AMENDED NOTICE OF REGULAR MEETING
OF THE CITY COUNCIL OF THE CITY OF ST. GEORGE,
WASHINGTON COUNTY, UTAH

Public Notice

Public notice is hereby given that the City Council of the City of St. George, Washington County, Utah, will hold a regular meeting in the City Council Chambers at the St. George City Offices located at 175 East 200 North, St. George, Utah, on Thursday, November 7, 2024, commencing at 5:00 p.m.

The amended agenda for the meeting is as follows:

Call to Order
Invocation
Flag Salute

1. **Mayor's recognitions, proclamations, and updates.**

   a. **Read a Proclamation proclaiming the week of November 11-16, 2024 as National Veterans Small Business Week.**

   b. **Read a Proclamation proclaiming November, 2024 as Lung Cancer Awareness Month.**

2. **Comments from the public.**

   The Open Comment Period provides an opportunity to address the Mayor and City Council regarding concerns or ideas about the City which the Council may choose to address. Comments pertaining to an agenda item that includes a public hearing, or public input should be given as that item is being discussed during the meeting.

   Up to ten (10) members of the public will be given a limit of two (2) minutes per person. The Council will not respond to comments or questions but will take the comments under consideration for possible discussion at another time. If there are more than 10 individuals wishing to provide public comment, speakers will be selected by random draw.

   Rules for making comments:
   1. You must be a resident of the City of St. George.
   2. Public input shall not be allowed on any agenda item or pending land use application.
   3. Comments should relate to City business.
   4. Speakers shall be courteous and show respect. Comments shall not include obscene or profane language, nor contain attacks on any individual.

   In order to provide an opportunity for a broader scope of residents to provide public comments, any person selected to provide comments at a meeting will not be able to provide public comments again for three (3) months (once per quarter); however, written comments may be submitted anytime to the City Recorder at 175 East 200 North, St. George, UT 84770 or publiccomments@sgcity.org.

   The Mayor and City Council encourage civil discourse for everyone who participates in the meeting.

3. **Consent calendar.**

a. **Consider approval of a Professional Services Agreement with Bowen Collins & Associates for the update and redevelopment of the Culinary Water, Irrigation, and Wastewater Master Plans.**

BACKGROUND and RECOMMENDATION: This Professional Services Agreement with Bowen, Collins, & Associates is for the redevelopment of our water, irrigation, and sewer master plans. Our current culinary water, secondary irrigation, and wastewater master plans were developed in 2018. There have been a lot of changes recently to our future water supplies. With the development of the WCWCD 20-Year Water Supply Plan relying heavily on the reduction of water demand from 0.89 AF/yr to 0.59 AF/yr and the further development of reuse water as our largest future water supply, there is a need for an extensive redevelopment of our master plans. In addition, projects costs have escalated over the past 6 years such that our impact fee project estimates are grossly understated in our Impact Fee Facilities Plan. Staff recommends approval.

b. **Consider approval of a Professional Services Agreement with Intermountain Consumer Professional Engineers, Inc. to provide engineering services for the design of the Slickrock Substation and Transmission line.**

BACKGROUND and RECOMMENDATION: Due to increased load growth on the east side of the city, essential system improvements are required to maintain the reliability of electrical services. The surrounding substations are nearing their capacity limits, and as a result, new infrastructure developments are necessary. This project will focus on engineering the design of a new substation, along with the construction of the associated transmission lines. These upgrades will ensure the continued stability and efficiency of the power supply to meet demand in the area. Staff recommends approval.

c. **Consider approval of a Professional Services Agreement with Alliance Consulting for the design of the Woodsview Circle Sewer Line Replacement project.**

BACKGROUND and RECOMMENDATION: The existing line in Woodsview Circle is undersized and is identified in the Sewer Master Plan to be upsized to match the pipe sizes both upstream and downstream. The sewer system both upstream and downstream consists of 36" diameter pipes. This section that needs to be replaced is 24" diameter pipe and is at or near capacity. Staff recommends approval.

d. **Consider approval of a Reimbursement Agreement with Quality Excavation for upsizing a waterline in Airport Parkway from 8" to 16".**

BACKGROUND and RECOMMENDATION: Quality Excavation is constructing the Desert Canyons Business Park along Airport Parkway including improvements and Utilities. There is a master planned 16" waterline in Airport Parkway. It is the intent to upsize the line that Quality is installing from 8" to 16". Staff recommends approval.

e. **Consider approval of a Reimbursement Agreement with Rogers Construction for the upsizing waterlines in Sky Rocket Road.**

BACKGROUND and RECOMMENDATION: Contractor is constructing Sky Rocket Road that has masterplanned irrigation lines. The contractor is responsible to install 6" lines in the roadway at his cost, this agreement upsizes the line to match the masterplan. The irrigation line will serve the area with irrigation water and reduce culinary water usage per the master plan. Staff recommends approval.

f. **Consider approval of a Reimbursement Agreement with the Washington County Flood Control Authority for the design and construction of flood control improvements for the Virgin River at Crosby Way project.**

BACKGROUND and RECOMMENDATION: This agreement reimburses costs associated with the design and construction of flood control improvement project in the vicinity of the Virgin River and Crosby Way. The Washington County Flood Control Authority has reviewed and approved the agreement on October 1, 2024. Costs associated with this project includes engineering services, environmental permitting and construction in the amount of $140,000. Staff recommends approval.

g. **Consider approval of the minutes from the meetings held on September 19, 2024 (Special Meeting); October 17, 2024 (Work Meeting); October 17, 2024 (Regular Meeting); and October 31, 2024.**

4. **Public hearing and consideration of Ordinance 2024-066 to vacate a portion of an existing municipal utility easement located on the eastern boundary of Lots 11 and 30 of the Woodhaven Estates Subdivision.**

BACKGROUND and RECOMMENDATION: The final subdivision plat for Woodhaven Estates Subdivision was approved by the Land Use Authority of the 15th day of March, 2023 and recorded in the Office of the Washington County Recorder as Doc. No. 20230008672. This area was part of the original Crimson Cliffs Way right-of-way. The right-of-way was shifted to the east. When the subdivision plat was approved this portion was left out because it was still owned by the City. This item has been cleaned up so now the owners of Lot 11 and Lot 30 want to clean up the layout of the lots and easements to fit the current right-of-way location of Crimson Cliffs Way. The Joint Utility Commission recommended approval.

5. **Public Hearing and consideration of Ordinance 2024-067 to vacate a portion of an existing public utility and drainage easement located on the southern boundary of Lot 12 of Ancestor Estates Phase 2.**

BACKGROUND and RECOMMENDATION: The final plat for Ancestor Estates Phase 2 was approved by City Council in the 20th day of June, 2013 and recorded in the Office of the Washington County Recorder on the 12th day of February, 2014 as Doc. No. 20140004192. The owner of Lot 21 in Ancestor Estates Phase 3, a vacant lot, also owns the adjacent Lot 12 in Ancestor Estates Phase 2, where the dwelling unit is located. The owner wishes to merge these two lots into a single lot. Since Lot 21 and Lot 12 are part of different subdivisions, Lot 21 must be removed from its subdivision plat to be incorporated into the Phase 2 subdivision plat. The Joint Utility Commission recommended approval.

6. **Public hearing and consideration of Ordinance 2024-068 to vacate Lot 21 from the Ancestor Estates Phase 3 subdivision.**

BACKGROUND and RECOMMENDATION: The final plat for Ancestor Estates Phase 3 was approved by City Council in the 1st day of June, 2017 and recorded in the Office of the Washington County Recorder on the 26th day of August, 2019 as Doc. No. 20190034341. The owner of Lot 21 in Ancestor Estates Phase 3, a vacant lot, also owns the adjacent Lot 12 in Ancestor Estates Phase 2, where the dwelling unit is located. The owner wishes to merge these two lots into a single lot. Since Lot 21 and Lot 12 are part of different subdivisions, Lot 21 must be removed from its subdivision plat to be incorporated into the Phase 2 subdivision plat. The Joint Utility Commission recommended approval.

7. **Consider approval of Ordinance No. 2024-069 to amend the City zoning map from A-20 (Agricultural, 20-acre minimum lot size) to PD-R (Planned Development Residential) on approximately 35.16 acres generally located southeast off exit 6 along Southern Parkway at the eastern terminus of Desert Canyons Parkway, with conditions from Planning Commission. (Case No. 2024-ZC-011 - Desert Talus)**

BACKGROUND and RECOMMENDATION: On November 7, 2019, the subject site and surrounding acreage was annexed into the City of St. George by City Council approval. At that time, the entire 212.67 acres included as part of the annexation was given a zoning designation of Agriculture (A-20). The applicant is proposing PD-R (Planned Development Residential) zoning. At their meeting held on October 8, 2024, the Planning Commission held a public hearing for the project and recommended approval with a 4-0 vote.

8. **Consider approval of Ordinance No. 2024-070 to amend an approved PD-C (Planned Development Commercial) on approximately 3.44 acres located on the northeast corner of Black Ridge Drive and 250 West, with conditions from the Planning Commission. (Case No. 2024-PDA-020 - Black Ridge Restaurants)**

BACKGROUND and RECOMMENDATION: The purpose of the proposed amendment is to allow the construction of a restaurant including a second, future restaurant pad. On October 17, 2019, the City Council approved the site for a hotel to be constructed with a parking garage. Along with the PD amendment approved at the time, a hillside permit was approved. The hillside permit set forth certain conditions including limiting detention on site and the use of a secant wall. With time, the owners of the hotel sought zoning approval to move the hotel across 250 West on the west side of the street, freeing up the subject property. The Hillside Review Board and Planning Commission heard the request for the hillside permit and PD amendment. At their meeting held on October 8, 2024, the Planning Commission held a public hearing and recommended approval with conditions. The vote was 4-0; there were no public comments.

9. **Consider approval of a hillside development permit on approximately 3.77 acres located on the northeast corner of Black Ridge Drive and 250 West, with conditions from the Planning Commission. (Case No. 2024-HS-011 - Black Ridge Restaurants)**

BACKGROUND and RECOMMENDATION: The purpose of this item is to allow construction of a restaurant and future restaurant pad. In 2019, the subject property was approved for a hotel with conditions. In 2021, the hotel moved across the street onto a different site leaving this site open for a new development. The applicant has now applied for a hillside permit and PD amendment to allow the construction of a restaurant, leaving a pad for a future restaurant as well. The Hillside Review Board recommended approval of the hillside permit with conditions. The Planning Commission unanimously recommends approval (4-0) with the conditions proposed by the Hillside Review Board.

10. **Consider approval of Resolution No. 2024-034R authorizing and approving the Power County, Idaho Power Project Power Sales Contract with Utah Associated Municipal Power Systems; and related matters.**

BACKGROUND and RECOMMENDATION: This is a 400 Megawatt (MW) natural gas generation project being built by UAMPS. St. George is signing up for 21.00 (MW) of energy. This project will be located in Power County, Idaho. Staff recommends approval.

11. **Consider approval of Resolution No. 2024-035R authorizing and approving the Millard County, Utah Power Project Power Sales Contract with Utah Associated Municipal Power Systems; and related matters.**

BACKGROUND and RECOMMENDATION: This is a 200 Megawatt (MW) natural gas generation project being built by UAMPS. St. George is signing up for 13.00 (MW) of energy. This project will be located in Millard County, Utah. Staff recommends approval.

12. **Appointments to Boards and Commissions of the City.**

13. **Reports from Mayor, Councilmembers, and City Manager.**

14. **Request a closed meeting to discuss litigation, security, property acquisition or sale or the character and professional competence or physical or mental health of an individual.**

Christina Fernandez, City Recorder

November 6, 2024
Date

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8. **Consider approval of Ordinance 2024-070 to amend an approved PD-C (Planned Development Commercial) on approximately .51 acres located at 1380 East Medical Center Drive. (Case No. 2024-PDA-019 - St. George Regional Hospital OR Expansion)**

BACKGROUND and RECOMMENDATION: The purpose of this Planned Development Amendment is to add an addition to the hospital campus. Specifically, a three-level building expansion with approximately 14,000 square feet per level. The lower level will be a central processing unit for the hospital, allowing for increased volumes of sterilization. The first level will be shelled space, the use will be dedicated in the future. The second level will serve as an expansion to the operating suite. Four new operating rooms, storage, and workspace will make up half of the second level. The other half will be a new post anesthesia care unit. At their meeting held on October 8, 2024, the Planning Commission held a public hearing and recommended approval with a vote of 4-0; no public comments were made.

9. **Consider approval of Ordinance No. 2024-071 to amend an approved PD-C (Planned Development Commercial) on approximately 3.44 acres located on the northeast corner of Black Ridge Drive and 250 West, with conditions from the Planning Commission. (Case No. 2024-PDA-020 - Black Ridge Restaurants)**

BACKGROUND and RECOMMENDATION: The purpose of the proposed amendment is to allow the construction of a restaurant including a second, future restaurant pad. On October 17, 2019, the City Council approved the site for a hotel to be constructed with a parking garage. Along with the PD amendment approved at the time, a hillside permit was approved. The hillside permit set forth certain conditions including limiting detention on site and the use of a secant wall. With time, the owners of the hotel sought zoning approval to move the hotel across 250 West on the west side of the street, freeing up the subject property. The Hillside Review Board and Planning Commission heard the request for the hillside permit and PD amendment. At their meeting held on October 8, 2024, the Planning Commission held a public hearing and recommended approval with conditions. The vote was 4-0; there were no public comments.

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permit and PD amendment to allow the construction of a restaurant, leaving a pad for a future restaurant as well. The Hillside Review Board recommended approval of the hillside permit with conditions. The Planning Commission unanimously recommends approval (4-0) with the conditions proposed by the Hillside Review Board.

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14. Reports from Mayor, Councilmembers, and City Manager.

15. Request a closed meeting to discuss litigation, security, property acquisition or sale or the character and professional competence or physical or mental health of an individual.

Christina Fernandez, City Recorder

November 1, 2024
Date

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PROCLAMATION

WHEREAS, nearly one out of ten small businesses across the United States is veteran owned -- from Main Street store fronts to virtual high-tech startups that advance America, veteran owned small businesses are a pillar of our economy and contribute to the foundation of our nation; and

WHEREAS, veteran small business owners are resilient, disciplined, and mission-oriented, thanks to their military service and committed to serving our country and communities; and

WHEREAS, when we resolve ourselves to strengthen our communities, we must empower and support the giants that veteran entrepreneurs are in our economy; and

WHEREAS, National Veterans Small Business Week highlights the programs and services available to veteran entrepreneurs through the U.S. Small Business Administration and resource partners; and

WHEREAS, the City of St. George supports and joins in this national effort to help America's veteran owned small businesses rebuild and recover from this pandemic and ensure that our communities remain vibrant.

NOW, THEREFORE I, Michele Randall, Mayor, along with the City Council of the City of St. George, Utah, do hereby proclaim November 11 through November 16, 2024 as

NATIONAL VETERANS SMALL BUSINESS WEEK

in the City of St. George and call upon our community members to honor and recognize the contributions veterans have made to American small business and to the City's economy and to continue supporting them.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Seal of the City of St. George, Utah this 7th day of November, 2024.

Michele Randall, Mayor

PROCLAMATION

WHEREAS, lung cancer is the leading cause of cancer death among men and women in the United States and Utah, accounting for more deaths than colon cancer, breast cancer, and prostate cancer combined; and

WHEREAS, according to the Centers for Disease Control, there were 2848 new lung cancer cases between 2017 and 2021 and 98 deaths due to lung cancer between 2018 and 2022 in Utah. The 5-year survival rate for localized lung cancer is ~60%, yet only ~24% of lung cancers are diagnosed at this stage; and

WHEREAS, screening for lung cancer for high-risk individuals using low-dose computed tomography can lead to the earlier detection of lung cancer and save lives, reducing the mortality by 20% when compared to screening by chest x-ray in the National Lung Screening Trial and reducing the risk of death at 10 years by 24% in men and 33% in women as demonstrated by another large randomized trial; and

WHEREAS, funding for lung cancer research trails far behind funding for research of many other cancers, and additional research is needed in early diagnosis, screening, and treatment for lung cancer as well as in lung cancer affecting women and lung cancer health disparities. The stigma surrounding lung cancer creates barriers to early diagnosis, treatment, and funding for research, has a detrimental impact on the quality of life of people diagnosed with lung cancer, and hinders awareness of and research into lung cancer risk factors other than smoking; and

WHEREAS, lung cancer incidence is decreasing twice as fast in men as it is in women, each year more women die from lung cancer than breast cancer and by 2035, and more women will die from lung cancer than men. African Americans have the highest lung cancer incidence and mortality of all races, and disparities in lung cancer screening, diagnosis, treatment, and mortality are well characterized among African Americans and other racial minorities; and

WHEREAS, lung cancer in individuals who never smoked is the 7th leading cause of cancer-related death and accounts for 17,000-26,000 deaths in the US every year, 60-70% of individuals diagnosed with lung cancer who never smoked are women, and the proportion of lung cancers diagnosed in people who never smoked is increasing in the US. Radon is the leading cause of lung cancer among individuals who never smoked and the second leading cause of lung cancer overall; and

WHEREAS, organizations working in Utah such as the American Lung Cancer Screening Initiative and Women's Lung Cancer Forum, are committed to educating about lung cancer and lung cancer screening and working to increase lung cancer screening rates in Utah.

NOW, THEREFORE, I, Michele Randall, Mayor, along with the City Council of the City of St. George, Utah, do hereby proclaim November, 2024 as:

LUNG CANCER AWARENESS MONTH

in the City of St. George; and recognize the need for research in lung cancer affecting women and lung cancer health disparities and encourage all citizens to learn about lung cancer and early detection through lung cancer screening.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Seal of the City of St. George, Utah this 7th day of November, 2024.

OFFICIAL SEAL
City of St. George
STATE OF UTAH

Michele Randall, Mayor

Agenda Date: 11/07/2024 **Agenda Item Number:** 3a

Subject:

Consider approval of a Professional Services Agreement with Bowen Collins & Associates for the update and redevelopment of the Culinary Water, Irrigation, and Wastewater Master Plans.

Item at-a-glance:

Staff Contact: Scott Taylor

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

N/A

Item History (background/project status/public process):

This Professional Services Agreement with Bowen, Collins, & Associates is for the redevelopment of our water, irrigation, and sewer master plans. Our current culinary water, secondary irrigation, and wastewater masters plans were developed in 2018. There have been a lot of changes recently to our future water supplies. With the development of the WCWCD 20-Year Water Supply Plan relying heavily on the reduction of water demand from 0.89 AF/yr to 0.59 AF/yr and the further development of reuse water as our largest future water supply, there is a need for an extensive redevelopment of our master plans. In addition, projects costs have escalated over the past 6 years such that our impact fee project estimates are grossly understated in our Impact Fee Facilities Plan.

Staff Narrative (need/purpose):

New culinary water, secondary irrigation, and wastewater master plans and impact fee facilities plans are necessary to sustain the anticipated growth over the next several years. With the escalation of project costs since our last impact fee analysis was performed in 2020, our impact fees are not adequate to cover the costs of infrastructure projects necessary to sustain the new development. In addition, changes in future water supplies and the reliance of reuse water to meet future water demands, our master plan needs to be redeveloped to account for these changes.

Name of Legal Dept approver: Alicia Carlton

Budget Impact:

Cost for the agenda item: 264,64

Amount approved in current FY budget for item: Not in current budget

If not approved in current FY budget or exceeds the budgeted amount, please explain

funding source:

Funding will come from impact fees and reserves. There are projects in this years budget that are behind schedule and the expenditures will not occur in this budget year. Projects and schedules will be adjusted to cover the cost of the master plan redevelopment.

Description of funding source:

Impact fees and user rates.

Recommendation (Include any conditions):

Staff recommends approval of the Professional Services Agreement

CITY OF ST. GEORGE PROFESSIONAL SERVICES AGREEMENT FOR SERVICES WITH BOWEN COLLINS & ASSOCIATES

This Professional Services Agreement (hereinafter "Agreement") is made and entered into on _____ by and between the City of St. George, a municipal corporation, with offices at 175 East 200 North, St. George, Utah 84770 (hereinafter called the "CITY"), and Bowen Collins & Associates, with offices at 20 N. Main Street, Ste 107, St. George, Utah 84770 (hereinafter "CONSULTANT").

WITNESSETH THAT:

WHEREAS CITY desires professional services to be performed and has solicited CONSULTANT to provide an update to the city's master plans and impact fee facilities plans for the potable water system, secondary irrigation system, and sewer collection/treatment system on one or more projects from time to time on an as needed basis (hereinafter called the PROJECT); and

WHEREAS, CONSULTANT has submitted a proposal, which outlines the general scope of services to be provided and the fees for the PROJECT; and

WHEREAS CITY selected CONSULTANT to perform the services for the PROJECT;

NOW, THEREFORE, for the consideration hereinafter set forth, the parties hereto do mutually agree as follows:

1. **ENGAGEMENT OF CONSULTANT.**

1.1 CONSULTANT is a professional licensed by the State of Utah and the City of St. George. CONSULTANT has all licenses, permits, and approvals that are legally required for CONSULTANT to practice its profession and shall keep them in effect at all times during the term of this Agreement.

1.2 CONSULTANT states that it has the necessary knowledge, experience, abilities, skills, and resources to perform its obligations under this Agreement and agrees to perform its obligations under this Agreement in a professional manner, consistent with prevailing industry standards and practices as observed by competent practitioners of the profession in which CONSULTANT and its subcontractors or agents are engaged.

1.3 CONSULTANT certifies that it does not and will not during the performance of this contract knowingly employ, or subcontract with any entity which employs workers in violation of 8 USC §1324(a). CONSULTANT agrees to require all subcontractors at the time they are hired for this project to sign a Certification of Legal Work Status and submit the Certification to CITY prior to any work being

performed by the subcontractors. CONSULTANT agrees to produce, at CITY'S request, documents to verify compliance with applicable State and Federal laws. If CONSULTANT knowingly employs workers or subcontractors in violation of 8 USC § 1324(a), such violation shall be cause for unilateral cancellation of the contract between CONSULTANT and CITY. In addition, CONSULTANT may be suspended from participating in future projects with CITY for a period of one (1) year. In the event this contract is terminated due to a violation of 8 USC § 1324(a) by CONSULTANT or a subcontractor of CONSULTANT, CONSULTANT shall be liable for any and all costs associated with such termination, including, but not limited to, any damages incurred by CITY excluding attorney fees. For purposes of compliance, CITY requires CONSULTANT and subcontractors to use E-Verify or other federally accepted forms of verification to verify the employment eligibility of all employees as allowed by law and the E-Verify procedures. CONSULTANT and subcontractors must maintain authorized documentation of the verification.

1.4 CONSULTANT shall not, either during or after the term of this Agreement, make public any reports or articles, or disclose to any third party any confidential information relative to the work of City or the operations or procedures of CITY without the prior written consent of CITY.

1.5 CONSULTANT further agrees that it shall not, during the term of this Agreement, take any action that would affect the appearance of impartiality or professionalism.

1.6 CONSULTANT, by execution of this Agreement, certifies that it does not discriminate against any person upon the basis of race, color, creed, national origin, age, sex, sexual orientation, gender identity, disability, or marital status in its employment practices.

1.7 CONSULTANT expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve CONSULTANT from any obligation to comply with all applicable requirements of CITY during the term of this Agreement including the payment of fees and compliance with all other applicable ordinances, resolutions, regulations, policies, and procedures of CITY, except as modified or waived in this Agreement.

1.8 CONSULTANT shall comply with all applicable federal, state, and local laws, regulations, and ordinances that affect those employees or those engaged by CONSULTANT on the PROJECT, and will procure all necessary licenses, permits and insurance required.

1.9 CONSULTANT certifies it is in compliance with the public contract boycotting restrictions set forth in Utah Code § 63G-27-201 and agrees not to engage in any such restricted boycotting for the duration of this Agreement, and to notify the City in writing if it begins engaging in an economic boycott.

1.10 CITY acknowledges that CONSULTANT may employ various specialized subcontractors for up to 15% of the services provided herein. CONSULTANT shall

give written notice to CITY at least seven (7) days prior to CONSULTANT'S employment of the subcontractors to perform portions of the work provided for in this Agreement. It shall be solely CONSULTANT's responsibility to ensure that any of CONSULTANT'S subcontractors perform in compliance with the terms of this Agreement. Subcontractors may not be changed without ten (10) days prior written notice to CITY.

2. **PROJECT SERVICES DESCRIPTION.**

2.1 CITY makes no guarantee as to the total volume of work, if any, that will be needed under this Agreement. CONSULTANT will provide the services on an as needed basis as described in the attached Scope of Work (**"Exhibit A Scope of Services"**) which is made a part of this Agreement by this reference. As services are needed, CITY shall provide CONSULTANT with a description of the work needed which shall be known as a "Work Order" and CONSULTANT will provide CITY with a specific scope of work and cost for the Work Order, which if accepted by the CITY shall become part of this Agreement binding both parties. CITY may at any time, as the need arises, order changes within the scope of the services without invalidating the Agreement. If such changes increase or decrease the amount due under the Agreement, or in the time required for performance of the work, an equitable adjustment shall be authorized by change order.

2.2 CONSULTANT shall furnish all the material, supplies, tools, transportation, equipment, labor, subcontractor services and other services necessary for the completion of the work described in **"Exhibit A Scope of Services"** or in subsequent Work Orders.

2.3 CONSULTANT shall provide services in compliance with all applicable requirements of federal, state, and local laws, codes, rules, regulations, ordinances, and standards.

3. **TERM OF AGREEMENT.**

3.1 This Agreement shall be effective as of the date executed by all parties and shall continue for one year unless otherwise terminated as set forth in this Agreement. If a Work Order was started during this term but not completed, the terms of this Agreement shall continue through completion of the Work Order.

3.2 CONSULTANT agrees to perform services as expeditiously as is consistent with professional skill and care and the orderly progress of the PROJECT. CONSULTANT shall perform the services in a timely manner according to the schedule approved by CITY.

3.3 CONSULTANT shall perform its services upon notice from the CITY to proceed and in accordance with the schedule approved by CITY. In the event performance of its services is delayed by causes beyond the reasonable control of CONSULTANT, and without the fault or negligence of CONSULTANT, the time

for the performance of the services shall be equitably adjusted by written amendment to reflect the extent of such delay. CONSULTANT shall provide CITY with written notice of delay, including a description of the delay and the steps contemplated or taken by CONSULTANT to mitigate the effect of such delay.

4. **COMPENSATION.** For the performance of the services and completion of PROJECT set forth herein, CITY shall pay CONSULTANT as agreed in **"Exhibit A"** and each Work Order as applicable. The aggregate total of all Work Orders shall not exceed **(two hundred sixty-four thousand six hundred sixty four dollars),** (**$264,664)**.

5. **INVOICING, PAYMENT, NOTICES.**

5.1 CONSULTANT shall submit invoices, no more frequently than monthly, for the services rendered during the preceding period; invoices shall describe the services performed, list all subcontractors used and the amount owed or paid to them, list all suppliers used and the amount owed or paid to them, list the contract amount, list the current invoice amount based on percentage of task complete, list the previous invoice amount, list total invoices to date, and list the contract balance.

5.2 In executing the request for payment, CONSULTANT shall attest that payment has been made to all subcontractors involved with prior requests, unless CONSULTANT provides a detailed explanation why such payments have not occurred. CONSULTANT shall also sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status and submit them with each request for payment. CONSULTANT shall require each subcontractor to sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status at the time subcontractor is paid and shall provide a copy of both documents to CITY. CONSULTANT shall also sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status and submit them with each request for payment.

5.3 A "Waiver and Release Upon Final Payment" signed by CONSULTANT attesting that all subcontractors, laborers, and material suppliers involved with prior requests for payment have been paid, and that all subcontractors, laborers, and material suppliers upon which the final payment is based will be paid immediately unless CONSULTANT provides a detailed explanation why such payments have not occurred or will not occur. CONSULTANT shall also require each subcontractor to sign a "Waiver and Release Upon Final Payment" and a Certificate of Legal Work Status at the time subcontractor is paid its final payment and shall provide a copy of both documents to CITY.

5.4 If such liens, claims, security interests or encumbrances remain unsatisfied after payments are made, CONSULTANT shall refund to CITY all money that CITY may be compelled to pay in discharging such liens, including all costs except for attorneys' fees.

5.5 All invoices for reimbursable costs shall be taken from the books of account kept by CONSULTANT, and CONSULTANT shall maintain copies of payroll distribution, receipted bills, and other documents. CITY shall have the right to review all books and records kept by CONSULTANT and any subcontractors concerning the operation and services performed under this Agreement. CITY shall withhold payment for any expenditure not substantiated by CONSULTANT'S or subcontractor's books and records.

5.6 In the event CITY has made payment for expenditures that are not allowed, as determined by CITY'S audit, CONSULTANT shall reimburse CITY the amount of the un-allowed expenditures. If additional money is owed to CONSULTANT, the reimbursement may be deducted from the additional money owed.

5.7 CITY shall make no payment for any services not specified in this Agreement unless such additional services and the price thereof are agreed to in writing, prior to the time that such additional services are rendered.

5.8 Invoices shall be paid to CONSULTANT within thirty (30) days of presentation to CITY.

5.9 CITY may withhold 5% of billed amount as retention. Retention held shall be included in the final invoice after the contract is complete.

6. **CHARGES AND EXTRA SERVICE.**

6.1 CITY may make changes within the general scope of this Agreement. If CONSULTANT is of the opinion a proposed change causes an increase or decrease in the cost and/or the time required for performance of this Agreement, CONSULTANT shall notify CITY of that fact. An agreed-upon change will be reduced to writing signed by the parties hereto and will modify this Agreement accordingly. CONSULTANT may initiate such notification upon identifying conditions which may change the services agreed to on the effective date of this Agreement, as set forth in **Exhibit A**. However, CONSULTANT represents that to the best of its knowledge that it is not aware of any such conditions on the date hereof. Any such notification must be provided within thirty (30) days from the date of receipt by that party of the other party's written notification of a proposed change.

6.2 CITY may request CONSULTANT to perform extra services not covered by **Exhibit A**, and CONSULTANT shall perform such extra services and will be compensated for such extra services when they are reduced to a writing mutually agreed to and signed by the parties hereto amending this Agreement accordingly.

6.3 CITY shall not be liable for payment of any extra services, nor shall CONSULTANT be obligated to perform any extra services except upon such written amendment.

7. **TO BE FURNISHED BY CITY.** Resources to be furnished by CITY to CONSULTANT, at no cost to CONSULTANT, consist of CITY staff assistance for oversight and meetings to help perform the services. CONSULTANT shall verify accuracy of the information provided, unless otherwise stated in the contract documents.

8. **INSPECTIONS.** All work shall be subject to inspection and approval of CITY or its authorized representative.

9. **ACCURACY AND COMPLETENESS.**

9.1 CONSULTANT has total responsibility for the accuracy and completeness of its investigations, calculations, reports, plans and related designs, specifications and estimates prepared for the PROJECT and shall check all such material accordingly.

9.2 The plans will be reviewed by CITY for conformity with PROJECT objectives and compliance with CITY Standards.

9.3 Reviews by CITY do NOT include the detailed review or checking of major design components and related details or the accuracy with which such designs are depicted on the plans.

9.4 The responsibility for accuracy and completeness remains solely with CONSULTANT and shall be performed consistent with the standard of care.

10. **INDEPENDENT CONTRACTOR.**

10.1 CITY retains and engages CONSULTANT, as an independent contractor, to act for and represent it in all matters involved in the performance of services on the PROJECT, subject to the terms, conditions and stipulations as hereinafter stated.

10.2 It is understood and agreed that CONSULTANT will provide the services without supervision from CITY. CONSULTANT is an independent contractor and is not an employee, officer, or agent of CITY for any purposes related to the performance of this Agreement and is not an employee of CITY and is not entitled to any benefits from CITY.

10.3 Nothing in this agreement shall create nor be construed to constitute a partnership or joint venture between CONSULTANT and CITY.

10.4 CONSULTANT is advised to obtain and maintain in effect during the term of this Agreement medical insurance and disability insurance for all related work performed under this Agreement.

10.5 CONSULTANT acknowledges that CITY will not withhold any federal, state, or local taxes, including FICA, nor will CITY provide any unemployment compensation or worker's compensation coverage. As an independent contractor, CONSULTANT shall be responsible for all taxes, worker's compensation coverage

and insurance coverage, and shall hold CITY harmless and indemnify CITY from and against any and all claims related to taxes, unemployment compensation, and worker's compensation.

10.6 CONSULTANT shall secure, at its own expense all personnel required in performing the services under this Agreement. The employees of CONSULTANT shall not be considered employees of CITY nor have any contractual relationship with CITY. CONSULTANT and its employees shall not hold themselves out as, nor claim to be officers or employees of CITY by reason of this Agreement. The employees of CITY shall not be considered employees of CONSULTANT.

10.7 Neither party has the right to bind or obligate the other in any way. CONSULTANT shall not use the name, trademarks, copyrighted materials, or any information related to this Agreement in any advertising or publicity without CITY'S prior written authorization.

11. **INSURANCE.**

11.1 GENERAL: CONSULTANT shall secure and maintain insurance as required by laws and regulations and the terms of this agreement to protect against any liability, loss or expense which occurs or arises as a result of the performance of the services provided pursuant to this agreement or as changed as provided herein. CONSULTANT'S insurer must be authorized to do business in Utah and must have an A.M. Best rating of A VIII or better at the time this contract is executed.

11.2 COMMENCEMENT OF WORK: Neither CONSULTANT, its Suppliers nor any subcontractors shall enter the site of the work or commence work under this contract before CITY has received and accepted Certificate(s) of Insurance and Insurance Endorsements and has issued the Notice to Proceed, as applicable.

11.3 INSURANCE CERTIFICATES AND COVERAGE: Insurance certificates shall be issued on all policies required under this contract and shall be signed by an authorized representative of the insurance company. The insurance certificate or the coverage required shall include the following:

A. The name and address of the insured.

B. CITY shall be named as a Certificate Holder.

C. CITY shall be named as an additional primary insured on the General Liability Certificate with CITY listed as non-contributory on the General Liability certificate.

D. The location of the operations to which the insurance applies.

E. The number of the policy and the type or types of insurance in force

thereunder on the date borne by the certificate.

F. The expiration date of the policy and the limit or limits of liability thereunder on the date borne by the certificate.

G. A statement that all coverage is on an occurrence basis rather than a claims basis except for the Professional Errors and Omissions Malpractice Insurance coverage.

H. A provision that the policy or policies will not be canceled, denied renewal, or reduced in coverage until at least 30 days after written notice has been received by CITY.

I. Name, address, and telephone number of the insurance company's agent of process in Utah.

J. Other information to demonstrate compliance with additional requirements stipulated for the various types of insurance coverage.

11.4 COMPENSATION INSURANCE: CONSULTANT shall, as applicable, take out and maintain Workers' Compensation Insurance as required by the Labor Code for all its employees at the site of the work during the life of this contract. Coverage must be provided by a company authorized by the State of Utah to provide Workers' Compensation Insurance. The insurance shall include:

A. Insurance certificates shall provide a waiver of subrogation by the carrier to Certificate Holder.

B. CONSULTANT shall require each subcontractor to provide Workers' Compensation Insurance for its employees unless such employees are covered by CONSULTANT.

C. In the event any class of employees engaged in hazardous work under this contract is not protected by the Workers' Compensation Statute, CONSULTANT shall provide, and shall cause its subcontractors to provide, special insurance for the protection of such employees not otherwise protected.

11.5 COMMERCIAL GENERAL LIABILITY INSURANCE: CONSULTANT shall procure and maintain commercial general liability insurance for the duration of the contract against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the CONSULTANT, its agents, representatives, employees, or subcontractors. The insurance shall remain in effect during the term of this agreement and such that claims reported beyond the date of substantial completion of this agreement are covered and during the warranty period, to the extent that it relates to the activities covered by this Agreement, in such manner and amounts as

set forth herein. The Insurance Endorsement shall evidence such provisions.

A. The minimum commercial general liability insurance shall be as follows:

i. Comprehensive general liability insurance for injuries, including accidental death, to any one person in any one occurrence in an amount not less than $1,000,000.00 Dollars.
ii. Comprehensive general liability insurance for injuries, including accidental death, to two or more persons in any one occurrence in an amount not less than $3,000,000.00 Dollars (umbrella coverage may be considered).
iii. Broad form property damage insurance in an amount not less than $300,000.00 Dollars.

B. Such policy shall include each of the following coverages (as applicable):

i. Comprehensive form.
ii. Premises - operations.
iii. Explosion and collapse hazard.
iv. Underground hazard.
v. Product/completed operations hazard.
vi. Contractual insurance.
vii. Broad form property damage, including completed operations.
viii. Independent contractors for vicarious liability.
ix. Personal injury.
x. Cross liability or severability of interest's clause shall be included unless a separate policy covering CITY is provided.

11.6 PROFESSIONAL LIABILITY ERRORS AND OMISSIONS INSURANCE:

A. CONSULTANT shall carry and maintain Professional Liability Errors and Omissions Insurance in an amount not less than $3,000,000.00 Dollars for all work performed under this Agreement.

B. CONSULTANT shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the CONSULTANT, its agents, representatives, employees, or subcontractors. With respect to General Liability, Professional liability coverage should be maintained for a minimum of five (5) years after contract completion.

C. If Professional Liability coverages are written on a claims-made form:

i. The retroactive date must be shown and must be before the date of the contract or the beginning of contract work.
ii Insurance must be maintained, and evidence of insurance must be

provided, for at least five (5) years after completion of the contract of work.

iii. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the contract effective date, the CONSULTANT must purchase an extended period coverage for a minimum of five (5) years after completion of contract work.

iv. A copy of the policy must be submitted to CITY for review.

11.7 BUSINESS AUTOMOBILE COVERAGE: CONSULTANT shall carry and maintain business automobile insurance coverage on each vehicle used in the performance of the work in an amount not less than $1,000,000.00 Dollars for one person and $3,000,000.00 Dollars for more than one person and for property damage resulting from any one occurrence which may arise from the operations of CONSULTANT in performing the work.

Such business automobile insurance shall include each of the following types:

A. Comprehensive form, including loading and unloading.
B. Owned.
C. Hired.
D. Non-owned.

12. **INDEMNITY AND LIMITATION.**

12.1 Except as otherwise provided herein, CONSULTANT shall indemnify, defend, and hold harmless CITY, its elected officials, officers, employees, and representatives against any and all claims, suits, causes of action, demands, losses, costs, and damages and liability of every kind including but not limited to all fees and charges of professionals, except for attorney's fees, and all court or other dispute resolution costs for:

A. death or injuries to persons or for loss of or damage to property which directly or indirectly, in whole or in part are caused by, resulting from, or arising out of the intentional, reckless, negligent, or wrongful acts, errors or omissions, or other liability imposed by law of CONSULTANT, its officers, employees, agents, or representatives in the performance of services under this Agreement or any subcontractor, any supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the work;

B. CONSULTANT's failure or refusal, whatever the reason, to pay subcontractors or suppliers for Work performed under the Agreement;

C. claims by any employee of the CONSULTANT, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, CONSULTANT'S indemnification obligation

shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONSULTANT or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.

12.2 CITY shall give CONSULTANT prompt written notice of any such claims or suits filed against CITY arising out of the services provided under this Agreement. CONSULTANT agrees to defend against any claims brought or actions filed against CITY arising out of the services provided under this Agreement. If CITY'S tender of defense, based upon the indemnity provision, is rejected by CONSULTANT or CONSULTANT'S insurer, and CONSULTANT is later found by a court of competent jurisdiction to have been required to indemnify the CITY, then, in addition to any other remedies the CITY may have, CONSULTANT shall pay the CITY'S reasonable costs and expenses, except for attorney's fees, incurred in obtaining such indemnification, defending themselves or enforcing the indemnification provision.

12.3 The insurance requirements in this agreement shall not be construed as limiting CONSULTANT'S liability. Irrespective of the requirements for CONSULTANT to carry insurance as provided herein, insolvency, bankruptcy, or failure of any insurance company to pay all claims accruing shall not be held to relieve CONSULTANT of any obligations under this agreement.

12.4 This section does not apply to a design professional services contract, design professional services, and design professionals.

13. **DOCUMENTS.**

13.1 All data used in compiling CONSULTANT's work, and the results of any tests or surveys, as well as all photographs, drawings, electronically stored records of work performed, renderings, specifications, schedules, CONSULTANT's work, data processing output, computations, studies, audits, research, reports, models and other items of like kind prepared by CONSULTANT, and its employees, shall be the sole and exclusive property of CITY, and CITY shall own all intellectual property rights thereto whether the specific work project for which they are made is undertaken or not. CONSULTANT may retain reproducible copies of all the foregoing documents for information and reference and customary marketing and public relations. The originals of all the foregoing documents shall be delivered to CITY promptly upon completion thereof. This provision may be enforced by an order of specific performance and is independent of any other provision of this Agreement. Compliance by CONSULTANT with this paragraph shall be a condition precedent to CITY's obligation to make final payment to CONSULTANT. If CITY has specific requirements on the information and manner the documentation is collected, CITY shall provide those specifics to CONSULTANT in writing.

13.2 Plans, specifications, maps, and record drawings prepared or obtained under this

Agreement shall be provided to CITY in a format approved by CITY which shall generally be a hard copy and an electronic copy and shall become the property of CITY whether the work for which they are prepared is executed or not.

13.3 The basic survey notes and sketches, charts, computations, and other data prepared under this Agreement shall be made available upon request to CITY without restriction or limitation on their use.

13.4 CITY shall have the right to use reports, designs, details, or products developed as part of this Agreement for purposes of maintenance, remodeling or reconstruction of existing facilities or construction of new facilities without additional compensation to CONSULTANT or without restriction or limitation on its use even if documents are considered copyrighted material.

13.5 CITY will hold harmless CONSULTANT for any use or reuse of these reports, designs, or details for purposes other than the project associated with this Agreement unless CITY obtains validation of that use or reuse from CONSULTANT.

14. **RECORDS.**

14.1 CONSULTANT shall maintain records, books, documents, and other evidence directly pertinent to the performance of services under this Agreement in accordance with generally accepted accounting principles and practices.

14.2 CONSULTANT agrees to keep proper books of records and accounts in which complete and correct entries will be made of payroll costs, travel, subsistence, and field expenses.

14.3 Said books shall, at all times, be available for at least three (3) years after final payment for reasonable examination by CITY.

15. **TERMINATION.**

15.1 CITY may terminate this Agreement by providing fourteen (14) days written notice prior to the effective termination date to CONSULTANT.

15.2 In the event of such termination, CITY shall pay CONSULTANT for all services actually rendered up to and including the date of termination.

15.3 CONSULTANT shall deliver to CITY copies of all drawings, reports, analyses, documents, and investigations, whether completed or not, that were prepared or were being prepared under the provisions of this Agreement.

16. **CONFLICT BETWEEN DOCUMENTS.** In the event of a conflict between this Agreement and any other documents with CONSULTANT, this Agreement shall govern.

17. **CONFLICT OF INTEREST.** CONSULTANT certifies that it has disclosed to CITY any actual, apparent or potential conflicts of interest that may exist relative to the services to be provided pursuant to this Agreement.

17.1 CONSULTANT agrees to advise CITY of any actual, apparent or potential conflicts of interest that may develop after the date of execution of this Agreement.

17.2 CONSULTANT further agrees to complete any statements of economic interest required by either CITY ordinance or State law.

18. **NON-WAIVER.** No failure or waiver or successive failures or waivers on the part of either party hereto, their successors or permittee assigns, in the enforcement of any condition, covenant, or Article of this Agreement shall operate as a discharge of any such condition, covenant, or Article nor render the same invalid, nor impair the right of either party hereto, their successors or permitted assigns, to enforce the same in the event of any subsequent breaches by the other party hereto, its successors or permitted assigns.

19. **NOTIFICATION.** All notices required or permitted to be made by either party in connection with this Agreement shall be in writing, and shall be deemed to have been duly given: (a) five (5) business days after the date of mailing if sent by U.S. mail, postage prepaid, (b) when transmitted if sent by facsimile, provided a confirmation of transmission is produced by the sending machine and a copy of such facsimile is promptly sent by another means specified in this Section; or (c) when delivered if delivered personally or sent by express courier service. All notices shall be sent to the other party at its address as set forth below unless written notice is given by either party of a change of address:

CITY:	City of St. George 175 East 200 North St. George, Utah 84770	CONSULTANT:	Bowen Collins & Associates 20 N. Main St., Suite 107 St. George, Utah 84770
Attention:	City Attorney	Attention:	Todd Olsen
Copy:	legal@sgcity.org		

20. **GOVERNING LAW AND VENUE.** This Agreement shall be construed according to the laws of the State of Utah. The parties agree that venue for all legal actions, unless they involve a cause of action with mandatory federal jurisdiction, shall be the Fifth District Court for the State of Utah. The parties further agree that the Federal District Court for the District of Utah shall be the venue for any cause of action with mandatory federal jurisdiction. The parties shall have all rights and remedies provided under applicable Federal or State law for a breach or threatened breach of this Agreement. These rights and remedies shall not be mutually exclusive, and the exercise of one or more of these rights and remedies shall not preclude the exercise of any other rights and remedies. Each party agree that damages at law may be an inadequate remedy for a breach or threatened breach of any provision hereof and the respective rights and obligations of the parties hereunder shall be enforceable by specific performance, injunction, or other equitable remedy. Nothing in this Agreement shall be construed to waive the sovereign immunity of the government parties.

21. **LEGAL FEES.** Should any party default on any of the covenants or agreements contained herein, the defaulting party shall pay all costs and expenses, (excluding reasonable attorney's fees,) which may arise or accrue from enforcing this Agreement or in pursuing any remedy provided hereunder or by applicable law, whether such remedy is pursued by filing a lawsuit or otherwise. This obligation of the defaulting party to pay costs and expenses includes, without limitation, all costs, and expenses, (excluding reasonable attorney's fees) including appeals and bankruptcy proceedings. If either party commences legal action to interpret any term of this agreement, the prevailing party shall be entitled to recover all reasonable fees (excluding attorney's fees), court costs, and any other costs incurred in connection with such action. The parties agree that they shall each pay their own attorney's fees.

22. **MODIFICATION OF AGREEMENT.** CITY specifically reserves the right to modify or amend this Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work. All modifications shall be in writing and executed by both parties. Each Work Order adopted under this Agreement shall incorporate the terms and conditions of this Agreement and shall constitute a modification to this contract. A Work Order may amend the terms and conditions of this Agreement only as they apply to that particular Work Order and shall not have any general effect on this Agreement.

23. **RESERVED LEGISLATIVE POWERS.** Nothing in this Agreement shall limit the future exercise of the police power by CITY in enacting zoning, subdivision, development, transportation, environment, open space, and related land use plans, policies, ordinances, and regulations after the date of this Agreement, but which shall not be retroactively applied to or modify this Agreement.

24. **SUCCESSORS AND ASSIGNS.** CONSULTANT shall not assign, sublet, sell, transfer, or otherwise dispose of any interest in this Agreement without assigning the rights and the responsibilities under this Agreement and without the prior written approval of CITY. This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns, but shall not inure to the benefit of any third party or other person.

25. **NO JOINT VENTURE, PARTNERSHIP OR THIRD-PARTY RIGHTS.** It is not intended by this Agreement to, and nothing contained in this Agreement shall, create any partnership, joint venture, or other arrangement between the parties. No term or provision of this Agreement is intended to or shall, be for the benefit of any person, firm, organization, or corporation not a party hereto, and no such other person, firm, organization, or corporation shall have any right or cause of action hereunder.

26. **INTEGRATION.** This Agreement contains the entire Agreement with respect to the subject matter hereof and integrates all prior conversations, discussions or understanding of whatever kind or nature between CITY and CONSULTANT and supersedes and replaces all terms and conditions of any prior agreements, arrangements, negotiations, or representations, written or oral, with respect to this PROJECT.

27. **SEVERABILITY.** If any part or provision of this Agreement shall be determined to be unconstitutional, invalid or unenforceable by a court of competent jurisdiction, then such a decision shall not affect any other part or provision of this Agreement except that specific provision determined to be unconstitutional, invalid or unenforceable. If any condition, covenant or other provision of this Agreement shall be deemed invalid due to its scope or breadth, such provision shall be deemed valid to the extent of the scope or breadth permitted by law.

28. **CONSTRUCTION.** Each of the parties hereto has had the opportunity to review this agreement with counsel of their choosing and the rule of contracts requiring interpretation of a contract against the party drafting the same is hereby waived and shall not apply in interpreting this agreement.

29. **SURVIVAL.** It is expressly agreed that the terms, covenants, and conditions of this Agreement shall survive any legal act or conveyance required under this Agreement.

30. **HEADINGS.** The section and other headings in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement.

31. **COUNTERPARTS.** This Agreement may be signed in counterparts and each such counterpart shall constitute an original document. All such counterparts, taken together, shall constitute one and the same instrument. Any signature on this Agreement transmitted by facsimile, electronically in PDF format, or by other generally accepted means of conveying digital signatures (e.g. DocuSign) shall by deemed an original signature for all purposes and the exchange of copies of this Agreement and of signature pages by any such transmission, or by a combination of such means, shall constitute effective execution and delivery of this Agreement as to the Parties and may be used in lieu of the original for all purposes.

32. **AUTHORITY OF PARTIES.** The parties executing this Agreement hereby warrant and represent that they are duly authorized to do so in the capacity stated and that this Agreement constitutes a valid and binding Agreement.

IN WITNESS WHEREOF, this Agreement has been executed by the CITY and CONSULTANT effective from the day and year first written above.

CITY OF ST. GEORGE		**CONSULTANT (Name)**
Mayor	Date	Todd Olsen
ATTEST:		APPROVED AS TO FORM: CITY ATTORNEY'S OFFICE

Christina Fernandez, City Recorder

EXHIBIT A
SCOPE OF SERVICES

This Exhibit A Scope of Services is attached to, and fully incorporated into, the Professional Services Agreement by and between the City of St. George (the "City") and the following individual or entity ("Contractor"):

Name: Bowen Collins & Associates

Address: 20 N. Main Street, Suite 107, St. George, UT 84770

Email: tolsen@bowencollins.com Phone Number: 435-656-3299

Scope of Services and/or Deliverables by Contractor:

- See attached Scope of Services
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Compensation: City shall pay Contractor the following sum:

- $264,664

BOWEN COLLINS & ASSOCIATES

20 NORTH MAIN, SUITE NO. 107 • ST. GEORGE, UTAH 84770
TEL: (435) 656-3299

October 4, 2024

Scott Taylor, P.E.
Water Services Department Engineer
City of St. George
811 Red Hills Parkway
St. George, UT 84770

Subject: **Proposed Scope of Services for Update to City of St. George Culinary Water Master Plan, Sewer Master Plan, Secondary Irrigation Master Plan, and Impact Fee Facilities Plans**

Dear Scott:

In accordance with your request, this letter has been prepared for your review and consideration. Below is a scope of services and an associated fee from Bowen Collins & Associates (BC&A) to provide engineering services to evaluate and master plan the city's culinary water system, sewer system, and secondary irrigation system and to develop an Impact Fee Facilities Plan (IFFP) for each respective utility. The scope of services presented herein describes the individual tasks that will be performed to complete this project. Our proposed scope of services is as follows:

PROPOSED SCOPE OF SERVICES – CULINARY WATER SYSTEM MASTER PLAN AND IFFP

Task 1: Culinary Water System Master Plan and IFFP

Subtask 1-1: Collect, Review and Organize Data

BC&A will collect, review, and organize the data needed to perform the tasks listed in this scope of services. This will include the following information:

- Updated GIS data for the culinary water system.
- Updated land use/zoning shapefiles.
- Source production data and other water demand data needed to supplement data that BC&A already has in hand.

As part of this Task, BC&A will prepare for and attend a project kickoff meeting to review the project objectives and schedule, develop project and data coordination procedures, and discuss questions regarding information to be provided by the city.

Subtask 1-2: Progress and Coordination Meetings (For All Master Plans)

BC&A will prepare for and attend up to eight (8) progress/coordination meetings with the city to review goals and findings as the total combined master planning effort (all three reports). BC&A will also prepare and attend up to two (2) meetings with the St. George City Council to present and discuss finding and recommendations for the master plan update.

Subtask 1-3: Update City Population Projections

As part of the ongoing update to the WCWCD Regional Water Master Plan, BC&A has developed updated growth projections for the RWSA Partner cities based on information provided by the Kem C. Gardner Policy Institute. Using the data from the WCWCD report, BC&A will update the growth forecast for St. George City. The updated growth projections will be developed through an estimated "build out" condition.

Subtask 1-4: Evaluate Current Water Use Patterns and Project Future System Water Demand

As part of the ongoing update to the WCWCD Regional Water Master Plan, BC&A has evaluated historical water use data from the City of St. George. This data will be used to develop an update for the city's source sizing standard and to update future demand forecasts for the system. This task will account for the forecasted demands on the secondary irrigation system and how they will impact demands on the secondary irrigation system.

Subtask 1-5: Evaluate City Water Supplies

Water sources will be evaluated on a city-wide basis as well as by each individual pressure zone. This task will involve the following steps:

- Meet with city personnel, as appropriate, to discuss existing supply production and future supply alternatives. Evaluation of supply will include consideration of imported water from other agencies (WCWCD).
- Evaluate the adequacy of city sources to meet projected demands on an annual basis.
- Evaluate the adequacy of city sources to meet projected demands on a seasonal basis.
- Evaluate the adequacy of city sources to meet projected peak demands.
- Investigate the effects of major source failure on the system and identify needed source redundancy.

Subtask 1-6: Evaluate City Water Storage Facilities

BC&A will review the city's existing storage capacities and projected needs for future storage needs. Like the evaluation of the city's sources, this analysis will be performed on a city-wide basis as well as by individual pressure zone. Total storage needs will consider equalization, emergency, and fire flow storage needs. This task includes:

- Evaluation of existing storage capacity in terms of equalization, emergency, and fire flow needs.
- Evaluation of the adequacy of existing storage tanks to meet future water system demands.

Subtask 1-7: Update and Calibrate Hydraulic Computer Model and Evaluate Water Distribution System

BC&A will update and calibrate the existing hydraulic computer model of the city's water transmission and distribution system. The master plan will utilize a "steady state" simulation which provides a snapshot of the system under steady state flow conditions. Using the updated system demands, supplies, and distribution model, BC&A will evaluate the performance of existing and projected future conveyance and distribution facilities. This will include the evaluation of the following:

- Update demands, pipelines, and other facilities in the city's hydraulic water model. The model will include all pipelines 4-inch and larger and will not include individual service connections. It has been assumed that the city can provide all physical properties regarding pipelines, etc. in an updated GIS shapefile and that no survey work will be required as part of this project.
- Use available meter data/GIS records to distribute demand throughout the model.
- Calibrate the model using any available pressure logger data, flow data, etc.
- Evaluate the distribution system under peak day, peak hour, fire flow, and static demand conditions.

Subtask 1-8: Identify Existing Operating Deficiencies

Using the information gathered in previous tasks, BC&A will identify any existing deficiencies in the city's supply sources, storage facilities, transmission and distribution pipelines, and pump stations. This task will include:

- Use the hydraulic computer model to identify potential system deficiencies. Computer model output will be reviewed with city personnel.
- Utilize information provided by the city operations personnel to identify condition related system improvements that should be implemented.

Subtask 1-9: Identify Future Operating Deficiencies

Using the information gathered in previous tasks, BC&A will identify future system deficiencies with sources, storage facilities, pipelines and pump stations. This task includes:

- Use the hydraulic computer model with future demands to identify parts of the system that have insufficient capacity for future growth.
- Evaluate the adequacy of existing water supply sources and water storage facilities to meet the future needs imposed on the water system.

Subtask 1-10: Evaluate Improvements to Resolve Identified Operating Deficiencies

BC&A will evaluate alternative improvement projects to resolve the identified water system deficiencies. This includes improvements to the city's sources, storage facilities, pipelines, and pump stations. Together with city personnel, BC&A will identify recommended water system capital improvement projects that will resolve the identified deficiencies. The city will also provide a list of

any condition related improvements that it desires to have included in the list of capital improvements. A cost estimate will be included for the list of improvements.

Subtask 1-11: Develop Water System Capital Facilities Plan

With input from city personnel, BC&A will develop a detailed Capital Facilities Plan for the water system. The plan will prioritize projects based on whether they are needed to correct existing deficiencies, replacement and rehabilitation, or future development. The Capital Facilities Plan will provide the city with a detailed 10-year project and budget plan for culinary water system improvements.

Subtask 1-12: Develop Impact Fee Facilities Plan

Using the Capital Facilities Plan developed in Subtask 1-11, BC&A will complete an Impact Fee Facilities Plan (IFFP) for projects to be included in the 10-year planning window. BC&A will develop a methodology for dividing projects between expenses eligible for impact fees and expenses not eligible for impact fees. This will include consideration of capacity used by growth within the 10-year planning window and capacity used by growth beyond the 10-year planning window. The IFFP will provide the basis of the Impact Fee Analysis to be completed by the city's financial consultant. In the previous iteration of the master plans, culinary water and secondary irrigation were combined into a single "water" impact fee facilities plan. It has been assumed that the same approach with be used for this project.

Subtask 1-13: Document Results

BC&A will prepare a report summarizing the results of this study. This will include the following:

- Prepare a draft electronic (pdf) report that summarizes the results of the study and presents the recommended water system capital improvements plan and IFFP.
- Meet with city personnel to review comments on draft reports.
- Incorporate city comments into the final reports.
- Provide electronic (pdf) and 5 hard copies of the final reports to the city.

Task 2: Secondary Irrigation System Master Plan and IFFP

Subtask 2-1: Collect, Review, and Organize Data

BC&A will collect, review, and organize the data needed to perform the tasks listed in this scope of services. This will include the following information:

- Recent irrigation water usage data and source production data.
- Updated GIS data for the secondary irrigation system.

As part of this Subtask, BC&A will prepare for and attend a project kickoff meeting to review the project objectives and schedule, develop project and data coordination procedures, and discuss questions regarding information to be provided by the city.

Subtask 2-2: Update City Population Projections

In conjunction with Subtask 1-3, BCA will update the growth projections for the secondary irrigation system.

Subtask 2-3: Evaluate Current Irrigation Usage and Project Future Irrigation Demand

BC&A will evaluate existing irrigation usage and project future irrigation demand on the secondary irrigation system. Future demand projections will be based on the service area identified by the city of St. George. This task includes:

- Analyze available irrigation water use records to estimate outdoor water usage for various development types.
- Evaluate the land use and zoning classification of areas to be included in the secondary irrigation system.
- Develop projected secondary irrigation demands through buildout for the proposed secondary irrigation service area.

Subtask 2-4: Evaluate City Irrigation Water Supplies

Water sources will be evaluated on a city-wide basis as well as by region. This task will involve the following steps:

- Meet with city personnel, as appropriate, to discuss existing supply production and future supply alternatives.
- Evaluate the adequacy of city sources to meet projected demands on an annual basis, considering seasonal variability of sources.
- Evaluate the adequacy of city sources to meet projected peak demands. This will include consideration of the capacity of individual sources during peak demand periods.
- Identify and quantify potential future irrigation supply sources.

Subtask 2-5: Evaluate City Irrigation Storage Facilities

BC&A will review the city's existing irrigation storage capacities and projected future storage needs. Like the evaluation of the city's sources, this analysis will be performed on a city-wide basis as well as by individual regions. This task includes:

- Evaluate existing storage capacity and its ability to service existing and future system demands.
- Identify potential storage locations and required volume of future storage facilities.

Subtask 2-6: Update and Calibrate Hydraulic Computer Model and Evaluate Irrigation Distribution System

BC&A will develop and calibrate a hydraulic computer model of the city's secondary irrigation transmission and distribution system. The master plan will utilize a "steady state" simulation which provides a snapshot of the system under steady state flow conditions. Using the hydraulic computer model, BC&A will evaluate the performance of existing and future conveyance and distribution facilities. This will include the evaluation of the following:

- The model will include all pipelines 4-inch and larger, but will not include individual service connections. It has been assumed that the city will provide GIS data to update the existing model.
- Use available meter data/GIS records to distribute demand throughout the model.
- Calibrate the model using any available pressure logger data, flow data, etc.
- Evaluate the distribution system under peak day, peak hour, and static demand conditions.

Subtask 2-7: Identify Existing Operating Deficiencies

Using the information gathered in previous tasks, BC&A will identify any existing deficiencies in the city's supply sources, storage facilities, transmission and distribution pipelines, and pump stations. This task will include:

- Use the hydraulic computer model to identify potential system deficiencies. Computer model output will be reviewed with city personnel.
- Utilize information provided by the city operations personnel to identify condition related system improvements that should be implemented.

Subtask 2-8: Identify Future Operating Deficiencies

Using the information gathered in previous tasks, BC&A will identify future system deficiencies with sources, storage facilities, pipelines and pump stations. This task includes:

- Use the hydraulic computer model with future demands to identify parts of the system that have insufficient capacity for future growth.
- Evaluate the adequacy of existing water supply sources and water storage facilities to meet the future needs imposed on the secondary irrigation system.

Subtask 2-9: Evaluate Improvements to Resolve Identified Operating Deficiencies

BC&A will evaluate alternative improvement projects to resolve the identified irrigation system deficiencies. This includes improvements to the city's sources, storage facilities, pipelines, and pump stations. Together with city personnel, BC&A will identify recommended irrigation system capital improvement projects that will resolve the identified deficiencies. A cost estimate will be included for the list of improvements.

Subtask 2-10: Develop Secondary Irrigation System Capital Facilities Plan

With input from city personnel, BC&A will develop a detailed Capital Facilities Plan for the secondary irrigation system. The plan will prioritize projects based on whether they are needed to correct existing deficiencies or future development. The Capital Facilities Plan will provide the city with a detailed 10-year project and budget plan for the irrigation system improvements.

Note that the recommended secondary irrigation capital improvements will be combined with the recommended culinary water system improvements in a single "water" IFFP (see Subtask 1-12).

Task 2-11: Document Results

BC&A will prepare a report summarizing the results of this study. This will include the following:

- Prepare a draft electronic (pdf) report that documents the results of the study and presents the recommended secondary irrigation system Capital Facilities Plan.
- Meet with city personnel to review comments on draft reports.
- Incorporate city comments into the final reports.
- Provide electronic (pdf) and 5 hard copies of the final reports to the city.

Task 3: Sewer System Master Plan and IFFP

Subtask 3-1: Collect, Review, and Organize Data

BC&A will collect, review, and organize the data needed to perform the tasks listed in this scope of services. This will include the following information:

- Updated GIS data for the sewer collection system.
- Historical flow data at the SGRWRF.
- Metered flow records for the collection system.

As part of this Task, BC&A will prepare for and attend a project kickoff meeting to review the project objectives and schedule, develop project and data coordination procedures, and discuss questions regarding information to be provided by the city.

Subtask 3-2: Update Service Area Population Projections

In conjunction with the culinary and secondary irrigation master plan, BC&A will update the population projections for the sewer collection and treatment system. In addition, BC&A will also update the assumed growth projections from Washington, Ivins, and Santa Clara. The city is evaluating the potential of allowing the areas north of the city along SR-18 (Diamond Valley, Dammeron Valley, Veyo) to connect to the sewer system. These areas will be added/incorporated into the master plan.

Subtask 3-3: Evaluate Current Water Use Patterns and Project Future Sewer System Demand

In order to determine the quantity and distribution of wastewater production through the service area, BC&A will evaluate available water use records. In particular, BC&A will compare seasonal water use in order to estimate indoor water usage throughout the city. This Subtask includes:

- Analysis of available water use records to estimate wastewater production per Equivalent Residential Unit (ERU).
- Estimation of indoor water use.
- Estimation of infiltration (groundwater entering collection pipe via cracks, loose joins, etc.).
- Develop projections for wastewater production through buildout based on the activities described above.

Subtask 3-4: Update and Calibrate Hydraulic Model and Evaluate Sewer Collection System

BC&A will update and calibrate the existing hydraulic computer mode of the city's sewer collection system. The sewer model will utilize an "Extended Period Simulation", which is a time-dependent model which allows the user to examine sewer flows throughout the course of a day of operation. Using the updated wastewater production estimates for the system, BC&A will evaluate the performance of existing sewer collection infrastructure with existing and future sewer flows. This task includes the following:

- Update sewer production estimates, sewer collection pipes, lift stations, and force mains in the hydraulic model. It has been assumed that the city will provide updated GIS data.
- Calibrate the sewer model using available flow data from key points in the system as well as flow records into the treatment plant. This data will help to determine and adjust wastewater peaking factors on the system.
- Compare water use records against plant flows to estimate system infiltration/exfiltration.

Subtask 3-5: Identify Existing Operating Deficiencies

Using the hydraulic model, BC&A will identify any deficiencies in the city's existing sewer collection pipe network, lift stations, and force mains. This task includes:

- Establish evaluation criteria for the sewer collection system.
- Use the hydraulic computer model to identify potential system deficiencies. Computer model results will be reviewed with city personnel.
- Utilize information provided by the city operations personnel to identify condition related system improvements that should be implemented.

Subtask 3-6: Identify Future Operating Deficiencies

Using future wastewater production estimates and the hydraulic computer model, BC&A will identify potential future system deficiencies brought on my future growth.

Subtask 3-7: Evaluate Improvements to Resolve Identified Operating Deficiencies

BC&A will evaluate alternative improvement projects to resolve the identified sewer collection system deficiencies. This includes improvements to the city's collection pipes, force mains, and lift stations. Together with city personnel, BC&A will identify recommended sewer system capital improvement projects that will resolve the identified deficiencies. The city will also provide a list of any condition related improvements that it desires to have included in the list of capital improvements. A cost estimate will be included for the list of improvements.

Subtask 3-8: Develop Sewer Collection System Capital Facilities Plan

With input from city personnel, BC&A will develop a detailed Capital Facilities Plan for the sewer system. The plan will prioritize projects based on whether they are needed to correct existing deficiencies, replacement and rehabilitation, or future development. The Capital Facilities Plan will provide the City with a detailed 10-year project and budget plan for the water system improvements.

Subtask 3-9: Develop Impact Fee Facilities Plan

Using the Capital Facilities Plan developed in Subtask 3-8, BC&A will assemble an Impact Fee Facilities Plan for projects to be included in the 10-year planning window. BC&A will develop a methodology for dividing projects between expenses eligible for impact fees and expenses not eligible for impact fees. This will include consideration of capacity used by growth within the 10-year planning window and capacity used by growth beyond the 10-year planning window. The IFFP will provide the basis of the Impact Fee Analysis to be completed by the city's financial consultant.

Subtask 3-10: Document Results

BC&A will prepare a report summarizing the results of this study. This will include the following:

- Prepare a draft electronic (pdf) report that summarizes the results of the study and presents the recommended water system capital improvements plan and IFFP.
- Meet with city personnel to review comments on draft reports.
- Incorporate city comments into the final reports.
- Provide electronic (pdf) and 5 hard copies of the final reports to the city.

PROJECT SCHEDULE

This project is anticipated to take approximately 6 months to complete. The target date for completion is March 31, 2025.

COST SUMMARY

BC&A has tabulated the estimated man-hours and costs to complete each task outlined in the previously defined scope of services. As presented in the attached exhibit, we propose to complete the scope of services for a fee not to exceed $264,664.

We are willing to negotiate the scope of work, schedule, and fee if there is something in this proposal that does not meet your needs. We enjoy working with the City of St. George and are very interested in providing engineering services on this project. We are available to start work immediately. Please call if you have any questions or if you need additional information.

Sincerely,

BOWEN COLLINS AND ASSOCIATES



Aaron Anderson, P.E.
Project Manager

Attachment

ATTACHMENT 1

St. George Culinary, Secondary, and Irrigation Master Plan & IFFP

City of St. George

Engineering Man-hours and Fee Estimate

10/4/2024

		Office		Engineers				Subtotal Hours	Subtotal Labor	Subtotal Expenses	Total Cost
	Labor Category	Account	Editor	PE	PE	PM	PIC				
	Staff	Snow	Hilbert	Goodrich	Clymore	Anderson	Olsen				
Task	**Task Description**										
TASK 1 - Culinary Water System Master Plan and IFFP											
1-1	Collect, Review and Organize Data			8		4		12	$ 1,728	$ -	$ 1,728
1-2	Progress and Coordination Meetings (For All Master Plans)			16	16	24		56	$ 8,272	$ 100	$ 8,372
1-3	Update City Population Projections			24		4		28	$ 3,824	$ -	$ 3,824
1-4	Evaluate Current Water Use Patterns and Project Future System Water Demand			40		12		52	$ 7,280	$ -	$ 7,280
1-5	Evaluate City Water Supplies			32		12		44	$ 6,232	$ -	$ 6,232
1-6	Evaluate City Water Storage Facilities			24		8		32	$ 4,504	$ -	$ 4,504
1-7	Update and Calibrate Hydraulic Computer Model and Evaluate Water Distribution System			80		32		112	$ 15,920	$ -	$ 15,920
1-8	Identify Existing Operating Deficiencies			24		12		36	$ 5,184	$ -	$ 5,184
1-9	Identify Future Operating Deficiencies			24		12		36	$ 5,184	$ -	$ 5,184
1-10	Evaluate Improvements to Resolve Identified Operating Deficiencies			32		12		44	$ 6,232	$ -	$ 6,232
1-11	Develop Culinary Water System Capital Facilities Plan			24		12		36	$ 5,184	$ -	$ 5,184
1-12	Develop Impact Fee Facilities Plan			32		40	4	76	$ 11,864	$ -	$ 11,864
1-13	Document Results			60		32	6	98	$ 14,608	$ -	$ 14,608
	Task 1 Sub-Total	**0**	**0**	**420**	**16**	**216**	**10**	**662**	**$ 96,016**	**$ 100**	**$ 96,116**
TASK 2 - Secondary Irrigation Master Plan and IFFP											
2-1	Collect, Review and Organize Data			12		6		18	$ 2,592	$ -	$ 2,592
2-2	Update City Population Projections			12		4		16	$ 2,252	$ -	$ 2,252
2-3	Evaluate Current Irrigation Usage and Project Future Irrigation Demand			40		12		52	$ 7,280	$ -	$ 7,280
2-4	Evaluate City Irrigation Water Supplies			32		12		44	$ 6,232	$ -	$ 6,232
2-5	Evaluate City Irrigation Storage Facilities			24		4		28	$ 3,824	$ -	$ 3,824
2-6	Update and Calibrate Hydraulic Computer Model and Evaluate Irrigation Distribution System			80		32		112	$ 15,920	$ -	$ 15,920
2-7	Identify Existing Operating Deficiencies			24		12		36	$ 5,184	$ -	$ 5,184
2-8	Identify Future Operating Deficiencies			24		12		36	$ 5,184	$ -	$ 5,184
2-9	Evaluate Improvements to Resolve Identified Operating Deficiencies			32		12		44	$ 6,232	$ -	$ 6,232
2-10	Develop Secondary Irrigation System Capital Facilities Plan			24		12	4	40	$ 6,056	$ -	$ 6,056
2-11	Document Results			60		32	6	98	$ 14,608	$ -	$ 14,608
	Task 2 Sub-Total	**0**	**0**	**364**	**0**	**150**	**10**	**130**	**$ 75,364**	**$ -**	**$ 75,364**
TASK 3 - Sewer Master Plan and IFFP											
3-1	Collect, Review, and Organize Data				20	8		28	$ 3,980	$ -	$ 3,980
3-2	Update Service Area Population Projections				28	16		44	$ 6,388	$ -	$ 6,388
3-3	Evaluate Current Water Use Patterns and Project Future Sewer System Demand				50	20		70	$ 9,950	$ -	$ 9,950
3-4	Update and Calibrate Hydraulic Model and Evaluate Sewer Collection System				90	40		130	$ 18,590	$ -	$ 18,590
3-5	Identify Existing Operating Deficiencies				32	16		48	$ 6,912	$ -	$ 6,912
3-6	Identify Future Operating Deficiencies				28	16		44	$ 6,388	$ -	$ 6,388
3-7	Evaluate Improvements to Resolve Identified Operating Deficiencies				40	20		60	$ 8,640	$ -	$ 8,640
3-8	Develop Sewer Collection System Capital Facilities Plan				24	16		40	$ 5,864	$ -	$ 5,864
3-9	Develop Impact Fee Facilities Plan				32	40	4	76	$ 11,864	$ -	$ 11,864
3-10	Document Results				60	32	6	98	$ 14,608	$ -	$ 14,608
	Task 3 Sub-Total	**0**	**0**	**0**	**404**	**224**	**10**	**638**	**$ 93,184**	**$ -**	**$ 93,184**
	TOTAL HOURS	***0***	***0***	***784***	***420***	***590***	***30***	***1430***			
	TOTAL COST NOT TO EXCEED								**$ 264,564**	**$ 100**	**$ 264,664**

Expenses include:
Mileage Charge at $0.75/mile
10% Markup on other project related expenses

Agenda Date: 11/07/2024 **Agenda Item Number:** 3b

Subject:

Consider approval of a Professional Services Agreement with Intermountain Consumer Professional Engineers, Inc. to provide engineering services for the design of the Slickrock Substation and Transmission line.

Item at-a-glance:

Staff Contact: Bryan Dial

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

811 East Red Hills Pkwy

Item History (background/project status/public process):

This is to provide engineering service for the design of the Slickrock Substation and Transmission line.

Staff Narrative (need/purpose):

Due to increased load growth on the east side of the city, essential system improvements are required to maintain the reliability of electrical services. The surrounding substations are nearing their capacity limits, and as a result, new infrastructure developments are necessary. This project will focus on engineering the design of a new substation, along with the construction of the associated transmission lines. These upgrades will ensure the continued stability and efficiency of the power supply to meet demand in the area.

Name of Legal Dept approver: Alicia Carlton

Budget Impact:

Cost for the agenda item: $103,170

Amount approved in current FY budget for item: $1,200,000

If not approved in current FY budget or exceeds the budgeted amount, please explain funding source:

The amount for this project is approved in the FY25 budget.

Description of funding source:

The amount for this project is approved in the FY25 budget.

Recommendation (Include any conditions):

Staff recommends approval.

PROFESSIONAL SERVICES AGREEMENT
WITH INTERMOUNTAIN CONSUMER PROFESSIONAL ENGINEERS, INC. (ICPE)

This Professional Services Agreement (hereinafter "Agreement") is made and entered into on _____ by and between the City of St. George, a municipal corporation, with offices at 175 East 200 North, St. George, Utah 84770 (hereinafter "CITY"), and Intermountain Consumer Professional Engineers, Inc., with offices at 1145 E. South Union Ave, Midvale, Utah, 84047 (hereinafter "CONSULTANT").

WITNESSETH THAT:

WHEREAS CITY desires professional services to be performed and has solicited CONSULTANT to provide Engineering and Design services including preparation of construction drawings, relay settings, specifications, providing support during bidding process and construction for the Slickrock Substation and Transmission Line Project (hereinafter called the PROJECT); and

WHEREAS, CONSULTANT has submitted a proposal, which outlines the general scope of services to be provided and the fees for the PROJECT; and

WHEREAS CITY selected CONSULTANT to perform the services for the PROJECT;

NOW, THEREFORE, for the consideration hereinafter set forth, the parties hereto do mutually agree as follows:

1. **ENGAGEMENT OF CONSULTANT.**

1.1 CONSULTANT is a professional licensed by the State of Utah and the City of St. George. CONSULTANT has all licenses, permits, and approvals that are legally required for CONSULTANT to practice its profession and shall keep them in effect at all times during the term of this Agreement.

1.2 CONSULTANT states that it has the necessary knowledge, experience, abilities, skills, and resources to perform its obligations under this Agreement and agrees to perform its obligations under this Agreement in a professional manner, consistent with prevailing industry standards and practices as observed by competent practitioners of the profession in which CONSULTANT and its subcontractors or agents are engaged.

1.3 CONSULTANT certifies that it does not and will not during the performance of this contract knowingly employ, or subcontract with any entity which employs workers in violation of 8 USC §1324(a). CONSULTANT agrees to require all subcontractors at the time they are hired for this project to sign a Certification of Legal Work Status and submit the Certification to CITY prior to any work being

performed by the subcontractors. CONSULTANT agrees to produce, at CITY'S request, documents to verify compliance with applicable State and Federal laws. If CONSULTANT knowingly employs workers or subcontractors in violation of 8 USC § 1324(a), such violation shall be cause for unilateral cancellation of the contract between CONSULTANT and CITY. In addition, CONSULTANT may be suspended from participating in future projects with CITY for a period of one (1) year. In the event this contract is terminated due to a violation of 8 USC § 1324(a) by CONSULTANT or a subcontractor of CONSULTANT, CONSULTANT shall be liable for any and all costs associated with such termination, including, but not limited to, any damages incurred by CITY excluding attorney fees. For purposes of compliance, CITY requires CONSULTANT and subcontractors to use E-Verify or other federally accepted forms of verification to verify the employment eligibility of all employees as allowed by law and the E-Verify procedures. CONSULTANT and subcontractors must maintain authorized documentation of the verification.

1.4 CONSULTANT shall not, either during or after the term of this Agreement, make public any reports or articles, or disclose to any third party any confidential information relative to the work of City or the operations or procedures of CITY without the prior written consent of CITY.

1.5 CONSULTANT further agrees that it shall not, during the term of this Agreement, take any action that would affect the appearance of impartiality or professionalism.

1.6 CONSULTANT, by execution of this Agreement, certifies that it does not discriminate against any person upon the basis of race, color, creed, national origin, age, sex, sexual orientation, gender identity, disability, or marital status in its employment practices.

1.7 CONSULTANT expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve CONSULTANT from any obligation to comply with all applicable requirements of CITY during the term of this Agreement including the payment of fees and compliance with all other applicable ordinances, resolutions, regulations, policies, and procedures of CITY, except as modified or waived in this Agreement.

1.8 CONSULTANT shall comply with all applicable federal, state, and local laws, regulations, and ordinances that affect those employees or those engaged by CONSULTANT on the PROJECT, and will procure all necessary licenses, permits and insurance required.

1.9 CITY acknowledges that CONSULTANT may employ various specialized subcontractors for up to 15% of the services provided herein. CONSULTANT shall give written notice to CITY at least seven (7) days prior to CONSULTANT'S employment of the subcontractors to perform portions of the work provided for in this Agreement. It shall be solely CONSULTANT's responsibility to ensure that any of CONSULTANT'S subcontractors perform in compliance with the terms of this Agreement. Subcontractors may not be changed without ten (10) days prior

written notice to CITY.

2. **PROJECT SERVICES DESCRIPTION.**

2.1 CONSULTANT will provide the services covered by this Agreement as described in the attached Scope of Work (**"Exhibit A"**) which is made a part of this Agreement by this reference. CITY may at any time, as the need arises, order changes within the scope of the services without invalidating the Agreement. If such changes increase or decrease the amount due under the Agreement, or in the time required for performance of the work, an equitable adjustment shall be authorized by change order.

2.2 CONSULTANT shall furnish all the material, supplies, tools, transportation, equipment, labor, subcontractor services and other services necessary for the completion of the work described in **"Exhibit A"** .

2.3 CONSULTANT shall provide services in compliance with all applicable requirements of federal, state, and local laws, codes, rules, regulations, ordinances, and standards.

3. **TERM OF AGREEMENT.**

3.1 This Agreement shall be effective as of the date executed by all parties and shall continue until services provided for this Agreement have been performed otherwise terminated as set forth in this Agreement.

3.2 CONSULTANT agrees to perform services as expeditiously as is consistent with professional skill and care and the orderly progress of the PROJECT. CONSULTANT shall perform the services in a timely manner according to the schedule approved by CITY.

3.3 CONSULTANT shall perform its services upon notice from the CITY to proceed and in accordance with the schedule approved by CITY. In the event performance of its services is delayed by causes beyond the reasonable control of CONSULTANT, and without the fault or negligence of CONSULTANT, the time for the performance of the services shall be equitably adjusted by written amendment to reflect the extent of such delay. CONSULTANT shall provide CITY with written notice of delay, including a description of the delay and the steps contemplated or taken by CONSULTANT to mitigate the effect of such delay.

4. **COMPENSATION.** For the performance of the services and completion of PROJECT set forth herein, CITY shall pay CONSULTANT as agreed in **"Exhibit A" .**

5. **INVOICING, PAYMENT, NOTICES.**

5.1 CONSULTANT shall submit invoices, no more frequently than monthly, for the services rendered during the preceding period; invoices shall describe the services

performed, list all subcontractors used and the amount owed or paid to them, list all suppliers used and the amount owed or paid to them, list the contract amount, list the current invoice amount based on percentage of task complete, list the previous invoice amount, list total invoices to date, and list the contract balance.

5.2 In executing the request for payment, CONSULTANT shall attest that payment has been made to all subcontractors involved with prior requests, unless CONSULTANT provides a detailed explanation why such payments have not occurred. CONSULTANT shall also sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status and submit them with each request for payment. CONSULTANT shall require each subcontractor to sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status at the time subcontractor is paid and shall provide a copy of both documents to CITY. CONSULTANT shall also sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status and submit them with each request for payment.

5.3 A "Waiver and Release Upon Final Payment" signed by CONSULTANT attesting that all subcontractors, laborers, and material suppliers involved with prior requests for payment have been paid, and that all subcontractors, laborers, and material suppliers upon which the final payment is based will be paid immediately unless CONSULTANT provides a detailed explanation why such payments have not occurred or will not occur. CONSULTANT shall also require each subcontractor to sign a "Waiver and Release Upon Final Payment" and a Certificate of Legal Work Status at the time subcontractor is paid its final payment and shall provide a copy of both documents to CITY.

5.4 If such liens, claims, security interests or encumbrances remain unsatisfied after payments are made, CONSULTANT shall refund to CITY all money that CITY may be compelled to pay in discharging such liens, including all costs except for attorneys' fees.

5.5 All invoices for reimbursable costs shall be taken from the books of account kept by CONSULTANT, and CONSULTANT shall maintain copies of payroll distribution, receipted bills, and other documents. CITY shall have the right to review all books and records kept by CONSULTANT and any subcontractors concerning the operation and services performed under this Agreement. CITY shall withhold payment for any expenditure not substantiated by CONSULTANT'S or subcontractor's books and records.

5.6 In the event CITY has made payment for expenditures that are not allowed, as determined by CITY'S audit, CONSULTANT shall reimburse CITY the amount of the un-allowed expenditures. If additional money is owed to CONSULTANT, the reimbursement may be deducted from the additional money owed.

5.7 CITY shall make no payment for any services not specified in this Agreement unless such additional services and the price thereof are agreed to in writing, prior to the time that such additional services are rendered.

5.8 Invoices shall be paid to CONSULTANT within thirty (30) days of presentation to CITY.

5.9 CITY may withhold 5% of billed amount as retention. Retention held shall be included in the final invoice after the contract is complete.

6. **CHARGES AND EXTRA SERVICE.**

6.1 CITY may make changes within the general scope of this Agreement. If CONSULTANT is of the opinion a proposed change causes an increase or decrease in the cost and/or the time required for performance of this Agreement, CONSULTANT shall notify CITY of that fact. An agreed-upon change will be reduced to writing signed by the parties hereto and will modify this Agreement accordingly. CONSULTANT may initiate such notification upon identifying conditions which may change the services agreed to on the effective date of this Agreement, as set forth in **Exhibit A**. However, CONSULTANT represents that to the best of its knowledge that it is not aware of any such conditions on the date hereof. Any such notification must be provided within thirty (30) days from the date of receipt by that party of the other party's written notification of a proposed change.

6.2 CITY may request CONSULTANT to perform extra services not covered by **Exhibit A**, and CONSULTANT shall perform such extra services and will be compensated for such extra services when they are reduced to a writing mutually agreed to and signed by the parties hereto amending this Agreement accordingly.

6.3 CITY shall not be liable for payment of any extra services, nor shall CONSULTANT be obligated to perform any extra services except upon such written amendment.

7. **TO BE FURNISHED BY CITY.** Resources to be furnished by CITY to CONSULTANT, at no cost to CONSULTANT, consist of CITY staff assistance for oversight and meetings to help perform the services. CONSULTANT shall verify accuracy of the information provided, unless otherwise stated in the contract documents.

8. **INSPECTIONS.** All work shall be subject to inspection and approval of CITY or its authorized representative.

9. **ACCURACY AND COMPLETENESS.**

9.1 CONSULTANT has total responsibility for the accuracy and completeness of its investigations, calculations, reports, plans and related designs, specifications and estimates prepared for the PROJECT and shall check all such material accordingly.

9.2 The plans will be reviewed by CITY for conformity with PROJECT objectives and compliance with CITY Standards.

9.3 Reviews by CITY do NOT include the detailed review or checking of major design components and related details or the accuracy with which such designs are depicted on the plans.

9.4 The responsibility for accuracy and completeness remains solely with CONSULTANT and shall be performed consistent with the standard of care.

10. **INDEPENDENT CONTRACTOR.**

10.1 CITY retains and engages CONSULTANT, as an independent contractor, to act for and represent it in all matters involved in the performance of services on the PROJECT, subject to the terms, conditions and stipulations as hereinafter stated.

10.2 It is understood and agreed that CONSULTANT will provide the services without supervision from CITY. CONSULTANT is an independent contractor and is not an employee, officer, or agent of CITY for any purposes related to the performance of this Agreement and is not an employee of CITY and is not entitled to any benefits from CITY.

10.3 Nothing in this agreement shall create nor be construed to constitute a partnership or joint venture between CONSULTANT and CITY.

10.4 CONSULTANT is advised to obtain and maintain in effect during the term of this Agreement medical insurance and disability insurance for all related work performed under this Agreement.

10.5 CONSULTANT acknowledges that CITY will not withhold any federal, state, or local taxes, including FICA, nor will CITY provide any unemployment compensation or worker's compensation coverage. As an independent contractor, CONSULTANT shall be responsible for all taxes, worker's compensation coverage and insurance coverage, and shall hold CITY harmless and indemnify CITY from and against any and all claims related to taxes, unemployment compensation, and worker's compensation.

10.6 CONSULTANT shall secure, at its own expense all personnel required in performing the services under this Agreement. The employees of CONSULTANT shall not be considered employees of CITY nor have any contractual relationship with CITY. CONSULTANT and its employees shall not hold themselves out as, nor claim to be officers or employees of CITY by reason of this Agreement. The employees of CITY shall not be considered employees of CONSULTANT.

10.7 Neither party has the right to bind or obligate the other in any way. CONSULTANT

shall not use the name, trademarks, copyrighted materials, or any information related to this Agreement in any advertising or publicity without CITY'S prior written authorization.

11. **INSURANCE.**

11.1 GENERAL: CONSULTANT shall secure and maintain insurance as required by laws and regulations and the terms of this agreement to protect against any liability, loss or expense which occurs or arises as a result of the performance of the services provided pursuant to this agreement or as changed as provided herein. CONSULTANT'S insurer must be authorized to do business in Utah and must have an A.M. Best rating of A VIII or better at the time this contract is executed.

11.2 COMMENCEMENT OF WORK: Neither CONSULTANT, its Suppliers nor any subcontractors shall enter the site of the work or commence work under this contract before CITY has received and accepted Certificate(s) of Insurance and Insurance Endorsements and has issued the Notice to Proceed, as applicable.

11.3 INSURANCE CERTIFICATES AND COVERAGE: Insurance certificates shall be issued on all policies required under this contract and shall be signed by an authorized representative of the insurance company. The insurance certificate or the coverage required shall include the following:

A. The name and address of the insured.

B. CITY shall be named as a Certificate Holder.

C. CITY shall be named as an additional primary insured on the General Liability Certificate with CITY listed as non-contributory on the General Liability certificate.

D. The location of the operations to which the insurance applies.

E. The number of the policy and the type or types of insurance in force thereunder on the date borne by the certificate.

F. The expiration date of the policy and the limit or limits of liability thereunder on the date borne by the certificate.

G. A statement that all coverage is on an occurrence basis rather than a claims basis except for the Professional Errors and Omissions Malpractice Insurance coverage.

H. A provision that the policy or policies will not be canceled, denied renewal, or reduced in coverage until at least 30 days after written notice has been received by CITY.

I. Name, address, and telephone number of the insurance company's agent of process in Utah.

J. Other information to demonstrate compliance with additional requirements stipulated for the various types of insurance coverage.

11.4 COMPENSATION INSURANCE: CONSULTANT shall, as applicable, take out and maintain Workers' Compensation Insurance as required by the Labor Code for all its employees at the site of the work during the life of this contract. Coverage must be provided by a company authorized by the State of Utah to provide Workers' Compensation Insurance. The insurance shall include:

A. Insurance certificates shall provide a waiver of subrogation by the carrier to Certificate Holder.

B. CONSULTANT shall require each subcontractor to provide Workers' Compensation Insurance for its employees unless such employees are covered by CONSULTANT.

C. In the event any class of employees engaged in hazardous work under this contract is not protected by the Workers' Compensation Statute, CONSULTANT shall provide, and shall cause its subcontractors to provide, special insurance for the protection of such employees not otherwise protected.

11.5 COMMERCIAL GENERAL LIABILITY INSURANCE: CONSULTANT shall procure and maintain commercial general liability insurance for the duration of the contract against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the CONSULTANT, its agents, representatives, employees, or subcontractors. The insurance shall remain in effect during the term of this agreement and such that claims reported beyond the date of substantial completion of this agreement are covered and during the warranty period, to the extent that it relates to the activities covered by this Agreement, in such manner and amounts as set forth herein. The Insurance Endorsement shall evidence such provisions.

A. The minimum commercial general liability insurance shall be as follows:

i. Comprehensive general liability insurance for injuries, including accidental death, to any one person in any one occurrence in an amount not less than $1,000,000.00 Dollars.
ii. Comprehensive general liability insurance for injuries, including accidental death, to two or more persons in any one occurrence in an amount not less than $3,000,000.00 Dollars (umbrella coverage may be considered).
iii. Broad form property damage insurance in an amount not less than $300,000.00 Dollars.

B. Such policy shall include each of the following coverages (as applicable):

i. Comprehensive form.
ii. Premises - operations.
iii. Explosion and collapse hazard.
iv. Underground hazard.
v. Product/completed operations hazard.
vi. Contractual insurance.
vii. Broad form property damage, including completed operations.
viii. Independent contractors for vicarious liability.
ix. Personal injury.
x. Cross liability or severability of interest's clause shall be included unless a separate policy covering CITY is provided.

11.6 PROFESSIONAL LIABILITY ERRORS AND OMISSIONS INSURANCE:

A. CONSULTANT shall carry and maintain Professional Liability Errors and Omissions Insurance in an amount not less than $3,000,000.00 Dollars for all work performed under this Agreement.

B. CONSULTANT shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the CONSULTANT, its agents, representatives, employees, or subcontractors. With respect to General Liability, Professional liability coverage should be maintained for a minimum of five (5) years after contract completion.

C. If Professional Liability coverages are written on a claims-made form:

i. The retroactive date must be shown and must be before the date of the contract or the beginning of contract work.
ii Insurance must be maintained, and evidence of insurance must be provided, for at least five (5) years after completion of the contract of work.
iii. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the contract effective date, the CONSULTANT must purchase an extended period coverage for a minimum of five (5) years after completion of contract work.
iv. A copy of the policy must be submitted to CITY for review.

11.7 BUSINESS AUTOMOBILE COVERAGE: CONSULTANT shall carry and maintain business automobile insurance coverage on each vehicle used in the performance of the work in an amount not less than $1,000,000.00 Dollars for one person and $3,000,000.00 Dollars for more than one person and for property

damage resulting from any one occurrence which may arise from the operations of CONSULTANT in performing the work.

Such business automobile insurance shall include each of the following types:

A. Comprehensive form, including loading and unloading.
B. Owned.
C. Hired.
D. Non-owned.

12. **INDEMNITY AND LIMITATION.**

12.1 Except as otherwise provided herein, CONSULTANT shall indemnify, defend, and hold harmless CITY, its elected officials, officers, employees, and representatives against any and all claims, suits, causes of action, demands, losses, costs, and damages and liability of every kind including but not limited to all fees and charges of professionals, except for attorney's fees, and all court or other dispute resolution costs for:

A. death or injuries to persons or for loss of or damage to property which directly or indirectly, in whole or in part are caused by, resulting from, or arising out of the intentional, reckless, negligent, or wrongful acts, errors or omissions, or other liability imposed by law of CONSULTANT, its officers, employees, agents, or representatives in the performance of services under this Agreement or any subcontractor, any supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the work;

B. CONSULTANT's failure or refusal, whatever the reason, to pay subcontractors or suppliers for Work performed under the Agreement;

C. claims by any employee of the CONSULTANT, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, CONSULTANT'S indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONSULTANT or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.

