.2 \text{ min.}$
 $\max d_r = 0.5 / t_f = 0.4180 \text{ in./min.}$
 $\text{selected } d_r = 0.0024 \text{ in./min.}$
 $\text{condition} = \text{Drained}$

Cedar Hills Townhomes Dev. - Additional Work

Sage Vista Lane and North Morgan Drive, Cedar Hills, Utah

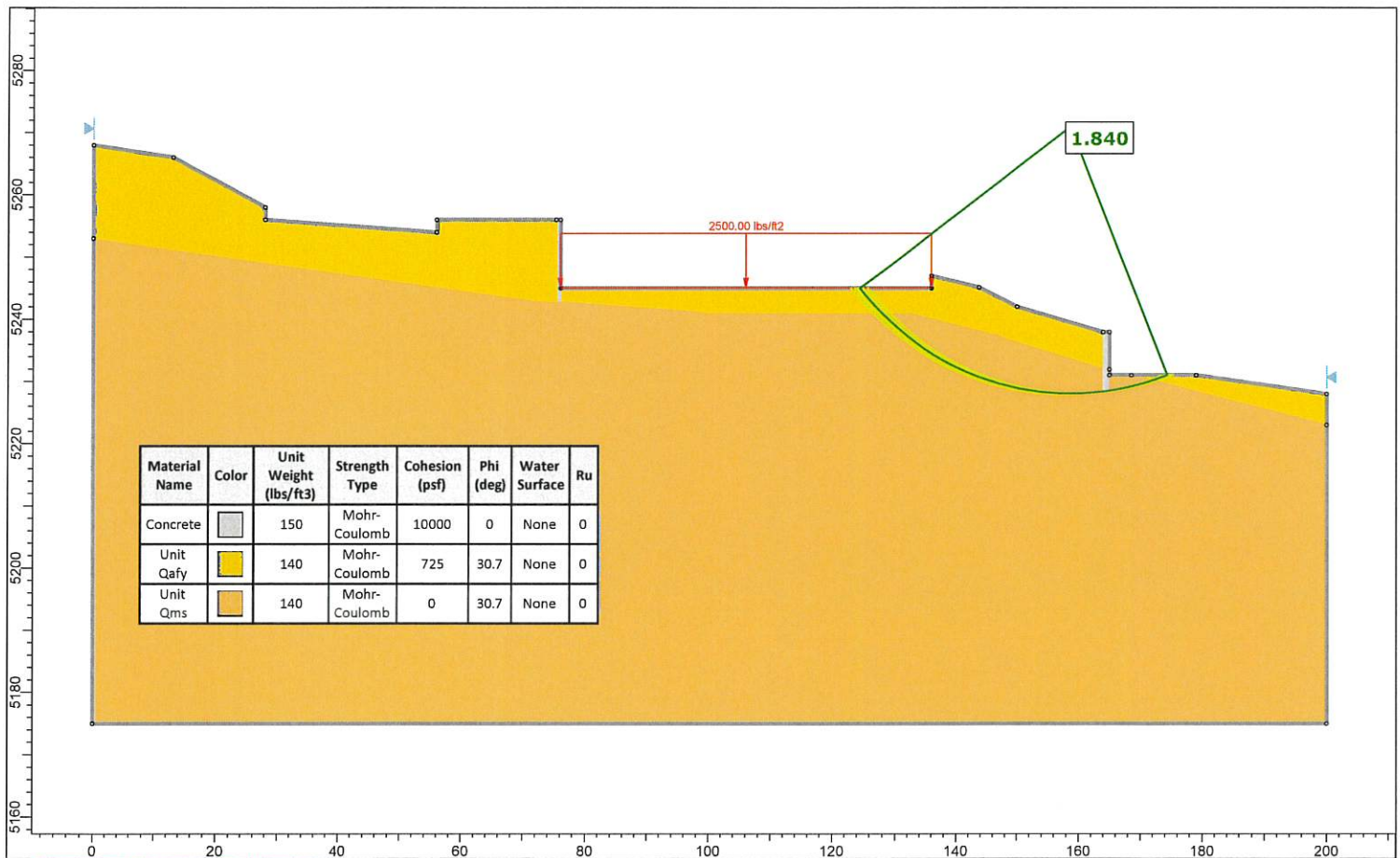
CMT TECHNICAL SERVICES

Lab Data

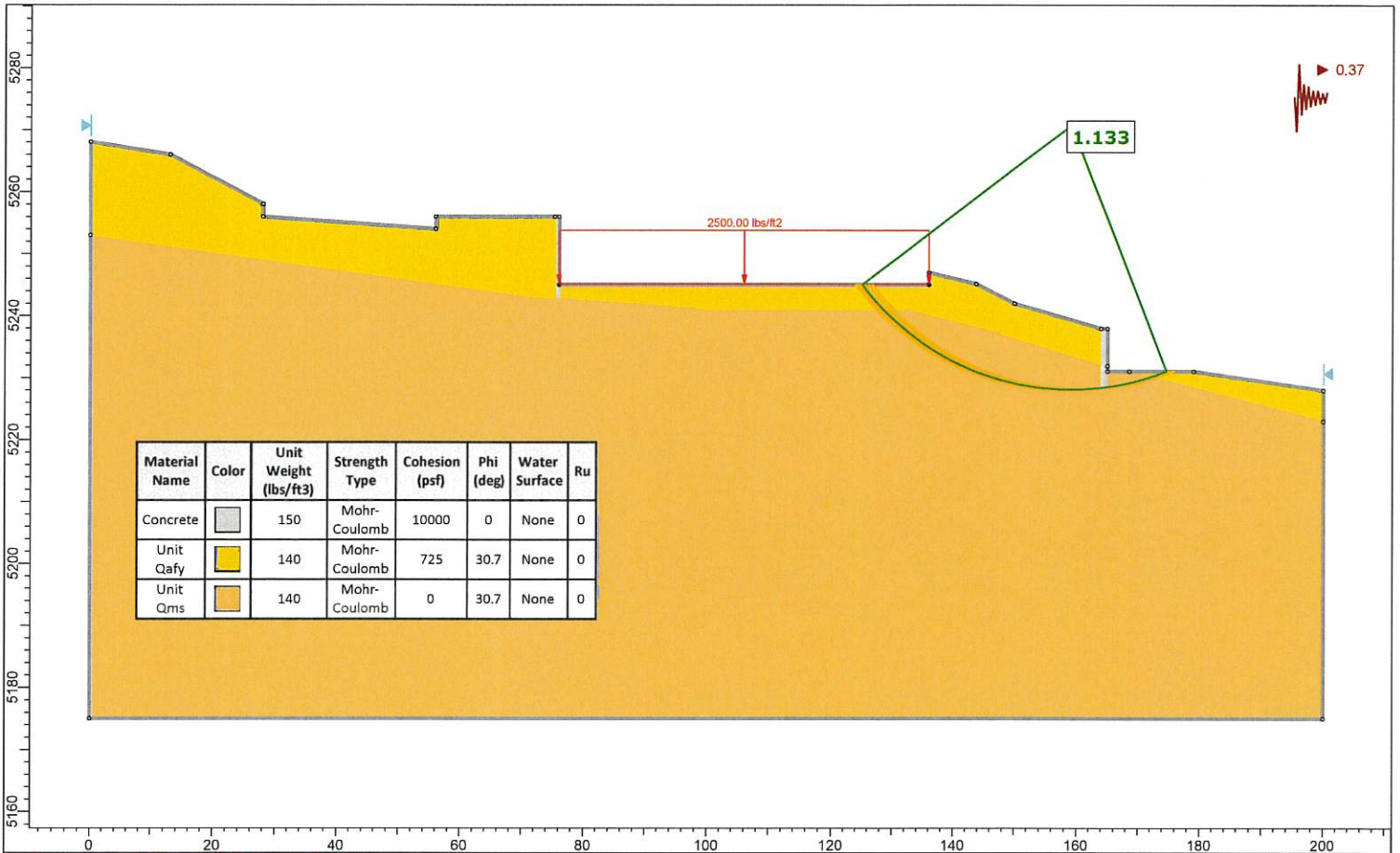
Date: 18-Feb-26
Job #: 104124

Figure:

11B



CMT TECHNICAL SERVICES	Project		Cedar Hills Townhome Development	
	Analysis Description		Global Slope Stability	
	Drawn By		J. Egbert	Company CMT Technical Services
	Date		1/29/2026, 2:27:26 PM	File Name Cedar Hills Townhomes Slope Stability - Copy.slmd



CMT
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SERVICES

Project		Cedar Hills Townhome Development	
Analysis Description		Global Slope Stability	
Drawn By	J. Egbert	Company	CMT Technical Services
Date	1/29/2026, 2:27:26 PM	File Name	Cedar Hills Townhomes Slope Stability - Copy.slmd

SLIDEINTERPRET 9.020

Slide Analysis Information

Cedar Hills Townhomes Slope Stability - Copy

Project Summary

File Name:	Cedar Hills Townhomes Slope Stability - Copy.slmd
Slide Modeler Version:	9.02
Project Title:	Cedar Hills Townhome Development
Analysis:	Global Slope Stability
Author:	J. Egbert
Company:	CMT Technical Services
Date Created:	1/29/2026, 2:27:26 PM

Currently Open Scenarios

Group Name	Scenario Name	Global Minimum	Compute Time
Group 1 	Master Scenario	Bishop Simplified: 1.840000	00h:00m:02.150s
		Janbu Simplified: 1.724870	
	Scenario 2	Bishop Simplified: 1.840000	00h:00m:02.557s
		Janbu Simplified: 1.724870	

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

All Open Scenarios

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
	Janbu simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Surface Options

All Open Scenarios

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

All Open Scenarios

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

All Open Scenarios

Distribution:	Constant
Magnitude [psf]:	2500
Orientation:	Vertical

Materials

Concrete

Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	150
Cohesion [psf]	10000
Friction Angle [deg]	0
Water Surface	Assigned per scenario
Ru Value	0

Unit Qafy

Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	140
Cohesion [psf]	725
Friction Angle [deg]	30.7
Water Surface	Assigned per scenario
Ru Value	0

Unit Qms

Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	140
Cohesion [psf]	0
Friction Angle [deg]	30.7
Water Surface	Assigned per scenario
Ru Value	0

Materials In Use

Material		Group 1	Scenario 2
Concrete		✓	✓
Unit Qafy		✓	✓
Unit Qms		✓	✓

Global Minimums

◆ Group 1 - Master Scenario

Method: bishop simplified

FS**1.840000**

Center: 158.619, 5270.913
 Radius: 42.896
 Left Slip Surface Endpoint: 124.435, 5245.000
 Right Slip Surface Endpoint: 174.335, 5231.000
 Resisting Moment: 2.79025e+06 lb-ft
 Driving Moment: 1.51644e+06 lb-ft
 Total Slice Area: 448.001 ft²
 Surface Horizontal Width: 49.8998 ft
 Surface Average Height: 8.978 ft

Method: janbu simplified**FS****1.724870**

Center: 156.115, 5261.891
 Radius: 34.617
 Left Slip Surface Endpoint: 125.899, 5245.000
 Right Slip Surface Endpoint: 171.736, 5231.000
 Resisting Horizontal Force: 51138.2 lb
 Driving Horizontal Force: 29647.6 lb
 Total Slice Area: 465.848 ft²
 Surface Horizontal Width: 45.8373 ft
 Surface Average Height: 10.1631 ft

◆ **Group 1 - Scenario 2****Method: bishop simplified****FS****1.840000**

Center: 158.619, 5270.913
 Radius: 42.896
 Left Slip Surface Endpoint: 124.435, 5245.000
 Right Slip Surface Endpoint: 174.335, 5231.000
 Resisting Moment: 2.79025e+06 lb-ft
 Driving Moment: 1.51644e+06 lb-ft
 Total Slice Area: 448.001 ft²
 Surface Horizontal Width: 49.8998 ft
 Surface Average Height: 8.978 ft

Method: janbu simplified**FS****1.724870**

Center: 156.115, 5261.891
 Radius: 34.617
 Left Slip Surface Endpoint: 125.899, 5245.000
 Right Slip Surface Endpoint: 171.736, 5231.000
 Resisting Horizontal Force: 51138.2 lb
 Driving Horizontal Force: 29647.6 lb
 Total Slice Area: 465.848 ft²
 Surface Horizontal Width: 45.8373 ft
 Surface Average Height: 10.1631 ft

Global Minimum Support Data

All Open Scenarios

No Supports Present

Slice Data**◆ Group 1 - Master Scenario****Global Minimum Query (bishop simplified) - Safety Factor: 1.84**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.384848	14.4318	-52.4147	Concrete	10000	0	5434.78	10000	-4519.08	0	-4519.08	2541.87	2541.87
2	1.01813	165.693	-50.9147	Unit Qafy	725	30.7	897.092	1650.65	1558.97	0	1558.97	2663.43	2663.43
3	1.01813	337.923	-48.8038	Unit Qafy	725	30.7	955.739	1758.56	1740.7	0	1740.7	2832.58	2832.58
4	1.01813	498.032	-46.7784	Unit Qafy	725	30.7	1011.5	1861.16	1913.5	0	1913.5	2989.83	2989.83
5	1.00152	635.684	-44.8421	Unit Qms	0	30.7	765.913	1409.28	2373.49	0	2373.49	3135.19	3135.19
6	1.00152	770.949	-42.9844	Unit Qms	0	30.7	811.293	1492.78	2514.12	0	2514.12	3270.25	3270.25
7	1.00152	897.814	-41.1813	Unit Qms	0	30.7	854.837	1572.9	2649.06	0	2649.06	3396.92	3396.92
8	1.00152	1016.97	-39.4266	Unit Qms	0	30.7	896.658	1649.85	2778.66	0	2778.66	3515.88	3515.88
9	1.00152	1128.99	-37.7151	Unit Qms	0	30.7	936.859	1723.82	2903.25	0	2903.25	3627.73	3627.73
10	1.00152	1234.38	-36.0423	Unit Qms	0	30.7	975.527	1794.97	3023.08	0	3023.08	3732.95	3732.95
11	1.00152	1333.55	-34.4044	Unit Qms	0	30.7	1012.74	1863.45	3138.41	0	3138.41	3831.96	3831.96
12	1.00152	1426.88	-32.798	Unit Qms	0	30.7	1048.57	1929.37	3249.43	0	3249.43	3925.14	3925.14
13	1.00152	1745.51	-31.2201	Unit Qms	0	30.7	547.087	1006.64	1695.38	0	1695.38	2026.97	2026.97
14	1.00152	1825.66	-29.6681	Unit Qms	0	30.7	496.943	914.376	1539.98	0	1539.98	1823.07	1823.07
15	1.00152	1869.31	-28.1398	Unit Qms	0	30.7	513.698	945.204	1591.9	0	1591.9	1866.65	1866.65
16	1.00152	1908.18	-26.633	Unit Qms	0	30.7	529.235	973.792	1640.05	0	1640.05	1905.46	1905.46
17	1.00152	1942.46	-25.1458	Unit Qms	0	30.7	543.582	1000.19	1684.51	0	1684.51	1939.67	1939.67
18	1.00152	1972.3	-23.6765	Unit Qms	0	30.7	556.755	1024.43	1725.34	0	1725.34	1969.46	1969.46
19	1.00152	1997.88	-22.2236	Unit Qms	0	30.7	568.783	1046.56	1762.61	0	1762.61	1995	1995
20	1.00152	2018.83	-20.7856	Unit Qms	0	30.7	579.538	1066.35	1795.93	0	1795.93	2015.91	2015.91
21	1.00152	2012.61	-19.3612	Unit Qms	0	30.7	582.467	1071.74	1805.01	0	1805.01	2009.69	2009.69
22	1.00152	1989.81	-17.9491	Unit Qms	0	30.7	580.484	1068.09	1798.87	0	1798.87	1986.91	1986.91
23	1.00152	1963.21	-16.5483	Unit Qms	0	30.7	577.245	1062.13	1788.82	0	1788.82	1960.34	1960.34
24	1.00152	1932.88	-15.1575	Unit Qms	0	30.7	572.745	1053.85	1774.89	0	1774.89	1930.04	1930.04
25	1.00152	1898.9	-13.7758	Unit Qms	0	30.7	567.005	1043.29	1757.09	0	1757.09	1896.11	1896.11
26	1.00152	1861.34	-12.4023	Unit Qms	0	30.7	560.016	1030.43	1735.45	0	1735.45	1858.6	1858.6
27	1.00152	1832.44	-11.0359	Unit Qms	0	30.7	555.484	1022.09	1721.39	0	1721.39	1829.72	1829.72
28	1.00152	1817.31	-9.67593	Unit Qms	0	30.7	555.027	1021.25	1719.98	0	1719.98	1814.61	1814.61
29	1.00152	1798.89	-8.32141	Unit Qms	0	30.7	553.5	1018.44	1715.26	0	1715.26	1796.22	1796.22
30	1.00152	1777.08	-6.97155	Unit Qms	0	30.7	550.859	1013.58	1707.08	0	1707.08	1774.43	1774.43
31	1.00152	1751.92	-5.62558	Unit Qms	0	30.7	547.098	1006.66	1695.41	0	1695.41	1749.3	1749.3
32	1.00152	1723.43	-4.28272	Unit Qms	0	30.7	542.203	997.654	1680.24	0	1680.24	1720.84	1720.84
33	1.00152	1691.63	-2.94221	Unit Qms	0	30.7	536.166	986.545	1661.53	0	1661.53	1689.09	1689.09
34	1.00152	1656.54	-1.60331	Unit Qms	0	30.7	528.972	973.308	1639.24	0	1639.24	1654.05	1654.05
35	1.00152	1618.17	-0.265287	Unit Qms	0	30.7	520.605	957.914	1613.31	0	1613.31	1615.73	1615.73
36	1.00152	1576.52	1.07259	Unit Qms	0	30.7	511.048	940.328	1583.69	0	1583.69	1574.12	1574.12
37	1.00152	1531.59	2.41105	Unit Qms	0	30.7	500.278	920.511	1550.31	0	1550.31	1529.25	1529.25
38	1.00152	1483.36	3.75084	Unit Qms	0	30.7	488.27	898.416	1513.1	0	1513.1	1481.09	1481.09
39	1.00152	1431.84	5.09268	Unit Qms	0	30.7	474.997	873.995	1471.97	0	1471.97	1429.64	1429.64
40	1.00152	1377	6.43732	Unit Qms	0	30.7	460.428	847.188	1426.83	0	1426.83	1374.88	1374.88
41	1.00152	1424.26	7.78555	Unit Qms	0	30.7	480.071	883.331	1487.7	0	1487.7	1422.06	1422.06
42	1.00152	415.839	9.13812	Unit Qms	0	30.7	141.316	260.022	437.926	0	437.926	415.195	415.195
43	1.00152	317.14	10.4959	Unit Qms	0	30.7	108.677	199.966	336.78	0	336.78	316.646	316.646
44	1.00152	289.387	11.8596	Unit Qms	0	30.7	100.015	184.028	309.939	0	309.939	288.936	288.936
45	1.00152	258.136	13.2302	Unit Qms	0	30.7	89.9962	165.593	278.89	0	278.89	257.732	257.732
46	1.00152	223.328	14.6085	Unit Qms	0	30.7	78.5609	144.552	243.453	0	243.453	222.977	222.977
47	1.00152	184.901	15.9955	Unit Qms	0	30.7	65.6446	120.786	203.427	0	203.427	184.609	184.609
48	1.00152	142.781	17.3923	Unit Qms	0	30.7	51.1741	94.1603	158.584	0	158.584	142.555	142.555
49	1.19689	109.943	18.9383	Unit Qafy	725	30.7	476.377	876.534	255.213	0	255.213	91.7561	91.7561
50	1.19689	37.7676	20.6376	Unit Qafy	725	30.7	460.086	846.558	204.728	0	204.728	31.4476	31.4476

Global Minimum Query (janbu simplified) - Safety Factor: 1.72487

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.284994	10.6873	-60.3174	Concrete	10000	0	5797.54	10000	-7620.14	0	-7620.14	2551.19	2551.19
2	0.776313	127.356	-58.6076	Unit Qafy	725	30.7	855.453	1475.55	1264.06	0	1264.06	2665.94	2665.94
3	0.776313	259.551	-56.2186	Unit Qafy	725	30.7	922.13	1590.55	1457.76	0	1457.76	2836.19	2836.19
4	0.776313	380.614	-53.9708	Unit Qafy	725	30.7	984.398	1697.96	1638.65	0	1638.65	2992.11	2992.11
5	0.936154	606.411	-51.6303	Unit Qms	0	30.7	755.518	1303.17	2194.79	0	2194.79	3149.05	3149.05
6	0.936154	754.958	-49.1964	Unit Qms	0	30.7	814.032	1404.1	2364.77	0	2364.77	3307.71	3307.71
7	0.936154	891.525	-46.8773	Unit Qms	0	30.7	869.306	1499.44	2525.35	0	2525.35	3453.57	3453.57
8	0.936154	1017.64	-44.6547	Unit Qms	0	30.7	921.716	1589.84	2677.6	0	2677.6	3588.27	3588.27
9	0.936154	1134.5	-42.5144	Unit Qms	0	30.7	971.546	1675.79	2822.36	0	2822.36	3713.07	3713.07
10	0.936154	1243.03	-40.4452	Unit Qms	0	30.7	1019.04	1757.71	2960.32	0	2960.32	3828.98	3828.98
11	0.936154	1344.01	-38.438	Unit Qms	0	30.7	1064.38	1835.92	3092.05	0	3092.05	3936.82	3936.82
12	0.936154	1438.66	-36.4852	Unit Qms	0	30.7	1106.36	1908.32	3213.98	0	3213.98	4032.19	4032.19
13	0.936154	1768.3	-34.5806	Unit Qms	0	30.7	525.652	906.682	1527.02	0	1527.02	1889.38	1889.38
14	0.936154	1820.39	-32.7186	Unit Qms	0	30.7	548.283	945.717	1592.76	0	1592.76	1945.01	1945.01
15	0.936154	1866.89	-30.8949	Unit Qms	0	30.7	569.357	982.066	1653.98	0	1653.98	1994.67	1994.67
16	0.936154	1908.14	-29.1053	Unit Qms	0	30.7	588.931	1015.83	1710.84	0	1710.84	2038.71	2038.71
17	0.936154	1944.4	-27.3463	Unit Qms	0	30.7	607.049	1047.08	1763.49	0	1763.49	2077.43	2077.43
18	0.936154	1975.92	-25.6148	Unit Qms	0	30.7	623.757	1075.9	1812.03	0	1812.03	2111.08	2111.08
19	0.936154	2002.91	-23.9081	Unit Qms	0	30.7	639.097	1102.36	1856.58	0	1856.58	2139.9	2139.9
20	0.936154	2025.56	-22.2237	Unit Qms	0	30.7	653.087	1126.49	1897.22	0	1897.22	2164.06	2164.06
21	0.936154	2035.29	-20.5593	Unit Qms	0	30.7	662.92	1143.45	1925.8	0	1925.8	2174.44	2174.44
22	0.936154	2019.03	-18.9129	Unit Qms	0	30.7	664.189	1145.64	1929.47	0	1929.47	2157.04	2157.04
23	0.936154	1997.79	-17.2825	Unit Qms	0	30.7	663.627	1144.67	1927.85	0	1927.85	2134.33	2134.33
24	0.936154	1972.74	-15.6664	Unit Qms	0	30.7	661.609	1141.19	1921.98	0	1921.98	2107.53	2107.53
25	0.936154	1943.96	-14.0631	Unit Qms	0	30.7	658.137	1135.2	1911.91	0	1911.91	2076.77	2076.77
26	0.936154	1911.55	-12.4709	Unit Qms	0	30.7	653.232	1126.74	1897.64	0	1897.64	2042.11	2042.11
27	0.936154	1875.6	-10.8884	Unit Qms	0	30.7	646.901	1115.82	1879.25	0	1879.25	2003.69	2003.69
28	0.936154	1850.22	-9.31436	Unit Qms	0	30.7	644.031	1110.87	1870.92	0	1870.92	1976.55	1976.55
29	0.936154	1833.1	-7.74734	Unit Qms	0	30.7	643.933	1110.7	1870.63	0	1870.63	1958.24	1958.24
30	0.936154	1812.57	-6.18614	Unit Qms	0	30.7	642.559	1108.33	1866.63	0	1866.63	1936.28	1936.28
31	0.936154	1788.66	-4.62955	Unit Qms	0	30.7	639.892	1103.73	1858.9	0	1858.9	1910.71	1910.71
32	0.936154	1761.39	-3.07637	Unit Qms	0	30.7	635.932	1096.9	1847.39	0	1847.39	1881.57	1881.57
33	0.936154	1730.8	-1.52545	Unit Qms	0	30.7	630.656	1087.8	1832.06	0	1832.06	1848.86	1848.86
34	0.936154	1696.87	0.0243468	Unit Qms	0	30.7	624.047	1076.4	1812.86	0	1812.86	1812.6	1812.6
35	0.936154	1659.63	1.57416	Unit Qms	0	30.7	616.081	1062.66	1789.72	0	1789.72	1772.79	1772.79
36	0.936154	1619.07	3.12513	Unit Qms	0	30.7	606.736	1046.54	1762.58	0	1762.58	1729.45	1729.45
37	0.936154	1575.17	4.6784	Unit Qms	0	30.7	595.97	1027.97	1731.31	0	1731.31	1682.54	1682.54
38	0.936154	1527.92	6.23512	Unit Qms	0	30.7	583.754	1006.9	1695.81	0	1695.81	1632.04	1632.04
39	0.936154	1477.29	7.79649	Unit Qms	0	30.7	570.045	983.253	1655.98	0	1655.98	1577.93	1577.93
40	0.936154	1423.25	9.3637	Unit Qms	0	30.7	554.79	956.941	1611.67	0	1611.67	1520.19	1520.19
41	0.936154	1365.74	10.938	Unit Qms	0	30.7	537.936	927.869	1562.71	0	1562.71	1458.75	1458.75
42	0.936154	1313.08	12.5208	Unit Qms	0	30.7	522.741	901.66	1518.57	0	1518.57	1402.48	1402.48
43	0.936154	1325.25	14.1133	Unit Qms	0	30.7	533.412	920.067	1549.56	0	1549.56	1415.45	1415.45
44	0.936154	318.175	15.717	Unit Qms	0	30.7	129.526	223.416	376.276	0	376.276	339.826	339.826
45	0.936154	281.765	17.3335	Unit Qms	0	30.7	116.06	200.188	337.155	0	337.155	300.932	300.932
46	0.936154	241.537	18.9643	Unit Qms	0	30.7	100.713	173.717	292.572	0	292.572	257.964	257.964
47	0.936154	197.384	20.6113	Unit Qms	0	30.7	83.3576	143.781	242.155	0	242.155	210.804	210.804
48	0.936154	149.181	22.2763	Unit Qms	0	30.7	63.8466	110.127	185.475	0	185.475	159.32	159.32
49	0.936154	96.7864	23.9614	Unit Qms	0	30.7	42.007	72.4567	122.031	0	122.031	103.363	103.363
50	1.09646	40.7137	25.8173	Unit Qafy	725	30.7	519.503	896.076	288.125	0	288.125	36.7938	36.7938