12.2 CITY shall give CONSULTANT prompt written notice of any such claims or suits filed against CITY arising out of the services provided under this Agreement. CONSULTANT agrees to defend against any claims brought or actions filed against CITY arising out of the services provided under this Agreement. If CITY'S tender of defense, based upon the indemnity provision, is rejected by CONSULTANT or CONSULTANT'S insurer, and CONSULTANT is later found by a court of competent jurisdiction to have been required to indemnify the CITY, then, in addition to any other remedies the CITY may have, CONSULTANT shall

pay the CITY'S reasonable costs and expenses, except for attorney's fees, incurred in obtaining such indemnification, defending themselves or enforcing the indemnification provision.

12.3 The insurance requirements in this agreement shall not be construed as limiting CONSULTANT'S liability. Irrespective of the requirements for CONSULTANT to carry insurance as provided herein, insolvency, bankruptcy, or failure of any insurance company to pay all claims accruing shall not be held to relieve CONSULTANT of any obligations under this agreement.

12.4 This section does not apply to a design professional services contract, design professional services, and design professionals.

13. **DOCUMENTS.**

13.1 All data used in compiling CONSULTANT's work, and the results of any tests or surveys, as well as all photographs, drawings, electronically stored records of work performed, renderings, specifications, schedules, CONSULTANT's work, data processing output, computations, studies, audits, research, reports, models and other items of like kind prepared by CONSULTANT, and its employees, shall be the sole and exclusive property of CITY, and CITY shall own all intellectual property rights thereto whether the specific work project for which they are made is undertaken or not. CONSULTANT may retain reproducible copies of all the foregoing documents for information and reference and customary marketing and public relations. The originals of all the foregoing documents shall be delivered to CITY promptly upon completion thereof. This provision may be enforced by an order of specific performance and is independent of any other provision of this Agreement. Compliance by CONSULTANT with this paragraph shall be a condition precedent to CITY's obligation to make final payment to CONSULTANT. If CITY has specific requirements on the information and manner the documentation is collected, CITY shall provide those specifics to CONSULTANT in writing.

13.2 Plans, specifications, maps, and record drawings prepared or obtained under this Agreement shall be provided to CITY in a format approved by CITY which shall generally be a hard copy and an electronic copy and shall become the property of CITY whether the work for which they are prepared is executed or not.

13.3 The basic survey notes and sketches, charts, computations, and other data prepared under this Agreement shall be made available upon request to CITY without restriction or limitation on their use.

13.4 CITY shall have the right to use reports, designs, details, or products developed as part of this Agreement for purposes of maintenance, remodeling or reconstruction of existing facilities or construction of new facilities without additional compensation to CONSULTANT or without restriction or limitation on its use even

if documents are considered copyrighted material.

13.5 CITY will hold harmless CONSULTANT for any use or reuse of these reports, designs, or details for purposes other than the project associated with this Agreement unless CITY obtains validation of that use or reuse from CONSULTANT.

14. **RECORDS.**

14.1 CONSULTANT shall maintain records, books, documents, and other evidence directly pertinent to the performance of services under this Agreement in accordance with generally accepted accounting principles and practices.

14.2 CONSULTANT agrees to keep proper books of records and accounts in which complete and correct entries will be made of payroll costs, travel, subsistence, and field expenses.

14.3 Said books shall, at all times, be available for at least three (3) years after final payment for reasonable examination by CITY.

15. **TERMINATION.**

15.1 CITY may terminate this Agreement by providing fourteen (14) days written notice prior to the effective termination date to CONSULTANT.

15.2 In the event of such termination, CITY shall pay CONSULTANT for all services actually rendered up to and including the date of termination.

15.3 CONSULTANT shall deliver to CITY copies of all drawings, reports, analyses, documents, and investigations, whether completed or not, that were prepared or were being prepared under the provisions of this Agreement.

16. **CONFLICT BETWEEN DOCUMENTS.** In the event of a conflict between this Agreement and any other documents with CONSULTANT, this Agreement shall govern.

17. **CONFLICT OF INTEREST.** CONSULTANT certifies that it has disclosed to CITY any actual, apparent or potential conflicts of interest that may exist relative to the services to be provided pursuant to this Agreement.

17.1 CONSULTANT agrees to advise CITY of any actual, apparent or potential conflicts of interest that may develop after the date of execution of this Agreement.

17.2 CONSULTANT further agrees to complete any statements of economic interest required by either CITY ordinance or State law.

18. **NON-WAIVER.** No failure or waiver or successive failures or waivers on the part of either party hereto, their successors or permittee assigns, in the enforcement of any condition,

covenant, or Article of this Agreement shall operate as a discharge of any such condition, covenant, or Article nor render the same invalid, nor impair the right of either party hereto, their successors or permitted assigns, to enforce the same in the event of any subsequent breaches by the other party hereto, its successors or permitted assigns.

19. **NOTIFICATION.** All notices required or permitted to be made by either party in connection with this Agreement shall be in writing, and shall be deemed to have been duly given: (a) five (5) business days after the date of mailing if sent by U.S. mail, postage prepaid, (b) when transmitted if sent by facsimile, provided a confirmation of transmission is produced by the sending machine and a copy of such facsimile is promptly sent by another means specified in this Section; or (c) when delivered if delivered personally or sent by express courier service. All notices shall be sent to the other party at its address as set forth below unless written notice is given by either party of a change of address:

CITY:	City of St. George	CONSULTANT:	Intermountain Consumer Professional Engineers, Inc (ICPE)
	175 East 200 North		1145 E South Union Ave.
	St. George, Utah 84770		Midvale, UT, 84047
Attention:	City Attorney	Attention:	Steve Nash
Copy:	legal@sgcity.org		

20. **GOVERNING LAW AND VENUE.** This Agreement shall be construed according to the laws of the State of Utah. The parties agree that venue for all legal actions, unless they involve a cause of action with mandatory federal jurisdiction, shall be the Fifth District Court for the State of Utah. The parties further agree that the Federal District Court for the District of Utah shall be the venue for any cause of action with mandatory federal jurisdiction. The parties shall have all rights and remedies provided under applicable Federal or State law for a breach or threatened breach of this Agreement. These rights and remedies shall not be mutually exclusive, and the exercise of one or more of these rights and remedies shall not preclude the exercise of any other rights and remedies. Each party agree that damages at law may be an inadequate remedy for a breach or threatened breach of any provision hereof and the respective rights and obligations of the parties hereunder shall be enforceable by specific performance, injunction, or other equitable remedy. Nothing in this Agreement shall be construed to waive the sovereign immunity of the government parties.

21. **LEGAL FEES.** Should any party default on any of the covenants or agreements contained herein, the defaulting party shall pay all costs and expenses, (excluding reasonable attorney's fees,) which may arise or accrue from enforcing this Agreement or in pursuing any remedy provided hereunder or by applicable law, whether such remedy is pursued by filing a lawsuit or otherwise. This obligation of the defaulting party to pay costs and expenses includes, without limitation, all costs, and expenses, (excluding reasonable attorney's fees) including appeals and bankruptcy proceedings. If either party commences legal action to interpret any term of this agreement, the prevailing party shall be entitled to recover all reasonable fees (excluding attorney's fees), court costs, and any other costs incurred in connection with such action. The parties agree that they shall each pay their own attorney's fees.

22. **MODIFICATION OF AGREEMENT.** CITY specifically reserves the right to modify or amend this Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work. All modifications shall be in writing and executed by both parties. Each Work Order adopted under this Agreement shall incorporate the terms and conditions of this Agreement and shall constitute a modification to this contract. A Work Order may amend the terms and conditions of this Agreement only as they apply to that particular Work Order and shall not have any general effect on this Agreement.

23. **RESERVED LEGISLATIVE POWERS.** Nothing in this Agreement shall limit the future exercise of the police power by CITY in enacting zoning, subdivision, development, transportation, environment, open space, and related land use plans, policies, ordinances, and regulations after the date of this Agreement, but which shall not be retroactively applied to or modify this Agreement.

24. **SUCCESSORS AND ASSIGNS.** CONSULTANT shall not assign, sublet, sell, transfer, or otherwise dispose of any interest in this Agreement without assigning the rights and the responsibilities under this Agreement and without the prior written approval of CITY. This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns, but shall not inure to the benefit of any third party or other person.

25. **NO JOINT VENTURE, PARTNERSHIP OR THIRD-PARTY RIGHTS.** It is not intended by this Agreement to, and nothing contained in this Agreement shall, create any partnership, joint venture, or other arrangement between the parties. No term or provision of this Agreement is intended to or shall, be for the benefit of any person, firm, organization, or corporation not a party hereto, and no such other person, firm, organization, or corporation shall have any right or cause of action hereunder.

26. **INTEGRATION.** This Agreement contains the entire Agreement with respect to the subject matter hereof and integrates all prior conversations, discussions or understanding of whatever kind or nature between CITY and CONSULTANT and supersedes and replaces all terms and conditions of any prior agreements, arrangements, negotiations, or representations, written or oral, with respect to this PROJECT.

27. **SEVERABILITY.** If any part or provision of this Agreement shall be determined to be unconstitutional, invalid or unenforceable by a court of competent jurisdiction, then such a decision shall not affect any other part or provision of this Agreement except that specific provision determined to be unconstitutional, invalid or unenforceable. If any condition, covenant or other provision of this Agreement shall be deemed invalid due to its scope or breadth, such provision shall be deemed valid to the extent of the scope or breadth permitted by law.

28. **CONSTRUCTION.** Each of the parties hereto has had the opportunity to review this agreement with counsel of their choosing and the rule of contracts requiring interpretation of a contract against the party drafting the same is hereby waived and shall not apply in interpreting this agreement.

29. **SURVIVAL.** It is expressly agreed that the terms, covenants, and conditions of this Agreement shall survive any legal act or conveyance required under this Agreement.

30. **HEADINGS.** The section and other headings in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement.

31. **COUNTERPARTS.** This Agreement may be signed in counterparts and each such counterpart shall constitute an original document. All such counterparts, taken together, shall constitute one and the same instrument. Any signature on this Agreement transmitted by facsimile, electronically in PDF format, or by other generally accepted means of conveying digital signatures (e.g. DocuSign) shall by deemed an original signature for all purposes and the exchange of copies of this Agreement and of signature pages by any such transmission, or by a combination of such means, shall constitute effective execution and delivery of this Agreement as to the Parties and may be used in lieu of the original for all purposes.

32. **AUTHORITY OF PARTIES.** The parties executing this Agreement hereby warrant and represent that they are duly authorized to do so in the capacity stated and that this Agreement constitutes a valid and binding Agreement.

IN WITNESS WHEREOF, this Agreement has been executed by the CITY and CONSULTANT effective from the day and year first written above.

CITY OF ST. GEORGE	**INTERMOUNTAIN CONSUMER PROFESSIONAL ENGINEERS, INC. (ICPE)**
_____	_____
Michele Randall, Mayor	Steve Nash
ATTEST:	APPROVED AS TO FORM: CITY ATTORNEY'S OFFICE
_____	_____
Christina Fernandez, City Recorder	Alicia Carlton, Assistant City Attorney

Agenda Date: 11/07/2024 **Agenda Item Number:** 3c

Subject:

Consider approval of a Professional Services Agreement with Alliance Consulting for the design of the Woodsview Circle Sewer Line Replacement project.

Item at-a-glance:

Staff Contact: Kade Bringhurst

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

Woodsview Circle

Item History (background/project status/public process):

The existing line in Woodsview Circle is undersized and is identified in the Sewer Master Plan to be upsized to match the pipe sizes both upstream and downstream.

Staff Narrative (need/purpose):

The sewer system both upstream and downstream consists of 36" diameter pipes. This section that needs to be replaced is 24" diameter pipe and is at or near capacity.

Name of Legal Dept approver: Alicia Carlton

Budget Impact:

Cost for the agenda item: $81,650

Amount approved in current FY budget for item: na

If not approved in current FY budget or exceeds the budgeted amount, please explain

funding source:

impact fees.

Description of funding source:

Impact Fees

Recommendation (Include any conditions):

Staff Recommends Approval

Engineering Scope of Work

JOB NO:	4664-24 St. George City	CLIENT:	**St. George Water Department**
PROJECT:	South Woodsview Circle Sewer Line Replacement	CONTACT:	Kade Bringhurst
		ADDRESS:	811 East Red Hills Parkway St. George, UT 84790

ARTICLE I - Background Information

The City of St. George is seeking professional engineering services to support the design and implementation of a sewer line replacement project *R7 South Woodsview Circle Sewer Line Replacement* of the sewer master plan. The primary objective of this project is to upsize an existing 24-inch sewer pipe to a 36-inch pipe, covering a distance of approximately 1,350 feet through Woodsview Circle. This upgrade is essential to enhance the capacity and efficiency of the sewer system in the area. It has also been requested to evaluate alternative route for this sewer line.

ARTICLE II - Work Plan

ALLIANCE CONSULTING shall perform services specified herein, following practices consistent with acceptable professional and technical standards for work of this nature.

Work Activity

Program Definition

This phase establishes team relationships and work flow. It also inventories and analyzes available existing information to determine additional data that may be required.

Meet with appropriate team members and personnel to review project objectives, team communication procedures, time schedules, costs, available data, project requirements and elements to be included in the plan.

Collect available basic data such as existing proposals, aerial photos, base maps, planning reports, topography, soils, geology, vegetative cover, utilities, drainage, and hydrology, existing zoning, surrounding land use, access, etc. Identify additional data requirements not readily available and research efforts required.

Design Engineering

Coordination Meetings
Attend and participate in all project coordination meetings as requested by the Client or the government agency during the design process.

Topographical Survey
Field survey any ground features to determine site topography, street locations. Survey will include topography of drainage ways, grade breaks, swells, slopes, topo data, etc. Prepare a project base map showing existing features at 2 foot contours.

Prepare Project Construction Plans
Prepare the construction plan set, to show existing and proposed contours, utilities, infrastructure items. Establish required grading features. Submit the construction plans to the applicable government agency for review. Follow through with agency reviews.

Utility Plans
Prepare project irrigation utility construction plans to include irrigation infrastructure. Meet with local utility companies to determine design requirements. Review plans with the utility companies. Submit the utility plans to the applicable government agency for review. Follow through with agency reviews.

Plan and Profile Plans
Prepare horizontal and vertical alignment plans for the irrigation system to include in the construction plan set, including typical cross sections, construction notes, and details. Submit the profile plans to the applicable government agency for review. Follow through with agency reviews.

Legal Descriptions
Prepare legal descriptions for the projects as needed for alternate route. This includes one (1) legal per property affected by the alternate route.

Property Owners Coordination Meetings
Attend and participate in property owner's coordination meetings per owners affected by the sewer line and as requested by the client/government agency during the design process.

Engineer's Estimate
Provide an Engineer's Estimate of construction costs based on the final improvement plans.

Project Construction Assistance

Specifications
Provide contract specifications with bidding requirements, contract documents, measurement & payment, technical specifications and supplementary information requirements for the project.

Addenda to Bid Package
If necessary, prepare addenda to the package and issue to all plan holders.

Bid Opening
Prepare a bid tabulation form for use at the bid opening meeting. Attend the pre-bid, and opening meeting and tabulate the final bid numbers. Determine the lowest responsive bid. Assist the owner in selection of contractor. Prepare the notice of award and issue to the successful contractor.

Coordination Meetings

Attend and participate in all project coordination meetings as requested by the Client or the government agency during the construction development process.

* This Scope does not include any easement of right-of-way acquisition.

ARTICLE III - Fees

Alliance Consulting agrees to provide services as itemized in the *Work Plan* on a time and materials basis, with a total contract fee not to exceed:

Project Engineering	
Design Engineering	**$78,150**
Construction Bidding	**$3,500**
Total	**$81,650**

Work will be invoiced monthly, in accordance with current hourly rates. Hourly rates are subject to change annually.

Category	Staff	Unit	Rate
Engineers			
	Senior Principal Engineer	Hourly	$ 240.00
	Principal Engineer	Hourly	$ 180.00
	Senior Associate Engineer	Hourly	$ 210.00
	Associate Engineer	Hourly	$ 140.00
	Senior Engineer	Hourly	$ 165.00
	Staff Engineer	Hourly	$ 135.00
	Engineering Intern	Hourly	$ 100.00
Other Professionals			
	Senior Project Manager	Hourly	$ 150.00
	Project Manager	Hourly	$ 130.00
	Senior Planner	Hourly	$ 180.00
	Planner	Hourly	$ 115.00
	Senior Environmental Specialist	Hourly	$ 183.00
	Environmental Specialist	Hourly	$ 115.00
	Senior Communication Specialist	Hourly	$ 120.00
	Communication/Graphics Specialist	Hourly	$ 95.00
	Senior Public Involvement Specialist	Hourly	$ 150.00
	Public Involvement Specialist	Hourly	$ 115.00
	Senior GIS Analyst	Hourly	$ 135.00
	GIS Analyst	Hourly	$ 115.00

Category	Staff	Unit	Rate
Technicians			
	Senior Engineering Technician	Hourly	$ 145.00
	Engineering Technician	Hourly	$ 115.00
	Senior CAD Technician	Hourly	$ 135.00
	CAD Technician	Hourly	$ 95.00
	Senior Field Technician	Hourly	$ 110.00
	Field Technician II	Hourly	$ 100.00
	Field Technician	Hourly	$ 95.00
Surveyors and Technicians			
	Senior Licensed Surveyor	Hourly	$ 170.00
	Licensed Surveyor	Hourly	$ 150.00
	Senior Surveyor/ROW Technician	Hourly	$ 175.00
	Senior ROW Acquisition Technician IV	Hourly	$ 130.00
	ROW Acquisition Technician	Hourly	$ 100.00
	Administrative Assistant	Hourly	$ 65.00
	Water Rights Specialist	Hourly	$ 180.00
	1-Person GPS Survey Crew	Hourly	$ 135.00
	2-Person GPS Survey Crew	Hourly	$ 170.00
	3-Person GPS Survey Crew	Hourly	$ 210.00
Indirect Expenses			
	*Mileage per mile	Each	$ 0.70
	*Vehicle Charge	Daily	$ 200.00
	ATV Charge	Daily	$ 190.00
	Per Diem	Daily	$ 125.00
	Side-by-Side ATV	Daily	$ 190.00
	Snow Equipment/Snowmobile	Daily	$ 75.00

CITY OF ST. GEORGE PROFESSIONAL SERVICES AGREEMENT FOR SERVICES WITH ALLIANCE CONSULTING, LLC

This Professional Services Agreement (hereinafter "Agreement") is made and entered into on _____ by and between the City of St. George, a municipal corporation, with offices at 175 East 200 North, St. George, Utah 84770 (hereinafter called the "CITY"), and ALLIANCE CONSULTING LLC, with offices at 2303 North Coral Canyon Blvd Suite 201, Washington, Utah 84780 (hereinafter "CONSULTANT").

WITNESSETH THAT:

WHEREAS CITY desires professional services to be performed and has solicited CONSULTANT to provide design engineering services to support the design and implementation of a sewer line replacement project R7 South Woodsview Circle Sewer Line Replacement. The primary object of this project is to upsize an existing 24-inch sewer pipe to a 36" pipe, covering a distance of approximately 1,350 feet through Woodsview Circle. This upgrade is essential to enhance the capacity and efficiency of the sewer system in the area. (hereinafter called the PROJECT); and

WHEREAS, CONSULTANT has submitted a proposal, which outlines the general scope of services to be provided and the fees for the PROJECT; and

WHEREAS CITY selected CONSULTANT to perform the services for the PROJECT;

NOW, THEREFORE, for the consideration hereinafter set forth, the parties hereto do mutually agree as follows:

1. **ENGAGEMENT OF CONSULTANT.**

1.1 CONSULTANT is a professional licensed by the State of Utah and the City of St. George. CONSULTANT has all licenses, permits, and approvals that are legally required for CONSULTANT to practice its profession and shall keep them in effect at all times during the term of this Agreement.

1.2 CONSULTANT states that it has the necessary knowledge, experience, abilities, skills, and resources to perform its obligations under this Agreement and agrees to perform its obligations under this Agreement in a professional manner, consistent with prevailing industry standards and practices as observed by competent practitioners of the profession in which CONSULTANT and its subcontractors or agents are engaged.

1.3 CONSULTANT certifies that it does not and will not during the performance of this contract knowingly employ, or subcontract with any entity which employs workers in violation of 8 USC §1324(a). CONSULTANT agrees to require all

subcontractors at the time they are hired for this project to sign a Certification of Legal Work Status and submit the Certification to CITY prior to any work being performed by the subcontractors. CONSULTANT agrees to produce, at CITY'S request, documents to verify compliance with applicable State and Federal laws. If CONSULTANT knowingly employs workers or subcontractors in violation of 8 USC § 1324(a), such violation shall be cause for unilateral cancellation of the contract between CONSULTANT and CITY. In addition, CONSULTANT may be suspended from participating in future projects with CITY for a period of one (1) year. In the event this contract is terminated due to a violation of 8 USC § 1324(a) by CONSULTANT or a subcontractor of CONSULTANT, CONSULTANT shall be liable for any and all costs associated with such termination, including, but not limited to, any damages incurred by CITY excluding attorney fees. For purposes of compliance, CITY requires CONSULTANT and subcontractors to use E-Verify or other federally accepted forms of verification to verify the employment eligibility of all employees as allowed by law and the E-Verify procedures. CONSULTANT and subcontractors must maintain authorized documentation of the verification.

1.4 CONSULTANT shall not, either during or after the term of this Agreement, make public any reports or articles, or disclose to any third party any confidential information relative to the work of City or the operations or procedures of CITY without the prior written consent of CITY.

1.5 CONSULTANT further agrees that it shall not, during the term of this Agreement, take any action that would affect the appearance of impartiality or professionalism.

1.6 CONSULTANT, by execution of this Agreement, certifies that it does not discriminate against any person upon the basis of race, color, creed, national origin, age, sex, sexual orientation, gender identity, disability, or marital status in its employment practices.

1.7 CONSULTANT expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve CONSULTANT from any obligation to comply with all applicable requirements of CITY during the term of this Agreement including the payment of fees and compliance with all other applicable ordinances, resolutions, regulations, policies, and procedures of CITY, except as modified or waived in this Agreement.

1.8 CONSULTANT shall comply with all applicable federal, state, and local laws, regulations, and ordinances that affect those employees or those engaged by CONSULTANT on the PROJECT, and will procure all necessary licenses, permits and insurance required.

1.9 CONSULTANT certifies it is in compliance with the public contract boycotting restrictions set forth in Utah Code § 63G-27-201 and agrees not to engage in any such restricted boycotting for the duration of this Agreement, and to notify the City in writing if it begins engaging in an economic boycott.

1.10 CITY acknowledges that CONSULTANT may employ various specialized subcontractors for up to 15% of the services provided herein. CONSULTANT shall give written notice to CITY at least seven (7) days prior to CONSULTANT'S employment of the subcontractors to perform portions of the work provided for in this Agreement. It shall be solely CONSULTANT's responsibility to ensure that any of CONSULTANT'S subcontractors perform in compliance with the terms of this Agreement. Subcontractors may not be changed without ten (10) days prior written notice to CITY.

2. PROJECT SERVICES DESCRIPTION.

2.1 CITY makes no guarantee as to the total volume of work, if any, that will be needed under this Agreement. CONSULTANT will provide the services on an as needed basis as described in the attached Scope of Work (**"Exhibit A Scope of Services"**) which is made a part of this Agreement by this reference. As services are needed, CITY shall provide CONSULTANT with a description of the work needed which shall be known as a "Work Order" and CONSULTANT will provide CITY with a specific scope of work and cost for the Work Order, which if accepted by the CITY shall become part of this Agreement binding both parties. CITY may at any time, as the need arises, order changes within the scope of the services without invalidating the Agreement. If such changes increase or decrease the amount due under the Agreement, or in the time required for performance of the work, an equitable adjustment shall be authorized by change order.

2.2 CONSULTANT shall furnish all the material, supplies, tools, transportation, equipment, labor, subcontractor services and other services necessary for the completion of the work described in **"Exhibit A Scope of Services"** or in subsequent Work Orders.

2.3 CONSULTANT shall provide services in compliance with all applicable requirements of federal, state, and local laws, codes, rules, regulations, ordinances, and standards.

3. TERM OF AGREEMENT.

3.1 This Agreement shall be effective as of the date executed by all parties and shall continue for one year unless otherwise terminated as set forth in this Agreement. If a Work Order was started during this term but not completed, the terms of this Agreement shall continue through completion of the Work Order.

3.2 CONSULTANT agrees to perform services as expeditiously as is consistent with professional skill and care and the orderly progress of the PROJECT. CONSULTANT shall perform the services in a timely manner according to the schedule approved by CITY.

3.3 CONSULTANT shall perform its services upon notice from the CITY to proceed and in accordance with the schedule approved by CITY. In the event performance

of its services is delayed by causes beyond the reasonable control of CONSULTANT, and without the fault or negligence of CONSULTANT, the time for the performance of the services shall be equitably adjusted by written amendment to reflect the extent of such delay. CONSULTANT shall provide CITY with written notice of delay, including a description of the delay and the steps contemplated or taken by CONSULTANT to mitigate the effect of such delay.

4. **COMPENSATION.** For the performance of the services and completion of PROJECT set forth herein, CITY shall pay CONSULTANT as agreed in **"Exhibit A"** and each Work Order as applicable. The aggregate total of all Work Orders shall not exceed **(Eighty one Thousand six hundred fifty dollar), $(81,650.00)**. Each individual Work Order shall not exceed **(forty thousand dollars), $(40,000.00).**

5. **INVOICING, PAYMENT, NOTICES.**

5.1 CONSULTANT shall submit invoices, no more frequently than monthly, for the services rendered during the preceding period; invoices shall describe the services performed, list all subcontractors used and the amount owed or paid to them, list all suppliers used and the amount owed or paid to them, list the contract amount, list the current invoice amount based on percentage of task complete, list the previous invoice amount, list total invoices to date, and list the contract balance.

5.2 In executing the request for payment, CONSULTANT shall attest that payment has been made to all subcontractors involved with prior requests, unless CONSULTANT provides a detailed explanation why such payments have not occurred. CONSULTANT shall also sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status and submit them with each request for payment. CONSULTANT shall require each subcontractor to sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status at the time subcontractor is paid and shall provide a copy of both documents to CITY. CONSULTANT shall also sign a "Conditional Waiver and Release Upon Progress Payment" and a Certificate of Legal Work Status and submit them with each request for payment.

5.3 A "Waiver and Release Upon Final Payment" signed by CONSULTANT attesting that all subcontractors, laborers, and material suppliers involved with prior requests for payment have been paid, and that all subcontractors, laborers, and material suppliers upon which the final payment is based will be paid immediately unless CONSULTANT provides a detailed explanation why such payments have not occurred or will not occur. CONSULTANT shall also require each subcontractor to sign a "Waiver and Release Upon Final Payment" and a Certificate of Legal Work Status at the time subcontractor is paid its final payment and shall provide a copy of both documents to CITY.

5.4 If such liens, claims, security interests or encumbrances remain unsatisfied after payments are made, CONSULTANT shall refund to CITY all money that CITY

may be compelled to pay in discharging such liens, including all costs except for attorneys' fees.

5.5 All invoices for reimbursable costs shall be taken from the books of account kept by CONSULTANT, and CONSULTANT shall maintain copies of payroll distribution, receipted bills, and other documents. CITY shall have the right to review all books and records kept by CONSULTANT and any subcontractors concerning the operation and services performed under this Agreement. CITY shall withhold payment for any expenditure not substantiated by CONSULTANT'S or subcontractor's books and records.

5.6 In the event CITY has made payment for expenditures that are not allowed, as determined by CITY'S audit, CONSULTANT shall reimburse CITY the amount of the un-allowed expenditures. If additional money is owed to CONSULTANT, the reimbursement may be deducted from the additional money owed.

5.7 CITY shall make no payment for any services not specified in this Agreement unless such additional services and the price thereof are agreed to in writing, prior to the time that such additional services are rendered.

5.8 Invoices shall be paid to CONSULTANT within thirty (30) days of presentation to CITY.

5.9 CITY may withhold 5% of billed amount as retention. Retention held shall be included in the final invoice after the contract is complete.

6. **CHARGES AND EXTRA SERVICE.**

6.1 CITY may make changes within the general scope of this Agreement. If CONSULTANT is of the opinion a proposed change causes an increase or decrease in the cost and/or the time required for performance of this Agreement, CONSULTANT shall notify CITY of that fact. An agreed-upon change will be reduced to writing signed by the parties hereto and will modify this Agreement accordingly. CONSULTANT may initiate such notification upon identifying conditions which may change the services agreed to on the effective date of this Agreement, as set forth in **Exhibit A**. However, CONSULTANT represents that to the best of its knowledge that it is not aware of any such conditions on the date hereof. Any such notification must be provided within thirty (30) days from the date of receipt by that party of the other party's written notification of a proposed change.

6.2 CITY may request CONSULTANT to perform extra services not covered by **Exhibit A**, and CONSULTANT shall perform such extra services and will be compensated for such extra services when they are reduced to a writing mutually agreed to and signed by the parties hereto amending this Agreement accordingly.

6.3 CITY shall not be liable for payment of any extra services, nor shall

CONSULTANT be obligated to perform any extra services except upon such written amendment.

7. **TO BE FURNISHED BY CITY.** Resources to be furnished by CITY to CONSULTANT, at no cost to CONSULTANT, consist of CITY staff assistance for oversight and meetings to help perform the services. CONSULTANT shall verify accuracy of the information provided, unless otherwise stated in the contract documents.

8. **INSPECTIONS.** All work shall be subject to inspection and approval of CITY or its authorized representative.

9. **ACCURACY AND COMPLETENESS.**

9.1 CONSULTANT has total responsibility for the accuracy and completeness of its investigations, calculations, reports, plans and related designs, specifications and estimates prepared for the PROJECT and shall check all such material accordingly.

9.2 The plans will be reviewed by CITY for conformity with PROJECT objectives and compliance with CITY Standards.

9.3 Reviews by CITY do NOT include the detailed review or checking of major design components and related details or the accuracy with which such designs are depicted on the plans.

9.4 The responsibility for accuracy and completeness remains solely with CONSULTANT and shall be performed consistent with the standard of care.

10. **INDEPENDENT CONTRACTOR.**

10.1 CITY retains and engages CONSULTANT, as an independent contractor, to act for and represent it in all matters involved in the performance of services on the PROJECT, subject to the terms, conditions and stipulations as hereinafter stated.

10.2 It is understood and agreed that CONSULTANT will provide the services without supervision from CITY. CONSULTANT is an independent contractor and is not an employee, officer, or agent of CITY for any purposes related to the performance of this Agreement and is not an employee of CITY and is not entitled to any benefits from CITY.

10.3 Nothing in this agreement shall create nor be construed to constitute a partnership or joint venture between CONSULTANT and CITY.

10.4 CONSULTANT is advised to obtain and maintain in effect during the term of this Agreement medical insurance and disability insurance for all related work performed under this Agreement.

10.5 CONSULTANT acknowledges that CITY will not withhold any federal, state, or

local taxes, including FICA, nor will CITY provide any unemployment compensation or worker's compensation coverage. As an independent contractor, CONSULTANT shall be responsible for all taxes, worker's compensation coverage and insurance coverage, and shall hold CITY harmless and indemnify CITY from and against any and all claims related to taxes, unemployment compensation, and worker's compensation.

10.6 CONSULTANT shall secure, at its own expense all personnel required in performing the services under this Agreement. The employees of CONSULTANT shall not be considered employees of CITY nor have any contractual relationship with CITY. CONSULTANT and its employees shall not hold themselves out as, nor claim to be officers or employees of CITY by reason of this Agreement. The employees of CITY shall not be considered employees of CONSULTANT.

10.7 Neither party has the right to bind or obligate the other in any way. CONSULTANT shall not use the name, trademarks, copyrighted materials, or any information related to this Agreement in any advertising or publicity without CITY'S prior written authorization.

11. **INSURANCE.**

11.1 GENERAL: CONSULTANT shall secure and maintain insurance as required by laws and regulations and the terms of this agreement to protect against any liability, loss or expense which occurs or arises as a result of the performance of the services provided pursuant to this agreement or as changed as provided herein. CONSULTANT'S insurer must be authorized to do business in Utah and must have an A.M. Best rating of A VIII or better at the time this contract is executed.

11.2 COMMENCEMENT OF WORK: Neither CONSULTANT, its Suppliers nor any subcontractors shall enter the site of the work or commence work under this contract before CITY has received and accepted Certificate(s) of Insurance and Insurance Endorsements and has issued the Notice to Proceed, as applicable.

11.3 INSURANCE CERTIFICATES AND COVERAGE: Insurance certificates shall be issued on all policies required under this contract and shall be signed by an authorized representative of the insurance company. The insurance certificate or the coverage required shall include the following:

A. The name and address of the insured.

B. CITY shall be named as a Certificate Holder.

C. CITY shall be named as an additional primary insured on the General Liability Certificate with CITY listed as non-contributory on the General Liability certificate.

D. The location of the operations to which the insurance applies.

E. The number of the policy and the type or types of insurance in force thereunder on the date borne by the certificate.

F. The expiration date of the policy and the limit or limits of liability thereunder on the date borne by the certificate.

G. A statement that all coverage is on an occurrence basis rather than a claims basis except for the Professional Errors and Omissions Malpractice Insurance coverage.

H. A provision that the policy or policies will not be canceled, denied renewal, or reduced in coverage until at least 30 days after written notice has been received by CITY.

I. Name, address, and telephone number of the insurance company's agent of process in Utah.

J. Other information to demonstrate compliance with additional requirements stipulated for the various types of insurance coverage.

11.4 COMPENSATION INSURANCE: CONSULTANT shall, as applicable, take out and maintain Workers' Compensation Insurance as required by the Labor Code for all its employees at the site of the work during the life of this contract. Coverage must be provided by a company authorized by the State of Utah to provide Workers' Compensation Insurance. The insurance shall include:

A. Insurance certificates shall provide a waiver of subrogation by the carrier to Certificate Holder.

B. CONSULTANT shall require each subcontractor to provide Workers' Compensation Insurance for its employees unless such employees are covered by CONSULTANT.

C. In the event any class of employees engaged in hazardous work under this contract is not protected by the Workers' Compensation Statute, CONSULTANT shall provide, and shall cause its subcontractors to provide, special insurance for the protection of such employees not otherwise protected.

11.5 COMMERCIAL GENERAL LIABILITY INSURANCE: CONSULTANT shall procure and maintain commercial general liability insurance for the duration of the contract against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the CONSULTANT, its agents, representatives, employees, or subcontractors. The insurance shall remain in effect during the term of this

agreement and such that claims reported beyond the date of substantial completion of this agreement are covered and during the warranty period, to the extent that it relates to the activities covered by this Agreement, in such manner and amounts as set forth herein. The Insurance Endorsement shall evidence such provisions.

A. The minimum commercial general liability insurance shall be as follows:

i. Comprehensive general liability insurance for injuries, including accidental death, to any one person in any one occurrence in an amount not less than $1,000,000.00 Dollars.
ii. Comprehensive general liability insurance for injuries, including accidental death, to two or more persons in any one occurrence in an amount not less than $3,000,000.00 Dollars (umbrella coverage may be considered).
iii. Broad form property damage insurance in an amount not less than $300,000.00 Dollars.

B. Such policy shall include each of the following coverages (as applicable):

i. Comprehensive form.
ii. Premises - operations.
iii. Explosion and collapse hazard.
iv. Underground hazard.
v. Product/completed operations hazard.
vi. Contractual insurance.
vii. Broad form property damage, including completed operations.
viii. Independent contractors for vicarious liability.
ix. Personal injury.
x. Cross liability or severability of interest's clause shall be included unless a separate policy covering CITY is provided.

11.6 PROFESSIONAL LIABILITY ERRORS AND OMISSIONS INSURANCE:

A. CONSULTANT shall carry and maintain Professional Liability Errors and Omissions Insurance in an amount not less than $3,000,000.00 Dollars for all work performed under this Agreement.

B. CONSULTANT shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the CONSULTANT, its agents, representatives, employees, or subcontractors. With respect to General Liability, Professional liability coverage should be maintained for a minimum of five (5) years after contract completion.

C. If Professional Liability coverages are written on a claims-made form:

i. The retroactive date must be shown and must be before the date of the contract or the beginning of contract work.

ii Insurance must be maintained, and evidence of insurance must be provided, for at least five (5) years after completion of the contract of work.

iii. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the contract effective date, the CONSULTANT must purchase an extended period coverage for a minimum of five (5) years after completion of contract work.

iv. A copy of the policy must be submitted to CITY for review.

11.7 BUSINESS AUTOMOBILE COVERAGE: CONSULTANT shall carry and maintain business automobile insurance coverage on each vehicle used in the performance of the work in an amount not less than $1,000,000.00 Dollars for one person and $3,000,000.00 Dollars for more than one person and for property damage resulting from any one occurrence which may arise from the operations of CONSULTANT in performing the work.

Such business automobile insurance shall include each of the following types:

A. Comprehensive form, including loading and unloading.
B. Owned.
C. Hired.
D. Non-owned.

12. **INDEMNITY AND LIMITATION.**

12.1 Except as otherwise provided herein, CONSULTANT shall indemnify, defend, and hold harmless CITY, its elected officials, officers, employees, and representatives against any and all claims, suits, causes of action, demands, losses, costs, and damages and liability of every kind including but not limited to all fees and charges of professionals, except for attorney's fees, and all court or other dispute resolution costs for:

A. death or injuries to persons or for loss of or damage to property which directly or indirectly, in whole or in part are caused by, resulting from, or arising out of the intentional, reckless, negligent, or wrongful acts, errors or omissions, or other liability imposed by law of CONSULTANT, its officers, employees, agents, or representatives in the performance of services under this Agreement or any subcontractor, any supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the work;

B. CONSULTANT's failure or refusal, whatever the reason, to pay subcontractors or suppliers for Work performed under the Agreement;

C. claims by any employee of the CONSULTANT, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, CONSULTANT'S indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONSULTANT or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.

12.2 CITY shall give CONSULTANT prompt written notice of any such claims or suits filed against CITY arising out of the services provided under this Agreement. CONSULTANT agrees to defend against any claims brought or actions filed against CITY arising out of the services provided under this Agreement. If CITY'S tender of defense, based upon the indemnity provision, is rejected by CONSULTANT or CONSULTANT'S insurer, and CONSULTANT is later found by a court of competent jurisdiction to have been required to indemnify the CITY, then, in addition to any other remedies the CITY may have, CONSULTANT shall pay the CITY'S reasonable costs and expenses, except for attorney's fees, incurred in obtaining such indemnification, defending themselves or enforcing the indemnification provision.

12.3 The insurance requirements in this agreement shall not be construed as limiting CONSULTANT'S liability. Irrespective of the requirements for CONSULTANT to carry insurance as provided herein, insolvency, bankruptcy, or failure of any insurance company to pay all claims accruing shall not be held to relieve CONSULTANT of any obligations under this agreement.

12.4 This section does not apply to a design professional services contract, design professional services, and design professionals.

13. **DOCUMENTS.**

13.1 All data used in compiling CONSULTANT's work, and the results of any tests or surveys, as well as all photographs, drawings, electronically stored records of work performed, renderings, specifications, schedules, CONSULTANT's work, data processing output, computations, studies, audits, research, reports, models and other items of like kind prepared by CONSULTANT, and its employees, shall be the sole and exclusive property of CITY, and CITY shall own all intellectual property rights thereto whether the specific work project for which they are made is undertaken or not. CONSULTANT may retain reproducible copies of all the foregoing documents for information and reference and customary marketing and public relations. The originals of all the foregoing documents shall be delivered to CITY promptly upon completion thereof. This provision may be enforced by an order of specific performance and is independent of any other provision of this Agreement. Compliance by CONSULTANT with this paragraph shall be a condition precedent to CITY's obligation to make final payment to CONSULTANT. If CITY has specific requirements on the information and manner the documentation is collected, CITY shall provide those specifics to

CONSULTANT in writing.

13.2 Plans, specifications, maps, and record drawings prepared or obtained under this Agreement shall be provided to CITY in a format approved by CITY which shall generally be a hard copy and an electronic copy and shall become the property of CITY whether the work for which they are prepared is executed or not.

13.3 The basic survey notes and sketches, charts, computations, and other data prepared under this Agreement shall be made available upon request to CITY without restriction or limitation on their use.

13.4 CITY shall have the right to use reports, designs, details, or products developed as part of this Agreement for purposes of maintenance, remodeling or reconstruction of existing facilities or construction of new facilities without additional compensation to CONSULTANT or without restriction or limitation on its use even if documents are considered copyrighted material.

13.5 CITY will hold harmless CONSULTANT for any use or reuse of these reports, designs, or details for purposes other than the project associated with this Agreement unless CITY obtains validation of that use or reuse from CONSULTANT.

14. **RECORDS.**

14.1 CONSULTANT shall maintain records, books, documents, and other evidence directly pertinent to the performance of services under this Agreement in accordance with generally accepted accounting principles and practices.

14.2 CONSULTANT agrees to keep proper books of records and accounts in which complete and correct entries will be made of payroll costs, travel, subsistence, and field expenses.

14.3 Said books shall, at all times, be available for at least three (3) years after final payment for reasonable examination by CITY.

15. **TERMINATION.**

15.1 CITY may terminate this Agreement by providing fourteen (14) days written notice prior to the effective termination date to CONSULTANT.

15.2 In the event of such termination, CITY shall pay CONSULTANT for all services actually rendered up to and including the date of termination.

15.3 CONSULTANT shall deliver to CITY copies of all drawings, reports, analyses, documents, and investigations, whether completed or not, that were prepared or were being prepared under the provisions of this Agreement.

16. **CONFLICT BETWEEN DOCUMENTS.** In the event of a conflict between this Agreement and any other documents with CONSULTANT, this Agreement shall govern.

17. **CONFLICT OF INTEREST.** CONSULTANT certifies that it has disclosed to CITY any actual, apparent or potential conflicts of interest that may exist relative to the services to be provided pursuant to this Agreement.

    17.1 CONSULTANT agrees to advise CITY of any actual, apparent or potential conflicts of interest that may develop after the date of execution of this Agreement.

    17.2 CONSULTANT further agrees to complete any statements of economic interest required by either CITY ordinance or State law.

18. **NON-WAIVER.** No failure or waiver or successive failures or waivers on the part of either party hereto, their successors or permittee assigns, in the enforcement of any condition, covenant, or Article of this Agreement shall operate as a discharge of any such condition, covenant, or Article nor render the same invalid, nor impair the right of either party hereto, their successors or permitted assigns, to enforce the same in the event of any subsequent breaches by the other party hereto, its successors or permitted assigns.

19. **NOTIFICATION.** All notices required or permitted to be made by either party in connection with this Agreement shall be in writing, and shall be deemed to have been duly given: (a) five (5) business days after the date of mailing if sent by U.S. mail, postage prepaid, (b) when transmitted if sent by facsimile, provided a confirmation of transmission is produced by the sending machine and a copy of such facsimile is promptly sent by another means specified in this Section; or (c) when delivered if delivered personally or sent by express courier service. All notices shall be sent to the other party at its address as set forth below unless written notice is given by either party of a change of address:

CITY:	City of St. George 175 East 200 North St. George, Utah 84770	CONSULTANT:	Alliance Consulting 2303 N Coral Canyon Blvd Suite 201 Washington, UT 84780
Attention:	City Attorney	Attention:	Deloss Hammon
Copy:	legal@sgcity.org		

20. **GOVERNING LAW AND VENUE.** This Agreement shall be construed according to the laws of the State of Utah. The parties agree that venue for all legal actions, unless they involve a cause of action with mandatory federal jurisdiction, shall be the Fifth District Court for the State of Utah. The parties further agree that the Federal District Court for the District of Utah shall be the venue for any cause of action with mandatory federal jurisdiction. The parties shall have all rights and remedies provided under applicable Federal or State law for a breach or threatened breach of this Agreement. These rights and remedies shall not be mutually exclusive, and the exercise of one or more of these rights and remedies shall not preclude the exercise of any other rights and remedies. Each party agree that damages at law may be an inadequate remedy for a breach or threatened breach of any provision hereof and the respective rights and

obligations of the parties hereunder shall be enforceable by specific performance, injunction, or other equitable remedy. Nothing in this Agreement shall be construed to waive the sovereign immunity of the government parties.

21. **LEGAL FEES.** Should any party default on any of the covenants or agreements contained herein, the defaulting party shall pay all costs and expenses, (excluding reasonable attorney's fees,) which may arise or accrue from enforcing this Agreement or in pursuing any remedy provided hereunder or by applicable law, whether such remedy is pursued by filing a lawsuit or otherwise. This obligation of the defaulting party to pay costs and expenses includes, without limitation, all costs, and expenses, (excluding reasonable attorney's fees) including appeals and bankruptcy proceedings. If either party commences legal action to interpret any term of this agreement, the prevailing party shall be entitled to recover all reasonable fees (excluding attorney's fees), court costs, and any other costs incurred in connection with such action. The parties agree that they shall each pay their own attorney's fees.

22. **MODIFICATION OF AGREEMENT.** CITY specifically reserves the right to modify or amend this Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work. All modifications shall be in writing and executed by both parties. Each Work Order adopted under this Agreement shall incorporate the terms and conditions of this Agreement and shall constitute a modification to this contract. A Work Order may amend the terms and conditions of this Agreement only as they apply to that particular Work Order and shall not have any general effect on this Agreement.

23. **RESERVED LEGISLATIVE POWERS.** Nothing in this Agreement shall limit the future exercise of the police power by CITY in enacting zoning, subdivision, development, transportation, environment, open space, and related land use plans, policies, ordinances, and regulations after the date of this Agreement, but which shall not be retroactively applied to or modify this Agreement.

24. **SUCCESSORS AND ASSIGNS.** CONSULTANT shall not assign, sublet, sell, transfer, or otherwise dispose of any interest in this Agreement without assigning the rights and the responsibilities under this Agreement and without the prior written approval of CITY. This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns, but shall not inure to the benefit of any third party or other person.

25. **NO JOINT VENTURE, PARTNERSHIP OR THIRD-PARTY RIGHTS.** It is not intended by this Agreement to, and nothing contained in this Agreement shall, create any partnership, joint venture, or other arrangement between the parties. No term or provision of this Agreement is intended to or shall, be for the benefit of any person, firm, organization, or corporation not a party hereto, and no such other person, firm, organization, or corporation shall have any right or cause of action hereunder.

26. **INTEGRATION.** This Agreement contains the entire Agreement with respect to the subject matter hereof and integrates all prior conversations, discussions or understanding of whatever kind or nature between CITY and CONSULTANT and supersedes and

replaces all terms and conditions of any prior agreements, arrangements, negotiations, or representations, written or oral, with respect to this PROJECT.

27. **SEVERABILITY.** If any part or provision of this Agreement shall be determined to be unconstitutional, invalid or unenforceable by a court of competent jurisdiction, then such a decision shall not affect any other part or provision of this Agreement except that specific provision determined to be unconstitutional, invalid or unenforceable. If any condition, covenant or other provision of this Agreement shall be deemed invalid due to its scope or breadth, such provision shall be deemed valid to the extent of the scope or breadth permitted by law.

28. **CONSTRUCTION.** Each of the parties hereto has had the opportunity to review this agreement with counsel of their choosing and the rule of contracts requiring interpretation of a contract against the party drafting the same is hereby waived and shall not apply in interpreting this agreement.

29. **SURVIVAL.** It is expressly agreed that the terms, covenants, and conditions of this Agreement shall survive any legal act or conveyance required under this Agreement.

30. **HEADINGS.** The section and other headings in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement.

31. **COUNTERPARTS.** This Agreement may be signed in counterparts and each such counterpart shall constitute an original document. All such counterparts, taken together, shall constitute one and the same instrument. Any signature on this Agreement transmitted by facsimile, electronically in PDF format, or by other generally accepted means of conveying digital signatures (e.g. DocuSign) shall by deemed an original signature for all purposes and the exchange of copies of this Agreement and of signature pages by any such transmission, or by a combination of such means, shall constitute effective execution and delivery of this Agreement as to the Parties and may be used in lieu of the original for all purposes.

32. **AUTHORITY OF PARTIES.** The parties executing this Agreement hereby warrant and represent that they are duly authorized to do so in the capacity stated and that this Agreement constitutes a valid and binding Agreement.

IN WITNESS WHEREOF, this Agreement has been executed by the CITY and CONSULTANT effective from the day and year first written above.

CITY OF ST. GEORGE	**CONSULTANT:** **ALLIANCE CONSULTING, LLC**
_____	_____
Mayor Date	(Deloss Hammon)

ATTEST:

APPROVED AS TO FORM:
CITY ATTORNEY'S OFFICE

_____

Christina Fernandez, City Recorder

_____

ALLICON-02 MBENNETT

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 10/18/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Joni Konschot
American Insurance & Investment Corp. 448 South 400 East Salt Lake City, UT 84111	PHONE (A/C, No, Ext): (801) 364-3434 643 FAX (A/C, No):
	E-MAIL ADDRESS: joni.konschot@american-ins.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : RLI Insurance Company	13056
INSURER B : XL Specialty Insurance Company	37885
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

Alliance Consulting, LLC
2303 Coral Canyon Blvd Ste 201
Washington, UT 84780-2088

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:	X	X	PSB0007762	7/1/2024	7/1/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 1,000,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY	X	X	PSA0002579	7/1/2024	7/1/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
A	X UMBRELLA LIAB [X] OCCUR EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $	X	X	PSE0003868	7/1/2024	7/1/2025	EACH OCCURRENCE AGGREGATE **Aggregate**	$ 2,000,000 $ $ 2,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N [ ] **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		PSW0004334	7/1/2024	7/1/2025	[ ] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ 1,000,000 $ 1,000,000 $ 1,000,000
B	**Professional Liab**			DPR5025341	2/20/2024	2/20/2025	**Per Claim**	2,000,000
B	**RetroDate: 1/1/2003**			DPR5025341	2/20/2024	2/20/2025	**Aggregate**	3,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Sewer Line Replacement Project R7 (South Woodsview Circle)

CERTIFICATE HOLDER

City of St. George
175 E 200 N
Saint George, UT 84770

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Jeffrey M. Hirst

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® BUSINESS AUTO ENHANCEMENT

SCHEDULE OF COVERAGES ADDRESSED BY THIS ENDORSEMENT

A. Broad Form Named Insured
B. Employees As Insureds
C. Blanket Additional Insured
D. Blanket Waiver Of Subrogation
E. Employee Hired Autos
F. Fellow Employee Coverage
G. Auto Loan Lease Gap Coverage
H. Glass Repair – Waiver Of Deductible
I. Personal Effects Coverage
J. Hired Auto Physical Damage Coverage
K. Hired Auto Physical Damage – Loss Of Use
L. Hired Car – Worldwide Coverage
M. Temporary Transportation Expenses
N. Amended Bodily Injury Definition – Mental Anguish
O. Airbag Coverage
P. Amended Insured Contract Definition – Railroad Easement
Q. Coverage Extensions – Audio, Visual And Data Electronic Equipment Not Designed Solely For The Production Of Sound
R. Notice Of And Knowledge Of Occurrence
S. Unintentional Errors Or Omissions
T. Towing Coverage

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

A. Broad Form Named Insured

The following is added to the **SECTION II – COVERED AUTOS LIABILITY COVERAGE,** Paragraph **A.1. Who Is An Insured** Provision:

Any business entity newly acquired or formed by you during the policy period, provided you own fifty percent (50%) or more of the business entity and the business entity is not separately insured for Bus-iness Auto Coverage. Coverage is extended up to a maximum of one hundred eighty (180) days following the acquisition or formation of the business entity.

This provision does not apply to any person or organization for which coverage is excluded by endorsement.

B. Employees As Insureds

The following is added to the **SECTION II – COVERED AUTOS LIABILITY COVERAGE,** Paragraph **A.1. Who Is An Insured** Provision:

Any "employee" of yours is an "insured" while using a covered "auto" you don't own, hire or borrow in your business or your personal affairs.

C. Blanket Additional Insured

The following is added to the **SECTION II – COVERED AUTOS LIABILITY COVERAGE,** Paragraph **A.1. Who Is An Insured** Provision:

Any person or organization that you are required to include as an additional insured on this coverage form in a contract or agreement that is executed by you before the "bodily injury" or "property damage" occurs is an "insured" for liability coverage, but only for damages to which this insurance applies and only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in **SECTION II – COVERED AUTOS LIABILITY COVERAGE**.

The insurance provided to the additional insured will be on a primary and non-contributory basis to the additional insured's own business auto coverage if you are required to do so in a contract or agreement that is executed by you before the "bodily injury" or "property damage" occurs.

D. Blanket Waiver Of Subrogation

The following is added to the **SECTION IV – BUSI-NESS AUTO CONDITIONS, A. Loss Conditions, 5. Transfer Of Rights Of Recovery Against Others To Us**:

We waive any right of recovery we may have against any person or organization to the extent required of you by a contract executed prior to any "accident" or "loss", provided that the "accident" or "loss" arises out of the operations contemplated by such contract. The waiver applies only to the person or organization designated in such contract.

E. Employee Hired Autos

1. The following is added to the **SECTION II – COVERED AUTOS LIABILITY COVERAGE,** Paragraph **A.1. Who Is An Insured** Provision:

An "employee" of yours is an "insured" while operating an "auto" hired or rented under a contract or agreement in that "employee's" name, with your permission, while performing duties related to the conduct of your business.

2. Changes In General Conditions:

Paragraph **5.b.** of the **Other Insurance** Con-dition in the **BUSINESS AUTO CONDITIONS** is deleted and replaced with the following:

b. For Hired Auto Physical Damage Coverage, the following are deemed to be covered "autos" you own:

(1) Any covered "auto" you lease, hire, rent or borrow; and

(2) Any covered "auto" hired or rented by your "employee" under a contract in that individual "employee's" name, with your permission, while performing duties related to the conduct of your business. However, any "auto" that is leased, hired, rented or borrowed with a driver is not a covered "auto".

F. Fellow Employee Coverage

SECTION II – COVERED AUTOS LIABILITY COVERAGE, Exclusion B.5. does not apply if you have workers compensation insurance in-force covering all of your employees.

G. Auto Loan Lease Gap Coverage

SECTION III – PHYSICAL DAMAGE COVERAGE, C. Limit Of Insurance, is amended by the addition of the following:

In the event of a total "loss" to a covered "auto" shown in the Schedule of Declarations, we will pay any unpaid amount due on the lease or loan for a covered "auto", less:

1. The amount paid under the **PHYSICAL DAMAGE COVERAGE** section of the policy; and

2. Any:

a. Overdue lease/loan payments at the time of the "loss";

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® FOR PROFESSIONALS
BLANKET ADDITIONAL INSURED ENDORSEMENT

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM - SECTION II – LIABILITY

1. **C. WHO IS AN INSURED** is amended to include as an additional insured any person or organization that you agree in a contract or agreement requiring insurance to include as an additional insured on this policy, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused in whole or in part by you or those acting on your behalf:

a. In the performance of your ongoing operations;

b. In connection with premises owned by or rented to you; or

c. In connection with “your work” and included within the “product-completed operations hazard”.

2. The insurance provided to the additional insured by this endorsement is limited as follows:

a. This insurance does not apply on any basis to any person or organization for which coverage as an additional insured specifically is added by another endorsement to this policy.

b. This insurance does not apply to the rendering of or failure to render any "professional services".

c. This endorsement does not increase any of the limits of insurance stated in **D. Liability And Medical Expenses Limits of Insurance**.

3. The following is added to **SECTION III H.2. Other Insurance – COMMON POLICY CONDITIONS (BUT APPLICABLE ONLY TO SECTION II – LIABILITY)**

However, if you specifically agree in a contract or agreement that the insurance provided to an additional insured under this policy must apply on a primary basis, or a primary and non-contributory basis, this insurance is primary to other insurance that is available to such additional insured which covers such additional insured as a named insured, and we will not share with that other insurance, provided that:

a. The "bodily injury" or "property damage" for which coverage is sought occurs after you have entered into that contract or agreement; or

b. The "personal and advertising injury" for which coverage is sought arises out of an offense committed after you have entered into that contract or agreement.

4. The following is added to **SECTION III K. 2. Transfer of Rights of Recovery Against Others to Us – COMMON POLICY CONDITIONS (BUT APPLICABLE TO ONLY TO SECTION II – LIABILITY)**

We waive any rights of recovery we may have against any person or organization because of payments we make for "bodily injury", "property damage" or "personal and advertising injury" arising out of "your work" performed by you, or on your behalf, under a contract or agreement with that person or organization. We waive these rights only where you have agreed to do so as part of a contract or agreement with such person or organization entered into by you before the "bodily injury" or "property damage" occurs, or the "personal and advertising injury" offense is committed.

ALL OTHER TERMS AND CONDITIONS OF THIS POLICY REMAIN UNCHANGED.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® FOR PROFESSIONALS
SCHEDULED ADDITIONAL INSURED ENDORSEMENT

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM – SECTION II – LIABILITY

Schedule

Name of Person(s) or Organization(s):

as per schedule to be provided upon request

1. **SECTION II C. Who Is An Insured** is amended to include as an additional insured the person or organization shown in the schedule above, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused in whole or in part by you or those acting on your behalf:
   - **a.** In the performance of your ongoing operations;
   - **b.** In connection with premises owned by or rented to you; or
   - **c.** In connection with “your work” and included within the “product-completed operations hazard”.
2. The insurance provided to the additional insured by this endorsement is limited as follows:
   - **a.** This insurance does not apply to the rendering of or failure to render any "professional services".
   - **b.** This endorsement does not increase any of the limits of insurance stated in **D. Liability And Medical Expenses Limits of Insurance**.
3. The following is added to **SECTION III H.2. Other Insurance – COMMON POLICY CONDITIONS (BUT APPLICABLE ONLY TO SECTION II – LIABILITY)**

   However, if you specifically agree in a contract or agreement that the insurance provided to an additional insured under this policy must apply on a primary basis, or a primary and non-contributory basis, this insurance is primary to other insurance that is available to such additional insured which covers such additional insured as a named insured, and we will not share with that other insurance, provided that:
   - **a.** The "bodily injury" or "property damage" for which coverage is sought occurs after you have entered into that contract or agreement; or
   - **b.** The "personal and advertising injury" for which coverage is sought arises out of an offense committed after you have entered into that contract or agreement.
4. The following is added to **SECTION III K.2 Transfer of Rights of Recovery Against Others to Us – COMMON POLICY CONDITIONS (BUT APPLICABLE TO SECTION I – PROPERTY AND SECTION II – LIABILITY)**

   We waive any rights of recovery we may have against any person or organization because of payments we make for "bodily injury", "property damage" or "personal and advertising injury" arising out of "your work" performed by you, or on your behalf, under a contract or agreement with that person or organization. We waive these rights only where you have agreed to do so as part of a contract or agreement with such person or organization entered into by you before the "bodily injury" or "property damage" occurs, or the "personal and advertising injury" offense is committed.

ALL OTHER TERMS AND CONDITIONS OF THIS POLICY REMAIN UNCHANGED.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® FOR DESIGN PROFESSIONALS LIABILITY ENHANCEMENT

SCHEDULE OF COVERAGES ADDRESSED BY THIS ENDORSEMENT

A. First Aid And Good Samaritan Services
B. Supplementary Payments
C. Reasonable Force – Bodily Injury Or Property Damage
D. Non-Owned Watercraft
E. Canoes Or Rowboats
F. Damage To Premises Rented To You
G. Aircraft Chartered With Crew
H. Electronic Data Liability
I. Who Is An Insured – Newly Acquired Or Formed Organizations
J. Who Is An Insured – Unnamed Partnership Or Joint Venture
K. Additional Insured – Owner, Manager Or Lessor Of Premises Or Leased Equipment
L. Additional Insured – State Or Political Subdivisions – Permits Related To Premises Or Operations
M. General Aggregate Limit – Per Project Or Per Location
N. Knowledge And Notice Of Occurrence Or Offense
O. Amended Bodily Injury Definition
P. Amended Insured Contract Definition – Construction Or Demolition Operations Within 50' Of Railroad
Q. Amended Personal And Advertising Injury Definition – Electronic Material
R. Unintentional Omission
S. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM – SECTION II – LIABILITY AND SECTION III AS IT PERTAINS TO LIABILITY ONLY

A. First Aid And Good Samaritan Services

1. The following is added to **Section II A.1. Business Liability Coverages**

We will pay those sums that the insured becomes legally obligated to pay as damages because of "bodily injury" arising out of either the rendering of or failure to render, "First Aid" or "Good Samaritan Services" to any person. For the purposes of this coverage grant, "First Aid" or "Good Samaritan Services" will be deemed to meet the definition of "occurrence". For the purposes of determining the applicable limits of insurance, any act or omission together with all related acts or omissions in the rendering of "First Aid" or "Good Samaritan Services" to any one person will be deemed one "occurrence".

a. "First Aid" means initial care for medical attention immediately following a "bodily injury".

b. "Good Samaritan Services" means medical attention provided in an emergency and for which no remuneration is demanded or received.

2. The insurance provided by this provision shall be excess over any valid and collectible other insurance available to any insured whether primary, excess, contingent or any other basis, except for insurance purchased specifically by you to apply in excess of the limits of Insurance shown in the declarations for Business Liability.

B. Supplementary Payments

Section II A.1.f. Coverage Extension – Supplementary Payments Paragraphs **1.(b)** and **1.(d)** are deleted and replaced with the following:

(b) Up to $2,500 for the cost of bail bonds required because of accidents or traffic violations arising out of any vehicle to which Business Liability Coverage for "bodily injury" applies. We do not have to furnish these bonds.

(d) All reasonable expenses incurred by the insured at our request to assist in the investigation or defense of the claim or "suit", including actual loss of earnings up to $500 a day because of time off work.

C. Reasonable Force – Bodily Injury Or Property Damage

Section II B.1.a. Exclusions, **Expected Or Intended Injury**, is deleted and replaced by the following:

a. Expected or Intended Injury

"Bodily Injury" or "property damage" expected or intended from the standpoint of the insured. This exclusion does not apply to "bodily injury" or "property damage" resulting from the use of reasonable force to protect persons or property.

D. Non-Owned Watercraft

1. Section II B.1.g. Exclusions, Aircraft, Auto Or Watercraft Subparagraph **(2)** is deleted and replaced by the following:

(2) A watercraft you do not own that is:

(a) Up to seventy-five (75) feet long; and

(b) Not being used to carry persons or property for a charge;

2. Only as respects to the insurance provided by this provision **C. Who Is An Insured** is amended to include as an insured any person who, with your express consent uses the watercraft.

3. The insurance provided by this provision shall be excess over any valid and collectible other insurance available to the insured, whether primary, excess, contingent or on any other basis, except for the insurance purchased specifically by you to apply in excess of the Limits of Insurance shown in the declarations for this Coverage Part.

E. Canoes Or Rowboats

The following is added to the exceptions contained in **Section II B.1.g. Exclusions**, **Aircraft, Auto Or Watercraft:**

(6) Any non-motorized canoe or rowboat owned by the insured. Only as respects to the insurance provided by this provision **C. Who Is An Insured** is amended to include as an insured any person who, with your express consent, uses any such canoe or rowboat.

F. Damage to Premises Rented to You

1. The last paragraph of **Section II B.1. Exclusions – Applicable To Business Liability Coverage** is deleted and replaced by the following:

Exclusions **c., d., e., f., g., h., i., k., l., m., n.** and **o.** in **SECTION II – LIABILITY** do not apply to damage by water, fire, explosion, lightning, or smoke resulting from fire to premises while

rented to you, or temporarily occupied by you with permission by the owner. A separate Damage To Premises Rented To You Limit of Insurance applies to this coverage as described in paragraph **D. Liability And Medical Expenses Limits of Insurance** in **SECTION II – LIABILITY**.

2. **Section II F.9.a. Liability And Medical Expenses Definitions**, is deleted and replaced by the following:

a. A contract for a lease of premises. However, that portion of the contract for a lease of premises that indemnifies any person or organization for damage by water, fire, explosion, lightning, or smoke resulting from fire to premises while rented to you or temporarily occupied by you with permission of the owner is not an "insured contract";

3. This provision does not apply if coverage for Damage To Premises Rented To You is excluded by another endorsement to this policy.

G. Aircraft Chartered With Crew

1. The following is added to the exceptions contained in **Section II B.1.g**. **Exclusions**, **Aircraft, Auto or Watercraft:**

(6) Any non-owned aircraft chartered to you with a crew including a pilot.

2. The insurance provided by this provision shall be excess over any valid and collectible other insurance available to the insured whether primary, excess, contingent or on any other basis, except for insurance purchased specifically by you to apply in excess of the Limits of Insurance shown in Declarations.

H. Electronic Data Liability

1. **Section II B.1.q. Exclusions** is deleted and replaced by the following:

q. Electronic Data

Damages arising out of the loss of, loss of use of, damage to, corruption of, inability to access, disclosure of, display of, theft or misappropriation of or inability to manipulate "electronic data". However this exclusion does not apply to "Property Damage".

2. The following definition is added to **Section II F. Liability And Medical Expenses Definitions**:

"Electronic data" means information, facts or programs stored as or on, created or used on, or transmitted to or from computer software (including systems and applications software), hard or floppy disks, CD-ROMS, tapes, drives, cells, data processing devices or any other media which are used with electronically controlled equipment.

3. For the purposes of the coverage provided by this endorsement, **Section II F. Liability And Medical Expenses Definitions,** Paragraph **17.** is deleted and replaced by the following:

17. "Property damage" means:

a. Physical injury to tangible property, including all resulting loss of use of that property. All such loss of use shall be deemed to occur at the time of the physical injury that caused it;

b. Loss of use of tangible property that is not physically injured. All such loss of use shall be deemed to occur at the time of the "occurrence" that caused it; or

c. Loss of, loss of use of, damage to, corruption of, inability to access, or inability to manipulate "electronic data", resulting from physical injury to tangible property. All such loss of "electronic data" shall be deemed to occur at the time of the "occurrence" that caused it.

d. Property damage does not mean disclosure of, display of, or theft or misappropriation of electronic data however caused.

For the purposes of this insurance, "electronic data" is not tangible property.

I. Who Is An Insured – Newly Acquired Or Formed Organizations

The following is added to **Section II C. Who Is An Insured:**

Any organization you newly acquire or form, other than a partnership, joint venture or limited liability company, over which you maintain ownership or majority interest, will qualify as a Named Insured if there is no other similar insurance available to that organization. However:

1. Coverage under this provision is afforded only until the one hundred eightieth (180th) day after you acquire or form the organization or the end of the policy period, whichever is earlier;

2. Coverage does not apply for "bodily injury" or "property damage" that occurred before you acquired or formed the organization.

3. Coverage does not apply for "personal and advertising injury" arising out of an offense committed before you acquired or formed the organization.

4. This provision does not apply to any organization for which coverage is excluded by another endorsement to this policy.

J. Who Is An Insured – Unnamed Partnership Or Joint Venture

1. The last paragraph of **Section II C. Who Is An Insured** is deleted and replaced by the following:

No person or organization is an insured with respect to the conduct of any current or past partnership, joint venture or limited liability company that is not shown as a Named Insured in the Declarations. However this limitation does not apply to your liability with respect to your conduct of the business of any current or past partnership or joint venture:

a. That is not shown as a Named Insured in the Declarations; and

b. In which you are a member or partner but only if:

(i) Each and every member or partner in that joint venture or partnership is not a construction contractor; and

(ii) The joint venture or partnership is not providing construction contracting services.

2. This provision does not apply to any person or organization for which coverage is excluded by another endorsement to this policy.

3. The insurance provided by this provision shall be excess over any valid and collectible other insurance, whether primary, excess, contingent or on any other basis, which is available covering your liability with respect to your conduct of the business of any current or past partnership or joint venture that is not shown as a Named Insured in the Declarations and which is issued to such partnership or joint venture.

K. Additional Insured – Owner, Manager Or Lessor Of Premises Or Leased Equipment

Section II C. Who Is An Insured is amended to include as an insured:

1. Any person or organization that you have agreed in a contract or agreement to include as an additional insured on this policy, but:

a. Only with respect to liability for "bodily injury" or "property damage" that occurs, or "personal and advertising injury" caused by an offense committed, after you have entered into that contract or agreement; and

(1) Only if the "bodily injury", "property damage" or "personal and advertising injury" is caused, in whole or in part, by you or any person or organization performing operations on your behalf, and arises out of the ownership, maintenance or use of that part of any premises leased to you under that contract or agreement; or

(2) The "bodily injury", "property damage" or "personal and advertising injury" is caused, in whole or in part, by you or any person or organization performing operations on your behalf, and arises out of the maintenance, operation or use of equipment leased to you by such additional insured.

2. The insurance provided to such additional insured under this provision is subject to the following:

a. The limits of insurance afforded to such additional insured shall be the limits which you agreed to provide in the contract or agreement, or the limits shown in the Declarations, whichever are less; and

b. The insurance afforded to such additional insured does not apply:

(1) To any "bodily injury" or "property damage" that occurs, or "personal and advertising injury" caused by an offense committed, after you cease to be a tenant in that premises;

(2) To any structural alterations, construction or demolition operations performed by or on behalf of such additional insured;

(3) To any premises for which coverage is excluded by another endorsement to this Coverage Part;

(4) To any "bodily injury" or "property damage" that occurs, or "personal and advertising injury" caused by an offense committed, after the equipment lease expires; or

(5) If the equipment is leased with an operator.

3. This provision does not apply on any basis to any person or organization for which coverage as an additional insured specifically is added by another endorsement to this policy.

L. Additional Insured – State Or Political Subdivisions – Permits Related To Premises Or Operations

Section II C. Who Is An Insured is amended to include as an insured:

1. Any state or political subdivision that has issued a permit in connection with premises owned or occupied by, or rented or loaned to, you, but only with respect to "bodily injury", "property damage", "personal and advertising injury" arising out of the existence, ownership, use, maintenance, repair, construction, erection or removal of advertising signs, awnings, canopies, cellar entrances, coal holes, driveways, manholes, marquees, hoist away openings, sidewalk vaults, elevators, street banners or decorations for which that state or political subdivision has issued such permit.

2. Any state or political subdivision that has issued a permit, but only with respect to "bodily injury", "property damage", "personal and advertising injury" arising out of operations performed by you or on your behalf for which that state or political subdivision has issued such permit. However, no such state or political subdivision is an insured for:

a. "Bodily injury", "property damage", "personal and advertising injury" arising out of operations performed for that state or political subdivision; or

b. "Bodily injury" or "property damage" included within the "products-completed operations hazard".

M. General Aggregate Limit – Per Project Or Per Location

Section II D. Liability And Medical Expenses Limits of Insurance, Paragraph **4. Aggregate Limits**. is deleted and replaced by the following:

4. Aggregate Limits

The most we will pay for:

a. All "bodily injury" and "property damage" that is included in the "products-completed operations hazard" is twice the Liability and Medical Expenses limit.

b. All:

(1) "Bodily injury" and **"**property damage" except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard";

(2) Plus medical expenses;

(3) Plus all "personal and advertising injury" caused by offenses committed;

is twice the Liability and Medical Expenses limit.

The aggregate limit for all "bodily injury" and "property damage", medical expenses and "personal and advertising injury" other than "bodily injury" or "property damage" included in the "products-completed operations hazard" applies separately to each of your "projects" away from premises owned by or occupied by you or to each of your "locations" owned by or occupied by you.

"Projects" mean an area away from premises owned by or rented to you at which you are performing operations pursuant to a contract or agreement. For the purposes of determining the applicable aggregate limit of insurance, each "project" at the same "location" shall be considered a single "project".

For the purposes of this provision, "location" means

1. Premises involving the same or connecting lots;

2. Premises where connection is interrupted only by a street, roadway, waterway or right-of-way of a railroad; or

3. Premises where operations are performed in sections, stages or phases as a continuation of the same contract or agreement, even if the premises do not involve connecting lots.

Subject to Paragraph **a.** or **b.** above, whichever applies, the Damage To Premises Rented To You Limit is the most we will pay for damages because of "property damage" to any one premises, while rented to you, or in the case of fire; explosion; lightning; smoke resulting from such fire, explosion or lightning; or water while rented to you or temporarily occupied by you with permission of the owner.

The Limits of Insurance of **SECTION II – LIABILITY** apply separately to each consecutive annual period and to any remaining period of less than twelve (12) months, starting with the beginning of the policy period shown in the Declarations, unless the policy period is extended after issuance for an additional period of less than twelve (12) months. In that case, the additional period will be deemed part of the last preceding period for purposes of determining the Limits of Insurance.

N. Knowledge And Notice Of Occurrence Or Offense

The following is added to **Section II E. 2. Liability and Medical Expenses General Conditions, Duties In The Event of Occurrence, Offense, Claim Or Suit:**

Notice of an "occurrence" or of an offense which may result in a claim must be given as soon as practicable after knowledge of the "occurrence" or offense has been reported to you, one of your "executive officers" (if you are a corporation), one of your partners who is an individual (if you are a partnership), one of your managers (if you are a limited liability company), one of your trustees who is an individual (if you are a trust), or an "employee" (such as an insurance, loss control or risk manager or administrator) designated by you to give such notice.

Knowledge by any other "employee" of an "occurrence" or offense does not imply that you also have such knowledge.

Notice of an "occurrence" or of an offense which may result in a claim will be deemed to be given as soon as practicable to us if it is given in good faith as soon as practicable to your workers' compensation, accident, or health insurer. This applies only if you subsequently give notice of the "occurrence" or offense to us as soon as practicable after you, one of your "executive officers" (if you are a corporation), one of your partners who is an individual (if you are a partnership), one of your managers (if you are a limited liability company), one of your trustees who is an individual (if you are a trust), or an "employee" (such as an insurance, loss control or risk manager or administrator) designated by you to give such notice discovers that the "occurrence" or offense may involve this policy.

O. Amended Bodily Injury Definition

The definition of "bodily injury" in **Section II F.3. Liability And Medical Expenses Definitions** is deleted and replaced by the following:

"Bodily injury" means injury to the body, sickness, disease, or death. "Bodily injury" also means mental injury, mental anguish, emotional distress, pain and suffering, or shock resulting from injury to the body, sickness, disease or death of any person.

P. Amended Insured Contract Definition – Construction Or Demolition Operations Within 50' Of Railroad

1. The definition of "insured contract" in **Section II F.9.c**. **Liability And Medical Expenses Definitions** is deleted and replaced by the following:

c. Any easement or license agreement

2. The definition of "insured contract" in **Section II F.9.f.(1) Liability And Medical Expenses Definitions** is deleted.

3. The insurance provided by this provision shall be excess over any valid and collectible Railroad Protective Liability insurance available to an insured , whether primary, excess, contingent or on any other basis, except for the insurance purchased specifically by you to apply in excess of the Limits of Insurance shown in the declarations for this Coverage Part.

Q. Amended Personal And Advertising Injury Definition – Electronic Material

1. The definition of "personal and advertising injury" in **Section II F.14.d. Liability And Medical Expenses Definitions** is deleted and replaced by the following:

d. Oral, written or electronic publication, in any manner, of material that slanders or libels a person or organization or disparages a person's or organization's goods, products or services;

2. The definition of "personal and advertising injury" in **Section II F.14.e. Liability And Medical Expenses Definitions** is deleted and replaced by the following:

e. Oral, written or electronic publication, in any manner, of material that violates a person's right of privacy;

3. **Section II B.1.p.(2) Exclusions** for **Personal And Advertising Injury** is deleted and replaced by the following:

(2) Arising out of oral, written or electronic publication of material if done by or at the direction of the insured with knowledge of its falsity;

4. **Section II B.1.p.(2) Exclusions** for **Personal And Advertising Injury** is deleted and replaced by the following:

(3) Arising out of oral, written or electronic publication of material whose first publication took place before the beginning of the policy period;

R. Unintentional Omission

The following is added to **SECTION III – COMMON POLICY CONDITIONS** Paragraph **C. Concealment, Misrepresentation Or Fraud (BUT APPLICABLE ONLY TO SECTION II – LIABILITY)**

However as it pertains to Business Liability Coverage only, the unintentional omission of, or unintentional error in, any information provided by you which we relied upon in issuing this policy shall not prejudice your rights under this insurance. This provision does not affect our right to collect additional premium or to exercise our right of cancellation or nonrenewal in accordance with applicable insurance laws or regulations.

S. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

SECTION III – COMMON POLICY CONDITIONS Paragraph **K.2. Transfer of Rights of Recovery Against Others to Us (BUT APPLICABLE ONLY TO SECTION II – LIABILITY)** is deleted and replaced by the following:

2. Applicable to Business Liability Coverage:

We waive any rights of recovery we may have against any person or organization because of payments we make for "bodily injury", "property damage", "personal injury and advertising injury" arising out of:

a. Premises owned by you, temporarily occupied by you with permission of the owner, or leased or rented to you;

b. Ongoing and completed operations performed by you, or on your behalf, under a contract or agreement with that person or organization;

c. Your "work"; or

d. "Your products".

We waive these rights only where you have agreed to do so as part of a contract or agreement entered into by you before the "bodily injury" or "property damage" occurs or the "personal and advertising injury" offense is committed.

ALL OTHER TERMS AND CONDITIONS OF THIS POLICY REMAIN UNCHANGED.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® NOTICE OF CANCELLATION OR NONRENEWAL – DESIGNATED PERSON OR ORGANIZATION

Schedule

Designated Person or Organization:

As per schedule to be provided upon request

Email Address:

US Mail Address:

UT

If we cancel or chose to nonrenew this policy for any reason other than nonpayment of premium we will provide written notice at least (30) days before the effective date of the cancellation or nonrenewal to the designated person or organization in the above schedule.

Such notice will be sent via the US mail address or E-mail address listed above. Proof of mailing or e-mailing will be sufficient proof of notice.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® NOTICE OF CANCELLATION OR NONRENEWAL – DESIGNATED PERSON OR ORGANIZATION

Schedule

Designated Person or Organization:

City of St. George

Email Address:

US Mail Address:

Attn: Wendy Burke

175 E. 200 N.

St. George, UT 84770

If we cancel or chose to nonrenew this policy for any reason other than nonpayment of premium we will provide written notice at least (30) days before the effective date of the cancellation or nonrenewal to the designated person or organization in the above schedule.

Such notice will be sent via the US mail address or E-mail address listed above. Proof of mailing or e-mailing will be sufficient proof of notice.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® NOTICE OF CANCELLATION OR NONRENEWAL – DESIGNATED PERSON OR ORGANIZATION

Schedule

Designated Person or Organization:

TOK Commercial

Email Address:

US Mail Address:

250 South Fifth Street

2nd Floor

Boise, ID 83702

If we cancel or chose to nonrenew this policy for any reason other than nonpayment of premium we will provide written notice at least (30) days before the effective date of the cancellation or nonrenewal to the designated person or organization in the above schedule.

Such notice will be sent via the US mail address or E-mail address listed above. Proof of mailing or e-mailing will be sufficient proof of notice.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

EMPLOYMENT-RELATED PRACTICES EXCLUSION

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM

The following exclusion is added to Paragraph **B.1. Exclusions – Applicable To Business Liability Coverage** in **Section II** – **Liability:**

This insurance does not apply to "bodily injury" or "personal and advertising injury" to:

(1) A person arising out of any:

(a) Refusal to employ that person;

(b) Termination of that person's employment; or

(c) Employment-related practices, policies, acts or omissions, such as coercion, demotion, evaluation, reassignment, discipline, defamation, harassment, humiliation, discrimination or malicious prosecution directed at that person; or

(2) The spouse, child, parent, brother or sister of that person as a consequence of "bodily injury" or "personal and advertising injury" to that person at whom any of the employment-related practices described in Paragraph **(a), (b)** or **(c)** above is directed.

This exclusion applies:

(1) Whether the injury-causing event described in Paragraph **(a), (b)** or **(c)** above occurs before employment, during employment or after employment of that person;

(2) Whether the insured may be liable as an employer or in any other capacity; and

(3) To any obligation to share damages with or repay someone else who must pay damages because of the injury.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):
RDO Equipment Co.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

Section II – Liability is amended as follows:

A. The following is added to Paragraph **C. Who Is An Insured:**

3. Any person(s) or organization(s) shown in the Schedule is also an additional insured, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your acts or omissions or the acts or omissions of those acting on your behalf in the performance of your ongoing operations or in connection with your premises owned by or rented to you.

However:

a. The insurance afforded to such additional insured only applies to the extent permitted by law; and

b. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to Paragraph **D. Liability And Medical Expenses Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or

2. Available under the applicable Limits Of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits Of Insurance shown in the Declarations.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):
First National Bank & Trust Co. of Williston
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

Section II – Liability is amended as follows:

A. The following is added to Paragraph **C. Who Is An Insured:**

3. Any person(s) or organization(s) shown in the Schedule is also an additional insured, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your acts or omissions or the acts or omissions of those acting on your behalf in the performance of your ongoing operations or in connection with your premises owned by or rented to you.

However:

a. The insurance afforded to such additional insured only applies to the extent permitted by law; and

b. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to Paragraph **D. Liability And Medical Expenses Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or

2. Available under the applicable Limits Of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits Of Insurance shown in the Declarations.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CALCULATION OF PREMIUM

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS COVERAGE FORM

The following is added:

The premium shown in the Declarations was computed based on rates in effect at the time the policy was issued. On each renewal, continuation, or anniversary of the effective date of this policy, we will compute the premium in accordance with our rates and rules then in effect.

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THIS ENDORSEMENT IS ATTACHED TO AND MADE PART OF YOUR POLICY IN RESPONSE TO THE DISCLOSURE REQUIREMENTS OF THE TERRORISM RISK INSURANCE ACT. THIS ENDORSEMENT DOES NOT GRANT ANY COVERAGE OR CHANGE THE TERMS AND CONDITIONS OF ANY COVERAGE UNDER THE POLICY.

DISCLOSURE PURSUANT TO TERRORISM RISK INSURANCE ACT

SCHEDULE

SCHEDULE – PART I
Terrorism Premium (Certified Acts) $ **Additional information, if any, concerning the terrorism premium:**
SCHEDULE – PART II
Federal share of terrorism losses 80 % (Refer to Paragraph **B.** in this endorsement.)
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

A. Disclosure Of Premium

In accordance with the federal Terrorism Risk Insurance Act, we are required to provide you with a notice disclosing the portion of your premium, if any, attributable to coverage for terrorist acts certified under the Terrorism Risk Insurance Act. The portion of your premium attributable to such coverage is shown in the Schedule of this endorsement or in the policy Declarations.

B. Disclosure Of Federal Participation In Payment Of Terrorism Losses

The United States Government, Department of the Treasury, will pay a share of terrorism losses insured under the federal program. The federal share equals a percentage (as shown in Part **II** of the Schedule of this endorsement or in the policy Declarations) of that portion of the amount of such insured losses that exceeds the applicable insurer retention. However, if aggregate insured losses attributable to terrorist acts certified under the Terrorism Risk Insurance Act exceed $100 billion in a calendar year, the Treasury shall not make any payment for any portion of the amount of such losses that exceeds $100 billion.

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C. Cap On Insurer Participation In Payment Of Terrorism Losses

If aggregate insured losses attributable to terrorist acts certified under the Terrorism Risk Insurance Act exceed $100 billion in a calendar year and we have met our insurer deductible under the Terrorism Risk Insurance Act, we shall not be liable for the payment of any portion of the amount of such losses that exceeds $100 billion, and in such case insured losses up to that amount are subject to pro rata allocation in accordance with procedures established by the Secretary of the Treasury.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

RLIPack® FOR DESIGN PROFESSIONALS EXCESS LIABILITY ENHANCEMENT

SCHEDULE OF COVERAGES ADDRESSED BY THIS ENDORSEMENT

A. General Aggregate Limit – Per Project Or Per Location
B. Additional Insured – Primary/Non-contributory
C. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

This endorsement modifies insurance provided under the following:

COMMERCIAL EXCESS LIABILITY COVERAGE FORM

A. General Aggregate Limit – Per Project Or Per Location

Paragraph **2.a.** of **C. Limits of Liability** of **SECTION I – INSURING AGREEMENT** is deleted and replaced by the following:

a. The limit of liability stated in the Declarations as general aggregate is the most we will pay during each policy period for all ultimate net loss, except ultimate net loss because of:

(1) injury and damage included in the products-completed operations hazard or;

(2) any coverage included in **underlying insurance** to which no underlying aggregate applies.

The general aggregate applies separately to each of your “projects” away from premises owned by or occupied by you or to each of your locations owned by or occupied by you.

“Projects” mean an area away from premises owned by or rented to you at which you are performing operations pursuant to a contract or agreement. For the purposes of determining the applicable aggregate limit of insurance, each "project" at the same “location” shall be considered a single "project".

For the purposes of this provision, “location” means

(1) premises involving the same or connecting lots;

(2) premises where connection is interrupted only by a street, roadway, waterway or right-of-way of a railroad; or

(3) premises where operations are performed in sections, stages or phases as a continuation of the same contract or agreement, even if the premises do not involve connecting lots.

B. Additional Insured – Primary/Non-contributory

Paragraph **K. Other Insurance** of **SECTION IV – CONDITIONS** is deleted and replaced by the following:

K. Other Insurance

If other insurance, whether collectible or not, is available to the insured covering a loss also covered by this policy, the insurance afforded by this policy shall be in excess of, and shall not contribute with, such other insurance. However, if the **underlying insurance** provides coverage to an additional insured on a primary basis, or a primary and non-contributory basis, this insurance shall be available to such additional insured on an excess basis over the underlying insurance. We will not share with other insurance which covers such additional insured as a named insured.

C. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

Paragraph **L. Subrogation** of **SECTION IV – CONDITIONS** is deleted and replaced by the following:

L. Subrogation

In the event of any payment under this policy, the insured must notify us of any of the insured's rights of recovery against any person or organization. We shall be subrogated to all such rights. The insured shall execute and deliver instruments and papers and do whatever else is necessary to secure such rights. The insured shall do nothing after loss to prejudice such rights. However we waive any rights of recovery we may have against any person or organization if the **underlying insurance** also waives such rights.

Any amount recovered through subrogation or otherwise shall be apportioned in the inverse order of payment of the claim or claims involved to the extent of actual payment thereof by all interests. The expenses of all such recoveries and proceedings in connection therewith shall be apportioned in the ratio of respective recoveries. With respect to proceedings conducted solely by us, if there is no recovery, we will bear the expense thereof. If there is a recovery, we shall be reimbursed in full from such recovery for the amount of all expenses incurred by us before apportionment of such recovery as herein provided.

ALL OTHER TERMS AND CONDITIONS OF THIS POLICY REMAIN UNCHANGED.

Agenda Date: 11/07/2024 **Agenda Item Number:** 3d

Subject:

Consider approval of a Reimbursement Agreement with Quality Excavation for upsizing a waterline in Airport Parkway from 8" to 16".

Item at-a-glance:

Staff Contact: Kade Bringhurst

Applicant Name: St. George

Reference Number: N/A

Address/Location:

Airport Parkway

Item History (background/project status/public process):

Quality Excavation is constructing the Desert Canyons Business Park along Airport Parkway including improvements and Utilities.

Staff Narrative (need/purpose):

There is a master planned 16" waterline in Airport Parkway. It is the intent to upsize the line that Quality is installing from 8" to 16".

Name of Legal Dept approver: Alicia Carlton

Budget Impact:

Cost for the agenda item: $277,439.50

Amount approved in current FY budget for item: na

If not approved in current FY budget or exceeds the budgeted amount, please explain funding source:

Planned Projects will be amended as needed to fund the project.

Description of funding source:

Impact fees.

Recommendation (Include any conditions):

Staff recommends approval.

CITY OF ST. GEORGE REIMBURSEMENT AGREEMENT
FOR DC BUSINESS PARK WATER UPSIZE WITH QUALITY EXCAVATION
(Developer Construct-City Reimburse Developer)

THIS AGREEMENT is entered into this _____ by and between the City of St. George, a Utah municipal corporation, ("CITY"), and Quality Excavation, a Corporation, ("Developer"). City and Developer are herein collectively referred to as the "Parties."

RECITALS

WHEREAS, Developer owns property at along Airport Parkway , St. George, Utah (the "Property"); and

WHEREAS, Developer is extending utilities and adding improvements to Airport Parkway; and

WHEREAS, the improvements include a waterline that is identified in the Master Plan to be upsized larger than the 8" lines that would otherwise be the responsibility of the developer; and

WHEREAS, the City agrees to pay the upsize costs so that the correct size of pipe can be installed prior to paving and the completed construction of the roadway; and

WHEREAS, City, acting pursuant to its authority under Utah Code Annotated, Section 10-9a-101, et. seq., and in furtherance of its land use policies, goals, objectives, ordinances, resolutions, and regulations has determined this Agreement is in the best interest of the citizens of the City of St. George, and, in the exercise of its legislative discretion, has elected to approve this Agreement.

AGREEMENT

NOW THEREFORE, in consideration of the covenants contained herein, and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. **THE PROJECT**. The contractor will upsize the 8" lines in the roadway to 16" diamter lines as shown in the approved construction drawings. All construction of the lines shall be to the city standard.

2. **REIMBURSEMENT**. Upon completion of the Project to City's satisfaction, Developer shall request reimbursement from City in writing. The request for reimbursement shall be accompanied by a detailed description of the costs of the Project. City may request more

information from Developer regarding the actual costs and management of the Project, and Developer shall comply with any such request. Within a reasonable time of the receipt of the request for reimbursement and any requested additional information, City will reimburse Developer in the amount of $277,439.50. The amount of City's obligation for reimbursement shall not increase due to an increase in the costs of construction without the express written consent of City.

3. **REPRESENTATIVES**. The representative for the City for this Project will be Kade Bringhurst. The representative for Developer will be Mike Bracken.

4. **EXHIBITS**. All exhibits attached hereto are incorporated as part of this Agreement.

5. **DESIGN AND CONSTRUCTION STANDARDS**. All design, construction, inspection, and testing associated with the Project shall comply with the City of St. George Standard Specifications for Design and Construction. It shall be the responsibility of Developer to ensure compliance with the standard specifications, and no reimbursement shall be made under this Agreement until City determines that the Project is in compliance with the standard specifications.

6. **COMPLIANCE WITH APPLICABLE LAWS**. Developer expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve Developer from any obligation to comply with all applicable requirements of City including the payment of fees and compliance with all other applicable ordinances, resolutions, regulations, policies, and procedures of City, except as modified, waived or declared in this Agreement.

7. **INTEGRATION**. This Agreement contains the entire Agreement with respect to the subject matter hereof and integrates all prior conversations, discussions or understanding of whatever kind or nature and may only be modified by a subsequent writing duly executed by the parties hereto. In the event of a conflict between this Agreement and any other documents with Developer, this Agreement shall govern.

8. **RESERVED LEGISLATIVE POWERS.** Nothing in this Agreement shall limit the future exercise of the police power by the City in enacting zoning, subdivision, development, transportation, environmental, open space and related land use plans, policies, ordinances, and regulations after the date of this agreement. This Agreement is not intended to and does not bind the St. George City Council in the independent exercise of its legislative discretion with respect to such zoning regulations.

9. **INDEMNITY AND LIABILITY.** Developer shall indemnify City against all claims, demands, causes or action, suits, or judgments, including but not limited to all claims, demands, causes of action, suits or judgments for death or injuries to persons or for loss of or damage to property, arising out of or in connection with the Project to the extent that it relates to performance of construction, injury, or damage related to the acts of Developer

or its agents or assigns. In the event of any such claims made or suits filed against the City, City shall give Developer prompt written notice. Developer agrees to defend against any claims brought or actions filed against City, whether such claims or actions are rightfully or wrongfully brought or filed. In case a claim should be brought, or an action filed with respect to the subject of indemnity herein, Developer agrees that City may employ attorneys of its own selection to appear and defend the claim or action on its own behalf at the expense of Developer. Said attorney fees shall be reasonable and subject to review by Developer. Developer shall be responsible for all costs associated with any claim, demand, action, suit, or judgment including attorney fees for which they indemnify or defend City.

10. **NO WAIVER OF GOVERNMENTAL IMMUNITY.** Nothing in this Agreement is intended to or shall be deemed to be a waiver of the City's governmental immunity as set forth in applicable statutory and case law.

11. **GOVERNING LAW AND VENUE.** This Agreement shall be construed according to the laws of the State of Utah. The parties agree that jurisdiction and venue for all legal actions, unless they involve a cause of action with mandatory federal jurisdiction, shall be the Fifth District Court, Washington County, State of Utah. The parties further agree that the Federal District Court for the District of Utah shall be the venue for any cause of action with mandatory federal jurisdiction.

12. **LEGAL FEES.** Should any party default on any of the covenants or agreements contained herein, the defaulting party shall pay all costs and expenses, (excluding reasonable attorney's fees,) which may arise or accrue from enforcing this Agreement or in pursuing any remedy provided hereunder or by applicable law, whether such remedy is pursued by filing a lawsuit or otherwise. This obligation of the defaulting party to pay costs and expenses includes, without limitation, all costs, and expenses, (excluding reasonable attorney's fees) including appeals and bankruptcy proceedings. If either party commences legal action to interpret any term of this agreement, the prevailing party shall be entitled to recover all reasonable fees (excluding attorney's fees), court costs, and any other costs incurred in connection with such action. The parties agree that they shall each pay their own attorney's fees.