◆ Group 1 - Scenario 2

Global Minimum Query (bishop simplified) - Safety Factor: 1.84

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.384848	14.4318	-52.4147	Concrete	10000	0	5434.78	10000	-4519.08	0	-4519.08	2541.87	2541.87
2	1.01813	165.693	-50.9147	Unit Qafy	725	30.7	897.092	1650.65	1558.97	0	1558.97	2663.43	2663.43
3	1.01813	337.923	-48.8038	Unit Qafy	725	30.7	955.739	1758.56	1740.7	0	1740.7	2832.58	2832.58
4	1.01813	498.032	-46.7784	Unit Qafy	725	30.7	1011.5	1861.16	1913.5	0	1913.5	2989.83	2989.83
5	1.00152	635.684	-44.8421	Unit Qms	0	30.7	765.913	1409.28	2373.49	0	2373.49	3135.19	3135.19
6	1.00152	770.949	-42.9844	Unit Qms	0	30.7	811.293	1492.78	2514.12	0	2514.12	3270.25	3270.25
7	1.00152	897.814	-41.1813	Unit Qms	0	30.7	854.837	1572.9	2649.06	0	2649.06	3396.92	3396.92
8	1.00152	1016.97	-39.4266	Unit Qms	0	30.7	896.658	1649.85	2778.66	0	2778.66	3515.88	3515.88
9	1.00152	1128.99	-37.7151	Unit Qms	0	30.7	936.859	1723.82	2903.25	0	2903.25	3627.73	3627.73
10	1.00152	1234.38	-36.0423	Unit Qms	0	30.7	975.527	1794.97	3023.08	0	3023.08	3732.95	3732.95
11	1.00152	1333.55	-34.4044	Unit Qms	0	30.7	1012.74	1863.45	3138.41	0	3138.41	3831.96	3831.96
12	1.00152	1426.88	-32.798	Unit Qms	0	30.7	1048.57	1929.37	3249.43	0	3249.43	3925.14	3925.14
13	1.00152	1745.51	-31.2201	Unit Qms	0	30.7	547.087	1006.64	1695.38	0	1695.38	2026.97	2026.97
14	1.00152	1825.66	-29.6681	Unit Qms	0	30.7	496.943	914.376	1539.98	0	1539.98	1823.07	1823.07
15	1.00152	1869.31	-28.1398	Unit Qms	0	30.7	513.698	945.204	1591.9	0	1591.9	1866.65	1866.65
16	1.00152	1908.18	-26.633	Unit Qms	0	30.7	529.235	973.792	1640.05	0	1640.05	1905.46	1905.46
17	1.00152	1942.46	-25.1458	Unit Qms	0	30.7	543.582	1000.19	1684.51	0	1684.51	1939.67	1939.67
18	1.00152	1972.3	-23.6765	Unit Qms	0	30.7	556.755	1024.43	1725.34	0	1725.34	1969.46	1969.46
19	1.00152	1997.88	-22.2236	Unit Qms	0	30.7	568.783	1046.56	1762.61	0	1762.61	1995	1995
20	1.00152	2018.83	-20.7856	Unit Qms	0	30.7	579.538	1066.35	1795.93	0	1795.93	2015.91	2015.91
21	1.00152	2012.61	-19.3612	Unit Qms	0	30.7	582.467	1071.74	1805.01	0	1805.01	2009.69	2009.69
22	1.00152	1989.81	-17.9491	Unit Qms	0	30.7	580.484	1068.09	1798.87	0	1798.87	1986.91	1986.91
23	1.00152	1963.21	-16.5483	Unit Qms	0	30.7	577.245	1062.13	1788.82	0	1788.82	1960.34	1960.34
24	1.00152	1932.88	-15.1575	Unit Qms	0	30.7	572.745	1053.85	1774.89	0	1774.89	1930.04	1930.04
25	1.00152	1898.9	-13.7758	Unit Qms	0	30.7	567.005	1043.29	1757.09	0	1757.09	1896.11	1896.11
26	1.00152	1861.34	-12.4023	Unit Qms	0	30.7	560.016	1030.43	1735.45	0	1735.45	1858.6	1858.6
27	1.00152	1832.44	-11.0359	Unit Qms	0	30.7	555.484	1022.09	1721.39	0	1721.39	1829.72	1829.72
28	1.00152	1817.31	-9.67593	Unit Qms	0	30.7	555.027	1021.25	1719.98	0	1719.98	1814.61	1814.61
29	1.00152	1798.89	-8.32141	Unit Qms	0	30.7	553.5	1018.44	1715.26	0	1715.26	1796.22	1796.22
30	1.00152	1777.08	-6.97155	Unit Qms	0	30.7	550.859	1013.58	1707.08	0	1707.08	1774.43	1774.43
31	1.00152	1751.92	-5.62558	Unit Qms	0	30.7	547.098	1006.66	1695.41	0	1695.41	1749.3	1749.3
32	1.00152	1723.43	-4.28272	Unit Qms	0	30.7	542.203	997.654	1680.24	0	1680.24	1720.84	1720.84
33	1.00152	1691.63	-2.94221	Unit Qms	0	30.7	536.166	986.545	1661.53	0	1661.53	1689.09	1689.09
34	1.00152	1656.54	-1.60331	Unit Qms	0	30.7	528.972	973.308	1639.24	0	1639.24	1654.05	1654.05
35	1.00152	1618.17	-0.265287	Unit Qms	0	30.7	520.605	957.914	1613.31	0	1613.31	1615.73	1615.73
36	1.00152	1576.52	1.07259	Unit Qms	0	30.7	511.048	940.328	1583.69	0	1583.69	1574.12	1574.12
37	1.00152	1531.59	2.41105	Unit Qms	0	30.7	500.278	920.511	1550.31	0	1550.31	1529.25	1529.25
38	1.00152	1483.36	3.75084	Unit Qms	0	30.7	488.27	898.416	1513.1	0	1513.1	1481.09	1481.09
39	1.00152	1431.84	5.09268	Unit Qms	0	30.7	474.997	873.995	1471.97	0	1471.97	1429.64	1429.64
40	1.00152	1377	6.43732	Unit Qms	0	30.7	460.428	847.188	1426.83	0	1426.83	1374.88	1374.88
41	1.00152	1424.26	7.78555	Unit Qms	0	30.7	480.071	883.331	1487.7	0	1487.7	1422.06	1422.06
42	1.00152	415.839	9.13812	Unit Qms	0	30.7	141.316	260.022	437.926	0	437.926	415.195	415.195
43	1.00152	317.14	10.4959	Unit Qms	0	30.7	108.677	199.966	336.78	0	336.78	316.646	316.646
44	1.00152	289.387	11.8596	Unit Qms	0	30.7	100.015	184.028	309.939	0	309.939	288.936	288.936
45	1.00152	258.136	13.2302	Unit Qms	0	30.7	89.9962	165.593	278.89	0	278.89	257.732	257.732
46	1.00152	223.328	14.6085	Unit Qms	0	30.7	78.5609	144.552	243.453	0	243.453	222.977	222.977
47	1.00152	184.901	15.9955	Unit Qms	0	30.7	65.6446	120.786	203.427	0	203.427	184.609	184.609
48	1.00152	142.781	17.3923	Unit Qms	0	30.7	51.1741	94.1603	158.584	0	158.584	142.555	142.555
49	1.19689	109.943	18.9383	Unit Qafy	725	30.7	476.377	876.534	255.213	0	255.213	91.7561	91.7561
50	1.19689	37.7676	20.6376	Unit Qafy	725	30.7	460.086	846.558	204.728	0	204.728	31.4476	31.4476

Global Minimum Query (janbu simplified) - Safety Factor: 1.72487

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.284994	10.6873	-60.3174	Concrete	10000	0	5797.54	10000	-7620.14	0	-7620.14	2551.19	2551.19
2	0.776313	127.356	-58.6076	Unit Qafy	725	30.7	855.453	1475.55	1264.06	0	1264.06	2665.94	2665.94
3	0.776313	259.551	-56.2186	Unit Qafy	725	30.7	922.13	1590.55	1457.76	0	1457.76	2836.19	2836.19
4	0.776313	380.614	-53.9708	Unit Qafy	725	30.7	984.398	1697.96	1638.65	0	1638.65	2992.11	2992.11
5	0.936154	606.411	-51.6303	Unit Qms	0	30.7	755.518	1303.17	2194.79	0	2194.79	3149.05	3149.05
6	0.936154	754.958	-49.1964	Unit Qms	0	30.7	814.032	1404.1	2364.77	0	2364.77	3307.71	3307.71
7	0.936154	891.525	-46.8773	Unit Qms	0	30.7	869.306	1499.44	2525.35	0	2525.35	3453.57	3453.57
8	0.936154	1017.64	-44.6547	Unit Qms	0	30.7	921.716	1589.84	2677.6	0	2677.6	3588.27	3588.27
9	0.936154	1134.5	-42.5144	Unit Qms	0	30.7	971.546	1675.79	2822.36	0	2822.36	3713.07	3713.07
10	0.936154	1243.03	-40.4452	Unit Qms	0	30.7	1019.04	1757.71	2960.32	0	2960.32	3828.98	3828.98
11	0.936154	1344.01	-38.438	Unit Qms	0	30.7	1064.38	1835.92	3092.05	0	3092.05	3936.82	3936.82
12	0.936154	1438.66	-36.4852	Unit Qms	0	30.7	1106.36	1908.32	3213.98	0	3213.98	4032.19	4032.19
13	0.936154	1768.3	-34.5806	Unit Qms	0	30.7	525.652	906.682	1527.02	0	1527.02	1889.38	1889.38
14	0.936154	1820.39	-32.7186	Unit Qms	0	30.7	548.283	945.717	1592.76	0	1592.76	1945.01	1945.01
15	0.936154	1866.89	-30.8949	Unit Qms	0	30.7	569.357	982.066	1653.98	0	1653.98	1994.67	1994.67
16	0.936154	1908.14	-29.1053	Unit Qms	0	30.7	588.931	1015.83	1710.84	0	1710.84	2038.71	2038.71
17	0.936154	1944.4	-27.3463	Unit Qms	0	30.7	607.049	1047.08	1763.49	0	1763.49	2077.43	2077.43
18	0.936154	1975.92	-25.6148	Unit Qms	0	30.7	623.757	1075.9	1812.03	0	1812.03	2111.08	2111.08
19	0.936154	2002.91	-23.9081	Unit Qms	0	30.7	639.097	1102.36	1856.58	0	1856.58	2139.9	2139.9
20	0.936154	2025.56	-22.2237	Unit Qms	0	30.7	653.087	1126.49	1897.22	0	1897.22	2164.06	2164.06
21	0.936154	2035.29	-20.5593	Unit Qms	0	30.7	662.92	1143.45	1925.8	0	1925.8	2174.44	2174.44
22	0.936154	2019.03	-18.9129	Unit Qms	0	30.7	664.189	1145.64	1929.47	0	1929.47	2157.04	2157.04
23	0.936154	1997.79	-17.2825	Unit Qms	0	30.7	663.627	1144.67	1927.85	0	1927.85	2134.33	2134.33
24	0.936154	1972.74	-15.6664	Unit Qms	0	30.7	661.609	1141.19	1921.98	0	1921.98	2107.53	2107.53
25	0.936154	1943.96	-14.0631	Unit Qms	0	30.7	658.137	1135.2	1911.91	0	1911.91	2076.77	2076.77
26	0.936154	1911.55	-12.4709	Unit Qms	0	30.7	653.232	1126.74	1897.64	0	1897.64	2042.11	2042.11
27	0.936154	1875.6	-10.8884	Unit Qms	0	30.7	646.901	1115.82	1879.25	0	1879.25	2003.69	2003.69
28	0.936154	1850.22	-9.31436	Unit Qms	0	30.7	644.031	1110.87	1870.92	0	1870.92	1976.55	1976.55
29	0.936154	1833.1	-7.74734	Unit Qms	0	30.7	643.933	1110.7	1870.63	0	1870.63	1958.24	1958.24
30	0.936154	1812.57	-6.18614	Unit Qms	0	30.7	642.559	1108.33	1866.63	0	1866.63	1936.28	1936.28
31	0.936154	1788.66	-4.62955	Unit Qms	0	30.7	639.892	1103.73	1858.9	0	1858.9	1910.71	1910.71
32	0.936154	1761.39	-3.07637	Unit Qms	0	30.7	635.932	1096.9	1847.39	0	1847.39	1881.57	1881.57
33	0.936154	1730.8	-1.52545	Unit Qms	0	30.7	630.656	1087.8	1832.06	0	1832.06	1848.86	1848.86
34	0.936154	1696.87	0.0243468	Unit Qms	0	30.7	624.047	1076.4	1812.86	0	1812.86	1812.6	1812.6
35	0.936154	1659.63	1.57416	Unit Qms	0	30.7	616.081	1062.66	1789.72	0	1789.72	1772.79	1772.79
36	0.936154	1619.07	3.12513	Unit Qms	0	30.7	606.736	1046.54	1762.58	0	1762.58	1729.45	1729.45
37	0.936154	1575.17	4.6784	Unit Qms	0	30.7	595.97	1027.97	1731.31	0	1731.31	1682.54	1682.54
38	0.936154	1527.92	6.23512	Unit Qms	0	30.7	583.754	1006.9	1695.81	0	1695.81	1632.04	1632.04
39	0.936154	1477.29	7.79649	Unit Qms	0	30.7	570.045	983.253	1655.98	0	1655.98	1577.93	1577.93
40	0.936154	1423.25	9.3637	Unit Qms	0	30.7	554.79	956.941	1611.67	0	1611.67	1520.19	1520.19
41	0.936154	1365.74	10.938	Unit Qms	0	30.7	537.936	927.869	1562.71	0	1562.71	1458.75	1458.75
42	0.936154	1313.08	12.5208	Unit Qms	0	30.7	522.741	901.66	1518.57	0	1518.57	1402.48	1402.48
43	0.936154	1325.25	14.1133	Unit Qms	0	30.7	533.412	920.067	1549.56	0	1549.56	1415.45	1415.45
44	0.936154	318.175	15.717	Unit Qms	0	30.7	129.526	223.416	376.276	0	376.276	339.826	339.826
45	0.936154	281.765	17.3335	Unit Qms	0	30.7	116.06	200.188	337.155	0	337.155	300.932	300.932
46	0.936154	241.537	18.9643	Unit Qms	0	30.7	100.713	173.717	292.572	0	292.572	257.964	257.964
47	0.936154	197.384	20.6113	Unit Qms	0	30.7	83.3576	143.781	242.155	0	242.155	210.804	210.804
48	0.936154	149.181	22.2763	Unit Qms	0	30.7	63.8466	110.127	185.475	0	185.475	159.32	159.32
49	0.936154	96.7864	23.9614	Unit Qms	0	30.7	42.007	72.4567	122.031	0	122.031	103.363	103.363
50	1.09646	40.7137	25.8173	Unit Qafy	725	30.7	519.503	896.076	288.125	0	288.125	36.7938	36.7938