13. **NOTICES.** All notices required herein, and subsequent correspondence in connection with this agreement shall be mailed to the following:

CITY:	City of St. George 175 East 200 North St. George, Utah 84770	OWNER:	Quality Excavation 1472 East 3950 South St. George, Utah 84790
Attention:	Kade Bringhurst	Attention:	Mike Bracken

Copy: City Attorney (at address above)
And to: legal@sgcity.org

Such notices shall be deemed delivered following the mailing of such notices in the United States mail. Adequate notice shall be deemed given at the addresses set forth herein unless written notice is given by either party of a change of address.

14. **SUCCESSORS AND ASSIGNS.** Developer shall not assign, sublet, sell, transfer, or otherwise dispose of any interest in this Agreement without assigning the rights and the responsibilities under this Agreement and without the prior written approval of City. This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns, but shall not inure to the benefit of any third party or other person.

15. **NO JOINT VENTURE, PARTNERSHIP OR THIRD-PARTY RIGHTS**. It is not intended by this Agreement to, and nothing contained in this Agreement shall, create any partnership, joint venture, or other arrangement between the parties. No term or provision of this Agreement is intended to or shall, be for the benefit of any person, firm, organization, or corporation not a party hereto, and no such other person, firm, organization, or corporation shall have any right or cause of action hereunder.

16. **SEVERABILITY.** If any provision of this Agreement is declared invalid by a court of competent jurisdiction, the remaining provisions shall not to be affected, and shall remain in full force and effect.

17. **CONSTRUCTION.** Each of the parties hereto has had the opportunity to review this agreement with counsel of their choosing and the rule of contracts requiring interpretation of a contract against the party drafting the same is hereby waived and shall not apply in interpreting this agreement.

18. **SURVIVAL.** It is expressly agreed that the terms, covenants, and conditions of this Agreement shall survive any legal act or conveyance required under this Agreement.

19. **HEADINGS.** The section and other headings in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement.

20. **COUNTERPARTS.** This Agreement may be executed in counterparts each of which shall be an original and shall constitute one and the same agreement.

21. **AUTHORITY OF PARTIES.** The parties executing this Agreement hereby warrant and represent that they are duly authorized to do so in the capacity stated.

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first above written.

CITY OF ST. GEORGE

_____
Michele Randall, Mayor

Attest

_____
Christina Fernandez, City Recorder

Approved as to Form

_____
Alicia Carlton, Assistant City Attorney

QUALITY EXCAVATION

_____
Ed Burgess, Owner

Quality Excavation, Inc.

(435) 634-0111 (435) 674-3711 Fax

Presented To: City of St George
Project Name: Desert Canyons Business Park Upsizing
Date: 9-26-24

WATER

1	UPSIZE FROM 8" TO 16" WATER LINE	2430	LF	$101.65	$247,009.50
2	UPSIZE BEND	2	EA	$1,500.00	$3,000.00
3	UPSIZE TEE	2	EA	$1,950.00	$3,900.00
4	UPSIZE CROSS	2	EA	$2,225.00	$4,450.00
5	UPSIZE TO 16" BUTTERFLY VALVE	8	EA	$2,385.00	$19,080.00
				SUB TOTAL:	**$277,439.50**

GRAND TOTAL: **$277,439.50**

EXCLUSIONS:

NOTES:

1.

2. **Bid does not include rock excavation that can not be ripped with a D8 Dozer or 330 Trackhoe.**
3. **Prices on the bid include the price of fuel at the date of signing. Due to the increase in fuel prices, any fuel price increase during the contract will be surcharged as a change order.**
4. **Bid does not include the following: Over excavation of any kind, staking or engineering, rock excavation, ground water or materials stabilization, landscaping of any kind including topsoil or placement, yard or storm drainage, footing excavation, or replacement of property corners, reseeding of any kind, encroachment permits, grading permits,and inspection fees.**
5. **We are not responsible for water puddling on asphalt designed at less than 2% grade or concrete designed at less than .75% grade.**

ACCEPTED:

QUALITY EXCAVATION INC. OWNER

DATE DATE

Agenda Date: 11/07/2024 **Agenda Item Number:** 3e

Subject:

Consider approval of a Reimbursement Agreement with Rogers Construction for the upsizing waterlines in Sky Rocket Road.

Item at-a-glance:

Staff Contact: Kade Bringhurst

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

Sky Rocket Road

Item History (background/project status/public process):

Contractor is constructing Sky Rocket Road that has masterplanned Irrigation lines. The contractor is responsible to install 6" lines in the roadway at his cost, this agreement upsizes the line to match the masterplan.

Staff Narrative (need/purpose):

The irrigation line will serve the area with irrigation water and reduce culinary water usage per the master plan.

Name of Legal Dept approver: Alicia Carlton

Budget Impact:

Cost for the agenda item: $133,127.22

Amount approved in current FY budget for item: na

If not approved in current FY budget or exceeds the budgeted amount, please explain funding source:

Projects will be shuffled as necessary to cover the costs.

Description of funding source:

Impact Fees

Recommendation (Include any conditions):

Staff Recommends approval

CITY OF ST. GEORGE REIMBURSEMENT AGREEMENT
FOR SKY ROCKET ROAD IRRIGATION UPSIZE WITH ROGERS CONSTRUCTION
(Developer Construct-City Reimburse Developer)

THIS AGREEMENT is entered into this _____ by and between the City of St. George, a Utah municipal corporation, ("CITY"), and Rogers Construction, a Corporation, ("Developer"). City and Developer are herein collectively referred to as the "Parties."

RECITALS

WHEREAS, Developer owns property at Sky Rocket Road, St. George, Utah (the "Property"); and

WHEREAS, Developer is extending utilities and constructing Sky Rockey Road; and

WHEREAS, the extension includes irrigation lines identified in the Irrigation Master Plan to be upsized larger than the 6" lines that would otherwise be the responsibility of the developer; and

WHEREAS, the City agrees to pay the upsize costs so that the correct size of pipe can be installed prior to paving and the completed construction of the roadway; and

WHEREAS, City, acting pursuant to its authority under Utah Code Annotated, Section 10-9a-101, et. seq., and in furtherance of its land use policies, goals, objectives, ordinances, resolutions, and regulations has determined this Agreement is in the best interest of the citizens of the City of St. George, and, in the exercise of its legislative discretion, has elected to approve this Agreement.

AGREEMENT

NOW THEREFORE, in consideration of the covenants contained herein, and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. **THE PROJECT**. The contractor will upsize the 6" lines in the roadway to 12" diamter lines as shown in the approved construction drawings. All construction of the lines shall be to the city standard.

2. **REIMBURSEMENT**. Upon completion of the Project to City's satisfaction, Developer shall request reimbursement from City in writing. The request for reimbursement shall be accompanied by a detailed description of the costs of the Project. City may request more information from Developer regarding the actual costs and management of the Project, and

Developer shall comply with any such request. Within a reasonable time of the receipt of the request for reimbursement and any requested additional information, City will reimburse Developer in the amount of $110,007.22. The amount of City's obligation for reimbursement shall not increase due to an increase in the costs of construction without the express written consent of City.

3. **REPRESENTATIVES**. The representative for the City for this Project will be Kade Bringhurst. The representative for Developer will be Curtis Rogers.

4. **EXHIBITS**. All exhibits attached hereto are incorporated as part of this Agreement.

5. **DESIGN AND CONSTRUCTION STANDARDS**. All design, construction, inspection, and testing associated with the Project shall comply with the City of St. George Standard Specifications for Design and Construction. It shall be the responsibility of Developer to ensure compliance with the standard specifications, and no reimbursement shall be made under this Agreement until City determines that the Project is in compliance with the standard specifications.

6. **COMPLIANCE WITH APPLICABLE LAWS**. Developer expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve Developer from any obligation to comply with all applicable requirements of City including the payment of fees and compliance with all other applicable ordinances, resolutions, regulations, policies, and procedures of City, except as modified, waived or declared in this Agreement.

7. **INTEGRATION**. This Agreement contains the entire Agreement with respect to the subject matter hereof and integrates all prior conversations, discussions or understanding of whatever kind or nature and may only be modified by a subsequent writing duly executed by the parties hereto. In the event of a conflict between this Agreement and any other documents with Developer, this Agreement shall govern.

8. **RESERVED LEGISLATIVE POWERS.** Nothing in this Agreement shall limit the future exercise of the police power by the City in enacting zoning, subdivision, development, transportation, environmental, open space and related land use plans, policies, ordinances, and regulations after the date of this agreement. This Agreement is not intended to and does not bind the St. George City Council in the independent exercise of its legislative discretion with respect to such zoning regulations.

9. **INDEMNITY AND LIABILITY.** Developer shall indemnify City against all claims, demands, causes or action, suits, or judgments, including but not limited to all claims, demands, causes of action, suits or judgments for death or injuries to persons or for loss of or damage to property, arising out of or in connection with the Project to the extent that it relates to performance of construction, injury, or damage related to the acts of Developer or its agents or assigns. In the event of any such claims made or suits filed against the City, City

shall give Developer prompt written notice. Developer agrees to defend against any claims brought or actions filed against City, whether such claims or actions are rightfully or wrongfully brought or filed. In case a claim should be brought, or an action filed with respect to the subject of indemnity herein, Developer agrees that City may employ attorneys of its own selection to appear and defend the claim or action on its own behalf at the expense of Developer. Said attorney fees shall be reasonable and subject to review by Developer. Developer shall be responsible for all costs associated with any claim, demand, action, suit, or judgment including attorney fees for which they indemnify or defend City.

10. **NO WAIVER OF GOVERNMENTAL IMMUNITY.** Nothing in this Agreement is intended to or shall be deemed to be a waiver of the City's governmental immunity as set forth in applicable statutory and case law.

11. **GOVERNING LAW AND VENUE.** This Agreement shall be construed according to the laws of the State of Utah. The parties agree that jurisdiction and venue for all legal actions, unless they involve a cause of action with mandatory federal jurisdiction, shall be the Fifth District Court, Washington County, State of Utah. The parties further agree that the Federal District Court for the District of Utah shall be the venue for any cause of action with mandatory federal jurisdiction.

12. **LEGAL FEES.** Should any party default on any of the covenants or agreements contained herein, the defaulting party shall pay all costs and expenses, (excluding reasonable attorney's fees,) which may arise or accrue from enforcing this Agreement or in pursuing any remedy provided hereunder or by applicable law, whether such remedy is pursued by filing a lawsuit or otherwise. This obligation of the defaulting party to pay costs and expenses includes, without limitation, all costs, and expenses, (excluding reasonable attorney's fees) including appeals and bankruptcy proceedings. If either party commences legal action to interpret any term of this agreement, the prevailing party shall be entitled to recover all reasonable fees (excluding attorney's fees), court costs, and any other costs incurred in connection with such action. The parties agree that they shall each pay their own attorney's fees.

13. **NOTICES.** All notices required herein, and subsequent correspondence in connection with this agreement shall be mailed to the following:

CITY:	City of St. George 175 East 200 North St. George, Utah 84770	OWNER:	Rogers Construction PO Box 10 St. George, Utah 84771
Attention:	Kade Bringhurst	Attention:	Curtis Rogers

Copy: City Attorney (at address above)
And to: legal@sgcity.org

Such notices shall be deemed delivered following the mailing of such notices in the United States mail. Adequate notice shall be deemed given at the addresses set forth herein

unless written notice is given by either party of a change of address.

14. **SUCCESSORS AND ASSIGNS.** Developer shall not assign, sublet, sell, transfer, or otherwise dispose of any interest in this Agreement without assigning the rights and the responsibilities under this Agreement and without the prior written approval of City. This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns, but shall not inure to the benefit of any third party or other person.

15. **NO JOINT VENTURE, PARTNERSHIP OR THIRD-PARTY RIGHTS**. It is not intended by this Agreement to, and nothing contained in this Agreement shall, create any partnership, joint venture, or other arrangement between the parties. No term or provision of this Agreement is intended to or shall, be for the benefit of any person, firm, organization, or corporation not a party hereto, and no such other person, firm, organization, or corporation shall have any right or cause of action hereunder.

16. **SEVERABILITY.** If any provision of this Agreement is declared invalid by a court of competent jurisdiction, the remaining provisions shall not to be affected, and shall remain in full force and effect.

17. **CONSTRUCTION.** Each of the parties hereto has had the opportunity to review this agreement with counsel of their choosing and the rule of contracts requiring interpretation of a contract against the party drafting the same is hereby waived and shall not apply in interpreting this agreement.

18. **SURVIVAL.** It is expressly agreed that the terms, covenants, and conditions of this Agreement shall survive any legal act or conveyance required under this Agreement.

19. **HEADINGS.** The section and other headings in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement.

20. **COUNTERPARTS.** This Agreement may be executed in counterparts each of which shall be an original and shall constitute one and the same agreement.

21. **AUTHORITY OF PARTIES.** The parties executing this Agreement hereby warrant and represent that they are duly authorized to do so in the capacity stated.

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first above written.

CITY OF ST. GEORGE ROGERS CONSTRUCTION

Michele Randall, Mayor	Curtis Rogers, Owner
Attest	Approved as to form
_____	_____
Christina Fernandez, City Recorder	Alicia Carlton, Assistant City Attorney

ROGERS CONSTRUCTION
P O Box 10
St. George Ut. 84771

Estimate

Date	Estimate #
9/26/2024	99

Name / Address
City of St. George 175 E. 200 N. St. George, UT 84770

Project

Description	Qty	Cost	Total
760 Ft. Irrigation Main Line	760	70.23	53,374.80
Install 1 new Inline 12 inch valve	1	8,632.42	8,632.42
12 inch Cross with 3 12 inch Valves, Joint Restraints & Acc.	1	16,650.00	16,650.00
12 inch Tee with Valves, Joint Restraints & Acc.	2	12,650.00	25,300.00
3 - 12 inch Main Line Bends with Acc.	3	1,210.00	3,630.00
2 - 12 inch Main Line Caps with Acc.	2	1,210.00	2,420.00

Subtotal	$110,007.22
Sales Tax (0.0%)	$0.00
Total	$110,007.22

Agenda Date: 11/07/2024 **Agenda Item Number:** 3f

Subject:

Consider approval of a Reimbursement Agreement with the Washington County Flood Control Authority for the design and construction of flood control improvements for the Virgin River at Crosby Way project.

Item at-a-glance:

Staff Contact: Jay Sandberg

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

Virgin River at Crosby Way

Item History (background/project status/public process):

This agreement reimburses costs associated with the design and construction of flood control improvement project in the vicinity of the Virgin River and Crosby Way. The Washington County Flood Control Authority has reviewed and approved the agreement on October 1, 2024. Costs associated with this project includes engineering services, environmental permitting and construction in the amount of $140,000.

Staff Narrative (need/purpose):

As indicated in the agreement, the Flood Control Authority will be reimbursing the City for 100% of the costs of this project. This project will stabilize the bank of the Virgin River in the vacinity of Crosby Way that has been gradually eroding and moving closer to Crosby Way.

Name of Legal Dept approver: Daniel Baldwin

Budget Impact: No Impact

Recommendation (Include any conditions):

Recommend approval

REIMBURSEMENT AGREEMENT BETWEEN THE CITY OF ST. GEORGE AND THE WASHINGTON COUNTY FLOOD CONTROL AUTHORITY FOR THE VIRGIN RIVER at CROSBY WAY PROJECT

THIS AGREEMENT dated the _____ day of _____, 2024, between the City of St. George, Utah (hereinafter "CITY"), a municipal corporation, and the Washington County Flood Control Authority, (hereinafter "AUTHORITY").

RECITALS

Whereas, CITY and AUTHORITY wish to enter into an agreement to design and construct flood control improvements known as the ***Virgin River at Crosby Way Project*** located within the City of St. George, and (hereinafter "Project") which shall be partially funded by the Authority; and

Whereas, AUTHORITY determined that the Project was within the mission of AUTHORITY, that they had funds available and that this was an appropriate project to assist on by providing funding therefore they authorized funding for the Project; and

Whereas, CITY will create and manage the Project and AUTHORITY will reimburse CITY for a portion of the work done on the project as provided herein.

Now therefore, in consideration of the covenants contained herein, and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, AUTHORITY and CITY agree as follows:

1. Project: At its own expense CITY shall complete engineering services, environmental permitting, and construction for the Project as described in the scope of work (Exhibit A which is hereby incorporated into this document). All aspects of the work shall be under the direction of CITY and shall be the sole responsibility of CITY. The Project shall be constructed consistent with approved plans and construction drawings on file with CITY. The Project shall not be deemed complete until accepted by CITY. Upon completion of construction, CITY shall assume all maintenance responsibilities and costs. CITY acknowledges that AUTHORITY does not have any ownership interest in, or any continuing liability relative to the Project other than the obligation to pay the reimbursement amount provided herein. CITY may construct or install other improvements in conjunction with Project, but those improvements shall not be considered part of the Project and shall have no effect on the amount of funds reimbursed to CITY. Changes to the Project that increase AUTHORITY's cost participation will not be made without consent from both parties to this Agreement.

2. Compliance with City Design and Standards: CITY acknowledges and agrees that it must comply with all applicable laws and requirements necessary for completion of the Project and compliance with the CITY's design and construction standards or if no standards have been adopted by CITY then CITY must comply with accepted industry standards.

3. Reimbursement: CITY and AUTHORITY anticipate the total cost of the Project to be $140,000.00. AUTHORITY agrees to reimburse CITY for 100% of the actual costs of the Project up to $140,000.00. A cost breakdown of the Project is shown in Exhibit A.
    a. Payment of AUTHORITY's obligation shall be made in installments beginning within thirty (30) days of written proof of the actual costs of the Project.

b. AUTHORITY reserves the right to adjust the payment plan if funds are not available. Available funds mean funds held by AUTHORITY in excess of 20% of the fees collected from the Primary Members of AUTHORITY during a fiscal year.
c. AUTHORITY shall not pay any CITY administrative fees. Administrative fees shall not be included in the price of the Project.
d. Pursuant to the Interlocal Agreement for the AUTHORITY the withdrawal of any Primary Member of the AUTHORITY from the AUTHORITY shall not adversely affect this Agreement or relieve the withdrawing Primary Member of its obligation to pay its share of obligations, indebtedness and liabilities incurred prior to withdrawal.

4. Indemnity. City shall defend, indemnify, save and hold harmless AUTHORITY, its governing body, officers and agents against all claims, demands, causes or action, suits or judgements, including but not limited to all claims, demands, causes of action, suits or judgements, including but not limited to all claims, demands, causes of action, suits or judgements for death or injuries to persons or for loss of or damage to property, arising out of or in connection with this Agreement. In the event of any such claims made or suits filed against AUTHORITY, AUTHORITY shall give CITY prompt written notice. CITY agrees to defend against any claims brought or actions filed against AUTHORITY, whether such claims or actions are rightfully or wrongfully brought or filed. In case a claim should be brought, or an action filed with respect to the subject of indemnity herein, CITY agrees that AUTHORITY may employ attorneys of its own selection to appear and defend the claim or action on its own behalf at the expense of CITY. Said attorney fees shall be reasonable and subject to review by CITY.
   a. CITY shall indemnify, defend, save and hold harmless AUTHORITY, its governing body, officers, and representatives against any and all claims, suits, causes of action, demands, losses, costs and damages and liability of every kind including but not limited to all fees and charges of attorneys and other professionals and all court or other dispute resolution for:
      i. death or injuries to persons or for loss of or damage to property caused by, resulting from, or arising out of r in connection with this Agreement.
      ii. CITY's failure or refusal, whatever the reason, to pay subcontractors or suppliers for Work performed under this Agreement.
      iii. Claims by any employee of the CITY, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, CITY's indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CITY or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.
   b. AUTHORITY shall give CITY prompt written notice of any such claims or suits filed against AUTHORITY arising under this Agreement. CITY agrees to defend against any claims brought or actions filed against AUTHORITY arising out of the services provided under this Agreement, whether such claims or actions are rightfully or wrongfully brought or filed. When a claim is brought, or an action filed with respect to the subject of indemnity herein, CITY agrees that AUTHORRITY may employ a separate attorney of its own selection to appear and defend the claim or action on its own behalf at the expense

of CITY. CITY shall be responsible for all costs associated with any claim, demand, action, suit, or judgment including attorney fees for AUTHORITY.

c. The insurance requirements in this agreement shall not be construed as limiting CITY'S liability. Irrespective of the requirements for CITY to carry insurance as provided herein, insolvency, bankruptcy, or failure of any insurance company to pay all claims accruing shall not be held to relieve CITY of obligations under this agreement.

5. Insurance: CITY shall have a continuing duty to require any contractor engaged to perform the work on the Project to procure and maintain insurance against claims for injuries to persons or damages to the property which may arise from, or in connection with the exercise of the rights, privileges, and authority granted hereunder to the CITY, its agents, representatives, or employees. CITY shall provide to the AUTHORITY for its respective interests may appear prior to the commencement of any work or installation of any facilities pursuant to this franchise.

   a. Neither contractor, nor any subcontractor, shall enter the site of the work or commence work under this contract before AUTHORITY has received and accepted certificate(s) of insurance, and insurance endorsements.

   b. Insurance certificates shall set forth the following information and shall be signed by an authorized representative of the insurance company:

      i. Name and address of the insured.

      ii. Shall name as certificate holder the AUTHORITY. Certificate holder shall be named as additional primary insured without offset against their exiting insurance.

      iii. The location of the operations to which the insurance applied.

      iv. The number of the policy and the type of types of insurance in force thereunder on the date borne by the certificate.

      v. The expiration date of the policy and the limit or limits of liability thereunder on the date borne by the certificate.

      vi. A statement that the insurance covered by the certificate applies to all of the operations on and at the site of the work which are undertaken by the insured during the life of the contract.

      vii. A statement that all coverage is on an occurrence basis rather than a claims basis.

      viii. A provision that the policy or policies may not be cancelled, denied renewal, or reduced in coverage until at least 30 days after written notice has been received by AUTHORITY.

      ix. A statement that a cross liability or severability of interests' clause is included, unless a separate policy covering AUTHORITY is provided.

      x. Name, address, and telephone number of the insurance company's agent of process in Utah.

      xi. Other information to demonstrate compliance with additional requirements stipulated for the various types of insurance coverages.

   c. Commercial General Liability and Property Damage Insurance:

      i. Contractor shall procure, and maintain during the life of the contract, such general liability and property damage insurance necessary to protect itself,

AUTHORITY, and CITY, the certificate holder, and subcontractors performing work under this contract, from all claims and legal costs for bodily injury or personal injury, including accidental death and property damage arising from operations under this contract, whether such operations are the contractor's or the subcontractors'.

ii. The minimum general liability and property damage liability shall be as follows:
    1. Comprehensive general liability insurance for insurance for injuries, including accidental death, to any one person in any one occurrence in an amount not less than $1,000,000 Dollars.
    2. Comprehensive general liability insurance for injuries, including accidental death, to two or more persons in any one occurrence in an amount not less than #3,000,000 Dollars.
    3. Broad form property damage insurance in an amount not less than $300,000 Dollars.

iii. Such policy shall include each of the following coverage's:
    1. Comprehensive form.
    2. Premises – operations.
    3. Explosion and collapse hazard.
    4. Underground hazard.
    5. Product/completed operations hazard.
    6. Contractual insurance.
    7. Broad form property damage, including completed operations.
    8. Independent contractors.
    9. Personal injury.

d. Builder's "All Risk" Insurance. Contractor shall provide certificates of insurance showing that contractor has obtained, for the duration of the contract time, builder's risk "All Risk" insurance in the amount equal to the contract price including flood, tidal wave, and earthquake, but excluding tidal wave and earthquake coverage in excess of 5 percent of the contract price.

6. Assignment. Neither this Agreement nor any of the provisions, terms or conditions hereof can be assigned to any other party, individual or entity without assigning the rights as well as the responsibilities under this Agreement and without prior written consent of CITY and WCF, which consent shall not be unreasonably withheld.
7. Binding Effect. All of the provisions of this Agreement shall inure to the benefit of and be binding upon the heirs, assigns, receivers, and successors of the parties.
8. No Joint Venture, Partnership or Third-Party Rights. Nothing in this Agreement is intended to, or shall be deemed to, constitute a partnership or joint venture between WCF and CITY. No term or provision of this Agreement is intended to or shall, be for the benefit of any person, firm, organization or corporation not a party hereto, and no such other person, firm, organization or corporation shall have any right or cause of action hereunder.
9. Integration. This Agreement contains the entire Agreement with respect to the subject matter hereof and integrates all prior conversations, discussions or understanding of whatever kind or nature and may only be modified by a subsequent writing duly executed by the parties hereto.

10. Severability. If any part or provision of this Agreement shall be determined to be unconstitutional, invalid, or unenforceable by a court of competent jurisdiction, such a decision shall not affect any other part or provision of this Agreement.
11. Survival. It is expressly agreed that the terms, covenants, and conditions of this Agreement shall survive any legal act or conveyance required under this Agreement.
12. Headings. The section and other headings in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement.
13. Governing Law and Venue. This Agreement shall be construed according to the laws of the State of Utah. The parties agree that venue for all legal actions, unless they involve a cause of action with mandatory federal jurisdiction, shall be the Fifth District Court for the State of Utah. The parties further agree that the Federal District Court for the District of Utah shall be the venue for any cause of action with mandatory federal jurisdiction.
14. Notices. All notices required herein, and subsequent correspondence in connection with this agreement shall be given in writing and shall be mailed to the following:

Washington County Flood Control Authority
111 East Tabernacle
St. George, Utah 84770
Attn: Washington County Clerk

City of St. George, Utah
175 East 200 North
St. George, Utah 84770
Attn: City Attorney

Such notices shall be deemed delivered following the mailing of such notices in the United States mail. Adequate notice shall be deemed given at the addresses set forth herein unless written notice is given by either party of a change of address.

15. Attorney Fees and Court Costs. In the event of any litigation between the parties arising out of or related to this Agreement, the prevailing part shall be entitled to recover from the other party reasonable attorney fees, court costs, and any other reasonable costs incurred in connection with such action, whether at trial or on appeal.

16. Counterparts. This Agreement may be executed in counterparts each of which shall be an original and shall constitute one and the same agreement.

17. Authority of Parties. The parties executing this Agreement warrant and represent that they are duly authorized to do so in the capacity stated.

***

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

[SIGNATURES FOLLOW]

Washington County Flood Control Authority:

Jimmie Hughes, Chairman

City of St. George, Utah:

Michele Randall, Mayor

Attest:

Daniel Baldwin, ~~Deputy~~ Assistant City Attorney

Christina Fernandez, City Recorder

ST. GEORGE CITY COUNCIL MINUTES
SPECIAL MEETING
SEPTEMBER 19, 2024, 4:00 P.M.
ADMINISTRATIVE CONFERENCE ROOM

PRESENT:

Mayor Michele Randall
Councilmember Dannielle Larkin
Councilmember Natalie Larsen (arrived @ 4:04)
Councilmember Michelle Tanner
Councilmember Steve Kemp

EXCUSED:

Councilmember Jimmie Hughes

STAFF MEMBERS PRESENT:

City Manager John Willis
City Attorney Ryan Dooley
Deputy City Attorney Jami Brackin
Deputy City Recorder Annette Hansen

Mayor Randall called the meeting to order.

ADJOURN TO CLOSED MEETING:

Request a closed session to discuss litigation, security, property acquisition or sale or the character and professional competence or physical or mental health of an individual.

The City Council moved into a closed meeting to discuss litigation, security, property acquisition or sale or the character and professional competence or physical or mental health of an individual.

Following the closed meeting, the Council moved into the City Council Chambers for the regular meeting. Following the regular meeting, the Council then moved back into a closed meeting in the Administrative Conference Room. The special meeting adjourned following the closed meeting.

_____
Annette Hansen, Deputy City Recorder

DRAFT

ST. GEORGE CITY COUNCIL MINUTES
WORK MEETING
OCTOBER 17, 2024, 4:00 P.M.
ADMINISTRATIVE CONFERENCE ROOM

PRESENT:

Mayor Michele Randall
Councilmember Jimmie Hughes
Councilmember Dannielle Larkin
Councilmember Natalie Larsen
Councilmember Steve Kemp

EXCUSED:

Councilmember Michelle Tanner

STAFF MEMBERS PRESENT:

City Manager John Willis
City Attorney Ryan Dooley – left following the recess
City Recorder Christina Fernandez
Operations Director Marc Mortensen
Community Arts Manager Peyton Lee – left during the recess
Community Arts Administrative Assistant Bree Holmberg– left during the recess
Deputy Director of Arts Michelle Graves – left during the recess
Parks and Community Services Director Shane Moore – left during the recess
Government Affairs Director Shawn Guzman – left following the recess
Budget and Financial Planning Director Robert Myers – left following the recess
Energy Services Director Byran Dial- left following his presentation
Water Services Director Scott Taylor
Administrative Services Director Trevor Coombs
Deputy City Attorney Jami Brackin – arrived during the recess

OTHERS PRESENT:

Dick Whithead
Cameron Gunter

CALL TO ORDER:

Mayor Randall called the meeting to order and welcomed all in attendance.

DISCUSSION REGARDING CITY HALL AT TOWN SQUARE ART AND SEGO LILY PROJECT:

Link to introduction from Operations Director Marc Mortensen and presentation from Dick Whitehead, including discussion between the City Council, Mayor Randall, and Mr. Whitehead: 00:00:00 [Recording 1]

Link to introduction from Operations Director Marc Mortensen and presentation from Community Arts Manager Peyton Lee, including discussion between the City Council, Deputy Director of Arts Michelle Graves, City Manager John Willis, Dick Whitehead, and Ms. Lee: 00:20:10 [Recording 1]

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DRAFT

DISCUSSION REGARDING THE PROPOSED CITY VIEW PARKING GARAGE MURAL:

Link to introduction from City Manager John Willis and presentation from Government Affairs Director Shawn Guzman, Cameron Gunter, and Councilmember Larkin, including discussion between the City Council, Mayor Randall, Community Arts Manager Peyton Lee, and Mr. Gunter 00:36:22 [Recording 1]

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Mayor Randall called for a motion to recess from the work meeting and convene in the regular meeting.

Link to motion: 00:52:01 [Recording 1]

MOTION:

A motion was made by Councilmember Larkin to recess from the work meeting and convene into the regular meeting.

SECOND:

The motion was seconded by Councilmember Kemp

VOTE:

Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

UPDATE FROM ENERGY SERVICES:

Link to introduction from City Manager John Willis and presentation from Energy Services Director Bryan Dial, including discussion between the City Council, Mayor Randall, and Mr. Dial: 00:00:00 [Recording 2]

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UPDATE FROM WATER SERVICES:

Link to introduction from City Manager John Willis and presentation from Water Services Director Scott Taylor, including discussion between the City Council, Mayor Randall, City Manager John Willis, Deputy City Attorney Jami Brackin, Administrative Services Director Trevor Coombs, and Mr. Taylor: 00:21:18 [Recording 2]

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REPORTS FROM MAYOR, COUNCILMEMBERS, CITY MANAGER, AND CITY STAFF:

No reports were given.

ADJOURN TO A CLOSED MEETING:

Request a closed meeting to discuss litigation, security, property

DRAFT

acquisition or sale, or the character and professional competence or physical or mental health of an individual.

Link to motion: 01:17:35 [Recording 2]

MOTION:
A motion was made by Councilmember Larkin to adjourn to a closed meeting to discuss litigation.

SECOND:
The motion was seconded by Councilmember Hughes.

VOTE:
Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

_____
Christina Fernandez, City Recorder

DRAFT

ST. GEORGE CITY COUNCIL MINUTES
REGULAR MEETING
OCTOBER 17, 2024, 5:00 P.M.
CITY COUNCIL CHAMBERS

PRESENT:

Mayor Michele Randall
Councilmember Jimmie Hughes
Councilmember Dannielle Larkin
Councilmember Natalie Larsen
Councilmember Steve Kemp

EXCUSED:

Councilmember Michelle Tanner

STAFF MEMBERS PRESENT:

City Manager John Willis
City Attorney Ryan Dooley
City Recorder Christina Fernandez
Government Affairs Director Shawn Guzman
Budget and Financial Planning Director Robert Myers
Planner Brenda Hatch
Economic Development Director Chad Thomas

CALL TO ORDER:

Mayor Randall called the meeting to order and welcomed all in attendance. An invocation was offered by Pastor Jill Doherty with New Promise Lutheran Church and The Pledge of Allegiance to the Flag was led by Councilmember Hughes.

Link to call to order, invocation, and flag salute: 00:00:00

MAYOR'S RECOGNITIONS AND UPDATES:

No recognition or updates were given.

CONSENT CALENDAR:

a. Consider approval to award bid to Holbrook Asphalt for the FY 2025 Crack Seal Project.

BACKGROUND and RECOMMENDATION: A total of ten (10) bids were received. The low bid was from Superior Asphalt in the amount of $204,160; Holbrook Asphalt submitted a bid in the amount of $208,987.20 which was within 5% of the lowest bid and per the local preference provision of the city code was able to match Superior's low bid. Staff recommends awarding the bid to Holbrook Asphalt in the amount of $204,160.

b. Consider approval to award bid to Caliber Construction for the construction of the Black Hill Trail project.

BACKGROUND and RECOMMENDATION: This trail was originally going to be built back in 2022, but it was unable to be constructed due to the new stairs that Public Works were going to install. Public Works has almost completed the stairs so we will be able to start construction soon. This project is one of the Recreation

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G.O. Bond projects. Staff recommends awarding the bid to Caliber Construction in the amount of $484,171.70.

c. Consider approval to award bid to Convergint for the installation of Access Control System for the new City Hall project.

BACKGROUND and RECOMMENDATION: Three (3) bids were received for the City Hall project's new digital locks and security software: Convergint $120,895.39; Stream Technologies $170,878.62; and Stone Security $277,279.70. Staff recommends awarding the bid to Convergint in the amount of $120,895.39.

d. Consider approval of a Reimbursement Agreement with Allan Goeser for the 1050 North Sewer Extension.

BACKGROUND and RECOMMENDATION: The area of 1050 North 1020 West is currently served by individual septic systems. Mr. Goeser is building on a lot in the area and has agreed to extend the City's sewer line to his property rather than install an individual septic system, with participation from the City. Each year, the Wastewater Collections Division budgets funds for participation of sewer line extensions to eliminate areas of individual septic systems. With this agreement, the City would reimburse the property owner for half of the cost of the sewer line extensions, not to exceed $71,764. Staff recommends approval of the reimbursement agreement for the sewer line extension.

e. Consider approval of a Cooperative Agency Agreement for AIP-47 for Pavement Maintenance.

BACKGROUND and RECOMMENDATION: The City of St George was awarded a grant from the FAA for AIP-47 Pavement Maintenance at the St George Regional Airport. This includes runway 1-19, taxiway A & B, West general aviation apron, and East FBO apron. Staff recommends approval.

f. Consider approval to waive the fees for the Sunrise Market and the Downtown Farmers Market for the use of City-property until December 31, 2025.

BACKGROUND and RECOMMENDATION: This request was discussed at the October 10, 2024 work meeting. The Council was in favor of waiving the fees for reasons discussed at the work meeting.

g. Consider approval of the minutes from the meetings held on September 19, 2024 and October 3, 2024.

h. Consider approval of a Programmatic Agreement between the United States Department of the Interior, Bureau of Land Management Saint George Field Office, and the Utah State of Historic Preservation Officer regarding the Northern Corridor Highway Project.

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BACKGROUND and RECOMMENDATION: This agreement is required under 36 CFR § 800.5 to address adverse effects to Zone 6 of the Red Cliffs National Conservation Area if the Northern Corridor is not built in the current UDOT ROW grant. Staff recommends approval.

Link to presentation from City Manager John Willis: 00:01:54

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Link to requests from Councilmember Larkin and Councilmember Larsen to remove items h and f for discussion: 00:02:15

Link to motion: 00:02:27

MOTION:
A motion was made by Councilmember Larkin to approve the consent calendar, minus items f and h.
SECOND:
The motion was seconded by Councilmember Larsen.
VOTE:
Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

Link to comments from Councilmembers Larsen and Larkin regarding item f: 00:02:42

Link to motion: 00:05:10

MOTION:
A motion was made by Councilmember Larkin to approve item f as presented.
SECOND:
The motion was seconded by Councilmember Kemp.
VOTE:
Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

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Link to discussion between the City Council and Government Affairs Director Shawn Guzman regarding item h: 00:05:30

Link to motion: 00:14:39

MOTION:
A motion was made by Councilmember Larkin to approve item h on the consent calendar as presented.
SECOND:
The motion was seconded by Councilmember Kemp.
VOTE:
Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

PUBLIC HEARING/AMEND FY 2024-2025 BUDGET/RESOLUTION:
Public hearing and consideration of Resolution No. 2024-031R to review and approve amendments to the Fiscal Year 2024-25 Budget.

BACKGROUND and RECOMMENDATION: State statute requires a public hearing when changes are requested to the City's budget. Staff typically bring budget openings forward to the City Council for consideration on a quarterly basis based on changes that occur during the fiscal year. Staff recommends taking public comment and approval of the resolution.

Link to introduction to from City Manager John Willis and presentation from Budget and Financial Planning Director Robert Myers, including comments from Mayor Randall and Councilmember Larsen: 00:14:57

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Link to public hearing; no comments were made: 00:26:32

Link to motion: 00:26:50

MOTION:
A motion was made by Councilmember Kemp to approve Resolution No. 2024-031R as presented by staff.
SECOND:
The motion was seconded by Councilmember Larkin.
VOTE:
Mayor Randall called for a roll call vote, as follows:

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Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

AMEND CITY CODE/ORDINANCE:

Consider approval of Ordinance No. 2024-065 amending a portion of the City Code, Title 10-8C-1, the allowed uses in the Manufacturing Zones. (Case No. 2024-ZRA-016)

BACKGROUND and RECOMMENDATION: This is a request to amend a portion of the City Code, Title 10-8C-1, the allowed uses in the Manufacturing Zones. The applicant would like to use a small portion of their warehousing space for their esthetics, permanent makeup and tattooing. In this amendment city facilities will be moved under Institutional Uses and adding Educational institutions, schools, colleges, learning centers, trade schools, and Religious Facilities as a code clean up item. At their meeting held on September 24, 2024, the Planning Commission held a public hearing and recommended approval with a vote of 4-0; there were no public comments.

Link to introduction to from City Manager John Willis and presentation from Planner Brenda Hatch, including discussion between the City Council and Ms. Hatch: 00:27:16

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Link to motion: 00:32:01

MOTION:

A motion was made by Councilmember Kemp to approve Ordinance No. 2024-065 amending a portion of the City Code, Title 10-8C-1, the allowed uses in the Manufacturing Zones as presented by staff.

SECOND:

The motion was seconded by Councilmember Larsen.

VOTE:

Mayor Randall called for a roll call vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

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INTERFUND LOAN/RESOLUTION:

Consider approval of Resolution No. 2024-032R authorizing an Interfund Loan from the Transportation Improvement Fund (the "TIF") to the Tech Ridge CDA Fund related to the construction of the east access roadway to Tech Ridge.

BACKGROUND and RECOMMENDATION: The City of St. George approved the construction of the East Access Roadway in the Fiscal Year 2024-25 budget and has decided to borrow the funds necessary from the Transportation Improvement Fund for the construction and improvement costs of the Project for term and repayment schedule not to exceed 10 years or at such time the Tech Ridge CDA Fund has money available to pay off the Loan. The FY 2025 Budget was presented in a public hearing on June 13, 2024 and June 20, 2024 and adopted by the City Council on June 20, 2024. These items can be found in the original budget document of FY2024/2025 on pages 37 (PW Capital Projects) and 402 (Transfers).

Link to introduction to from City Manager John Willis and presentation from Budget and Financial Planning Director Robert Myers, including discussion between the City Council and Mr. Myers: 00:32:39

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Link to motion: 00:35:00

MOTION:

A motion was made by Councilmember Larsen to approve Resolution No. 2024-032R authorizing an Interfund Loan from the Transportation Improvement Fund (the "TIF") to the Tech Ridge CDA Fund related to the construction of the east access roadway to Tech Ridge.

SECOND:

The motion was seconded by Councilmember Hughes.

VOTE:

Mayor Randall called for a roll call vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

CREATE TECH RIDGE PUBLIC INFRASTRUCTURE DISTRICT/RESOLUTION:

Consider approval of Resolution No. 2024-033R providing for the creation of the Tech Ridge Public Infrastructure District, and related matters.

BACKGROUND and RECOMMENDATION: This resolution provides for the creation of the Tech Ridge Public Infrastructure District (District); authorizing and approving a Governing Document; approving an Interlocal Agreement; and approving a Notice of

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Impending Boundary Action; delegating certain officers of the City authority to approve and execute the final terms and provisions of the Governing Document, the Interlocal Agreement, the Notice of Impending Boundary Action, and any other documents related to the District; authorizing the District to provide services relating to the financing and construction of public infrastructure to serve the district area; appointing a Board of Trustees for the District; authorizing other documents in connection with the District; and related matters.

Link to introduction to from City Manager John Willis and presentation from Economic Development Director Chad Thomas, including comments from Councilmember Hughes: 00:36:00

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Link to motion: 00:40:50

MOTION:
A motion was made by Councilmember Hughes to approve Resolution No. 2024-033R providing for the creation of the Tech Ridge Public Infrastructure District, and related matters.

SECOND:
The motion was seconded by Councilmember Larkin.

VOTE:
Mayor Randall called for a roll call vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

APPOINTMENTS:

Appointments to Boards and Commissions of the City.

No appointments were made.

REPORTS FROM MAYOR, COUNCILMEMBERS, AND CITY MANAGER:

Link to reports from Councilmember Kemp: 00:41:18

Link to reports from Councilmember Larkin: 00:41:40

Link to reports from Councilmember Hughes: 00:42:15

ADJOURN TO A CLOSED MEETING:

Request a closed meeting to discuss litigation, security, property acquisition or sale or the character and professional competence or physical or mental health of an individual.

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A closed meeting was not held.

ADJOURN TO THE RDA MEETING:

Link to motion: 00:42:40

MOTION:

A motion was made by Councilmember Larkin to adjourn from the City Council meeting and convene in the RDA meeting.

SECOND:

The motion was seconded by Councilmember Kemp.

VOTE:

Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – absent
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

_____
Christina Fernandez, City Recorder

DRAFT

ST. GEORGE CITY COUNCIL MINUTES
SPECIAL MEETING
OCTOBER 31, 2024, 12:00 P.M.
EMERGENCY OPERATIONS CENTER

PRESENT:

Mayor Michele Randall
Councilmember Jimmie Hughes
Councilmember Dannielle Larkin
Councilmember Natalie Larsen
Councilmember Michelle Tanner
Councilmember Steve Kemp

STAFF MEMBERS PRESENT:

City Manager John Willis
City Attorney Ryan Dooley
Deputy City Attorney Jami Brackin
City Recorder Christina Fernandez
Government Affairs Director Shawn Guzman
Assistant City Attorney Alicia Carlton

Mayor Randall called the meeting to order.

ADJOURN TO A CLOSED MEETING:

Request a closed session to discuss litigation, security, property acquisition or sale or the character and professional competence or physical or mental health of an individual.

Link to motion: 00:00:00

MOTION:

A motion was made by Councilmember Larsen to adjourn to a closed meeting to discuss litigation.

SECOND:

The motion was seconded by Councilmember tanner.

VOTE:

Mayor Randall called for a vote, as follows:

Councilmember Hughes – aye
Councilmember Larkin – aye
Councilmember Larsen – aye
Councilmember Tanner – aye
Councilmember Kemp – aye

The vote was unanimous and the motion carried.

The meeting adjourned following the closed meeting.

_____
Christina Fernandez, City Recorder

DRAFT

Agenda Date: 11/07/2024 **Agenda Item Number:** 04

Subject:

Public hearing and consideration of Ordinance 2024-066 to vacate a portion of an existing municipal utility easement located on the eastern boundary of Lots 11 and 30 of the Woodhaven Estates Subdivision.

Item at-a-glance:

Staff Contact: Todd Jaocbsen

Applicant Name: Ryan Lay, Bush and Gudgell

Reference Number: PLANLRE24-036

Address/Location:

Along Crimson Cliffs Way between Ashbury Drive and 2450 South Street

Item History (background/project status/public process):

The final subdivision plat for Woodhaven Estates Subdivision was approved by the Land Use Authority of the 15th day of March, 2023 and recorded in the Office of the Washington County Recorder as Doc. No. 20230008672. This area was part of the original Crimson Cliffs Way right-of-way. The right-of-way was shifted to the east. When the subdivision plat was approved this portion was left out because it was still owned by the City. This item has been cleaned up so now the owners of Lot 11 and Lot 30 want to clean up the layout of the lots and easements to fit the current right-of-way location of Crimson Cliffs Way. The Joint Utility Commission recommended approval.

Staff Narrative (need/purpose):

This area was part of the original Crimson Cliffs Way right-of-way. The right-of-way was shifted to the east. When the subdivision plat was approved this portion was left out because it was still owned by the City. This item has been cleaned up so now they owners of Lot 11 and Lot 30 want to clean up the layout of the lots and easements to fit the current right-of-way location of Crimson Cliffs Way.

Name of Legal Dept approver: Jami Brackin

Budget Impact: No Impact

Recommendation (Include any conditions):

JUC recommends approval.

When Recorded Return To:
City of St. George
City Recorder's Office
175 East 200 North
St. George, UT 84770

ORDINANCE NO. _____

Tax ID: SG-WHES-11, SG-WHES-30

AN ORDINANCE VACATING A PORTION OF A MUNICIPAL UTILITY EASEMENT LOCATED IN THE CITY OF ST. GEORGE, WASHINGTON COUNTY, UTAH
(Located on the eastern boundary of Lots 11 and 30, Woodhaven Estates Subdivision)

WHEREAS, a petition was received by this Council requesting it to vacate a portion of an existing municipal utility easement, located on the eastern boundary of Lots 11 and 30, Woodhaven Estates Subdivision, according to the official plat thereof, on file in the Office of the Washington County Recorder's Office as Doc. No. 20230008672, being more particularly describe and shown in Exhibit A and Exhibit B; and

WHEREAS, the Joint Utility Commission (JUC) has reviewed and recommended approval of the proposed vacation of the easement; and

WHEREAS, it appears that it will not be detrimental to the general public interest, and that there is good cause for vacating the municipal utility easement as described in Exhibit A and Exhibit B.

NOW, THEREFORE, BE IT ORDAINED, by the St. George City Council:

That the municipal utility easement as more particularly described and shown in Exhibit A and Exhibit B, which are incorporated herein, is hereby vacated by the City of St. George.

APPROVED AND ADOPTED by the St. George City Council on this ____ day of _____, 2024. This Ordinance shall become effective upon recording of documents, and upon posting in the manner required by law.

CITY OF ST. GEORGE:

_____
Michele Randall, Mayor

APPROVED AS TO FORM:
City Attorney's Office

_____
Jami Brackin, Deputy City Attorney

ATTEST:

_____
Christina Fernandez, City Recorder

VOTING OF CITY COUNCIL:
Councilmember Hughes _____
Councilmember Larkin _____
Councilmember Larsen _____
Councilmember Tanner _____
Councilmember Kemp _____

Bush and Gudgell, Inc.
Engineers • Planners • Surveyors
St. George, Utah
www.bushandgudgell.com

Exhibit A

Legal Description
Woodhaven Estates Subdivision
Lot 11 & Lot 30 Easement Vacation

Lot 11 Easement Vacation:

Beginning at a point that lies South 88°54'57" East along the section line 1993.09 feet and due North 233.49 feet from the Southwest Corner of Section 2, Township 43 South, Range 15 West, Salt Lake Base and Meridian, and running thence North 00°59'24" East 132.45 feet; thence South 89°06'03" East 21.88 feet; thence South 01°03'32" West 10.00 feet to a point on the east line of Lot 11, Woodhaven Estates Subdivision, according to the official plat thereof, on file in the Office of the Washington County Recorder's Office as Doc. No. 20230008672; thence along said line the following two (2) courses: 1) North 89°06'03" West 11.87 feet and 2) South 00°59'24" West 122.43 feet; thence North 89°12'07" West 10.00 feet to the point of beginning.

Lot 30 Easement Vacation:

Beginning at a point that lies South 88°54'57" East along the section line 1989.75 feet and due North 40.01 feet from the Southwest Corner of Section 2, Township 43 South, Range 15 West, Salt Lake Base and Meridian, and running thence North 00°59'24" East 178.45 feet; thence South 88°57'31" East 10.00 feet to a point on the east line of Lot 30, Woodhaven Estates Subdivision, according to the official plat thereof, on file in the Office of the Washington County Recorder's Office as Doc. No. 20230008672; thence South 00°59'24" West along said line 178.46 feet; thence North 88°54'57" West 10.00 feet to the point of beginning.

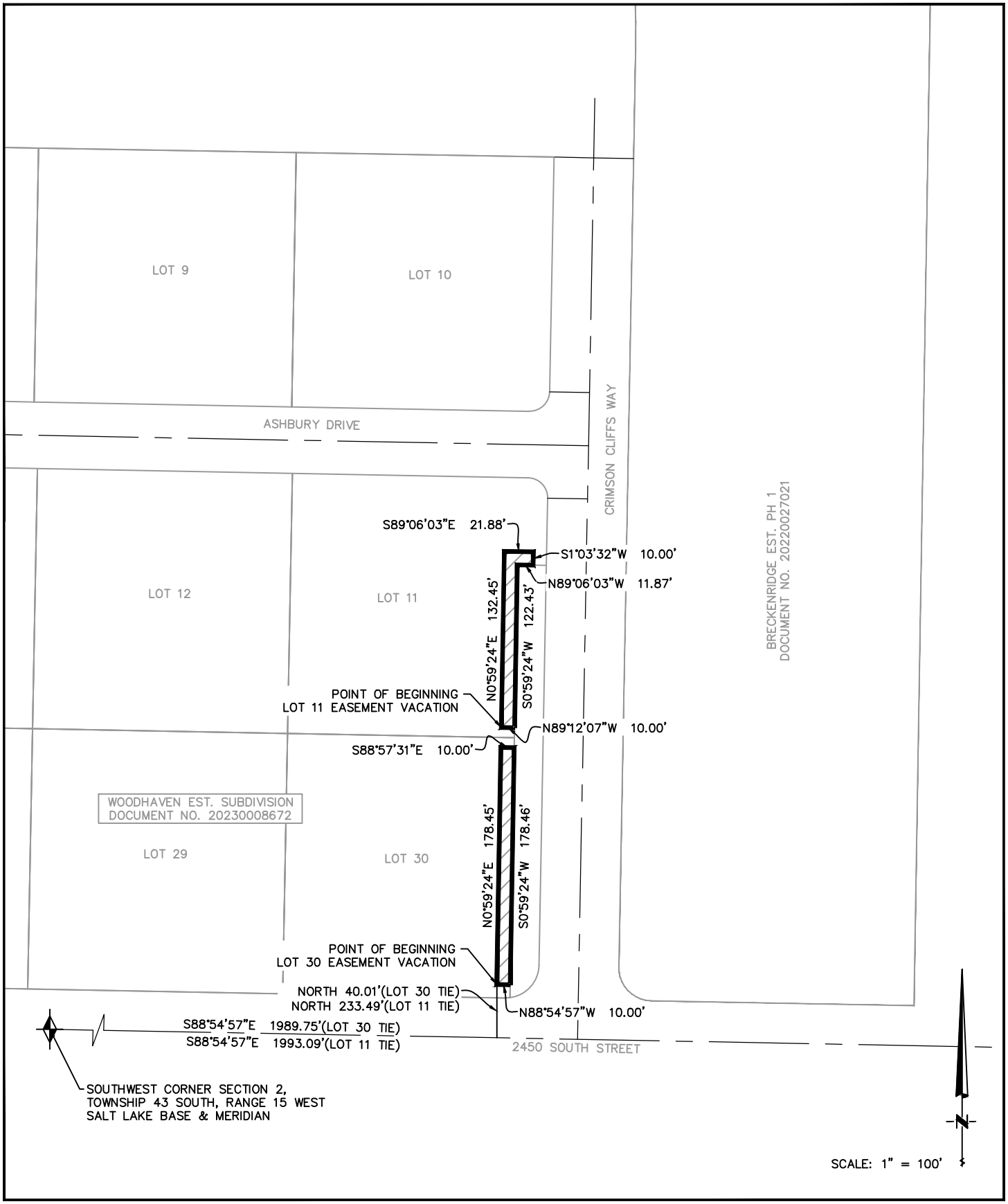


EXHIBIT B

EASEMENT VACATION

B & G 201308

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

St.George
THE BRIGHTER SIDE

Christina Fernandez <christina.fernandez@sgcity.org>

Notice of Public Hearing

1 message

Russ Condie <russc@dixiepower.com> Wed, Oct 30, 2024 at 8:35 AM
To: christina.fernandez@sgcity.org
Cc: Kaydell Whitlock <kaydellw@dixiepower.com>

Good morning Christina,

Dixie Power appreciates receiving the notices for changes to lots and easements. In each of the three submitted notices sent Oct 24th of 2024, Dixie Power has existing utilities within the requested boundaries.

1. Dixie Power should have no objection to remove Lot 21 from the subdivision plat of phase 3 of Ancestor Estates. The Cooperative has power facilities on the existing lot, but easements are not proposed to be removed.
2. Dixie Power has service electrical conductor that feeds power to the existing residence on Lot 12. The power to the home runs within the easement to be removed. With the request for vacation of the public utility easement, Dixie Power will require a recorded easement to maintain electrical service to the residence.
3. Dixie Power has power running along the east boundary of lots 11 and 30 of Woodhaven Estates. We are not certain if the buried underground power lines are within the requested easement to be vacated. Dixie Power approves of this easement vacation if power facilities are outside of the boundary. We are happy to work with the Bush & Gudgell to ensure the power lines remain inside a MUE.

Please let me know if you have any questions or need any follow up information.

Thank you,

Dixie Power Engineering

Russ Condie

Agenda Date: 11/07/2024 **Agenda Item Number:** 05

Subject:

Public Hearing and consideration of Ordinance 2024-067 to vacate a portion of an existing public utility and drainage easement located on the southern boundary of Lot 12 of Ancestor Estates Phase 2.

Item at-a-glance:

Staff Contact: Todd Jacobsen

Applicant Name: Robbie Pope, LR Pope Engineering

Reference Number: PLANLRE24-037

Address/Location:

1357 Sputh 2780 East Street

Item History (background/project status/public process):

The final plat for Ancestor Estates Phase 2 was approved by City Council in the 20th day of June, 2013 and recorded in the Office of the Washington County Recorder on the 12th day of February, 2014 as Doc. No. 20140004192. The owner of Lot 21 in Ancestor Estates Phase 3, a vacant lot, also owns the adjacent Lot 12 in Ancestor Estates Phase 2, where the dwelling unit is located. The owner wishes to merge these two lots into a single lot. Since Lot 21 and Lot 12 are part of different subdivisions, Lot 21 must be removed from its subdivision plat to be incorporated into the Phase 2 subdivision plat. The Joint Utility Commission recommended approval.

Staff Narrative (need/purpose):

The owner of Lot 21 in Ancestor Estates Phase 3, a vacant lot, also owns the adjacent Lot 12 in Ancestor Estates Phase 2, where the dwelling unit is located. The owner wishes to merge these two lots into a single lot. Since Lot 21 and Lot 12 are part of different subdivisions, Lot 21 must be removed from its subdivision plat to be incorporated into the Phase 2 subdivision plat.

Name of Legal Dept approver: Jami Brackin

Budget Impact: No Impact

Recommendation (Include any conditions):

JUC recommends approval.

When Recorded Return To:
City of St. George
City Recorder's Office
175 East 200 North
St. George, UT 84770

ORDINANCE NO. _____

Tax ID: SG-AST-2-12

AN ORDINANCE VACATING A PORTION OF A PUBLIC UTILITY AND DRAINAGE EASEMENT LOCATED IN CITY OF ST. GEORGE, WASHINGTON COUNTY, UTAH
(Located on the southern boundary of Lot 12, Ancestor Estates Phase 2)

WHEREAS, a petition was received by this Council requesting it to vacate a portion of an existing public utility and drainage easement, located on the southern boundary of Lot 12, Ancestor Estates Phase 2, according to the official plat thereof, on file in the Office of the Washington County Recorder's Office as Doc. No. 20140004192, being more particularly describe and shown in Exhibit A and Exhibit B; and

WHEREAS, the Joint Utility Commission (JUC) has reviewed and recommended approval of the proposed vacation of the easement; and

WHEREAS, it appears that it will not be detrimental to the general public interest, and that there is good cause for vacating the public utility and drainage easement as described in Exhibit A and Exhibit B.

NOW, THEREFORE, BE IT ORDAINED, by the St. George City Council:

That the public utility easement as more particularly described and shown in Exhibit A and Exhibit B, which are incorporated herein, is hereby vacated by the City of St. George.

APPROVED AND ADOPTED by the St. George City Council on this ____ day of _____, 2024. This Ordinance shall become effective upon recording of documents, and upon posting in the manner required by law.

CITY OF ST. GEORGE:

_____
Michele Randall, Mayor

APPROVED AS TO FORM:
City Attorney's Office

_____
Jami Brackin, Deputy City Attorney

ATTEST:

_____
Christina Fernandez, City Recorder

VOTING OF CITY COUNCIL:
Councilmember Hughes _____
Councilmember Larkin _____
Councilmember Larsen _____
Councilmember Tanner _____
Councilmember Kemp _____

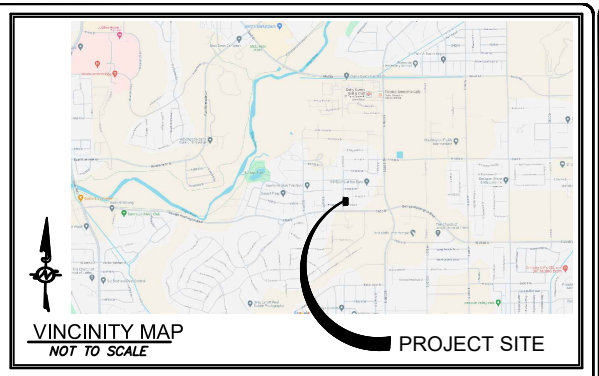
EXHIBIT A

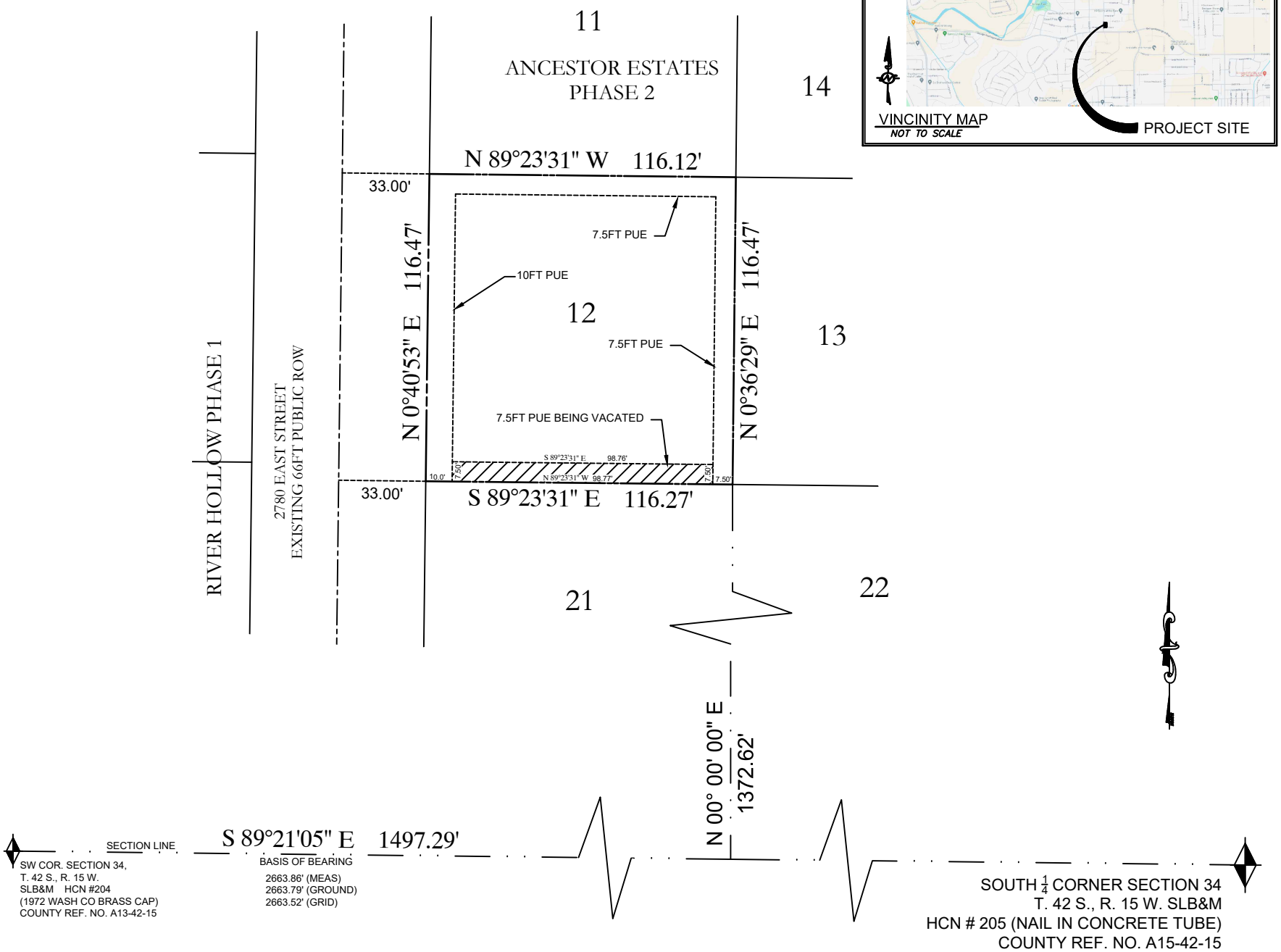
VACATION OF EASEMENT ON LOT 12, ANCESTOR ESTATES PHASE 2

THE EXISTING 7.5 FT WIDE PUBLIC UTILITIES EASEMENT ALONG THE SOUTHERN BOUNDARY OF LOT 12, ANCESTOR ESTATES PHASE 2, ACCORDING TO THE OFFICIAL PLAT THEREOF, ON FILE IN THE OFFICE OF THE WASHINGTON COUNTY RECORDER/S OFFICE AS DOC. NO. 20140004192, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHERN BOUNDARY OF SAID LOT 12, SAID POINT BEING SOUTH 89°21'05" EAST 1497.29 FEET ALONG THE SECTION LINE AND NORTH 1372.62 FEET TO THE SOUTHWEST CORNER OF LOT 13 OF SAID SUBDIVISION AND NORTH 89°19'07" WEST 7.50 FEET FROM THE SOUTHWEST CORNER OF SECTION 34, TOWNSHIP 42 SOUTH, RANGE 15 WEST, SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE NORTH 89°'23'31" WEST 98.77 FEET ALONG THE SOUTHERN BOUNDARY OF LOT 12; THENCE DEPARTING SAID BOUNDARY AND RUNNING NORTH 0°40'53" EAST 7.50 FEET; THENCE SOUTH 89°23'31" EAST 98.76 FEET; THENCE SOUTH 0°36'29" WEST 7.50 FEET TO THE POINT OF BEGINNING.

CONTAINING 741 SQ FT





No.	DATE	BY	APP'D	REVISION DESCRIPTION

L. R. POPE ENGINEERING INC.

EXHIBIT B - VACATE EASEMENT

LOT 12 - ANCESTOR ESTATES PHASE 2

ST GEORGE, UTAH

DRAWN BY: RRP

8/15/2024

NOT TO SCALE

SHEET

1 OF 1

St.George
THE BRIGHTER SIDE

Christina Fernandez <christina.fernandez@sgcity.org>

Notice of Public Hearing

1 message

Russ Condie <russc@dixiepower.com> Wed, Oct 30, 2024 at 8:35 AM
To: christina.fernandez@sgcity.org
Cc: Kaydell Whitlock <kaydellw@dixiepower.com>

Good morning Christina,

Dixie Power appreciates receiving the notices for changes to lots and easements. In each of the three submitted notices sent Oct 24th of 2024, Dixie Power has existing utilities within the requested boundaries.

1. Dixie Power should have no objection to remove Lot 21 from the subdivision plat of phase 3 of Ancestor Estates. The Cooperative has power facilities on the existing lot, but easements are not proposed to be removed.
2. Dixie Power has service electrical conductor that feeds power to the existing residence on Lot 12. The power to the home runs within the easement to be removed. With the request for vacation of the public utility easement, Dixie Power will require a recorded easement to maintain electrical service to the residence.
3. Dixie Power has power running along the east boundary of lots 11 and 30 of Woodhaven Estates. We are not certain if the buried underground power lines are within the requested easement to be vacated. Dixie Power approves of this easement vacation if power facilities are outside of the boundary. We are happy to work with the Bush & Gudgell to ensure the power lines remain inside a MUE.

Please let me know if you have any questions or need any follow up information.

Thank you,

Dixie Power Engineering

Russ Condie

Agenda Date: 11/07/2024 **Agenda Item Number:** 06

Subject:

Public hearing and consideration of Ordinance 2024-068 to vacate Lot 21 from the Ancestor Estates Phase 3 subdivision.

Item at-a-glance:

Staff Contact: Todd Jacobsen

Applicant Name: Robbie Pope, LR Pope Engineering

Reference Number: PLANLRE24-034

Address/Location:

The northeast lot at the intersection of 1400 S ST and 2780 E ST

Item History (background/project status/public process):

The final plat for Ancestor Estates Phase 3 was approved by City Council in the 1st day of June, 2017 and recorded in the Office of the Washington County Recorder on the 26th day of August, 2019 as Doc. No. 20190034341. The owner of Lot 21 in Ancestor Estates Phase 3, a vacant lot, also owns the adjacent Lot 12 in Ancestor Estates Phase 2, where the dwelling unit is located. The owner wishes to merge these two lots into a single lot. Since Lot 21 and Lot 12 are part of different subdivisions, Lot 21 must be removed from its subdivision plat to be incorporated into the Phase 2 subdivision plat. The Joint Utility Commission recommended approval.

Staff Narrative (need/purpose):

The owner of Lot 21 in Ancestor Estates Phase 3, a vacant lot, also owns the adjacent Lot 12 in Ancestor Estates Phase 2, where the dwelling unit is located. The owner wishes to merge these two lots into a single lot. Since Lot 21 and Lot 12 are part of different subdivisions, Lot 21 must be removed from its subdivision plat to be incorporated into the Phase 2 subdivision plat.

Name of Legal Dept approver: Jami Brackin

Budget Impact: No Impact

Recommendation (Include any conditions):

JUC recommends approval.

St.George
THE BRIGHTER SIDE

Christina Fernandez <christina.fernandez@sgcity.org>

Public Hearing November 7, 2024 / Ancestor Estates Lot 21

Scott J <[redacted]> Thu, Nov 7, 2024 at 1:33 PM
To: christina.fernandez@sgcity.org

Hello ,

I am writing in to express my opinion on the consideration of an ordinance to vacate lot 21, Ancestor Estates Phase 3, from the subdivision plot. I am the homeowner of Ancestor Estates Lot 24 and reside on said lot. I am located just down the street from Lot 21. Lot 21 has been vacant for the past 3 plus years. At times this vacant lot has been used as a commercial storage area. I assume it is a landscape commercial business from the plants and other mechanical items stored on lot 21. I further assume that the intended purpose of merging lots 12 and 21 is to make a commercial storage lot for the current owner(s) of lots 12 and 21. I make my assumptions based on the city/landowner not providing any information on what Lot 21 will be used for other than residential development and past observation of items stored on Lot 21 over the last 3 years.

I am AGAINST this consideration based upon the following:

1. This is a residential neighborhood with no commercial storage lots. The lot is very high profile as it is one of the first lots visible when you enter Ancestor Estates. Anything other than a home on this lot is a detriment to the community

2. Lot 21 is a beautiful corner lot in which a beautiful large, new home could be constructed. However the owner has put imitations regarding the certain type of home that could be built on this lot. That is most likely why he has been unable to sell lot 21. The lot has a large For Sale sign on it and it has been clearly visible for over 3 years. A new home on this lot will bring the house values of the entire neighborhood up. A commercial storage lot will bring our home values down.

3. The additional commercial equipment coming in and out of this lot will disrupt our quiet neighborhood and add additional vehicle traffic

4. The commercial storage lot would be a neighborhood eye sore.

In closing, I appreciate the opportunity to voice my opinion on this matter and hope the consideration to remove Lot 21 from the Ancestor Estates Plot Plan is denied.

If I can be of assistance any further please contact me at the below listed information. Thank you

Mr. Scott Jandro
[redacted]

Sent from my iPad

When Recorded Return To:
City of St. George
City Recorder's Office
175 East 200 North
St. George, UT 84770

ORDINANCE NO. _____

Tax ID: SG-AST-3-21

AN ORDINANCE VACATING LOT 21, ANCESTOR ESTATES PHASE 3, FROM THE SUBDIVISION PLAT - LOCATED IN CITY OF ST. GEORGE, WASHINGTON COUNTY, UTAH

(Located in Ancestor Estates Phase 3, according to the official plat thereof, on file in the Office of the Washington County Recorder's Office as Doc. No. 20190034341)

WHEREAS, a petition was received by this Council requesting it to vacate Lot 21, located in the Ancestor Estates Phase 3 subdivision, according to the official plat thereof, on file in the Office of the Washington County Recorder's Office as Doc. No. 20190034341, being more particularly describe and shown in Exhibit A and Exhibit B; and

WHEREAS, the Joint Utility Commission (JUC) recommends approval of the vacation said Lot 21; and

WHEREAS, it is proposed to merge said Lot 21 with Lot 12, Ancestor Estates Phase 2 by subdivision amendment; and

WHEREAS, it appears that it will not be detrimental to the general public interest, and that there is good cause for vacating said Lot 21 as described in Exhibit A and Exhibit B.

NOW, THEREFORE, BE IT ORDAINED, by the St. George City Council:

That Lot 21, Ancestor Estates Phase 3, as more particularly described and in Exhibit A and Exhibit B, which are incorporated herein, is hereby vacated by the City of St. George.

APPROVED AND ADOPTED by the St. George City Council on this ____ day of _____, 2024. This Ordinance shall become effective upon recording of documents, and upon posting in the manner required by law.

CITY OF ST. GEORGE:

_____
Michele Randall, Mayor

APPROVED AS TO FORM:
City Attorney's Office

_____
Jami Brackin, Deputy City Attorney

ATTEST:

_____
Christina Fernandez, City Recorder

VOTING OF CITY COUNCIL:
Councilmember Hughes _____
Councilmember Larkin _____
Councilmember Larsen _____
Councilmember Tanner _____
Councilmember Kemp _____

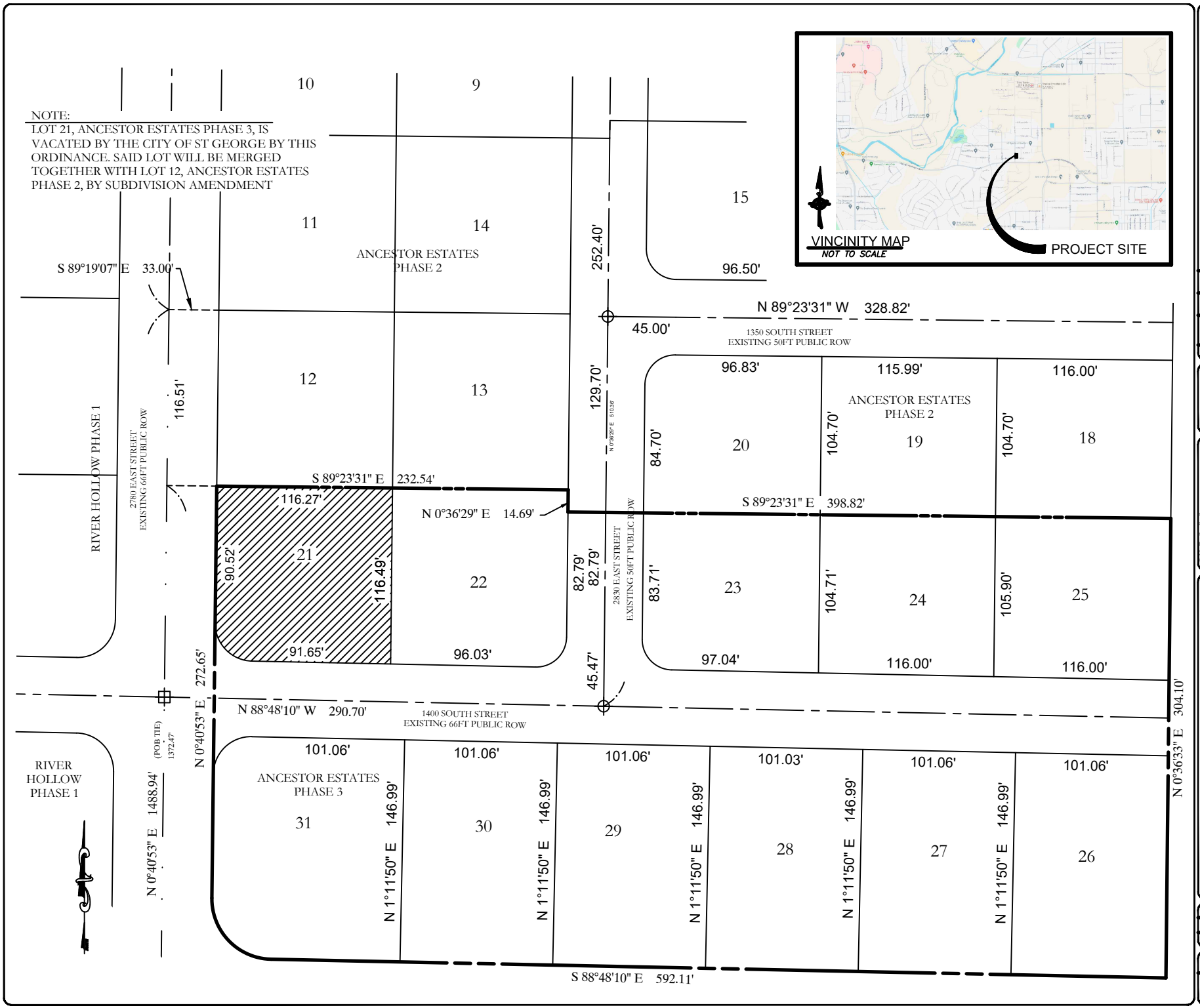
EXHIBIT A

VACATION OF LOT 21, ANCESTOR ESTATES PHASE 3

ALL OF LOT 21, ANCESTOR ESTATES PHASE 3, ACCORDING TO THE OFFICIAL PLAT THEREOF, ON FILE IN THE OFFICE OF THE WASHINGTON COUNTY RECORDER/S OFFICE AS DOC. NO. 20190034341 BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE EASTERLY RIGHT OF WAY OF 2780 EAST STREET, SAID POINT BEING THE SOUTHWEST CORNER OF LOT 12 OF ANCESTOR ESTATES - PHASE 2, SAID POINT ALSO BEING SOUTH 89°21'05" EAST 1331.69 FEET ALONG THE SECTION LINE TO THE 1/16TH CORNER AND NORTH 00°40'53" EAST 1372.47 FEET ALONG THE 1/16TH LINE AND SOUTH 89°19'07" EAST 33.00 FROM THE SOUTHWEST CORNER OF SECTION 34, TOWNSHIP 42 SOUTH, RANGE 15 WEST, SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE SOUTH 89°'23'31" EAST 116.27 FEET TO THE SOUTHWEST CORNER OF LOT 13 OF SAID SUBDIVISION; THENCE SOUTH 0°36'29" WEST 116.49 FEET TO A POINT ON THE NORTHERLY RIGHT OF WAY OF 1400 SOUTH STREET, SAID POINT BEING THE SOUTHWEST CORNER OF LOT 22 OF ANCESTOR ESTATES - PHASE 3; THENCE ALONG SAID RIGHT OF WAY NORTH 88°48'10" WEST 91.65 FEET TO THE POINT OF CURVATURE OF A 25.0 FOOT RADIUS CURVE TO THE RIGHT; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 89°29'03" FOR A DISTANCE OF 39.04 FEET TO A POINT OF TANGENCY, SAID POINT BEING ON THE EASTERLY RIGHT OF WAY OF 2780 EAST; THENCE ALONG SAID RIGHT OF WAY NORTH 0°40'53" EAST 90.52 FEET TO THE POINT OF BEGINNING.

CONTAINING 13,352 SQ FT OR 0.31 ACRES



No.	DATE	BY	APP'D	REVISION DESCRIPTION

L. R. POPE ENGINEERING INC.

EXHIBIT B - VACATE LOT 21
ANCESTOR ESTATES PHASE 3

ST GEORGE, UTAH

DRAWN BY: RRP

8/15/2024

NOT TO SCALE

SHEET
1 OF 1

St.George
THE BRIGHTER SIDE

Christina Fernandez <christina.fernandez@sgcity.org>

Notice of Public Hearing

1 message

Russ Condie <russc@dixiepower.com> Wed, Oct 30, 2024 at 8:35 AM
To: christina.fernandez@sgcity.org
Cc: Kaydell Whitlock <kaydellw@dixiepower.com>

Good morning Christina,

Dixie Power appreciates receiving the notices for changes to lots and easements. In each of the three submitted notices sent Oct 24th of 2024, Dixie Power has existing utilities within the requested boundaries.

1. Dixie Power should have no objection to remove Lot 21 from the subdivision plat of phase 3 of Ancestor Estates. The Cooperative has power facilities on the existing lot, but easements are not proposed to be removed.
2. Dixie Power has service electrical conductor that feeds power to the existing residence on Lot 12. The power to the home runs within the easement to be removed. With the request for vacation of the public utility easement, Dixie Power will require a recorded easement to maintain electrical service to the residence.
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Please let me know if you have any questions or need any follow up information.

Thank you,

Dixie Power Engineering

Russ Condie

Agenda Date: 11/07/2024 **Agenda Item Number:** 07

Subject:

Consider approval of Ordinance No. 2024-069 to amend the City zoning map from A-20 (Agricultural, 20-acre minimum lot size) to PD-R (Planned Development Residential) on approximately 35.16 acres generally located southeast off exit 6 along Southern Parkway at the eastern terminus of Desert Canyons Parkway, with conditions from Planning Commission. (Case No. 2024-ZC-011 - Desert Talus)

Item at-a-glance:

Staff Contact: Brett Hamilton

Applicant Name: DSG Engineering, Inc/Ken Miller

Reference Number: 2024-ZC-011

Address/Location:

southeast of exit 6 along Southern Parkway at the eastern terminus of Desert Canyons Parkway

Item History (background/project status/public process):

On November 7, 2019, the subject site and surrounding acreage was annexed into the City of St. George by City Council approval. At that time, the entire 212.67 acres included as part of the annexation was given a zoning designation of Agriculture (A-20). The applicant is proposing PD-R (Planned Development Residential) zoning. At their meeting held on October 8, 2024, the Planning Commission held a public hearing for the project and recommended approval with a 4-0 vote; there were .

Staff Narrative (need/purpose):

This project, if approved, would consist of 165 single-family units on individual pads with common area between lots. Each unit would be platted to be sold individually. The homes would range in size from 1,815 square feet up to 2,860 square feet, suiting a variety of needs and providing diversity in the housing market. The proposed zone change to PD-R is consistent with the surrounding residential development. The current General Plan land use designation is Medium Density Residential and allows up to 9 units per acre. The proposed project proposes a density of approximately 4.7 units per acre.

Name of Legal Dept approver: Jami Brackin

Budget Impact: No Impact

Recommendation (Include any conditions):

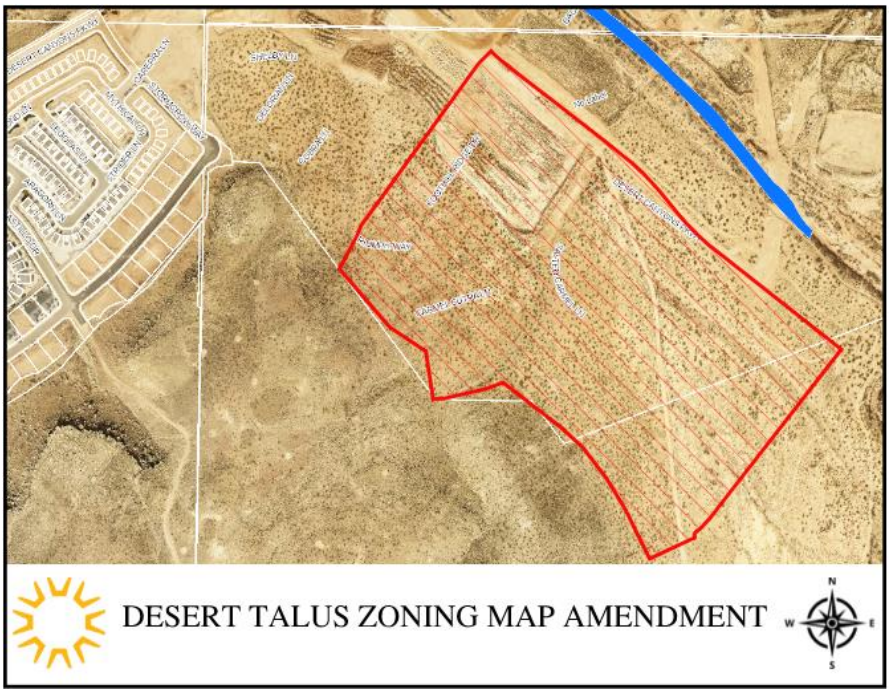
On October 8, 2024, the Planning Commission held a public hearing as part of their review of the Zone Change. They are forwarding a positive recommendation to the City Council for the project with a 4-0 vote with the following conditions: 1) The applicant meets all requirements found in Section 10-7F of the zoning regulations; 2) That a plat is recorded with each phase in compliance with Title 10, chapter 25 of the St. George municipal code; and 3) That there are at least three amenities constructed with the project in compliance with section 10-7F of the zoning regulations. All amenities shall be fully constructed prior to construction of 50% of the total project units.

St.George
Community Development

ITEM ?
Zone Change

PLANNING COMMISSION AGENDA REPORT: **10/8/2024**
CITY COUNCIL AGENDA REPORT: **11/7/2024**

Desert Talus Zone Change (Case No. 2024-ZC-011)		
Request:	Consider a request to amend the City Zoning Map by changing the zone from A-20 (Agricultural, 20-acre minimum lot size) to PD-R (Planned Development Residential) on an approximately 35.16 acre site. The zone change would allow single-family units.	
Applicant:	Desert Canyons Development, Inc.	
Representative:	Curt Gordon	
Location:	The property is generally located on the south side of Desert Canyons Parkway (approximately 4470 East) off Exit 6 of Southern Parkway.	
General Plan:	MDR (Medium Density Residential)	
Existing Zoning:	A-20 (Agricultural, 20-acre minimum lot size)	
Surrounding Zoning:	North	A-20 (Agricultural, 20-acre minimum lot size)
	South	A-20 (Agricultural, 20-acre minimum lot size)
	East	A-20 (Agricultural, 20-acre minimum lot size)
	West	PD-R (Planned Development Residential)
Land Area:	Approximately 35.16 acres	



BACKGROUND:
On November 7, 2019, the subject site and surrounding acreage was annexed into the City of St. George by City Council approval. At that time, the entire 212.67 acres included as part of the annexation was given a zoning designation of Agriculture (A-20) and placed in the Hillside Overlay Zone for all areas with slopes of 20% or greater.

The applicant is proposing PD-R (Planned Development Residential) zoning. This project, if approved, will consist of single-family units on individual pads with common area between lots. Each unit would be platted to be sold individually.

Overall, the development, as proposed, consists of 165 units over 35.16 acres, equating to an overall density of 4.7 units per acre, compliant with the MDR (Medium Density Residential) designation outlined in the general plan which allows up to a maximum of 9 units per acre. The applicant has designed the development in such a way to avoid disturbing slopes of 20% or greater.

At a rate of 200 ft² for each unit, the development is required to have a minimum of 33,000 ft² of amenity space with a minimum of three amenities. The amenity areas total approximately 40,400 ft². As of the time of this staff report, the applicant has not programmed all the park areas but will be required to provide that information at the time of the site plan review. At the main amenity area, there are currently two pickleball courts, a gazebo, and tot-lot proposed.

Please see the all the zoning requirements below:

Zoning Requirements			
Regulation	**Section Number**	**Proposal**	**Staff Comments**
Setbacks	10-7F-5	All setbacks are met and shown on the plan	Front: 25’ to garage, 15’ to home Side: 10’ between pads Rear: 20’ (40’ between pads)
Pedestrian Circulation Plan		Sidewalks are proposed throughout the project site	Staff will review the final site plan to ensure the circulation is adequate.
Height and Elevation	10-7F-5	Two-story homes	The PD-R zone allows for a maximum 40’ height.
Phasing Plan	10-7F-2	Six phases are proposed	Phase 1: 27 units Phase 2: 34 units Phase 3: 20 units Phase 4: 33 units Phase 5: 21 units Phase 6: 30 units

Landscape/ Amenity Plan	10-7F-6	Approximately 40,400 SF of recreation area is proposed, exceeding the required 33,000 SF. The project is required to provide a minimum of three amenities.	Staff will review the final site plan to ensure street trees, amenities, and landscape areas are compliant with code, including completion of all amenities prior to construction of 50% of the total project units.
Utilities	10-7F-2	Water, Irrigation, and sewer are shown on the preliminary plat and are proposed to be underground.	All utilities will be required to be underground, and all transformer equipment must be screened. Staff will ensure this is completed during site plan approval process.
Signs	10-7F-2	No signage has been provided.	The applicant is required to obtain sign permits for proposed signage.
Lighting	10-7F-2	A photometric plan has not been provided.	A photometric plan will be required at time of site plan.
Lot Coverage	10-7F-5	The proposed PD-R zoning allows a maximum lot coverage of 50% and requires a minimum of 30% open space.	Approximately 40% of the project area will be left open space. Approximately 35% of the site is roadways, sidewalks, and other hardscape areas (driveways, guest parking), and building lot coverage is approximately 25%.
Solid Waste	10-7F-2	The site plan does not show the location of solid waste.	There are no common garbage facilities planned for this project.
Overlay Zones	10-13	The property is located in the Hillside Overlay Zone.	A Hillside permit is not required for this project.
Parking	10-19-5	Each unit will have a two-car garage and a 25’ setback for additional driveway parking. Additional parking for guests have been spread throughout the site for a total of 754 parking spaces.	The plan exceeds the required parking for single-family development which requires two parking spaces per unit, one of which must be covered, for a total requirement of 330 parking spaces.

Preliminary Plat:

A preliminary plat was approved at the Planning Commission for this development. The preliminary plat shows the proposed layout of the lots, roads, open space and road cross sections. A condition was placed on the preliminary plat that if this rezone was not approved, the preliminary plat would be considered null and void.

RECOMMENDATION ZONE CHANGE:
The Planning Commission recommends approval of this Zone Change with the following conditions:

1. The applicant meets all requirements found in Section 10-7F of the zoning regulations.
2. That a plat is recorded with each phase in compliance with Title 10, chapter 25 of the St. George municipal code.
3. That there are at least three amenities constructed with the project in compliance with section 10-7F of the zoning regulations. All amenities shall be fully constructed prior to construction of 50% of the total project units.

ALTERNATIVES:
1. Approve as presented.
2. Approve with conditions.
3. Deny the application.
4. Continue the proposed zone change to a later date.

PC RECOMMENDATION:
On October 8, 2024, the Planning Commission held a public hearing to receive public input on the request. No members of the public provided comment, and the Planning Commission voted 4-0 to recommend approval of the application.

POSSIBLE MOTION:
"I move that we approve the Desert Talus zone change request, application number 2024-ZC-011, based on the findings noted in the staff report."

FINDINGS FOR APPROVAL:
1. The proposed zone change meets the requirements of the city ordinance.
2. There will be adequate parking on site to facilitate the development.
3. The overall density of the development does not exceed a maximum of 9 units per acre delineated in the general plan for this area.
4. Approval of the project is in the best interest of the health, safety, and general welfare of the City of St. George.

Exhibit A
Applicant's Narrative

DESERT TALUS – ZONE CHANGE TO PLANNED DEVELOPMENT RESIDENTIAL

Introducing Desert Talus

Desert Talus is a new residential community coming soon to Desert Canyons. Desert Talus will be located just to the east of Desert Reflection, with easy access from Desert Canyons Parkway. This application seeks approval for PD-R zoning.

A variety of homes to choose from

Desert Talus will offer 165 new homes with several different unit types to suit a variety of needs. This variety is in keeping with the nature of development patterns already established at Desert Canyons. The variety in housing types is planned to provide diversity in the market, from mid-level starter homes to move ups.

Land use and phasing

Construction on Desert Talus will happen in six phases. The entire project will encompass 35.16 acres and upon completion, will have a density of 4.69 units per acre.

Fitting into the neighborhood

The area where Desert Talus is being built has a general plan designation as Medium Density Residential allowing up to 8 units per acre. Surrounding existing zoning and development patterns consists of PD-R which is the same zoning sought for Desert Talus.

Circulation and Access

Access to Desert Talus is provided along Desert Canyons Parkway which connects to Interchange #6 of the Sothern Parkway.

Exhibit B
PowerPoint Presentation



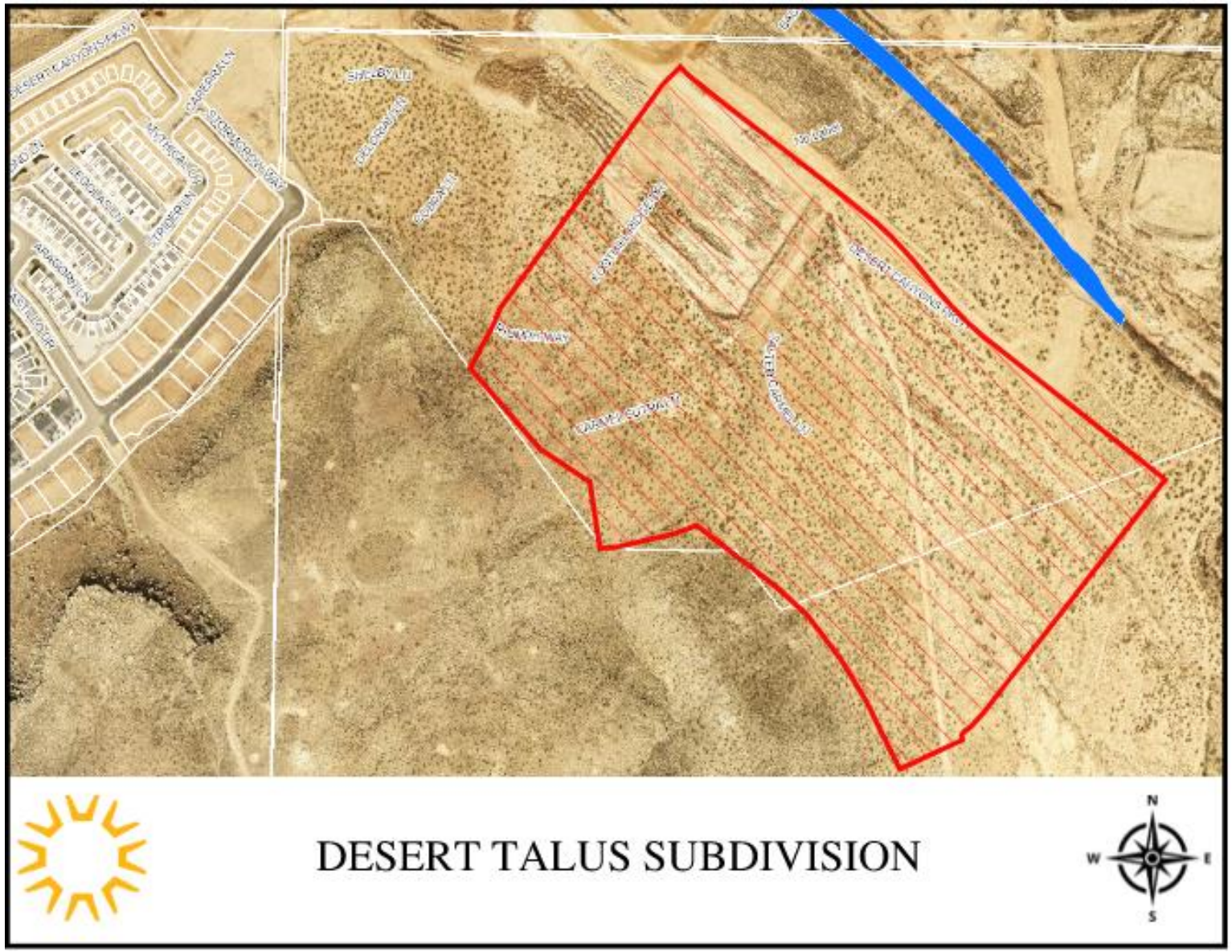
Desert Talus Zone Change

2024-ZC-011

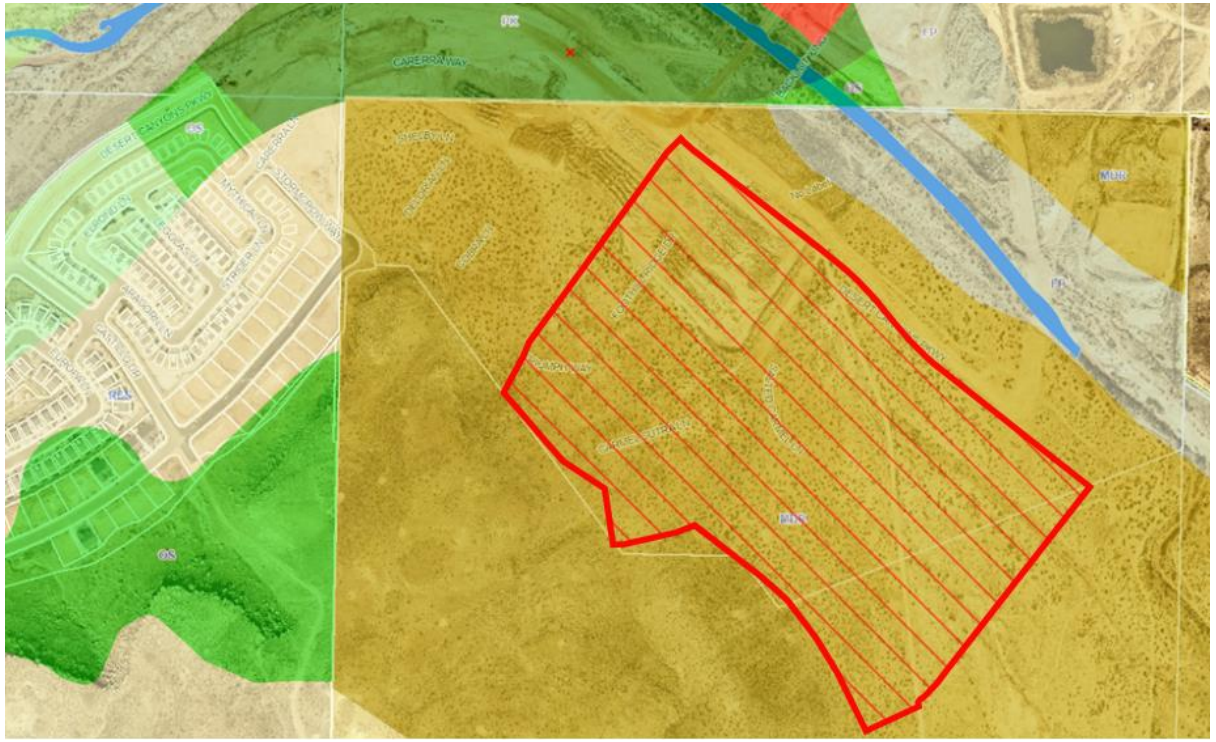
Vicinity Map

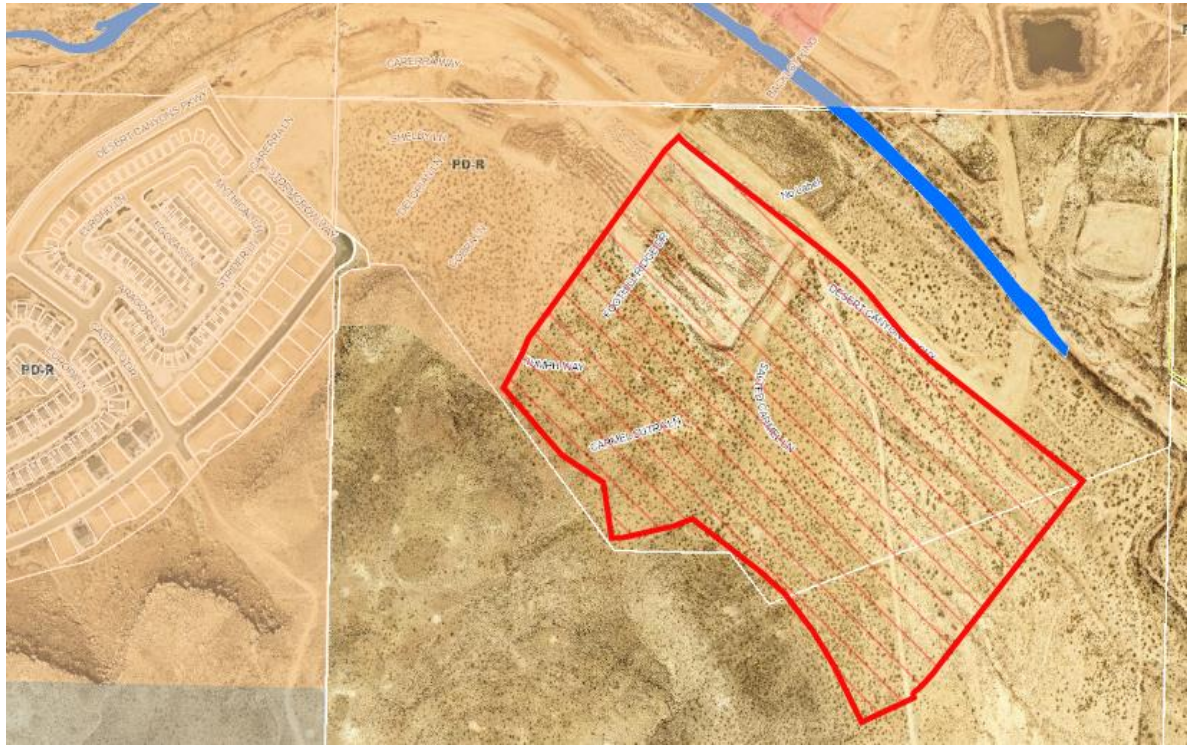


Aerial Map



Land Use Map & Zoning Map

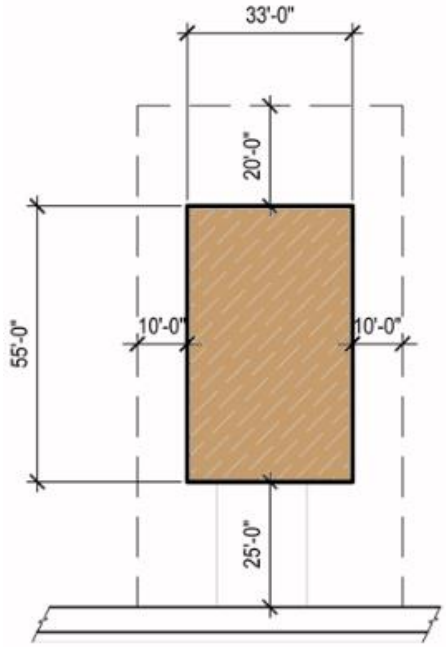


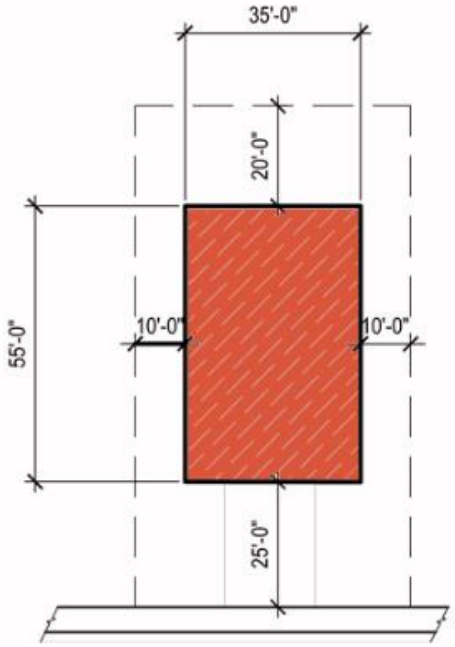


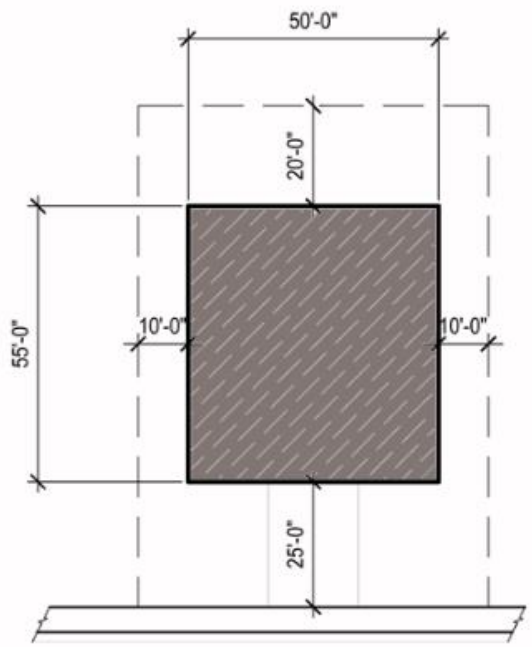
Proposed Layout & Landscaping

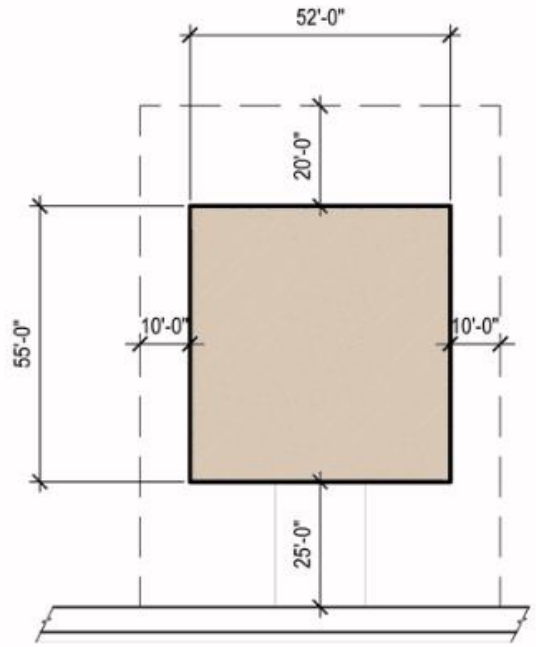


Typical Lot Detail









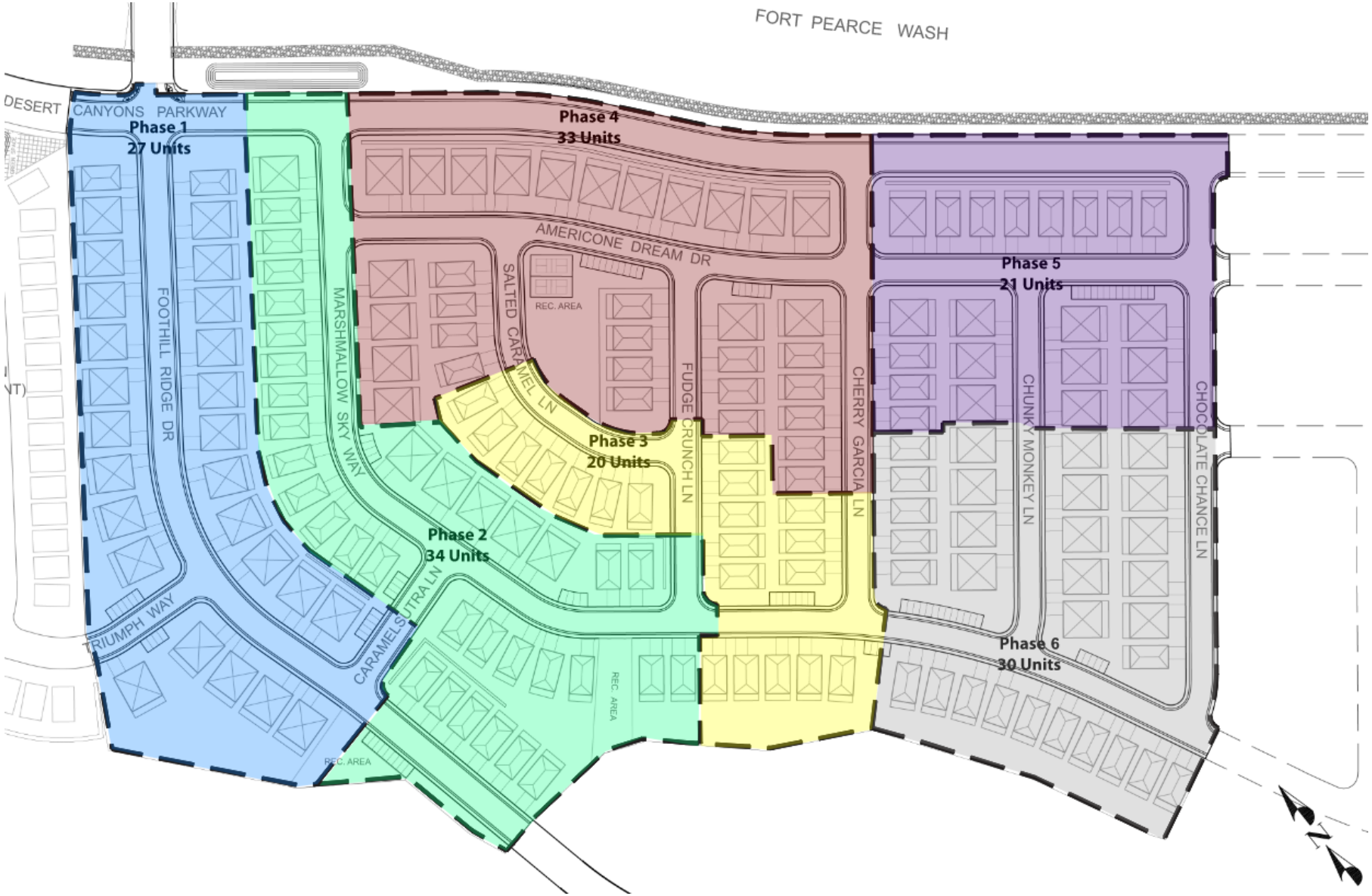
size	1,815 ft^2	1,925 ft^2	2,750 ft^2	2,860 ft^2
quantity	32	63	54	16

Amenities


CANYONS DEVELOPMENT
AMERICONE DREAM DR
SALTED CARAMEL LN
REC AREA
FUDGE CRUNCH LN
CHERRY GARCIA LN
CHUNKY MONKEY LN
CHOCOLATE CHANCE LN
FOOTHILL RIDGE DR
MARSHMALLOW SKY WAY
CARAMELSUTRA LN
TRIUMPH WAY


AMERICONE DREAM
SALTED CARAMEL LN
REC AREA

Phasing


FORT PEARCE WASH
DESERT CANYONS PARKWAY
Phase 1
27 Units
Phase 4
33 Units
AMERICONE DREAM DR
Phase 5
21 Units
FOOTHILL RIDGE DR
MARSHMALLOW SKY WAY
SALTED CARAMEL LN
REC. AREA
FUDGE CRUNCH LN
CHERRY GARCIA LN
CHUNKY MONKEY LN
CHOCOLATE CHANCE LN
Phase 3
20 Units
Phase 2
34 Units
TRIUMPH WAY
CARAMELSUTRA LN
REC. AREA
REC. AREA
Phase 6
30 Units

Elevations





ORDINANCE NO._____

AN ORDINANCE TO CHANGE THE ZONE FROM A-20 (AGRICULTURAL, 20-ACRE MINIMUM LOT SIZE) TO PD-R (PLANNED DEVELOPMENT RESIDENTIAL) ON APPROXIMATELY 35.16 ACRES LOCATED SOUTHEAST OF EXIT 6 ALONG SOUTHERN PARKWAY AT THE EASTERN TERMINUS OF DESERT CANYONS PARKWAY FOR THE PURPOSE OF ALLOWING A 165 UNIT SINGLE-FAMILY RESIDENTIAL DEVELOPMENT TO BE KNOWN AS DESERT TALUS, WITH CONDITIONS FROM PLANNING COMMISSION.

(DESERT TALUS)

WHEREAS, the property owner has requested a zone change from A-20 (Agricultural, 20-acre minimum lot size) to PD-R (Planned Development Residential) on approximately 35.16 acres located east along Desert Canyons Parkway for the purpose of allowing a 165 unit single family residential development: and

WHEREAS, the Planning Commission held a public hearing on the request on October 8, 2024; where the planning commission recommended approval with a vote of 4-0 with the following conditions:

1. The applicant meets all requirements found in Section 10-7F of the zoning regulations.
2. That a plat is recorded with each phase in compliance with Title 10, chapter 25 of the St. George municipal code.
3. That there are at least three amenities constructed with the project in compliance with section 10-7F of the zoning regulations. All amenities shall be fully constructed prior to construction of 50% of the total project units.

WHEREAS, the City Council held a public meeting on this request on November 7, 2024; and

WHEREAS, the City Council has determined that the requested zone change to PD-R is justified at this time, and is in the best interest of the health, safety, and welfare of the citizens of the City of St. George.

NOW, THEREFORE, BE IT ORDAINED, by the St. George City Council, as follows:

Section 1. Repealer. Any provision of the St. George City Code found to be in conflict with this Ordinance is hereby repealed.

Section 2. Adoption. The City Zoning Map shall be amended upon the Effective Date of this Ordinance to reflect the zone change from A-20 (Agricultural, 20-acre minimum lot size) to PD-R (Planned Development Residential). The zone change and location is more specifically described on the attached property legal description, incorporated herein as Exhibit "A," and parcel exhibit, incorporated herein as Exhibit "B." The project must comply with all conditions, requirements, and restrictions as approved by City Council.

Section 3. Severability. If any provision of this Ordinance is declared to be invalid by a court of competent jurisdiction, the remainder shall not be affected thereby.

Section 4. Effective Date. The effective date of the zone change shall be the date of final plat approval, recordation and/or final construction drawing approval.

APPROVED AND ADOPTED by the St. George City Council, this 7th day of November 2024.

ST. GEORGE CITY:

_____
Michele Randall, Mayor

ATTEST:

_____
Christina Fernandez, City Recorder

APPROVED AS TO FORM:
City Attorney's Office

_____
Jami Brackin, Deputy City Attorney

VOTING OF CITY COUNCIL:

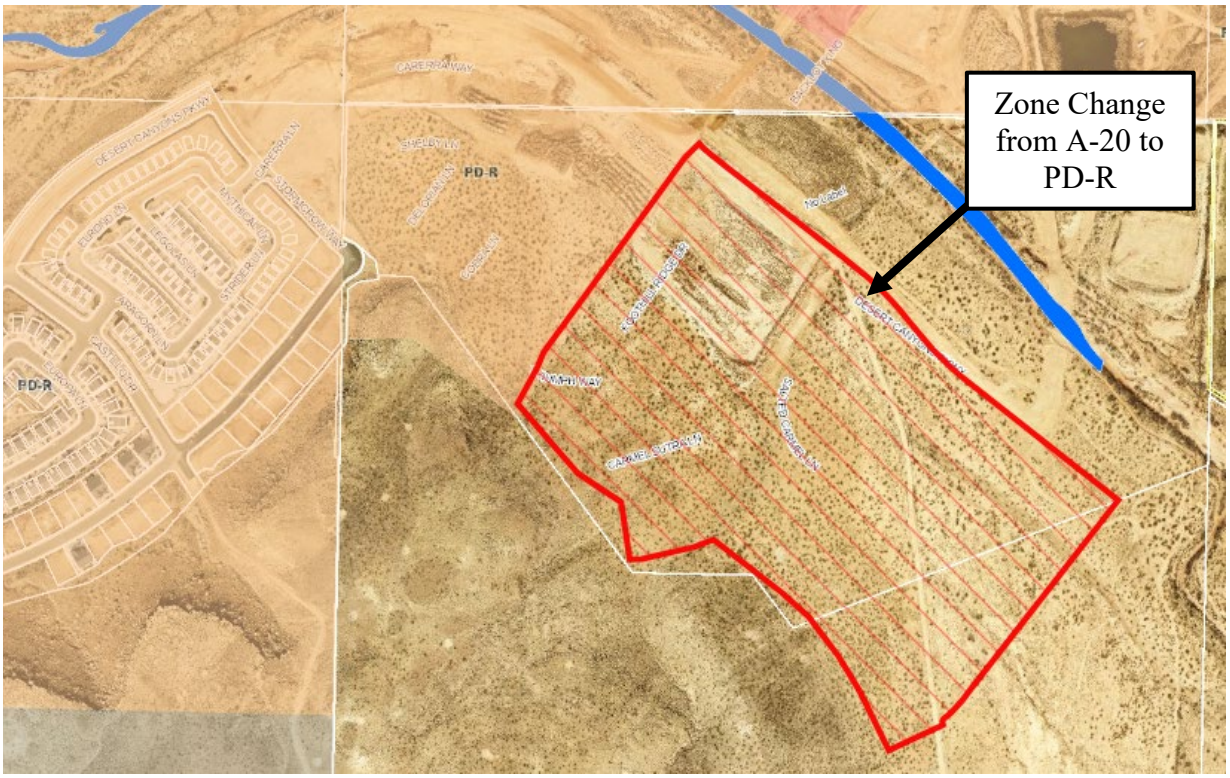
Councilmember Hughes _____
Councilmember Larkin _____
Councilmember Larsen _____
Councilmember Tanner _____
Councilmember Kemp _____

Exhibit “A” – Legal Description

BEGINNING AT A POINT NORTH 01°10’49” EAST ALONG THE SECTION LINE, A DISTANCE OF 1686.837 FEET AND SOUTH 88°49’11” EAST 540.714 FEET FROM THE EAST ONE-QUARTER CORNER OF SECTION 35, TOWNSHIP 43 SOUTH, RANGE 15 WEST, SALT LAKE BASE & MERIDIAN, (BASIS OF BEARING BEING NORTH 01°10'49" EAST ALONG THE EASTERLY SECTION LINE BETWEEN THE EAST ONE-QUARTER CORNER AND THE NORTHEAST CORNER OF SAID SECTION 35), AND RUNNING THENCE NORTH 28°15’44" EAST 125.058 FEET; THENCE NORTH 23°08’04" EAST 45.000 FEET; THENCE NORTH 35°58’06" EAST 714.664 FEET; THENCE NORTH 44°55’53" EAST 60.000 FEET TO A POINT ON THE ARC OF A NON-TANGENT CURVE, (RADIUS POINT BEARS NORTH 44°55’53” EAST); THENCE ALONG THE ARC OF A 568.000 FOOT RADIUS CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 07°03’44", A DISTANCE OF 70.012 FEET; THENCE SOUTH 52°07’52" EAST 522.655 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF A 832.000 FOOT RADIUS CURVE TO THE RIGHT, THROUGH A CENTRAL ANGLE OF 12°16’40", A DISTANCE OF 178.287 FEET; THENCE SOUTH 39°51’12" EAST 124.911 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF A 778.000 FOOT RADIUS CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 11°55’51", A DISTANCE OF 162.003 FEET; THENCE SOUTH 51°47’02" EAST 600.875 FEET; THENCE SOUTH 38°13’17" WEST 60.000 FEET TO A POINT ON THE ARC OF A NON-TANGENT CURVE, (RADIUS POINT BEARS SOUTH 38°12'58" WEST); THENCE ALONG THE ARC OF A 19.000 FOOT RADIUS CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 90°19’16", A DISTANCE OF 29.952 FEET; THENCE NORTH 52°06’18" WEST 1.000 FEET; THENCE SOUTH 37°53’42" WEST 692.649 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF A 172.500 FOOT RADIUS CURVE TO THE RIGHT, THROUGH A CENTRAL ANGLE OF 17°56’16", A DISTANCE OF 54.005 FEET TO A POINT OF REVERSE CURVATURE; THENCE ALONG THE ARC OF A 20.000 FOOT RADIUS CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 81°39’41", A DISTANCE OF 28.505 FEET; THENCE SOUTH 64°10’17" WEST 45.000 FEET; THENCE NORTH 25°49’43" WEST 4.785 FEET; THENCE SOUTH 64°10’17" WEST 131.986 FEET; THENCE NORTH 26°14’39" WEST 199.118 FEET; THENCE NORTH 31°13’53" WEST 125.314 FEET; THENCE NORTH 37°37’59" WEST 138.780 FEET; THENCE NORTH 47°20’06" WEST 107.694 FEET; THENCE NORTH 52°34’32" WEST 148.069 FEET; THENCE NORTH 52°03’22" WEST 109.309 FEET; THENCE SOUTH 69°35’42" WEST 75.691 FEET; THENCE SOUTH 77°43’34" WEST 97.991 FEET; THENCE SOUTH 77°50’57" WEST 50.000 FEET; THENCE SOUTH 88°40’41" WEST 33.697 FEET; THENCE NORTH 12°04’19" WEST 50.393 FEET; THENCE NORTH 06°50’11" WEST 121.540 FEET; THENCE NORTH 56°26’06" WEST 155.009 FEET; THENCE NORTH 40°47’26" WEST 273.256 FEET TO THE POINT OF BEGINNING.

CONTAINS 1,516,859 SQ. FT., (34.822 ACRES)

Exhibit "B" – Parcel Exhibit



Agenda Date: 11/07/2024 **Agenda Item Number:** 08

Subject:

Consider approval of Ordinance No. 2024-070 to amend an approved PD-C (Planned Development Commercial) on approximately 3.44 acres located on the northeast corner of Black Ridge Drive and 250 West, with conditions from the Planning Commission. (Case No. 2024-PDA-020 - Black Ridge Restaurants)

Item at-a-glance:

Staff Contact: Dan Boles

Applicant Name: Adam Allen

Reference Number: 2024-PDA-020

Address/Location:

Northeast corner of Black Ridge Drive and 250 West

Item History (background/project status/public process):

The purpose of the proposed amendment is to allow the construction of a restaurant including a second, future restaurant pad. On October 17, 2019, the City Council approved the site for a hotel to be constructed with a parking garage. Along with the PD amendment approved at the time, a hillside permit was approved. The hillside permit set forth certain conditions including limiting detention on site and the use of a secant wall. With time, the owners of the hotel sought zoning approval to move the hotel across 250 West on the west side of the street, freeing up the subject property. The Hillside Review Board and Planning Commission heard the request for the hillside permit and PD amendment. At their meeting held on October 8, 2024, the Planning Commission held a public hearing and recommended approval with conditions. The vote was 4-0,; there were no public comments.

Staff Narrative (need/purpose):

The applicant is proposing that the site be approved for a restaurant along with a second pad for future construction. The proposal is a steak house to be constructed on the south side of the property. A pad for a future restaurant is planned and shown on the plans but will have to come back in the future for zoning approval for building renderings.

Name of Legal Dept approver: Jami Brackin

Budget Impact: No Impact

Recommendation (Include any conditions):

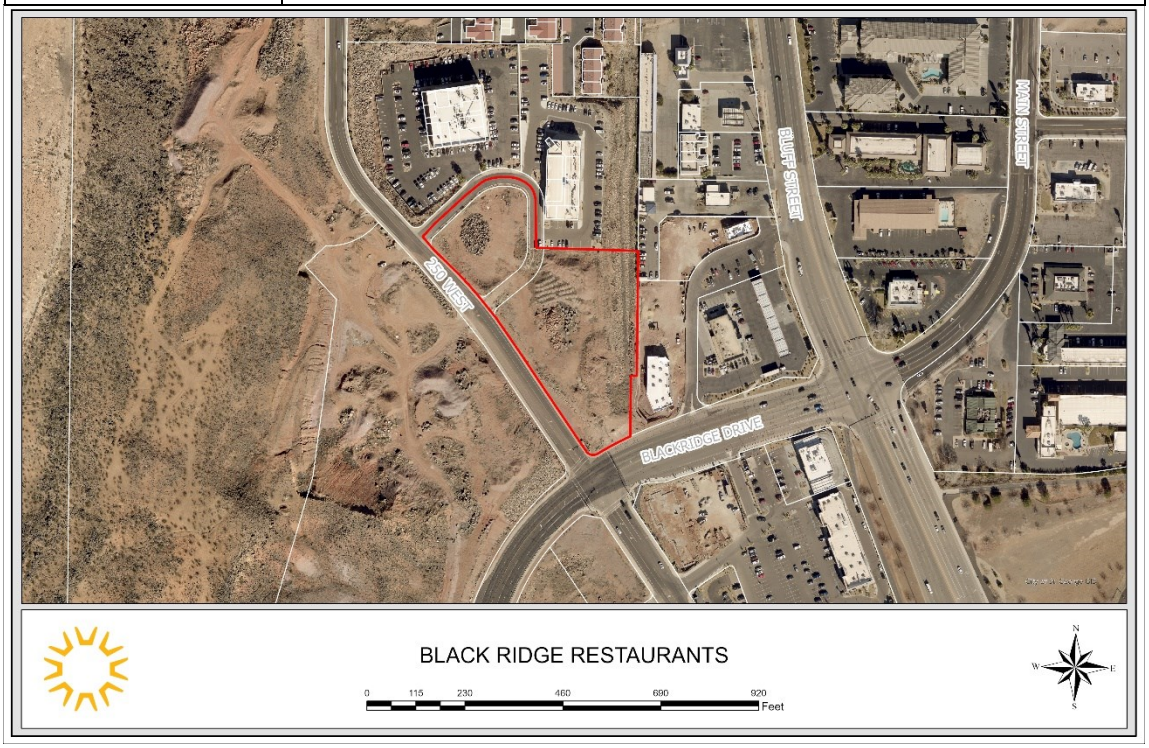
Planning Commission held a public hearing on October 8, 2024. There was no public comment received. Planning Commission recommends approval of the application with a 4-0 vote, in order to amend the PD for the Black Ridge Commercial Center in order to allow construction of a restaurant and a pad for a second future restaurant with the following condition:1.That the existing plat is amended to combine the two lots into one.

St.George
Community Development

Planned Development Amendment

PLANNING COMMISSION AGENDA REPORT: 10/08/2024
CITY COUNCIL AGENDA REPORT: 11/07/2024

Black Ridge Restaurants Planned Development Amendment (Case No. 2024-PDA-020)		
Request:	Consider an amendment of an approved PD-C (Planned Development Commercial) on approximately 3.44 acres, on the north-east corner of Black Ridge Drive and 250 West for the purpose of allowing the construction of a restaurant including a second, future restaurant pad.	
Applicant:	Adam Allen, American Land Consulting, LLC	
Location:	Located on the north-east corner of Black Ridge Drive and 250 West	
General Plan:	DTCC (Downtown Connected Corridor)	
Existing Zoning:	PD-C (Planned Development Commercial)	
Surrounding Zoning:	North	PD-C (Planned Development Commercial)
	South	C-2 (Highway Commercial)
	East	PD-C (Planned Development Commercial)
	West	PD-C (Planned Development Commercial)
Land Area:	Approximately 3.44 acres	



BACKGROUND:
On October 17, 2019, the City Council approved the site for a hotel to be constructed with a parking garage. Along with the PD amendment approved at the time, a hillside permit was approved. The hillside permit set forth certain conditions including limiting detention on site and the use of a secant wall. With time, the owners of the hotel sought zoning approval to move the hotel across 250 West on the west side of the street freeing up the subject property.

The applicant is now proposing that the site be approved for a restaurant along with a second pad for future construction. The proposal is a steak house to be constructed on the south side of the property. A pad for a future restaurant is planned and shown on the plans but will have to come back in the future for zoning approval for building renderings.

Please see the zoning requirement details below:

Zoning Requirements			
Regulation	**Section Number**	**Proposal**	**Staff Comments**
Setbacks		Front: 33’ Front: 122’ Side: N/A	The required setbacks are: Front/ Street Side: 20’ Side / Rear: 0’ and 10’
Uses	10-8D-2	Restaurant	The PD-C allows for restaurant (both sit down and fast food).
Height and Elevation	10-8D-2	Approximate Height: 18’5”	The maximum height allowed in a PD-C is 50’. This proposal meets the regulations.
Landscape Plan	10-8D-2	A conceptual landscape plan has been included.	The plans show a landscape strip along the public right-of-way that will meet or exceed 15’ as required by city code, along with landscaping immediately surrounding the buildings.
Utilities	10-8D-2	None shown	All utilities will be designed during the JUC process. Utilities have previously been discussed with the applicant in pre-application meetings. Staff will ensure this is completed during the site plan approval process.
Signs	10-8D-2	Signage has not been determined.	Any signs will need to meet the sign regulations found in Title 9-13 and will be reviewed at the time of permitting.

Lighting	10-8D-2	A photometric plan has not been submitted.	The lighting will need to be at or below 1.0 foot candles at the property line with dark sky lighting and meet all other site lighting standards.
Solid Waste	10-8D-6	This development shows dumpster locations in the upper parking area.	The applicant may want to consider that the dumpster location be moved closer to the restaurant for convenience. This is not required.
Buffer Protection of Residential Property	10-8D-6	N/A	N/A
Parking	10-19-5	Restaurant: 1 stall: 100 ft² Dining 1 stall: 250 ft² Kitchen	The applicant is planning on construction of all parking stalls for both pads at this time. They are providing enough parking for both pads to meet parking standards for a restaurant use.
EVCS And Bike Parking	10-19-6	None shown	They will be required to have conduit to one parking space for a future EVCS and a bike rack that holds at least two bikes.

RECOMMENDATION:
Planning Commission held a public hearing on October 8, 2024. There was no public comment received. Planning Commission recommends approval of the application in order to amend the PD for the Black Ridge Commercial Center in order to allow construction of a restaurant and a pad for a second future restaurant with the following condition:

1. That the existing plat is amended to combine the two lots into one.

ALTERNATIVES:
1. Approve as presented.
2. Approve with additional conditions.
3. Deny the request.
4. Continue the proposed PD amendment to a later date.

POSSIBLE MOTION:
“I move that we approve the PD amendment for Black Ridge Restaurants as presented, case no. 2024-PDA-020, based on the findings and subject to the conditions listed in the staff report.”

FINDINGS FOR APPROVAL:

1. The proposed uses are permitted uses found in the PD-C zone.
2. The proposed project meets the Planned Development Commercial general requirements found in Section 10-8D-2.
3. Approval of the PD amendment is in the best interest of the health, safety, and welfare of the city of St. George.
4. That the plat needs to be amended to combined the two lots into one.

Exhibit A

Applicant's Narrative

AMERICAN
CONSULTING & ENGINEERING

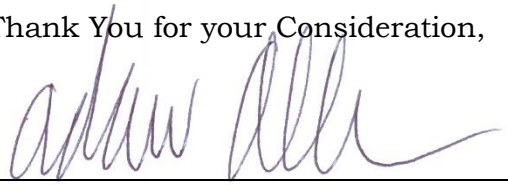
9/14/2024

Re: Black Ridge Restaurants

To whom it may concern,

The purpose of this submittal is to bring forward the details of the proposed Planned Development Amendment for Black Ridge Commercial. This property was previously approved for a Hotel. We are now proposing that we only put 2 Restaurants on this site. Currently we are bringing forward the Full details for the Site, and One of the Restaurants. That will be a Ruths Chris. The Second building will have to be brought forward in a second amendment once a restaurant is selected. We appreciate the opportunity to present you with this amendment.

Thank You for your Consideration,



Adam Allen, Manager – American Consulting and Engineering

Exhibit B

Approved Use List

Blackridge Commercial Center

(250 West, and Blackridge Dr.)

Uses Allowed:
The following uses are allowed:

Altering, pressing and repairing of wearing apparel
Antique, import or souvenir shop
Athletic and sporting goods store, excluding sale or repair of motor vehicles, motor boats or motors
Athletic club
Automobile parts sales (new parts only)
Bakery manufacture limited to goods retailed on premises
Bank or financial institution
Barber shop
Beauty shop
Bed & breakfast
Bookstore, retail
Bowling alley
Café' or cafeteria
Camera store
Candy store, confectionery
Caretaker dwelling for security (UBC Standards only)
Child nursery
Clinics, medical or dental
Clothing and accessory store
Convenience markets
Cycle, boat, sales and service
Dairy produce store
Data processing service and supplies
Delicatessen
Department store
Drapery and curtain store
Drug store
Educational institutions
Electronic equipment, appliances and fixtures sales and service
Employment agency
Fabric and textile store
Film exchange establishment
Florist shop
Fruit store (enclosed)
Furniture sales and repair
Gift store
Government buildings or uses, non-industrial
Grocery store
Hardware stores

Health club
Health food store
Hobby and craft store
Hotel
Household appliance sales and incidental repair
Ice cream parlor
Insurance agency
Interior decorating and design establishment
Jewelry store sales and service
Laboratory, dental or medical
Laundry or dry cleaners, laundromat
Legal office
Library
Locksmith
Medical office
Mortuary
Motel
Museum
Music store
Needlework, embroidery or knitting store
Newsstand
Office supply, office machines sales and service
Optometrist, optician or oculist
Paint or wall paper store
Park or playground
Penny arcade
Pest control and extermination
Pet and pet supply store
Pharmacy
Photographic supplies
Physician or surgeon office and clinic
Popcorn or nut shop
Post office
Professional office
Radio and television sales and service
Real estate agency
Reception center or wedding chapel
Recreation center
Restaurant
Restaurant drive-in
Service station, automobile painting, body and fender and upholstery work
Shoe repair or shoe shine shop
Shoe store
Supermarket
Theater
Toy store, retail

Travel agency
Variety store
Vegetable stand
Wholesale business
Wig sales, retail

Exhibit C

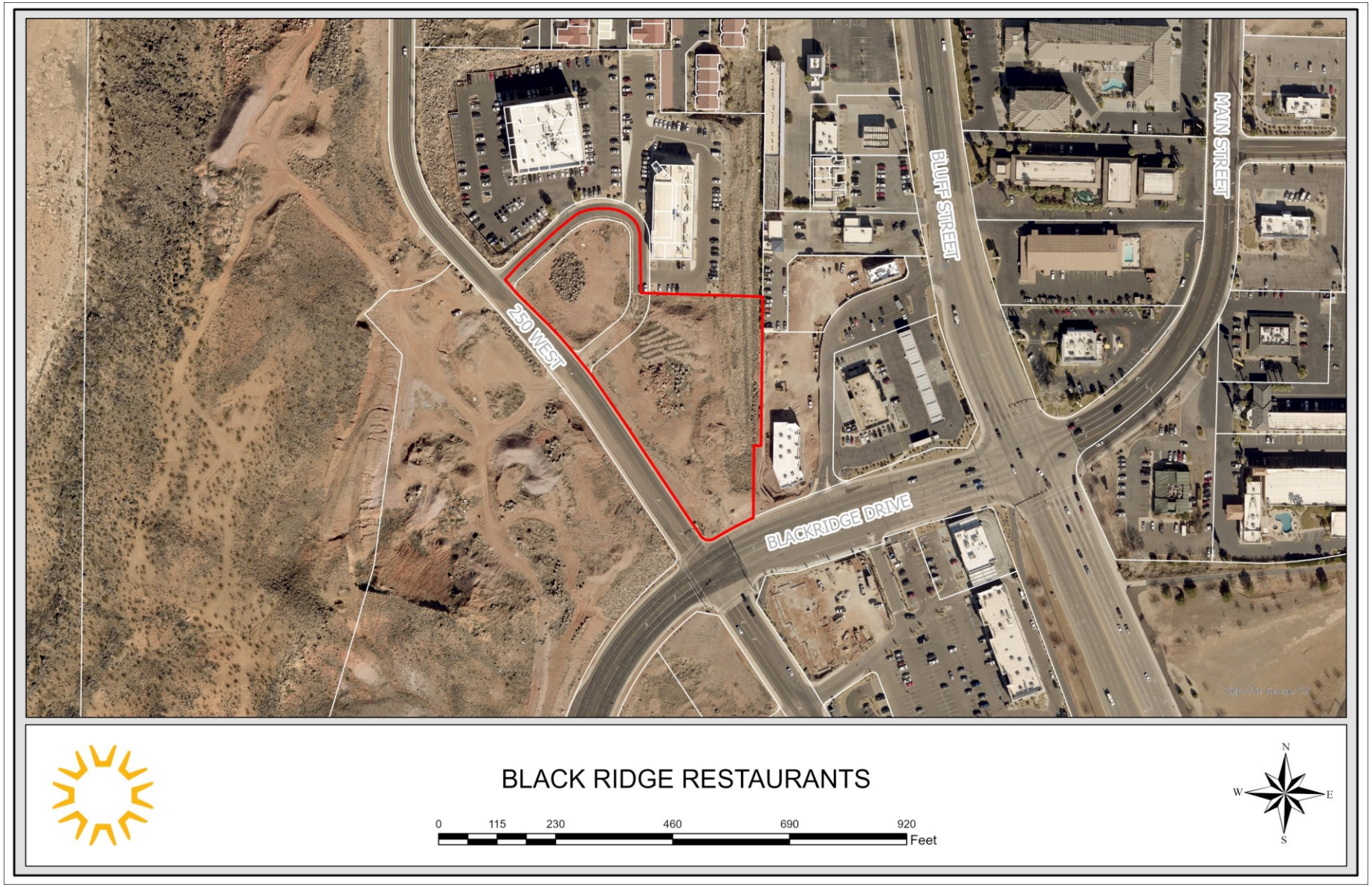
PowerPoint Presentation



Black Ridge Restaurants

2024-PDA-020

Aerial Map


250 WEST
BLACKRIDGE DRIVE
BLUFF STREET
MAIN STREET
BLACK RIDGE RESTAURANTS
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115
230
460
690
920
Feet
N
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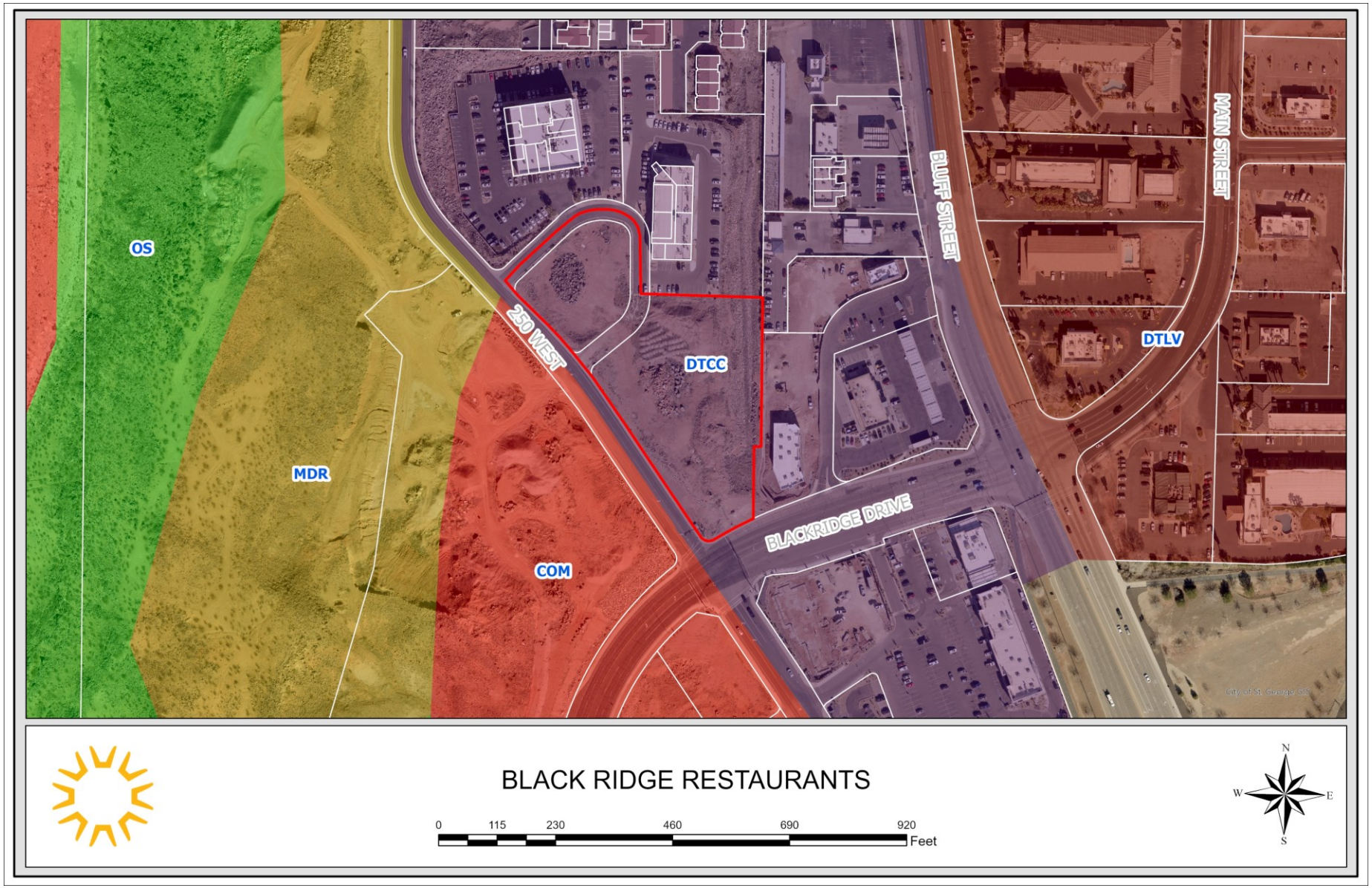
Land Use Map


OS
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MAIN STREET
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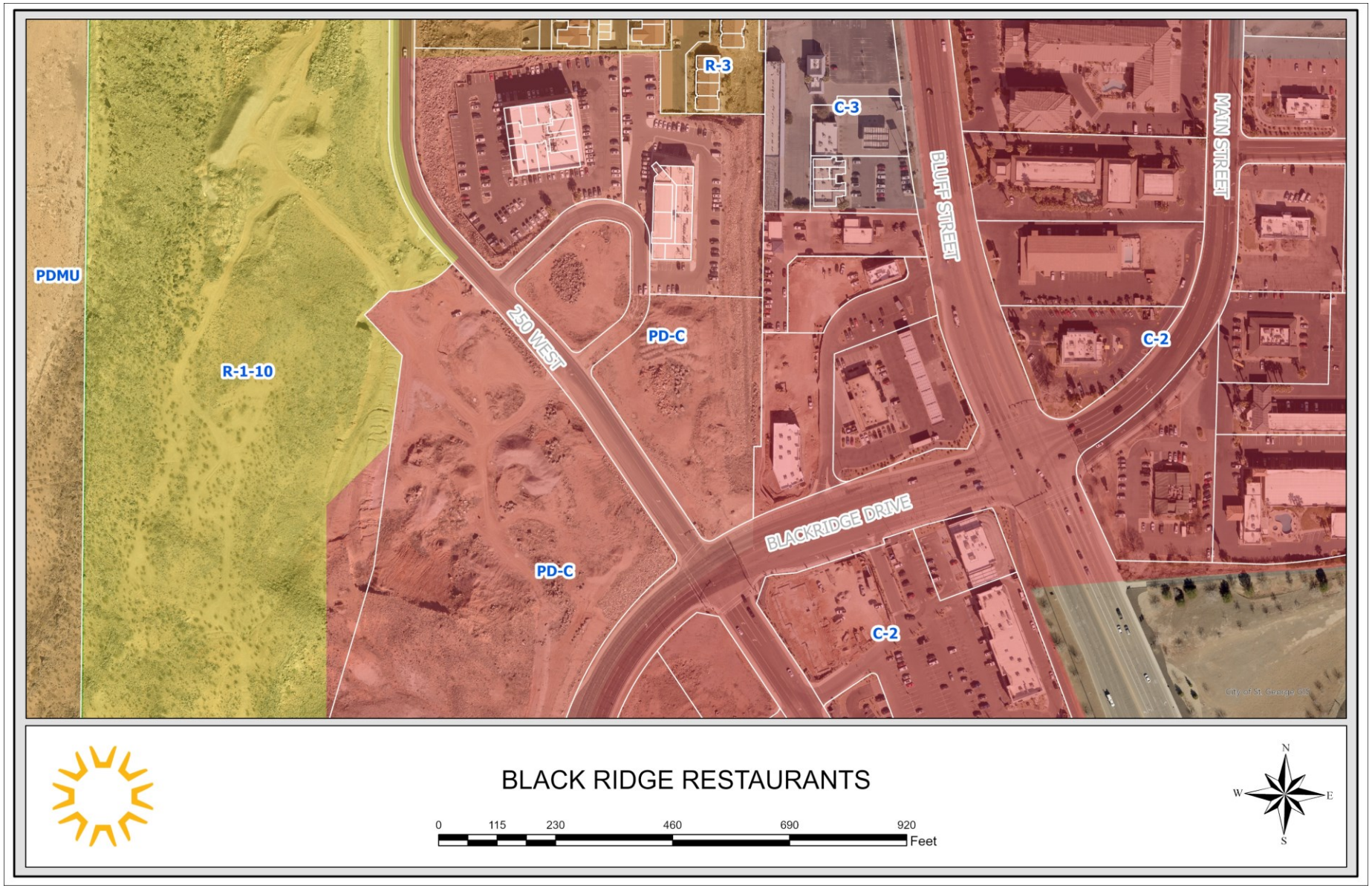
Zoning Map


PDMU
R-1-10
R-3
C-3
PD-C
PD-C
C-2
C-2
250 WEST
BLUFF STREET
MAIN STREET
BLACKRIDGE DRIVE
BLACK RIDGE RESTAURANTS
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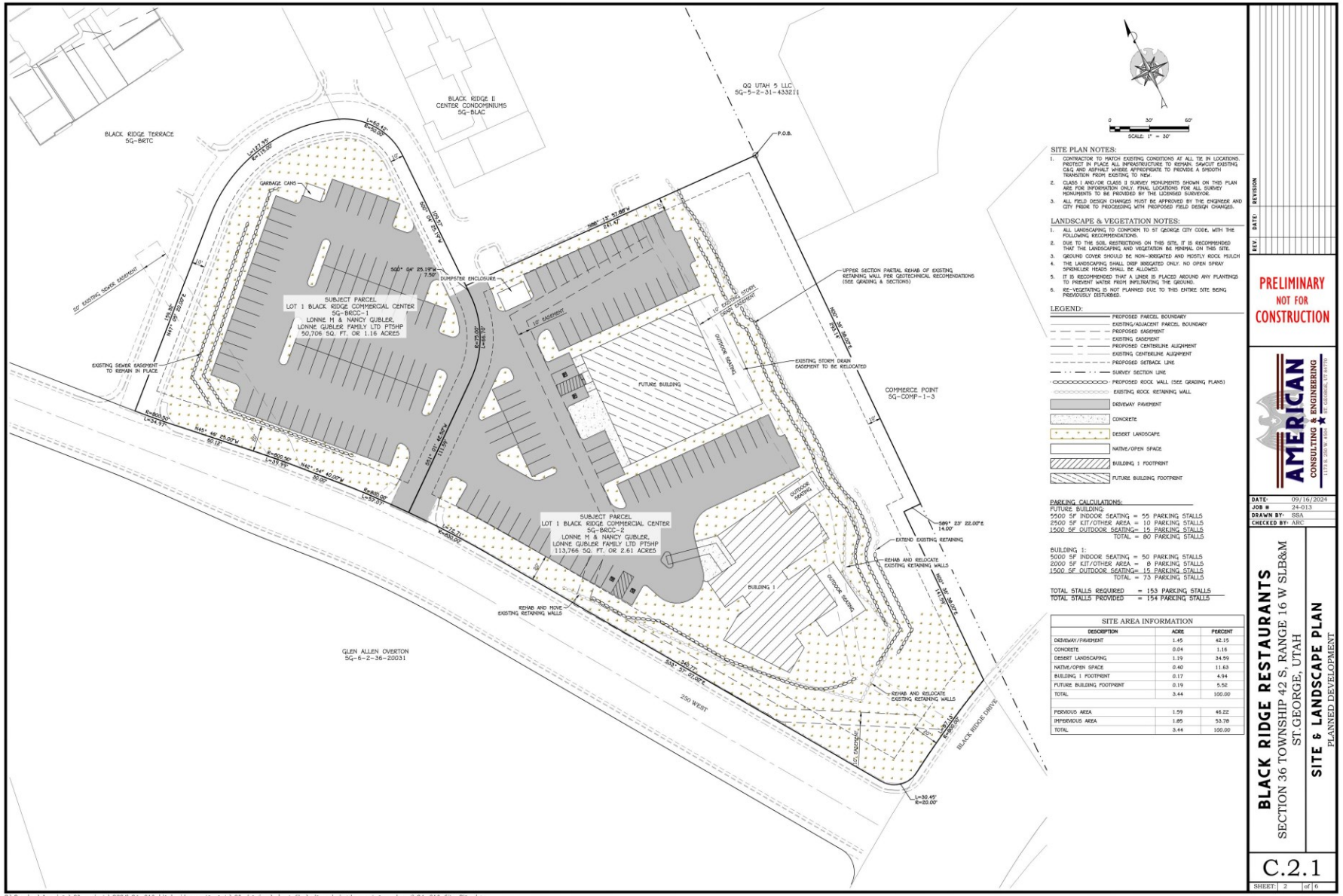
Proposed Site Plan



SITE PLAN NOTES:

1. CONTRACTOR TO MATCH EXISTING CONDITIONS AT ALL TIE IN LOCATIONS. PROTECT IN PLACE ALL INFRASTRUCTURE TO REMAIN. SAWCUT EXISTING C&G AND ASPHALT WHERE APPROPRIATE TO PROVIDE A SMOOTH TRANSITION FROM EXISTING TO NEW.
2. CLASS I AND/OR CLASS II SURVEY MONUMENTS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. FINAL LOCATIONS FOR ALL SURVEY MONUMENTS TO BE PROVIDED BY THE LICENSED SURVEYOR.
3. ALL FIELD DESIGN CHANGES MUST BE APPROVED BY THE ENGINEER AND CITY PRIOR TO PROCEEDING WITH PROPOSED FIELD DESIGN CHANGES.

LANDSCAPE & VEGETATION NOTES:

1. ALL LANDSCAPING TO CONFORM TO ST GEORGE CITY CODE, WITH THE FOLLOWING RECOMMENDATIONS.
2. DUE TO THE SOIL RESTRICTIONS ON THIS SITE, IT IS RECOMMENDED THAT THE LANDSCAPING AND VEGETATION BE MINIMAL ON THIS SITE.
3. GROUND COVER SHOULD BE NON-IRRIGATED AND MOSTLY ROCK MULCH
4. THE LANDSCAPING SHALL DRIP IRRIGATED ONLY. NO OPEN SPRAY SPRINKLER HEADS SHALL BE ALLOWED.
5. IT IS RECOMMENDED THAT A LINER IS PLACED AROUND ANY PLANTINGS TO PREVENT WATER FROM INFILTRATING THE GROUND.
6. RE-VEGETATING IS NOT PLANNED DUE TO THIS ENTIRE SITE BEING PREVIOUSLY DISTURBED.

LEGEND:

- PROPOSED PARCEL BOUNDARY
- EXISTING/ADJACENT PARCEL BOUNDARY
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPOSED CENTERLINE ALIGNMENT
- EXISTING CENTERLINE ALIGNMENT
- PROPOSED SETBACK LINE
- SURVEY SECTION LINE
- PROPOSED ROCK WALL (SEE GRADING PLANS)
- EXISTING ROCK RETAINING WALL
- DRIVEWAY PAVEMENT
- CONCRETE
- DESERT LANDSCAPE
- NATIVE/OPEN SPACE
- BUILDING 1 FOOTPRINT
- FUTURE BUILDING FOOTPRINT

PARKING CALCULATIONS:

FUTURE BUILDING:
5500 SF INDOOR SEATING = 55 PARKING STALLS
2500 SF EIT/OTHER AREA = 10 PARKING STALLS
1500 SF OUTDOOR SEATING= 15 PARKING STALLS
TOTAL = 80 PARKING STALLS

BUILDING 1:
5000 SF INDOOR SEATING = 50 PARKING STALLS
2000 SF EIT/OTHER AREA = 8 PARKING STALLS
1500 SF OUTDOOR SEATING= 15 PARKING STALLS
TOTAL = 73 PARKING STALLS

TOTAL STALLS REQUIRED = 153 PARKING STALLS
TOTAL STALLS PROVIDED = 154 PARKING STALLS

SITE AREA INFORMATION

DESCRIPTION	ACRE	PERCENT
DRIVEWAY/PAVEMENT	1.45	42.15
CONCRETE	0.04	1.16
DESERT LANDSCAPING	1.19	34.59
NATIVE/OPEN SPACE	0.40	11.63
BUILDING 1 FOOTPRINT	0.17	4.94
FUTURE BUILDING FOOTPRINT	0.19	5.52
TOTAL	3.44	100.00
PERVIOUS AREA	1.59	46.22
IMPERVIOUS AREA	1.85	53.78
TOTAL	3.44	100.00

REV: | DATE: | REVISION

PRELIMINARY
NOT FOR CONSTRUCTION

AMERICAN CONSULTING & ENGINEERING
1313 S. 2050 W. #300 ST.GEORGE, UT 84770

DATE: 09/16/2024
JOB #: 24-013
DRAWN BY: SSA
CHECKED BY: ARC

BLACK RIDGE RESTAURANTS
SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

SITE & LANDSCAPE PLAN
PLANNED DEVELOPMENT

C.2.1

SHEET: 2 of 6

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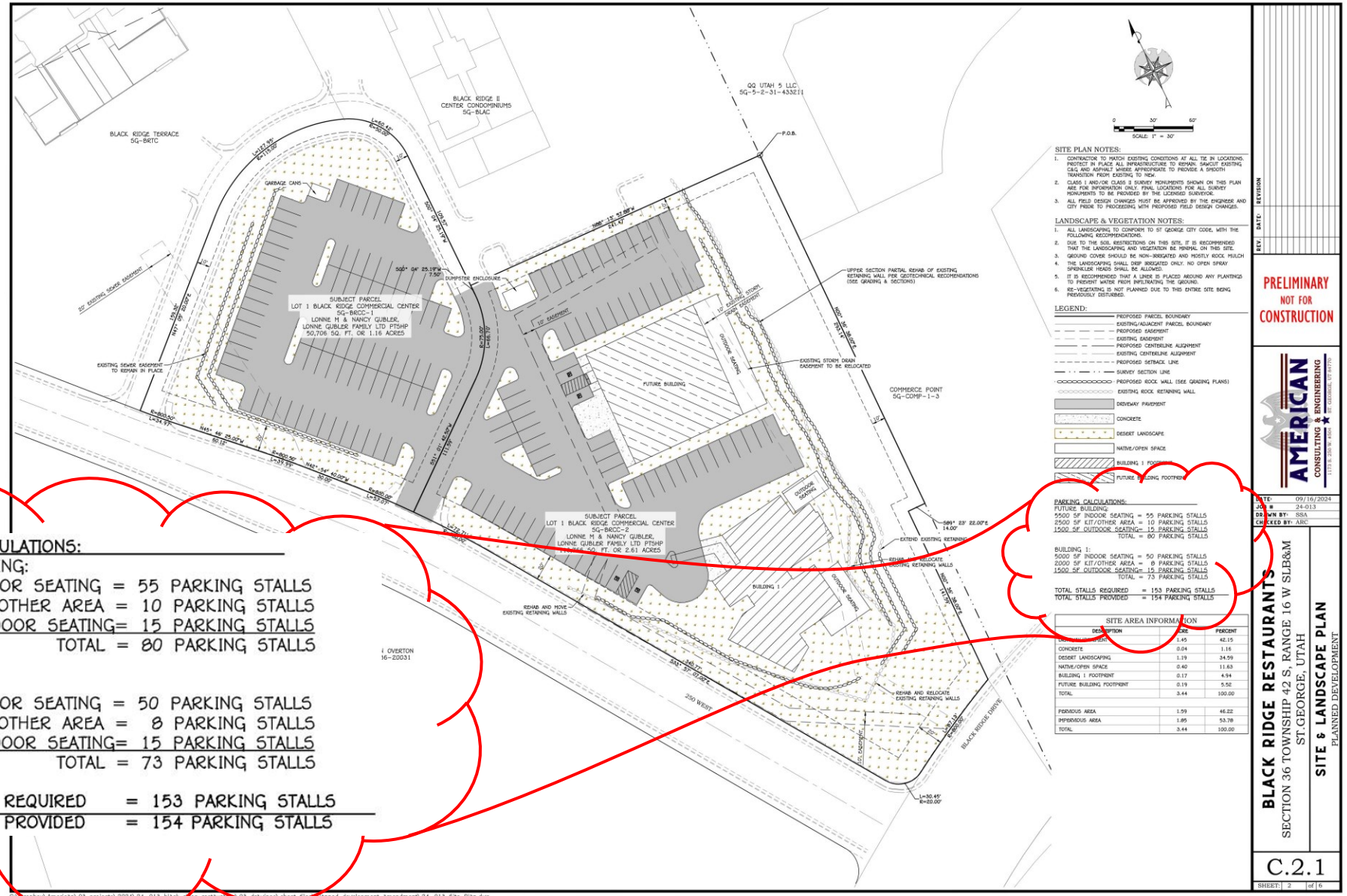
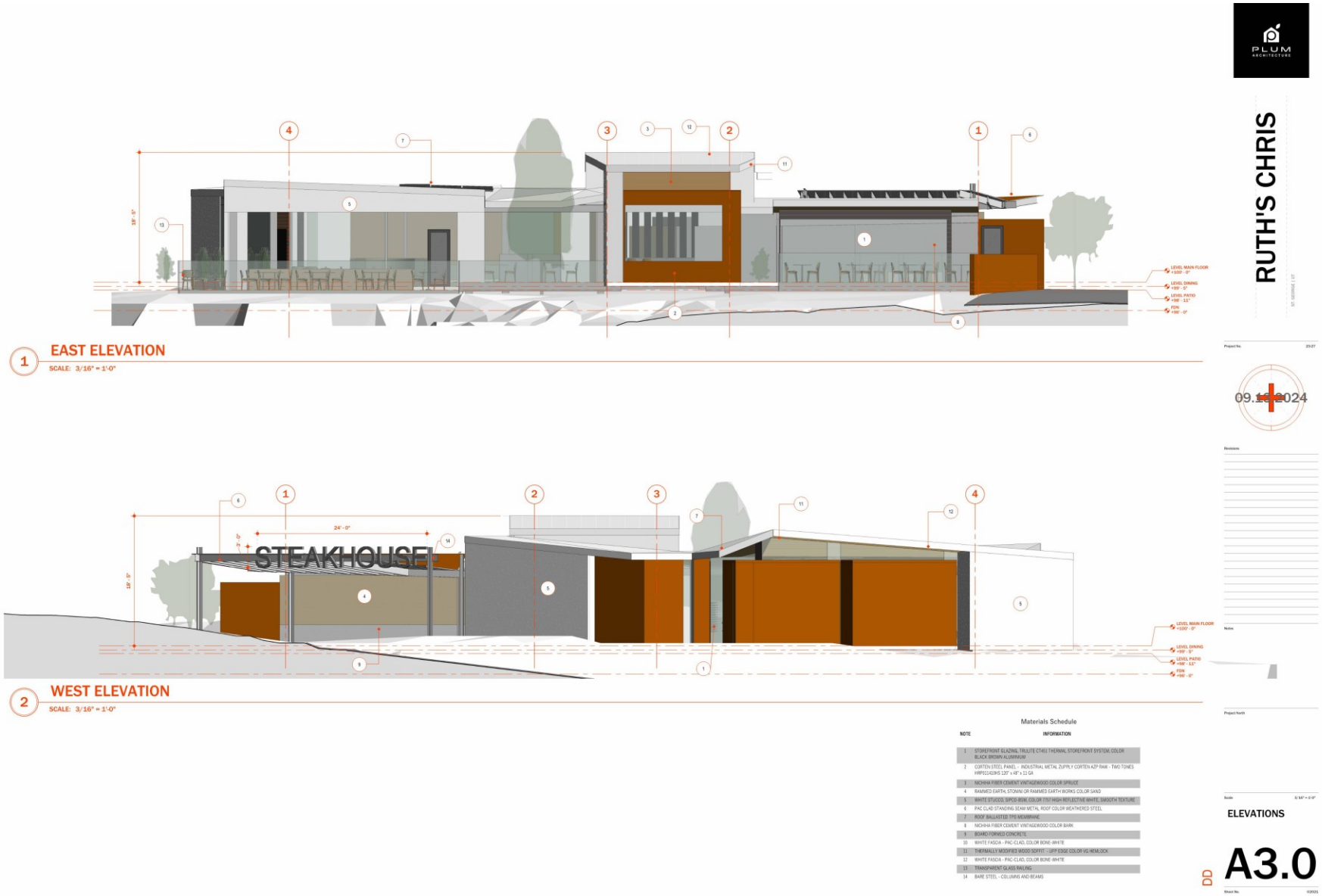
Proposed Site Plan



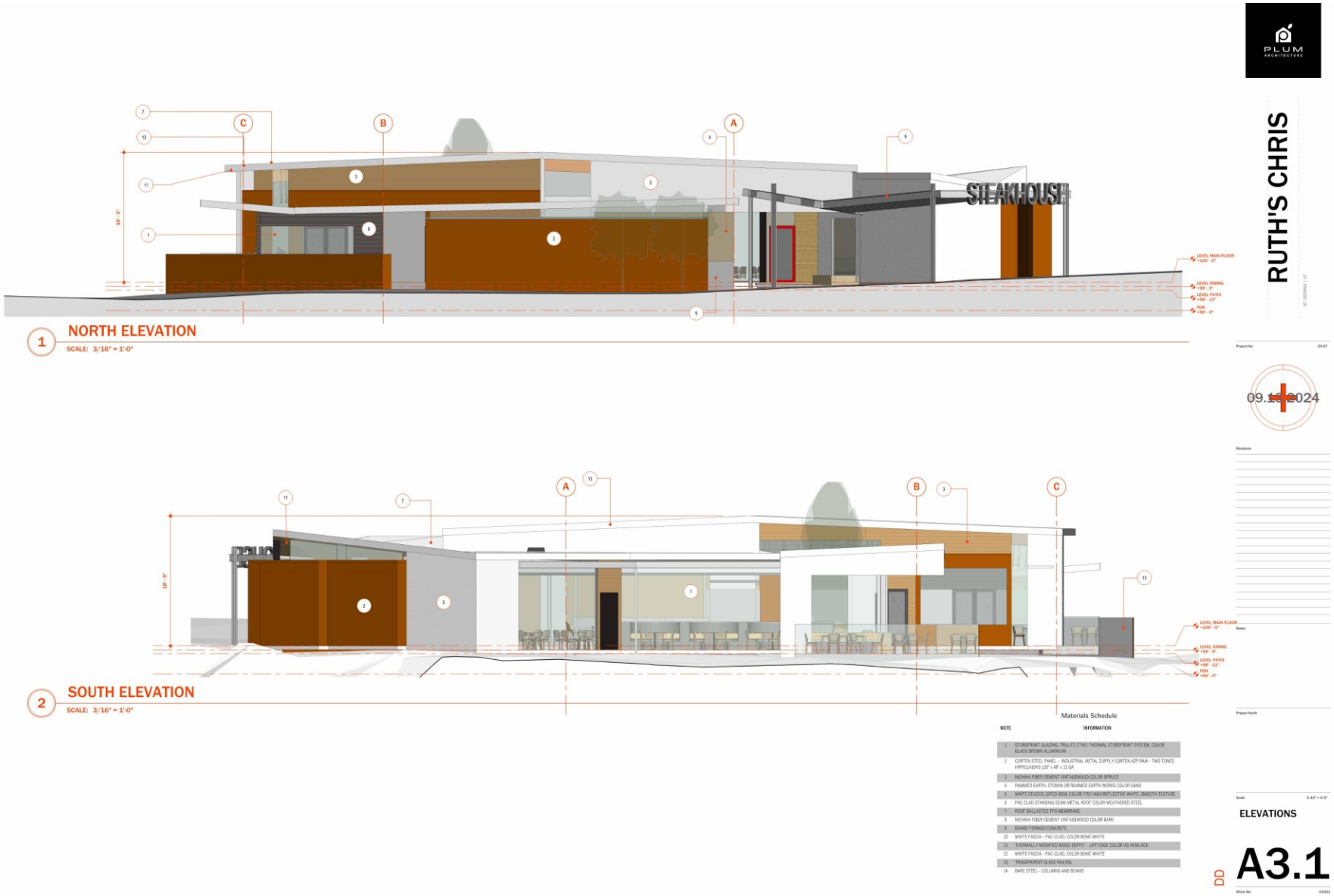
Landscape Plan



Building Elevations



Building Elevations



Building Renderings





PLUM ARCHITECTURE

RUTH'S CHRIS

09.[illegible]2024

PERSPECTIVE

DD A3.4

PLUM ARCHITECTURE

RUTH'S CHRIS

09.[illegible]2024

PERSPECTIVE

DD A3.3

Building Renderings





RUTH'S CHRIS

09.16.2024

PERSPECTIVE

DD A3.6

RUTH'S CHRIS

09.16.2024

PERSPECTIVE

DD A3.5

PDA Condition

1. That the existing plat is amended to combine the two lots into one.

Hillside Conditions

1. That there are special considerations for the drainage and the landscaping.
2. That the drainage pipes would be water-tight that will get reviewed by the City.
3. That the foundation will either be over excavation or deep foundation.
4. That there is installation of a monitoring well, inclinometers, and/or piezometers for monitoring possible movement in the site.
5. That a landscape monitor for leak detection is installed.

ORDINANCE NO._____

AN ORDINANCE AMENDING AN APPROVED PD-C (PLANNED DEVELOPMENT COMMERCIAL) ON APPROXIMATELY 3.44 ACRES, LOCATED ON THE NORTH-EAST CORNER OF BLACK RIDGE DRIVE AND 250 WEST FOR THE PURPOSE OF ALLOWING THE CONSTRUCTION OF A RESTAURANT INCLUDING A SECOND, FUTURE RESTAURANT PAD, WITH CONDITIONS FROM THE PLANNING COMMISSION.

(BLACK RIDGE RESTAURANTS)

WHEREAS, the property owner has requested to amend the PD-C (Planned Development Commercial) on approximately 3.44 acres, located on the north-east corner of Black Ridge Drive and 250 West for the purpose of allowing the construction of a restaurant including a second, future restaurant pad; and

WHEREAS, the City Council held a public meeting on this request on November 7, 2024; and

WHEREAS, the Planning Commission held a public hearing on this request on October 8, 2024, and recommended approval with a 4-0 vote with the following condition:

1. That the existing plat is amended to combine the two lots into one.

WHEREAS, the City Council has determined that the requested change to the Planned Development is justified at this time, and is in the best interest of the health, safety, and welfare of the citizens of the City of St. George.

NOW, THEREFORE, BE IT ORDAINED, by the St. George City Council, as follows:

Section 1. Repealer. Any provision of the St. George City Code found to be in conflict with this Ordinance is hereby repealed.

Section 2. Enactment. The approved planned development within the PD-C Zone for the property described in Exhibit “A”, shall be amended upon the Effective Date of this Ordinance to reflect the approval of an additional building as shown in Exhibit “C”. The planned development amendment and location is more specifically described on the attached property legal description, incorporated herein as Exhibit “A”, and parcel exhibit, incorporated herein as Exhibit “B”.

Section 3. Severability. If any provision of this Ordinance is declared to be invalid by a court of competent jurisdiction, the remainder shall not be affected thereby.

Section 4. Effective Date. This Ordinance shall take effect immediately on the date executed below, and upon posting in the manner required by law.

APPROVED AND ADOPTED by the St. George City Council, this 7th day of November 2024.

CITY OF ST. GEORGE:

_____
Michele Randall, Mayor

ATTEST:

_____
Christina Fernandez, City Recorder

APPROVED AS TO FORM:

City Attorney's Office

_____
Jami Brackin, Deputy City Attorney

VOTING OF CITY COUNCIL:

Councilmember Hughes _____
Councilmember Larkin _____
Councilmember Larsen _____
Councilmember Tanner _____
Councilmember Kemp _____

Exhibit “A” – Legal Description

Parcel 1:

All of Lot 1, Black Ridge Commercial Center, as recorded in the Washington County Recorder’s Office, as document number 20060040997.

Parcel 2:

All of Lot 2, Black Ridge Commercial Center, as recorded in the Washington County Recorder’s Office, as document number 20060040997.

Exhibit “B” – Parcel Exhibit

Location of the Black Ridge Restaurants Planned Development Amendment

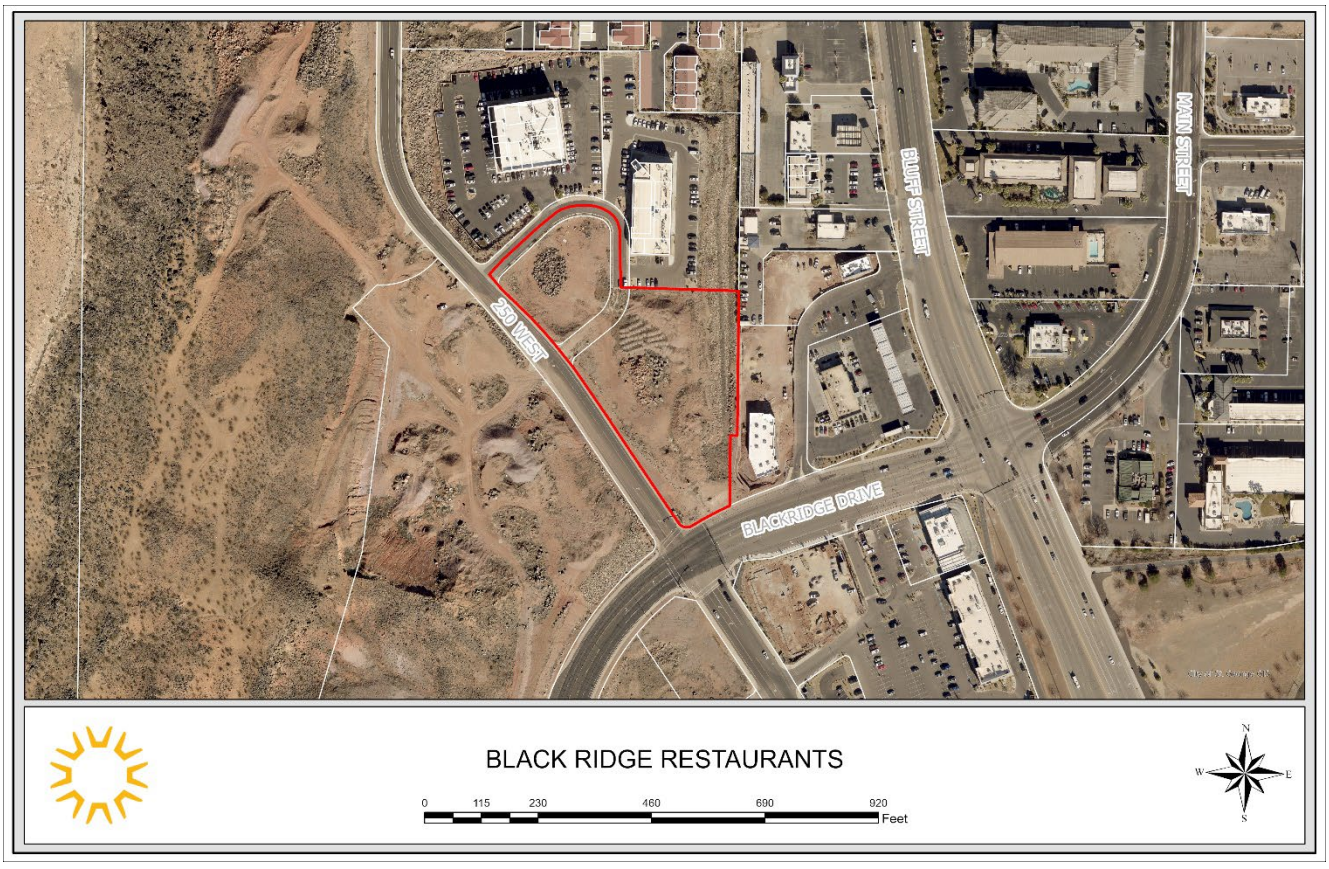
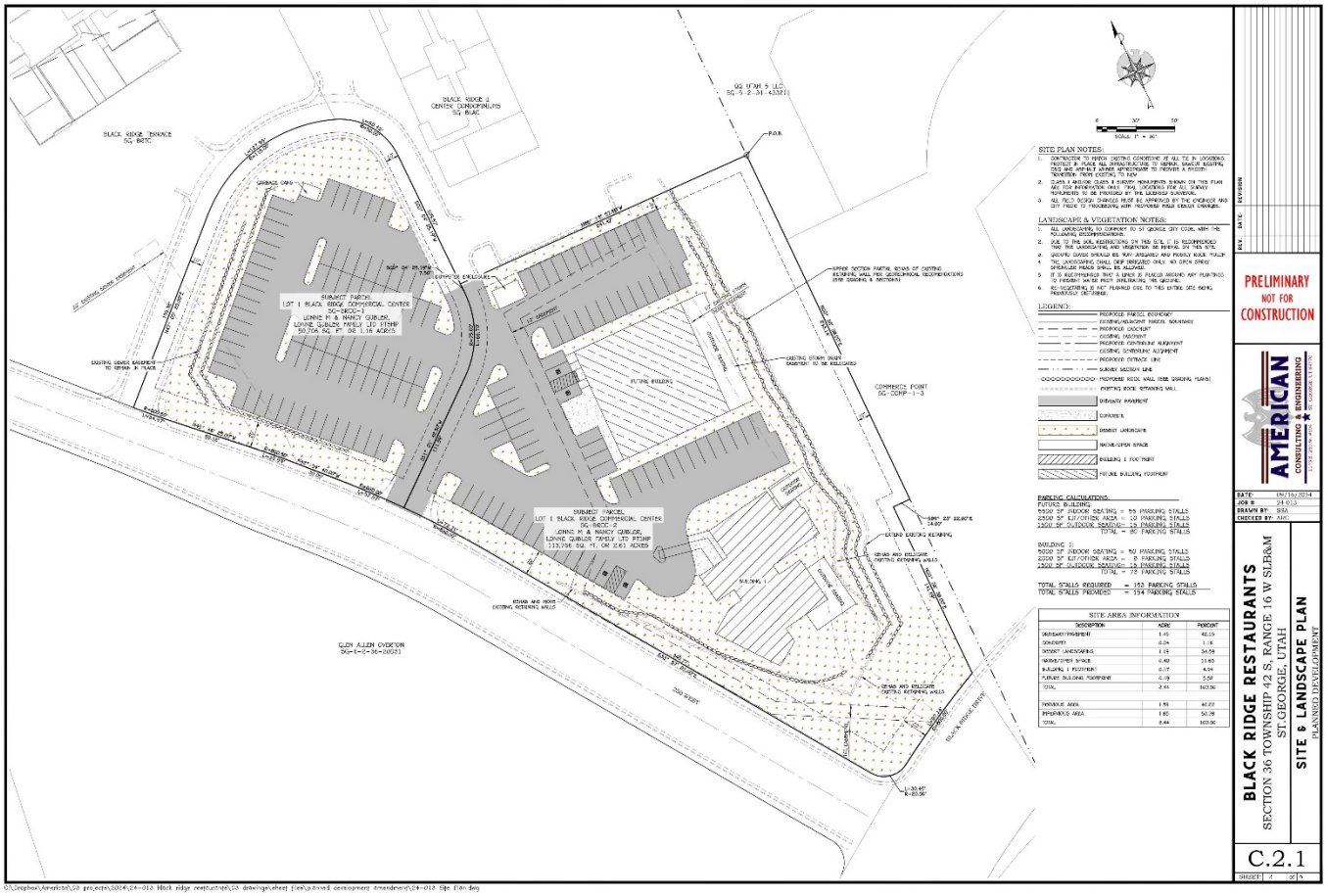


Exhibit “C” – Site Plan



Agenda Date: 11/07/2024 **Agenda Item Number:** 9

Subject:

Consider approval of a hillside development permit on approximately 3.77 acres located on the northeast corner of Black Ridge Drive and 250 West, with conditions from the Planning Commission. (Case No. 2024-HS-011 - Black Ridge Restaurants)

Item at-a-glance:

Staff Contact: Dan Boles

Applicant Name: Adam Allen

Reference Number: 2024-HS-011

Address/Location:

North-east corner of Black Ridge Drive & 250 West

Item History (background/project status/public process):

The purpose of this item is to allow construction of a restaurant and future restaurant pad. In 2019, the subject property was approved for a hotel with conditions. In 2021, the hotel moved across the street onto a different site leaving this site open for a new development. The applicant has now applied for a hillside permit and PD amendment to allow the construction of a restaurant, leaving a pad for a future restaurant as well. The Hillside Review Board recommended approval of the hillside permit with conditions. The Planning Commission unanimously recommends approval (4-0) with the conditions proposed by the Hillside Review Board.

Staff Narrative (need/purpose):

This particular request needs to address, 1) slopes that are in excess of 40% on the site. It appears that some of those slopes were created by piling dirt and other materials on the site through the years. 2) Landscaping on the site. The previously approved hotel required limiting the landscaping quantities and types in order to contain the water on site and limit the amount of water that accumulated in soil. The HRB and PC proposed conditions that will help mitigate those issues. 3) The property is in a designated landslide area identified by the Utah Geological Society (UGS). Due to the less impactful nature of these buildings combined with reduction of water and landscaping on the site, the HRB and PC felt that the conditions proposed would mitigate those issues as well.

Name of Legal Dept approver: Jami Brackin

Budget Impact: No Impact

Recommendation (Include any conditions):

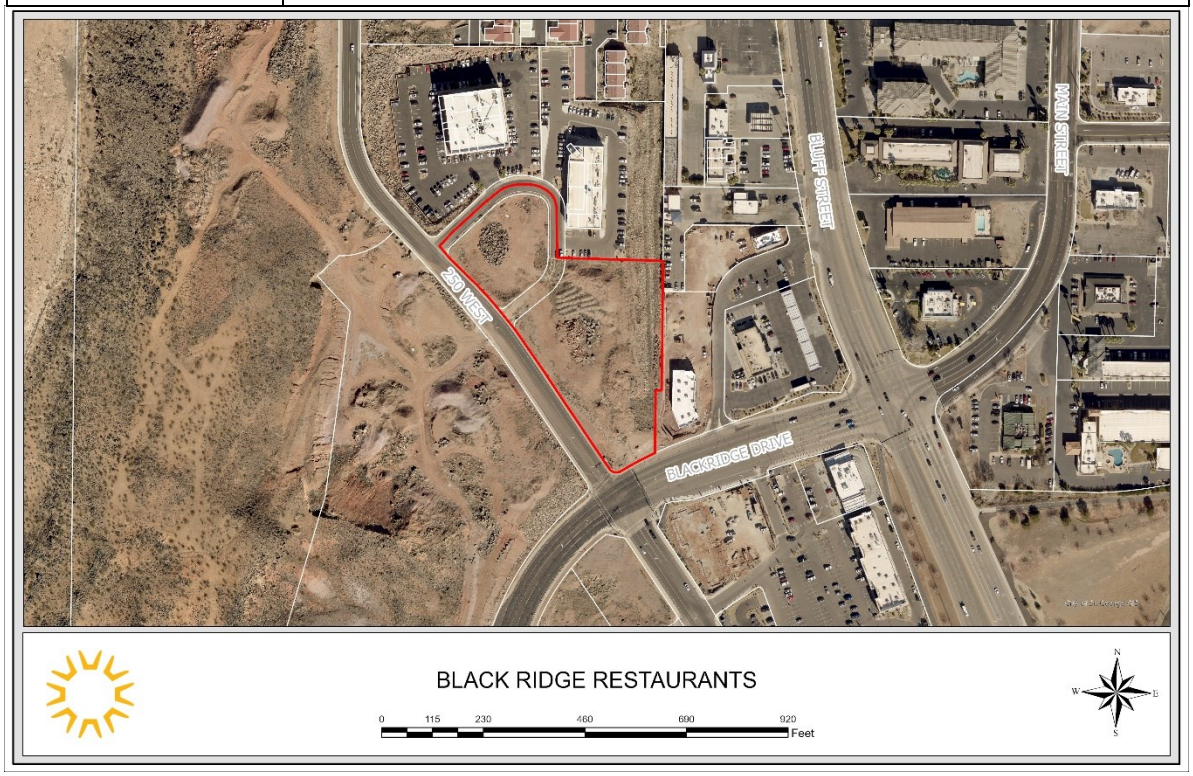
The Hillside Review Board and Planning Commission recommend approval of the application with the following conditions:1.That there are special considerations for the drainage and the landscaping.2.That the drainage pipes would be water tight that will get reviewed by the City.3.That the foundation will either be over excavation or deep foundation.4.That there is installation of a monitoring well, inclinometers, and/or piezometers for monitoring possible movement in the site.5.That a landscape monitor for leak detection is installed.

St.George
Community Development

Hillside Permit

HILLSIDE REVIEW BOARD AGENDA REPORT: **08/14/2024**
PLANNING COMMISSION AGENDA REPORT: **10/08/2024**
CITY COUNCIL AGENDA REPORT: 11/07/2024

Black Ridge Restaurants Hillside Development Permit (Case No. 2024-HS-011)		
Request:	A Hillside Development Permit to allow disturbance of areas in the 20-30%, 30-40% and 40% and above slope areas and review possible construction in a possible landslide area.	
Applicant:	American Land Consulting, LLC	
Representative:	Adam Allen	
Location:	North-East corner or Black Ridge Drive & 250 West	
General Plan:	DTCC (Downtown Connected Corridor)	
Existing Zoning:	PD-C (Planned Development Commercial)	
Surrounding Zoning:	North	PD-C (Planned Development Commercial)
	South	C-2 (Highway Commercial)
	East	PD-C (Planned Development Commercial)
	West	PD-C (Planned Development Commercial)
Land Area:	Approximately 164,473 ft² (3.77 acres)	



BACKGROUND

In 2019, the Hillside Review Board heard a request on this property for a hotel and associated parking structure. That application was ultimately approved by the City Council but had a number of conditions associate with the construction such as 15-18 feet of over-excavation and imported/structural fill, deep foundations, and a secant wall (intended to increase slope stability) to name a few. Additionally, restrictions on surface water were also imposed in order to limit the amount of water that soaks into the hillside soil. In the end, the hotel moved across the street and in 2021, received approval for a hillside permit. It appears that the hotel concept has been abandoned at this point.

The current application is to review two buildings that would be restaurants on the two lots. The lots were created in 2006 through the Black Ridge Commercial Center plat. The Hillside Review Board must weigh in and make a recommendation to Planning Commission and City Council on all applications in hillside overlay areas.

This particular request still will need to address the items listed above. Those items include, 1) slopes that are in excess of 40% on the site. It appears that some of those slopes were created by piling dirt and other materials on the site through the years. 2) Landscaping on the site. The previously approved hotel required limiting the landscaping quantities and types in order to contain the water on site and limit the amount of water that accumulated in soil. This will need to be considered here as well. 3) The property is in a designated landslide area identified by the Utah Geological Society (UGS). The applicant will need to identify how they intend to deal with this potential issue and the Hillside Review Board must carefully consider those measures and any other conditions needed to make this site compatible with development.

Hillside Meeting: On August 14, 2024, the application went before the Hillside Review Committee. They recommended approval of the application with conditions.

APPLICABLE ORDINANCE(S) *(Selected portions)*

10-13A-1: Density and Disturbance Standards

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

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

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

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

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

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

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

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

1. *Preparation of Contour Maps:* The applicant shall submit an accurate, current contour map, prepared and certified by a licensed professional engineer or surveyor, which shows all land contours at intervals no greater than five feet (5'), drawn at a one inch equals one hundred feet (1" = 100') scale maximum.

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

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

10-13B-2: Development in Geologic Hazard Areas

A. *Geologic Hazard Areas (UGS 1 – 4: subsections A1 through A4 of this section):* For any development in the city with a geologic hazard listed below, applicant shall submit a report prepared by a qualified, licensed geologist specializing in engineering geology, or a licensed civil engineer, trained and experienced in the practice of geotechnical engineering. Development in the geologic hazard overlay for high category rockfall areas shall be reviewed by the hillside review board.

1. Surface fault rupture and earthquake: well-defined Holocene, and well-defined fault areas, red and purple lines/categories (extending five hundred feet (500') on the downthrown side and two hundred fifty feet (250') on the upthrown side of each red/purple fault line).
2. Liquefaction: Very High category.

3. Landslide: Very High category.
4. Rockfall: High category.

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

1. Submit a site-specific report prepared by a qualified, licensed geologist specializing in engineering geology, or a licensed civil engineer, trained and experienced in the practice of geotechnical engineering with the following minimum requirements:

a. Identify all geologic hazard areas (UGS 1 – 4: subsections A1 through A4 of this section);

b. Identify any other geologic hazards, not listed above (UGS 1 – 4: subsections A1 through A4 of this section), which present an unacceptable risk to development;

c. Demonstrate which areas of the development are suitable for the proposed use;

d. Recommend specific measures necessary to make the land suitable for the proposed use;

e. Recommend the optimal placement of all structures, roadways, utilities, trails and infrastructure in relation to the geologic hazard area;

f. Slope stability analysis: conclusions and recommendations concerning the effects of material removal, introduction of water, both on and off site, including, where applicable, on mesa tops, seismic activity, and erosion on slope stability;

g. Foundation investigation: conclusions and recommendations concerning the effects of soil conditions on foundation and structural stability, including bearing capacity, sheer strength, and shrink/swell potential of soils;

h. Spring location: the location and yield of springs and seeps which shall be shown on the site plan;

i. Structural features: structural features including any geological limitations;

j. Surface hazards: existence of surface hazards including potential for rockfalls and toppling failures to cliffs, slopes and overhangs above the subject property; and

k. Effect of geologic conditions: conclusions and recommendations regarding the effect of geologic conditions on the proposed development, together with recommendations identifying the means proposed to minimize any hazard to life or property, or adverse impact on the natural environment.

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

3. All development shall be outside the geologic hazard areas in subsections A1 through A4 of this section, unless:

a. The city has accepted applicant's report, prepared by a qualified, licensed geologist specializing in engineering geology or a licensed professional engineer trained and practicing in the field of geotechnical engineering, and it recommends development, and shows hazards can be adequately mitigated for the proposed land use;

b. If the city has not accepted applicant's report, the applicant also adopts and implements the independent review and writing findings and comments, in addition to any nonconflicting recommendations in applicant's report;

c. All report recommendations, and HDOZ permit conditions (when required), are adopted by the city and are conditions of development.

4. Hold the city harmless from all claims resulting from any damage related to development within a geologic hazard area by executing a "geologic hazard disclaimer of liability and agreement" and by placing a "notice of hazard" on the final plat.

5. The applicant may appeal a decision in accordance with chapter 3 of this title.

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

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

E. *Interpretation:* In the interpretation and application of this chapter, all provisions are minimum requirements in addition to applicable provisions of this title.

EXHIBITS PROVIDED

1. Exhibit A – Site Plan
   "Exhibit A" in the packet shows the site plan as proposed.

2. Exhibit B – Grading Plan
   This is the proposed grading plan for the site.

3. Exhibit C – Landscape & Vegetation Plan
   Exhibit C shows proposed areas to be landscaped though not specific plantings. This may need to be updated to show plant and tree details.

4. Exhibit D – Slope Analysis
   Exhibit D shows the slopes on the site.

5. Exhibit E – Drainage Plan
   "Exhibit B" shows how the applicant intends to drain water on the property.

6. Exhibit F – 2018 AGEC Geotechnical Investigation
   This is the Geotech report for the original hotel project. See Exhibits G & H for updates.

7. Exhibit G – 2021 AGEC Geotechnical Investigation
   This was an update to the Geotech report conducted in 2021.

8. Exhibit H – 2024 AGEC Hillside Report
   This is another update to the previous two investigations. HSRB needs to determine if this updated report, at three years old, adequately addresses the needs of the site.

9. Exhibit I – 2019 AGEC Slope Stability Report
   As with the Geotechnical Investigation, the slope stability is several years old but has an update conducted in 2021.

10. Exhibit J – 2021 AGEC Slope Stability Update
    The HSRB should study and determine if this investigation adequately addresses the needs of the site.