Interslice Data

◆ Group 1 - Master Scenario

Global Minimum Query (bishop simplified) - Safety Factor: 1.84

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	124.435	5245	0	0	0
2	124.82	5244.5	-4349.81	0	0
3	125.838	5243.25	-3308.48	0	0
4	126.856	5242.08	-2256.24	0	0
5	127.874	5241	-1212.38	0	0
6	128.876	5240	385.046	0	0
7	129.877	5239.07	1919.76	0	0
8	130.879	5238.19	3385.22	0	0
9	131.88	5237.37	4775.8	0	0
10	132.882	5236.6	6086.62	0	0
11	133.883	5235.87	7313.36	0	0
12	134.885	5235.18	8452.24	0	0
13	135.886	5234.54	9499.86	0	0
14	136.888	5233.93	9981.41	0	0
15	137.889	5233.36	10362.6	0	0
16	138.891	5232.82	10701.2	0	0
17	139.892	5232.32	10995.2	0	0
18	140.894	5231.85	11243	0	0
19	141.895	5231.41	11443.4	0	0
20	142.897	5231	11595.4	0	0
21	143.898	5230.62	11698.1	0	0
22	144.9	5230.27	11750.3	0	0
23	145.901	5229.95	11752.9	0	0
24	146.903	5229.65	11707.5	0	0
25	147.904	5229.38	11615.7	0	0
26	148.906	5229.13	11479.7	0	0
27	149.908	5228.91	11301.4	0	0
28	150.909	5228.72	11081.6	0	0
29	151.911	5228.55	10819.8	0	0
30	152.912	5228.4	10517.1	0	0
31	153.914	5228.28	10174.8	0	0
32	154.915	5228.18	9794.44	0	0
33	155.917	5228.1	9377.77	0	0
34	156.918	5228.05	8926.65	0	0
35	157.92	5228.02	8443.16	0	0
36	158.921	5228.02	7929.56	0	0
37	159.923	5228.04	7388.36	0	0
38	160.924	5228.08	6822.26	0	0
39	161.926	5228.15	6234.2	0	0
40	162.927	5228.23	5627.4	0	0
41	163.929	5228.35	5005.33	0	0
42	164.93	5228.48	4321.11	0	0
43	165.932	5228.65	4109.11	0	0
44	166.933	5228.83	3937.85	0	0
45	167.935	5229.04	3772.56	0	0
46	168.936	5229.28	3616.82	0	0
47	169.938	5229.54	3474.64	0	0
48	170.939	5229.82	3350.53	0	0
49	171.941	5230.14	3249.56	0	0
50	173.138	5230.55	2574.93	0	0
51	174.335	5231	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.72487

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	125.899	5245	0	0	0
2	126.184	5244.5	-5460.11	0	0
3	126.96	5243.23	-4515.2	0	0
4	127.737	5242.07	-3538.43	0	0
5	128.513	5241	-2552.57	0	0
6	129.449	5239.82	-663.75	0	0
7	130.385	5238.73	1139.59	0	0
8	131.321	5237.73	2851.22	0	0
9	132.258	5236.81	4466.12	0	0
10	133.194	5235.95	5980.15	0	0
11	134.13	5235.15	7389.8	0	0
12	135.066	5234.41	8692.1	0	0
13	136.002	5233.72	9882.95	0	0
14	136.938	5233.07	10377	0	0
15	137.874	5232.47	10822.3	0	0
16	138.811	5231.91	11216.5	0	0
17	139.747	5231.39	11557.6	0	0
18	140.683	5230.9	11843.8	0	0
19	141.619	5230.46	12074	0	0
20	142.555	5230.04	12247	0	0
21	143.491	5229.66	12362.1	0	0
22	144.428	5229.31	12418.5	0	0
23	145.364	5228.99	12416.4	0	0
24	146.3	5228.7	12357.5	0	0
25	147.236	5228.43	12243.6	0	0
26	148.172	5228.2	12076.7	0	0
27	149.108	5227.99	11858.9	0	0
28	150.044	5227.81	11592.5	0	0
29	150.981	5227.66	11277.7	0	0
30	151.917	5227.53	10913.9	0	0
31	152.853	5227.43	10502.6	0	0
32	153.789	5227.35	10045.3	0	0
33	154.725	5227.3	9543.68	0	0
34	155.661	5227.28	8999.76	0	0
35	156.598	5227.28	8415.62	0	0
36	157.534	5227.3	7793.6	0	0
37	158.47	5227.35	7136.28	0	0
38	159.406	5227.43	6446.48	0	0
39	160.342	5227.53	5727.28	0	0
40	161.278	5227.66	4982.08	0	0
41	162.214	5227.82	4214.62	0	0
42	163.151	5228	3428.98	0	0
43	164.087	5228.21	2624.57	0	0
44	165.023	5228.44	1761.16	0	0
45	165.959	5228.7	1540.94	0	0
46	166.895	5229	1333.92	0	0
47	167.831	5229.32	1145.65	0	0
48	168.768	5229.67	982.458	0	0
49	169.704	5230.05	851.641	0	0
50	170.64	5230.47	761.598	0	0
51	171.736	5231	0	0	0

◆ **Group 1 - Scenario 2**

Global Minimum Query (bishop simplified) - Safety Factor: 1.84

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	124.435	5245	0	0	0
2	124.82	5244.5	-4349.81	0	0
3	125.838	5243.25	-3308.48	0	0
4	126.856	5242.08	-2256.24	0	0
5	127.874	5241	-1212.38	0	0
6	128.876	5240	385.046	0	0
7	129.877	5239.07	1919.76	0	0
8	130.879	5238.19	3385.22	0	0
9	131.88	5237.37	4775.8	0	0
10	132.882	5236.6	6086.62	0	0
11	133.883	5235.87	7313.36	0	0
12	134.885	5235.18	8452.24	0	0
13	135.886	5234.54	9499.86	0	0
14	136.888	5233.93	9981.41	0	0
15	137.889	5233.36	10362.6	0	0
16	138.891	5232.82	10701.2	0	0
17	139.892	5232.32	10995.2	0	0
18	140.894	5231.85	11243	0	0
19	141.895	5231.41	11443.4	0	0
20	142.897	5231	11595.4	0	0
21	143.898	5230.62	11698.1	0	0
22	144.9	5230.27	11750.3	0	0
23	145.901	5229.95	11752.9	0	0
24	146.903	5229.65	11707.5	0	0
25	147.904	5229.38	11615.7	0	0
26	148.906	5229.13	11479.7	0	0
27	149.908	5228.91	11301.4	0	0
28	150.909	5228.72	11081.6	0	0
29	151.911	5228.55	10819.8	0	0
30	152.912	5228.4	10517.1	0	0
31	153.914	5228.28	10174.8	0	0
32	154.915	5228.18	9794.44	0	0
33	155.917	5228.1	9377.77	0	0
34	156.918	5228.05	8926.65	0	0
35	157.92	5228.02	8443.16	0	0
36	158.921	5228.02	7929.56	0	0
37	159.923	5228.04	7388.36	0	0
38	160.924	5228.08	6822.26	0	0
39	161.926	5228.15	6234.2	0	0
40	162.927	5228.23	5627.4	0	0
41	163.929	5228.35	5005.33	0	0
42	164.93	5228.48	4321.11	0	0
43	165.932	5228.65	4109.11	0	0
44	166.933	5228.83	3937.85	0	0
45	167.935	5229.04	3772.56	0	0
46	168.936	5229.28	3616.82	0	0
47	169.938	5229.54	3474.64	0	0
48	170.939	5229.82	3350.53	0	0
49	171.941	5230.14	3249.56	0	0
50	173.138	5230.55	2574.93	0	0
51	174.335	5231	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.72487

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	125.899	5245	0	0	0
2	126.184	5244.5	-5460.11	0	0
3	126.96	5243.23	-4515.2	0	0
4	127.737	5242.07	-3538.43	0	0
5	128.513	5241	-2552.57	0	0
6	129.449	5239.82	-663.75	0	0
7	130.385	5238.73	1139.59	0	0
8	131.321	5237.73	2851.22	0	0
9	132.258	5236.81	4466.12	0	0
10	133.194	5235.95	5980.15	0	0
11	134.13	5235.15	7389.8	0	0
12	135.066	5234.41	8692.1	0	0
13	136.002	5233.72	9882.95	0	0
14	136.938	5233.07	10377	0	0
15	137.874	5232.47	10822.3	0	0
16	138.811	5231.91	11216.5	0	0
17	139.747	5231.39	11557.6	0	0
18	140.683	5230.9	11843.8	0	0
19	141.619	5230.46	12074	0	0
20	142.555	5230.04	12247	0	0
21	143.491	5229.66	12362.1	0	0
22	144.428	5229.31	12418.5	0	0
23	145.364	5228.99	12416.4	0	0
24	146.3	5228.7	12357.5	0	0
25	147.236	5228.43	12243.6	0	0
26	148.172	5228.2	12076.7	0	0
27	149.108	5227.99	11858.9	0	0
28	150.044	5227.81	11592.5	0	0
29	150.981	5227.66	11277.7	0	0
30	151.917	5227.53	10913.9	0	0
31	152.853	5227.43	10502.6	0	0
32	153.789	5227.35	10045.3	0	0
33	154.725	5227.3	9543.68	0	0
34	155.661	5227.28	8999.76	0	0
35	156.598	5227.28	8415.62	0	0
36	157.534	5227.3	7793.6	0	0
37	158.47	5227.35	7136.28	0	0
38	159.406	5227.43	6446.48	0	0
39	160.342	5227.53	5727.28	0	0
40	161.278	5227.66	4982.08	0	0
41	162.214	5227.82	4214.62	0	0
42	163.151	5228	3428.98	0	0
43	164.087	5228.21	2624.57	0	0
44	165.023	5228.44	1761.16	0	0
45	165.959	5228.7	1540.94	0	0
46	166.895	5229	1333.92	0	0
47	167.831	5229.32	1145.65	0	0
48	168.768	5229.67	982.458	0	0
49	169.704	5230.05	851.641	0	0
50	170.64	5230.47	761.598	0	0
51	171.736	5231	0	0	0

Discharge Sections

Entity Information

◆ Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 5268 0, 5253 0, 5175 200, 5175 200, 5223 200, 5228 179, 5231 168.555, 5231 165, 5231 165, 5231.91 165, 5237.95 164, 5237.95 150, 5242 143.733, 5245.13 136, 5247 136, 5245 76, 5245 76, 5256 75.333, 5256 56, 5256 56, 5254 28, 5256 28, 5258 13, 5266
Material Boundary	0, 5253 72, 5243 75.333, 5242.76 76, 5242.71 100, 5241 132, 5241 148, 5237 164, 5232.21 165, 5231.91
Material Boundary	168.555, 5231 200, 5223
Material Boundary	164, 5237.95 164, 5232.21 164, 5228.5 165, 5228.5 165, 5231
Material Boundary	75.333, 5242.76 75.333, 5256
Material Boundary	76, 5242.71 76, 5244.5 76, 5245
Material Boundary	76, 5244.5 136, 5244.5 136, 5245