RECOMMENDATION

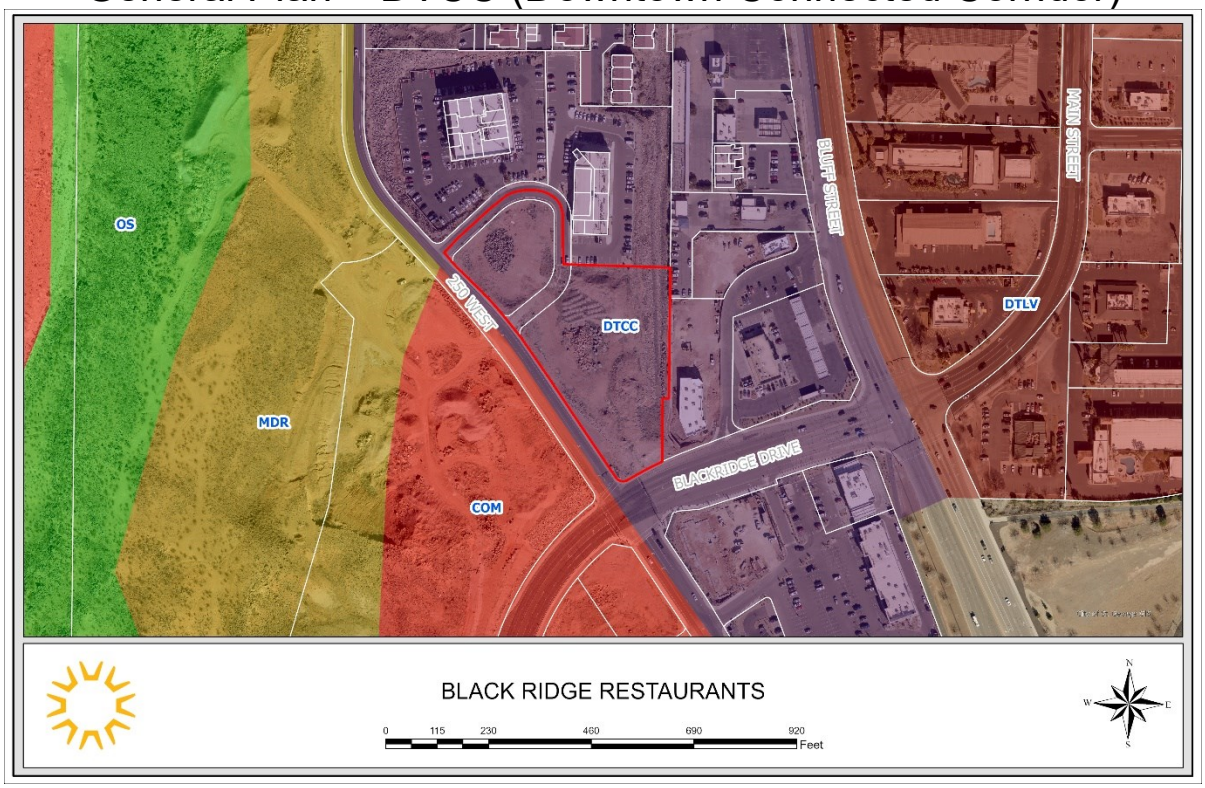
The Hillside Review Board and Planning Commission recommends approval of the application with the following conditions:

1. That there are special considerations for the drainage and the landscaping.
2. That the drainage pipes would be water tight that will get reviewed by the City.
3. That the foundation will either be over excavation or deep foundation.
4. That there is installation of a monitoring well, inclinometers, and/or piezometers for monitoring possible movement in the site.
5. That a landscape monitor for leak detection is installed.

POSSIBLE MOTION

"I move that we approve the hillside permit for Black Ridge Restaurants as presented, case no. 2024-HS-011, based on the findings and subject to the conditions listed in the staff report."

General Plan – DTCC (Downtown Connected Corridor)



Zoning – PD-C (Planned Development Commercial)

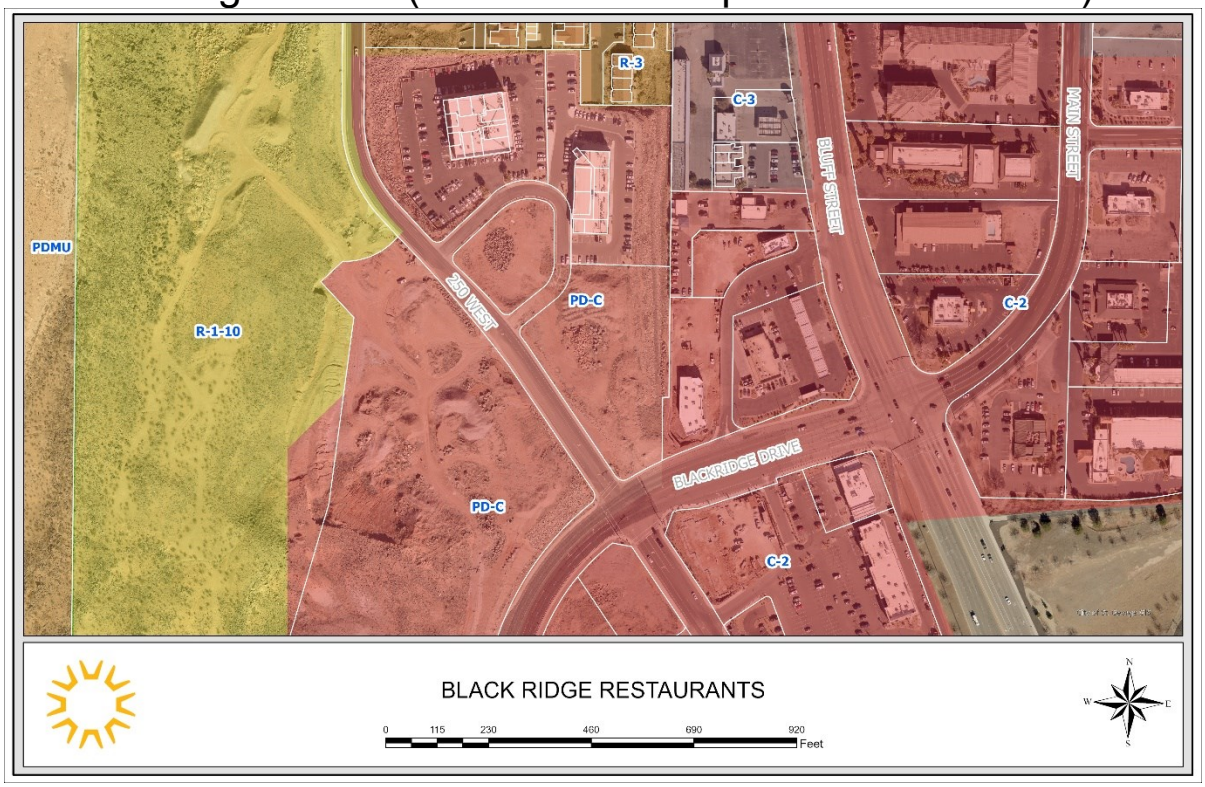
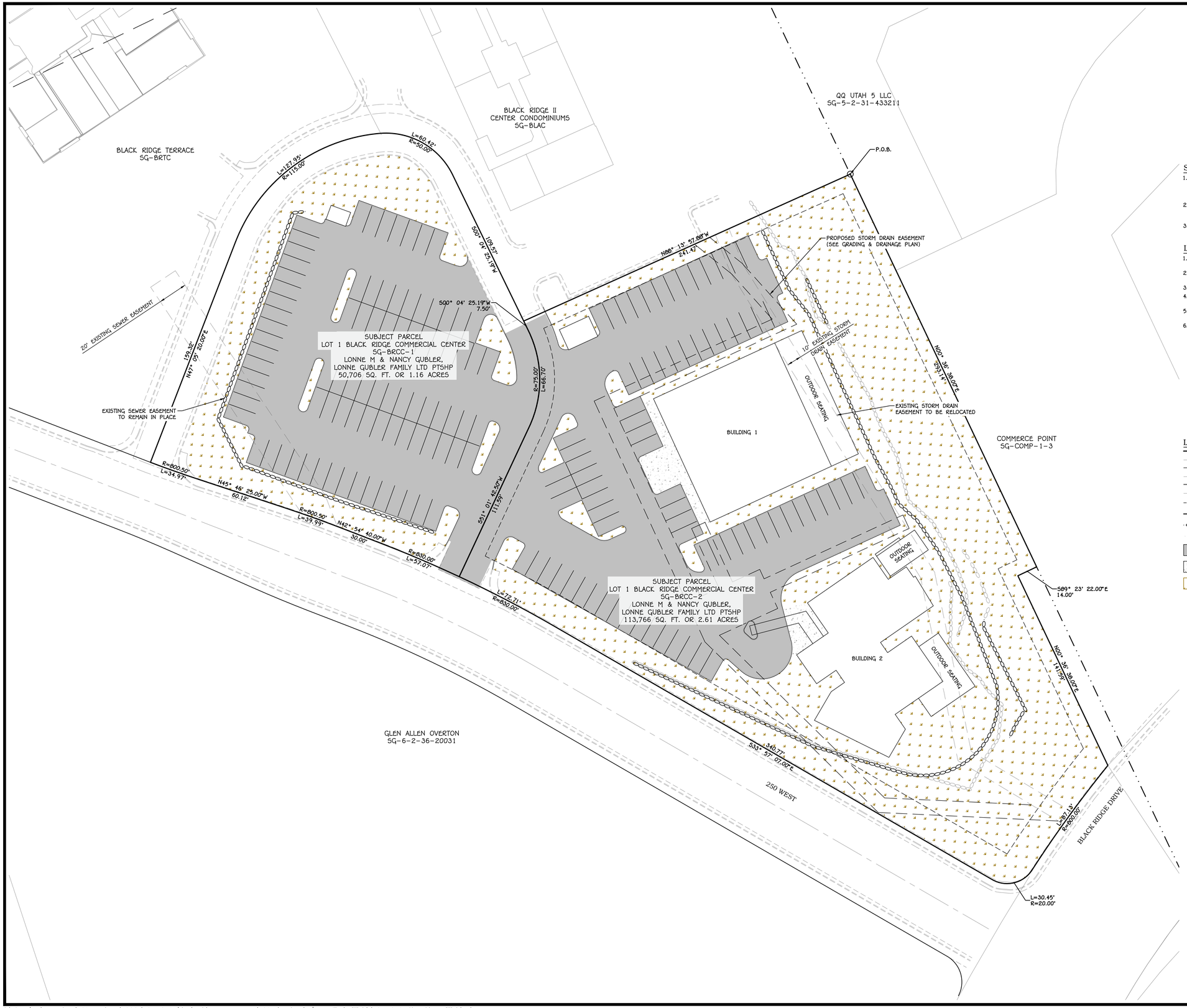


EXHIBIT A

Site Plan



SITE PLAN NOTES:

1. CONTRACTOR TO MATCH EXISTING CONDITIONS AT ALL TIE IN LOCATIONS. PROTECT IN PLACE ALL INFRASTRUCTURE TO REMAIN. SAWCUT EXISTING C&G AND ASPHALT WHERE APPROPRIATE TO PROVIDE A SMOOTH TRANSITION FROM EXISTING TO NEW.
2. CLASS 1 AND/OR CLASS II SURVEY MONUMENTS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. FINAL LOCATIONS FOR ALL SURVEY MONUMENTS TO BE PROVIDED BY THE LICENSED SURVEYOR.
3. ALL FIELD DESIGN CHANGES MUST BE APPROVED BY THE ENGINEER AND CITY PRIOR TO PROCEEDING WITH PROPOSED FIELD DESIGN CHANGES.

LANDSCAPE & VEGETATION NOTES:

1. ALL LANDSCAPING TO CONFORM TO ST GEORGE CITY CODE, WITH THE FOLLOWING RECOMMENDATIONS.
2. DUE TO THE SOIL RESTRICTIONS ON THIS SITE, IT IS RECOMMENDED THAT THE LANDSCAPING AND VEGETATION BE MINIMAL ON THIS SITE.
3. GROUND COVER SHOULD BE NON-IRRIGATED AND MOSTLY ROCK MULCH
4. THE LANDSCAPING SHALL DRIP IRRIGATED ONLY. NO OPEN SPRAY SPRINKLER HEADS SHALL BE ALLOWED.
5. IT IS RECOMMENDED THAT A LINER IS PLACED AROUND ANY PLANTINGS TO PREVENT WATER FROM INFILTRATING THE GROUND.
6. RE-VEGETATING IS NOT PLANNED DUE TO THIS ENTIRE SITE BEING PREVIOUSLY DISTURBED.

LEGEND:

	DETAIL
PROPOSED PARCEL BOUNDARY	
EXISTING/ADJACENT PARCEL BOUNDARY	
PROPOSED EASEMENT	
EXISTING EASEMENT	
PROPOSED CENTERLINE ALIGNMENT	
EXISTING CENTERLINE ALIGNMENT	
PROPOSED SETBACK LINE	
SURVEY SECTION LINE	
PROPOSED ROCK WALL (SEE GRADING PLANS)	
EXISTING ROCK RETAINING WALL	
PAVEMENT SECTION PER GEOTECHNICAL REPORT	
CONCRETE SURFACE	
LANDSCAPE AREA	

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN
CONSULTING & ENGINEERING
1173 S. 250 W. #504
ST. GEORGE, UT 84770

DATE:	07/10/2024
JOB #	24-013
DRAWN BY:	SSA
CHECKED BY:	ARC

BLACK RIDGE RESTAURANTS

SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

SITE & LANDSCAPE PLAN

HILLSIDE

C.3.1

SHEET: 3 of 6

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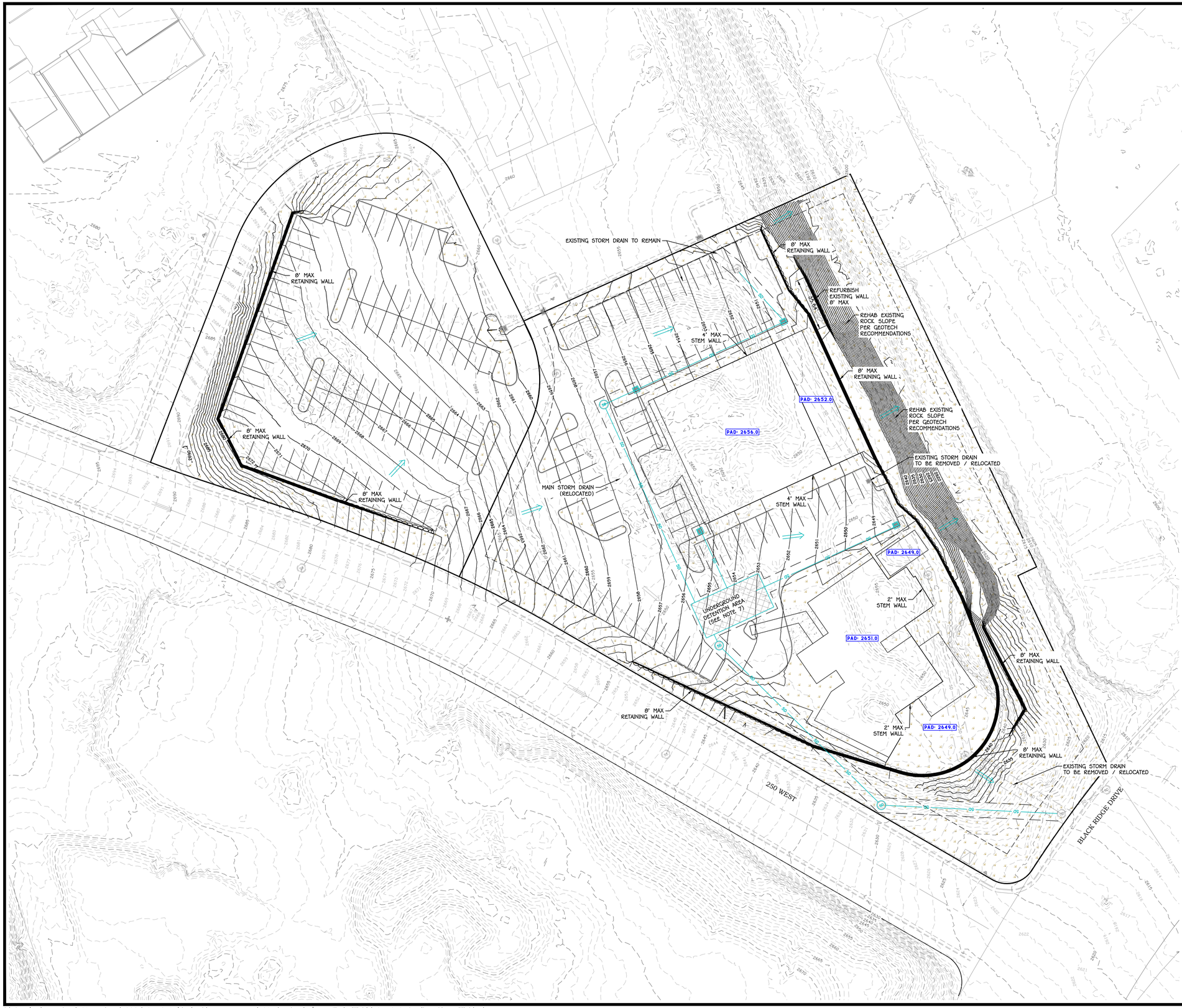
EXHIBIT B

Grading Plan



0 30' 60'

SCALE: 1" = 30'

Blue Stakes of UTAH811 Bluestakes.org

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GRADING PLAN NOTES:

1. THE CONTRACTOR SHALL PROVIDE APPROPRIATE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE APPROPRIATE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS, AND ADJACENT PROPERTIES IN A CLEAN CONDITION.
2. ALL EXCAVATION AND GRADING SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS ALONG WITH APPENDIX J STANDARDS OF THE INTERNATIONAL BUILDING CODE 2018 EDITION OR NEWER AS ADOPTED BY THE STATE OF UTAH AND CITY.
3. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY CONFLICTS BETWEEN THE REQUIREMENTS OF THE PLANS AND GEOTECHNICAL REPORT AND/OR GEOTECHNICAL FIELD OBSERVATIONS.
4. GEOTECHNICAL ENGINEER TO PROVIDE GRADING COMPLETION REPORT TO CONFIRM THAT WORK HAS BEEN PERFORMED IN CONFORMANCE WITH GEOTECHNICAL RECOMMENDATIONS.
5. RETAINING WALLS GREATER THAN 3' IN HEIGHT REQUIRE A PERMIT FROM THE CITY BUILDING DEPARTMENT. ALL ROCK RETAINING WALLS MUST BE CERTIFIED AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE CITY'S FINAL ACCEPTANCE.
6. IT IS THE PROPERTY OWNER'S RESPONSIBILITY (DEVELOPER, HOMEOWNER, HOA, ETC.) TO COMPLETE AND MAINTAIN THE FINAL GRADING ON THEIR PROPETY IN ACCORDANCE WITH THE GRADING AND DRAINAGE PLAN ALONG WITH ALL RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER. THE PROPERTY OWNER IS RESPONSIBLE IN PERPETUITY, FOR INSPECTING AND MAINTAINING PROPER DRAINAGE FOR THEIR PROPERTY.
7. ON-SITE DETENTION IS NOT RECOMMENDED DUE TO EXISTING SOILS AND GEOLOGICAL CONDITIONS, HOWEVER, IF ON-SITE DETENTION IS DETERMINED TO BE NECESSARY ALL STORM WATER RUNOFF WILL NEED TO BE STORED IN AN IMPERMEABLE UNDERGROUND DETENTION BASIN WITH AN APPROPRIATE LEAK DETECTION SYSTEM.

NOTICE TO CONTRACTORS:

ENGINEER CAN NOT GUARANTEE THE ACCURACY OF THE EXISTING UNDERGROUND UTILITIES DEPICTED IN THESE PLANS. LOCATIONS SHOWN FOR ALL EXISTING UNDERGROUND UTILITIES IS BASED ON EXTERNAL INFORMATION FROM GIS MAPPING, PREVIOUS AS-BUILT RECORD DRAWINGS, BLUE STAKES SURFACE MARKINGS IN THE FIELD, OR COMBINATION THEREOF. THE ENGINEER HAS MADE EVERY EFFORT TO ACCURATELY DEPICT THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT BLUE STAKES OF UTAH AT LEAST TWO (2) BUSINESS DAYS PRIOR TO COMMENCING WITH EXCAVATION TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES. CONTRACTOR ALSO REQUIRED TO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING UNDERGROUND UTILITIES BOTH SHOWN, AND NOT SHOWN, IN THESE PLANS. IF ANY UTILITY LOCATION DISCREPANCIES ARE FOUND IN THE FIELD, CONTRACTOR SHOULD NOTIFY THE ENGINEER IMMEDIATELY.

EARTHWORK QUANTITIES:

EARTHWORK QUANTITIES PROVIDED BELOW ARE APPROXIMATED BASED ON COMPARISON OF EXISTING GROUND AND FINISH GROUND SURFACE DATA USING A (SHRINK/SWELL) FACTOR OF X.XX. QUANTITIES SHOWN DO NOT ACCOUNT FOR ADDITIONAL CUT/FILL GENERATED BY BACKOUT VOLUMES FROM PAVEMENT SECTIONS, SIDEWALKS, FOOTINGS/FOUNDATIONS, CURB AND GUTTER, ETC. CONTRACTOR RESPONSIBLE TO INDEPENDENTLY VERIFY ALL EARTHWORK QUANTITIES REQUIRED TO COMPLETE CONSTRUCTION.

6,280	CU. YDS. CUT
10,204	CU. YDS. FILL
3,924	CU. YDS. (NET FILL)

LEGEND:

	DETAIL
PROPOSED PARCEL BOUNDARY	
EXISTING/ADJACENT PARCEL BOUNDARY	
PROPOSED CENTERLINE ALIGNMENT	
EXISTING CENTERLINE ALIGNMENT	
PROPOSED ROCK RETAINING WALL	
EXISTING ROCK RETAINING WALL	
GRADING LIMITS OF DISTURBANCE	
3000 EXISTING GROUND MAJOR CONTOUR	
3001 EXISTING GROUND MINOR CONTOUR	
3000 FINISH GROUND MAJOR CONTOUR	
3001 FINISH GROUND MINOR CONTOUR	
50 PROPOSED STORM PIPE (SIZE PER PLAN)	
50 EXISTING STORM PIPE (SIZE PER PLAN)	
CURB INLET SINGLE CATCH BASIN	205
STANDARD STORM DRAIN MANHOLE	220
SURFACE FLOW DIRECTION	

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN CONSULTING & ENGINEERING
1173 S. 250 W. #504 ST. GEORGE, UT 84770

DATE:	07/10/2024
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DRAWN BY:	SSA
CHECKED BY:	ARC

BLACK RIDGE RESTAURANTS
SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

GRADING & DRAINAGE PLAN
HILLSIDE

C.4.1

SHEET: 4 of 6

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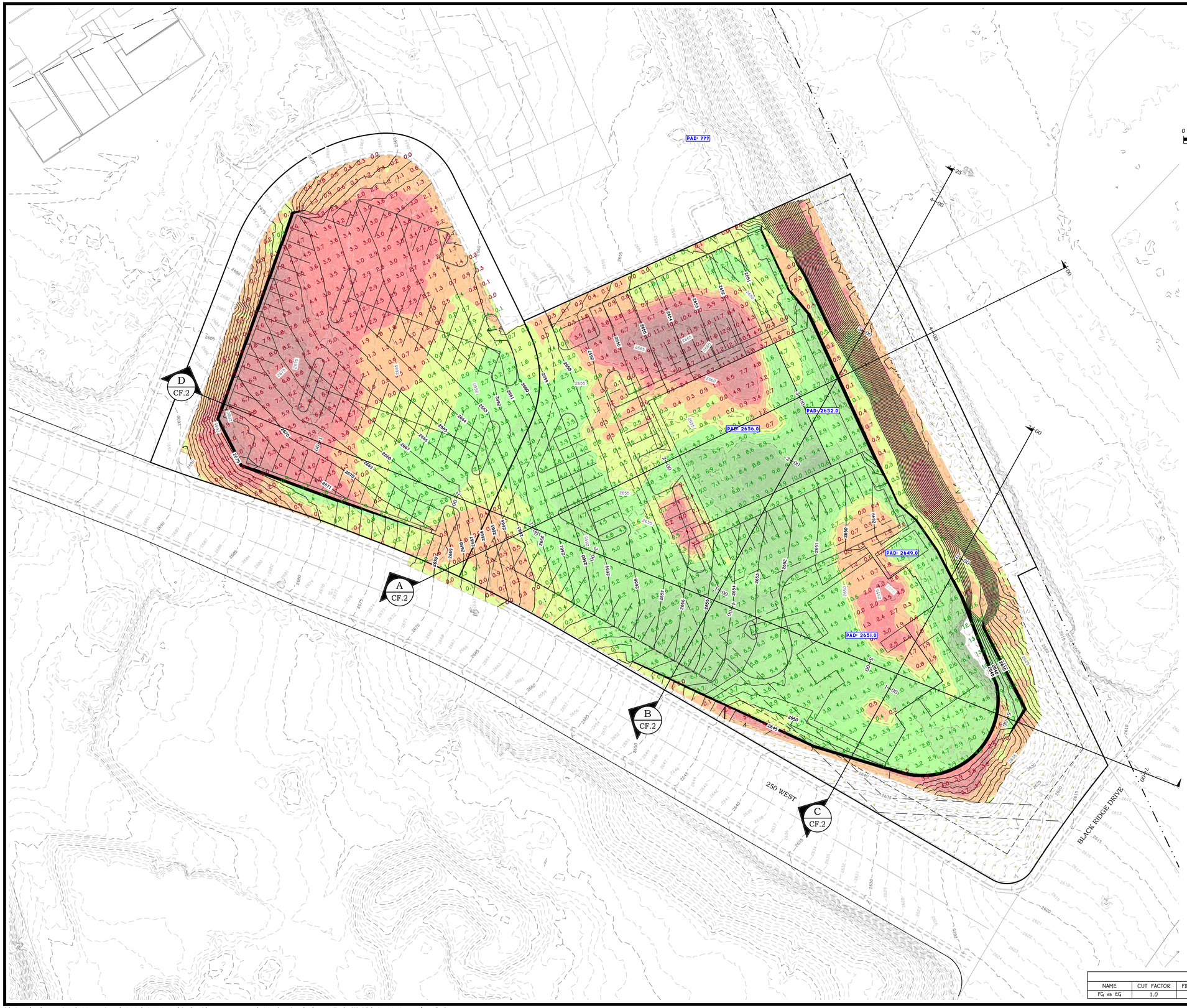

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Bluestakes.org
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ELEVATIONS TABLE		
MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
-14	-12	
-12	-10	
-10	-8	
-8	-6	
-6	-4	
-4	-2	
-2	0	
0	2	
2	4	
4	6	
6	8	
8	10	
10	12	

CUT / FILL SUMMARY						
NAME	CUT FACTOR	FILL FACTOR	2D AREA (s.f.)	CUT (cu.yds.)	FILL (cu.yds.)	NET (cu.yds.)
FG vs EG	1.0	1.0	126,821	6,280	10,204	3,924.0

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN
CONSULTING & ENGINEERING
1173 S. 250 W. #504 ST. GEORGE, UT 84770

DATE:	07/10/2024
JOB #:	24-013
DRAWN BY:	SSA
CHECKED BY:	ARC

BLACK RIDGE RESTAURANTS

SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

EARTH MOVING PLAN

HILLSIDE

C.4.2

SHEET: 5 of 6

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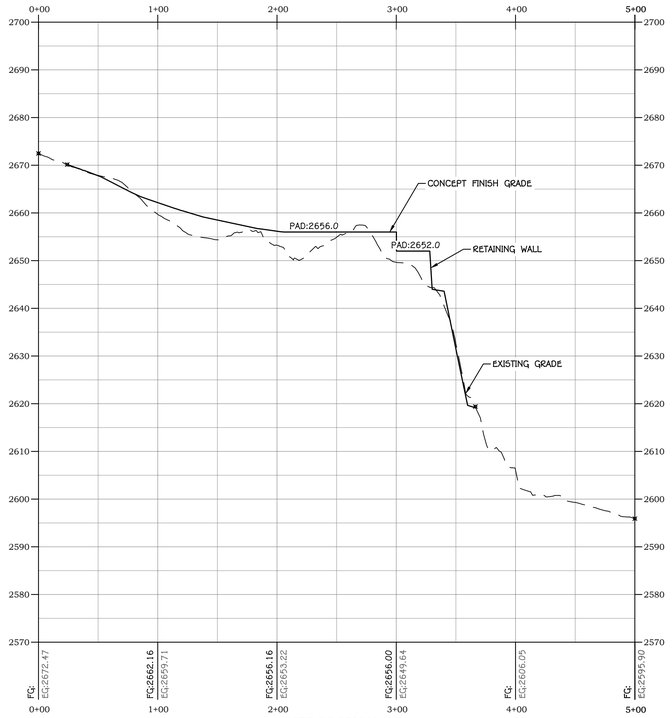
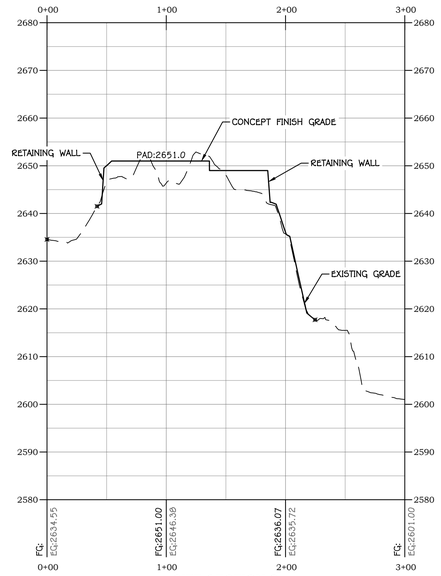
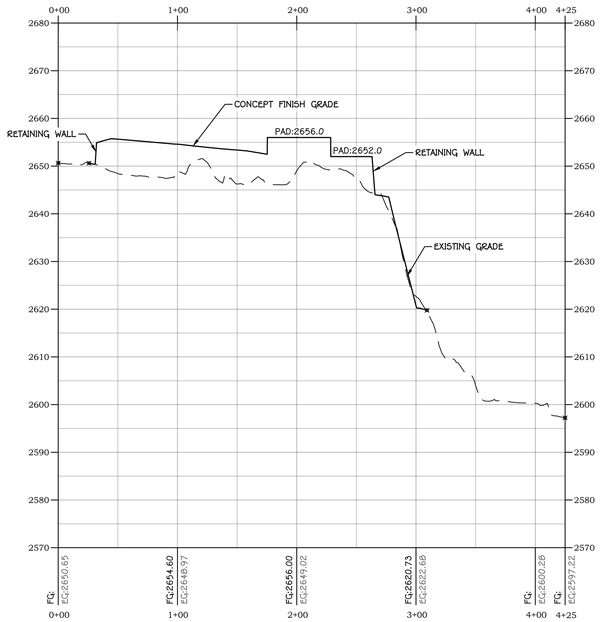


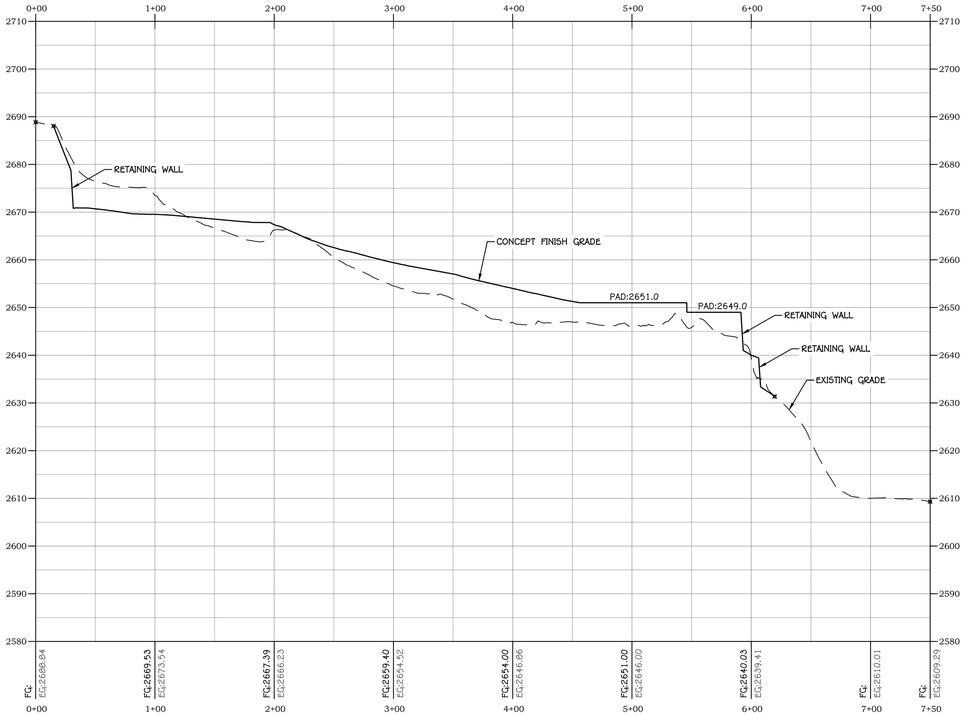
SITE SECTION A



SITE SECTION C



SITE SECTION B



SITE SECTION D

0 60' 120'

HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 15'

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BLACK RIDGE RESTAURANTS
SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

SITE SECTIONS
HILLSIDE

C.4.3

SHEET: 6 of 6

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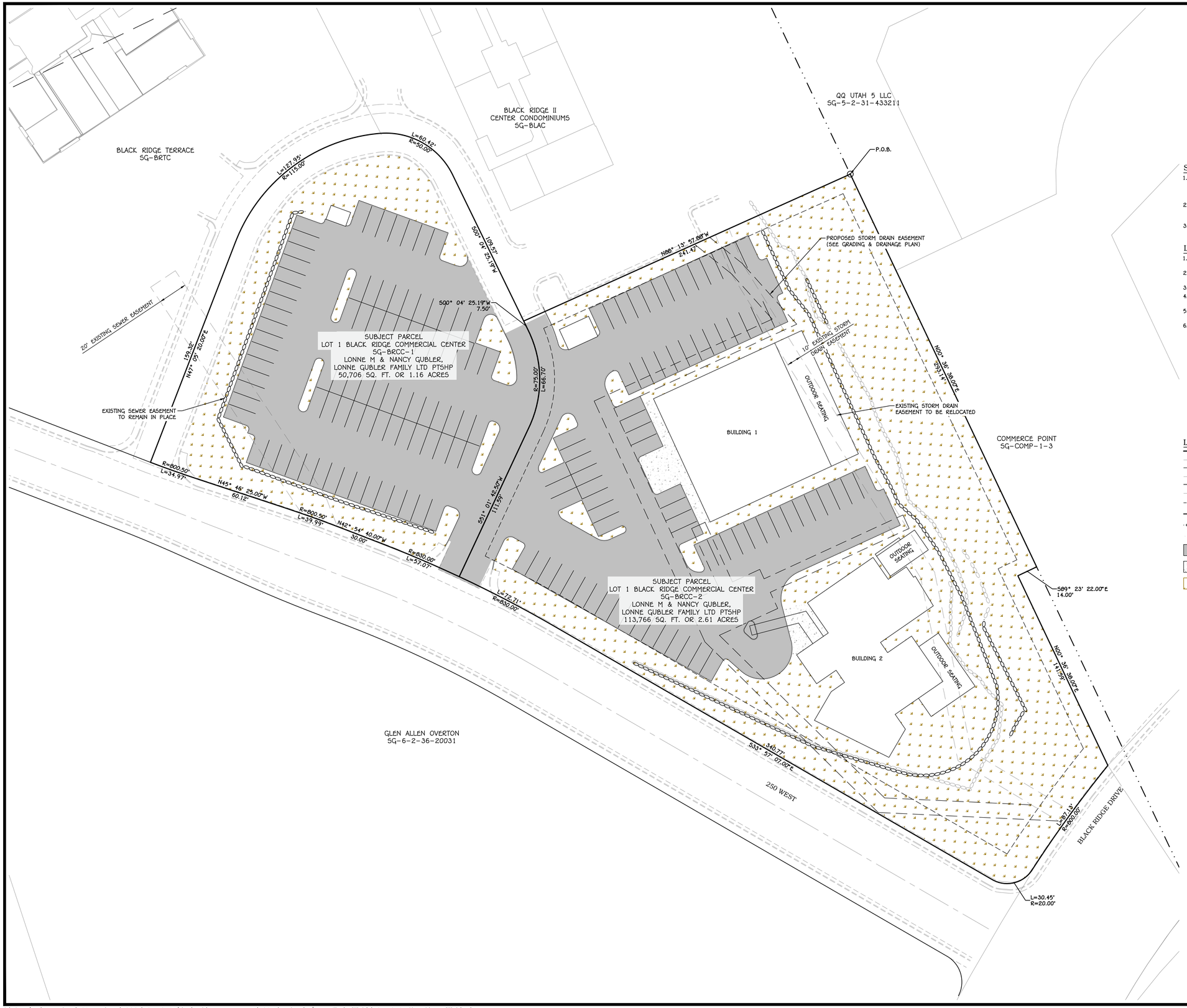
EXHIBIT C

Landscape & Vegetation Plan



SITE PLAN NOTES:

1. CONTRACTOR TO MATCH EXISTING CONDITIONS AT ALL TIE IN LOCATIONS. PROTECT IN PLACE ALL INFRASTRUCTURE TO REMAIN. SAWCUT EXISTING C&G AND ASPHALT WHERE APPROPRIATE TO PROVIDE A SMOOTH TRANSITION FROM EXISTING TO NEW.
2. CLASS 1 AND/OR CLASS II SURVEY MONUMENTS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. FINAL LOCATIONS FOR ALL SURVEY MONUMENTS TO BE PROVIDED BY THE LICENSED SURVEYOR.
3. ALL FIELD DESIGN CHANGES MUST BE APPROVED BY THE ENGINEER AND CITY PRIOR TO PROCEEDING WITH PROPOSED FIELD DESIGN CHANGES.

LANDSCAPE & VEGETATION NOTES:

1. ALL LANDSCAPING TO CONFORM TO ST GEORGE CITY CODE, WITH THE FOLLOWING RECOMMENDATIONS.
2. DUE TO THE SOIL RESTRICTIONS ON THIS SITE, IT IS RECOMMENDED THAT THE LANDSCAPING AND VEGETATION BE MINIMAL ON THIS SITE.
3. GROUND COVER SHOULD BE NON-IRRIGATED AND MOSTLY ROCK MULCH
4. THE LANDSCAPING SHALL DRIP IRRIGATED ONLY. NO OPEN SPRAY SPRINKLER HEADS SHALL BE ALLOWED.
5. IT IS RECOMMENDED THAT A LINER IS PLACED AROUND ANY PLANTINGS TO PREVENT WATER FROM INFILTRATING THE GROUND.
6. RE-VEGETATING IS NOT PLANNED DUE TO THIS ENTIRE SITE BEING PREVIOUSLY DISTURBED.

LEGEND:

	DETAIL
PROPOSED PARCEL BOUNDARY	
EXISTING/ADJACENT PARCEL BOUNDARY	
PROPOSED EASEMENT	
EXISTING EASEMENT	
PROPOSED CENTERLINE ALIGNMENT	
EXISTING CENTERLINE ALIGNMENT	
PROPOSED SETBACK LINE	
SURVEY SECTION LINE	
PROPOSED ROCK WALL (SEE GRADING PLANS)	
EXISTING ROCK RETAINING WALL	
PAVEMENT SECTION PER GEOTECHNICAL REPORT	
CONCRETE SURFACE	
LANDSCAPE AREA	

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BLACK RIDGE RESTAURANTS

SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

SITE & LANDSCAPE PLAN

HILLSIDE

C.3.1

SHEET: 3 of 6

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EXHIBIT D

Slope Analysis

HILLSIDE NOTES:

1. THE PROPOSED PROJECT PROPERTY HAS BEEN PREVIOUSLY GRADED. NATURAL GRADE / UNDISTURBED TERRAIN NOT ENCOUNTERED.

LEGEND

- EXISTING HILLSIDE SLOPE 20.01%-30%
- EXISTING HILLSIDE SLOPE 30.01%-40%
- EXISTING HILLSIDE SLOPE >40%

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BLACK RIDGE RESTAURANTS
SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

SLOPE MAP PLAN
HILLSIDE

C.2.1

SHEET: 2 of 6

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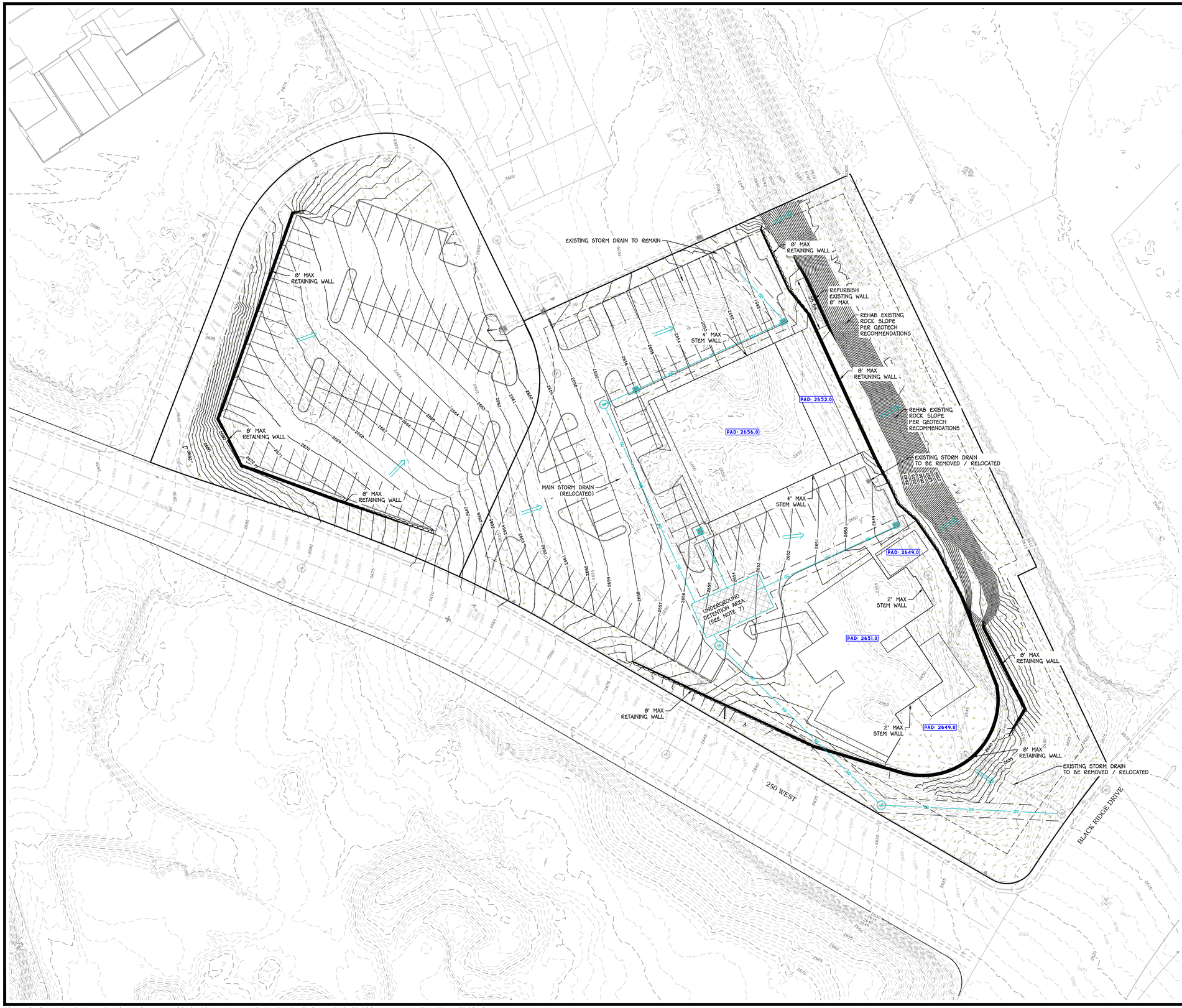
EXHBIT E

Drainage Plan



0 30' 60'

SCALE: 1" = 30'

Blue Stakes of UTAH811 Bluestakes.org

Call Before You Dig!

GRADING PLAN NOTES:

1. THE CONTRACTOR SHALL PROVIDE APPROPRIATE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE APPROPRIATE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS, AND ADJACENT PROPERTIES IN A CLEAN CONDITION.
2. ALL EXCAVATION AND GRADING SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS ALONG WITH APPENDIX J STANDARDS OF THE INTERNATIONAL BUILDING CODE 2018 EDITION OR NEWER AS ADOPTED BY THE STATE OF UTAH AND CITY.
3. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY CONFLICTS BETWEEN THE REQUIREMENTS OF THE PLANS AND GEOTECHNICAL REPORT AND/OR GEOTECHNICAL FIELD OBSERVATIONS.
4. GEOTECHNICAL ENGINEER TO PROVIDE GRADING COMPLETION REPORT TO CONFIRM THAT WORK HAS BEEN PERFORMED IN CONFORMANCE WITH GEOTECHNICAL RECOMMENDATIONS.
5. RETAINING WALLS GREATER THAN 3' IN HEIGHT REQUIRE A PERMIT FROM THE CITY BUILDING DEPARTMENT. ALL ROCK RETAINING WALLS MUST BE CERTIFIED AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE CITY'S FINAL ACCEPTANCE.
6. IT IS THE PROPERTY OWNER'S RESPONSIBILITY (DEVELOPER, HOMEOWNER, HOA, ETC.) TO COMPLETE AND MAINTAIN THE FINAL GRADING ON THEIR PROPETY IN ACCORDANCE WITH THE GRADING AND DRAINAGE PLAN ALONG WITH ALL RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER. THE PROPERTY OWNER IS RESPONSIBLE IN PERPETUITY, FOR INSPECTING AND MAINTAINING PROPER DRAINAGE FOR THEIR PROPERTY.
7. ON-SITE DETENTION IS NOT RECOMMENDED DUE TO EXISTING SOILS AND GEOLOGICAL CONDITIONS, HOWEVER, IF ON-SITE DETENTION IS DETERMINED TO BE NECESSARY ALL STORM WATER RUNOFF WILL NEED TO BE STORED IN AN IMPERMEABLE UNDERGROUND DETENTION BASIN WITH AN APPROPRIATE LEAK DETECTION SYSTEM.

NOTICE TO CONTRACTORS:

ENGINEER CAN NOT GUARANTEE THE ACCURACY OF THE EXISTING UNDERGROUND UTILITIES DEPICTED IN THESE PLANS. LOCATIONS SHOWN FOR ALL EXISTING UNDERGROUND UTILITIES IS BASED ON EXTERNAL INFORMATION FROM GIS MAPPING, PREVIOUS AS-BUILT RECORD DRAWINGS, BLUE STAKES SURFACE MARKINGS IN THE FIELD, OR COMBINATION THEREOF. THE ENGINEER HAS MADE EVERY EFFORT TO ACCURATELY DEPICT THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT BLUE STAKES OF UTAH AT LEAST TWO (2) BUSINESS DAYS PRIOR TO COMMENCING WITH EXCAVATION TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES. CONTRACTOR ALSO REQUIRED TO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING UNDERGROUND UTILITIES BOTH SHOWN, AND NOT SHOWN, IN THESE PLANS. IF ANY UTILITY LOCATION DISCREPANCIES ARE FOUND IN THE FIELD, CONTRACTOR SHOULD NOTIFY THE ENGINEER IMMEDIATELY.

EARTHWORK QUANTITIES:

EARTHWORK QUANTITIES PROVIDED BELOW ARE APPROXIMATED BASED ON COMPARISON OF EXISTING GROUND AND FINISH GROUND SURFACE DATA USING A (SHRINK/SWELL) FACTOR OF X.XX. QUANTITIES SHOWN DO NOT ACCOUNT FOR ADDITIONAL CUT/FILL GENERATED BY BACKOUT VOLUMES FROM PAVEMENT SECTIONS, SIDEWALKS, FOOTINGS/FOUNDATIONS, CURB AND GUTTER, ETC. CONTRACTOR RESPONSIBLE TO INDEPENDENTLY VERIFY ALL EARTHWORK QUANTITIES REQUIRED TO COMPLETE CONSTRUCTION.

6,280	CU. YDS. CUT
10,204	CU. YDS. FILL
3,924	CU. YDS. (NET FILL)

LEGEND:

	DETAIL
PROPOSED PARCEL BOUNDARY	
EXISTING/ADJACENT PARCEL BOUNDARY	
PROPOSED CENTERLINE ALIGNMENT	
EXISTING CENTERLINE ALIGNMENT	
PROPOSED ROCK RETAINING WALL	
EXISTING ROCK RETAINING WALL	
GRADING LIMITS OF DISTURBANCE	
3000 EXISTING GROUND MAJOR CONTOUR	
3001 EXISTING GROUND MINOR CONTOUR	
3000 FINISH GROUND MAJOR CONTOUR	
3001 FINISH GROUND MINOR CONTOUR	
50 PROPOSED STORM PIPE (SIZE PER PLAN)	
50 EXISTING STORM PIPE (SIZE PER PLAN)	
CURB INLET SINGLE CATCH BASIN	205
STANDARD STORM DRAIN MANHOLE	220
SURFACE FLOW DIRECTION	

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1173 S. 250 W. #504 ST. GEORGE, UT 84770

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JOB #:	24-013
DRAWN BY:	SSA
CHECKED BY:	ARC

BLACK RIDGE RESTAURANTS
SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

GRADING & DRAINAGE PLAN
HILLSIDE

C.4.1

SHEET: 4 of 6

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EXHIBIT F

2018 AGEC Geotechnical Investigation

AGEC

Applied GeoTech

GEOTECHNICAL INVESTIGATION

BLACKSTONE HOTEL SITE

250 WEST BLACKRIDGE DRIVE

ST. GEORGE, UTAH

PREPARED FOR:

BLACK RIDGE DEVELOPMENT, LLC
2001 PARK AVENUE
PARK CITY, UTAH 84060

ATTENTION: GLEN OVERTON

PROJECT NO. 2180187

DECEMBER 14, 2018

1420 South 270 East • St. George, Utah 84790 • (435) 673-6850 • FAX (435) 673-1044

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SUMMARY

1. Two geologic hazards exist at the site which could impact the project. The hazards include highly expansive soil and bedrock and the potential for landslide movement.

   The ancient landslide is not moving currently, but factors of safety against future movement do not meet industry standards. If the site is to be developed, the developer should be aware of this condition and accept the risk of future movement if the landslide reactivates. If movement occurs, significant distress to the development could be experienced.

2. Due to the expansive characteristics of the on site clay and bedrock, there is the potential for up to approximately 5 inches of heave without properly designing for this condition. Therefore, the recommendations contained in this report should be implemented to properly support the proposed improvements.

3. The subsurface profile observed in the borings drilled generally consists of fill overlying bedrock to the maximum depth investigated, approximately 93 feet. Talus (cobbles infilled gravel, sand and clay) and landslide deposits were encountered beneath the fill.

4. Groundwater levels were measured at elevations of approximately 2,595½ and 2,581 feet, which is about 42 feet below the proposed "0" level of the hotel.

5. Drainage of surface water away from structures and desert landscaping are critical for acceptable performance of the site. The storm drain system should be water tight. Water ways should be lined to prevent to seepage into the ground.

6. Detailed recommendations for subgrade preparation, grading, materials, foundations, pavement and drainage are included in the report.

7. The information provided in this summary should not be used independent of that provided within the body of this report.

SCOPE OF WORK

This report presents the results of a geotechnical investigation for the proposed Blackstone Hotel site to be located in St. George, Utah, as shown on Figure 1. This report presents the subsurface conditions encountered and recommendations for the geotechnical aspects of the project.

Field exploration was conducted to obtain information on the subsurface conditions and to obtain samples for laboratory testing. Results of the field exploration and laboratory testing were analyzed to develop conclusions, professional opinions and recommendations for the proposed development.

This report has been prepared to summarize the data obtained during the study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction are included in the report.

SITE CONDITIONS

The site consists of a partially developed and graded parcel of property in the Black Ridge Development in St. George, Utah. The site was previously rough graded. The grading generally appears to consist of cut on the south and west with increasing fill depth to the north and east. The east edge of the site consists of a tall fill slope which is graded at an approximate 1:1 (Horizontal:Vertical) slope. It is faced with basalt boulders. Comparison of existing elevations to previous topography indicates the site has received up to on the order of 41 feet of fill on the east tapering to less than 5 feet on the west.

A vacant parcel is located below the fill slope to the east with a new Maverik Gas Station further to the east. Black Ridge Drive is to the south, 250 West Street is to the west and existing commercial buildings are to the north.

The site is elevated above Black Ridge Drive on the south and the topography generally slopes down to the south and southeast. The site has only sparse vegetation and scattered large piles of boulders and fill.

FIELD STUDY

An engineer from AGEC visited the site on August 7, 2007, June 6, 7, August 16, September 17, 18, 20, 21, 24, and October 5, 2018 and observed the drilling of 11 borings as shown on Figure 2. The borings were drilled utilizing a truck mounted rill rig equipped with hollow stem augers and a 2½ inch HQ core barrel with a carbide and carbonado bit using mud rotary techniques. The subsurface conditions were logged and samples were obtained to conduct laboratory testing.

SUBSURFACE CONDITIONS

The subsurface profile observed in the borings drilled generally consists of fill overlying bedrock to the maximum depth investigated, approximately 93 feet. Talus (cobbles infilled gravel, sand and clay) and landslide deposits were encountered beneath the fill. The transition of landslide altered bedrock to undisturbed bedrock occurs at a depth of approximately 37 to 80 feet below the ground surface.

Descriptions of each soil and bedrock type observed follow.

Fill 1 - The fill consists of lean to fat clay with sand and gravel. It contains occasional cobbles and boulders. Consistency and moisture appears variable (poorly to well compacted) and is red to purple in color. The clay varies from low to high plasticity. The cobbles and boulders are basalt and sandstone.

Laboratory tests conducted on samples of the fill indicate in-place moisture contents ranging from 7 to 21 percent, in-place dry densities ranging from 94 to 117 pounds per cubic foot (pcf), gravel content (percent retained on the No. 4 sieve) of 10 percent, and fines contents (percent passing the No. 200 sieve) ranging from 62 to 88 percent. Atterberg Limits tests indicate liquid limits ranging from 29 to 54 percent and plasticity indexes ranging from 17 to 40 percent. A water soluble sulfate test indicates a water soluble sulfate concentration of 3,075 parts per million (ppm).

A one-dimensional consolidation test conducted on a sample of the fill indicates the fill is slightly expansive when wetted under a constant pressure of approximately 1,000 pounds per square foot (psf). A swell percentage of approximately 1.3 percent was measured with a swell pressure of approximately 2,800 pounds per square foot (psf).

Fill 2 - The fill contains basalt boulders with voids between the boulders.

Basalt Boulder - The basalt boulder is hard, dry and is grey in color.

Talus - The talus contains cobbles infilled with gravel, sand and clay and occasional boulders. It is typically stiff/dense, slightly moist to moist, gypsiferous, and is purple to red in color. The clay is low to high plastic.

Laboratory tests conducted on one sample indicates a gravel content of 32 percent and a fines content of 39 percent. An Atterberg Limits test indicates a liquid limit of 39 percent and a plasticity index of 28 percent.

Mudstone Bedrock - The mudstone bedrock is soft to moderately hard, slightly moist to very moist, medium to high plastic, and is purple to red to grey in color. The altered mudstone (above the landslide surface) contains sand and small basalt gravels. The mudstone changes to dark grey/black to yellow below the landslide and is red in boring B-10.

Laboratory tests conducted on samples of the mudstone bedrock indicate in-place moisture contents ranging from 2 to 25 percent, in-place dry densities ranging from 88 to 146 pcf, gravel contents ranging from 4 to 10 percent, and fines contents ranging from 34 to 97 percent. Atterberg Limits tests indicate liquid limits ranging from 25 to 64 percent and plasticity indexes ranging from non plastic to 51 percent. Water soluble sulfate tests indicate water soluble sulfate concentrations ranging from 270 to 4,770 ppm. Unconfined compressive strength tests indicate unconfined compressive strengths ranging from 4.0 to 40.7 kips per square foot (ksf).

One-dimensional consolidation tests conducted on samples of the mudstone indicate it is slightly to moderately expansive when wetted under a constant pressure of 1,000 psf. Swell percentages ranging from ½ to 2¼ percent were measured. Swell pressures ranging from approximately 1,600 to 5,000 pounds per square foot (psf) were also measured. The Atterberg limit tests and swell tests on nearby properties also indicate portions of the mudstone are highly expansive.

The Logs of Exploratory Borings are shown on Figures 3-7. Legend and Notes of the Exploratory Borings are shown on Figure 8. The laboratory test results are also shown on Figures 3-7 and are summarized in the Summary of Laboratory Testing, Table 1. The consolidation/collapse/swell test results are shown graphically on Figure 9-13.

SUBSURFACE WATER

Groundwater levels were measured on October 29, 2019. Groundwater was measured within Borings B-2 and B-5 at elevations of approximately 2,595½ and 2,581 feet, respectively. Groundwater was not encountered within the other borings drilled at the site. Our experience has shown that surface water may infiltrate and perch on, or within, the underlying mudstone.

PROPOSED CONSTRUCTION

It is currently proposed to develop a hotel resort on the site. The hotel will include a conference center, a restaurant, a gym as well as other amenities. There will also be a swimming pool/spa.

Architectural drawings of the development indicate the hotel will consist of a 4 story structure with an adjacent 2 story parking structure. The hotel will require excavation on the order of 20 to 30 feet below the existing grade to facilitate the "daylight" exposure of the east facing side of the hotel. The west side will include 2 to 4 stories of exposed building which will follow the topography of the site.

We understand the expose portion of the hotel will consist of conventional wood framing and we anticipate the below grade portions will utilize reinforced concrete construction. The parking structure will include one below grade level and will also be a reinforced concrete structure. The pool will use a reinforced gunnite shell.

Due to the presence of the underlying expansive soil and bedrock, the buildings and pool will be supported on deep foundation elements consisting of micropiles or drilled concrete piers in conjunction with grade beams and structural floors.

The development will also include underground utilities, asphalt concrete pavement and concrete retaining wall to support the east side of the property.

Additional details regarding the design, site improvements and building loads are currently not available. If the proposed construction, loading conditions, or grading are significantly different from what is described above, we should be notified so we may reevaluate our recommendations.

GEOLOGIC HAZARDS

Review of geologic hazard mapping by Lund et. al. (2008) and our experience in the area indicate the following potential conditions that could adversely impact the site:

A. Landslide

The site for the proposed new hotel is located above the toe of a 300 foot high slope. The lower ⅔ of the slope has been mapped as a landslide deposit. The ground surface of the landslide deposit slopes on average approximately 8.2:1 H:V (horizontal to vertical). The landslide deposit extends up to a depth of 83 feet below the existing ground surface at the site.

Old landslides are often barely stable and may reactivate with new loadings or other changes in condition that tend to reduce their stability. With the site located on a landslide deposit, the subsurface conditions need to be carefully investigated and the stability of the slope evaluated under static and seismic conditions. The risk of future movement needs to be recognized, potential impact of ground movement identified, appropriate consideration given to remedial measures and then a decision made if the benefit is worth the risk.

B. Expansive Soil and Bedrock

The Chinle formation is mapped at the site which consists of highlt expansive bedrock. It is high plastic and also has a high shrink/swell susceptibility.

Geologic hazard maps are shown on Figures 2a and 2b.

SLOPE STABILITY

A. Earlier Evaluations

Earlier studies by AGEC on the stability of the east slope of Black Ridge (slope on which the hotel is proposed) indicate that the stability of the slope is marginal.

In order to determine if movement is occurring on the slope, five inclinometers were installed in 2007 on the east slope of Black Ridge extending to depths of 92 to 250 feet. Four of the five indicate that there has been no movement since 2007. Ground movement was measured at multiple depths in the inclinometer installed immediately west of the vacant restaurant located at 1090 South Bluff Street, prior to 2011.

With the lack of measured movement in the four inclinometers over the past 10½ years along with the lack of surficial evidence of movement, it is apparent that the portion of the slope for this project is currently maintaining its stability. Using the information available from our subsurface exploration, the laboratory test results and our experience in the area, it is our professional opinion that the stability of the slope is marginal even with the lack of apparent movement.

B. Site Specific Stability

Based on our experience in the area along with the information that we have gathered from studies on this landslide, we have analyzed the stability of the slope in the area of the proposed hotel.

1. Prior Slope Modifications

A number of years ago, a relatively large amount of soil was removed from properties west of (up-slope from) the hotel site and placed on the hotel site. Up to 41 feet of fill was encountered during this study.

Our stability analysis of the slope indicates that the placement of fill at the toe of the slope has resulted in a 7 percent improvement of the stability.

2. **Proposed Site Grading**

The ground surface profile proposed for the hotel, does not change the improved stability resulting from the major grading that was accomplished a number of years ago.

3. **Stability Analysis**

The stability analysis indicates the following:

a. A calculated factor of safety using the parameters selected to characterize the materials in the slope and the existing configuration is near 1.1. A factor of safety on the order of 1.5 is typically desired for slopes upon which human occupied improvements are constructed. Lower factors of safety could be considered when using conservative soil strengths and with increased knowledge of the subsurface characteristics.

b. Changes in the internal conditions and the surficial geometry modifications may improve or reduce the ability of the slope to maintain its stability.

c. We anticipate that it is a matter of time before movement of the east slope of Black Ridge occurs. Determining a location and/or timing of such an event is not possible with the information currently available.

4. **Possible Impact of Current Conditions**

Assuming that strength characteristics of the landslide mass have improved (soils behaving as if they are unsaturated) since the ancient landslide movements occurred, overall calculated stability of the slope is estimated to increase approximately 30 percent.

The stability under a seismic event, assuming the improved strength characteristics described above, is estimated to have a safety factor of less than 1. A major seismic event could potentially result in displacement of approximately 10 inches. If the development proceeds, this potential increase in soil strength would need to be further evaluated and substantiated in order to quantify this improvement.

5. **Other Mitigating Factors**

If the decision is made to continue with further design and potential construction of the hotel at this location, we recommend that the following items be considered:

a. Evaluate options to strengthen the overall slope stability by increasing the resisting forces and/or by lowering the water level on the slope.

b. Minimize, if not eliminate the introduction of moisture into the subgrade. This could be accomplished by,

   i. Collecting and transporting surface drainage off of the site in water tight storm drainage systems. This type of construction is not standard and therefore it would require specific attention to verify that the improvements are water tight.

   ii. Water ways should be lined to prevent to seepage into the ground.

iii. Measures need to be taken to eliminate the potential for water to pond on the slope.

c. Positive steps would need to be taken on other improvements on the landslide mass to help maintain the overall stability of the slope.

RECOMMENDATIONS

Based on our experience in the area, subsurface conditions encountered, laboratory test results, and proposed construction, the following recommendations are provided:

A. Site Grading

Based on the subsurface conditions observed and the proposed grading, the following recommendations are provided.

1. Subgrade Preparation

General: Prior to placing site grading fill or concrete, the existing sparse vegetation should be removed. The piles of fill and boulders should also be removed.

Flatwork and Pavement Support: Portions of the existing fill exhibit expansive characteristics. Settlement of the ground surface could also occur due to due to the variable consistency and density of the fill. We anticipate improvements (pool and decking) will be supported on deep foundation elements where the fill is relatively deep (the east portion of the site). Thus, the condition of the fill will not affect their performance.

The fill is relatively shallow on the west portion of the site where pavement and flatwork are proposed to be supported on the ground surface. Our borings indicate the fill in this area is likely less than 10 feet deep in this area. Due to the variable consistency and density of the fill, the full depth of this fill should be removed from areas which will support pavement and flatwork.

We recommend flatwork and pavement be supported on an appropriate thickness of non-expansive, low permeable fill. The thickness of low permeable fill should be based on the acceptable magnitude of potential differential vertical movement. The low permeable fill layer is intended to reduce the risk of wetting. Strict site drainage is critical to the satisfactory performance of flatwork, pavement or other surface supported features. The estimated potential surface heave associated with corresponding overexcavation depths are provided in the following table.

Thickness of Non-Expansive Low Permeable Fill (feet)	Estimated Potential Differential Vertical Slab Movement (inches)	
	Fill Subgrade	Mudstone Subgrade
0	2 to 3½	3½ to 5
2	1½ to 2¼	2½ to 3¾
4	1 to 1½	2 to 3
6	¾ to 1	1½ to 2½
8	½ to ¾	1¼ to 2
10	< ½	1 to 1½
12	--	¾ to 1¼
14	--	¾ to 1
16	--	½ to ¾

As a minimum, we recommend at least 5 feet of non-expansive, low permeable fill be placed above the mudstone bedrock in areas which will support flatwork or pavement. The risk of heave potential may also be reduced by increasing the overexcavation depth and providing strict drainage.

Buildings: Buildings will be supported on deep foundation elements with raised structural floors. Therefore, removal of fill or mudstone is not critical under building areas unless slab on grade floors will be considered.

Lateral Extent: All overexcavation and subgrade preparation procedures should extend at least 5 feet beyond the perimeter of the proposed construction. Excavations should be located by survey.

2. Excavation/Earthwork

Excavation of the on-site soil and soft bedrock at the site may be accomplished with typical excavation equipment. The drilling of the soil and bedrock encountered to the depths investigated may be performed with typical rotary drilling equipment. Difficulty may be encountered when drilling through cobbles and boulders which are present in the fill and talus. Loss of drilling fluid may also occur due to the presence of voids in the fill.

3. Grading Slopes and Trenches

Permanent cut slopes excavated into the overburden soils should be cut no steeper than 2:1 (Horizontal:Vertical). Permanent cut slopes into the soft mudstone bedrock should be cut no steeper than 1:1 (Horizontal:Vertical).

It has been our experience that the mudstone surface will dry to a "pop corn" texture and ravel resulting in deposition of material at the toe until an approximate 2½:1 slope is achieved over time. To improve performance of steeper cut slopes in mudstone, slope facing should be considered along with

strict site drainage away from the slope and implementation of desert landscaping.

Facing could consist of large stacked boulders, precast concrete blocks or reinforced gunnite facing attached with soil nails. A drain should also be constructed behind the facing to reduce the potential for water accumulation and buildup of hydro-static pressure. If these options will be considered, AGEC should be contacted to provide further consultation.

Unretained fill slopes constructed with properly compacted on-site soil should be graded no steeper than 2:1 (horizontal to vertical). Slopes should include benches in accordance with the 2015 IBC. The cut and fill slopes will be highly susceptible to erosion, particularly resulting from run off from the adjacent slopes. Water should be directed around slopes using drainage swales to reduce potential erosion.

Fill slopes should be graded by overbuilding and then cutting them back to the desired grade to provide a compacted slope face. Fill placed on existing slopes steeper than 4:1 (horizontal to vertical) should be placed using a benching procedure. Benches should be of sufficient width to allow adequate area for the compaction equipment.

Utility trenches excavated in the on-site soils should be excavated in accordance with OSHA requirements using a OSHA Soil Class C (1½:1 Horizontal:Vertical) for overburden soils and soft mudstone. Steeper trenches may require the use of shoring or a trench box to provide as safe work environment. Safe trench excavation is the responsibility of the contractor.

4. Compaction

Compaction of fill materials placed at the site should equal or exceed the following percentages when compared to the maximum dry density as determined by ASTM D-698 or ASTM D-1557:

Area	Percent Compaction ASTM D-698*	Percent Compaction ASTM D-1557**
Subgrade	95	90
Site grading	95	90
Slabs (base course)	Does not apply	95
Utility trench backfill	95	90
Wall Backfill	95	90

* Fine-grained low permeable fill/processed mudstone.
** Granular site grading fill/granular low permeable fill/structural fill.

Prior to placing approved fill, the exposed subgrade should be moisture conditioned and compacted as recommended above. Fill should be placed in lifts which do not exceed the capability of the equipment used. Generally 6 to 8 inch lifts are adequate for heavy rubber tire equipment. Lift thicknesses should be reduced to 4 inches for hand compaction equipment.

Fill materials should be properly moisture conditioned prior to placement. Fine-grained soil, low permeable fill and processed mudstone or mudstone/sand mixture should be moisture conditioned to 2 to 4 percentage points over the optimum moisture content as determined by ASTM D-698. Granular soil should be moisture conditioned to within 2 percentage points of the optimum moisture content as determined by ASTM D-1557. Each lift of fill placed should be tested to verify moisture content and compaction are appropriate.

5. Materials

Recommendations for imported fill types follow. If structural floors are used, the type of fill placed under the buildings is not critical. Imported fill should be non-expansive and meet the following recommendations.

Area	Fill Type	Recommendations
Footings/pads/site	Structural and site grading fill	**-200** <35%, **LL** <30% Maximum size: 4 inches Solubility < 1%
Under slabs/flatwork	Base course	**-200** <12% Maximum size: 1 inch
Drains	Gravel	1 inch max size **-200** <5%

-200 = Percent Passing the No. 200 Sieve

LL = Liquid Limit

The existing site grading fill is variable in plasticity and portions are expansive. The on site fill is suitable for use as site grading fill, wall backfill and utility trench backfill in areas which will support hard surfaces and pavement at depths greater than 5 feet below the finished grade.

If portions of the onsite fill appear low plastic, it may also be suitable for use as fill extending to the surface, but observation and additional testing would be necessary. Alternatively, the fill may be mixed with imported, non-expansive fill or imported soil would be placed to support in the upper 5 feet of the profile.

The on-site mudstone is not suitable for use wall backfill or as fill in structural areas or areas which will support hard surfaces and pavement. It may be used as fill in landscape areas or it should be disposed of offsite.

The potential impact of the expansive characteristics of the underlying mudstone bedrock can be reduced by protecting the bedrock from becoming wet. Placement of relatively low permeable fill above the bedrock can help reduce the possibility of water coming in contact with the bedrock. The low permeable fill supporting these areas is intended to provide a low permeable

zone to reduce the potential for water to infiltrate and wet the underlying subgrade. If the expansive subgrade below the low permeable fill is wetted, surface heave will occur. This will result in reduced flatwork and pavement life.

Low permeable fill used to replace removed mudstone should meet one of the following set of criteria.

Liquid Limit (%)	Percent Passing the No. 200 Sieve
45 +	15-20
30-45	20-40
0-30	30-100

The onsite fill soil mixed with some imported, non-expansive, granular fill will likely meet the low permeable fill requirements at a ratio of 1 part granular soil to one part of the onsite fill. The mixture should be tested by AGEC to verify its engineering characteristics prior to use as fill.

6. Drainage

The following drainage recommendations should be implemented to reduce the potential for wetting of the underlying expansive soils and bedrock.

a. Positive site drainage away from foundations should be maintained during the course of construction.

b. After construction has been completed, positive drainage of surface water away from the buildings should be maintained throughout the life of the structure. We recommend a minimum slope of 6 inches in the first 10 feet from the perimeter of the structure. In no case should water be allowed to pond adjacent to foundations.

c. Desert landscaping, which requires no water, should be implemented. Grass should not be used. Rock mulch and turf are recommended.

d. Rain gutters should be utilized and roof down spouts should be piped to discharge to the storm drain system. This will require design of buried discharge pipes with flexible watertight connections.

e. If planters are used, they should be underlined by a impermeable membrane which is sloped to a discharge pipe which discharges water to storm drain.

f. We also recommend that desert landscaping, which requires no water, be used adjacent to concrete walls and masonry walls or other cement containing elements which will be backfilled. Further, the below grade portions of walls/fences which are backfilled with soil should be protected with an impermeable membrane and a subsurface drain. A gravel covered, perforated PVC pipe should also be placed at the base of the wall to carry water to a discharge point. This is intended to reduce the potential for salt weathering on concrete/masonry.

7. Subsurface Drainage Protection

As a precautionary measure, the crawl space and below grade portions of the hotel and parking structure should be protected from potential infiltration of surface water by constructing a perimeter subsurface drain around the crawl space of the building.

The drain system should consist of a 1 foot wide trench excavated around the outside perimeter of the grade beam/walls supporting the buildings. The trench should be excavated to a depth of at least 2 feet below the crawl space depth. A 4 inch perforated PVC pipe should be placed in the bottom of the trench and covered with free-draining gravel to within 2 feet of the ground surface. Prior to backfilling, Mirafi 140N filter fabric should be placed over the gravel. The perimeter drain trench and the grade beams should be backfilled with properly compacted, low permeable fill above the gravel to reduce the potential for surface water infiltration directly to the crawl space between the beams and the trench.

The drain pipe should be placed in the bottom of the drain trench and sloped at a 2% grade (minimum) to drain by gravity or to a sump and discharge to the storm drain system.

B. Foundations

We recommend the proposed hotel, parking structure, pool and pool decking be supported on deep foundation elements which will extend support of the structures through the existing fill down to the underlying "non-active" mudstone. The deep foundation elements should extend at least 45 feet into the underlying expansive mudstone and be designed by a structural engineer according to the parameters provided in Table 2 of this report. Grade beams should be utilized to span the distance between piers and support a structural floor with a crawl space below. The following recommendations should be followed for the design and construction of the deep foundation system.

1. Micropile Design

a. Minimum length = 45 feet.

b. End bearing should not be considered for micropile capacity. Capacity of micropiles will be developed through skin friction.

c. The micropiles should be structurally reinforced to resist tensile forces on the pile due to upward skin friction (uplift) which could result if the mudstone is wetted and swells. The tensile force may be calculated utilizing at least 20 feet of pile length with an ultimate skin friction of 1,000 psf. A "greased PVC bond breaker" may also be considered to reduce uplift forces on the micropiles.

d. Micropile capacity should be reduced to account for a downdrag of 250 psf which could result if the existing fill densifies adjacent to the deep foundation element resulting in downward force on the deep foundation element. A greased bond breaker may also be considered to address down drag forces.

e. The micropile should be designed for a minimum dead load of 3,000 pounds. If the minimum dead load cannot be met and piles are spaced as far apart as practical, the length should extend beyond the minimum penetration to make up the dead load deficit. This can be accomplished by using the appropriate resisting ultimate skin friction as given in Table 2.

f. Care should be taken to assure the micropiles are not over-sized (mushroomed) at the ground surface, which could provide an area where swelling soil/rock could exert uplift forces on the piles.

g. The water cement ratio of the grout should be on the order of 0.45 to 0.50. This should be verified during construction using a grout scale to verify the grout has a specific gravity on the order of 1.8 to 1.9. The grout volume should be recorded for each micropile constructed to ensure the appropriate volume is placed.

h. Grout should be placed in the micropiles the same day they are drilled using a tremmie pipe which extends to the bottom of the drill hole. The tremmie pipe should be raised as the grout is placed to ensure the element is free of voids. If water enters the drill holes, it would be necessary to place grout immediately after the drill hole is completed using a tremmie. The tremmie will also displace water out of the hole as grout is placed. Failure to place grout the day of drilling may require re-drilling for additional bedrock penetration.

i. Micropile holes should be observed during drilling to verify depth. If air rotary methods are used, they can also be inspected to verify caving does not occur below the ground surface which could also result in additional uplift forces.

j. "Centralizers" should be used on the micropile steel reinforcing bar at approximately a 5 to 7 foot spacing to ensure the appropriate grout cover on the reinforcing.

2. Drill Pier Design

a. Minimum length = 45 feet.

b. Capacity of drilled piers may consider end bearing and skin friction to determine capacity. The end bearing capacities provided in Table 2 are allowable and include a factor of safety of 2.0.

c. The drilled piers should be structurally reinforced to resist tensile forces on the pier due to upward skin friction (uplift) which could result if the mudstone is wetted and swells. The tensile force may be calculated utilizing at least 20 feet of pier length with an ultimate skin friction of 1,000 psf.

d. Drilled piers should also be designed for down drag of 250 psf which could result if the existing fill densifies adjacent to the deep foundation element resulting in downward force on the deep foundation element.

e. The foundation elements should be designed for a minimum dead load of 10,000 psf. If the minimum dead load cannot be met and piers are spaced as far apart as practical, the length should extend beyond the minimum penetration to make up the dead load deficit. This can be accomplished by assuming an appropriate resisting ultimate skin friction as given in Table 2.

g. Care should be taken to assure the drilled piers are not over-sized (mushroomed) at the ground surface, which could provide an area where swelling soil/rock could exert uplift forces on the piers.

h. The concrete volume should be recorded for each pier constructed to ensure the appropriate volume is placed.

i. Concrete should be placed in the piers the same day they are drilled using a tremmie pipe which extends to the bottom of the drill hole. The tremmie pipe should be raised as the concrete is placed to ensure the element is free of voids. If water enters the drill holes, it would be necessary to place concrete immediately after the drill hole is completed using a tremmie. The tremmie will also displace water out of the hole

as concrete is placed. Failure to place concrete the day of drilling may require re-drilling for additional bedrock penetration.

j. Drilled pier holes should also be inspected to verify caving does not occur below the ground surface which could also result in additional uplift forces. Casing the drill hole may be necessary if the caving occurs to ensure a straight shaft with a consistent diameter. Pier holes must also be inspected to ensure they are cleaned and free of loose or disturbed soil.

k. Concrete coverage should be verified on reinforcing cages by placing spacers on the outside of the reinforcing cage to ensure it is not touching the drill hole side wall.

C. Floor System and Construction Details

1. Structural Floor/Beams/Crawl Space

Structural floors (including entries, porches and patios), supported on grade beams should be supported on deep foundation systems.

We recommend that a minimum 24 inch crawl space be provided below structural floors. Proper ventilation of the crawl space is critical and the ventilation system should be designed by the appropriate design professional.

A minimum 12-inch void space should be provided below the grade beams to allow the expansive mudstone to swell without exerting uplift forces on the grade beams. The void space should be protected prior to backfilling the grade beams to ensure the void space is not compromised. We also recommend low permeable fill be used as backfill around the beams to reduce the potential for infiltration and migration of water to the crawl space. Proper compaction and moisture conditioning of the backfill is critical.

2. Vapor Barrier

A vapor barrier should be placed on the bottom of the crawl space, attached to the grade beams using a water resistant attachment system to reduce moisture in the crawl space.

3. Plumbing and Utility Lines

Plumbing lines and utility lines should be hung from the floor when a pier/pile foundation system is utilized. Plumbing lines should have flexible joints where connections are made. A 12-inch void space should also be provided below plumbing where it crosses below grade beams.

4. Exterior Flatwork

The owners should be aware that exterior flatwork may move where expansive materials are present. To reduce concerns for flatwork movement causing distress to the structures, the flatwork should be separated from the main structure and allow for unrestrained vertical movement. This generally is accomplished by providing a construction joint between the concrete flatwork and the wall/slab with a heavy felt board.

A 4-inch layer of properly compacted base course should be placed below slabs to provide a firm and consistent subgrade and to promote even curing of the concrete.

Use of pavers or compacted decorative gravel in lieu of concrete flatwork may also be considered. Pavers or gravel will allow for some movement if the supporting subgrade heaves.

5. Exterior Porches

Exterior porches, patios and overhangs that are structurally tied to the remainder of the building should be supported by the same foundation system as the building.

D. Pool Construction Details

1. Pool Structural Floor

The shell of the pool should be structurally reinforced to span the distance between the piers. We recommend a minimum 24 inch void be provided below the pool to prevent expansive materials from exerting uplift forces on the pool. A void box should be placed in the bottom of the pool excavation prior to placing plumbing and rebar, or spraying gunnite to allow for construction above the void below the pool.

As an alternative, the bottom of the pool may be constructed as a structural floor supported on the piers using V-decking with a crawl space (This is the preferred method). The raised structural floor should be supported on grade beams. We recommend that a minimum 24 inch crawl space and access be provided below the structural floor. A 12-inch void space should be provided below the grade beams to allow the expansive materials to swell without exerting uplift forces on the grade beams. Subsequent to removing concrete forms from grade beams, the void should be inspected by AGEC to ensure the proper void space is provided.

2. Pool Plumbing and Utility Lines

Plumbing lines and utility lines should be hung from the floor when a pier foundation and structural floor system is utilized or placed above the void box (if used) to prevent crushing of the piping or connections.

Plumbing lines should have flexible joints where connections are made. A 12-inch void space should also be provided below plumbing where it crosses below grade beams. Exterior plumbing lines may be run inside a larger pipe conduit to allow for some movement without negatively affecting the plumbing lines. Plumbing lines should be tested prior to operation.

3. Pool Decking

Due to the presence of the underlying fill and expansive materials, we recommend the pool decking consist of a raised structural slab supported on deep foundation elements.

If slab on grade pool decking will be considered, the subgrade supporting the decking should be prepared as recommended in the Subgrade Preparation section of this report for "Flatwork". The owner should be aware that exterior flatwork will likely heave (as stated in the Subgrade Preparation section of this report).

Slab on grade pool decking should be separated (free vertical movement) from the main structure of the pool and should not be tied directly to the pool shell or to adjacent buildings. This is recommended to allow for unrestrained uplift of the pool decking so as not to affect the main structure of the pool. This generally is accomplished by providing a construction joint between the concrete flatwork and pool or building with a heavy felt board.

The pool decking should be sloped away from the pool to provide adequate drainage. We also recommend constructing a water-tight concrete gutter system (depression) or drain around the pool decking to catch runoff water, divert it around the pool, and discharge off site. Joints or seams in the pool decking should be sealed to reduce infiltration of surface water.

A 4-inch layer of properly compacted base course should be placed below slabs to provide a firm and consistent subgrade and to promote even curing of the concrete.

E. Lateral Earth Pressures

1. Retaining Structures

The following equivalent fluid weights are given for design of subgrade walls and retaining structures. The active condition is where the wall moves away from the soil. The passive condition is where the wall moves into the soil and the at-rest condition is where the wall does not move. We recommend basement walls or below grade beams be designed in an at-rest condition. Walls where lateral movement is not tolerable should also be designed in the at-rest condition.

The values listed below assume a horizontal surface adjacent the top and bottom of the wall.

Soil Type	**Active Condition**		**At-Rest Condition**		**Passive Condition**
	Equivalent Fluid Weight	Earth Pressure Coefficient	Equivalent Fluid Weight	Earth Pressure Coefficient	Equivalent Fluid Weight
Imported Granular Backfill	35 pcf	0.28	55 pcf	0.44	325 pcf
On-site Clayey Fill Soil	45 pcf	0.38	65pcf	0.54	225 pcf

The above values account for the lateral earth pressures due to the soil and level backfill conditions and do not account for hydrostatic pressures or surcharge loads.

Lateral loading should be increased to account for surcharge loading using the appropriate earth pressure coefficient and a rectangular distribution if structures are placed above the wall and are within a horizontal distance equal to the height of the wall. If the ground surface slopes up away from the wall, the equivalent fluid weights should also be increased.

Care should be taken to prevent percolation of surface water into the backfill material adjacent to the retaining walls. The risk of hydrostatic buildup can be reduced by placing a subdrain behind the walls consisting of free-draining gravel wrapped in a filter fabric.

2. Seismic Conditions

Under seismic conditions, the equivalent fluid weights should be modified as follows according to the Mononobe-Okabe method assuming a level backfill condition:

Lateral Earth Pressure Condition	**Seismic Modification (2% PE in 50 yrs)**
Active	9 pcf increase
At-rest	no increase
Passive	18 pcf decrease

The seismic increases and decrease assume a peak ground acceleration (PGA) of 0.21g and a 1 second period ground acceleration (S_1) of 0.14g using the Mononobe-Okabe pressure distribution.

3. Safety Factors

The values recommended assume mobilization of the soil to achieve the assumed soil strength. Conventional safety factors used for structural analysis for such items as overturning and sliding resistance should be used in design.

F. Seismicity, Liquefaction and Faulting

1. Seismicity

Listed below is a summary of the seismic site parameters.

Description	Value - Seismic Event - 2% PE in 50 yrs
2015 IBC Seismic Site Class	C
PGA	0.21g
S_s	0.50g
S_1	0.15g
F_a	1.20
F_v	1.65
F_{PGA}	1.19

2. Liquefaction

Based on subsurface conditions encountered in the boring, the subsurface soils observed are non-liquefiable during a severe seismic event.

3. Faults

Based on review of available geologic literature, there are no mapped faults extending through the site.

G. Soil Corrosion

Our experience in the area and laboratory test results indicates the on-site soil and bedrock contain sulfate concentration corresponding to a "moderate" to "severe" potential sulfate attack on concrete exposed to these materials. Therefore, we recommend concrete elements that will be exposed to the on-site soils be designed in accordance with provisions provided in the American Concrete Institute Manual of Concrete Practice (ACI) 318-11. Tables 4.2.1 and 4.3.1 of ACI 318-11 should be

referenced for design of concrete elements utilizing a Sulfate Exposure Class of S2, and a sulfate exposure severity of "severe".

Consideration should also be given to cathodic protection of buried metal pipes. We recommend utilizing PVC pipes where local building codes allow.

H. Pavement

Based on the subsoil conditions encountered and the laboratory test results, the following recommendations are given:

1. Analysis

   The flexible pavement analysis is based on AASHTO design methods and a 20 year design lifeThe rigid pavement is based on AASHTO and PCCA design methods and a 20 year design life.

2. Subgrade Support

   Our design assumes a properly prepared subgrade as recommended in the Subgrade Preparation section of this report. The subgrade preparation varies depending on the location on the site. Prior to base course or pavement or grading fill, the subgrade should be prepared as recommended in the Subgrade Preparation section of this report.

3. Pavement Thickness

   Based on the anticipated traffic, the following pavement sections are recommended.

	Rigid Pavement		Flexible Pavement	
Area	Portland Cement (inches)	Base Course (inches)	Asphaltic concrete (inches)	Base Course (inches)
Light Duty Parking	--	--	2½	8
Entrances and dumpster pad	4	4	3	12

4. Pavement Materials

a. *Flexible Pavement (Asphaltic Concrete)*

The pavement materials should meet AASHTO, St. George City specifications for gradation and quality. The pavement thicknesses indicated above assume that the base course is a high quality material with a CBR value of at least 80 percent. Asphalt material should have a Marshal stability of at least 1,800 pounds.

b. *Rigid Pavement (Portland Cement Concrete)*

The pavement thicknesses indicated assumes that the concrete will have a 28-day compressive strength of at least 4,500 psi.

5. Jointing

Joints for concrete (rigid) pavement should be laid out in a square or rectangular pattern. Joint spacings should not exceed 30 times the thickness of the slab. The depth of joints should be at least one-quarter of the slab thickness.

6. Drainage

The collection and diversion of drainage away from the pavement surface is extremely important to the satisfactory performance of the pavement section. Proper drainage should be provided. We further recommend proper pavement maintenance to extend the pavement life.

I. Design Review/Construction Observation

Design review and construction observations are recommended to verify the recommendations in this report are properly implemented and followed. In order to provide a foundation compliance report as required by the St. George City, we recommend the following be done as a minimum:

1. Review the foundation plan and design to verify the geotechnical aspects of the design were correctly and properly included.

2. Observe on a full time basis the drilling and construction of the micropiles and piers including reinforcement and concrete placement.

3. Observe the reinforcing steel in the grade beams.

4. Verify the proper void space is provided below the grade beams.

5. Conduct special inspections as required by the St. George City, the 2015 International Building Code and the Structural engineer.

The above observations will be conducted by qualified individuals and according to standard test methods (ASTM, ICBO, ICC, etc.).

LIMITATIONS

This report has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the borings drilled, geologic literature, laboratory test results, engineering analysis and our experience in the area. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface soil or groundwater conditions are found to be different from what is described in this report, we should be notified to reevaluate the recommendations given.

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

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

Arnold DeCastro, P.E.

Reviewed By: James E Nordquist, P.E., D.G.E.

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GEOLOGIC LITERATURE REFERENCES

"Geologic map of the St. George quadrangle, Washington County, Utah", Hayden, J.M., Willis, G.C., 2011, Utah Geological Survey map, 251DM.

"Geologic hazards and adverse construction conditions, St. George-Hurricane Metropolitan Area, Washington County, Utah", Lund, W.R., Knudsen, T.R., Vice, G.S., and Shaw, L.M., 2008, Utah Geological Survey Special Study 127, variously paginated, 14 plates, scale 1:24,000.



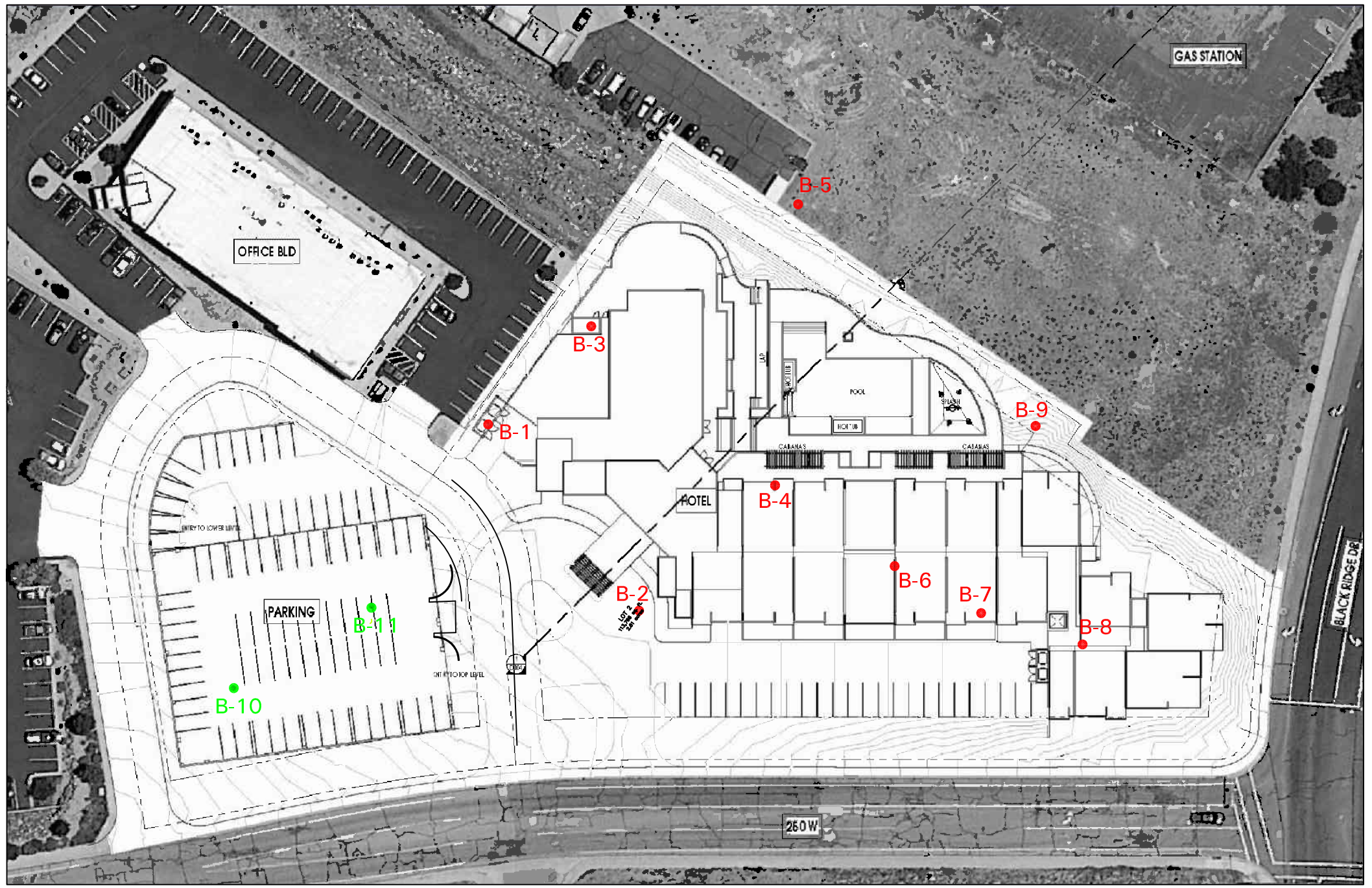
N

Not to Scale

BLACKSTONE HOTEL SITE
ST. GEORGE, UTAH

2180187	AGEC	Vicinity Map	Figure 1

BLACKSTONE HOTEL SITE
ST. GEORGE, UTAH



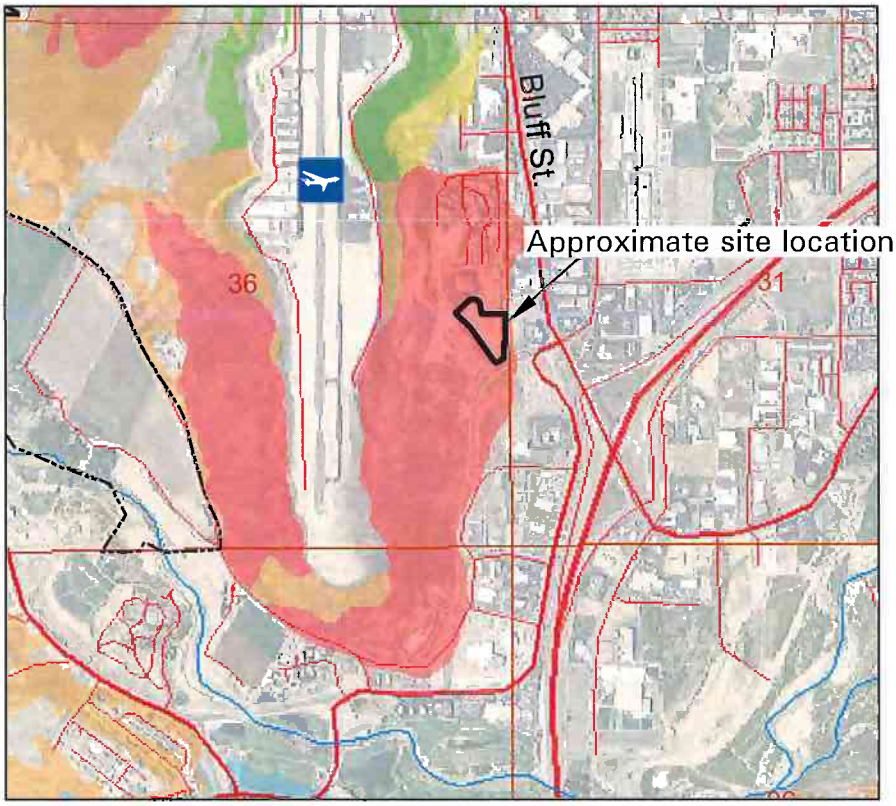
- Approximate boring location (current study)
- Approximate boring location (previous study by AGEC under Project No. 2061672)

N

0 80 160 feet

Approximate Scale

2180187	AGEC	Site Plan	Figure 2



Landslide-Hazard Map for the St. George-Hurricane Metropolitan Area, Washington County, Utah, UGS Special Study 127 2008, W.R. Lund, T.R. Knudson, G.S. Vice and L.M. Shaw

EXPLANATION

VH	Very High: Existing landslides (Category A).
H	High: Areas where Category B geologic units crop out on slopes greater than 15 percent (8.5°).
M_C	Moderate C: Areas where Category C geologic units crop out on slopes greater than 20 percent (11.3°).
M_B	Moderate B: Areas where Category B geologic units crop out on slopes less than 15 percent (8.5°).
L	Low: Arees where Category D geologic units crop out on slopes greater than 30 percent (16.7°).

Landslide Susceptibility of Geologic Units

Susceptibility Category	Geologic Units[1]	Comments
A	Existing landslides	Existing slope failures are considered the most likely units in which landsliding may initiate.
B	Petrified Forest Mbr., Chinle Fm.	This rock unit consists chiefly of bentonitic clay, which is highly expansive and has low shear strength especially when wet. This unit includes the greatest number of landslides mapped in the study area.
C	Woods Ranch Mbr., Toroweap Fm.; Harrisburg Mbr., Kaibab Fm.; Shnabkaib Mbr. and red members, Moenkopi Fm.; Whitmore Point Mbr., Moenave Fm.; Temple Cap Fm.; Carmel Fm.; Cretaceous bentonitic beds; Iron Springs Fm.	These bedrock units contain varying amounts of gypsum, shale, claystone, mudstone, siltstone, or a combination of the above that imparts weak shear strength characteristics to the units, at least locally, and makes them susceptible to slope failure. These units contain the second greatest number of landslides in the study area.
D	Remaining bedrock and unconsolidated geologic units in the study area.	These geologic units either contain a higher percentege of stronger rock types, crop out on slopes too low to generate slope failures, or generate failures that are too small to map at 1:24,000-scale. As e result, they exhibit few or no mapped landslides. Some landslides identified within these units are likely the result of failures in underlying, weaker geologic units.

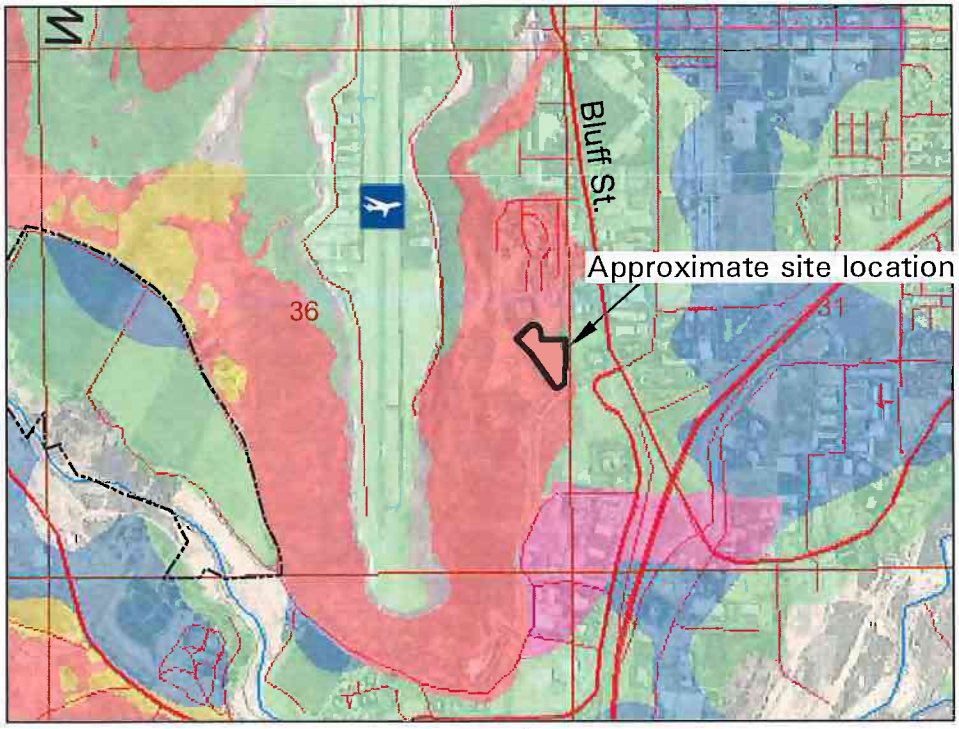
[1]Refer to UGS 1:24,000-scale geologic maps (see SOURCES OF DATA and REFERENCES in accompanying text) for a description of map units.

BLACKSTONE HOTEL SITE
ST. GEORGE, UTAH

N

Approximate Scale 1 = 24,000'

2180187	AGEC	Landslide Hazard Map	Figure 2a



Expansive-Soil-and Rock-Susceptibility Map for the St. George-Hurricane Metropolitan Area, Washington County, Utah, UGS Special Study 127 2008, W.R. Lund, T.R. Knudson, G.S. Vice and L.M. Shaw

ROCK

ERH — Bedrock units with high shrink/swell susceptibility include claystone horizons in the Virgin Limestone Member of the Moenkopi Formation; the Petrified Forest Member of the Chinle Formation, known locally as the "Blue Clay;" the lower red beds of the Dinosaur Canyon Member and the Whitmore Point Member of the Moenave Formation; the Iron Springs Formation, which contains abundant cley-rich strata in its lower part; and a thin interval (maximum thickness 90 feet) of montmorillonitic clay that lies between the Carmel Formation and the overlying Iron Springs Formation. Landslides mapped within these rock units were also included in the high-susceptibility category. These bedrock units contain an abundance of expansive clay minerals and are commonly associated with expansive rock problems in the study area.

ERM — Bedrock units with moderate shrink/swell susceptibility include the Shnabkaib and lower, middle, and upper red members of the Moenkopi Formation; the Co-op Creek and Crystal Creek Members of the Carmel Formation; and the Temple Cap Formation. These rock units are chiefly fine grained and contain alternating strata of shale, claystone, mudstone, siltstone, sandstone, and limestone. Not all or necessarily the majority of these strata contain expansive clay minerals, but past experience in the study area has shown that e sufficiently high percentage of strata do contain expansive clays that foundation problems are often associated with these rock units. Where mepped as undivided, we assigned a moderate susceptibility to the Moenkopi Formation, Carmel Formation, and grouped Triassic, Triassic/Jurassic, and Jurassic/Cretaceous rocks. Landslides mapped within moderate-susceptibility units are also included in this category.

ERL — Bedrock units with low shrink/swell susceptibility include the Timpoweap Member of the Moenkopi Formation and the the Kayenta Formation. Although we consider these units to have a low susceptibility relative to the bedrock units identified above, they contein some fine-grained, clay-rich strata that may cause shrink/swell problems locally.

CONCEALED

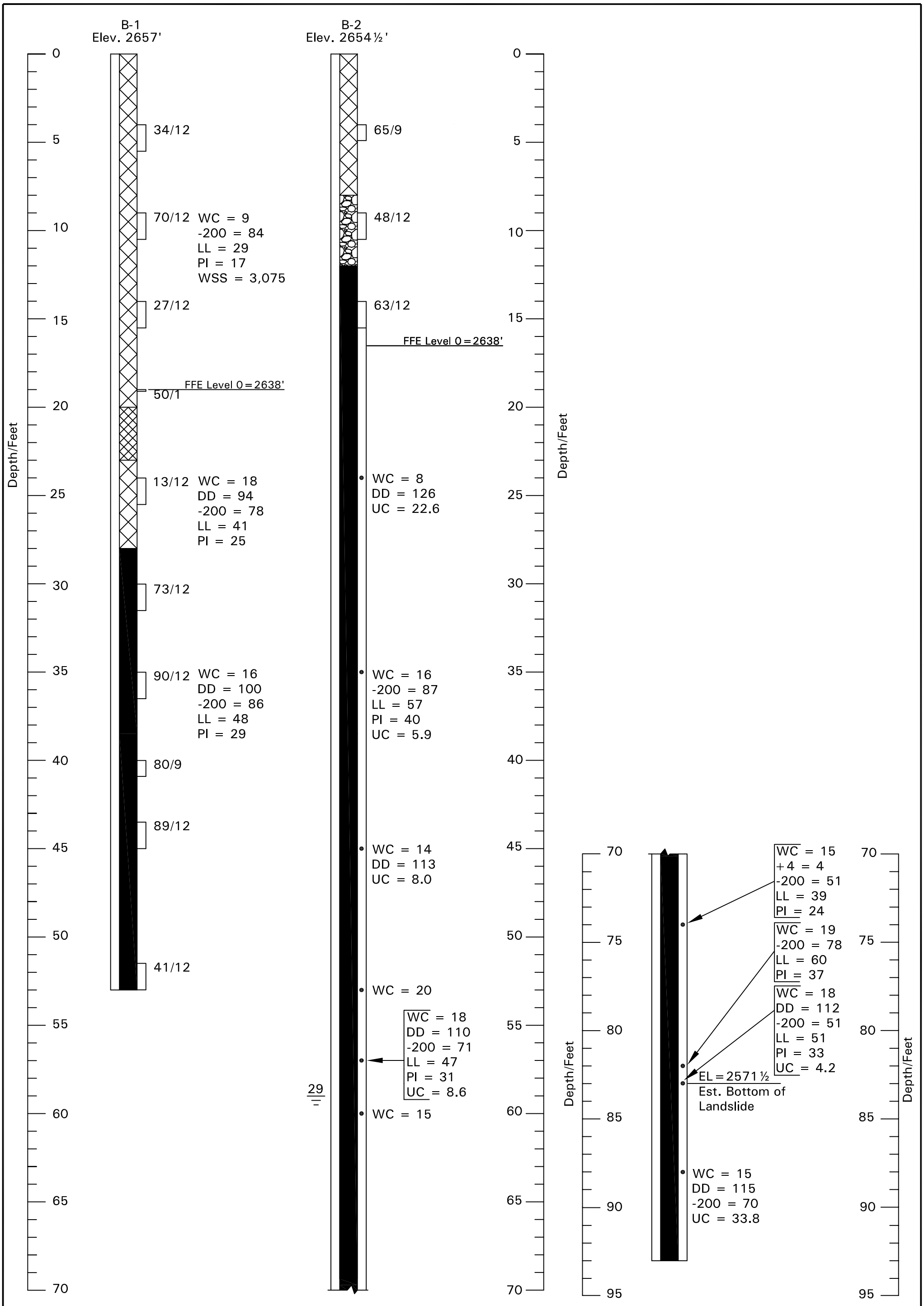
CHESR — Area of highly expansive soil or rock (≥5 percent swell) in the shallow subsurface (≤20 feet), but with little or no evidence of such material at the ground surface. Based on past engineering experience, such highly expansive soil or rock can cause differential displacements at the ground surface even when overlain by as much as 20 feet of nonexpansive material, and these areas are considered to have a high potential for expansive soil and rock problems.

BLACKSTONE HOTEL SITE
ST. GEORGE, UTAH

N

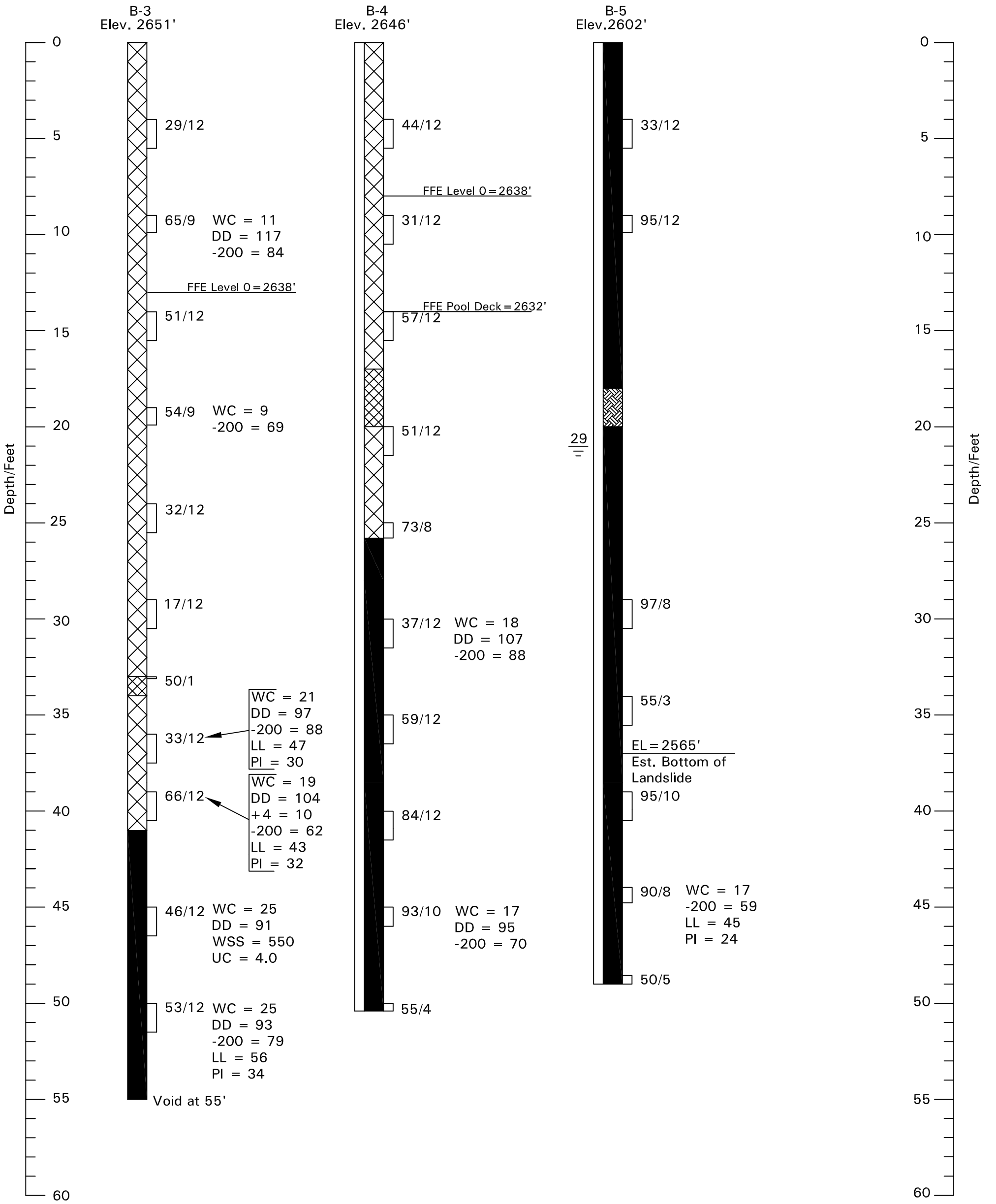
Approximate Scale 1 = 24,000'

2180187	AGEC	Expansive Soil and Rock Susceptibility Map	Figure 2b

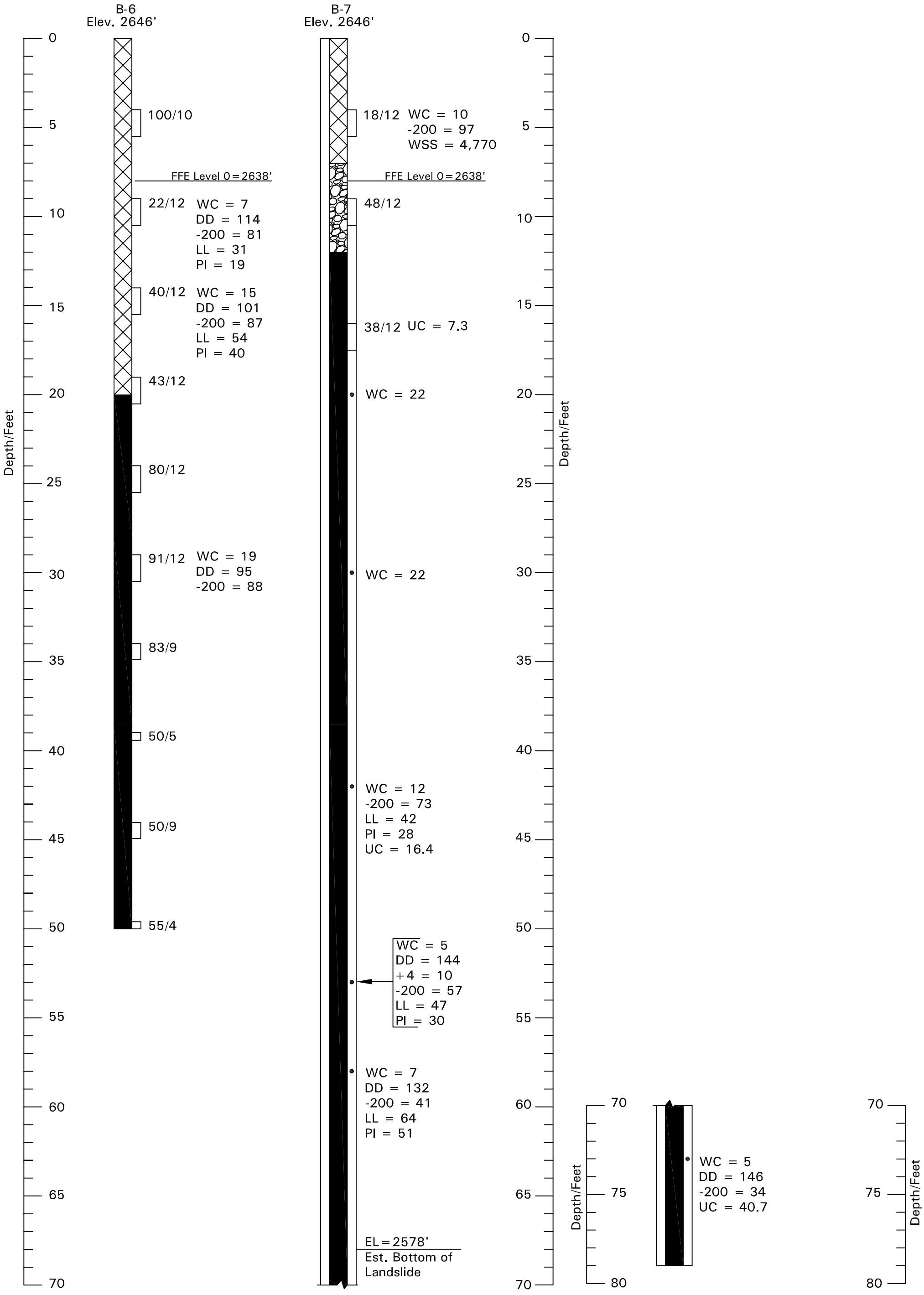


See Figure 8 for Legend and Notes

2180187	AGEC	Logs of Exploratory Borings	Figure 3

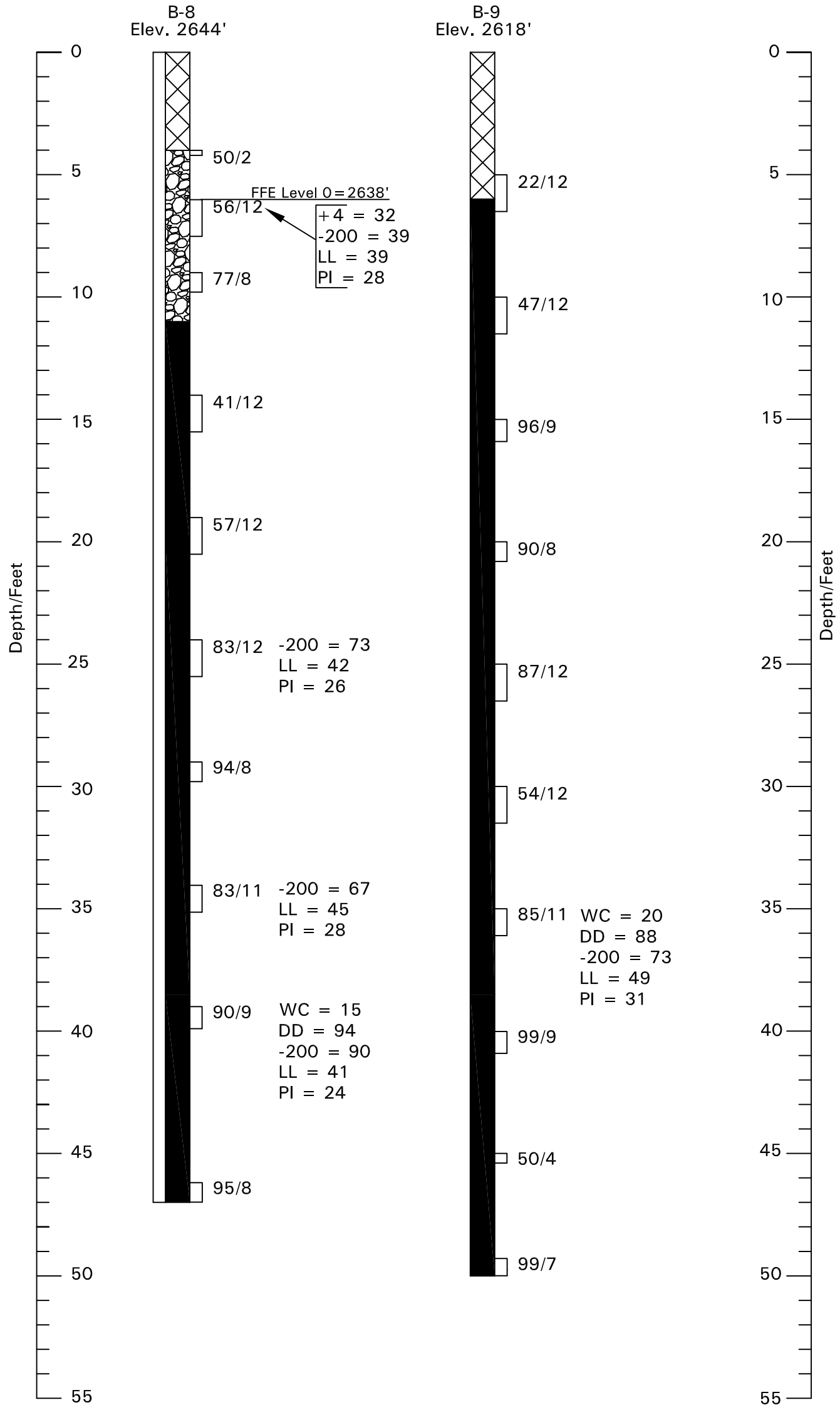


See Figure 8 for Legend and Notes



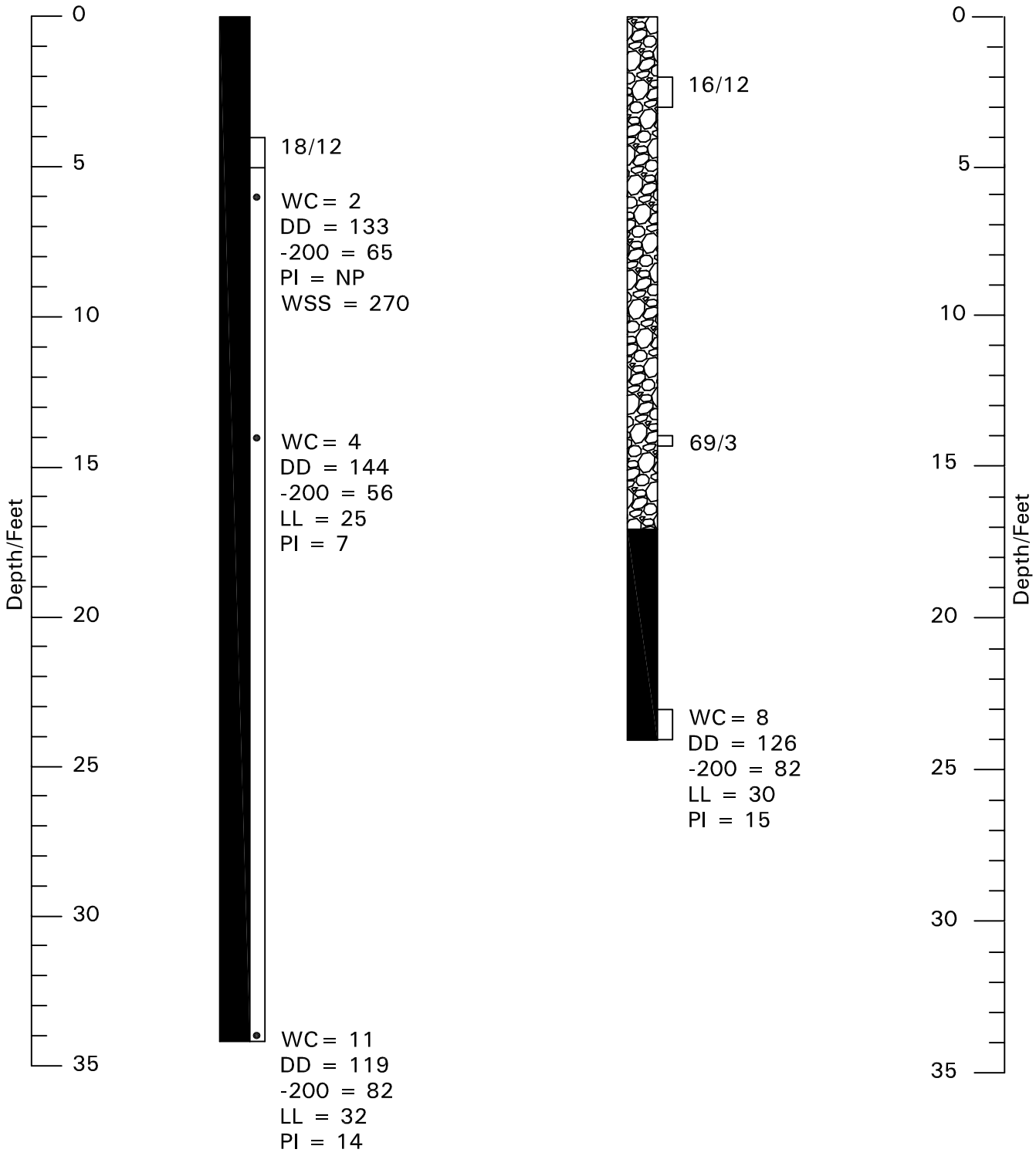
See Figure 8 for Legend and Notes

2180187	AGEC	Logs of Exploratory Borings	Figure 5



See Figure 8 for Legend and Notes

2180187	AGEC	Logs of Exploratory Borings	Figure 6



See Figure 8 for Legend and Notes

2180187	AGEC	Logs of Exploratory Borings	Figure 7

LEGEND:

Fill 1; lean to fat clay with sand and gravel, contains occasional cobbles and boulders. Consistency appears inconsistent (poorly to well compacted), slightly moist to moist, red to purple. Clay varies from low to high plasticity. Cobbles and boulders are basalt and sandstone.

Fill 2; basalt boulders, contains voids.

Basalt Boulder; hard, dry, grey.

Talus; cobbles infilled with gravel, sand and clay, occasional boulders, typically stiff/dense, slightly moist to moist, gypsiferous, purple to red. Clay is low to high plastic.

Mudstone Bedrock; soft to moderately hard, slightly moist to very moist, medium to high plastic, purple to red to grey. Altered mudstone (above the landslide slop surface) contains sand, clay and small basalt gravels. Changes to dark grey/black to yellow below the landslide. Red in boring B-10.

10/12 California drive sample taken. The symbol 10/12 indicates that 10 blows from a 140 pound automatic hammer falling 30 inches were required to drive the sampler 12 inches.

Indicates core sample taken.

Indicates slotted 1 inch PVC pipe installed in the boring to the depth shown.

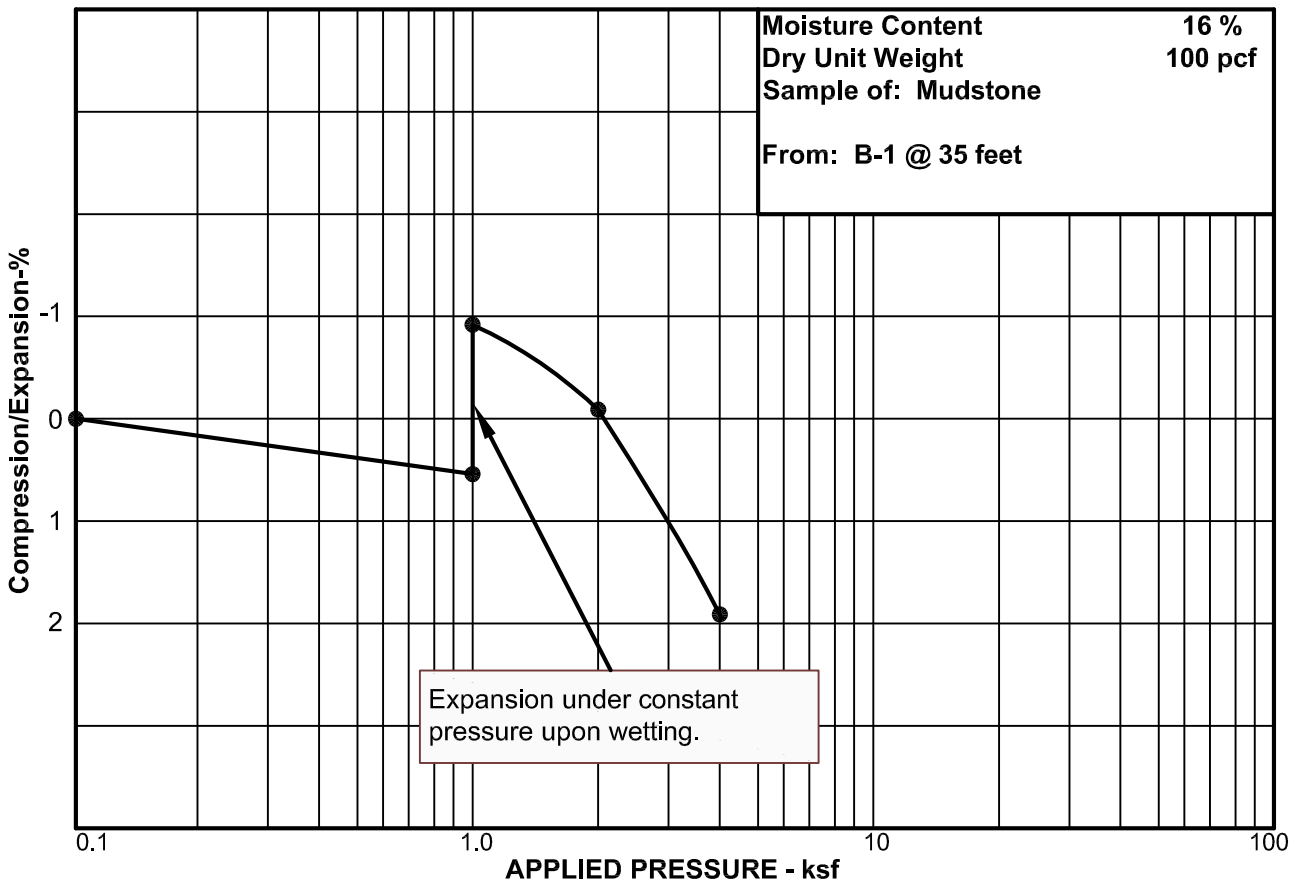
0 Indicates the depth to free water and the number days after drilling the measurement was taken.

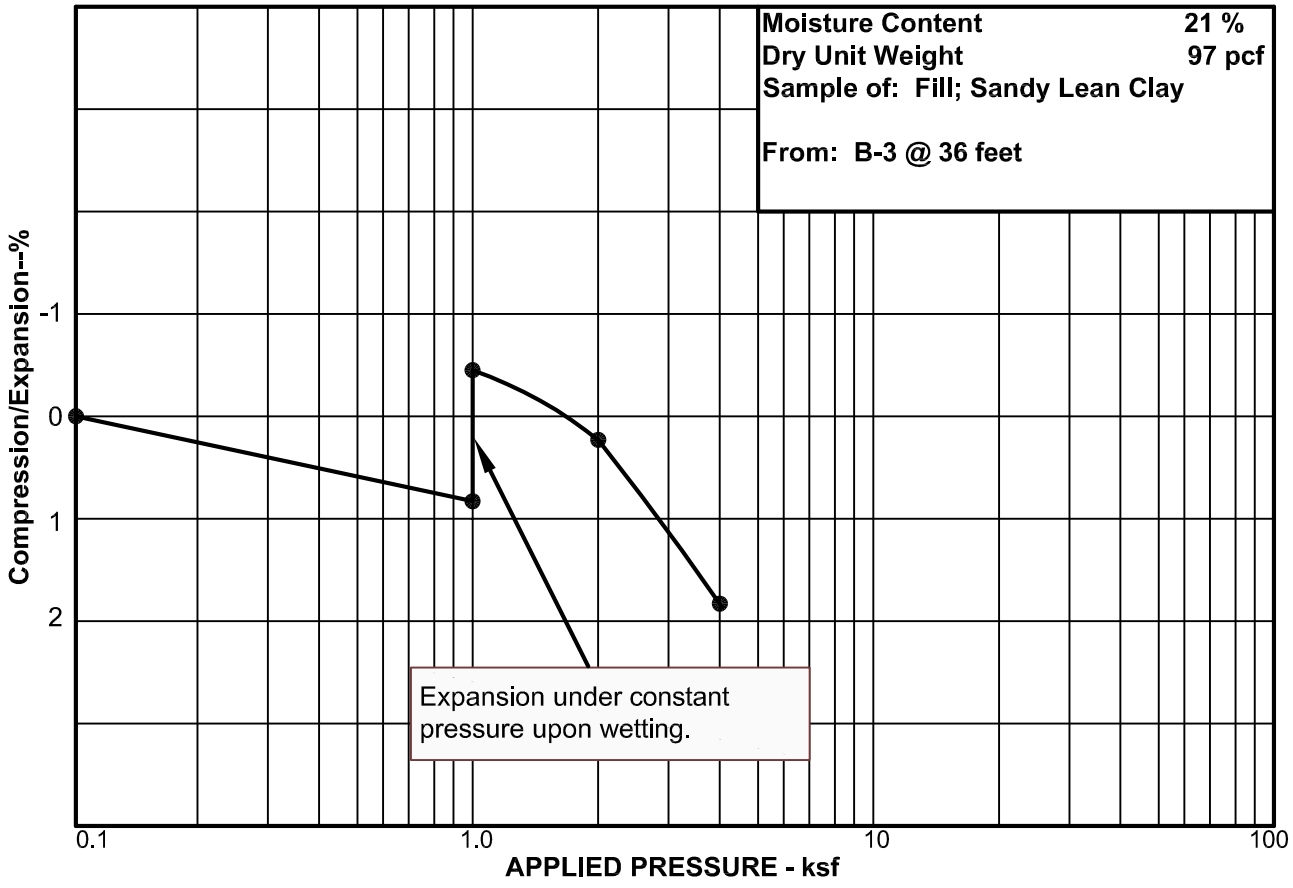
FFE Finished Floor Elevation

NOTES:

1. The borings were drilled on August 7, 2007, June 6, 7, August 16, September 17, 18, 20, 21, 24, and October 5, 2018 with a truck-mounted drill rig equipped with 8-inch hollow-stem augers and 2½ inch HQ core barrel with a carbide bit using mud rotary techniques.
2. The locations and elevations of the borings B-1 to B-9 were measured by Bush & Gudgell using GPS methods. The locations of borings B-10 and B-11 (2061672) were measured by pacing from features shown on Figure 2. The elevations were determined by interpolating between contours shown on the site plan for this report.
3. The boring locations and elevations should be considered accurate only to the degree implied by the method used.
4. The lines between the materials shown on the boring logs represent the approximate boundaries between material types and the transitions may be gradual.
5. Free water was not encountered in the borings B-1 to B-4 and B-6 to B-11 at the time of drilling.
6. WC = water content (%);
   DD = dry density (pcf);
   +4 = percent retained on the No. 4 sieve;
   -200 = percent passing No. 200 sieve;
   LL = liquid limit (%);
   PI = plasticity index (%);
   NP = non-plastic;
   UCC = unconfined compressive strength (ksf);
   WSS = water soluble sulfates (ppm).

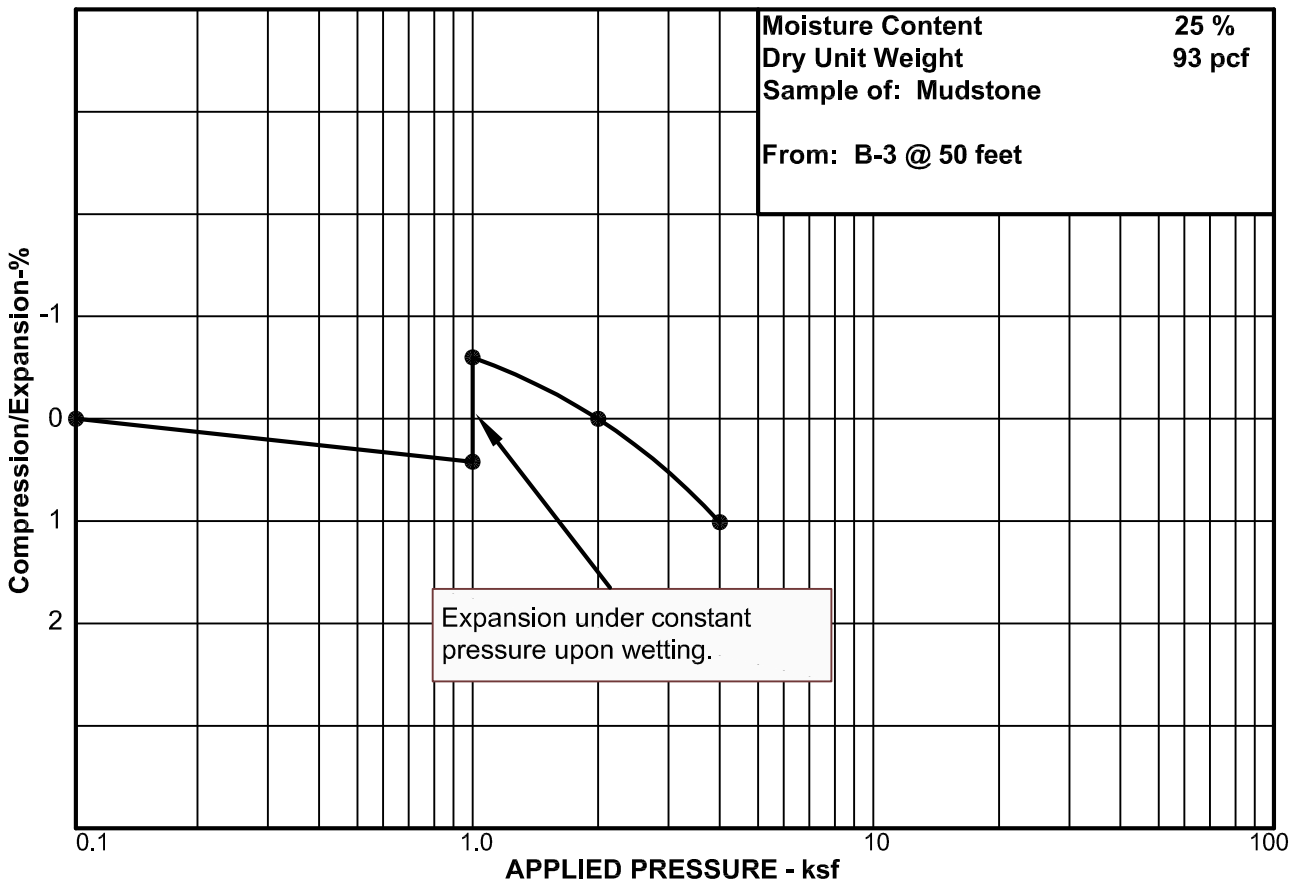
Applied Geotechnical Engineering Consultants, Inc.

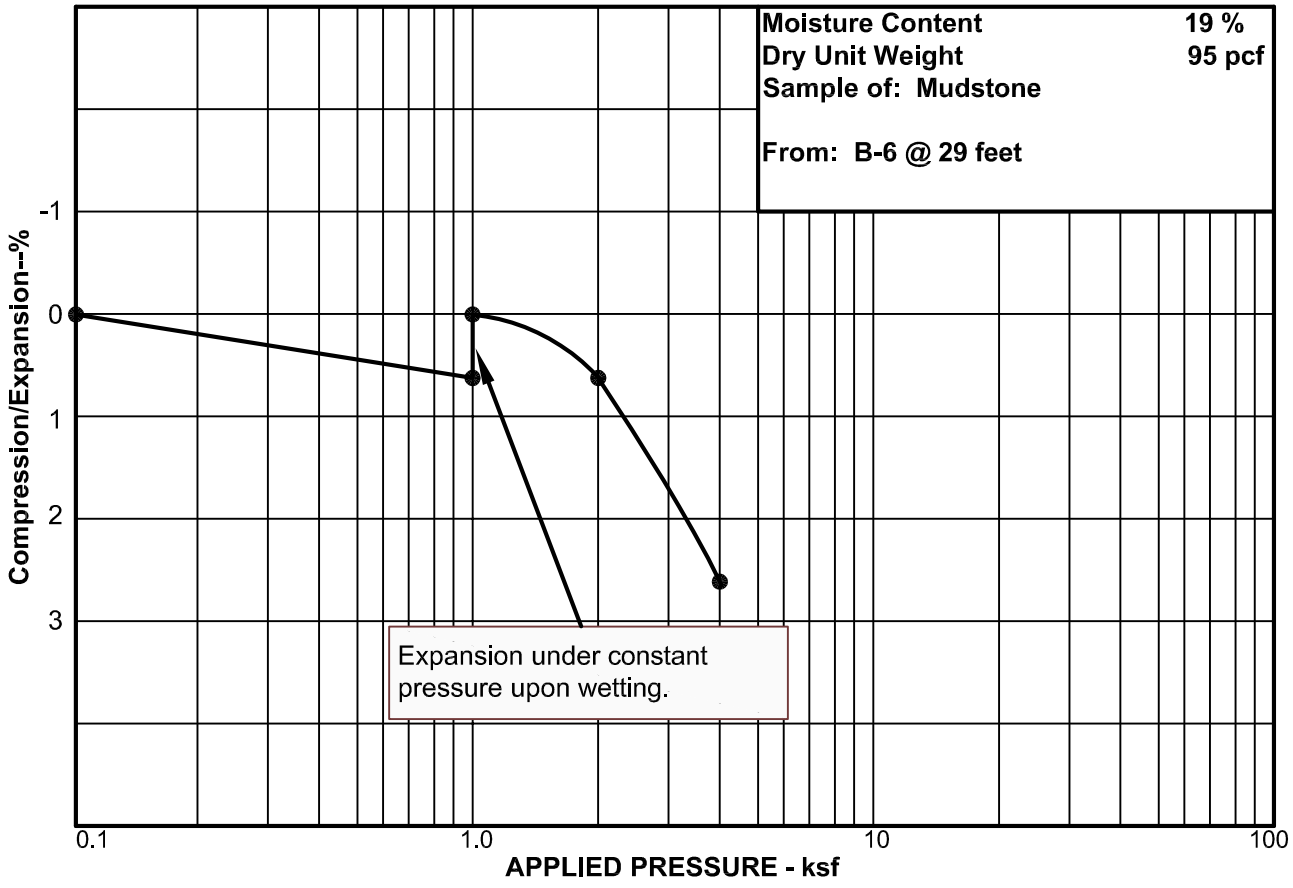




Project No. 2180187 **CONSOLIDATION TEST RESULTS** **Figure 9**

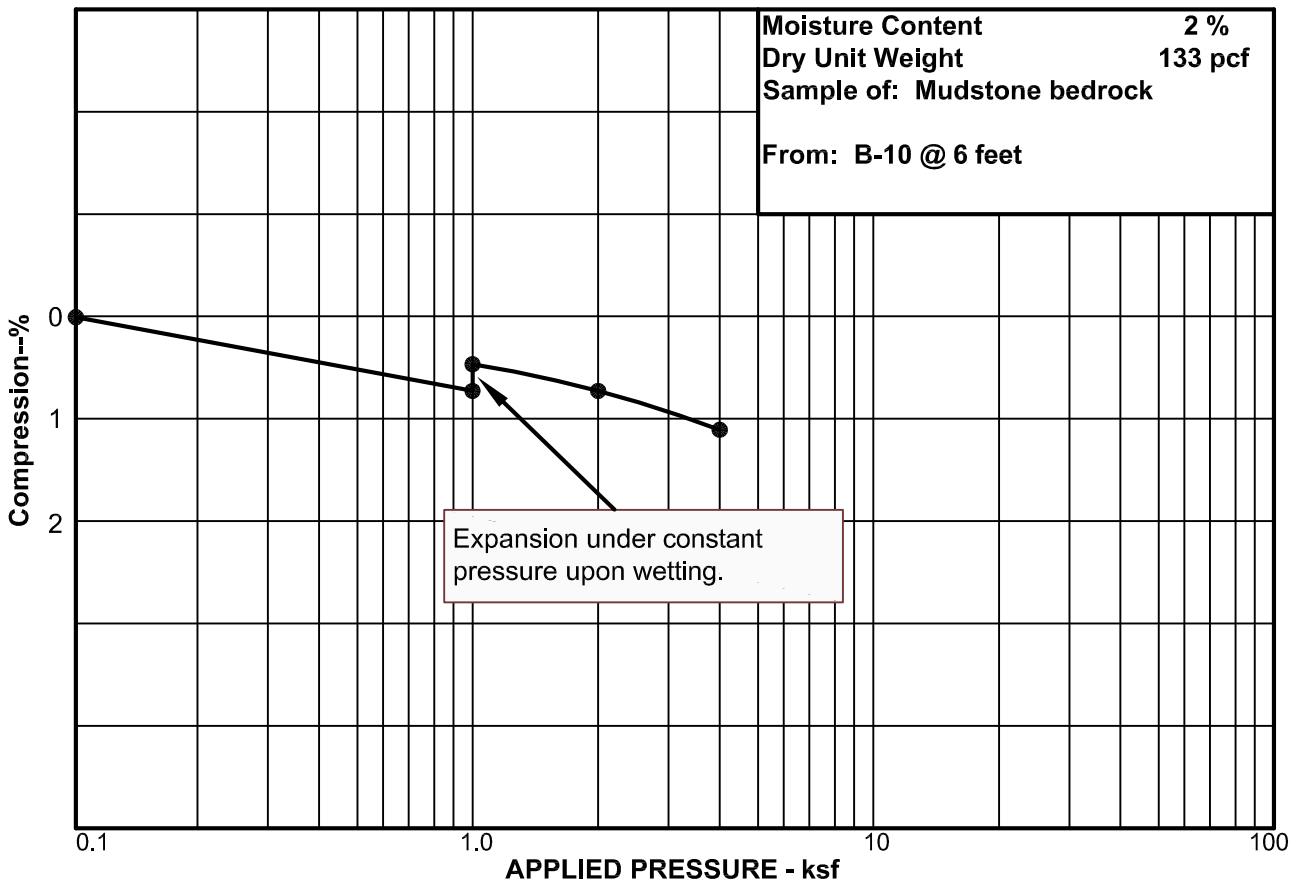
Applied Geotechnical Engineering Consultants, Inc.

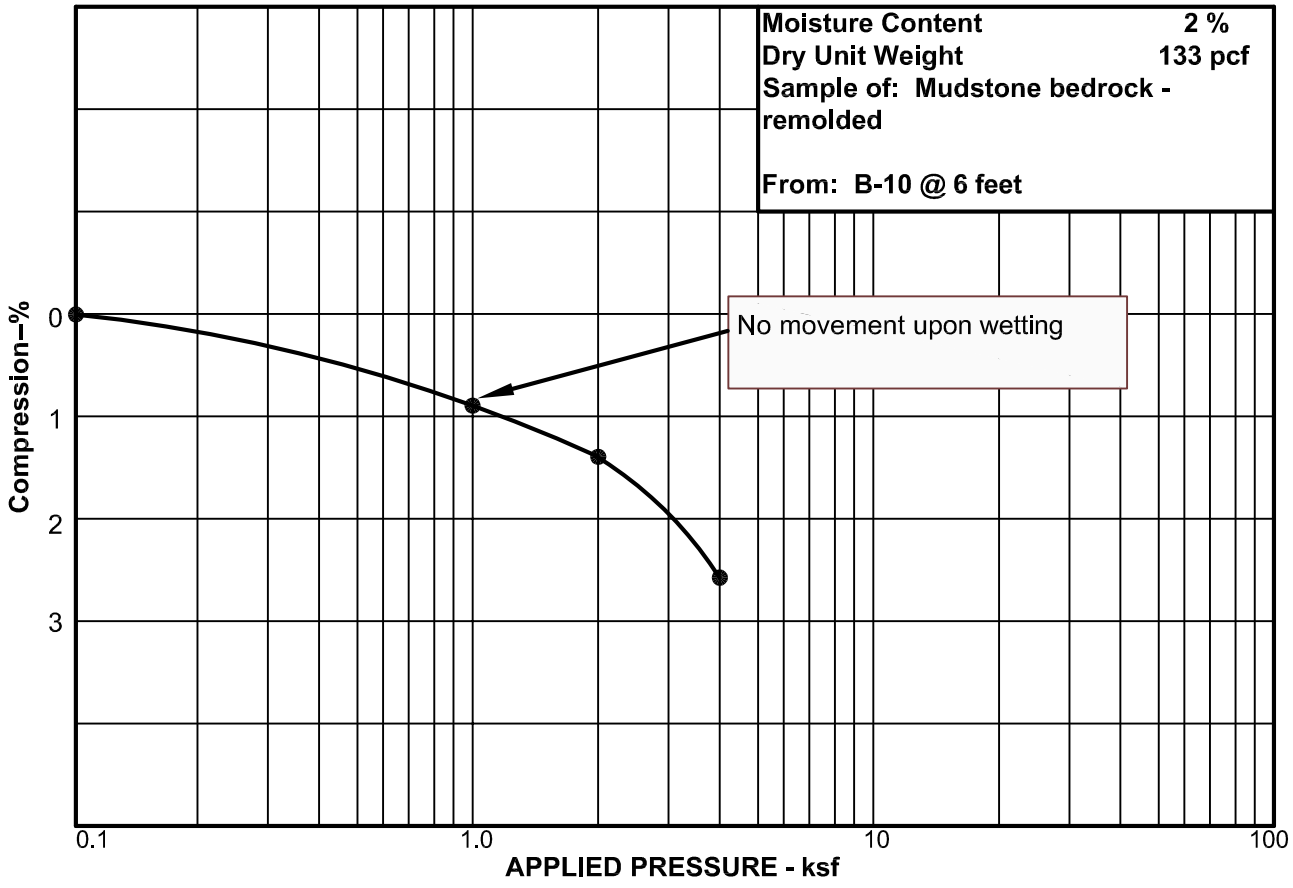




Project No. 2180187 **CONSOLIDATION TEST RESULTS** **Figure 10**

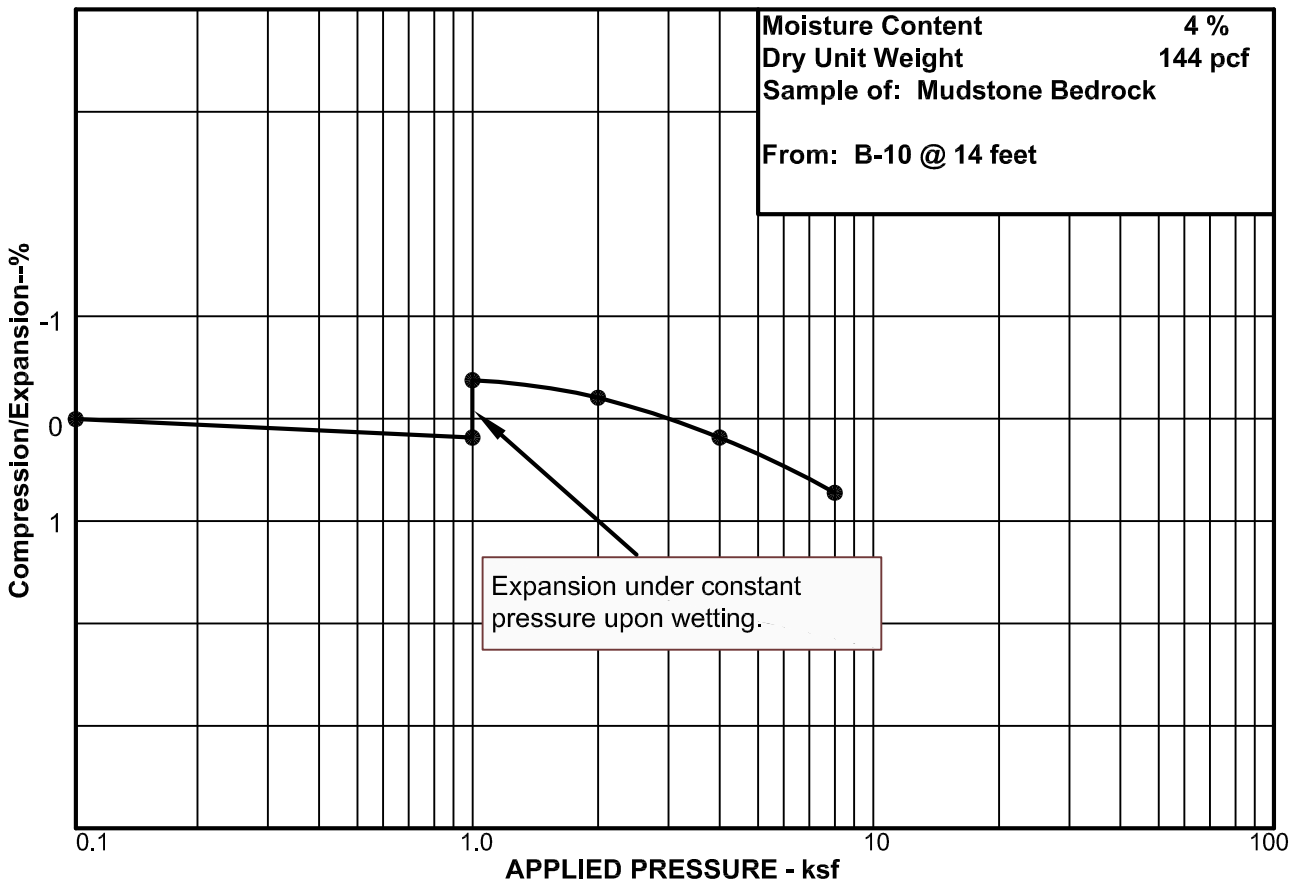
Applied Geotechnical Engineering Consultants, Inc.

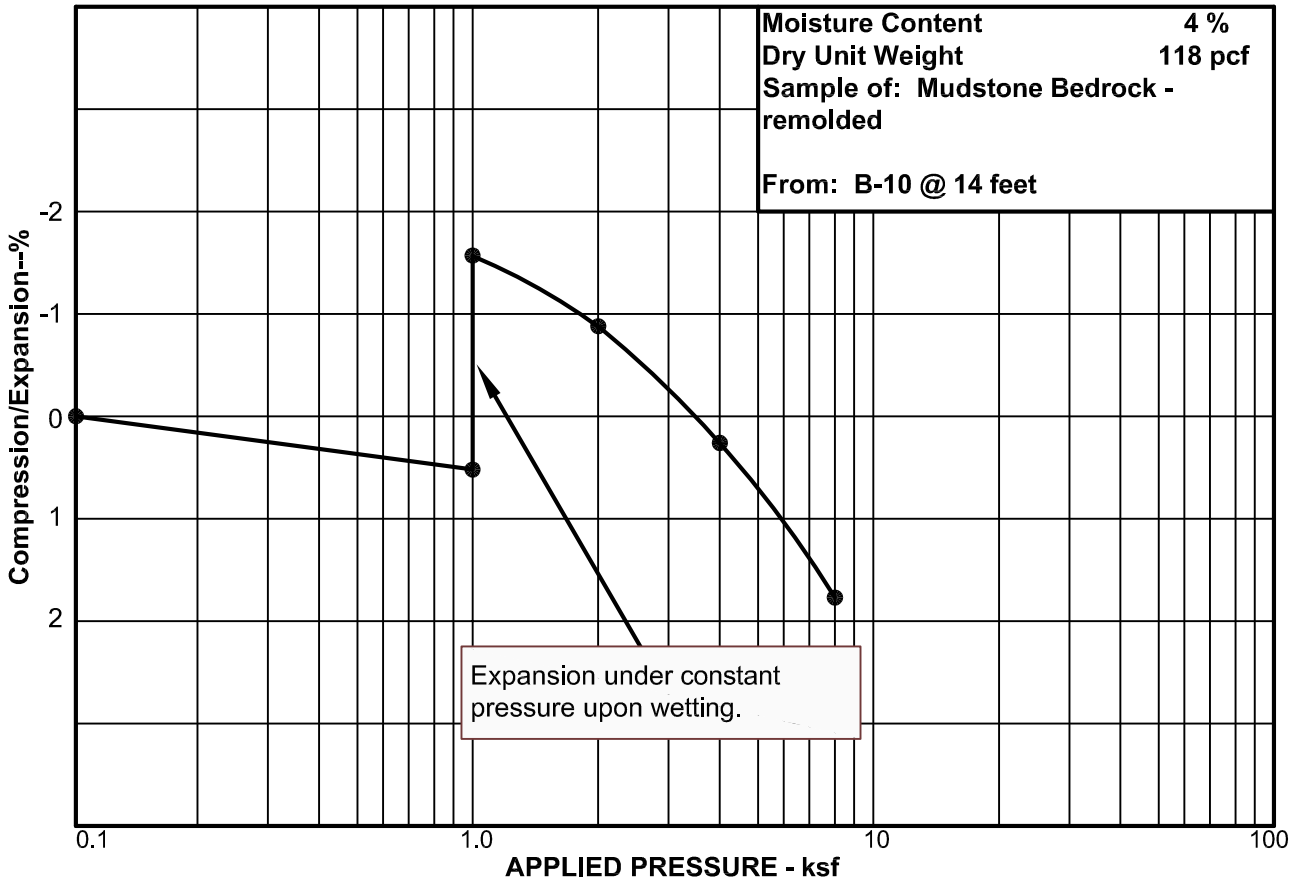




Project No. 2180187 **CONSOLIDATION TEST RESULTS** **Figure 11**

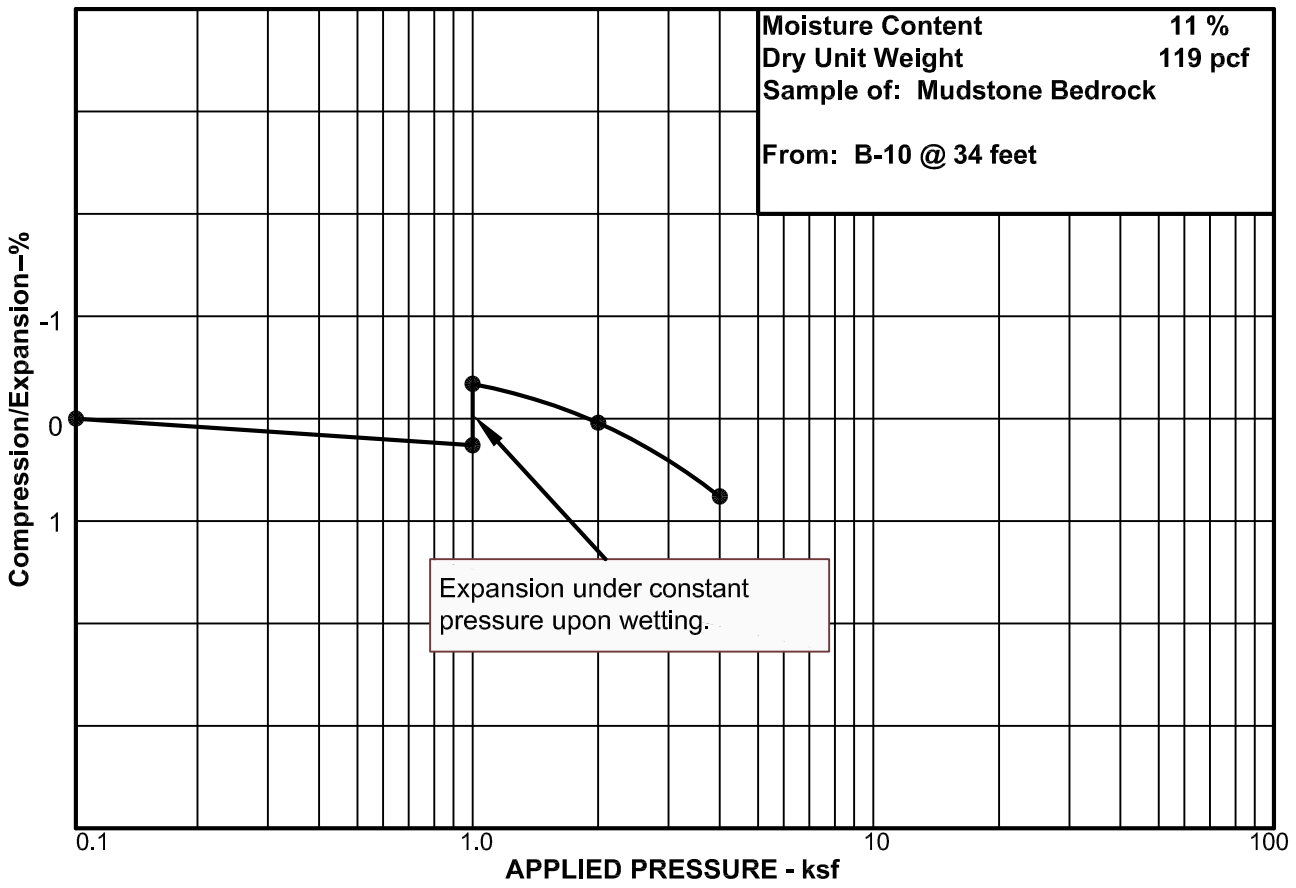
Applied Geotechnical Engineering Consultants, Inc.

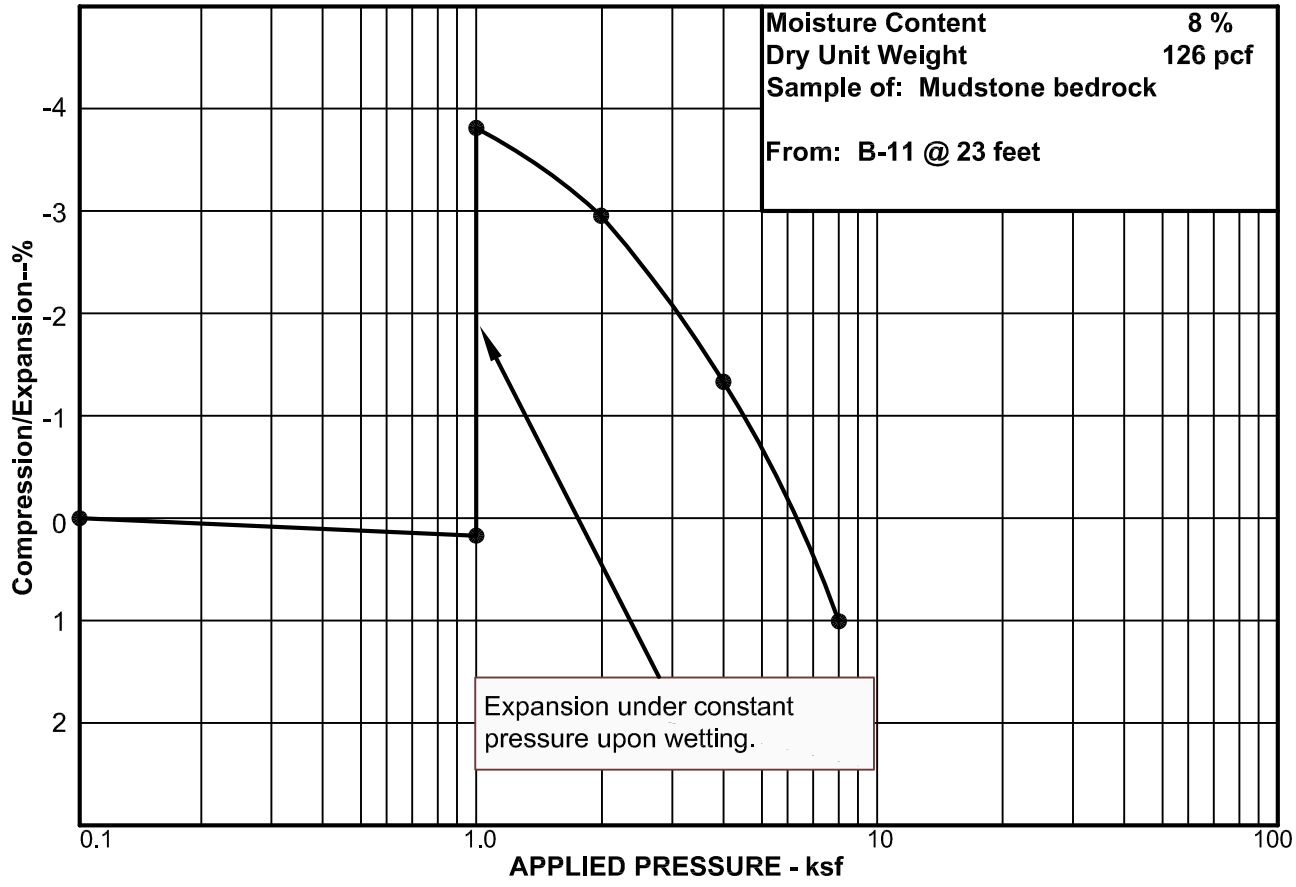




Project No. 2180187 **CONSOLIDATION TEST RESULTS** **Figure 12**

Applied Geotechnical Engineering Consultants, Inc.





Project No. 2180187 **CONSOLIDATION TEST RESULTS** **Figure 13**

Applied Geotechnical Engineering Consultants, Inc.

Table 1 - Summary of Laboratory Test Results

Blackstone Hotel

Project No. 2180187

Sample Location				Gradation			Atterberg Limits				
Boring No.	Depth (ft)	Natural Moisture Content (%)	Natural Dry Density (pcf)	Gravel (%)	Sand (%)	Silt/Clay (%)	Liquid Limit (%)	Plastic Index (%)	Unconfined Compressive Strength (ksf)	Water Soluble Sulfates (ppm)	Soil Type
B-1	9	9				84	29	17		3,075	Fill; Lean Clay with Sand (CL)
B-1	24	18	94			78	41	25			Fill; Lean Clay with Sand (CL)
B-1	35	16	100			86	48	29			Mudstone Bedrock
B-2	24	8	126						22.6		Mudstone Bedrock
B-2	35	16				87	57	40	5.9		Mudstone Bedrock
B-2	45	14	113						8.0		Mudstone Bedrock
B-2	53	20									Mudstone Bedrock
B-2	57	18	110			71	47	31	8.6		Mudstone Bedrock
B-2	60	15									Mudstone Bedrock
B-2	74	15		4	45	51	39	24			Mudstone Bedrock
B-2	82	19				78	60	37			Mudstone Bedrock
B-2	83	18	112			51	51	33	4.2		Mudstone Bedrock
B-2	88	15	115			70			33.8		Mudstone Bedrock
B-3	9	11	117			84					Fill; Lean Clay with Sand (CL)
B-3	19	9				69					Fill; Lean Clay with Sand (CL)

Applied Geotechnical Engineering Consultants, Inc.

Table 1 - Summary of Laboratory Test Results

Blackstone Hotel

Project No. 2180187

Sample Location				Gradation			Atterberg Limits				
Boring No.	Depth (ft)	Natural Moisture Content (%)	Natural Dry Density (pcf)	Gravel (%)	Sand (%)	Silt/Clay (%)	Liquid Limit (%)	Plastic Index (%)	Unconfined Compressive Strength (ksf)	Water Soluble Sulfates (ppm)	Soil Type
B-3	36	21	97			88	47	30			Fill; Sandy Lean Clay (CL)
B-3	39	19	104	10	28	62	43	32			Fill; Sandy Lean Clay (CL)
B-3	45	25	91						4.0	550	Mudstone Bedrock
B-3	50	25	93			79	56	34			Mudstone Bedrock
B-4	30	18	107			88					Mudstone Bedrock
B-4	45	17	95			70					Mudstone Bedrock
B-5	44	17				59	45	24			Mudstone Bedrock
B-6	9	7	114			81	31	19			Fill; Lean Clay with Sand (CL)
B-6	14	15	101			87	54	40			Fill; Lean Clay with Sand (CL)
B-6	29	19	95			88					Mudstone Bedrock
B-7	4	10				97				4,770	Mudstone Bedrock
B-7	16								7.3		Mudstone Bedrock
B-7	20	22									Mudstone Bedrock
B-7	30	22									Mudstone Bedrock
B-7	42	12				73	42	28	16.4		Mudstone Bedrock
B-7	53	5	144	10	33	57	47	30			Mudstone Bedrock

Applied Geotechnical Engineering Consultants, Inc.

Table 1 - Summary of Laboratory Test Results

Blackstone Hotel

Project No. 2180187

Sample Location				Gradation			Atterberg Limits				
Boring No.	Depth (ft)	Natural Moisture Content (%)	Natural Dry Density (pcf)	Gravel (%)	Sand (%)	Silt/Clay (%)	Liquid Limit (%)	Plastic Index (%)	Unconfined Compressive Strength (ksf)	Water Soluble Sulfates (ppm)	Soil Type
B-7	58	7	132			41	64	51			Mudstone Bedrock
B-7	73	5	146			34			40.7		Mudstone Bedrock
B-8	6			32	29	39	39	28			Clayey Sand with Gravel (SC)
B-8	24					73	42	26			Mudstone Bedrock
B-8	34					67	45	28			Mudstone Bedrock
B-8	39	15	94			90	41	24			Mudstone Bedrock
B-9	35	20	88			73	49	31			Mudstone Bedrock
B-10	6	2	133			65		NP		270	Mudstone Bedrock
B-10	14	4	144			56	25	7			Mudstone Bedrock
B-10	34	11	119			82	32	14			Mudstone Bedrock
B-11	23	8	126			82	30	15			Mudstone Bedrock

Applied Geotechnical Engineering Consultants, Inc.

Table 2

Deep Foundation Element Design Parameters

Blackstone Hotel Project No. 2180187

Soil Type	Soil Properties			Lateral Design Parameters			Axial Design Parameters		
	Total Unit Weight (pcf)	Cohesion (psf)	Friction Angle (Degrees)	Horizontal Modulus (pci)	Ultimate Passive Resistance (psf)	Strain @ 50% Yield (k_{rm})	Ultimate Skin Friction (psf)	Ultimate Uplift Skin Friction (psf)	Net Allowable** Bearing Capacity (ksf)
Fill (Thickness varies)	100	500	0	30	4,500*	0.04	250	167	--
Active Mudstone (upper 20 feet)	100	2,000	0	500	18,000	0.006	1,000	750	--
Mudstone (>20 to 40 feet)	110	4,000	0	1,400	36,000	0.006	2,000	1,333	--
Mudstone (>40 to 60 feet)	120	6,000	0	2,000	54,000	0.005	3,000	2,000	35
Mudstone (>60 to 70 feet)	130	7,500	0	2,500	67,500	0.004	3,750	2,500	40
Hard Mudstone (>70 feet)	140	12,500	0	3,000	112,500	0.003	6,250	4,167	60

* Ignore the upper 2 feet

** Minimum embedment of 45 feet into the mudstone.

APPENDIX

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackridge Hotel Site

CORE SIZE 2½" HQ

DATE 08/16/2018

LOCATION See Figure 2

ELEVATION 2654½'

PAGE 1 of 5

FIELD ENG. HA

DRILLER AGEC

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0–8			Fill; Silty Sand with Gravel, poorly compacted, slightly moist, fine to medium grained with gravel, cobbles and boulders, red-brown.														Boring cased with 8" HSA to 14'.
8–12			Talus; Lean to Fat Clay, stiff to very stiff, moist to slightly moist, fine to medium grained, gypsiferous, medium to high plastic, red/brown.														
12–19			Landslide, mudstone, weathered, altered, soft, moist to slightly moist, fine to medium grained, with varied amounts of sand with silt, red/purple to grey to red/purple.				0° 0° 0° 0°					5	4	75	1 2 0 0 2	2.8 2.8 2.8 2.8 2.8	Boring advanced with 2½" HQ Core and carbide bit using mud.
												6	4	80	0	5	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackrock Hotel Site

CORE SIZE 2½" HQ

DATE 08/16/2018

LOCATION See Figure 2

ELEVATION 2654½'

PAGE Page 2 of 5

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
20			Landslide, mudstone, weathered, extremely to moderately altered, soft, moist to slightly moist, fine to medium grained, with varied amounts of sand with silt, red/purple to grey to red/purple.														Boring advanced with 2½" HQ core barrel with carbide bit using mud.
21							0°								0	5	
															0	5	
22							0°					5	4	80			Loss of mud.
							0°								I	5	
23																	
							0°								I	5	
24							0°										Grey
															I	6	Red/Purple
25															0	6	
26												5	4	75			Grey
															0	6	
27															0	5	
28							0°										
															2	7	Red/Purple
29							0°								0	4	
30															0	4	
31												5	5	100			
							0°								0	5	
32																	
							0°								0	6	
33															0	6	
34							0°										
															0	7	
35							0°								0	12	Red/Purple Grey
36							0°					4	4	100			Speed change.
							0°								1	3	
37							0°										
							0°								2	8	
38							0°										
															1	8	
39												4	5	100			
															0	3	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackrock Hotel Site

CORE SIZE 2½" HQ

DATE 08/16/18

LOCATION See Figure 2

ELEVATION 2654½'

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
41			Landslide, mudstone, weathered, extremely to moderately altered, soft, moist to slightly moist, fine to medium grained, with varied amounts of sand, silt, red clay and basalt gravels, red/purple to grey to purple.				30°					4	5	100	1	5	Boring advanced with 2½" HQ core barrel with carbide bit using mud.
42							0°								2	5	Grey
43							0°					2	2	100	1	4	Purple
44															I	5	
45							0°								2	10	
46							0°					3	3	100	1	5	
47							0°								1	3	
48												½	½	100	0	5	
49															0	5	
50												5½	5	100	0	4	
51															0	5	
52							0°								0	19	
53							0°					2	3	100	1	8	
54							0°								1	10	
55							0°								1	14	
56							0°					4	5	100	2	14	
57							0°				B				1	11	
58							0°								2	10	Gravel, red, clay dots.
59							0°					3½	4½	100	0	11	
															1	11	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackridge Hotel Site

CORE SIZE 2½" HQ

DATE 08/16/2018

LOCATION See Figure 2

ELEVATION 2654½'

PAGE 4 of 5

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
60																	
61			Landslide, mudstone, weathered, extremely to moderately altered, soft, moist to slightly moist, fine to medium grained, with varied amounts of sand, silt, red clay and basalt gravels, red/purple to grey to red/purple.									3½	4½	100	I	11	Boring advanced with 2½" HQ Core and carbide bit using mud.
															0	8	
62												2½	4	100	0	4	
															I	10	
63																	
															2	10	
64											B						Gravel
											B				2	12	
65											B						
															2	10	Basalt piece Loss mud
66											B	4½	5	66			
															1	10	
67															0		
																8	
68											B				2		Gravels
											B					9	
69											B				0	1	
															1		
70																4	
												4½	5	95	1	8	
71											B						
											B				1	8	
72																	
															1	7	
73											B						
											B				2	7	
74											B						
															1	8	
75												4	5	65			
											B				1	7	Red/Purple Grey
76																	
															0	9	
77																	
															3	6	
78												2	2	67			
															2	10	
79											B						Pebbles
												2	2½	21	I	16	Change to carbonado bit

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackrock Hotel Site

CORE SIZE 2½" HQ

DATE 08/20/2018

LOCATION See Figure 2

ELEVATION 2654½'

PAGE 5 of 5

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
80																8	Boring advanced with 2½" HQ Core and carbide bit using air.
81			Landslide, mudstone, weathered, extremely to moderately altered, soft, moist to slightly moist, fine to medium grained, with varied amounts of sand, silt, red clay and basalt gravels, red/purple to grey to red/purple.				0°				Fe	2	2½	21	I	10	
82							0°				Fe	5	5	93	I	20	
83			Bottom of Landslide				0°					2½	2½	63	I	4	
84			Mudstone, soft to moderately hard, slightly altered, slightly moist, high plastic, iron oxide deposits, grey to yellow to purple.				0°					1½	1½	60	I	9	
85							0°								3	17	Grey/Yellow
86							0°				Fe	4	5	95	2	12	
87							0°								1	10	
88							0°								0	12	
89							0°								2	13	
90							0°					1	1½	0	I	16	
91							0°				Fe	4	4½	56	2	18	
92							0°								I	17	
93							0°								0	10	Change speed Pueple/Yellow
94															0	11	
95																	End of boring at 93'.
96																	
97																	
98																	
99																	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackridge Hotel Site

CORE SIZE 2½" HQ

DATE 06/06/2018

LOCATION See Figure 2

ELEVATION 2646'

PAGE 1 of 4

FIELD ENG. HA

DRILLER AGEC

BORING NO. B-7

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0–7			Fill; Silty Sand with Gravel, poorly compacted, slightly moist, fine to medium grained with gravel, highly plastic, purple/red.														Boring cased with 8" HSA to 9'.
7–12			Talus; Lean to Fat Clay with gravel, cobbles and occasional boulders, very stiff, moist, fine to medium grained, gypsiferous, medium to high plastic, purple/red.														Boring advanced with 2" diameter NWJ using Tricone bit with mud.
12–19			Landslide Mudstone, altered, soft to moderately hard, slightly moist to moist to wet, layers of siltstone, purple.														
16–17												3	1½	36	I	3	Boring advanced with 2½" HQ Core and carbonado bit using mud.
17–18															I	3	
18–19															2	3	
19												5	4½	88	I	5	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackrock Hotel Site

CORE SIZE 2½" HQ

DATE 06/06/2018

LOCATION See Figure 2

ELEVATION 2646'

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-7

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
20																20	
21			Landslide Mudstone, weathered, altered, soft, slightly moist to moist to wet, occasional layers of low plastic siltstone, with varied amounts of sand, silt, basalt pebbles, purple to grey to dark grey.												1	5	Boring advanced with 2½" HQ core barrel with diamond embedded bit using air.
21															0	5	
22												5	4½	88		22	
22															0	5	
23																23	
23															0	5	
24							0°									24	
24							0°								2	7	
25							0°									25	
25															0	7	
26							0°					5	5	85		26	
26															1	7	
27																27	
27															0	7	
28																28	
28															0	7	
29							0°									29	
29							0°								2	9	
30							0°									30	
30							0°								0	9	
31							15	0	SR	PL	Fe	5	5	75		31	
31															0	9	
32							13°									32	
32															1	9	
33																33	
33															0	9	
34							0°									34	
34							0°				G				2	8	
35							45	0	SR	PL	Fe					35	
35															1	8	
36												5	5	93		36	
36															0	8	
37							0°									37	
37															2	8	
38							15	0	SR	PL	Fe					38	
38															1	8	
39							0°									39	
												5	5	80	2	2	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackrock Hotel Site

CORE SIZE 2½" HQ

DATE 06/07/18

LOCATION See Figure 2

ELEVATION 2646'

PAGE Page 3 of 4

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-7

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
41			Landslide, mudstone, weathered, altered, hard to soft, slightly moist to moist to wet, fine to medium grained, with varied amounts of sand, silt, red clay, pebbles, purple to grey to dark grey.									5	5	80	2	9	Boring advanced with 2½" HQ core barrel with diamond embedded bit using mud.
42															2	9	
43															0	9	
44															0	9	
45												5	5	85	1	8	
46															0	8	
47															2	8	
48															1	8	
49															2	8	
50												5	5	96	1	8	
51															2	8	
52															0	8	
53															0	8	
54															1	8	
55											B	5	5	92	I	5.6	Wet
56															0	5.6	Purple ↕ Grey (slightly moist)
57											B				I	5.6	
58															0	5.6	
59											Fe				0	5.6	
												5	3	60	0	10	

PROJECT NO. 2180187

AGEC FIELD CORE LOG

PROJECT Blackridge Hotel Site

CORE SIZE 2½" HQ

DATE 06/07/2018

LOCATION See Figure 2

ELEVATION 2646'

PAGE 4 of 4

FIELD ENG. H.A.

DRILLER AGEC

BORING NO. B-7

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
60			Landslide, mudstone, weathered, altered, hard to soft, slightly moist to moist to wet, fine to medium grained, purple to grey to dark grey to black to grey.												0	10	Boring advanced with 2½" HQ Core and carbide bit using air.
61							30°				Fe				0	10	
62							0°					5	3	60		10	
63															I	10	
64							0°								I	10	
65															1	13	Black Mudstone
66							20°				Fe	5	5	90	0	17	
67							0°								3	12	
68			Bottom of Landslide				0°				Fe				2	8	Grey
			Mudstone, moderately hard, slightly altered, medium plastic, iron oxide, dark grey to yellow.												0	5	Speed ↓
69							0°										Speed ↑
70							0°								0	18	
71							0°				Fe	5	5	98	1	11	
72											Fe				2	8	
73							0°				Fe				0	8	
74							0°				Fe				1	8	Speed ↓
75							0° 0°					5	5	92	2	20	
76							0°				Fe Fe				2	20	Speed ↑
77							0° 0°								2	9	
78							0° 0°				Fe				2	9	
79							0°								3	9	Purple
																	End of Boring at 79'.

LEGEND AND NOTES TO CORE LOG

Alteration

Log Symbol	Description	Field Identification
E	Extremely altered	The material is discolored and the original minerals of the rock have been almost entirely altered to secondary minerals, even though the original fabric may be intact.
H	Highly altered	The rock is weakened to such an extent that a 2-inch diameter core can be broken readily by hand across the rock fabric.
M	Moderately altered	Rock is discolored and noticeably weakened, but a 2-inch diameter core cannot usually be broken by hand across the rock fabric.
S	Slightly altered	Rock is slightly discolored but not noticeably lower in strength than fresh rock.
U	Unaltered	Rock shows no discoloration, loss of strength, or any other effect of weathering or alteration.

Hardness

Log Symbol	Description	Field Identification
S	Soft	Fingernail: Can be scratched with a fingernail.
M	Moderately hard	Knife: Can be readily scratched with a pocket knife blade. The scratch leaves a trace of dust and is readily visible after the dust is blown away. Pick: Shallow indentation under a firm blow from the point of a geology pick.
H	Hard	Knife: Can be scratched with difficulty with a pocket knife blade. The scratch leaves little dust and is often only faintly visible. Pick: A hand-held sample breaks with one firm blow with the hammer end of a geology pick.
V	Very hard	Knife: Cannot be scratched with a pocket knife blade. Pick: Requires many blows from the hammer end of a geology pick.

Joint Type

Log Symbol	Description	Field Identification
B	Bedding	Joint associated with bedding plane.
H	Healed	Joint is healed closed.
O	Open	Joint is open and sides do not fit together.
S	Shear	Joint is due to shear.

Joint Surface Roughness

Log Symbol	Description	Field Identification
VR	Very rough	Near vertical steps and ridges occur on the discontinuity surface.
R	Rough	Some ridges and side-angle steps are evident. Asperities are clearly visible, and discontinuity surface feels very abrasive.
SR	Slightly rough	Asperities on the discontinuity surface are distinguishable and can be felt.
S	Smooth	Surface appears smooth and feels smooth to the touch.
SLK	Slickensided	Visual evidence of polishing exists.

LEGEND AND NOTES TO CORE LOG

Joint Surface Planarity

Log Symbol	Description	Field Identification
W	Wavy	A moderately undulating surface.
PL	Planar	A flat surface.
ST	Stepped	A surface with asperities or steps.

Joint Filling Material

Log Symbol	Description	Field Identification
CL	Clay	Joint filled with clay-sized particles.
Sd	Sand	Joint filled with sand-sized particles.
G	Gypsum	Joint filled with gypsum.
Ca	Calcite	Joint filled with calcite.
Fe	Iron oxide	Joint surfaces coated with iron oxide stains.
C	Clean	No surface coating or joint filling.
Q	Quartz	Joint filled with quartz
B	Basalt pebbles	Joint filled with basalt pebbles

Other

Log Symbol	Description
RQD (Rock Quality Designation)	Percent of intact core which is 4 inches or greater in length.
Fractures Per Foot	Number of fractures per foot of core. "I" indicates intensely fractured.
Progress	Time to advance boring (minutes per foot).

EXHIBIT G

2021 AGEC Geotechnical Investigation

AGEC
Applied GeoTech

GEOTECHNICAL INVESTIGATION

BLACKSTONE HOTEL SITE
WEST PARCEL

250 WEST BLACKRIDGE DRIVE

ST. GEORGE, UTAH

PREPARED FOR:

BLACK RIDGE DEVELOPMENT, LLC
2001 PARK AVENUE
PARK CITY, UTAH 84060

ATTENTION: OSCAR COVARRUBIAS

PROJECT NO. 2211175 **SEPTEMBER 8, 2021**

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EXECUTIVE SUMMARY

1. Two geologic hazards exist at the site which could impact the project. The hazards include the potential for landslide movement and heave due to the highly expansive soil and bedrock.

2. The stability of the slope, upon which the hotel is planned does not meet the minimum standard criteria for stability using saturated soil strengths. AGEC is conducting additional studies to evaluate the stability of the slope incorporating unsaturated strengths of the landslide and undisturbed materials.

3. Due to the expansive characteristics of the on site clay and bedrock, there is the potential for significant heave up wetting of the subgrade soil and bedrock. We understand that the foundation system is planned to be a deep foundation system consisting of caissons or micropiles to address this issue.

4. The subsurface investigation include the drilling of Six borings were drilled at the locations shown on Figure 2. The borings were drilled to depths of 24 to 124 feet below the existing ground surface. The borings were drilled entirely in the landslide deposit. The subsurface profile observed in the borings drilled generally consists clay mixed with rock (talus) overlying mudstone bedrock to the maximum depth investigated. There were layers of sandstone within the mudstone.

5. Groundwater was measured at an elevation of approximately 2,576½ feet, which is approximately 113 feet below the proposed “0" level of the hotel.

6. Detailed recommendations for subgrade preparation, grading, materials, foundations, pavement and drainage are included in the report.

SCOPE OF WORK

This report presents the results of a geotechnical investigation for the proposed Blackstone Hotel to be located in St. George, Utah, as shown on Figure 1. This report presents the subsurface conditions encountered and recommendations for the geotechnical aspects of the project.

Field exploration was conducted to obtain information on the subsurface conditions and to obtain samples for laboratory testing. Results of the field exploration and laboratory testing were analyzed to develop conclusions, professional opinions and recommendations for the proposed development.

This report has been prepared to summarize the data obtained during the study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction are included in the report. Our scope of work was conducted in general accordance with our proposal dated April 19, 2021 and signed May 19, 2021.

An additional slope stability report will be provided that will address the landslide hazard.

PREVIOUS STUDIES

AGEC has conducted various levels of studies on the property and adjacent properties since 1998. The following studies were referenced as a part of our study.

1. Blackridge Development, Geologic Hazard Assessment and Preliminary Geotechnical Recommendations, AGEC Project No. 980473, dated March 5, 1999.

2. Blackridge Drive Special Improvement District, AGEC Project No. 981307, dated April 25, 2000.

3. Grading Recommendations and West Slope Grading Recommendations, AGEC Project No. 2991121, dated September 15, 1999 and November 15,1999.

4. Tech Ridge South Access Road, AGEC Project No. 2180187, dated October 19, 2018.

5. Black Stone Hotel, (east parcel), AGEC Project No. 2180187, dated December 14, 2018.

6. Black Stone Hotel Slope Stability Consultation, AGEC Project No. 2180187, dated September 23, 2019.

SITE CONDITIONS

The site consists of a previously graded parcel of undeveloped property in the Black Ridge Development in St. George, Utah. A large amount of soil and bedrock was removed from the site resulting in a relatively level site with a few stockpiles of soil.

The graded area has a significant cut slope along the west side of the property and a moderately steep cut slope along the south portion of the property. The graded area is generally lower through the center of the site with several piles of fill. Due to the lower area, storm water has not been allowed to drain off the property and is generally retained on the site.

A containment area of deposited pieces of asbestos pipe is also located on the property. The area is shown on a recorded survey map included in Appendix A of this report. The asbestos removal and disposal is not included in our scope of work.

There is a roadway, (250 West Street) located along the eastern portion of the site which slopes down from the north to the south to the intersection with Blackridge Drive. The slope, which was cut to grade the roadway is partially lined with stacked basalt boulders.

The property to the south consists of additional hillside and slopes from the top of Tech Ridge to the west down to Blackridge Drive.

The property immediately to the west, above the graded slopes up to the top of Tech Ridge (the previous airport property). The top of the ridge is a basalt capped ridge with talus or littered rocks along the upper slope.

The area to the north is relatively level with additional small knolls and bench areas.

Across 250 West Street to the east is vacant, previously graded property along with two office buildings.

Several photos of the site conditions are included in the appendix.

FIELD STUDY

An engineer from AGEC visited the site on June 14-16, 2021 and observed the drilling of six borings as shown on Figure 2. The borings were drilled utilizing a truck-mounted rill rig equipped with augers and coring tools. Boring B-4 was drilled using a 2½ inch HQ core barrel with a carbide and carbonado bit using mud rotary techniques. The other borings were drilled with auger. The subsurface conditions were logged and samples were obtained.

In addition, five test pits were excavated on July 6, 2021 with a track excavator at the approximate locations shown on Figure 2.

SUBSURFACE CONDITIONS

The subsurface profile observed in the borings drilled and test pits excavated generally consists lean clay mixed with rock (talus) overlying mudstone bedrock, all within the landslide deposit. There were layers of sandstone within the mudstone.

Descriptions of each soil and bedrock type observed follow.

Fill - The fill varies from clayey gravel to lean/fat clay. It contains occasional cobbles and boulders. Consistency appears poorly compacted and is red to brown to purple in color. The clay varies from low to high plasticity. The cobbles and boulders are mixed with basalt and sandstone/shale bedrock chunks.

Lean/Fat Clay (CL/CH) - The lean clay is medium stiff to very stiff and is slightly moist. It is generally medium to highly plastic an red to brown to purple in color.

Clayey Gravel GC) - The clayey gravel is dense and generally dry. The gravel is angular and generally contains cobbles and boulder size particles. It is brown to red in color. The basalt gravel is gray and black in color.

Mudstone Bedrock - The mudstone consists of lean to fat clay with varied amounts of sand. It is soft to moderately hard, slightly moist to very moist to wet, medium to high plastic, and is purple to red to grey in color.

Laboratory tests conducted on samples of the mudstone bedrock indicate in-place moisture contents ranging from 7 to 24 percent, in-place dry densities ranging from 93 to 126 pounds per cubic foot (pcf) and percent passing the No. 200 sieve (fines contents) ranging from 60 to 94 percent. Atterberg Limits tests indicate liquid limits ranging from 53 to 77 percent and plasticity indexes ranging from 37 to 54 percent. Water soluble sulfate tests indicate water soluble sulfate concentrations ranging from

370 to 11,707 ppm. Unconfined compressive strength tests indicate unconfined compressive strengths ranging from 1,540 to 6,900 psf.

Relatively undisturbed, one-dimensional consolidation tests conducted on samples of the mudstone indicate it is non to highly expansive when wetted under a constant pressure of 1,000 psf. Swell percentages up to 7½ percent were measured. Swell pressures ranging from approximately 3 to 13 kips per square foot (ksf) were also measured.

The Logs of Exploratory Borings are shown on Figures 3 to 6. Legend and Notes of the Exploratory Borings are shown on Figure 7. The laboratory test results are also shown on Figures 3 to 6 and are summarized in the Summary of Laboratory Testing, Table 1. The consolidation/swell test results are shown graphically on Figures 8 to 12.