Scenario-based Entities

Type	Coordinates (x,y)	Master Scenario	Scenario 2
Distributed Load	76, 5245 136, 5245	Constant DistributionOrientation: VerticalMagnitude: 2500 lbs/ft2Creates Excess Pore Pressure: No	
Distributed Load	76, 5245 136, 5245		Constant DistributionOrientation: VerticalMagnitude: 2500 lbs/ft2Creates Excess Pore Pressure: No

Slide Analysis Information

Cedar Hills Townhomes Slope Stability - Copy

Project Summary

File Name:	Cedar Hills Townhomes Slope Stability - Copy.slmd
Slide Modeler Version:	9.02
Project Title:	Cedar Hills Townhome Development
Analysis:	Global Slope Stability
Author:	J. Egbert
Company:	CMT Technical Services
Date Created:	1/29/2026, 2:27:26 PM

Currently Open Scenarios

Group Name	Scenario Name	Global Minimum	Compute Time
Group 1 	Master Scenario	Bishop Simplified: 1.840000	00h:00m:02.150s
		Janbu Simplified: 1.724870	
	Scenario 2	Bishop Simplified: 1.132740	00h:00m:02.759s
		Janbu Simplified: 1.020520	

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

All Open Scenarios

Slices Type:	Vertical
	Analysis Methods Used
	Bishop simplified
	Janbu simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Surface Options

All Open Scenarios

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

◆ Group 1 - Master Scenario

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

◆ Group 1 - Scenario 2

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.37

Loading

All Open Scenarios

&nbsp;

Distribution:

Constant

Magnitude [psf]:

2500

Orientation:

Vertical

Materials

Concrete

Color



Strength Type

Mohr-Coulomb

Unit Weight [lbs/ft3]

150

Cohesion [psf]

10000

Friction Angle [deg]

0

Water Surface

Assigned per scenario

Ru Value

0

Unit Qafy

Color



Strength Type

Mohr-Coulomb

Unit Weight [lbs/ft3]

140

Cohesion [psf]

725

Friction Angle [deg]

30.7

Water Surface

Assigned per scenario

Ru Value

0

Unit Qms

Color



Strength Type

Mohr-Coulomb

Unit Weight [lbs/ft3]

140

Cohesion [psf]

0

Friction Angle [deg]

30.7

Water Surface

Assigned per scenario

Ru Value

0

Materials In Use

	Material		Group 1		Scenario 2
Concrete		✓		✓	
Unit Qafy		✓		✓	
Unit Qms		✓		✓	

Global Minimums

◆ Group 1 - Master Scenario

Method: bishop simplified

FS**1.840000**

Center: 158.619, 5270.913
 Radius: 42.896
 Left Slip Surface Endpoint: 124.435, 5245.000
 Right Slip Surface Endpoint: 174.335, 5231.000
 Resisting Moment: 2.79025e+06 lb-ft
 Driving Moment: 1.51644e+06 lb-ft
 Total Slice Area: 448.001 ft²
 Surface Horizontal Width: 49.8998 ft
 Surface Average Height: 8.978 ft

Method: janbu simplified**FS****1.724870**

Center: 156.115, 5261.891
 Radius: 34.617
 Left Slip Surface Endpoint: 125.899, 5245.000
 Right Slip Surface Endpoint: 171.736, 5231.000
 Resisting Horizontal Force: 51138.2 lb
 Driving Horizontal Force: 29647.6 lb
 Total Slice Area: 465.848 ft²
 Surface Horizontal Width: 45.8373 ft
 Surface Average Height: 10.1631 ft

◆ **Group 1 - Scenario 2****Method: bishop simplified****FS****1.132740**

Center: 159.074, 5270.723
 Radius: 42.639
 Left Slip Surface Endpoint: 125.068, 5245.000
 Right Slip Surface Endpoint: 174.572, 5231.000
 Resisting Moment: 2.53294e+06 lb-ft
 Driving Moment: 2.23613e+06 lb-ft
 Total Slice Area: 436.859 ft²
 Surface Horizontal Width: 49.5041 ft
 Surface Average Height: 8.8247 ft

Method: janbu simplified**FS****1.020520**

Center: 159.136, 5251.197
 Radius: 23.798
 Left Slip Surface Endpoint: 136.000, 5245.622
 Right Slip Surface Endpoint: 171.723, 5231.000
 Left Slope Intercept: 136.000 5247.000
 Right Slope Intercept: 171.723 5231.000
 Resisting Horizontal Force: 25280.9 lb
 Driving Horizontal Force: 24772.5 lb
 Total Slice Area: 333.373 ft²
 Surface Horizontal Width: 35.7231 ft
 Surface Average Height: 9.33214 ft

Global Minimum Support Data

All Open Scenarios

No Supports Present

Slice Data

◆ Group 1 - Master Scenario

Global Minimum Query (bishop simplified) - Safety Factor: 1.84

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.384848	14.4318	-52.4147	Concrete	10000	0	5434.78	10000	-4519.08	0	-4519.08	2541.87	2541.87
2	1.01813	165.693	-50.9147	Unit Qafy	725	30.7	897.092	1650.65	1558.97	0	1558.97	2663.43	2663.43
3	1.01813	337.923	-48.8038	Unit Qafy	725	30.7	955.739	1758.56	1740.7	0	1740.7	2832.58	2832.58
4	1.01813	498.032	-46.7784	Unit Qafy	725	30.7	1011.5	1861.16	1913.5	0	1913.5	2989.83	2989.83
5	1.00152	635.684	-44.8421	Unit Qms	0	30.7	765.913	1409.28	2373.49	0	2373.49	3135.19	3135.19
6	1.00152	770.949	-42.9844	Unit Qms	0	30.7	811.293	1492.78	2514.12	0	2514.12	3270.25	3270.25
7	1.00152	897.814	-41.1813	Unit Qms	0	30.7	854.837	1572.9	2649.06	0	2649.06	3396.92	3396.92
8	1.00152	1016.97	-39.4266	Unit Qms	0	30.7	896.658	1649.85	2778.66	0	2778.66	3515.88	3515.88
9	1.00152	1128.99	-37.7151	Unit Qms	0	30.7	936.859	1723.82	2903.25	0	2903.25	3627.73	3627.73
10	1.00152	1234.38	-36.0423	Unit Qms	0	30.7	975.527	1794.97	3023.08	0	3023.08	3732.95	3732.95
11	1.00152	1333.55	-34.4044	Unit Qms	0	30.7	1012.74	1863.45	3138.41	0	3138.41	3831.96	3831.96
12	1.00152	1426.88	-32.798	Unit Qms	0	30.7	1048.57	1929.37	3249.43	0	3249.43	3925.14	3925.14
13	1.00152	1745.51	-31.2201	Unit Qms	0	30.7	547.087	1006.64	1695.38	0	1695.38	2026.97	2026.97
14	1.00152	1825.66	-29.6681	Unit Qms	0	30.7	496.943	914.376	1539.98	0	1539.98	1823.07	1823.07
15	1.00152	1869.31	-28.1398	Unit Qms	0	30.7	513.698	945.204	1591.9	0	1591.9	1866.65	1866.65
16	1.00152	1908.18	-26.633	Unit Qms	0	30.7	529.235	973.792	1640.05	0	1640.05	1905.46	1905.46
17	1.00152	1942.46	-25.1458	Unit Qms	0	30.7	543.582	1000.19	1684.51	0	1684.51	1939.67	1939.67
18	1.00152	1972.3	-23.6765	Unit Qms	0	30.7	556.755	1024.43	1725.34	0	1725.34	1969.46	1969.46
19	1.00152	1997.88	-22.2236	Unit Qms	0	30.7	568.783	1046.56	1762.61	0	1762.61	1995	1995
20	1.00152	2018.83	-20.7856	Unit Qms	0	30.7	579.538	1066.35	1795.93	0	1795.93	2015.91	2015.91
21	1.00152	2012.61	-19.3612	Unit Qms	0	30.7	582.467	1071.74	1805.01	0	1805.01	2009.69	2009.69
22	1.00152	1989.81	-17.9491	Unit Qms	0	30.7	580.484	1068.09	1798.87	0	1798.87	1986.91	1986.91
23	1.00152	1963.21	-16.5483	Unit Qms	0	30.7	577.245	1062.13	1788.82	0	1788.82	1960.34	1960.34
24	1.00152	1932.88	-15.1575	Unit Qms	0	30.7	572.745	1053.85	1774.89	0	1774.89	1930.04	1930.04
25	1.00152	1898.9	-13.7758	Unit Qms	0	30.7	567.005	1043.29	1757.09	0	1757.09	1896.11	1896.11
26	1.00152	1861.34	-12.4023	Unit Qms	0	30.7	560.016	1030.43	1735.45	0	1735.45	1858.6	1858.6
27	1.00152	1832.44	-11.0359	Unit Qms	0	30.7	555.484	1022.09	1721.39	0	1721.39	1829.72	1829.72
28	1.00152	1817.31	-9.67593	Unit Qms	0	30.7	555.027	1021.25	1719.98	0	1719.98	1814.61	1814.61
29	1.00152	1798.89	-8.32141	Unit Qms	0	30.7	553.5	1018.44	1715.26	0	1715.26	1796.22	1796.22
30	1.00152	1777.08	-6.97155	Unit Qms	0	30.7	550.859	1013.58	1707.08	0	1707.08	1774.43	1774.43
31	1.00152	1751.92	-5.62558	Unit Qms	0	30.7	547.098	1006.66	1695.41	0	1695.41	1749.3	1749.3
32	1.00152	1723.43	-4.28272	Unit Qms	0	30.7	542.203	997.654	1680.24	0	1680.24	1720.84	1720.84
33	1.00152	1691.63	-2.94221	Unit Qms	0	30.7	536.166	986.545	1661.53	0	1661.53	1689.09	1689.09
34	1.00152	1656.54	-1.60331	Unit Qms	0	30.7	528.972	973.308	1639.24	0	1639.24	1654.05	1654.05
35	1.00152	1618.17	-0.265287	Unit Qms	0	30.7	520.605	957.914	1613.31	0	1613.31	1615.73	1615.73
36	1.00152	1576.52	1.07259	Unit Qms	0	30.7	511.048	940.328	1583.69	0	1583.69	1574.12	1574.12
37	1.00152	1531.59	2.41105	Unit Qms	0	30.7	500.278	920.511	1550.31	0	1550.31	1529.25	1529.25
38	1.00152	1483.36	3.75084	Unit Qms	0	30.7	488.27	898.416	1513.1	0	1513.1	1481.09	1481.09
39	1.00152	1431.84	5.09268	Unit Qms	0	30.7	474.997	873.995	1471.97	0	1471.97	1429.64	1429.64
40	1.00152	1377	6.43732	Unit Qms	0	30.7	460.428	847.188	1426.83	0	1426.83	1374.88	1374.88
41	1.00152	1424.26	7.78555	Unit Qms	0	30.7	480.071	883.331	1487.7	0	1487.7	1422.06	1422.06
42	1.00152	415.839	9.13812	Unit Qms	0	30.7	141.316	260.022	437.926	0	437.926	415.195	415.195
43	1.00152	317.14	10.4959	Unit Qms	0	30.7	108.677	199.966	336.78	0	336.78	316.646	316.646
44	1.00152	289.387	11.8596	Unit Qms	0	30.7	100.015	184.028	309.939	0	309.939	288.936	288.936
45	1.00152	258.136	13.2302	Unit Qms	0	30.7	89.9962	165.593	278.89	0	278.89	257.732	257.732
46	1.00152	223.328	14.6085	Unit Qms	0	30.7	78.5609	144.552	243.453	0	243.453	222.977	222.977
47	1.00152	184.901	15.9955	Unit Qms	0	30.7	65.6446	120.786	203.427	0	203.427	184.609	184.609
48	1.00152	142.781	17.3923	Unit Qms	0	30.7	51.1741	94.1603	158.584	0	158.584	142.555	142.555
49	1.19689	109.943	18.9383	Unit Qafy	725	30.7	476.377	876.534	255.213	0	255.213	91.7561	91.7561
50	1.19689	37.7676	20.6376	Unit Qafy	725	30.7	460.086	846.558	204.728	0	204.728	31.4476	31.4476