SUBSURFACE WATER

The depth to groundwater was measured on August 11, 2021 (in deeper borings in the area) and found to be approximately 113 feet below the proposed "0" level of the hotel.

PROPOSED CONSTRUCTION

It is currently proposed to develop the site for a resort style hotel. The resort hotel will include a conference center, a restaurant, a gym as well as other amenities. There will also be a below grade swimming pool/spa on the east side of the hotel.

Architectural drawings of the development indicate the hotel will consist of a four-story structure with perimeter parking. The hotel will require excavation on the order of 10 to 15 feet below the existing grade. The front or east side of the hotel will expose the lower level, while the back or west side will be backfilled up to the main or 2nd level.

We understand the upper levels of the hotel will consist of conventional wood framing and we anticipate the below grade portions will utilize reinforced concrete construction. The swimming pool will use a reinforced gunnite shell.

Due to the presence of the underlying expansive soil and bedrock, the buildings and pool will be supported on deep foundation elements consisting of micropiles or drilled concrete piers in conjunction with grade beams and structural floors.

The development will also include underground utilities, asphalt concrete pavement and concrete retaining walls.

Additional details regarding the design, site improvements and building loads are currently not available. If the proposed construction, loading conditions, or grading are significantly different from what is described above, we should be notified so we may reevaluate our recommendations.

GEOLOGIC HAZARDS

Review of geologic hazard mapping by Lund et. al. (2008) and our experience in the area indicate the following conditions that could adversely impact the site:

A. Landslide

The site for the proposed new hotel is located in the lower section of a 300-foot high slope. The lower ⅔ of the slope has been mapped as a landslide deposit. The ground surface of the landslide deposit slopes on average approximately 7:1 H:V (horizontal to vertical). The landslide deposit is estimated to extend up to a depth of approximately 200 feet below the existing ground surface at the site.

Old landslides are often marginally stable and may reactivate with new loadings or other changes in condition that tend to reduce their stability. With the site located on a landslide deposit, the subsurface conditions need to be carefully investigated and the stability of the slope evaluated under static and seismic conditions in order to estimate the risk. The risk of future movement needs to then be recognized, potential impact of ground movement identified, appropriate consideration given to remedial measures and then a decision made if the benefit is worth the risk.

B. Expansive Soil and Bedrock

Geologic mapping indicates that the site is situated where the Chinle Formation, which consists of highly expansive bedrock, is present. It is high plastic and also has a high shrink/swell susceptibility.

SLOPE STABILITY

A. Earlier Evaluations

Earlier studies by AGEC on the stability of the east slope of Tech Ridge (slope on which the hotel is proposed) indicate that the stability of the slope is marginal.

Previous studies included the installment of five inclinometers. The inclinometers were installed in order to determine if movement is occurring on the slope, five inclinometers were installed in 2007 on the east slope of Tech Ridge extending to depths of 92 to 250 feet. When measured in 2018, four of the five inclinometer measurements indicated that there had been no movement since 2007. Ground movement was measured in 2011 at multiple depths in the inclinometer north of the proposed hotel site. The inclinometer was located immediately west of the vacant fast food restaurant located at 1090 South Bluff Street.

With the lack of measured movement in the four inclinometers over a time period of 10½ years, along with the lack of surficial evidence of movement, it appears that the portion of the slope, for this project, is currently maintaining its stability. Using the information available from our subsurface exploration, the laboratory test results and our experience in the area, it is our professional opinion that the stability of the slope is marginal even with the lack of apparent movement.

B. Site Specific Stability

Based on our experience in the area along with the information that we have gathered from studies on this landslide, we have analyzed the stability of the slope in the area of the proposed hotel.

1. Prior Slope Modifications

   A number of years ago, a relatively large amount of soil and bedrock was removed from the area currently proposed for the hotel and placed on the lower portions of the slope (east of the hotel site). These changes have not significantly changed the stability of the slope.

2. Proposed Site Grading

   The ground surface profile proposed for the hotel, does not change the stability of the slope.

3. Stability Analysis

   The stability analysis indicates the following:

   a. A calculated factor of safety using saturated soil and bedrock strengths is near 1. A factor of safety on the order of 1.5 is typically desired for slopes upon which human occupied improvements are constructed when using saturated soil and bedrock strengths. Lower factors of

safety can be considered appropriate when weaker strengths are included in the analysis.

b. Changes in the internal conditions and the surficial geometry modifications may improve or reduce the ability of the slope to maintain its stability.

4. Possible Impact of Current Conditions

Assuming that strength characteristics of the landslide mass have improved (soils behaving as if they are unsaturated) since the ancient landslide movements occurred, overall calculated stability of the slope is estimated to increase approximately 20 to 30 percent.

The stability under a seismic event, assuming the improved strength characteristics described above, is estimated to have a safety factor of less than 1. A major seismic event could potentially result in displacement of the slope.

The potential increase in the calculated safety factor using un-saturated soil strength needs further evaluation and substantiation in order to quantify this improvement.

5. Other Mitigating Factors

If the decision is made to continue with further design and potential construction of the hotel at this location, we recommend that the following items be considered:

a. Minimize, if not eliminate the introduction of moisture into the subgrade. This could be accomplished by,

i. Collecting and transporting surface drainage off of the site in water tight storm drainage systems. This type of construction is not standard and therefore it would require specific attention to verify that the improvements are water tight.

ii. Water ways should be lined to prevent seepage into the ground.

iii. Measures need to be taken to eliminate the potential for water to pond on the slope.

b. Positive steps would need to be taken on other improvements on the landslide mass to help maintain the overall stability of the slope.

RECOMMENDATIONS

Based on our experience in the area, subsurface conditions encountered, laboratory test results, and proposed construction, the following recommendations are provided:

A. Site Grading

Based on the subsurface conditions observed and the proposed grading, the following recommendations are provided.

1. Subgrade Preparation

a. General: Prior to placing site grading fill or concrete, the existing sparse vegetation should be removed. The piles of fill and boulders should also be removed.

b. Flatwork and Pavement Support: We recommend removing the existing fill, which appears to vary from 1 to 4 feet prior to placing additional fill in

these areas. We anticipate improvements (pool and decking) will be supported on deep foundation elements.

The Asbestos Deposit area subgrade preparation will be addressed by others.

We recommend flatwork and pavement be supported on an appropriate thickness of non-expansive, low permeable fill. The thickness of low permeable fill should be based on the acceptable magnitude of potential differential vertical movement.

The low permeable fill layer is intended to reduce the risk of wetting the expansive soil/bedrock. Strict site drainage is critical to the satisfactory performance of flatwork, pavement and other movement sensitive surface supported features. The estimated potential surface heave associated with corresponding overexcavation depths are provided in the following table.

Thickness of Non-Expansive Low Permeable Fill (feet)	Estimated Potential Differential Vertical Slab Movement (inches)
0	3½ to 5
2	2½ to 3¾
4	2 to 3
6	1½ to 2½
8	1¼ to 2
10	1 to 1½
12	¾ to 1¼
14	¾ to 1
16	½ to ¾

As a minimum, we recommend at least 5 feet of non-expansive, low permeable fill be placed above the mudstone bedrock in areas which will support flatwork or pavement. The risk of heave potential may also be reduced by increasing the overexcavation depth and providing strict drainage.

Buildings: Buildings will be supported on deep foundation elements with raised structural floors. Therefore, removal of fill or mudstone is not critical under building areas unless slab-on-grade floors will be considered.

Lateral Extent: All overexcavation and subgrade preparation procedures should extend at least 5 feet beyond the perimeter of the proposed construction. Excavations should be located by survey.

2. Excavation/Earthwork

Excavation of the on-site soil and soft bedrock at the site may be accomplished with typical excavation equipment. The drilling of the soil and bedrock encountered to the depths investigated may be performed with typical rotary drilling equipment. Difficulty may be encountered when drilling through cobbles and boulders which are present in the fill and talus. Loss of drilling fluid may also occur due to the presence of voids in the fill.

3. Grading Slopes and Trenches

Permanent cut slopes excavated into the overburden soils should be cut no steeper than 2:1 (Horizontal:Vertical). Permanent cut slopes into the soft mudstone bedrock should be cut no steeper than 1:1 (Horizontal:Vertical).

It has been our experience that the mudstone surface will dry to a "pop corn" texture and ravel resulting in deposition of material at the toe until an approximate 2½:1 slope is achieved over time. To improve performance of steeper cut slopes in the mudstone, slope facing should be considered along

with strict site drainage away from the slope and implementation of desert landscaping.

Facing could consist of large stacked boulders, precast concrete blocks or reinforced gunnite facing attached with soil nails. A drain should also be constructed behind the facing to reduce the potential for water accumulation and buildup of hydro-static pressure. If these options will be considered, AGEC should be contacted to provide further consultation.

Unretained fill slopes constructed with properly compacted on-site soil should be graded no steeper than 2:1 (horizontal to vertical). Slopes should include benches in accordance with the 2018 IBC. The cut and fill slopes will be highly susceptible to erosion, particularly resulting from run off from the adjacent slopes. Water should be directed around slopes using drainage swales to reduce potential erosion.

Fill slopes should be graded by overbuilding and then cutting them back to the desired grade to provide a compacted slope face. Fill placed on existing slopes steeper than 4:1 (horizontal to vertical) should be placed using a benching procedure. Benches should be of sufficient width to allow adequate area for the compaction equipment.

Utility trenches excavated in the on-site soils should be excavated in accordance with OSHA requirements using a OSHA Soil Class C (1½:1 Horizontal:Vertical) for overburden soils and soft mudstone. Steeper trenches may require the use of shoring or a trench box to provide as safe work environment. Safe trench excavation is the responsibility of the contractor.

4. Compaction

Compaction of fill materials placed at the site should equal or exceed the following percentages when compared to the maximum dry density as determined by ASTM D-698 or ASTM D-1557:

Area	Percent Compaction ASTM D-698*	Percent Compaction ASTM D-1557**
Subgrade	95	90
Site grading	95	90
Slabs (base course)	Does not apply	95
Utility trench backfill	95	90
Wall Backfill	95	90

* Fine-grained low permeable fill/processed mudstone.
** Granular site grading fill/granular low permeable fill/structural fill.

Prior to placing approved fill, the exposed subgrade should be moisture conditioned and compacted as recommended above. Fill should be placed in lifts which do not exceed the capability of the equipment used. Generally 6 to 8 inch lifts are adequate for heavy rubber tire equipment. Lift thicknesses should be reduced to 4 inches for hand compaction equipment.

Fill materials should be properly moisture conditioned prior to placement. Fine-grained soil, low permeable fill and processed mudstone or mudstone/sand mixture should be moisture conditioned to 2 to 4 percentage points over the optimum moisture content as determined by ASTM D-698. Granular soil should be moisture conditioned to within 2 percentage points of the optimum moisture content as determined by ASTM D-1557. Each lift of fill placed should be tested to verify moisture content and compaction are appropriate.

5. Materials

Recommendations for imported fill types follow. If structural floors are used, the type of fill placed under the buildings is not critical. Imported fill should be non-expansive and meet the following recommendations.

Area	Fill Type	Recommendations
Footings/pads/site	Structural and site grading fill	-200 <35%, **LL** <30% Maximum size: 4 inches Solubility < 1%
Under slabs/flatwork	Base course	-200 <12% Maximum size: 1 inch
Drains	Gravel	1 inch max size -200 <5%

-200 = Percent Passing the No. 200 Sieve
LL = Liquid Limit

The existing site grading fill is variable in plasticity and portions are expansive. The on site fill is suitable for use as site grading fill, wall backfill and utility trench backfill in areas which will support hard surfaces and pavement at depths greater than 5 feet below the finished grade.

If portions of the onsite fill appear low plastic, it may also be suitable for use as fill extending to the surface, but observation and additional testing would be necessary. Alternatively, the fill may be mixed with imported, non-expansive fill or imported soil would be placed to support in the upper 5 feet of the profile.

The on-site mudstone is not suitable for use wall backfill or as fill in structural areas or areas which will support hard surfaces and pavement. It may be used as fill in landscape areas or it should be disposed of offsite.

The potential impact of the expansive characteristics of the underlying clay and mudstone can be reduced by protecting the soil and bedrock from becoming wet. Placement of relatively low permeable fill above the expansive materials can help reduce the possibility of water coming in contact with the expansive materials. The low permeable fill supporting these areas is intended to provide a low permeable zone to reduce the potential for water to infiltrate and wet the underlying subgrade. If the expansive subgrade below the low permeable fill is wetted, surface heave will occur. This will result in reduced flatwork and pavement life.

Low permeable fill used to replace removed mudstone should meet one of the following set of criteria.

Liquid Limit (%)	Percent Passing the No. 200 Sieve
45 +	15-20
30-45	20-40
0-30	30-100

The onsite fill soil mixed with some imported, non-expansive, granular fill will likely meet the low permeable fill requirements at a ratio of 1 part granular soil to one part of the onsite fill. The mixture should be tested by AGEC to verify its engineering characteristics prior to use as fill.

6. Drainage

The following drainage recommendations should be implemented to reduce the potential for wetting of the underlying expansive soil and bedrock.

a. Positive site drainage away from foundations should be maintained during the course of construction.

b. After construction has been completed, positive drainage of surface water away from the buildings should be maintained throughout the life of the structure. We recommend a minimum slope of 6 inches in the first 10 feet from the perimeter of the structure. In no case should water be allowed to pond adjacent to foundations.

c. Desert landscaping, which requires no water, should be implemented. Grass should not be used. Rock mulch and turf are recommended.

d. Rain gutters should be utilized and roof down spouts should be piped to discharge to the storm drain system. This will require design of buried discharge pipes with flexible watertight connections.

e. If planters are used, they should be underlined by a impermeable membrane which is sloped to a discharge pipe which discharges water to storm drain.

f. We also recommend that desert landscaping, which requires no water, be used adjacent to concrete walls and masonry walls or other cement containing elements which will be backfilled. Further, the below grade portions of walls/fences which are backfilled with soil should be protected with an impermeable membrane and a subsurface drain. A gravel covered, perforated PVC pipe should also be placed at the base of the wall to carry water to a discharge point. This is intended to reduce the potential for salt weathering on concrete/masonry.

7. Subsurface Drainage Protection

As a precautionary measure, the crawl space and below grade portions of the hotel and parking structure should be protected from potential infiltration of surface water by constructing a perimeter subsurface drain around the crawl space of the building.

The drain system should consist of a 1 foot wide trench excavated around the outside perimeter of the grade beam/walls supporting the buildings. The trench should be excavated to a depth of at least 2 feet below the crawl space depth. A 4-inch perforated PVC pipe should be placed in the bottom of the trench and covered with free-draining gravel to within 2 feet of the ground surface. Prior to backfilling, Mirafi 140N filter fabric should be placed over the gravel. The perimeter drain trench and the grade beams should be backfilled with properly compacted, low permeable fill above the gravel to reduce the potential for surface water infiltration directly to the crawl space between the beams and the trench.

The drain pipe should be placed in the bottom of the drain trench and sloped at a 2 percent grade (minimum) to drain by gravity or to a sump and discharge to the storm drain system.

B. Foundations

We recommend the proposed hotel, parking structure, pool and pool decking be supported on deep foundation elements which will extend support of the structures through any existing fill and the active zone of the expansive materials down to the underlying "non-active" mudstone. The deep foundation elements should extend at least 30 feet into the underlying expansive mudstone and be designed by a structural engineer according to the parameters provided in Table 2 of this report. Grade beams should be utilized to span the distance between piers and support a structural floor with a crawl space below. The following recommendations should be followed for the design and construction of the deep foundation system.

1. <u>Micropile Design</u>
   a. Minimum length = 30 feet.

   b. End bearing should not be considered for micropile capacity. Capacity of micropiles will be developed through skin friction.

c. The micropiles should be structurally reinforced to resist tensile forces on the pile due to upward skin friction (uplift) which could result if the mudstone is wetted and swells. The tensile force may be calculated utilizing at least 10 feet of pile length with an ultimate skin friction of 1,000 psf. A "greased PVC bond breaker" may also be considered to reduce uplift forces on the micropiles.

d. The micropile should be designed for a minimum dead load of 3,000 pounds. If the minimum dead load cannot be met and piles are spaced as far apart as practical, the length should extend beyond the minimum penetration to make up the dead load deficit. This can be accomplished by using the appropriate resisting ultimate skin friction as given in Table 2.

e. Care should be taken to assure the micropiles are not over-sized (mushroomed) at the ground surface, which could provide an area where swelling soil/rock could exert uplift forces on the piles.

f. The water cement ratio of the grout should be on the order of 0.45 to 0.50. This should be verified during construction using a grout scale to verify the grout has a specific gravity on the order of 1.8 to 1.9. The grout volume should be recorded for each micropile constructed to ensure the appropriate volume is placed.

g. Grout should be placed in the micropiles the same day they are drilled using a tremmie pipe which extends to the bottom of the drill hole. The tremmie pipe should be raised as the grout is placed to ensure the element is free of voids. If water enters the drill holes, it would be necessary to place grout immediately after the drill hole is completed using a tremmie. The tremmie will also displace water out of the hole

as grout is placed. Failure to place grout the day of drilling may require re-drilling for additional bedrock penetration.

h. Micropile holes should be observed during drilling to verify depth. If air rotary methods are used, they can also be inspected to verify caving does not occur below the ground surface which could also result in additional uplift forces.

j. "Centralizers" should be used on the micropile steel reinforcing bar at approximately a 5 to 7 foot spacing to ensure the appropriate grout cover on the reinforcing.

2. Drill Pier Design

a. Minimum length = 30 feet.

b. Capacity of drilled piers may consider end bearing and skin friction to determine capacity. The end bearing capacities provided in Table 2 are allowable and include a factor of safety of 2.0.

c. The drilled piers should be structurally reinforced to resist tensile forces on the pier due to upward skin friction (uplift) which could result if the mudstone is wetted and swells. The tensile force may be calculated utilizing at least 20 feet of pier length with an ultimate skin friction of 1,000 psf.

d. The foundation elements should be designed for a minimum dead load of 10,000 psf. If the minimum dead load cannot be met and piers are spaced as far apart as practical, the length should extend beyond the minimum penetration to make up the dead load deficit. This can be accomplished by assuming an appropriate resisting ultimate skin friction as given in Table 2.

e. Care should be taken to assure the drilled piers are not over-sized (mushroomed) at the ground surface, which could provide an area where swelling soil/rock could exert uplift forces on the piers.

f. The concrete volume should be recorded for each pier constructed to ensure the appropriate volume is placed.

g. Concrete should be placed in the piers the same day they are drilled using a tremmie pipe which extends to the bottom of the drill hole. The tremmie pipe should be raised as the concrete is placed to ensure the element is free of voids. If water enters the drill holes, it would be necessary to place concrete immediately after the drill hole is completed using a tremmie. The tremmie will also displace water out of the hole as concrete is placed. Failure to place concrete the day of drilling may require re-drilling for additional bedrock penetration.

h. Drilled pier holes should also be inspected to verify caving does not occur below the ground surface which could also result in additional uplift forces. Casing the drill hole may be necessary if the caving occurs to ensure a straight shaft with a consistent diameter. Pier holes must also be inspected to ensure they are cleaned and free of loose or disturbed soil.

i. Concrete coverage should be verified on reinforcing cages by placing spacers on the outside of the reinforcing cage to ensure it is not touching the drill hole side wall.

C. Floor System and Construction Details

1. Structural Floor/Beams/Crawl Space

Structural floors (including entries, porches and patios), supported on grade beams should be supported on deep foundation systems.

We recommend that a minimum 24-inch crawl space be provided below structural floors. Proper ventilation of the crawl space is critical and the ventilation system should be designed by the appropriate design professional.

A minimum 12-inch void space should be provided below the grade beams to allow the expansive mudstone to swell without exerting uplift forces on the grade beams. The void space should be protected prior to backfilling the exterior grade beams to ensure the void space is not compromised. We also recommend low permeable fill be used as backfill adjacent to the beams to reduce the potential for infiltration and migration of water to the crawl space. Proper compaction and moisture conditioning of the backfill is critical.

2. Vapor Barrier

A vapor barrier should be placed on the bottom of the crawl space, attached to the exterior grade beams using a water resistant attachment system to reduce moisture in the crawl space.

3. Plumbing and Utility Lines

Plumbing lines and utility lines should be hung from the floor when a pier/pile foundation system is utilized. Plumbing lines should have flexible joints where connections are made. A 12-inch void space should also be provided below plumbing where it crosses below grade beams.

4. Exterior Flatwork

The owners should be aware that exterior flatwork may move where expansive materials are present. To reduce concerns for flatwork movement causing distress to the structures, the flatwork should be separated from the main structure and allow for unrestrained vertical movement. This generally is accomplished by providing a construction joint between the concrete flatwork and the wall/slab with a heavy felt board.

A 4-inch layer of properly compacted base course should be placed below slabs to provide a firm and consistent subgrade and to promote even curing of the concrete.

Use of pavers or compacted decorative gravel in lieu of concrete flatwork may also be considered. Pavers or gravel will allow for some movement if the supporting subgrade heaves.

5. Exterior Porches

Exterior porches, patios and overhangs that are structurally tied to the remainder of the building should be supported by the same foundation system as the building.

D. Pool Construction Details

1. Pool Structural Floor

The shell of the pool should be structurally reinforced to span the distance between the piers. We recommend a minimum 2- inch void be provided below the pool to prevent expansive materials from exerting uplift forces on the pool. A void box should be placed in the bottom of the pool excavation prior to placing plumbing and rebar, or spraying gunnite to allow for construction above the void below the pool.

As an alternative, the bottom of the pool may be constructed as a structural floor supported on the piers using V-decking with a crawl space (This is the preferred method). The raised structural floor should be supported on grade beams. We recommend that a minimum 24-inch crawl space and access be provided below the structural floor. A 12-inch void space should be provided below the grade beams to allow the expansive materials to swell without exerting uplift forces on the grade beams. Subsequent to removing concrete forms from grade beams, the void should be inspected by AGEC to ensure the proper void space is provided.

2. Pool Plumbing and Utility Lines

Plumbing lines and utility lines should be hung from the floor when a pier foundation and structural floor system is utilized or placed above the void box (if used) to prevent crushing of the piping or connections.

Plumbing lines should have flexible joints where connections are made. A 12-inch void space should also be provided below plumbing where it crosses below grade beams. Exterior plumbing lines may be run inside a larger pipe conduit to allow for some movement without negatively affecting the plumbing lines. Plumbing lines should be tested prior to operation.

3. Pool Decking

Due to the presence of the underlying fill and expansive materials, we recommend the pool decking consist of a raised structural slab supported on deep foundation elements.

If slab-on-grade pool decking will be considered, the subgrade supporting the decking should be prepared as recommended in the Subgrade Preparation section of this report for "Flatwork". The owner should be aware that exterior

flatwork will likely heave (as stated in the Subgrade Preparation section of this report).

Slab-on- grade pool decking should be separated (free vertical movement) from the main structure of the pool and should not be tied directly to the pool shell or to adjacent buildings. This is recommended to allow for unrestrained uplift of the pool decking so as not to affect the main structure of the pool. This generally is accomplished by providing a construction joint between the concrete flatwork and pool or building with a heavy felt board.

The pool decking should be sloped away from the pool to provide adequate drainage. We also recommend constructing a water-tight concrete gutter system (depression) or drain around the pool decking to catch runoff water, divert it around the pool, and discharge off site. Joints or seams in the pool decking should be sealed to reduce infiltration of surface water.

A 4-inch layer of properly compacted base course should be placed below slabs to provide a firm and consistent subgrade and to promote even curing of the concrete.

E. Lateral Earth Pressures

1. Retaining Structures

The following equivalent fluid weights are given for design of subgrade walls and retaining structures. The active condition is where the wall moves away from the soil. The passive condition is where the wall moves into the soil and the at-rest condition is where the wall does not move. We recommend basement walls or below grade beams be designed in an at-rest condition. Walls where lateral movement is not tolerable should also be designed in the at-rest condition.

The values listed below assume a horizontal surface adjacent the top and bottom of the wall.

	Active Condition		At-Rest Condition		Passive Condition
Soil Type	Equivalent Fluid Weight	Earth Pressure Coefficient	Equivalent Fluid Weight	Earth Pressure Coefficient	Equivalent Fluid Weight
Imported Granular Backfill	35 pcf	0.28	55 pcf	0.44	325 pcf
On-site Clayey Fill Soil	45 pcf	0.38	65pcf	0.54	225 pcf

The above values account for the lateral earth pressures due to the soil and level backfill conditions and do not account for hydrostatic pressures or surcharge loads.

Lateral loading should be increased to account for surcharge loading using the appropriate earth pressure coefficient and a rectangular distribution if structures are placed above the wall and are within a horizontal distance equal to the height of the wall. If the ground surface slopes up away from the wall, the equivalent fluid weights should also be increased.

Care should be taken to prevent percolation of surface water into the backfill material adjacent to the retaining walls. The risk of hydrostatic buildup can be reduced by placing a subdrain behind the walls consisting of free-draining gravel wrapped in a filter fabric.

2. Seismic Conditions

Under seismic conditions, the equivalent fluid weights should be modified as follows according to the Mononobe-Okabe method assuming a level backfill condition:

Lateral Earth Pressure Condition	Seismic Modification (2% PE in 50 yrs)
Active	9 pcf increase
At-rest	no increase
Passive	18 pcf decrease

The seismic increases and decrease assume a peak ground acceleration (PGA) of 0.23g and a 1 second period ground acceleration (S_1) of 0.17g using the Mononobe-Okabe pressure distribution.

3. Safety Factors

The values recommended assume mobilization of the soil to achieve the assumed soil strength. Conventional safety factors used for structural analysis for such items as overturning and sliding resistance should be used in design.

F. Seismicity, Liquefaction and Faulting

1. Seismicity

Listed below is a summary of the seismic site parameters.

Description	Value - Seismic Event (2% PE in 50 yrs)
2018 IBC Seismic Site Class	C
PGA	0.23g
S_s	0.51g
S_1	0.17g
F_a	1.38
F_v	2.27
F_{PGA}	1.37

2. Seismic Design Considerations

Based on the subsurface conditions anticipated, a ground motion hazard analysis as per ASCE 7-16 is not required by the 2018 International Building Code. A 10 percent decrease in design seismic load might be achieved if shear wave velocities are measured on site. If this is requested, we propose to perform a Refraction Microtremor (ReMi) survey to measure subsurface shear wave velocity

3. Liquefaction

Based on subsurface conditions encountered in the boring, the subsurface soils observed are non-liquefiable during a severe seismic event.

4. Faults

Based on review of available geologic literature, there are no mapped faults extending through the site.

G. Soil Corrosion

Our experience in the area and laboratory test results indicates the on-site soil and bedrock contain sulfate concentration corresponding to a "moderate" to "severe" potential sulfate attack on concrete exposed to these materials. Therefore, we recommend concrete elements that will be exposed to the on-site soils be designed in accordance with provisions provided in the American Concrete Institute Manual of Concrete Practice (ACI) 318-11. Tables 4.2.1 and 4.3.1 of ACI 318-11 should be referenced for design of concrete elements utilizing a Sulfate Exposure Class of S2, and a sulfate exposure severity of "severe".

Consideration should also be given to cathodic protection of buried metal pipes. We recommend utilizing PVC pipes where local building codes allow.

H. Pavement

Based on the subsoil conditions encountered and the laboratory test results, the following recommendations are given:

1. Analysis

The flexible pavement analysis is based on AASHTO design methods and a 20-year design life. The rigid pavement is based on AASHTO and PCCA design methods and a 20-year design life.

2. Subgrade Support

Our design assumes a properly prepared subgrade as recommended in the Subgrade Preparation section of this report. The subgrade preparation varies depending on the location on the site. Prior to base course or pavement or grading fill, the subgrade should be prepared as recommended in the Subgrade Preparation section of this report.

3. Pavement Thickness

Based on the anticipated traffic, the following pavement sections are recommended.

	Rigid Pavement		Flexible Pavement	
Area	Portland Cement (inches)	Base Course (inches)	Asphaltic concrete (inches)	Base Course (inches)
Light Duty Parking	--	--	2½	8
Entrances and dumpster pad	4	4	3	12

4. Pavement Materials

a. *Flexible Pavement (Asphaltic Concrete)*

The pavement materials should meet AASHTO, St. George City specifications for gradation and quality. The pavement thicknesses indicated above assume that the base course is a high quality material with a CBR value of at least 80 percent. Asphalt material should have a Marshal stability of at least 1,800 pounds.

b. *Rigid Pavement (Portland Cement Concrete)*

The pavement thicknesses indicated assumes that the concrete will have a 28-day compressive strength of at least 4,500 psi.

5. Jointing

Joints for concrete (rigid) pavement should be laid out in a square or rectangular pattern. Joint spacings should not exceed 30 times the thickness of the slab. The depth of joints should be at least one-quarter of the slab thickness.

6. Drainage

The collection and diversion of drainage away from the pavement surface is extremely important to the satisfactory performance of the pavement section. Proper drainage should be provided. We further recommend proper pavement maintenance to extend the pavement life.

I. Design Review/Construction Observation

Design review and construction observations are recommended to verify the recommendations in this report are properly implemented and followed. In order to provide a foundation compliance report as required by the St. George City, we recommend the following be done as a minimum:

1. Review the foundation plan and design to verify the geotechnical aspects of the design were correctly and properly included.

2. Observe on a full time basis the drilling and construction of the micropiles and piers including reinforcement and concrete placement.

3. Observe the reinforcing steel in the grade beams.

4. Verify the proper void space is provided below the grade beams.

5. Conduct special inspections as required by the St. George City, the 2018 International Building Code and the Structural engineer.

The above observations will be conducted by qualified individuals and according to standard test methods (ASTM, ICBO, ICC, etc.).

LIMITATIONS

This report has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the borings drilled, geologic literature, laboratory test results, engineering analysis and our experience in the area. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface soil or groundwater conditions are found to be different from what is described in this report, we should be notified to reevaluate the recommendations given.

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

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



G. Wayne Rogers, P.E.

Reviewed by: Arnold DeCastro, P.E.

Reviewed By: James E Nordquist, P.E., D.G.E.

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GEOLOGIC LITERATURE REFERENCES

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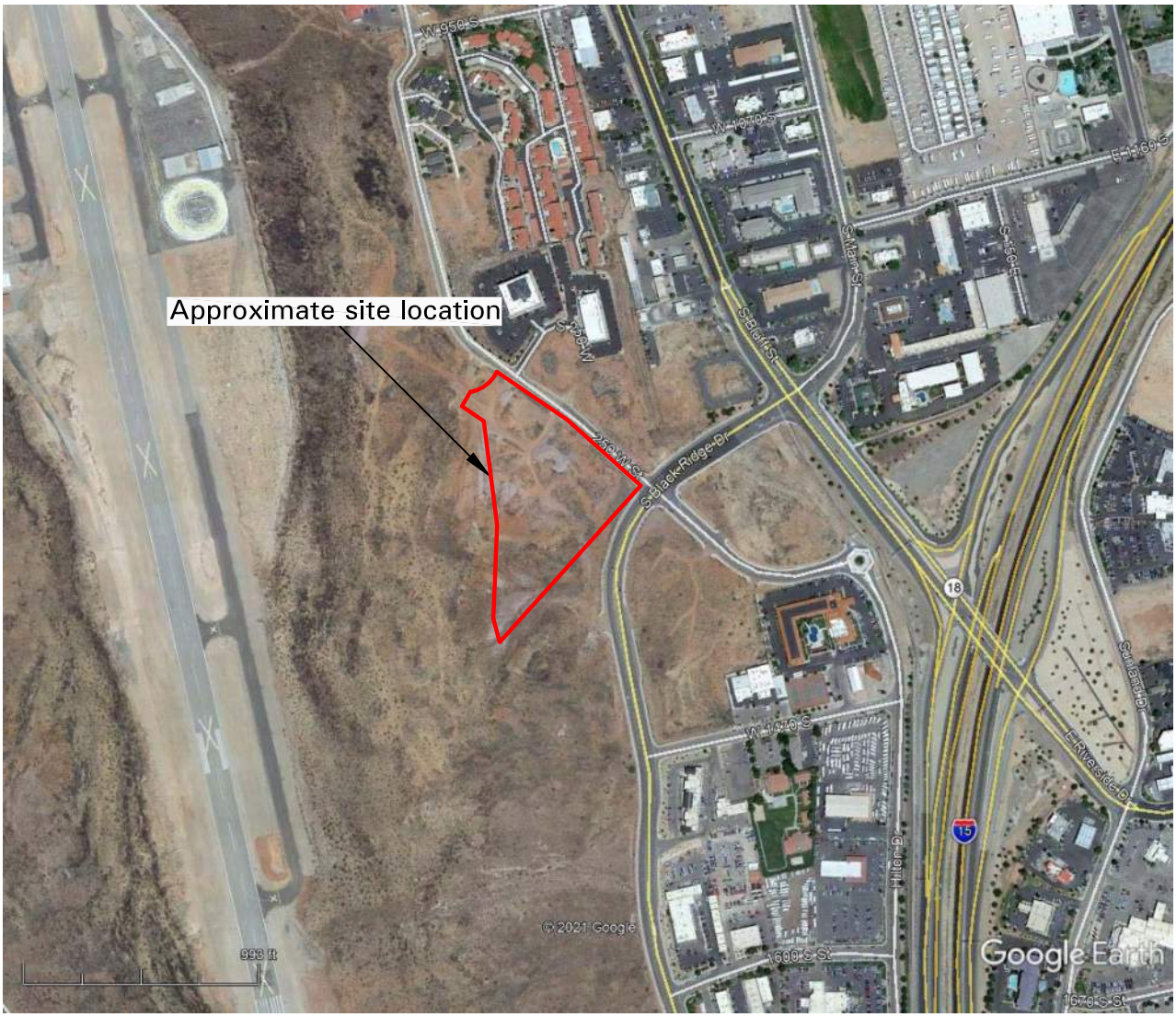
"Geologic hazards and adverse construction conditions, St. George-Hurricane Metropolitan Area, Washington County, Utah", Lund, W.R., Knudsen, T.R., Vice, G.S., and Shaw, L.M., 2008, Utah Geological Survey Special Study 127, variously paginated, 14 plates, scale 1:24,000.



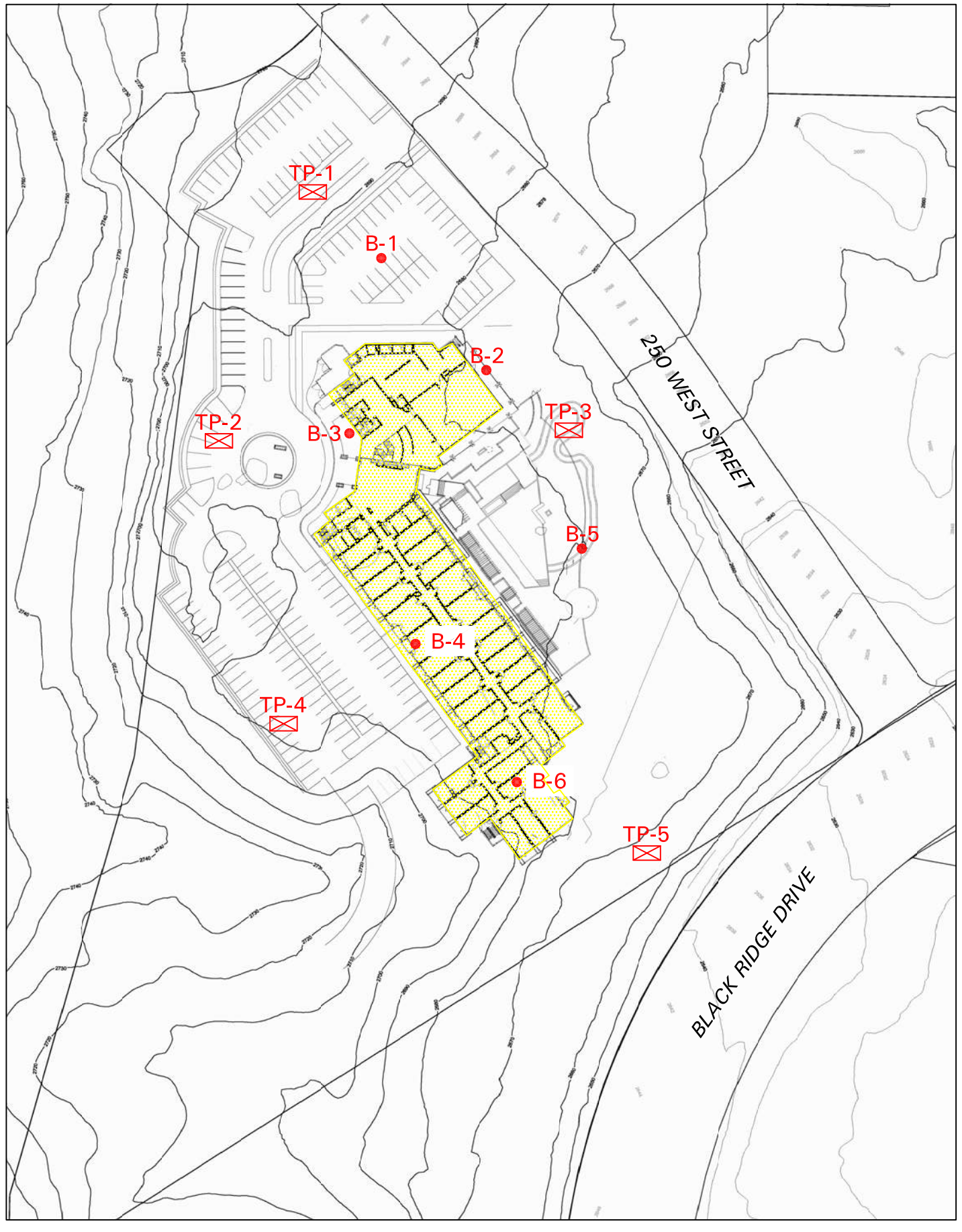
N

Not to Scale

BLACKSTONE HOTEL
WEST PARCEL
ST. GEORGE, UTAH

2211175	AGEC	Vicinity Map	Figure 1

BLACKSTONE HOTEL WEST PARCEL
ST. GEORGE, UTAH



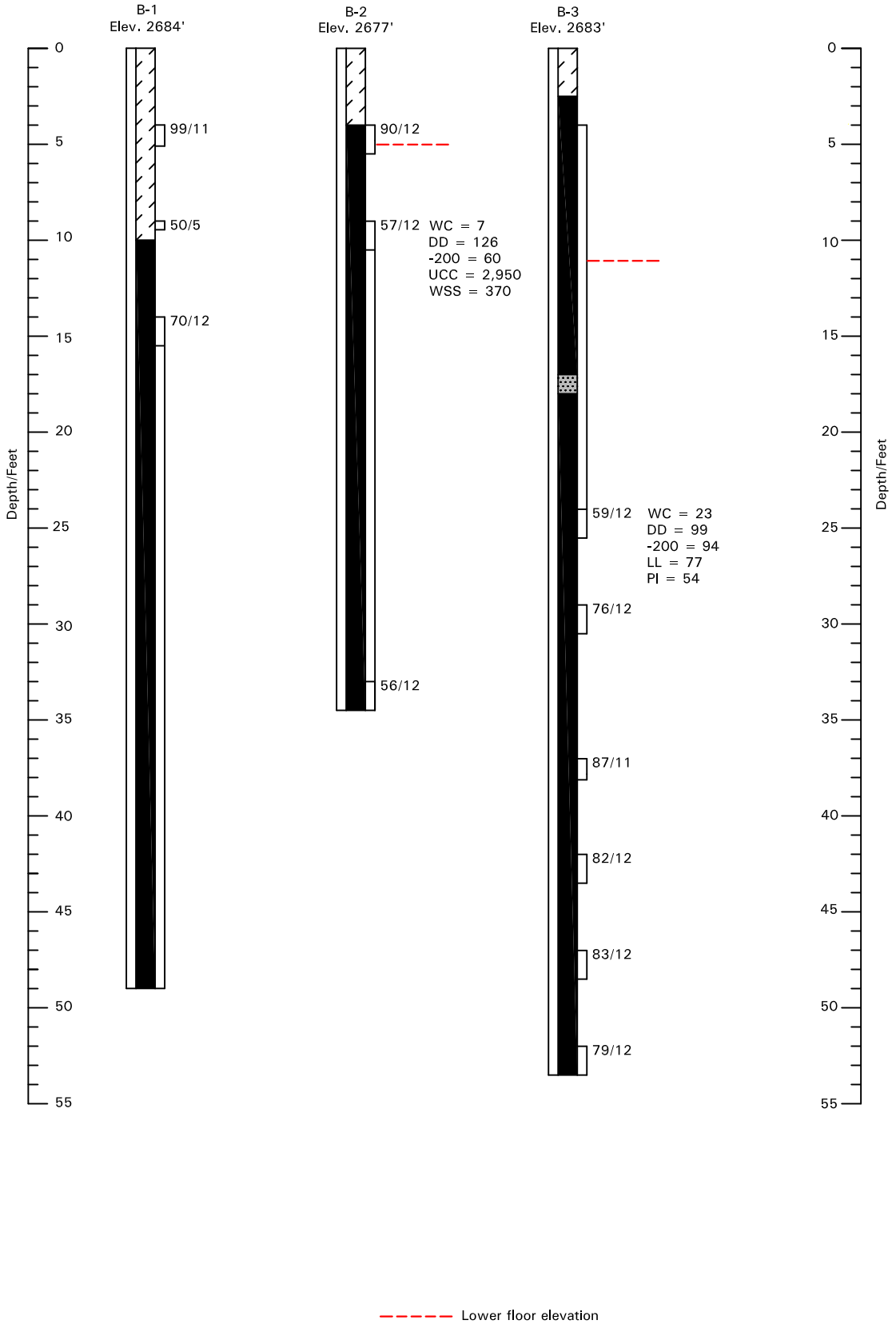
- Approximate boring location
- Approximate test pit location
- Proposed Hotel

N

0 80 160 feet

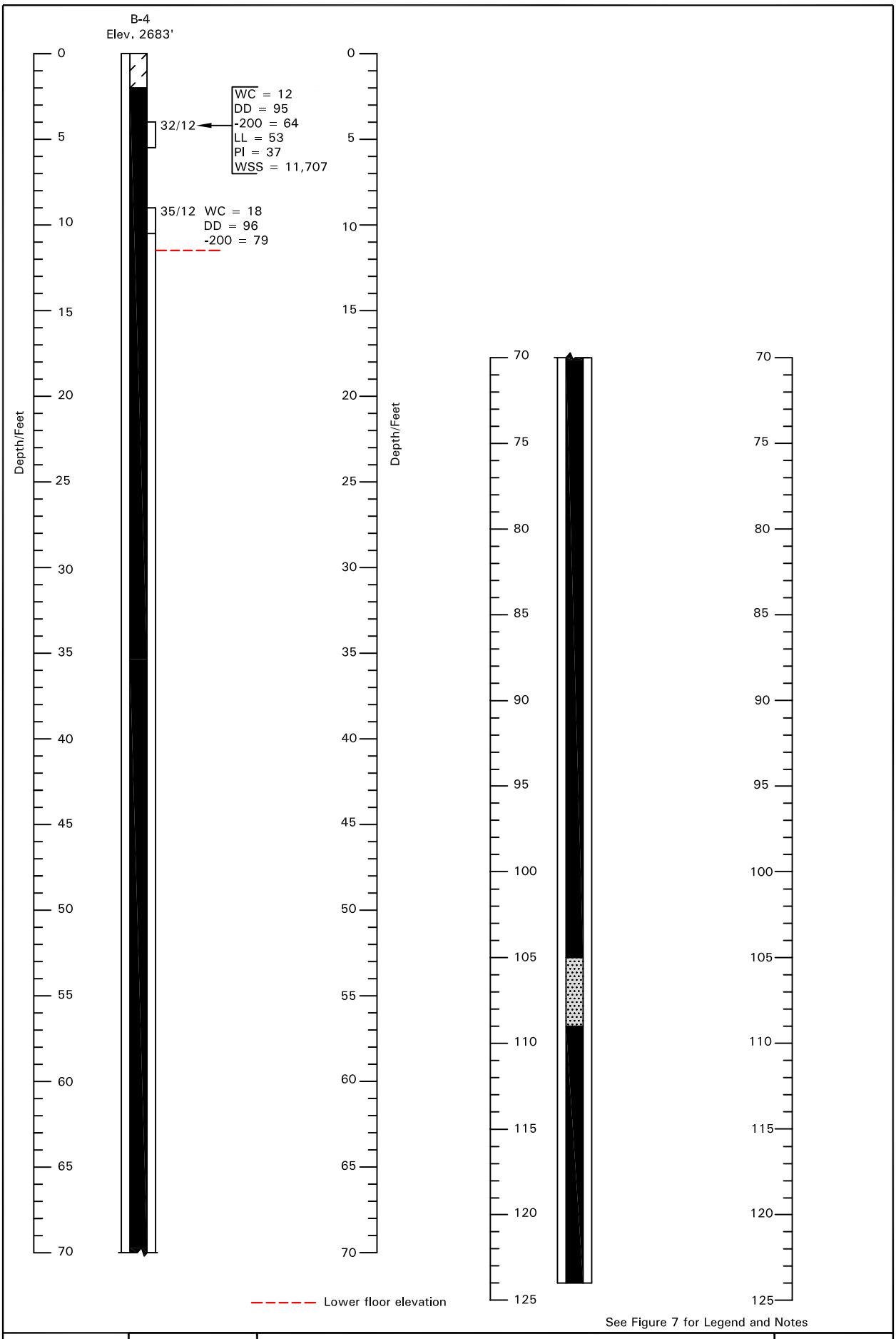
Approximate Scale

2211175	AGEC	Site Plan	Figure 2

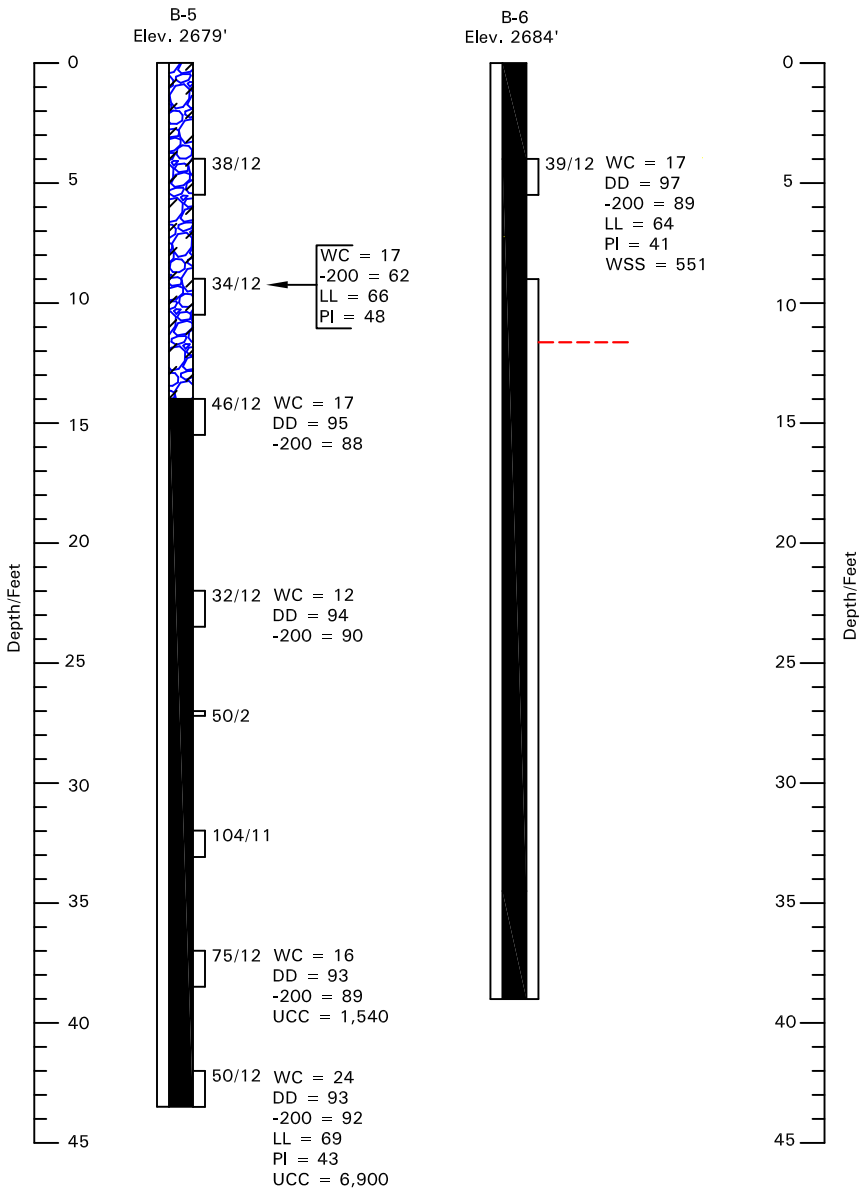


See Figure 7 for Legend and Notes

2211175	AGES	Logs of Exploratory Borings	Figure 3



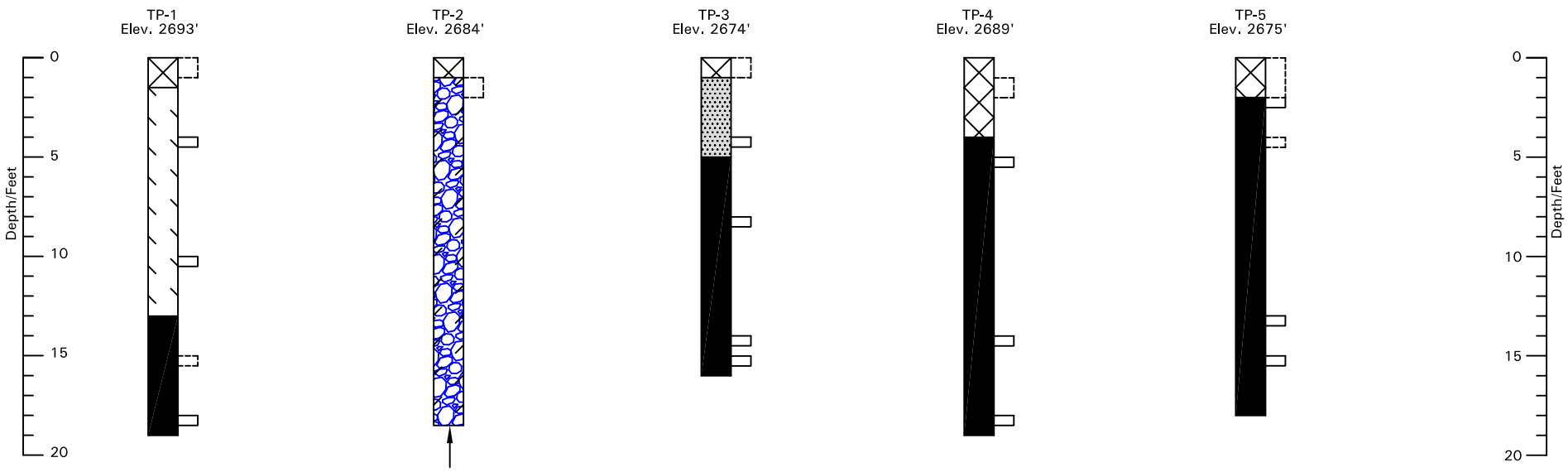
2211175	AGES	Logs of Exploratory Borings	Figure 4



Lower Floor Elevation.

See Figure 7 for Legend and Notes

2211175	AGES	Logs of Exploratory Borings	Figure 5



See Figure 7 for Legend and Notes

2211175	AGEC	Logs of Test Pits	Figure 6

LEGEND:



Fill; varies from clayey gravel to lean/fat clay, poorly compacted, dry, and red-brown to purple in color.



Landslide deposit - Lean/Fat Clay (CL/CH); medium stiff to very stiff, weathered mudstone, slightly moist, medium to highly plastic, and brown, red to slightly purple in color.



Landslide deposit - Clayey Gravel (GC); dense, dry, contains angular gravel up to boulder size, and and brown to red in color. The gravel is slightly gray to black basalt.



Landslide deposit - Mudstone Bedrock; consists of lean to fat clay with varied amounts of sand. It is soft to moderately hard, slightly moist to wet, and purple, grey, red-brown in color.



Landslide deposit - Sandstone Bedrock; moderately hard, contains layers of clay, dry to wet and grey to brown to red in color.



10/12 California drive sample taken. The symbol 10/12 indicates that 10 blows from a 140 pound hammer falling 30 inches were required to drive the sampler 12 inches.



Indicates slotted 1 inch PVC pipe installed in the boring to the depth shown.



Indicates core sample taken.

Indicates practical excavator refusal.

Lower floor elevation (Elevation 2671 feet)

NOTES:

1. The borings were drilled on June 14, 15, and 16, 2021 with a truck mounted drill rig equipped with 8-inch hollow-stem augers. The test pits were excavated on July 6, 2021with a track excavator (CAT 336).
2. The locations of the borings and test pits were located by a hand held GPS.
3. The elevations of the borings and test pits were determined by interpolations of the contours on the site plan provided.
4. The boring locations and elevations should be considered accurate only to the degree implied by the method used.
5. The lines between the materials shown on the logs represent the approximate boundaries between material types and the transitions may be gradual.
6. Free water was not encountered in the borings or test pits at the time of drilling/ excavation.
7. WC = water content (%);
   DD = dry density (pcf);
   +4 = percent retained on the No. 4 sieve;
   -200 = percent passing No. 200 sieve;
   LL = liquid limit (%);
   PI = plasticity index (%).

Applied Geotechnical Engineering Consultants, Inc.

Table 1 - Summary of Laboratory Test Results

Blackstone Hotel

Project No. 2211175

Sample Location				Gradation			Atterberg Limits		Moisture-Density Relationship				
Boring No.	Depth (ft)	Natural Moisture Content (%)	Natural Dry Density (pcf)	Gravel (%)	Sand (%)	Silt/Clay (%)	Liquid Limit (%)	Plastic Index (%)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Unconfined Compressive Strength (psf)	Water Soluble Sulfate (ppm)	Soil Type
B-2	9	7	126			60					2,950	370	Landslide Deposit - Mudstone Bedrock, Sandy Fat Clay (CH)
B-3	24	23	99			94	77	54					Landslide Deposit - Mudstone Bedrock, Fat Clay (CH)
B-4	4	12	95			64	53	37				11,707	Landslide Deposit - Mudstone Bedrock, Sandy Fat Clay (CH)
B-4	9	18	96			79							Landslide Deposit - Mudstone Bedrock, Fat Clay with Sand (CH)
B-5	9	17				62	66	48					Landslide Deposit - Mudstone Bedrock, Sandy Fat Clay (CH)
B-5	14	17	95			88							Landslide Deposit - Mudstone Bedrock, Fat Clay (CH)
B-5	22	12	94			90							Landslide Deposit - Mudstone Bedrock, Fat Clay (CH)
B-5	37	16	93			89					1,540		Landslide Deposit - Mudstone Bedrock, Fat Clay (CH)
B-5	42	24	93			92	69	43			6,900		Landslide Deposit - Mudstone Bedrock, Fat Clay (CH)
B-6	4	17	97			89	64	41				551	Landslide Deposit - Mudstone Bedrock, Fat Clay (CH)

Applied Geotechnical Engineering Consultants, Inc.

Table 2

Deep Foundation Element Design Parameters

Blackstone Hotel Project No. 2211175

Soil Type	Soil Properties			Lateral Design Parameters			Axial Design Parameters		
	Total Unit Weight (pcf)	Cohesion (psf)	Friction Angle (Degrees)	Horizontal Modulus (pci)	Ultimate Passive Resistance (psf)	Strain @ 50% Yield (k_{rm})	Ultimate Skin Friction (psf)	Ultimate Uplift Skin Friction (psf)	Net Allowable** Bearing Capacity (ksf)
Mudstone (upper 10 feet)	100	2,000	0	500	18,000	0.006	1,000	750	--
Mudstone (10 to 20 feet)	110	4,000	0	1,400	36,000	0.006	2,000	1,333	--
Mudstone (>20 feet)	120	6,000	0	2,000	54,000	0.005	3,000	2,000	35

* Ignore the upper 2 feet

** Minimum embedment of 20 feet into the mudstone.

APPENDIX

SITE PHOTOS, CORE LOGS
AND ASBESTOS LOCATION MAP



Photo No. 1, View of property to right or west of 250 West, looking south.



Photo No. 2, View of property from west of SWC property looking north



Photo No. 3, View of property from Near SWC, looking NE.



Photo No. 4, View of property from near SEC corner at top of slope, looking NW



Photo No. 5, View of property from above and west of property, looking west



Photo No. 6, View of property from above and west of property, looking south to southeast.

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 14, 2021

LOCATION

ELEVATION 2684'

PAGE Page 1 of 3

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-1

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0			Landslide deposit - Lean Clay with sand and gravel, hard, slightly moist, red/mottled.														Boring cased with 8" diameter HSA to 14'.
1																	
2			Boulder														
3																	
4																	
5																	
6																	
7																	
8			Boulder														
9																	
10			Boulder														
11																	
12																	
13																	
14			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.									5	2½	40		0.8	Boring advanced with 2½" HQ Core and carbide bit using air.
15																	
16																	
17																	
18																	
19												5	3½	30		1.8	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 14, 2021

LOCATION

ELEVATION 2684'

PAGE Page 2 of 3

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-1

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
20–21			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														
21–22																1.8	
22–23												5	3½	30			
23–24																	
24–25																	
25–26																	
26–27												5	3½	30		2.6	
27–28																	
28–29																	
29–30																	
30–31																	
31–32												5	3½	30		3.2	
32–33																	
33–34																	
34–35																	Switch to carbide bit
35–36																	
36–37												5	3½	30		0.4	
37–38																	
38–39																	
39–												5				1.2	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 14, 2021

LOCATION

ELEVATION 2684'

PAGE 3 of 3

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-1

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
40			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														
41																	
42												5	5	70		1.2	
43																	
44																	
45																	
46												5	5	40		0.8	
47																	
48																	
49																	End of boring at 49'.
50																	
51																	
52																	
53																	
54																	
55																	
56																	
57																	
58																	
59																	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 14, 2021

LOCATION

ELEVATION 2677'

PAGE Page 1 of 2

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0			Landslide deposit - Lean Clay with sand and gravel, hard, slightly moist, red/mottled.														Boring cased with 8" diameter HSA to 14'.
4			Landslide deposit - Mudstone Bedrock, soft to moderately hard, grey to purple to red.														
9																	Boring advanced with 2½" HQ Core and carbide bit using air.
10												5	2	25		0.4	
14												5	5			1.0	
17			Landslide deposit - Sandstone Bedrock, soft, grey to brown.														
18			Landslide deposit - Mudstone Bedrock, red to grey.														
19												5	3				

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 14, 2021

LOCATION

ELEVATION 2677'

PAGE Page 2 of 2

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-2

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
21			Landslide deposit - Mudstone Bedrock, soft to moderately hard, grey to purple to red.													1.8	
22												5	3				
23																	
24																	
25												5					
26																	
27																	
28																	
29			Landslide deposit - Shale/Sandstone, hard, moist to wet, red to grey.														
30																	
31												4	4			2.5	
32																	
33																	
34																	
35																	End of boring at 34½'.
36																	
37																	
38																	
39																	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 15, 2021

LOCATION

ELEVATION 2683'

PAGE Page 1 of 2

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-3

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0			Landslide deposit - Lean Clay with sand and gravel, hard, slightly moist, red/mottled.														Boring cased with 8" diameter HSA to 4'.
4			Landslide deposit - Mudstone Bedrock, soft to moderately hard, grey to purple to red.									5	1½	60		1.2	Boring advanced with 2½" HQ Core and carbide bit using air.
9												5	3	20		3.8	
14												5	1½	20		1.2	
17			Landslide deposit - Sandstone Bedrock, soft, grey to brown.														
18			Landslide deposit - Mudstone Bedrock, red to grey.									5	1½	0		0.8	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 15, 2021

LOCATION

ELEVATION

PAGE Page 2 of 2

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-3

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
21–24			Landslide deposit - Mudstone Bedrock, soft, moist, grey to purple to red.									5	1½	0		0.8	
24																	End of coring at 24'.

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 16, 2021

LOCATION

ELEVATION 2683'

PAGE Page 1 of 7

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0			Landslide deposit - Lean Clay with sand and gravel, hard, slightly moist, red/mottled.														Boring cased with 8" diameter HSA to 9'.
2			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														
9																	Boring advanced with 2½" HQ Core and carbide bit using air.
11												5	3½	70		0.6	
14																	
15												2				2.0	
17												3	2½	80			
19												5	5	80		4.8	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 16, 2021

LOCATION

ELEVATION 2683'

PAGE Page 2 of 7

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
20–21			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.		0–1												
21–22					1–2							5	5	80		4.8	
22–23					2–3												
23–24					3–4												
24–25					4–5							5	5	90		5.6	
25–26					5–6												
26–27					6–7												
27–28					7–8												
28–29					8–9												
29–30					9–10							5	5	90		5.6	
30–31					10–11												
31–32					11–12												
32–33					12–13												
33–34					13–14												
34–35					14–15							5	5	90		7.6	Switch to carbide bit
35–36					15–16												
36–37					16–17												
37–38					17–18												
38–39					18–19												
39–					19–							5	5	90		5.6	

PROJECT NO. 2211175 **AGEC FIELD CORE LOG**

PROJECT Blackstone Hotel West Parcel | CORE SIZE 2½" | DATE June 16/17, 2021

LOCATION | ELEVATION 2683' | PAGE 3 of 7

FIELD ENG. T.R.A. | DRILLER B.L. | BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
40			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														
41																	
42												5	5	90		5.6	
43																	
44																	
45																	
46												5	5	80		7.8	
47																	
48																	
49																	
50																	
51												5	5	50		10.6	
52																	
53																	
54																	
55																	
56												5	5	70		5.8	
57																	
58																	
59												5	5	60			

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 17, 2021

LOCATION

ELEVATION 2683'

PAGE 4 of 7

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
60			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														Boring advanced with 2½" HQ Core and carbide bit using air.
61																	
62												5	5	60		7.4	
63																	
64																	
65												5	5	80			
66																6.4	
67																	
68																	
69																	
70												5	5	95			
71																7.0	
72																	
73																	
74																	
75												5	4½	70			
76																	
77																9.6	
78																	
79																	
												5	5	40		6.6	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 17/18, 2021

LOCATION

ELEVATION 2683'

PAGE 5 of 7

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
80			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														Boring advanced with 2½" HQ Core and carbide bit using air.
81																	
82												5	5	90		6.6	
83																	
84																	
85																	
86																6.0	
87												5	5	90			
88																	
89																	
90																	
91																7.2	
92												5	5	90			
93																	
94																	
95																	
96																6.4	
97												5	5	90			
98																	
99																	
												5	5	95		7.0	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 18, 2021

LOCATION

ELEVATION 2683'

PAGE 6 of 7

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
100–101			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														Boring advanced with 2½" HQ Core and carbide bit using air.
101–102																	
102–103												5	5	95		7.0	
103–104																	
104–105																	
105–106			Landslide deposit - Sandstone Bedrock; moderately hard, grey to purple.														
106–107												5	5	95		6.2	
107–108																	
108–109																	
109–110			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.														
110–111																	
111–112												5	5	90		8.0	
112–113																	
113–114																	
114–115																	
115–116																	
116–117												5	5	95		10	
117–118																	
118–119																	
119–												5	5	95		2.8	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 18, 2021

LOCATION

ELEVATION 2683'

PAGE 7 of 7

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-4

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
120					120							120				120		
121			Landslide deposit - Mudstone Bedrock, moderately hard slightly moist to moist, purple.		121		121					121				121		Boring advanced with 2½" HQ Core and carbide bit using air.
122					122		122					122	5	5	95	122	7.8	
123					123		123					123				123		
124					124		124					124				124		End of boring at 124'.

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 15, 2021

LOCATION

ELEVATION 2784'

PAGE Page 1 of 2

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-6

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	TYPE	ROUGH.	PLAN.	FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
0			Landslide deposit - Mudstone Bedrock, soft to moderately hard, grey to purple to red.														Boring cased with 8" diameter HSA to 9'.
9																	
9												5	2	0		0.4	Boring advanced with 2½" HQ Core and carbide bit using air.
14																	
14												5	2	20		0.6	
19																	
19												5	4½	40		0.6	

PROJECT NO. 2211175

AGEC FIELD CORE LOG

PROJECT Blackstone Hotel West Parcel

CORE SIZE 2½"

DATE June 15, 2021

LOCATION

ELEVATION 2784'

PAGE Page 2 of 2

FIELD ENG. T.R.A.

DRILLER B.L.

BORING NO. B-6

DEPTH (ft)	ALTERATION	HARDNESS	CORE DESCRIPTION	WATER	PACKER TESTS	GRAPHIC LOG	DISCONTINUITY LOG: ORIENT.	DISCONTINUITY LOG: TYPE	DISCONTINUITY LOG: ROUGH.	DISCONTINUITY LOG: PLAN.	DISCONTINUITY LOG: FILLING	CORE RUN (FT)	RECOVERY (FT)	RQD (%)	FRAC./FT.	PROGRESS	DRILLING COMMENTS
20			Landslide deposit - Mudstone Bedrock, soft to moderately hard, grey to purple to red.														
21																	
22												5	4½	40		0.6	
23																	
24																	
25																	
26												5	3½	0			
27																0.8	
28																	
29																	
30																	
31																	
32												5	2½	0		2.5	
33																	
34																	
35																	
36												5	3	60			
37																2.0	
38																	
39																	End of boring at 39'.

BCE
BROWN CONSULTING ENGINEERS
CIVIL ENGINEERING * LAND SURVEYING * LAND PLANNING

MAY 3, 2004

BLACK RIDGE NORTH ASBESTOS DISPOSAL SITE

BEGINNING AT THE SOUTHEAST CORNER OF SECTION 36, T42S, R16W, SLB&M THENCE N0°36'40"E, 1820.09 FEET ALONG THE SECTION LINE AND WEST 102.98 FEET TO THE CENTERLINE OF 250 WEST STREET AND BLACKRIDGE DRIVE; THENCE N68°02'53"W, 139.22 FEET TO THE TRUE POINT OF BEGINNING; THENCE S44°45'38"W, 116.85 FEET; THENCE S70°32'28"W, 93.77 FEET; THENCE N24°25'31"W, 53.61 FEET; THENCE N12°33'52"W, 154.01 FEET; THENCE N52°02'14"E, 84.97 FEET; THENCE N33°11'25"W, 37.56 FEET; THENCE N56°48'35"E, 60.62 FEET; THENCE S81°03'14"E, 27.23 FEET; THENCE S58°19'12"E, 34.04 FEET; THENCE S33°57'07"E, 99.34; THENCE S53°34'40"W, 41.42 FEET; THENCE S45°56'41"E, 38.22 FEET; THENCE S39°24'39"E, 34.19 FEET; THENCE S5°45'45"E, 19.82 FEET TO THE TRUE POINT OF BEGINNING.

CONTAINS 1.0455 ACRES



163 WEST 1600 SOUTH #5 * ST. GEORGE UT 84770
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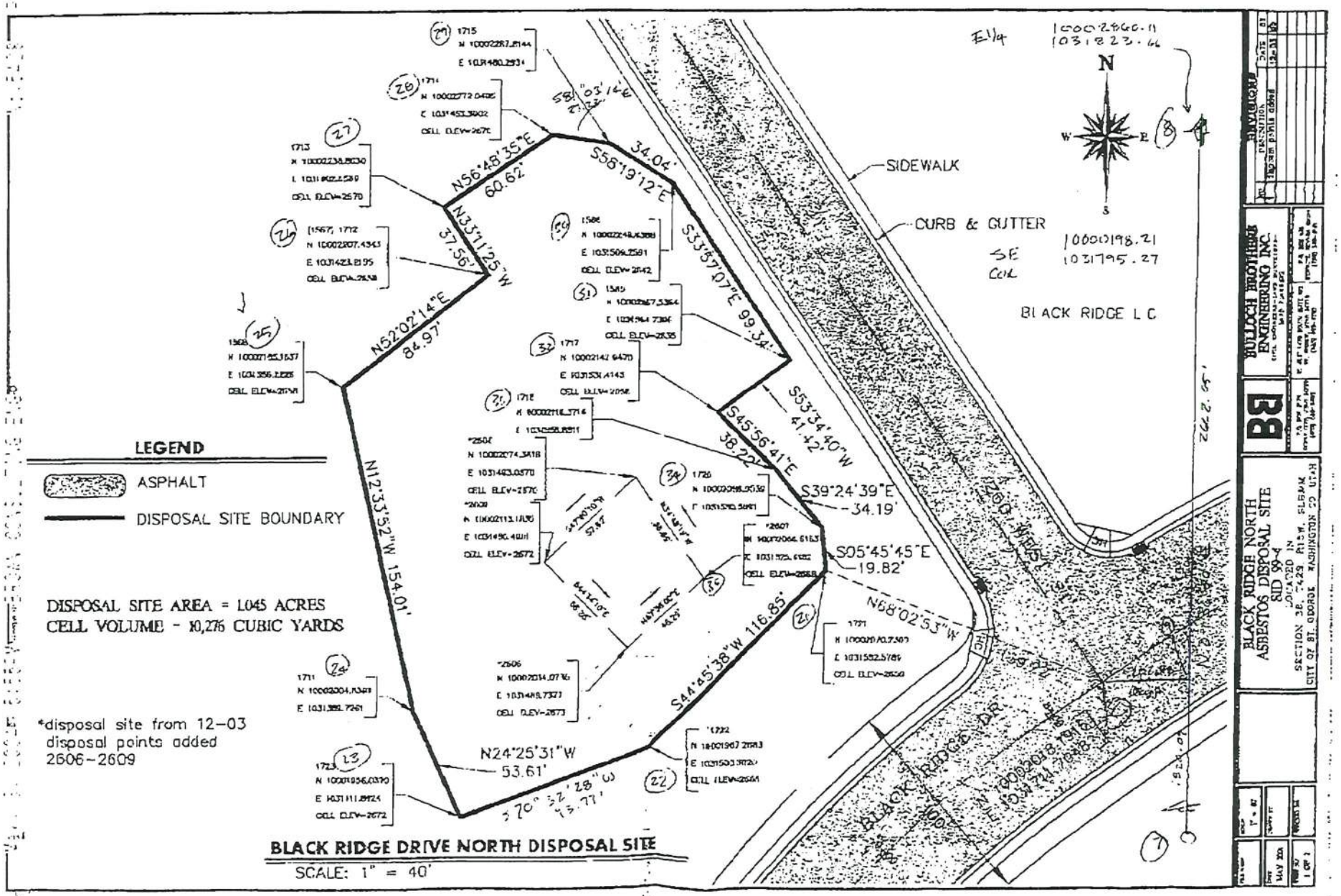
LEGEND
ASPHALT
DISPOSAL SITE BOUNDARY
DISPOSAL SITE AREA = 1.045 ACRES
CELL VOLUME - 10,276 CUBIC YARDS
*disposal site from 12-03 disposal points added 2606-2609
BLACK RIDGE DRIVE NORTH DISPOSAL SITE
SCALE: 1" = 40'
SIDEWALK
CURB & GUTTER
BLACK RIDGE L C
N
S
E
W
N56°48'35"E 60.62'
S56°19'12"E 34.04'
S33°57'07"E 99.34'
S53°34'40"W 41.42'
S45°56'41"E 38.22'
S39°24'39"E 34.19'
S05°45'45"E 19.82'
N68°02'53"W
S44°45'38"W 116.85'
N24°25'31"W 53.61'
N12°33'52"W 154.01'
N52°02'14"E 84.97'
N33°11'25"W 37.56'
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BLACK RIDGE NORTH ASBESTOS DISPOSAL SITE RID 99-4
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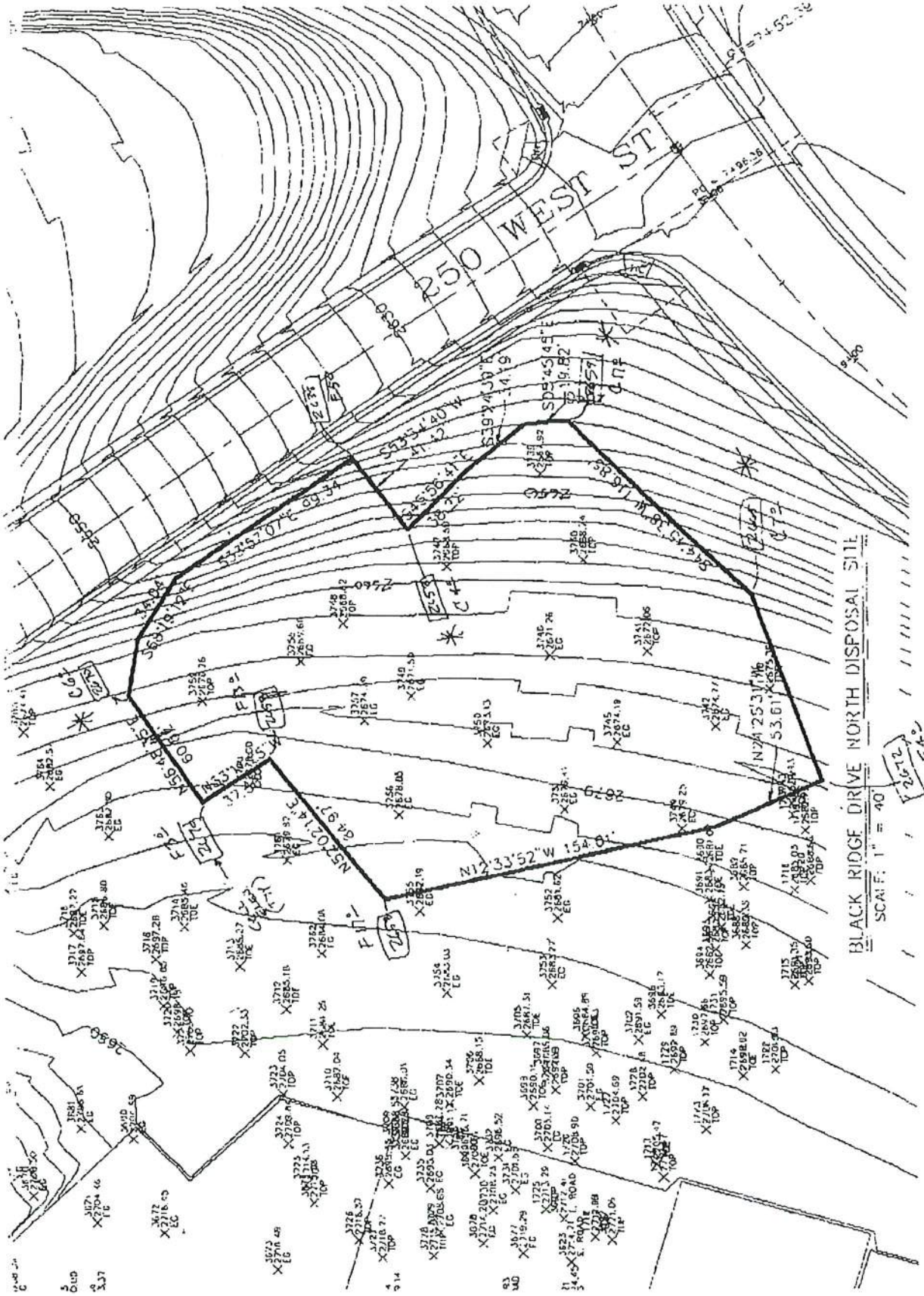
CITY OF ST. GEORGE WASHINGTON CO UTAH
BULLOCH HOLLADAY ENGINEERING INC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S33°57'07"E 69.34'
N53°40'48"W 150.00'
N36°19'12"E 150.00'
N24°25'13"W 53.61'
N12°33'52"W 154.01'
N52°02'17"E 64.97'
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EXHIBIT H

2024 AGEC Geotechnical Investigation

AGEC
Applied GeoTech

July 13, 2024

Cross L Holidings
2805 Cottonwood Circle
Santa Clara, Utah 84765

Attention: Lonne Gubler

Subject: Geologic Hazard Hillside Report
Blackridge Restaurants
St. George, Utah
Project Nos. 2240674

REFERENCES

1. 1. "Geotechnical Investigation, Blackstone Hotel" (current parcel), prepared by AGEC under Project No. 2180187, dated December 14, 2018.

2. "Slope Stability Consultation", Blackstone Hotel (current parcel), prepared by AGEC, Project No. 2180187

3. "Geotechnical Investigation", Blackstone Hotel, West Parcel, prepared by AGEC, Project No. 2211175, dated September 8, 2021.

4. "Stability Consultation", Blackstone Hotel, West Parcel, prepared by AGEC, Project No. 2211175, dated September 28, 2021.

5. "Preliminary Grading Plan", prepared by American Consulting and Engineering under Job #24-013 dated July 3, 2024.

BACKGROUND INFORMATION

AGEC has previously conducted a geotechnical study for the property (Ref No. 1) for a previously planned hotel site. Subsequently, the hotel site was moved across 250 West to the west. AGEC conducted by AGEC for the property to the west (Ref No. 3 and 4). The information from these references was used to evaluate the site and provide our conclusions and recommendations for the proposed new construction as shown on the attached site plan (Ref No. 5).

AGEC has used the proposed construction/grading plan (Ref No. 4) and evaluated

the slope stability of the property. Reference No.'s 1, 3 and 4 are attached for reference.

GENERAL SUMMARY-CONCLUSIONS

The following are the significant items that exist at the site;

1. There are basically 2 geologic hazards that exist at the site which could impact the project. The hazards include the potential for landslide movement, highly expansive soil and bedrock.

2. AGEC has evaluated the stability of the slope, upon which the restaurants are planned. Based on profiles and material strengths from previous work noted in References 1-4, the overall site does not meet the minimum standard for stability assuming that the soil and bedrock is saturated. As a part of AGEC's previous study has conducted additional investigation on this site to evaluate the factors of safety and for ground improvement at this location. During Reference No.'s 2-4, AGEC conducted additional laboratory testing for the analysis to determine the strengths and moisture characteristics for our evaluation. Additional evaluation in a partially saturated slope in the upper portion of the slope. The results of this evaluation are discussed in the stability section below.

3. Due to the expansive characteristics of the on-site clay and bedrock, there is the potential for significant heave up wetting of the subgrade soils. AGEC will provide foundation recommendations using an overexcavation and replacement method for the building areas.

SITE CONDITIONS

The site is located on a sloping hillside located north of Blackridge Drive and east of 250 West Street. The site consists of two parcels that are approximately 3.8 acres. There are retail buildings below and to the east of the property. The eastern portion of the property consists of a rock slope that varies with steeper sections up to approximately 1:1 (horizontal to vertical) with several benches within the slope. The slope height varies from approximately 30 to 55 feet in height increasing to the north. The base of the slope (retail project) has a reinforced concrete wall along the eastern property line.

The south edge of the property has limited rock facing along the top of the slope with exposed soil and rock below. The slope through this area is approximately 30 feet in height.

The western edge of the property borders 250 West Street, which slopes up to the north and slightly west with approximately 40 feet of elevation change along the roadway. There is an exposed soil/mudstone slope down to the 250 west at the southwest corner and decreases in height to the north to a point where the site is lower than 250 west and there is a slope down to the property of approximately 10 to 12 feet.

To the north of the property are two office buildings. These buildings are accessed off of 250 west along the north edge of the property with a roadway that slopes down to the northeast. The roadway extends along the edge of the property to near the north central portion of the property that will eventually extend southwest to connect to the planned entrance of the property along 250 West.

The northeast portion of the site is generally lower by several feet from the property to the north. There is a small retaining wall along the eastern portion of the north property line.

There are several stockpiles of materials that vary from rock to soil to mudstone. There is also a buried storm drain that extends along the crest of the slope on the eastern portion of the site and extends south to Blackridge drive.



Aerial Photo of the property.

SUBSURFACE CONDITIONS

AGEC investigated the subsurface conditions during the previous studies noted in Reference No.'s 1-3. The study for the overall slope was initiated in 2007 where several deep borings were drilled and inclinometers and piezometers were installed. During the 2018 study, AGEC observed the drilling of 6 borings and excavation of 5 test pits across the property.

The subsurface profile observed in the borings drilled generally consists of fill overlying bedrock to the maximum depth investigated, approximately 93 feet. Talus (cobbles infilled gravel, sand and clay) and landslide deposits were encountered beneath the fill. The transition of landslide altered bedrock to undisturbed bedrock occurs at a depth of approximately 37 to 80 feet below the ground surface.

Details of the various types of materials encountered along with laboratory testing are included in the referenced documents.

OVERALL HILLSIDE STABILITY

The area for the proposed restaurants is located on the lower section of a 300-foot-high slope. The lower two-thirds of the slope has been identified and mapped as a landslide deposit, which has the potential for landslide movement if environmental conditions change. The area has also received a significant amount of fill that is retained by a rockery slope on the eastern edge of the property.

The ground surface of the landslide deposit slopes down at an average slope of approximately 7.3 horizontal to 1 vertical. Earlier studies (Ref No.'s 1-3) of the landslide deposit has revealed that the depth of the landslide extends approximately 200 feet below the existing ground surface.

Previous studies have also included measurement of inclinometers that were installed in 2007 that extended 79 to 259 feet below the existing ground surface. Four of the five inclinometers have indicated that there has been no movement from the initial measurements in 2007 through measurements taken in 2018.

Ground movement was experienced at multiple depths prior to 2011 on a portion of the slope located on and west of a vacant restaurant located at 1090 South Bluff Street (Dairy Queen site).

PROPOSED CONSTRUCTION

There will be two restaurant pads as shown on the attached site plan. The restaurant pads are planned to be at elevations 2656.0 feet (north pad) and 2651.0 feet (south pad). Each pad will a portion of the pad on the east side that will be 2 feet lower than the main pad.

There are retaining walls planned around the east, south, southwest portion and northwest portion of the site. The walls are planned to be rock retaining and will be approximately 8 feet in height. In addition, portions of the existing slope along the east, south and southwest portions of the site will be rehabilitated. The existing storm drain along the east side to the west side of the property.

We understand that the grading will include adding fill on the eastern portion of the site up to the building pad, that will result in placement of approximately 9 to 10 feet of fill on the east end of the proposed building pad.

The site will include public improvements and parking lot as shown on the provided site/grading plan.

Additional details for the buildings and types of structures will likely be provided as the design proceeds.

STABILITY ANALYSES

Stability studies conducted in 2007 assumed that the soil and bedrock were wet. The strengths of the soil and bedrock were estimated by back calculating stability assuming a static factor of safety of 1.0 for the pre graded profile.

In 2021, AGEC was requested to evaluate the overall slope stability for proposed improvements to be located at the restaurant site and across Blackridge Drive to the west. A letter, addressed to Blackridge Development, LLC dated September 28, 2021, summarizes our the analysis and the results therefrom.

The soil and bedrock strength characteristics are included on the attached calculation sheets and summary calculation report.

A common factor of safety used in designing earth slopes and retainage systems within undisturbed ground conditions is 1.5. This value is used because of the uncertainty of the subsurface conditions.

Acceptable factors of safety for existing landslides is typically between 1.2 and 1.5.

Due to the large number of landslides in the state of Washington, the Washington State Highway Department assesses the stability of landslides. Their target factor of safety for landslide repairs is 1.25 (WSDOT Geotechnical Design Manual M46-03.08, October,2013).

Utah Department of Transportation accepts a safety factor of 1.3 for long-term static conditions for embankments and cut slopes located where failure or excessive deformation impacts adjacent bridges or critical facilities (Figure 12.1 – minimum acceptable factors of safety – global stability UDOT Geotechnical Manual of Instruction, September, 20217).

The stakeholders of this project may consider accepting factors of safety at or above 1.3 due to the following aspects of the analysis conducted.

a. The back calculated values are considered residual strengths which are the weakest strengths of the material. This approach significantly reduces the likelihood of lower values being experienced.

b. The laboratory strength test results of the weak layer materials are reasonably consistent with back calculated strength values. This increases our confidence that the values used in the analysis are representative.

c. The lack of hillside movement is a good indicator that the strength of the hillside is sufficient to prevent creep.

d. There could be an improvement in the stability of the slope if the development reduces the amount of water available to seep into the subgrade.

With the proposed grading along with the grading that has already been accomplished at the site and using the unsaturated strengths of the materials at the site above the water level and the saturated strengths below the water level result in a calculated factor safety of 1.3.

Using the same strengths and the seismic acceleration of 0.16g (which would reflect an event with a 2 percent probability of exceedance in 50 years). Results in a factor of safety of less than 1.0. Using these same parameters, we estimate that approximately 8 inches of movement would occur under a seismic event using unsaturated conditions.

CONSIDERATIONS

We anticipate that proper water management in conjunction with development should provide an opportunity for the strength of the slope to improvement and therefore, improve the stability of the slope. If the proposed improvements are constructed, we recommend that at least two inclinometers, two piezometers be installed and monitored over the lifetime of the facility. This would allow the stakeholders to know how the landslide mass is behaving. This would also allow steps to be taken if needed to improve the integrity of the slope.

LONG-TERM SLOPE RECOMMENDATIONS

The soil and bedrock strengths in the hillside need to remain similar to that used in this analysis in order to maintain the level of stability. This can be achieved by keeping the moisture conditions as they currently are and drier if possible.

There is also the opportunity to improve the existing conditions with strict adherence to the recommendations presented below.

Recommendations to maintain if not improve the current moisture conditions include:

a. Monitoring the landslide would be prudent to confirm that the acceptability of the approach being taken is providing the safety anticipated. Monitoring would also provide a warning if the conditions are changing.

b. Collect and remove surface drainage off the site in watertight storm drainage systems. This type of construction is not standard and therefore requires specific attention to verify that the improvements are watertight. This would also include not storing storm water on site without positive methods to eliminate and verify that water is not seeping into the subgrade.

c. Water ways should be lined to prevent seepage into the ground.

d. Positive measures need to be taken to eliminate the potential for water to ever pond on the site and on the hillside.

e. Eliminate as much as possible landscaping that requires irrigation.

f. Positive steps need to be taken with other improvements on the hillside and up on the bluff on the hillside the location of the restaurants, west of the restaurants and up on the bluff to help maintain the overall integrity of the slope.

FOUNDATIONS

AGEC understands that it is planned to support the restaurants on conventional spread and spot footing footings bearing on a properly prepared subgrade.

Based upon the proposed locations and preliminary plans, the estimates, at least 17 feet of properly compacted fill to reduce heave to within tolerable limits. Undocumented fill should also be removed the full depth.

FURTHER EVALUATION

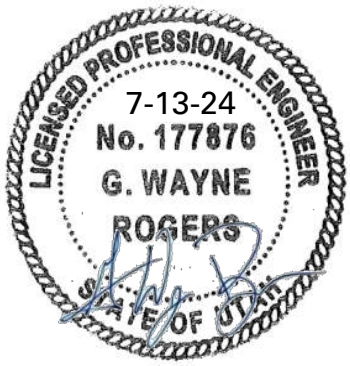
AGEC will provide further details that will include building foundation recommendations and detailed site grading recommendations including rockery wall details.

LIMITATIONS

This report has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the referenced documents that included field and laboratory testing. In addition, our conclusions and recommendations are based on our experience in the area. Variations in the subsurface conditions may not become evident until excavation is conducted. If the subsurface conditions are found to be significantly different from those described above, we should be notified to reevaluate our recommendations.

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

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



G. Wayne Rogers, P.E.

James E. Nordquist, P.E.

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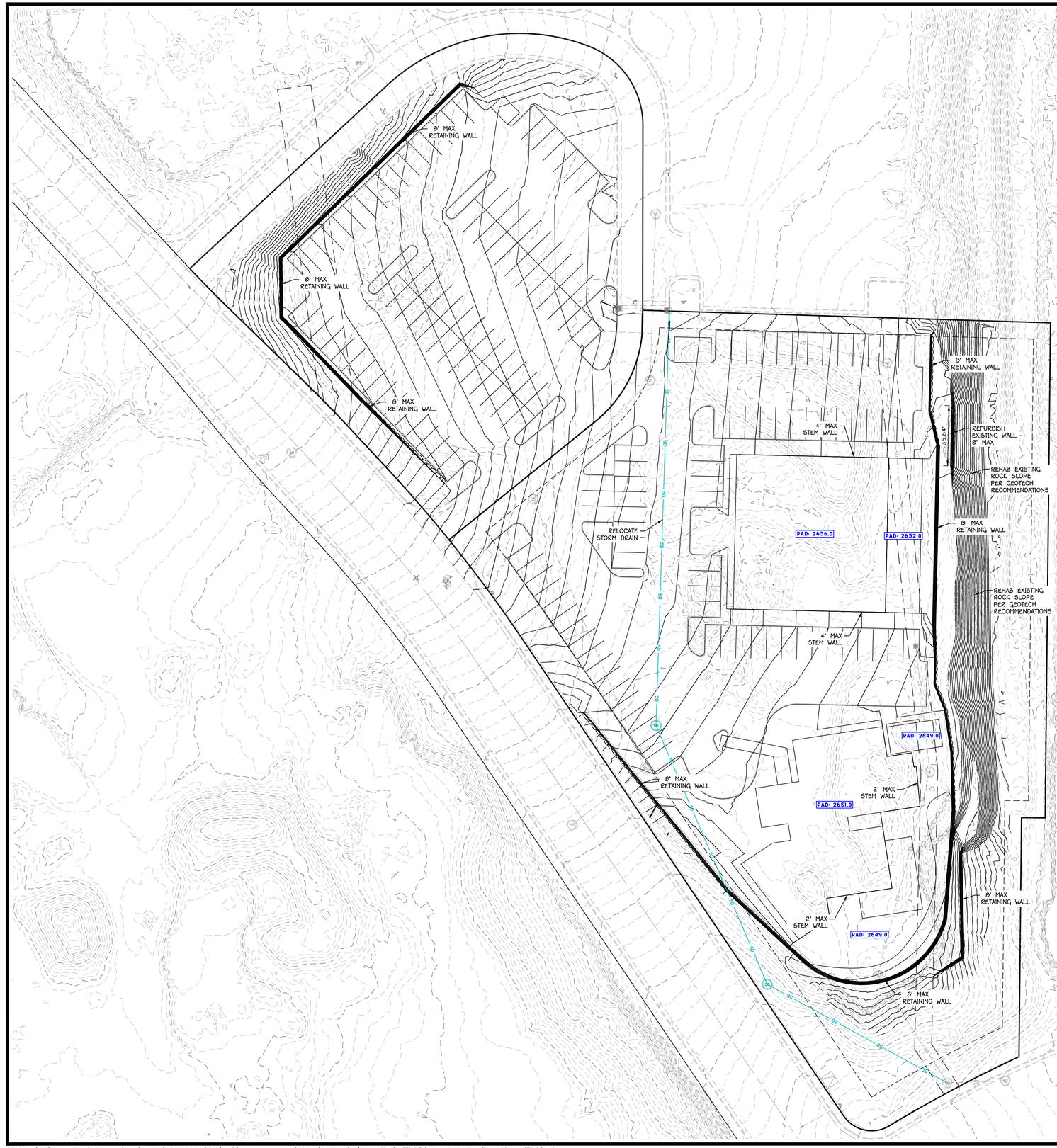
SITE/GRADING PLAN



0 30' 60'

SCALE: 1" = 30'

Blue Stakes of UTAH811 Bluestakes.org

Call Before You Dig!

GRADING PLAN NOTES:

1. THE CONTRACTOR SHALL PROVIDE APPROPRIATE EQUIPMENT TO CONTROL DUST AND AIR POLLUTION CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE APPROPRIATE MUD AND DIRT CONTAINMENT TO MAINTAIN THE WORK SITE, ACCESS ROADWAYS, AND ADJACENT PROPERTIES IN A CLEAN CONDITION.
2. ALL EXCAVATION AND GRADING SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS ALONG WITH APPENDIX J STANDARDS OF THE INTERNATIONAL BUILDING CODE 2018 EDITION OR NEWER AS ADOPTED BY THE STATE OF UTAH AND CITY.
3. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY CONFLICTS BETWEEN THE REQUIREMENTS OF THE PLANS AND GEOTECHNICAL REPORT AND/OR GEOTECHNICAL FIELD OBSERVATIONS.
4. GEOTECHNICAL ENGINEER TO PROVIDE GRADING COMPLETION REPORT TO CONFIRM THAT WORK HAS BEEN PERFORMED IN CONFORMANCE WITH GEOTECHNICAL RECOMMENDATIONS.
5. RETAINING WALLS GREATER THAN 3' IN HEIGHT REQUIRE A PERMIT FROM THE CITY BUILDING DEPARTMENT. ALL ROCK RETAINING WALLS MUST BE CERTIFIED AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE CITY'S FINAL ACCEPTANCE.
6. IT IS THE PROPERTY OWNER'S RESPONSIBILITY (DEVELOPER, HOMEOWNER, HOA, ETC.) TO COMPLETE AND MAINTAIN THE FINAL GRADING ON THEIR PROPERTY IN ACCORDANCE WITH THE GRADING AND DRAINAGE PLAN ALONG WITH ALL RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER. THE PROPERTY OWNER IS RESPONSIBLE IN PERPETUITY, FOR INSPECTING AND MAINTAINING PROPER DRAINAGE FOR THEIR PROPERTY.
7. ALL STORM DRAIN PIPE LENGTHS ARE GIVEN FROM AND TO THE CENTER OF EACH STRUCTURE. CONTRACTOR SHALL VERIFY THE ACTUAL LENGTHS REQUIRED PRIOR TO ORDERING PIPE MATERIALS.