Global Minimum Query (janbu simplified) - Safety Factor: 1.72487

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.284994	10.6873	-60.3174	Concrete	10000	0	5797.54	10000	-7620.14	0	-7620.14	2551.19	2551.19
2	0.776313	127.356	-58.6076	Unit Qafy	725	30.7	855.453	1475.55	1264.06	0	1264.06	2665.94	2665.94
3	0.776313	259.551	-56.2186	Unit Qafy	725	30.7	922.13	1590.55	1457.76	0	1457.76	2836.19	2836.19
4	0.776313	380.614	-53.9708	Unit Qafy	725	30.7	984.398	1697.96	1638.65	0	1638.65	2992.11	2992.11
5	0.936154	606.411	-51.6303	Unit Qms	0	30.7	755.518	1303.17	2194.79	0	2194.79	3149.05	3149.05
6	0.936154	754.958	-49.1964	Unit Qms	0	30.7	814.032	1404.1	2364.77	0	2364.77	3307.71	3307.71
7	0.936154	891.525	-46.8773	Unit Qms	0	30.7	869.306	1499.44	2525.35	0	2525.35	3453.57	3453.57
8	0.936154	1017.64	-44.6547	Unit Qms	0	30.7	921.716	1589.84	2677.6	0	2677.6	3588.27	3588.27
9	0.936154	1134.5	-42.5144	Unit Qms	0	30.7	971.546	1675.79	2822.36	0	2822.36	3713.07	3713.07
10	0.936154	1243.03	-40.4452	Unit Qms	0	30.7	1019.04	1757.71	2960.32	0	2960.32	3828.98	3828.98
11	0.936154	1344.01	-38.438	Unit Qms	0	30.7	1064.38	1835.92	3092.05	0	3092.05	3936.82	3936.82
12	0.936154	1438.66	-36.4852	Unit Qms	0	30.7	1106.36	1908.32	3213.98	0	3213.98	4032.19	4032.19
13	0.936154	1768.3	-34.5806	Unit Qms	0	30.7	525.652	906.682	1527.02	0	1527.02	1889.38	1889.38
14	0.936154	1820.39	-32.7186	Unit Qms	0	30.7	548.283	945.717	1592.76	0	1592.76	1945.01	1945.01
15	0.936154	1866.89	-30.8949	Unit Qms	0	30.7	569.357	982.066	1653.98	0	1653.98	1994.67	1994.67
16	0.936154	1908.14	-29.1053	Unit Qms	0	30.7	588.931	1015.83	1710.84	0	1710.84	2038.71	2038.71
17	0.936154	1944.4	-27.3463	Unit Qms	0	30.7	607.049	1047.08	1763.49	0	1763.49	2077.43	2077.43
18	0.936154	1975.92	-25.6148	Unit Qms	0	30.7	623.757	1075.9	1812.03	0	1812.03	2111.08	2111.08
19	0.936154	2002.91	-23.9081	Unit Qms	0	30.7	639.097	1102.36	1856.58	0	1856.58	2139.9	2139.9
20	0.936154	2025.56	-22.2237	Unit Qms	0	30.7	653.087	1126.49	1897.22	0	1897.22	2164.06	2164.06
21	0.936154	2035.29	-20.5593	Unit Qms	0	30.7	662.92	1143.45	1925.8	0	1925.8	2174.44	2174.44
22	0.936154	2019.03	-18.9129	Unit Qms	0	30.7	664.189	1145.64	1929.47	0	1929.47	2157.04	2157.04
23	0.936154	1997.79	-17.2825	Unit Qms	0	30.7	663.627	1144.67	1927.85	0	1927.85	2134.33	2134.33
24	0.936154	1972.74	-15.6664	Unit Qms	0	30.7	661.609	1141.19	1921.98	0	1921.98	2107.53	2107.53
25	0.936154	1943.96	-14.0631	Unit Qms	0	30.7	658.137	1135.2	1911.91	0	1911.91	2076.77	2076.77
26	0.936154	1911.55	-12.4709	Unit Qms	0	30.7	653.232	1126.74	1897.64	0	1897.64	2042.11	2042.11
27	0.936154	1875.6	-10.8884	Unit Qms	0	30.7	646.901	1115.82	1879.25	0	1879.25	2003.69	2003.69
28	0.936154	1850.22	-9.31436	Unit Qms	0	30.7	644.031	1110.87	1870.92	0	1870.92	1976.55	1976.55
29	0.936154	1833.1	-7.74734	Unit Qms	0	30.7	643.933	1110.7	1870.63	0	1870.63	1958.24	1958.24
30	0.936154	1812.57	-6.18614	Unit Qms	0	30.7	642.559	1108.33	1866.63	0	1866.63	1936.28	1936.28
31	0.936154	1788.66	-4.62955	Unit Qms	0	30.7	639.892	1103.73	1858.9	0	1858.9	1910.71	1910.71
32	0.936154	1761.39	-3.07637	Unit Qms	0	30.7	635.932	1096.9	1847.39	0	1847.39	1881.57	1881.57
33	0.936154	1730.8	-1.52545	Unit Qms	0	30.7	630.656	1087.8	1832.06	0	1832.06	1848.86	1848.86
34	0.936154	1696.87	0.0243468	Unit Qms	0	30.7	624.047	1076.4	1812.86	0	1812.86	1812.6	1812.6
35	0.936154	1659.63	1.57416	Unit Qms	0	30.7	616.081	1062.66	1789.72	0	1789.72	1772.79	1772.79
36	0.936154	1619.07	3.12513	Unit Qms	0	30.7	606.736	1046.54	1762.58	0	1762.58	1729.45	1729.45
37	0.936154	1575.17	4.6784	Unit Qms	0	30.7	595.97	1027.97	1731.31	0	1731.31	1682.54	1682.54
38	0.936154	1527.92	6.23512	Unit Qms	0	30.7	583.754	1006.9	1695.81	0	1695.81	1632.04	1632.04
39	0.936154	1477.29	7.79649	Unit Qms	0	30.7	570.045	983.253	1655.98	0	1655.98	1577.93	1577.93
40	0.936154	1423.25	9.3637	Unit Qms	0	30.7	554.79	956.941	1611.67	0	1611.67	1520.19	1520.19
41	0.936154	1365.74	10.938	Unit Qms	0	30.7	537.936	927.869	1562.71	0	1562.71	1458.75	1458.75
42	0.936154	1313.08	12.5208	Unit Qms	0	30.7	522.741	901.66	1518.57	0	1518.57	1402.48	1402.48
43	0.936154	1325.25	14.1133	Unit Qms	0	30.7	533.412	920.067	1549.56	0	1549.56	1415.45	1415.45
44	0.936154	318.175	15.717	Unit Qms	0	30.7	129.526	223.416	376.276	0	376.276	339.826	339.826
45	0.936154	281.765	17.3335	Unit Qms	0	30.7	116.06	200.188	337.155	0	337.155	300.932	300.932
46	0.936154	241.537	18.9643	Unit Qms	0	30.7	100.713	173.717	292.572	0	292.572	257.964	257.964
47	0.936154	197.384	20.6113	Unit Qms	0	30.7	83.3576	143.781	242.155	0	242.155	210.804	210.804
48	0.936154	149.181	22.2763	Unit Qms	0	30.7	63.8466	110.127	185.475	0	185.475	159.32	159.32
49	0.936154	96.7864	23.9614	Unit Qms	0	30.7	42.007	72.4567	122.031	0	122.031	103.363	103.363
50	1.09646	40.7137	25.8173	Unit Qafy	725	30.7	519.503	896.076	288.125	0	288.125	36.7938	36.7938

◆ Group 1 - Scenario 2

Global Minimum Query (bishop simplified) - Safety Factor: 1.13274

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.384052	14.402	-52.472	Concrete	10000	0	8828.15	10000	-8953.15	0	-8953.15	2540.28	2540.28
2	1.01676	165.506	-50.9637	Unit Qafy	725	30.7	1236.59	1400.73	1138.06	0	1138.06	2663.14	2663.14
3	1.01676	337.537	-48.8409	Unit Qafy	725	30.7	1328.24	1504.55	1312.91	0	1312.91	2832.34	2832.34
4	1.01676	497.394	-46.8049	Unit Qafy	725	30.7	1416.36	1604.37	1481.03	0	1481.03	2989.56	2989.56
5	1.01292	643.741	-44.8468	Unit Qms	0	30.7	1080.41	1223.82	2061.14	0	2061.14	3135.79	3135.79
6	1.01292	782.053	-42.957	Unit Qms	0	30.7	1152.69	1305.7	2199.05	0	2199.05	3272.33	3272.33
7	1.01292	911.632	-41.1236	Unit Qms	0	30.7	1222.75	1385.06	2332.7	0	2332.7	3400.26	3400.26
8	1.01292	1033.21	-39.3401	Unit Qms	0	30.7	1290.7	1462.03	2462.34	0	2462.34	3520.28	3520.28
9	1.01292	1147.39	-37.6011	Unit Qms	0	30.7	1356.67	1536.75	2588.19	0	2588.19	3633	3633
10	1.01292	1254.69	-35.9019	Unit Qms	0	30.7	1420.74	1609.33	2710.42	0	2710.42	3738.93	3738.93
11	1.01292	1355.57	-34.2385	Unit Qms	0	30.7	1483.01	1679.86	2829.21	0	2829.21	3838.51	3838.51
12	1.01292	1610.77	-32.6073	Unit Qms	0	30.7	1018.8	1154.04	1943.62	0	1943.62	2595.36	2595.36
13	1.01292	1779.98	-31.0054	Unit Qms	0	30.7	700.501	793.485	1336.38	0	1336.38	1757.38	1757.38
14	1.01292	1828.99	-29.4299	Unit Qms	0	30.7	730.51	827.478	1393.64	0	1393.64	1805.76	1805.76
15	1.01292	1872.83	-27.8786	Unit Qms	0	30.7	758.812	859.537	1447.62	0	1447.62	1849.03	1849.03
16	1.01292	1911.73	-26.3492	Unit Qms	0	30.7	785.429	889.687	1498.4	0	1498.4	1887.43	1887.43
17	1.01292	1945.87	-24.8397	Unit Qms	0	30.7	810.38	917.95	1546	0	1546	1921.13	1921.13
18	1.01292	1975.45	-23.3485	Unit Qms	0	30.7	833.68	944.343	1590.45	0	1590.45	1950.33	1950.33
19	1.01292	2000.62	-21.8739	Unit Qms	0	30.7	855.341	968.879	1631.78	0	1631.78	1975.17	1975.17
20	1.01292	2004.27	-20.4143	Unit Qms	0	30.7	867.909	983.115	1655.76	0	1655.76	1978.78	1978.78
21	1.01292	1983.89	-18.9685	Unit Qms	0	30.7	869.944	985.42	1659.64	0	1659.64	1958.65	1958.65
22	1.01292	1959.45	-17.5351	Unit Qms	0	30.7	869.943	985.419	1659.64	0	1659.64	1934.51	1934.51
23	1.01292	1931.07	-16.1129	Unit Qms	0	30.7	867.914	983.121	1655.76	0	1655.76	1906.48	1906.48
24	1.01292	1898.84	-14.7009	Unit Qms	0	30.7	863.855	978.523	1648.02	0	1648.02	1874.67	1874.67
25	1.01292	1862.83	-13.298	Unit Qms	0	30.7	857.754	971.612	1636.38	0	1636.38	1839.11	1839.11
26	1.01292	1832.24	-11.9032	Unit Qms	0	30.7	853.846	967.185	1628.93	0	1628.93	1808.91	1808.91
27	1.01292	1818.37	-10.5154	Unit Qms	0	30.7	857.566	971.399	1636.02	0	1636.02	1795.2	1795.2
28	1.01292	1801.65	-9.13394	Unit Qms	0	30.7	859.882	974.023	1640.44	0	1640.44	1778.69	1778.69
29	1.01292	1781.39	-7.75778	Unit Qms	0	30.7	860.42	974.632	1641.47	0	1641.47	1758.68	1758.68
30	1.01292	1757.62	-6.3861	Unit Qms	0	30.7	859.154	973.198	1639.05	0	1639.05	1735.21	1735.21
31	1.01292	1730.37	-5.01809	Unit Qms	0	30.7	856.053	969.686	1633.14	0	1633.14	1708.3	1708.3
32	1.01292	1699.66	-3.65295	Unit Qms	0	30.7	851.081	964.054	1623.66	0	1623.66	1677.99	1677.99
33	1.01292	1665.52	-2.28988	Unit Qms	0	30.7	844.2	956.259	1610.52	0	1610.52	1644.28	1644.28
34	1.01292	1627.97	-0.928105	Unit Qms	0	30.7	835.362	946.248	1593.66	0	1593.66	1607.19	1607.19
35	1.01292	1586.99	0.433144	Unit Qms	0	30.7	824.517	933.963	1572.97	0	1572.97	1566.74	1566.74
36	1.01292	1542.6	1.79464	Unit Qms	0	30.7	811.606	919.339	1548.34	0	1548.34	1522.91	1522.91
37	1.01292	1494.8	3.15715	Unit Qms	0	30.7	796.566	902.302	1519.65	0	1519.65	1475.71	1475.71
38	1.01292	1443.56	4.52144	Unit Qms	0	30.7	779.323	882.77	1486.75	0	1486.75	1425.13	1425.13
39	1.01292	1388.88	5.88832	Unit Qms	0	30.7	759.794	860.649	1449.5	0	1449.5	1371.14	1371.14
40	1.01292	1441.15	7.25857	Unit Qms	0	30.7	799.115	905.19	1524.51	0	1524.51	1422.73	1422.73
41	1.01292	379.142	8.63301	Unit Qms	0	30.7	213.162	241.457	406.66	0	406.66	374.297	374.297
42	1.01292	321.022	10.0125	Unit Qms	0	30.7	183.062	207.362	349.238	0	349.238	316.918	316.918
43	1.01292	293.863	11.3978	Unit Qms	0	30.7	170.035	192.605	324.383	0	324.383	290.105	290.105
44	1.01292	263.08	12.79	Unit Qms	0	30.7	154.524	175.035	294.793	0	294.793	259.715	259.715
45	1.01292	228.616	14.1899	Unit Qms	0	30.7	136.377	154.48	260.173	0	260.173	225.69	225.69
46	1.01292	190.405	15.5984	Unit Qms	0	30.7	115.418	130.739	220.19	0	220.19	187.968	187.968
47	1.01292	148.373	17.0168	Unit Qms	0	30.7	91.4491	103.588	174.461	0	174.461	146.473	146.473
48	0.837998	88.2875	18.3216	Unit Qafy	725	30.7	841.25	952.917	383.856	0	383.856	105.288	105.288
49	0.837998	54.5909	19.512	Unit Qafy	725	30.7	827.936	937.836	358.457	0	358.457	65.0734	65.0734
50	0.837998	18.5859	20.7113	Unit Qafy	725	30.7	812.694	920.571	329.38	0	329.38	22.1046	22.1046

Global Minimum Query (janbu simplified) - Safety Factor: 1.02052

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.826321	304.566	-73.0401	Unit Qafy	725	30.7	318.068	324.595	-674.359	0	-674.359	368.604	368.604
2	0.826321	551.224	-67.0737	Unit Qafy	725	30.7	462.434	471.923	-426.23	0	-426.23	667.106	667.106
3	0.826321	732.479	-62.3737	Unit Qafy	725	30.7	580.667	592.582	-223.016	0	-223.016	886.458	886.458
4	0.70198	738.238	-58.6057	Unit Qms	0	30.7	313.238	319.666	538.379	0	538.379	1051.66	1051.66
5	0.70198	828.283	-55.4916	Unit Qms	0	30.7	371.832	379.462	639.087	0	639.087	1179.94	1179.94
6	0.70198	906.934	-52.6081	Unit Qms	0	30.7	426.806	435.564	733.574	0	733.574	1291.98	1291.98
7	0.70198	976.381	-49.9043	Unit Qms	0	30.7	478.555	488.375	822.518	0	822.518	1390.91	1390.91
8	0.70198	1038.14	-47.345	Unit Qms	0	30.7	527.391	538.213	906.454	0	906.454	1478.88	1478.88
9	0.70198	1093.31	-44.9046	Unit Qms	0	30.7	573.564	585.334	985.815	0	985.815	1557.47	1557.47
10	0.70198	1142.71	-42.5641	Unit Qms	0	30.7	617.279	629.946	1060.95	0	1060.95	1627.85	1627.85
11	0.70198	1184.64	-40.3085	Unit Qms	0	30.7	657.394	670.884	1129.9	0	1129.9	1687.58	1687.58
12	0.70198	1208.58	-38.126	Unit Qms	0	30.7	687.685	701.796	1181.95	0	1181.95	1721.67	1721.67
13	0.70198	1226.22	-36.0071	Unit Qms	0	30.7	714.303	728.96	1227.71	0	1227.71	1746.81	1746.81
14	0.70198	1240.01	-33.9438	Unit Qms	0	30.7	738.538	753.693	1269.36	0	1269.36	1766.46	1766.46
15	0.70198	1250.23	-31.9294	Unit Qms	0	30.7	760.498	776.103	1307.11	0	1307.11	1781.02	1781.02
16	0.70198	1257.11	-29.9583	Unit Qms	0	30.7	780.27	796.281	1341.09	0	1341.09	1790.82	1790.82
17	0.70198	1260.86	-28.0255	Unit Qms	0	30.7	797.927	814.3	1371.44	0	1371.44	1796.16	1796.16
18	0.70198	1261.65	-26.127	Unit Qms	0	30.7	813.531	830.225	1398.26	0	1398.26	1797.28	1797.28
19	0.70198	1259.62	-24.2588	Unit Qms	0	30.7	827.132	844.105	1421.64	0	1421.64	1794.39	1794.39
20	0.70198	1257.4	-22.4178	Unit Qms	0	30.7	840.448	857.694	1444.52	0	1444.52	1791.23	1791.23
21	0.70198	1263.39	-20.6008	Unit Qms	0	30.7	859.22	876.851	1476.78	0	1476.78	1799.75	1799.75
22	0.70198	1268.13	-18.8053	Unit Qms	0	30.7	877.25	895.251	1507.77	0	1507.77	1806.5	1806.5
23	0.70198	1270.46	-17.0288	Unit Qms	0	30.7	893.729	912.068	1536.09	0	1536.09	1809.82	1809.82
24	0.70198	1270.46	-15.269	Unit Qms	0	30.7	908.671	927.317	1561.77	0	1561.77	1809.83	1809.83
25	0.70198	1268.2	-13.5239	Unit Qms	0	30.7	922.083	941.004	1584.84	0	1584.84	1806.61	1806.61
26	0.70198	1263.72	-11.7914	Unit Qms	0	30.7	933.967	953.132	1605.26	0	1605.26	1800.23	1800.23
27	0.70198	1257.07	-10.0699	Unit Qms	0	30.7	944.323	963.7	1623.06	0	1623.06	1790.75	1790.75
28	0.70198	1248.29	-8.35747	Unit Qms	0	30.7	953.142	972.7	1638.22	0	1638.22	1778.24	1778.24
29	0.70198	1237.4	-6.65256	Unit Qms	0	30.7	960.414	980.122	1650.71	0	1650.71	1762.73	1762.73
30	0.70198	1224.44	-4.95354	Unit Qms	0	30.7	966.123	985.948	1660.53	0	1660.53	1744.27	1744.27
31	0.70198	1209.41	-3.25889	Unit Qms	0	30.7	970.248	990.157	1667.62	0	1667.62	1722.86	1722.86
32	0.70198	1192.34	-1.56709	Unit Qms	0	30.7	972.759	992.72	1671.93	0	1671.93	1698.54	1698.54
33	0.70198	1173.24	0.123342	Unit Qms	0	30.7	973.624	993.603	1673.42	0	1673.42	1671.32	1671.32
34	0.70198	1152.09	1.81388	Unit Qms	0	30.7	972.804	992.766	1672.02	0	1672.02	1641.21	1641.21
35	0.70198	1128.91	3.50601	Unit Qms	0	30.7	970.251	990.161	1667.62	0	1667.62	1608.17	1608.17
36	0.70198	1103.68	5.2012	Unit Qms	0	30.7	965.91	985.73	1660.16	0	1660.16	1572.24	1572.24
37	0.70198	1076.39	6.90098	Unit Qms	0	30.7	959.714	979.407	1649.51	0	1649.51	1533.35	1533.35
38	0.70198	1047.01	8.60689	Unit Qms	0	30.7	951.587	971.114	1635.54	0	1635.54	1491.5	1491.5
39	0.70198	1015.53	10.3205	Unit Qms	0	30.7	941.441	960.759	1618.11	0	1618.11	1446.67	1446.67
40	0.70198	1028.79	12.0436	Unit Qms	0	30.7	973.524	993.501	1673.24	0	1673.24	1465.54	1465.54
41	0.70198	870.795	13.7777	Unit Qms	0	30.7	841.837	859.111	1446.91	0	1446.91	1240.48	1240.48
42	0.70198	268.304	15.5249	Unit Qms	0	30.7	265.246	270.689	455.892	0	455.892	382.209	382.209
43	0.70198	247.987	17.287	Unit Qms	0	30.7	250.982	256.132	431.376	0	431.376	353.266	353.266
44	0.70198	225.33	19.0661	Unit Qms	0	30.7	233.765	238.562	401.783	0	401.783	320.989	320.989
45	0.70198	200.26	20.8646	Unit Qms	0	30.7	213.277	217.653	366.568	0	366.568	285.277	285.277
46	0.70198	172.694	22.6849	Unit Qms	0	30.7	189.127	193.008	325.064	0	325.064	246.009	246.009
47	0.70198	142.534	24.5297	Unit Qms	0	30.7	160.84	164.14	276.444	0	276.444	203.044	203.044
48	0.70198	109.667	26.4021	Unit Qms	0	30.7	127.811	130.434	219.676	0	219.676	156.224	156.224
49	0.70198	73.9653	28.3054	Unit Qms	0	30.7	89.2788	91.1108	153.448	0	153.448	105.365	105.365
50	0.953043	37.5986	30.5982	Unit Qafy	725	30.7	1118.04	1140.98	700.597	0	700.597	39.4371	39.4371

Interslice Data

◆ Group 1 - Master Scenario

Global Minimum Query (bishop simplified) - Safety Factor: 1.84

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	124.435	5245	0	0	0
2	124.82	5244.5	-4349.81	0	0
3	125.838	5243.25	-3308.48	0	0
4	126.856	5242.08	-2256.24	0	0
5	127.874	5241	-1212.38	0	0
6	128.876	5240	385.046	0	0
7	129.877	5239.07	1919.76	0	0
8	130.879	5238.19	3385.22	0	0
9	131.88	5237.37	4775.8	0	0
10	132.882	5236.6	6086.62	0	0
11	133.883	5235.87	7313.36	0	0
12	134.885	5235.18	8452.24	0	0
13	135.886	5234.54	9499.86	0	0
14	136.888	5233.93	9981.41	0	0
15	137.889	5233.36	10362.6	0	0
16	138.891	5232.82	10701.2	0	0
17	139.892	5232.32	10995.2	0	0
18	140.894	5231.85	11243	0	0
19	141.895	5231.41	11443.4	0	0
20	142.897	5231	11595.4	0	0
21	143.898	5230.62	11698.1	0	0
22	144.9	5230.27	11750.3	0	0
23	145.901	5229.95	11752.9	0	0
24	146.903	5229.65	11707.5	0	0
25	147.904	5229.38	11615.7	0	0
26	148.906	5229.13	11479.7	0	0
27	149.908	5228.91	11301.4	0	0
28	150.909	5228.72	11081.6	0	0
29	151.911	5228.55	10819.8	0	0
30	152.912	5228.4	10517.1	0	0
31	153.914	5228.28	10174.8	0	0
32	154.915	5228.18	9794.44	0	0
33	155.917	5228.1	9377.77	0	0
34	156.918	5228.05	8926.65	0	0
35	157.92	5228.02	8443.16	0	0
36	158.921	5228.02	7929.56	0	0
37	159.923	5228.04	7388.36	0	0
38	160.924	5228.08	6822.26	0	0
39	161.926	5228.15	6234.2	0	0
40	162.927	5228.23	5627.4	0	0
41	163.929	5228.35	5005.33	0	0
42	164.93	5228.48	4321.11	0	0
43	165.932	5228.65	4109.11	0	0
44	166.933	5228.83	3937.85	0	0
45	167.935	5229.04	3772.56	0	0
46	168.936	5229.28	3616.82	0	0
47	169.938	5229.54	3474.64	0	0
48	170.939	5229.82	3350.53	0	0
49	171.941	5230.14	3249.56	0	0
50	173.138	5230.55	2574.93	0	0
51	174.335	5231	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.72487

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	125.899	5245	0	0	0
2	126.184	5244.5	-5460.11	0	0
3	126.96	5243.23	-4515.2	0	0
4	127.737	5242.07	-3538.43	0	0
5	128.513	5241	-2552.57	0	0
6	129.449	5239.82	-663.75	0	0
7	130.385	5238.73	1139.59	0	0
8	131.321	5237.73	2851.22	0	0
9	132.258	5236.81	4466.12	0	0
10	133.194	5235.95	5980.15	0	0
11	134.13	5235.15	7389.8	0	0
12	135.066	5234.41	8692.1	0	0
13	136.002	5233.72	9882.95	0	0
14	136.938	5233.07	10377	0	0
15	137.874	5232.47	10822.3	0	0
16	138.811	5231.91	11216.5	0	0
17	139.747	5231.39	11557.6	0	0
18	140.683	5230.9	11843.8	0	0
19	141.619	5230.46	12074	0	0
20	142.555	5230.04	12247	0	0
21	143.491	5229.66	12362.1	0	0
22	144.428	5229.31	12418.5	0	0
23	145.364	5228.99	12416.4	0	0
24	146.3	5228.7	12357.5	0	0
25	147.236	5228.43	12243.6	0	0
26	148.172	5228.2	12076.7	0	0
27	149.108	5227.99	11858.9	0	0
28	150.044	5227.81	11592.5	0	0
29	150.981	5227.66	11277.7	0	0
30	151.917	5227.53	10913.9	0	0
31	152.853	5227.43	10502.6	0	0
32	153.789	5227.35	10045.3	0	0
33	154.725	5227.3	9543.68	0	0
34	155.661	5227.28	8999.76	0	0
35	156.598	5227.28	8415.62	0	0
36	157.534	5227.3	7793.6	0	0
37	158.47	5227.35	7136.28	0	0
38	159.406	5227.43	6446.48	0	0
39	160.342	5227.53	5727.28	0	0
40	161.278	5227.66	4982.08	0	0
41	162.214	5227.82	4214.62	0	0
42	163.151	5228	3428.98	0	0
43	164.087	5228.21	2624.57	0	0
44	165.023	5228.44	1761.16	0	0
45	165.959	5228.7	1540.94	0	0
46	166.895	5229	1333.92	0	0
47	167.831	5229.32	1145.65	0	0
48	168.768	5229.67	982.458	0	0
49	169.704	5230.05	851.641	0	0
50	170.64	5230.47	761.598	0	0
51	171.736	5231	0	0	0

◆ **Group 1 - Scenario 2**

Global Minimum Query (bishop simplified) - Safety Factor: 1.13274

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	125.068	5245	0	0	0
2	125.452	5244.5	-7860.9	0	0
3	126.469	5243.25	-7629.57	0	0
4	127.486	5242.08	-7327.79	0	0
5	128.502	5241	-6979.67	0	0
6	129.515	5239.99	-5758.94	0	0
7	130.528	5239.05	-4562.86	0	0
8	131.541	5238.16	-3400.85	0	0
9	132.554	5237.33	-2281.26	0	0
10	133.567	5236.55	-1211.59	0	0
11	134.58	5235.82	-198.59	0	0
12	135.593	5235.13	751.551	0	0
13	136.606	5234.48	1575.23	0	0
14	137.619	5233.88	2337.97	0	0
15	138.632	5233.3	3071.32	0	0
16	139.645	5232.77	3771.52	0	0
17	140.657	5232.27	4435.22	0	0
18	141.67	5231.8	5059.44	0	0
19	142.683	5231.36	5641.53	0	0
20	143.696	5230.95	6179.15	0	0
21	144.709	5230.58	6666.02	0	0
22	145.722	5230.23	7096.89	0	0
23	146.735	5229.91	7472.09	0	0
24	147.748	5229.62	7792.17	0	0
25	148.761	5229.35	8057.9	0	0
26	149.774	5229.11	8270.28	0	0
27	150.787	5228.9	8431.34	0	0
28	151.8	5228.71	8543.29	0	0
29	152.813	5228.55	8606.28	0	0
30	153.825	5228.41	8620.57	0	0
31	154.838	5228.29	8586.66	0	0
32	155.851	5228.21	8505.24	0	0
33	156.864	5228.14	8377.24	0	0
34	157.877	5228.1	8203.81	0	0
35	158.89	5228.08	7986.36	0	0
36	159.903	5228.09	7726.53	0	0
37	160.916	5228.12	7426.25	0	0
38	161.929	5228.18	7087.76	0	0
39	162.942	5228.26	6713.58	0	0
40	163.955	5228.36	6306.61	0	0
41	164.968	5228.49	5833.9	0	0
42	165.981	5228.65	5695.78	0	0
43	166.993	5228.83	5566.72	0	0
44	168.006	5229.03	5437.02	0	0
45	169.019	5229.26	5310.09	0	0
46	170.032	5229.52	5189.94	0	0
47	171.045	5229.8	5081.24	0	0
48	172.058	5230.11	4989.45	0	0
49	172.896	5230.39	4210.8	0	0
50	173.734	5230.68	3430.91	0	0
51	174.572	5231	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.02052

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	136	5245.62	0	0	0
2	136.826	5242.91	-1977.34	0	0
3	137.653	5240.96	-2988.21	0	0
4	138.479	5239.38	-3549.11	0	0
5	139.181	5238.23	-2876.56	0	0
6	139.883	5237.21	-2178.56	0	0
7	140.585	5236.29	-1468.86	0	0
8	141.287	5235.46	-757.751	0	0
9	141.989	5234.69	-53.1967	0	0
10	142.691	5234	638.426	0	0
11	143.393	5233.35	1311.91	0	0
12	144.095	5232.75	1961.61	0	0
13	144.797	5232.2	2577.24	0	0
14	145.499	5231.69	3155.84	0	0
15	146.201	5231.22	3695.98	0	0
16	146.903	5230.78	4196.51	0	0
17	147.605	5230.38	4656.53	0	0
18	148.307	5230.01	5075.37	0	0
19	149.009	5229.66	5452.54	0	0
20	149.711	5229.35	5787.71	0	0
21	150.413	5229.06	6081.31	0	0
22	151.115	5228.79	6335.3	0	0
23	151.817	5228.55	6549.13	0	0
24	152.519	5228.34	6722.1	0	0
25	153.221	5228.15	6853.61	0	0
26	153.923	5227.98	6943.15	0	0
27	154.625	5227.83	6990.35	0	0
28	155.326	5227.71	6994.92	0	0
29	156.028	5227.6	6956.66	0	0
30	156.73	5227.52	6875.47	0	0
31	157.432	5227.46	6751.36	0	0
32	158.134	5227.42	6584.41	0	0
33	158.836	5227.4	6374.85	0	0
34	159.538	5227.4	6122.97	0	0
35	160.24	5227.42	5829.19	0	0
36	160.942	5227.47	5494.09	0	0
37	161.644	5227.53	5118.33	0	0
38	162.346	5227.62	4702.76	0	0
39	163.048	5227.72	4248.4	0	0
40	163.75	5227.85	3756.44	0	0
41	164.452	5228	3203.11	0	0
42	165.154	5228.17	2685.31	0	0
43	165.856	5228.37	2509.48	0	0
44	166.558	5228.59	2330.82	0	0
45	167.26	5228.83	2152.61	0	0
46	167.962	5229.1	1978.92	0	0
47	168.664	5229.39	1814.67	0	0
48	169.366	5229.71	1665.95	0	0
49	170.068	5230.06	1540.25	0	0
50	170.77	5230.44	1446.93	0	0
51	171.723	5231	0	0	0

Discharge Sections

Entity Information

◆ Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 5268 0, 5253 0, 5175 200, 5175 200, 5223 200, 5228 179, 5231 168.555, 5231 165, 5231 165, 5231.91 165, 5237.95 164, 5237.95 150, 5242 143.733, 5245.13 136, 5247 136, 5245 76, 5245 76, 5256 75.333, 5256 56, 5256 56, 5254 28, 5256 28, 5258 13, 5266
Material Boundary	0, 5253 72, 5243 75.333, 5242.76 76, 5242.71 100, 5241 132, 5241 148, 5237 164, 5232.21 165, 5231.91
Material Boundary	168.555, 5231 200, 5223
Material Boundary	164, 5237.95 164, 5232.21 164, 5228.5 165, 5228.5 165, 5231
Material Boundary	75.333, 5242.76 75.333, 5256
Material Boundary	76, 5242.71 76, 5244.5 76, 5245
Material Boundary	76, 5244.5 136, 5244.5 136, 5245

Scenario-based Entities

Type	Coordinates (x,y)	Master Scenario	Scenario 2
Distributed Load	76, 5245 136, 5245	Constant DistributionOrientation: VerticalMagnitude: 2500 lbs/ft2Creates Excess Pore Pressure: No	
Distributed Load	76, 5245 136, 5245		Constant DistributionOrientation: VerticalMagnitude: 2500 lbs/ft2Creates Excess Pore Pressure: No

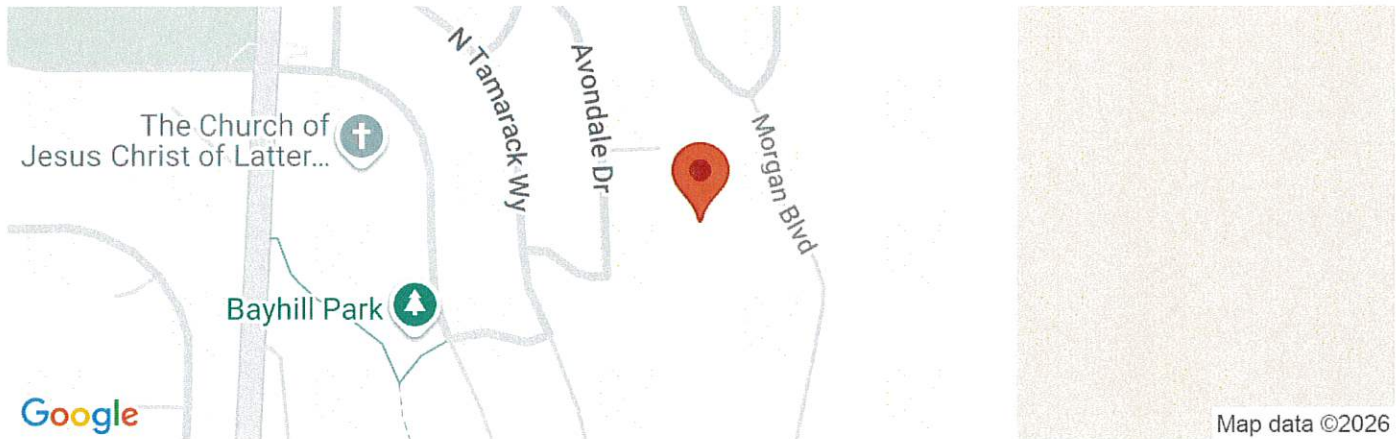
Announcement
ASCE 7-22 is now available.



OSHPD

Cedar Hills Townhomes 2026

Latitude, Longitude: 40.420080, -111.748011



Date	1/30/2026, 2:00:39 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C

Type	Value	Description
S_S	1.353	MCE_R ground motion. (for 0.2 second period)
S_1	0.506	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.623	Site-modified spectral acceleration value
S_{M1}	0.756	Site-modified spectral acceleration value
S_{DS}	1.082	Numeric seismic design value at 0.2 second SA
S_{D1}	0.504	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.494	Site amplification factor at 1.0 second
PGA	0.617	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.74	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
$SsRT$	1.353	Probabilistic risk-targeted ground motion. (0.2 second)
$SsUH$	1.565	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.836	Factored deterministic acceleration value. (0.2 second)
$S1RT$	0.506	Probabilistic risk-targeted ground motion. (1.0 second)
$S1UH$	0.575	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S1D$	1.268	Factored deterministic acceleration value. (1.0 second)
PGAd	1.102	Factored deterministic acceleration value. (Peak Ground Acceleration)

Type	Value	Description
PGA_{UH}	0.617	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.864	Mapped value of the risk coefficient at short periods
C_{R1}	0.879	Mapped value of the risk coefficient at a period of 1 s
C_V	1.171	Vertical coefficient

April 3, 2026

Mr. Tanner Johnson
11273 South Pervenche Lane
South Jordan, Utah 84095

RE: Memorandum
Response to Geotechnical Review No. 1
Geologic Hazards and Geotechnical Engineering Study
Cedar Hills Townhome Development
Sage Vista Lane and North Morgan Drive
Cedar Hills, Utah
CMT Project No. 104124

Mr. Johnson,

This memorandum presents CMT's responses to the geotechnical review comments provided by Bowen Collins & Associates¹ on behalf of Cedar Hills City of a geologic hazards and geotechnical engineering study² authored by the undersigned engineer. Following are the review comments and CMT's responses and corresponding sections of the geotechnical report which are revised as applicable.

BC&A Comment 13: The proposed development appears that it will make a cut into the toe of the slope on the north side of the development as shown on Figure 9 of the geotechnical report. It appears that relatively minor road cut will not be an issue; however, does the geotechnical engineer believe there is a risk to undermine/adversely impact those existing homes to the north with the road cuts proposed by the development?

CMT Response: Based upon the concept plan provided to CMT, as the reviewer noted, it appears that the road cut between the existing and proposed residence will be very minor and we do not believe there will be any adverse impact to the existing residences from this road cut. Similarly, we do not believe there will be any impact to the existing residences from the proposed gravel road cut on the south side of the development.

BC&A Comment 14: The section views provided by Civil Solutions Group don't seem to show much cut proposed into the existing ground. Conversely, the geotechnical report section view on Figure 9 appears to show cut depths of up to around 10-feet. However, the geotechnical report itself references excavation cuts of 10 to 15-feet expected. Yet the test pits were only dug to 8 to 10-feet of depth. It appears there is some ambiguity on the actual proposed soil cut depths. We'd like confirmation that the test pits were deep enough to provide at least 5-feet of soil depth below the proposed excavation bottoms.

CMT Response: There is a discrepancy between the cuts indicated on Figure 9 of the geotechnical report and the concept plan provided by the civil engineer which showed maximum cuts of about 5 feet. It is CMT's opinion

¹"The Cedars Townhomes Phase 5 – Engineering Review No. 1", Bowen Collins & Associates, March 23, 2026.

²Geologic Hazards and Geotechnical Engineering Study, Cedar Hills Townhome Development, Sage Vista Lane and North Morgan Drive, Cedar Hills, Utah," CMT Project No. 104124, February 19, 2026.

Cedar Hills Townhome Development, Cedar Hills, Utah
CMT Project No. 104124

that the civil drawing is the more accurate representation of the proposed site grading and as such the test pits did extend to sufficient depth to provide at least 5-feet of soil depth below the proposed excavation bottoms.

BC&A Comment 15: Figure 9 appears to show the test pit depths relative to the ground surface. Verify that those depths are shown accurately. It appears all of them are shown at approximately 10-feet deep. Yet some might be only 7 to 8-feet deep.

CMT Response: The discrepancy is most likely related to the use of publicly available topographic data to develop Figure 9, while the site cross sections prepared by the civil engineer likely used survey topo data.

BC&A Comment 16: The report seems to reference figure numbers that appear to be incorrect throughout the report, please verify those figure numbers. For example, Section 1.4 seems to show incorrect figure references.

CMT Response: The reviewer is correct and the report has been revised to correct the figure reference discrepancies.

BC&A Comment 17: Landscaping irrigation is strongly discouraged in the report. Is there any geotechnical analysis to reinforce that recommendation? Could the slope stability analysis be performed under saturated conditions?

CMT Response: CMT is aware that there have been slope failures in Cedar Hills to the north of this development on Sage Vista Lane and it is our understanding that the slope failure was the result of a leaking sprinkler. This is the reason the report discourages landscape irrigation. The slope stability analysis could be performed under saturated conditions but such conditions would represent an extreme and unlikely scenario.

BC&A Comment 18: The slope stability scenario with a factor of safety of 1.133 shown on the figure doesn't appear to have supporting calculations provided.

CMT Response: The Input-Output data for the seismic analysis has been added to the revised report.

BC&A Comment 19: Where are there pavement design recommendations for the cul-de-sac road shown?

CMT Response: Pavement design recommendations were not provided in the report. These have been added to the revised report.

Closure

If you have any questions, please call.

Sincerely,

CMT Technical Services

Jeffrey J. Egbert, P.E., LEED A.P., M. ASCE
Senior Geotechnical Engineer