NOTICE TO CONTRACTORS:

ENGINEER CAN NOT GUARANTEE THE ACCURACY OF THE EXISTING UNDERGROUND UTILITIES DEPICTED IN THESE PLANS. LOCATIONS SHOWN FOR ALL EXISTING UNDERGROUND UTILITIES IS BASED ON EXTERNAL INFORMATION FROM GIS MAPPING, PREVIOUS AS-BUILT RECORD DRAWINGS, BLUE STAKES SURFACE MARKINGS IN THE FIELD, OR COMBINATION THEREOF. THE ENGINEER HAS MADE EVERY EFFORT TO ACCURATELY DEPICT THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES, HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT BLUE STAKES OF UTAH AT LEAST TWO (2) BUSINESS DAYS PRIOR TO COMMENCING WITH EXCAVATION TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES. CONTRACTOR ALSO REQUIRED TO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING UNDERGROUND UTILITIES BOTH SHOWN, AND NOT SHOWN, IN THESE PLANS. IF ANY UTILITY LOCATION DISCREPANCIES ARE FOUND IN THE FIELD, CONTRACTOR SHOULD NOTIFY THE ENGINEER IMMEDIATELY.

EARTHWORK QUANTITIES:

EARTHWORK QUANTITIES PROVIDED BELOW ARE APPROXIMATED BASED ON COMPARISON OF EXISTING GROUND AND FINISH GROUND SURFACE DATA USING A (SHRINK/SWELL) FACTOR OF X.XX. QUANTITIES SHOWN DO NOT ACCOUNT FOR ADDITIONAL CUT/FILL GENERATED BY BACKOUT VOLUMES FROM PAVEMENT SECTIONS, SIDEWALKS, FOOTINGS/FOUNDATIONS, CURB AND GUTTER, ETC. CONTRACTOR RESPONSIBLE TO INDEPENDENTLY VERIFY ALL EARTHWORK QUANTITIES REQUIRED TO COMPLETE CONSTRUCTION.

XXX,XXX CU. YDS. CUT
XXX,XXX CU. YDS. FILL
X,XXX CU. YDS. (CUT/FILL)

KEY NOTES:

		DETAIL
00	SIDEWALK DRAINAGE STRUCTURE	204

LEGEND:

	DETAIL
PROPOSED PARCEL BOUNDARY	
EXISTING/ADJACENT PARCEL BOUNDARY	
PROPOSED CENTERLINE ALIGNMENT	
EXISTING CENTERLINE ALIGNMENT	
PHASE LINE	
SHEET MATCH LINE	
PROPOSED RETAINING WALL	
EXISTING RETAINING WALL	
PROPOSED ROCK RETAINING WALL	
EXISTING ROCK RETAINING WALL	
GRADING LIMITS OF DISTURBANCE	
3000 EXISTING GROUND MAJOR CONTOUR	
3001 EXISTING GROUND MINOR CONTOUR	
3000 FINISH GROUND MAJOR CONTOUR	
3001 FINISH GROUND MINOR CONTOUR	
50 PROPOSED STORM PIPE (SIZE PER PLAN)	
50 EXISTING STORM PIPE (SIZE PER PLAN)	
CURB INLET SINGLE CATCH BASIN	205
CURB INLET DOUBLE CATCH BASIN	206
STANDARD STORM DRAIN MANHOLE	220
FLARED END SECTION	
GRATE INLET AREA DRAIN BOX	
PROPOSED DRAINAGE SWALE/DITCH (SEE SECTIONS)	
EXISTING DRAINAGE SWALE/DITCH	

REV.	DATE:	REVISION

PRELIMINARY
NOT FOR
CONSTRUCTION

AMERICAN CONSULTING & ENGINEERING
1173 S. 250 W. #504 ST. GEORGE, UT 84770

DATE:	07/03/2024
JOB #:	24-013
DRAWN BY:	SSA
CHECKED BY:	ARC

BLACK RIDGE RESTAURANTS

SECTION 36 TOWNSHIP 42 S, RANGE 16 W SLB&M
ST.GEORGE, UTAH

GRADING PLAN

HILLSIDE

H.4.1

SHEET: 4 of 5

C:\Dropbox\American\03 projects\2024\24-013 black ridge restaurants\03 drawings\sheet files\Hillside\24-013 Grading Plan Hillside.dwg

EXHIBIT I

2019 AGEC Slope Stability Report

AGEC
Applied GeoTech

September 23, 2019

Blackridge Development, LLC
2001 Park Avenue
Park City, Utah 84060

Attention: Glen Overton
EMAIL: glenaoverton@gmail.com

Subject: Slope Stability Consultation
Blackstone Hotel Project
250 West Blackridge Drive
St. George, Utah
Project No. 2180187

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to conduct additional geotechnical analyses on the stability of the hillside upon which the Blackstone Hotel is proposed to be constructed. A geotechnical investigation for the proposed hotel, located at 250 West Blackridge Drive in St. George, was conducted and the findings and recommendations were presented in a report dated December 14, 2018 under Project No. 2180187.

The report indicates that the site is located on an ancient landslide deposit, which has the potential, if environmental conditions change, for landslide movement. The initial analysis conducted during the original study assumes that the hillside is wet, reflecting a most adverse moisture condition. The factor of safety against landslide movement, using the saturated material strengths, does not meet minimum standards.

AGEC has been requested to conduct further analysis to estimate the stability of the slope using a moisture condition that reflects the groundwater and seepage conditions anticipated during the life of the facility.

I. BACKGROUND

The geotechnical report provided the following comments with regards to the hillside stability.

A. Landslide Deposit

"The site for the proposed hotel is located above the toe of a 300-foot high slope. The lower two-thirds of the slope has been mapped as a landslide deposit. The ground surface of the landslide deposit slopes on average of approximately 8.2 horizontal to 1 vertical. The landslide deposit extends up to a depth of 83 feet below the existing ground surface at the site.

B. Slope Movement

"In order to determine if movement is occurring on the slope, five inclinometers were installed in 2007 on the east slope of Blackridge extending to depths of 92 to 250 feet. Four of the five indicate that there has been no movement since 2007. Ground movement was measured at multiple depths in the inclinometer installed immediately west of the vacant restaurant located at 1090 South Bluff Street prior to 2011.

With the lack of measured movement in the four inclinometers over the past 10½ years, along with the lack of surficial evidence of movement, it is apparent that the portion of the slope for this project is currently maintaining its stability."

C. Earlier Stability Analysis

1. The calculated static factor of safety using saturated material strengths in the slope and the existing configuration is near 1.1.

2. Changes in the internal conditions and the surficial geometry modifications may improve or reduce the ability of the slope to maintain its stability.

3. We anticipate that it is a matter of time before movement, somewhere on the east slope, occurs. Determining a location and/or timing of such an event is not possible with the information currently available.

D. Possible Impact of Current Conditions

Assuming that strength characteristics of the soil and bedrock in the hillside behave as unsaturated materials the stability of the slope is estimated to increase approximately 30 percent.

II. CURRENT STUDY

In order to model the slope with unsaturated conditions in the hillside, AGEC was requested to conduct additional testing and analyses in order to further understand the characteristics of unsaturated, on-site soil and bedrock. Unsaturated conditions would likely result in higher sod/bedrock strengths than were used in our original analysis.

In order to develop this additional understanding, samples of soil (weathered bedrock) from the hillside were obtained and tested in the laboratory to define the index properties and to measure strength characteristics with different moisture contents. Stability analyses have been conducted using this additional information.

A. Existing Moisture Conditions

Based on laboratory testing on soil and bedrock samples obtained in the hillside, the following moisture contents, dry densities and relative degree of saturation have been obtained.

Characteristic	Range		Average
	Low	High	
Moisture Content (%)	2	27	12.8
Dry Density (pcf)	88	146	111.2
Degree of Saturation (%)	10	100	65.6

The upper 10 feet has a wide range of moisture contents, likely due to the samples being obtained during differing times of the year. The moisture content trends from a depth of 10 at approximately 10% and increases to approximately 15% with depth.

B. Laboratory Testing

The predominant material in the hillside is mudstone. Disturbed, weathered samples of the mudstone were obtained for testing. The samples obtained have distinct colors of “blue”, “red”, and “gray”. A fourth sample, obtained from between basalt blocks in the debris portion of the landslide deposit was also obtained. These colors were used to identify the samples tested.

1. Index Properties

The disturb bulk samples were tested in the laboratory to determine their index properties. Listed below is a table summarizing the test results.

Index Property	Blue Clay	Red Clay	Gray Clay	Debris Clay
Moisture Content (%)	9.1	5.3	3.3	1.3
Grain-size Distribution				
+ #4 sieve (%) (gravel size)	0	0	0	17
- #4, + #200 sieves (%) (sand size)	33	21	6	31
- #200 sieve (%) (silt and clay size)	67	79	94	52
Atterberg Limits				
Liquid Limit (%)	55	46	47	38
Plasticity Index (%)	31	24	26	12
Moisture/density Relationship (standard Proctor)				
Maximum Dry Density (pcf)	98.0	104.5	104.2	108.2
Optimum Moisture Content (%)	22.0	17.6	19.2	15.1
Specific Gravity	2.64	2.64	2.71	2.65

These test results are projected on Figure 1-4.

2. Strength Testing

Testing for this study was conducted on disturbed samples that were remolded prior to strength testing. Testing included using the triaxial shear apparatus and the direct shear apparatus.

After reviewing the index properties of the four samples obtained, it was decided to focus the testing on the two mudstone sample colors which represent the predominant materials in the hillside. We therefore proceeded to conduct the testing using blue and red clay.

a. Fully Softened Strength

Samples of the blue and red clay were remolded at 38 and 36 percent moisture with densities of 73 and 84 pounds per cubic foot (pcf), respectively. The remolded moisture contents are 16 and 18.4 percent above the soil's optimum moisture contents and the remolded densities are approximately 74 and 80 percent compaction. Once the samples were remolded, they were placed in a triaxial shear apparatus and consolidated under a confining pressures of 2, 6 and 10 kips per square foot (ksf). The consolidated samples were then sheared with pore pressure measurements. Test results are presented on Figures 8 through 13 and the table below.

b. Unsaturated Strengths

Samples of the blue and red clay were also remolded at moisture contents between 12 and 24 percent with densities near 95 or 103.5 pcf (97 to 99 percent compaction) and tested in consolidated, undrained tests with confining pressures of 2, 6 and 10 ksf. The test results are included on Figures 7 through 12 and summarized in the table below.

c. Pre-sheared strength

Samples of the two materials were remolded at 10 and 13 percent moisture with densities of 95 and 101 pcf (97 percent compaction) and placed in a shear testing apparatus. The samples were then sheared and then reset and sheared at 2, 6 and 10 ksf normal load. The tests were conducted at an undrained shear rate. Test results are presented on Figures 14 and 15 and the table below.

d. Test Results

Listed below is a table summarizing the results of the tests conducted.

Blue Clay Strength Test Results

Moisture Content (%)	Dry Density (pcf)	Φ (°)	c (ksf)	Test Type
13.0	95.0	23.8	0.7	Direct Shear, pre-sheared with no water added
14.4	95.5	18.5	2.6	Triaxial, unsaturated
19.6	94.6	9.9	3.4	Triaxial, unsaturated
23.8	94.9	7.3	2.7	Triaxial, unsaturated
38.0	73.0	23.0	0.2	Triaxial, saturated

Red Clay Strength Test Results

Moisture Content (%)	Dry Density (pcf)	Φ (°)	c (ksf)	Test Type
10.0	101.0	14.5	0.9	Direct Shear, pre-sheared with no water added
12.6	103.5	20.1	2.2	Triaxial, unsaturated
14.9	102.0	16.2	3.3	Triaxial, unsaturated
17.9	105.1	12.7	3.3	Triaxial, unsaturated
36.0	84.0	24.0	0	Triaxial, saturated

C. Stability Model

1. Surface Conditions

The model of the hillside used in this analysis include the following characteristics.

Characteristics	Value
Top Elevation (feet)	2893
Toe Elevation (feet)	2593
Slope Height (feet)	301
Upper Intact Slope (Horizontal to Vertical)	1.2:1 (upper 100')
Mid- Landslide Slope (Horizontal to Vertical)	7.8:1 (middle 130')
Lower Landslide Slope (Horizontal to Vertical)	5.4:1 (lower 60')
Average overall Slope (Horizontal to Vertical)	4.4:1

2. Subsurface Profile

A subsurface profile has been developed from the deep borings drilled during earlier studies, geologic maps along with the results of the this and earlier analyses. The first figure of each stability condition (in the appendix) presents the profile used for our analysis.

The upper portion of the hillside consists of a basalt cap. It is estimated that the cap is from 20 to 30 feet thick.

The mudstone (referred to as "parent" material) in the slope extends from the basalt cap, down to sandstone.

The bedrock in the area dips down to the north east. The interface between the mudstone and the sandstone dips down to the east at 7.6 degrees.

Based on our prior studies and evaluation of other landslide events in the area, there is a weak plane within the mudstone deposit. Measurements obtained by us and others indicate that this weak plane dips at approximately 8 to 9 degrees towards the northeast. With this orientation, the weak plane has been modeled dipping down towards the east, following the slope at an angle of 5 to 10 degrees.

Also based on the subsurface conditions encountered during our earlier studies, we have estimated the thickness of the landslide to be up to approximately 125 feet thick.

3. Water & Moisture Conditions

Ground water has been measured in the deep borings drilled on the slope. Using this information, along with the water level measures obtained during this study, a groundwater elevation of 2605 feet (approximately 288 feet below the bluff) dropping down to elevation 2586 feet (approximately 6 feet below grade) near the toe of the slope was used in the model.

For the unsaturated model, the moisture contents measured in the borings were used with the water content characteristic curves (Figure 5) determined in the laboratory in order to estimate a suction profile below the ground surface down to the ground water level.

Using the values obtained along with the moisture contents of samples measured in this hillside, we have estimated two potential suction profiles with depth. These profiles are presented below.

Landslide Deposit

Depth for the ground surface (feet)	Suction (ksf)	(pF)
0 to 30	13.0	4.4
30 to 60	26.5	3.4
60 to 90	19.0	3.8
90 to 120	11.0	4.9
120 to 150 or to the water level	5.0	6.2

Natural, Undisturbed Hillside

Depth for the ground surface (feet)	Suction (ksf)	(pF)
0 to 50	14.0	4.3
50 to 100	33.0	3.2
100 to 150	21.0	3.6
150 to 200	11.0	4.9
200 to water level or to the water level	5.0	6.2

The suction value used in the analysis was based on the depth below the ground surface to the ground water level.

4. Material Strengths

a. Saturated Strengths

The stability analysis conducted for our 2018 report, was based on saturated soil strengths. Listed below is a table summarizing the strengths used in that study.

Material	Unit Weight (psf)	Φ (°)	c (psf)
Landslide	125	15	200
Parent	125	28	535
Parent Weak Plane	125	8.5	0
Sandstone	125	44	3,000
Basalt	165	45	30,000

b. Unsaturated Strengths

The unsaturated strength of the on-site material (soil / weathered bedrock) was investigated by remolding the two soil samples at different moisture contents, compressing the samples and then shearing the samples in a triaxial shear apparatus. The testing allowed us to estimate the anticipated increase in soil strength as the moisture content decreases.

The literature indicates that this increase in strength can be modeled as a friction angle used in conjunction with the soil suction presented earlier. This friction angle is indicated to be less than the normal friction angle, often times is around 0.6 times the normal friction angle and has been measured to be on the order of 17 degrees for the type of material on this site. With these considerations and the test results, we have selected a 7 degree angle for the unsaturated aspect of the materials on site for the landslide and parent materials. We have selected a value of 4.5 degrees to use along the weak plane of the undisturbed deposits.

D. Results

The stability of the hillside was evaluated assuming a number of conditions using the profile, strength and pore water pressures described above. The original profile stability was verified using saturated soil strengths for what we anticipate the original profile was before significant grading occurred on the site. A static safety factor of 1.0 was obtained using the existing water level and saturated soil strengths.

With the grading that has occurred (removal of material upslope from the hotel site and placement on the hotel site) has resulted in an increase of factor of safety to approximately 1.1.

Using the proposed grading of the hotel site, the unsaturated strengths of the materials at the site above the water level and the saturated strengths below the water level, results in a calculated factor of safety of 1.4.

Our analysis also indicates that in order to increase the factor of safety for the hotel site to 1.5, reinforcement could be placed at the toe of the slope, along the east side of the site. We envision this reinforcement would consist in drilled concrete piers. Preliminary estimates indicate that piers drilled to a depth of approximately 105 feet with sufficient strength could increase the factor of safety to 1.5. Preliminary calculations indicate that 2½ foot diameter piers, spaced at approximately 15 feet (center-to-center), would provide the estimated reinforcement. The design of the reinforcement needs to be verified during design of the facility.

Using the same strengths (including reinforcement) and a seismic acceleration of 0.16g (which would reflect an event with a 2% probability of accedence in 50 years) results in a safety factor of less than 1.0. Using these same parameters, we estimate that approximately 4 inches of movement would occur under a major seismic event using the unsaturated conditions.

We recommend that the design of the hotel include slope reinforcement along with the retaining wall proposed for the east side of the development.

III. LONG-TERM RECOMMENDATIONS

The soil and bedrock strengths in the hillside need to remain similar to that used in this analysis in order to maintain the desired level of stability. This can be achieved by keeping the moisture conditions as they currently are.

Recommendations to maintain the current moisture conditions are included in our 2018 report. The recommendations include:

A. Collect and remove surface drainage off the site in water tight storm drainage systems. This type of construction is not standard and therefore, would require specific attention to verify that the improvements are water tight. This would also include not storing storm water onsite without positive methods to eliminate and verify that water is not seeping into the subgrade.

B. Water ways should be lined to prevent seepage into the ground.

C. Positive measures need to be taken to eliminate the potential for water to ever pond on the site and on the hillside.

D. Eliminate, as much as possible, landscaping that requires irrigation.

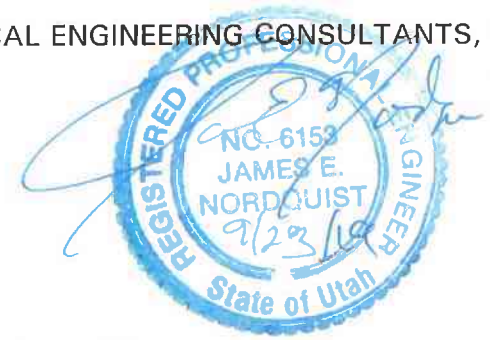
E. Positive steps need to be taken with other improvements on the hillside and up on the bluff to help maintain the overall integrity of the slope.

IV. LIMITATIONS

This letter has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client. The conclusions and recommendations included in the letter are based on conditions defined by our earlier studies and the testing conducted during this study. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface and/or surface drainage or proposed construction is found to be significantly different from what is described in this letter, we should be notified to reevaluate the recommendations given.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



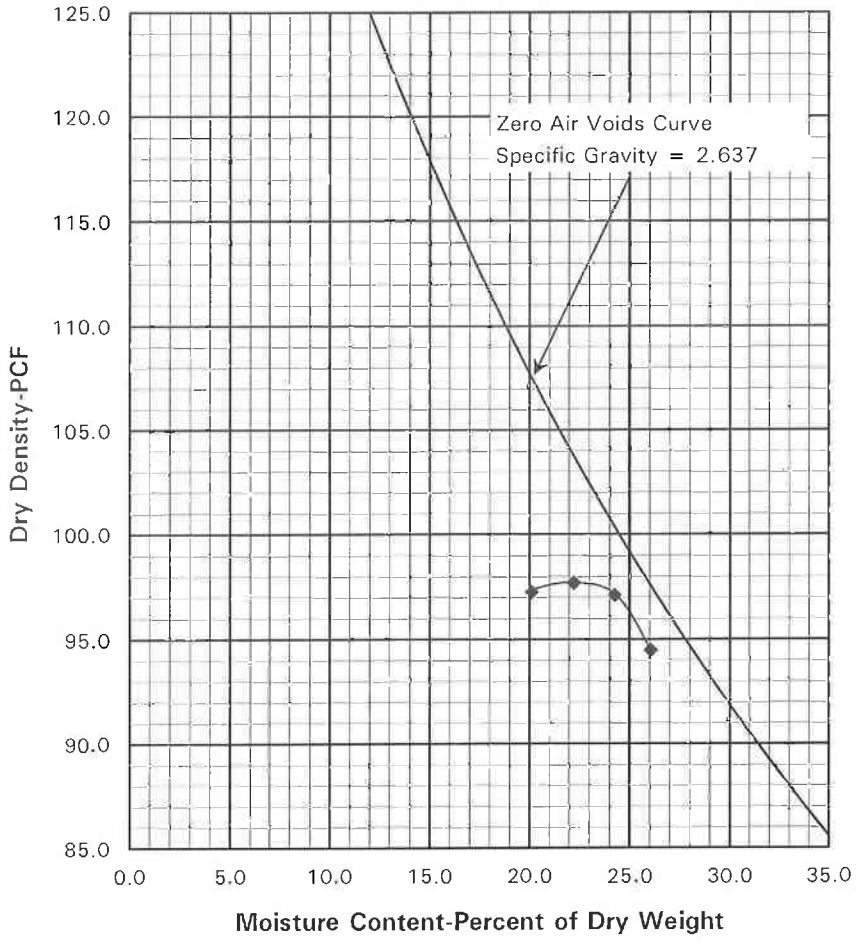
James E. Nordquist, P.E., D. G.E.

Reviewed by AD, P.E.
JEN/rs

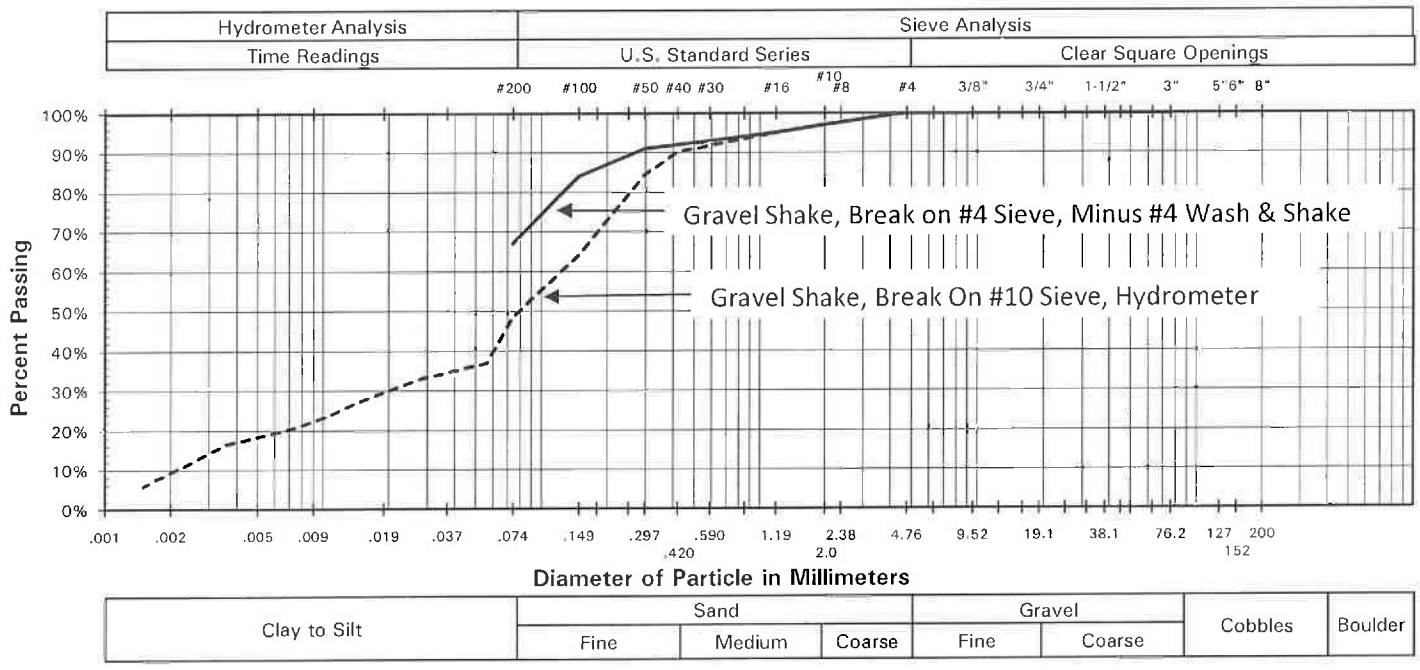
Enclosures

cc: Tyler Hoskins, EMAIL: tylerhoskins69@gmail.com

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



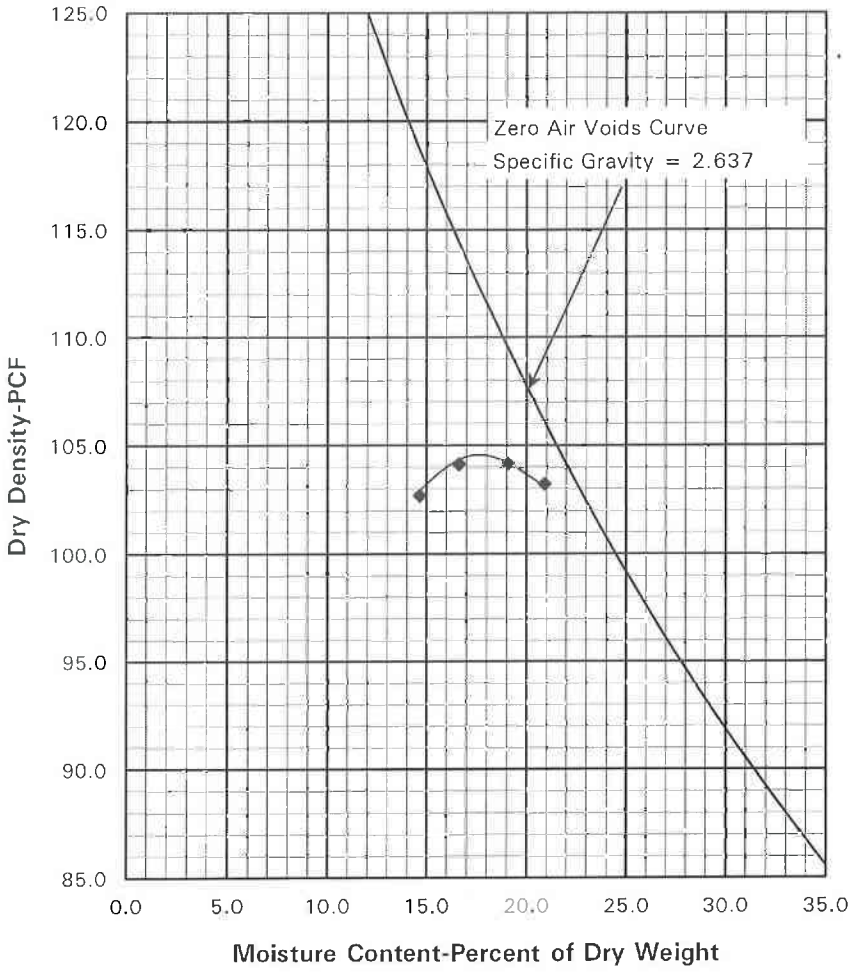
Project	Blackridge Hotel
Project No.	2180187
Sample No.	16527
Maximum Dry Density	97.7 pcf
Optimum Moisture	22.2%
Atterberg Limits	
Liquid Limit	55
Plasticity Index	31
Gradation	
Gravel	0%
Sand	33%
Silt & Clay	67%
Reviewed By:	KBB
Test Procedure:	ASTM D698 A
Sample Location:	Blue Clay
Soil Description:	Sandy Fat Clay
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



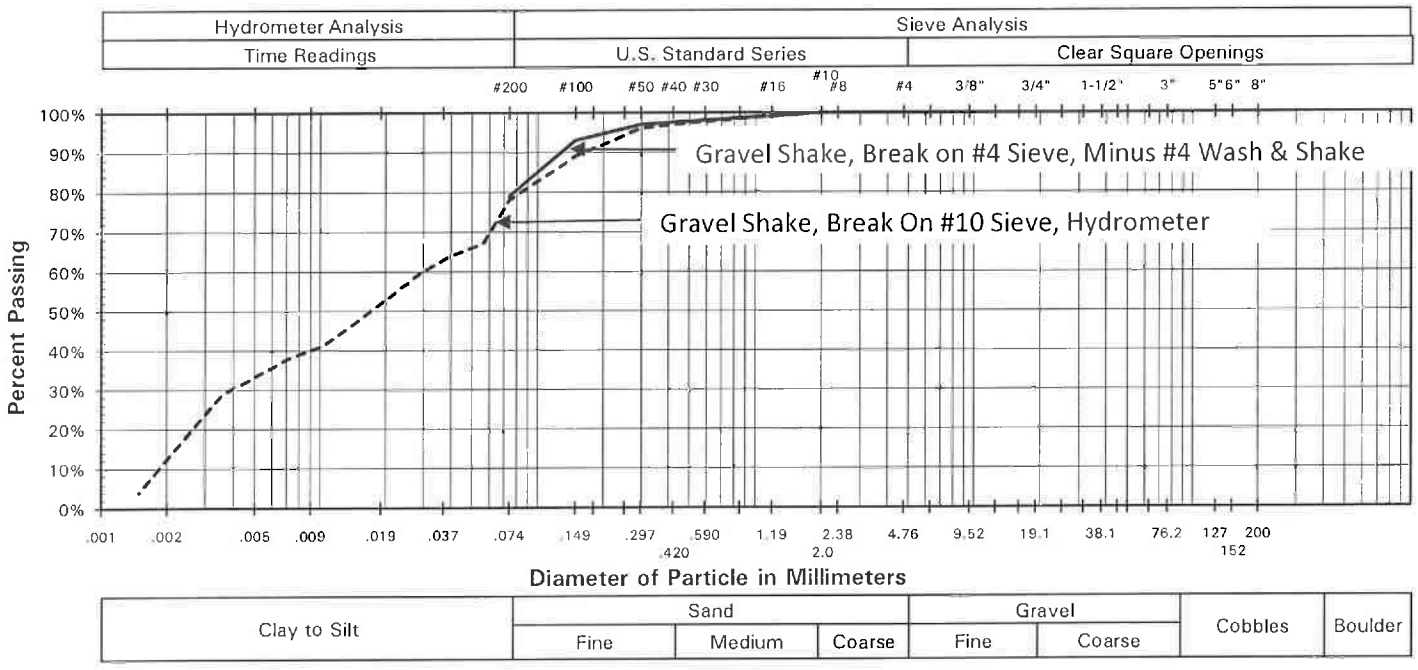
GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 1

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



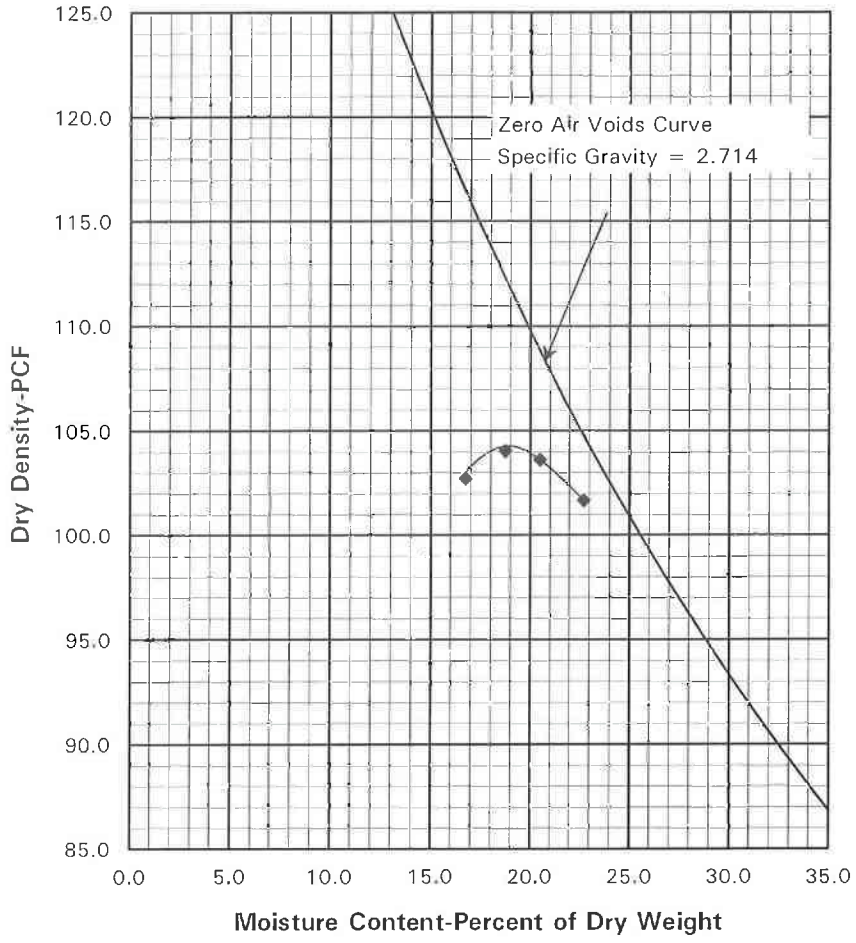
Project	Blackridge Hotel
Project No.	2180187
Sample No.	16528
Maximum Dry Density	104.5 pcf
Optimum Moisture	17.6%
Atterberg Limits	
Liquid Limit	46
Plasticity Index	24
Gradation	
Gravel	0%
Sand	21%
Silt & Clay	79%
Reviewed By:	KBB
Test Procedure:	ASTM D698 A
Sample Location:	Red Clay
Soil Description:	Lean Clay with Sand
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



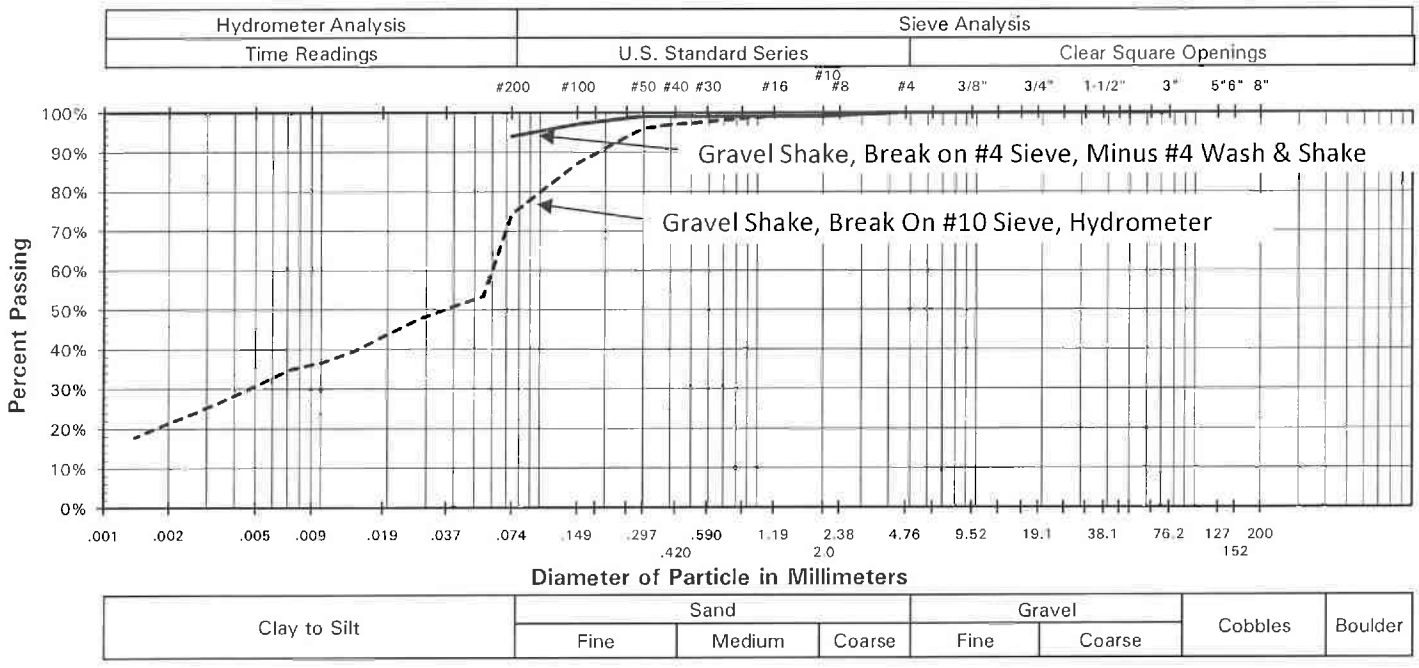
GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 2

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



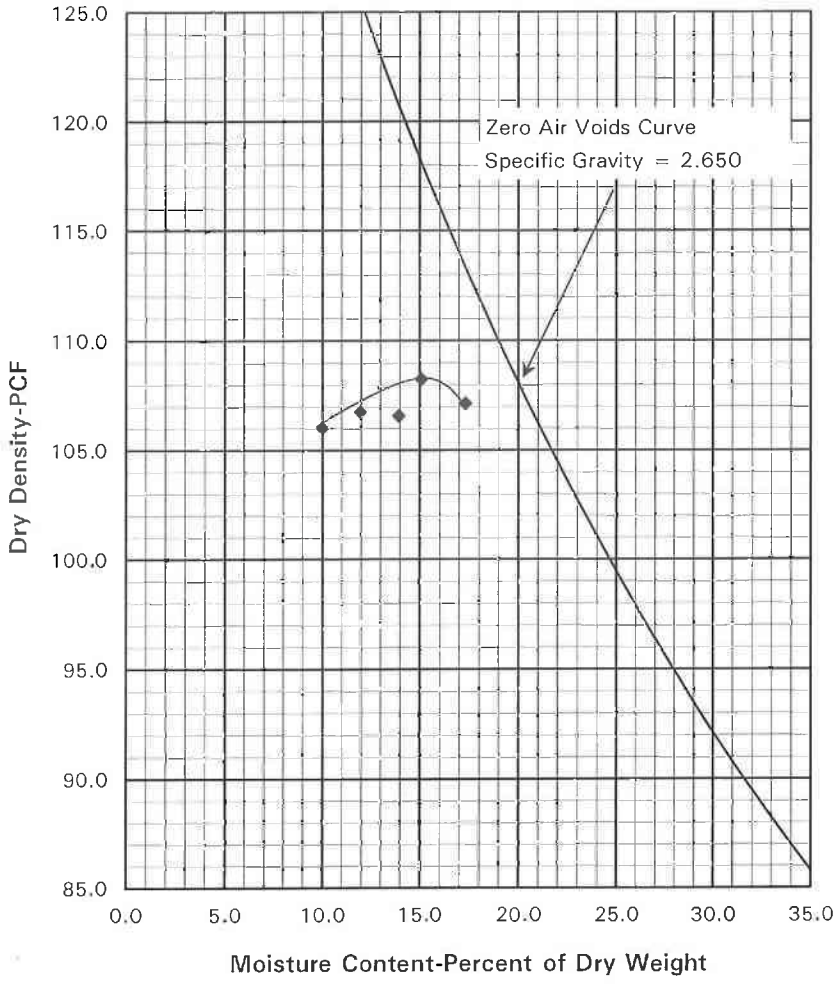
Project	Blackridge Hotel
Project No.	2180187
Sample No.	16529
Maximum Dry Density	104.2 pcf
Optimum Moisture	19.2%
Atterberg Limits	
Liquid Limit	47
Plasticity Index	26
Gradation	
Gravel	0%
Sand	6%
Silt & Clay	94%
Reviewed By:	KBB
Test Procedure:	ASTM D698 A
Sample Location:	Gray Clay
Soil Description:	Lean Clay
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



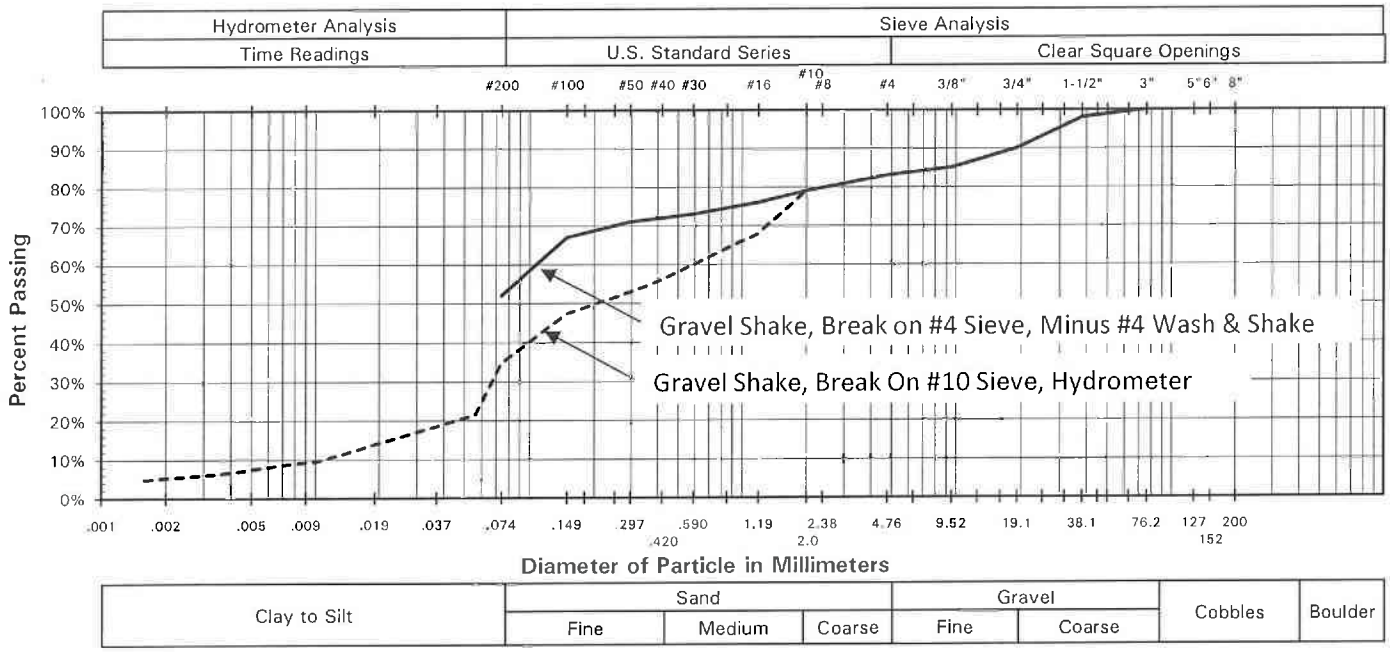
GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 3

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



Project	Blackridge Hotel
Project No.	2180187
Sample No.	16530
Maximum Dry Density	108.2 pcf
Optimum Moisture	15.1%
Atterberg Limits	
Liquid Limit	38
Plasticity Index	12
Gradation	
Gravel	17%
Sand	31%
Silt & Clay	52%
Reviewed By:	KBB
Test Procedure:	ASTM D698 C
Sample Location:	Debris
Soil Description:	Sandy Lean Clay with Gravel
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 4

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.

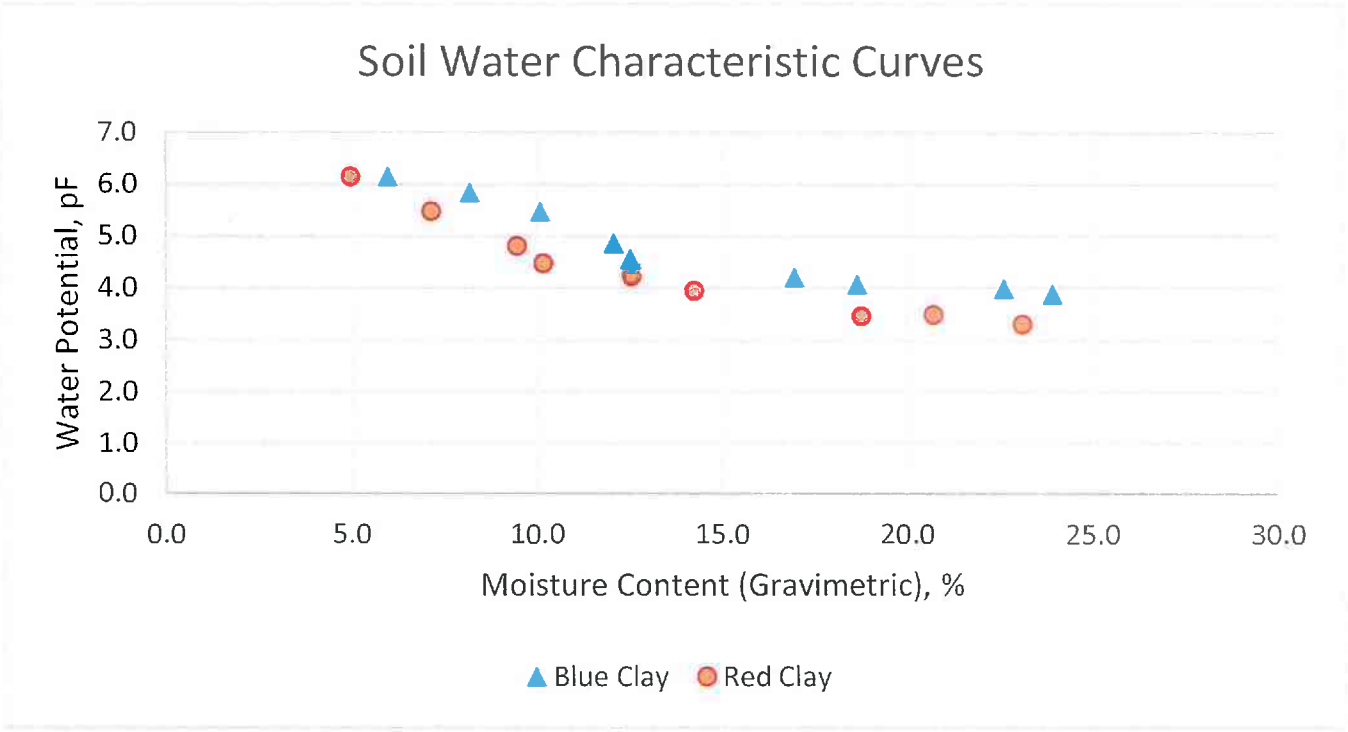
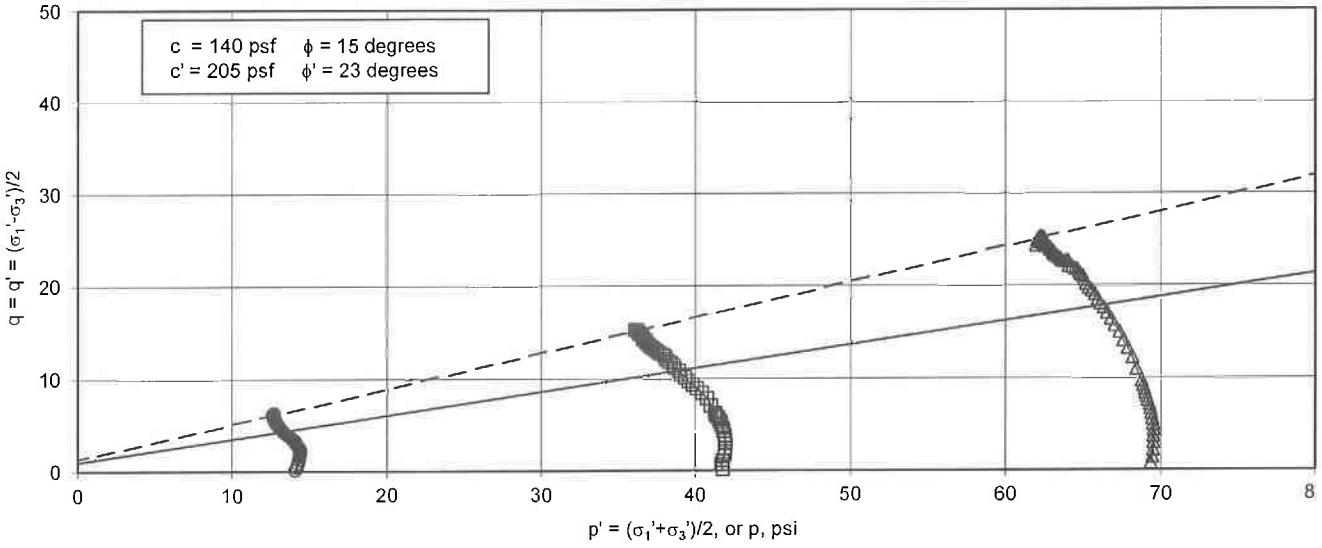
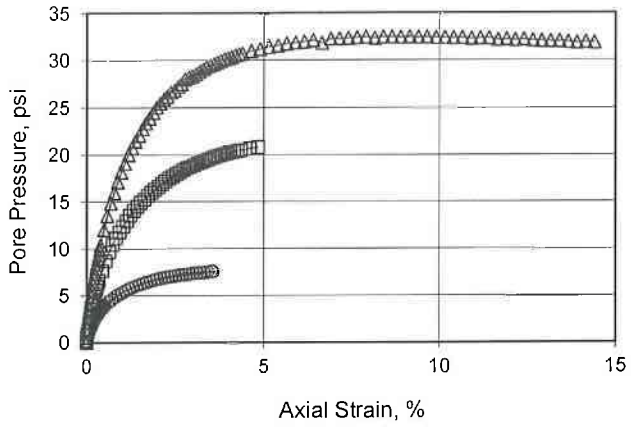
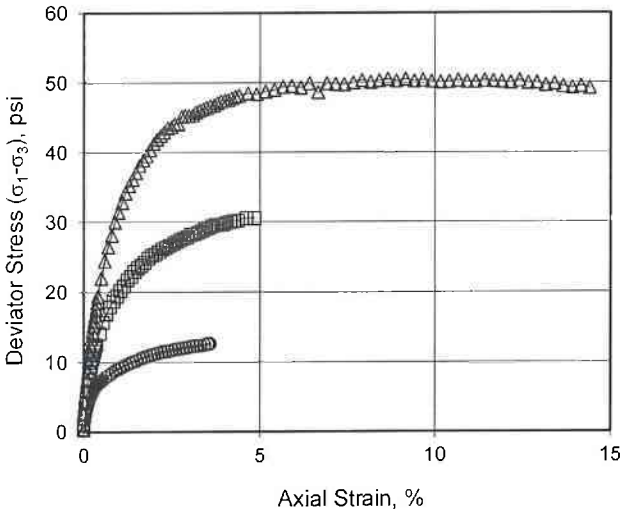


Figure 5

Applied Geotechnical Engineering Consultants, Inc.







Test No. (Symbol)	○	□	△
Sample Type	Remolded		
Length, in.	4.03	3.81	3.25
Diameter, in.	1.93	NM	NM
Dry Density, pcf	73	NM	NM
Moisture Content, %	38	NM	NM
Consolidation Pressure, psi	13.9	41.6	69.4
"B" Parameter	99	NA	NA
Total Confining Stress (σ_3), psi	13.9	41.6	69.4
Total Axial Stress (σ_1), psi	26.1	72.3	119.5
Deviator Stress (σ_1-σ_3), psi	12.2	30.5	50.0
Effective Lateral Stress (σ_3'), psi	6.6	20.8	37.1
Effective Axial Stress (σ_1'), psi	18.7	51.4	87.1
Pore Pressure (μ), psi	7.3	20.8	32.4
Strain, %	3.0	4.8	7.7

Remarks	Multistage Test (CU) Consolidated
Undrained with pore pressure measurements.	
Sample saturated with back pressure saturation.	
Sample pulverized to minus No. 40 sieve material	
and moisture-cured to a liquidity index of 45%.	

Sample Index Properties	
Remold Dry Density, pcf	73
Reold Moisture Content, %	38
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel	0
Percent Sand	46
Percent Passing No. 200 Sieve	54

Sample Description
Sandy Fat Clay

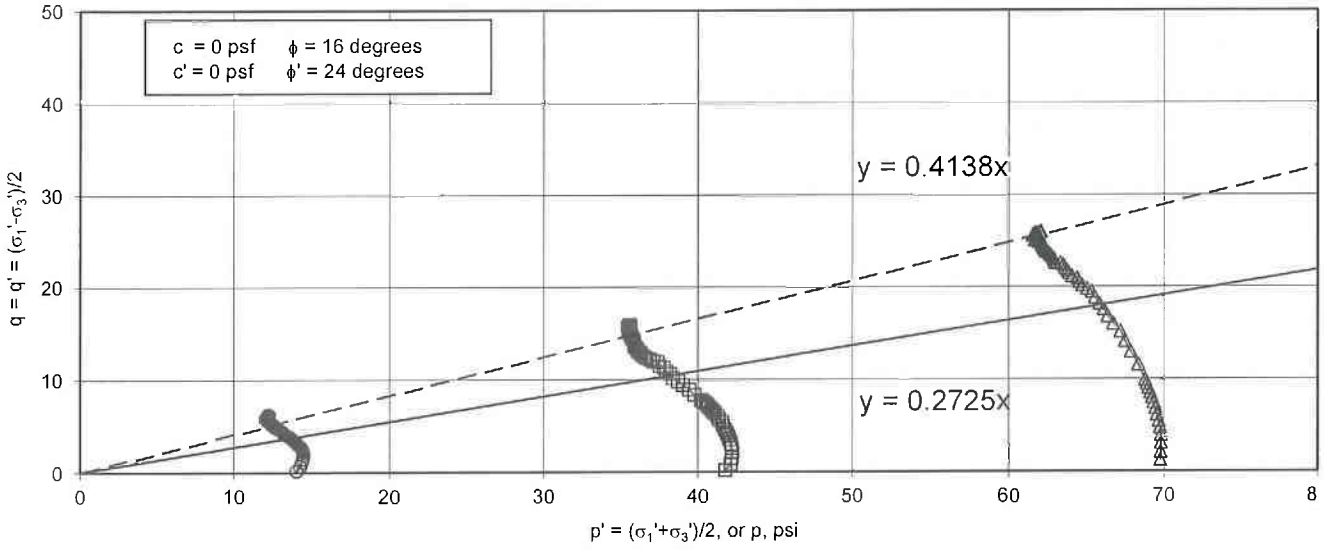
Test Description: Multi-Stage Triaxial Compression Test
Test Sample Location: Blue Clay
Project Name: Blackridge Hotel

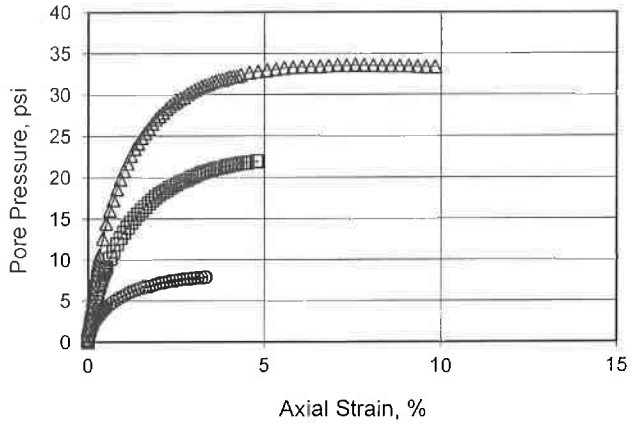
Project No. 2180187

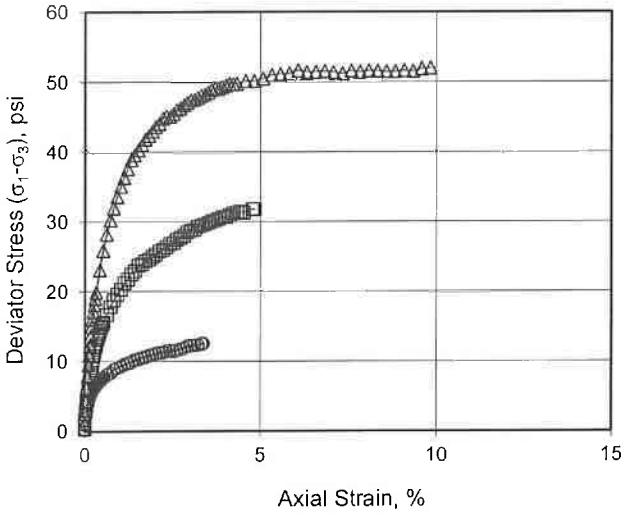
Triaxial Compression Test

Figure 6

Applied Geotechnical Engineering Consultants, Inc.







Test No. (Symbol)	○	□	△
Sample Type	Remolded		
Length, in.	3.96	3.61	3.39
Diameter, in.	1.93	NM	NM
Dry Density, pcf	84	NM	NM
Moisture Content, %	36	NM	NM
Consolidation Pressure, psi	13.9	41.6	69.4
"B" Parameter	99	NA	NA
Total Confining Stress (σ_3), psi	13.9	41.6	69.4
Total Axial Stress (σ_1), psi	26.4	73.4	120.5
Deviator Stress (σ_1-σ_3), psi	12.5	31.8	51.2
Effective Lateral Stress (σ_3'), psi	5.9	19.7	36.2
Effective Axial Stress (σ_1'), psi	18.5	51.5	87.4
Pore Pressure (μ), psi	7.9	21.9	33.2
Strain, %	3.4	4.8	5.6

Remarks	Multistage Test (CU) Consolidated
Undrained with pore pressure measurements.	
Sample saturated with back pressure saturation.	
Sample pulverized to minus No. 40 sieve material	
and moisture-cured to a liquidity index of 58%.	

Sample Index Properties	
Remold Dry Density, pcf	84
Reold Moisture Content, %	36
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel	0
Percent Sand	20
Percent Passing No. 200 Sieve	80

Sample Description
Lean Clay with Sand

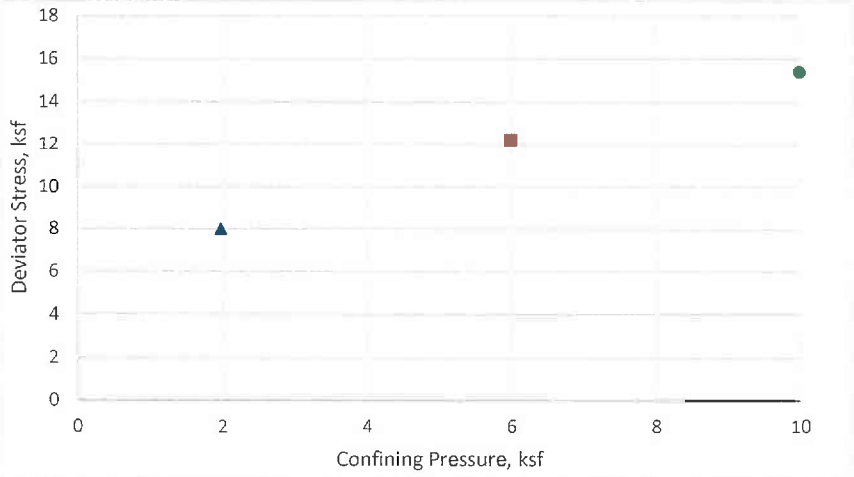
Test Description: Multi-Stage Triaxial Compression Test
Test Sample Location: Red Clay
Project Name: Blackridge Hotel

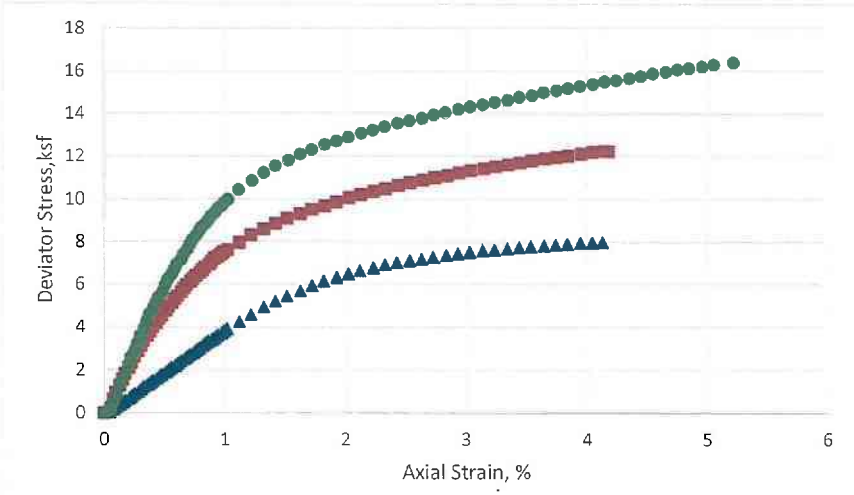
Project No. 2180187

Triaxial Compression Test

Figure 7

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	95.5	-	-
Moisture Content, %	14.4	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	8.0	12.2	15.4
Axial Strian, %	4.0	4.0	4.0
Rate of Strain, %/min	1.0	1.0	1.0

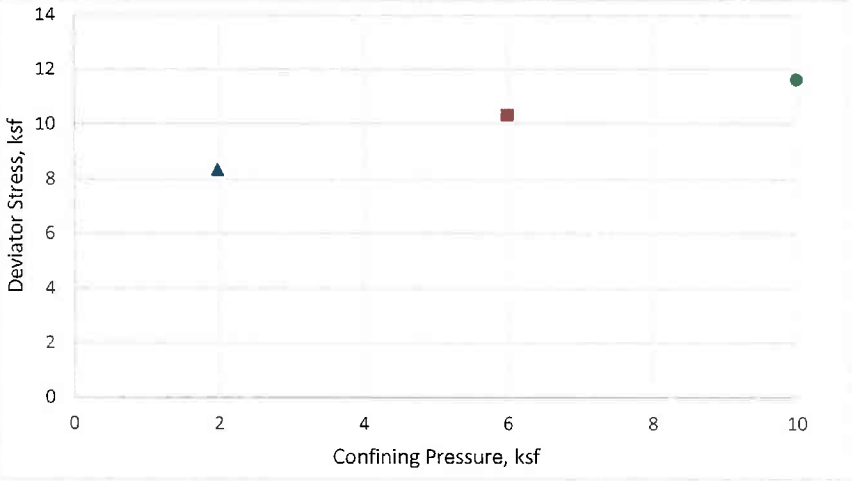
Remold Sample Properties	
Dry Density, pcf	95.5
Moisture Content, %	14.4
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

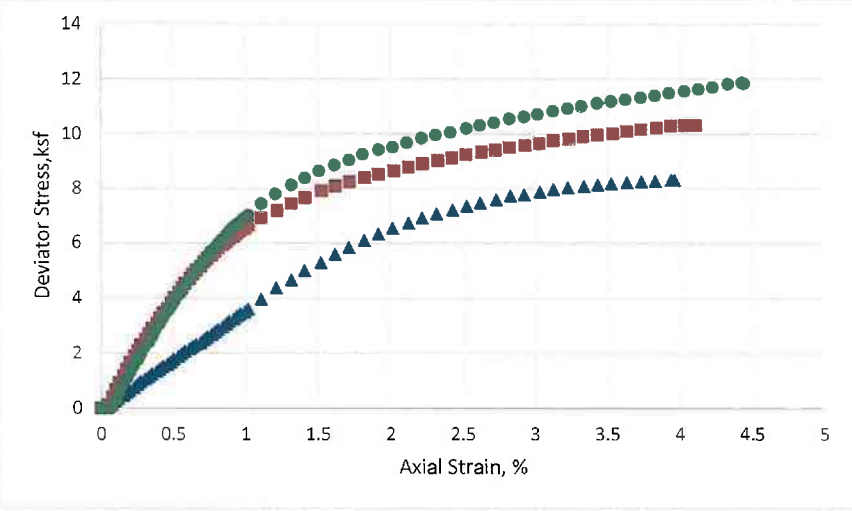
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	94.6	-	-
Moisture Content, %	19.6	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	8.30	10.30	11.60
Axial Strian, %	4.0	4.0	4.0
Rate of Strain, %/min	1.0	1.0	1.0

Remold Sample Properties	
Dry Density, pcf	94.6
Moisture Content, %	19.6
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

Notes

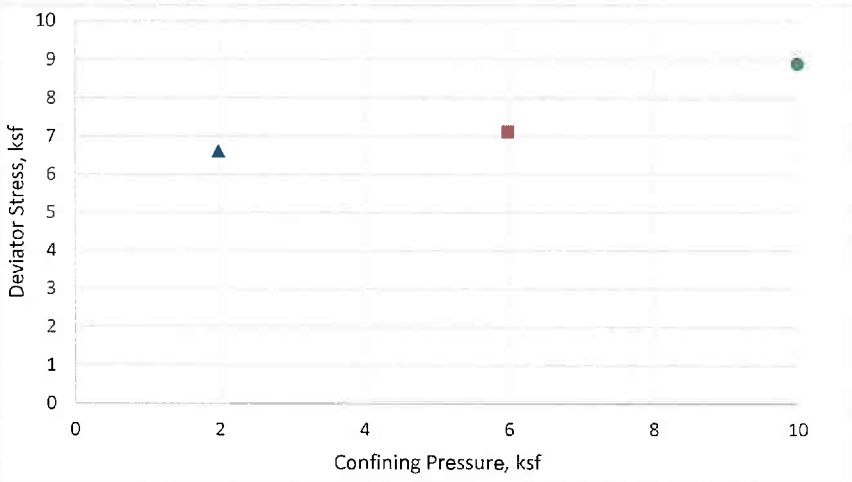
The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

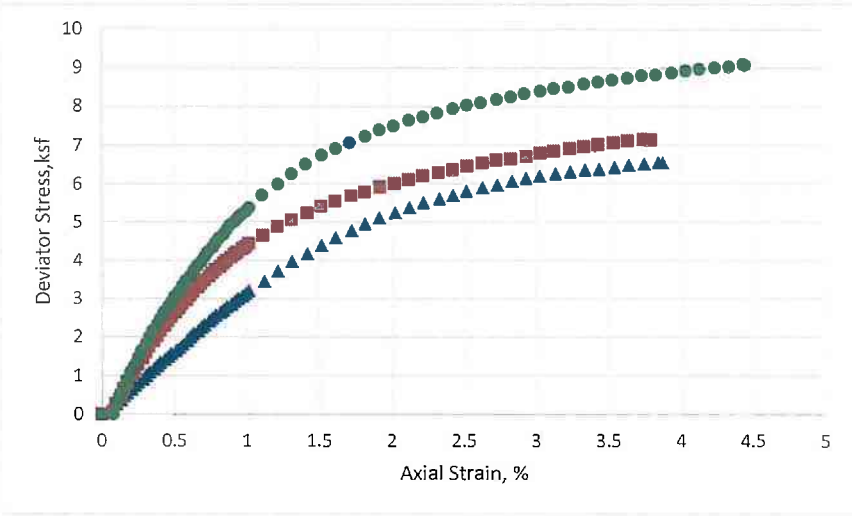
The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Project No. 2180187

Figure 9

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	94.9		
Moisture Content, %	23.8		
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	6.60	7.10	8.90
Axial Strian, %	3.9	3.8	4.0
Rate of Strain, %/min	1.0	1.0	1.0

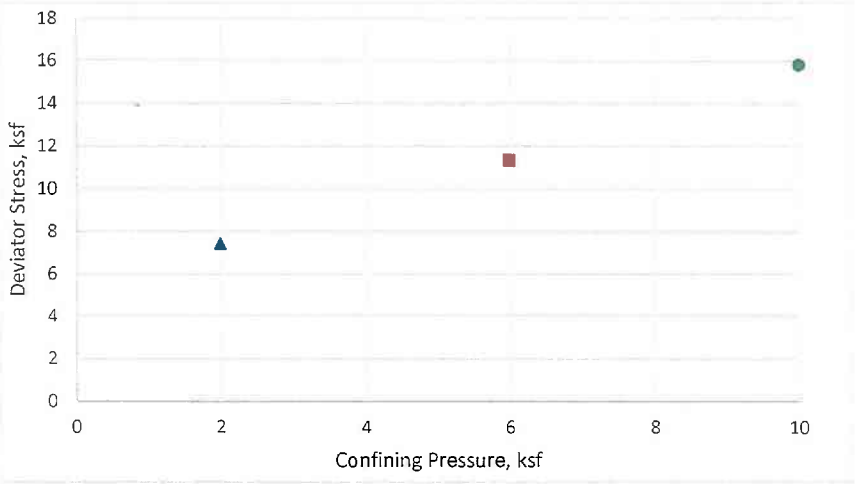
Remold Sample Properties	
Dry Density, pcf	94.9
Moisture Content, %	23.8
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

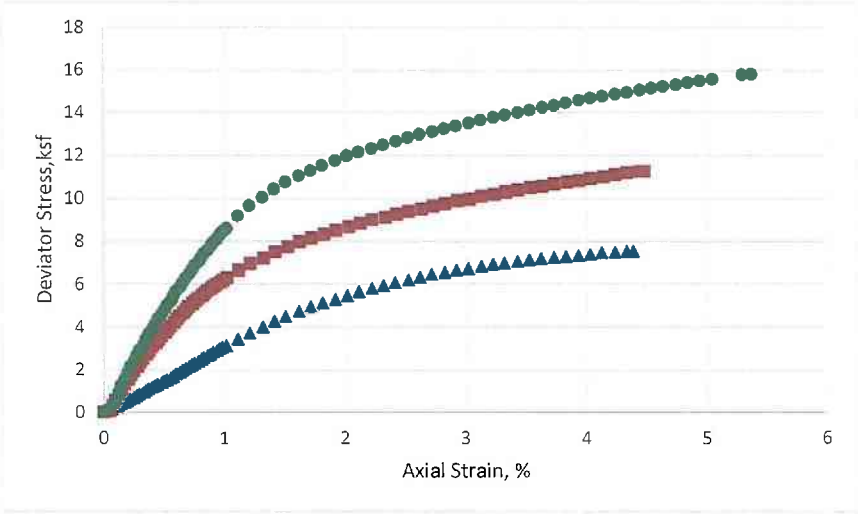
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay with Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	103.5	-	-
Moisture Content, %	12.6	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	7.40	11.30	15.80
Axial Strian, %	4.0	4.5	5.4
Rate of Strain, %/min	1.0	1.0	1.0

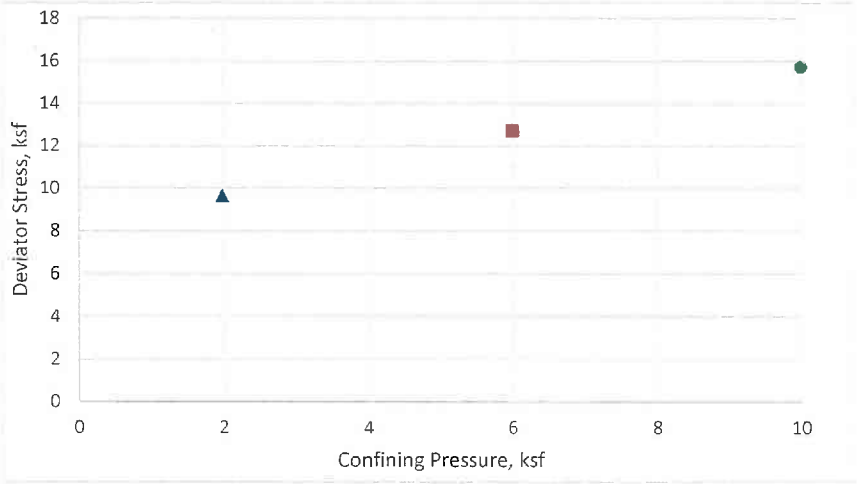
Remold Sample Properties	
Dry Density, pcf	103.5
Moisture Content, %	12.5
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

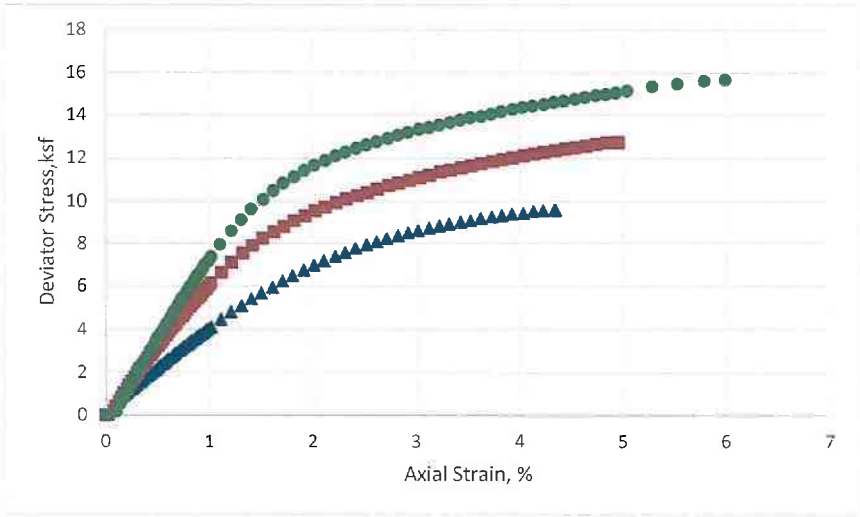
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay with Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	102	-	-
Moisture Content, %	14.9	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	9.60	12.70	15.70
Axial Strian, %	4.4	5.0	6.0
Rate of Strain, %/min	1.0	1.0	1.0

Remold Sample Properties	
Dry Density, pcf	102.0
Moisture Content, %	14.9
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

Notes

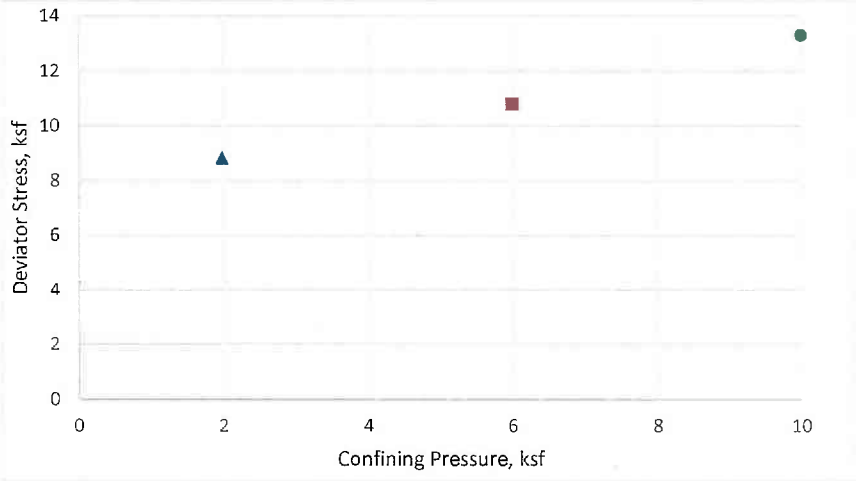
The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

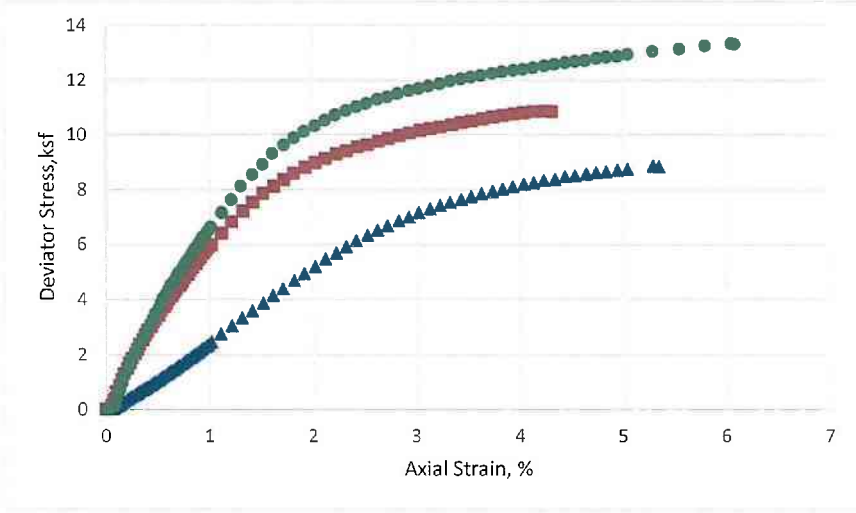
The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Project No. 2180187

Figure 12

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay with Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	105.1	-	-
Moisture Content, %	17.9	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	8.80	10.80	13.30
Axial Strian, %	5.4	4.3	6.0
Rate of Strain, %/min	1.0	1.0	1.0

Remold Sample Properties	
Dry Density, pcf	105.1
Moisture Content, %	17.9
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

Notes

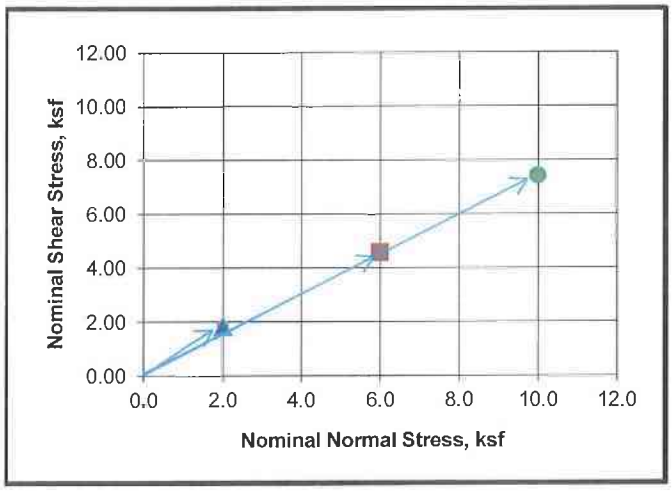
The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

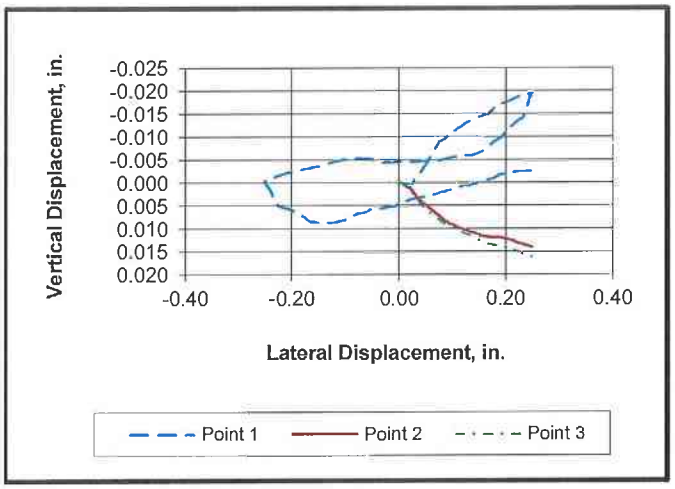
The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

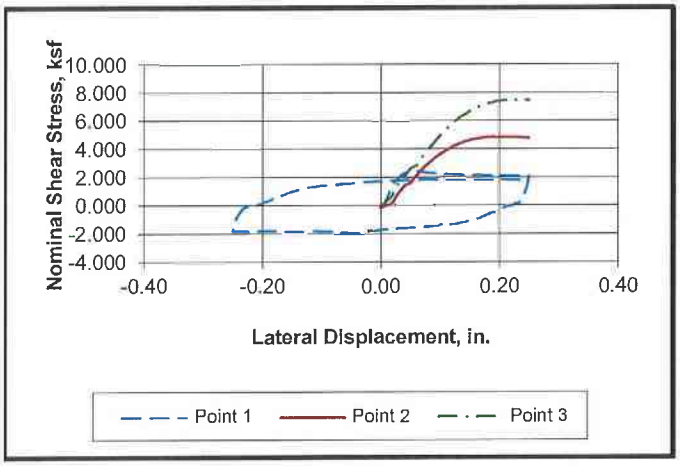
Project No. 2180187

Figure 13

Applied Geotechnical Engineering Consultants, Inc.







DIRECT SHEAR TEST

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Test Type	Consolidated Unsaturated		
Sample Type	Remolded		
Length, in.	1.00	-	-
Diameter, in.	2.42	2.42	2.42
Dry Density, pcf	95	-	-
Moisture Content, %	13	-	-
Consol. Load, ksf	2.0	6.0	10.0
Normal Load, ksf	2.0	6.0	10.0
Shear Stress, ksf	1.86	4.58	7.44
Secant Friction Angle	43	37	37
Lateral Displacement, in	0.200	0.200	0.200
Relative Lateral Displacement, %	8.26	8.26	8.26
Rate of Strain, in/min	0.04	0.04	0.040
Gap Width, in	0.075	0.080	0.070

Material passing the #10 sieve remolded to:
a dry density of approximately 95pcf
at a moisture content of approximately 13%.
A three-stage direct shear test was performed.
A pre-shear cycle was performed before the 1st shear stage.

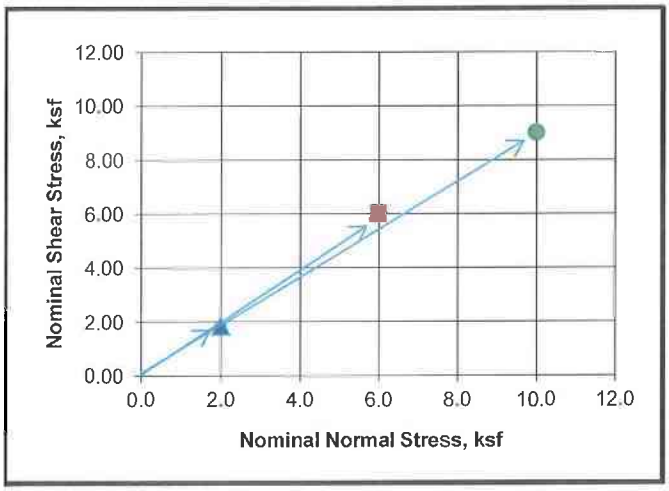
Sample Properties	
Dry Density, pcf	95
Moisture Content, %	13
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0

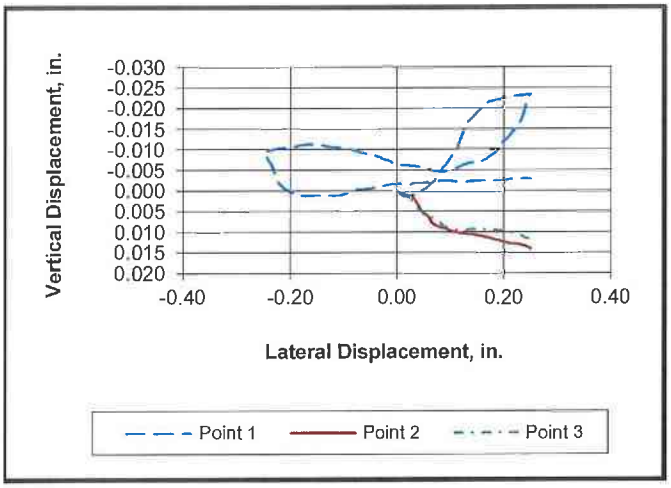
Project No. 2180187

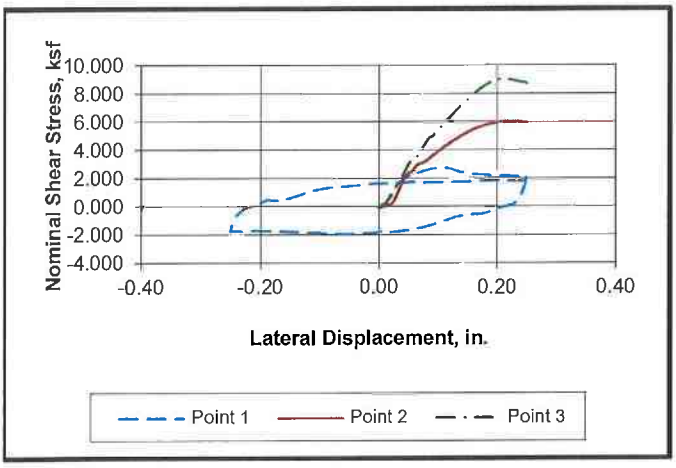
Direct Shear Results

Figure 14

Applied Geotechnical Engineering Consultants, Inc.







DIRECT SHEAR TEST

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay w Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Test Type	Consolidated Unsaturated		
Sample Type	Remolded		
Length, in.	1.00	-	-
Diameter, in.	2.42	2.42	2.42
Dry Density, pcf	101	-	-
Moisture Content, %	10	-	-
Consol. Load, ksf	2.0	6.0	10.0
Normal Load, ksf	2.0	6.0	10.0
Shear Stress, ksf	1.86	6.02	9.03
Secant Friction Angle	43	45	42
Lateral Displacement, in	0.202	0.203	0.202
Relative Lateral Displacement, %	8.35	8.39	8.35
Rate of Strain, in/min	0.04	0.04	0.040
Gap Width, in	0.075	0.080	0.070

Material passing the #10 sieve remolded to:
a dry density of approximately 105pcf
at a moisture content of approximately 10%.
A three-stage direct shear test was performed.
A pre-shear cycle was performed before the 1st shear stage.

Sample Properties	
Dry Density, pcf	105
Moisture Content, %	10
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0

Project No. 2180187

Direct Shear Results

Figure 15

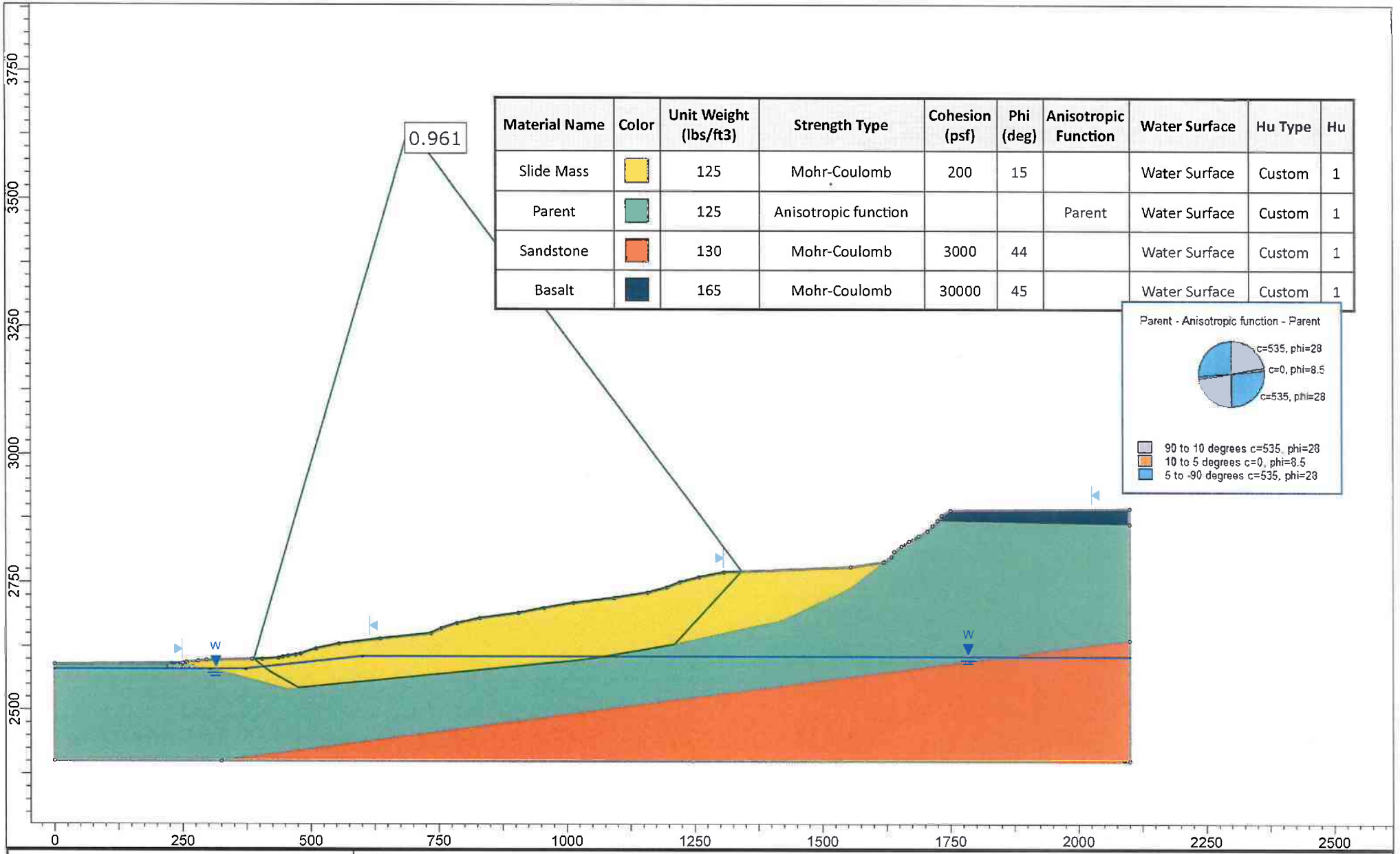
APPENDIX

A-1 Condition Before Grading
A-2 Proposed Profile - Static
A-3 Proposed Profile with Reinforcement - Static
A-4 Proposed Profile with Reinforcement - Seismic

APPENDIX

A-1 Condition Before Grading

Project No. 2180187



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu
Slide Mass		125	Mohr-Coulomb	200	15		Water Surface	Custom	1
Parent		125	Anisotropic function			Parent	Water Surface	Custom	1
Sandstone		130	Mohr-Coulomb	3000	44		Water Surface	Custom	1
Basalt		165	Mohr-Coulomb	30000	45		Water Surface	Custom	1

AGEC
Applied GeoTech

SLIDEINTERPRET 8.014

Project	Blackstone Hotel - original profile, static, saturated soil		
Analysis Description			
Drawn By		Scale 1:3098	Company
Date	9/20/2019 5:01:59 PM		File Name Blackridge Original Profile.slmd

Slide Analysis Information

Blackridge Original Profile

Project Summary

File Name:	Blackridge Original Profile.slmd
Slide Modeler Version:	8.014
Compute Time:	00h:00m:04.739s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	10/19/2018, 3:12:08 PM

General Settings

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

Analysis Options

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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Particle Swarm Search
Initial # of Surface Vertices:	8
Maximum Iterations:	200
Number of Particles:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Slide Mass	Parent	Sandstone	Basalt
Color				
Strength Type	Mohr-Coulomb	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	125	130	165
Cohesion [psf]	200		3000	30000
Friction Angle [°]	15		44	45
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Anisotropic Functions

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Global Minimums

Method: bishop simplified

FS	0.961382
Axis Location:	693.829, 3638.837
Left Slip Surface Endpoint:	388.665, 2600.000
Right Slip Surface Endpoint:	1341.800, 2771.403
Resisting Moment:	1.73224e+09 lb-ft
Driving Moment:	1.80182e+09 lb-ft
Total Slice Area:	82220.1 ft2
Surface Horizontal Width:	953.135 ft
Surface Average Height:	86.2628 ft

Method: janbu simplified

FS	0.929838
Axis Location:	693.829, 3638.837
Left Slip Surface Endpoint:	388.665, 2600.000
Right Slip Surface Endpoint:	1341.800, 2771.403
Resisting Horizontal Force:	1.47714e+06 lb
Driving Horizontal Force:	1.5886e+06 lb
Total Slice Area:	82220.1 ft2
Surface Horizontal Width:	953.135 ft
Surface Average Height:	86.2628 ft

Global Minimum Coordinates

Method: bishop simplified

X	Y
388.665	2600
405.303	2586.03
421.941	2573.42
475.948	2542.48
524.332	2547.35
552.78	2550.22
580.242	2552.99
610.913	2556.08
641.307	2559.14
668.326	2561.87
696.111	2564.67
722.899	2567.38
749.687	2570.08
779.284	2573.07
809.723	2576.14
840.161	2579.21
869.219	2582.14
915.483	2586.81
961.747	2591.48
1008.01	2596.15
1054.27	2602.2
1097.77	2609.16
1143.38	2617.03
1176.92	2622.87
1210.04	2628.71
1230.8	2651.19
1248.41	2670.26
1265.96	2689.27
1283.51	2708.28
1312.66	2739.84
1341.8	2771.4

Method: janbu simplified

X	Y
388.665	2600
405.303	2586.03
421.941	2573.42
475.948	2542.48
524.332	2547.35
552.78	2550.22
580.242	2552.99
610.913	2556.08
641.307	2559.14
668.326	2561.87
696.111	2564.67
722.899	2567.38
749.687	2570.08
779.284	2573.07
809.723	2576.14
840.161	2579.21
869.219	2582.14
915.483	2586.81
961.747	2591.48
1008.01	2596.15
1054.27	2602.2
1097.77	2609.16
1143.38	2617.03
1176.92	2622.87
1210.04	2628.71
1230.8	2651.19
1248.41	2670.26
1265.96	2689.27
1283.51	2708.28
1312.66	2739.84
1341.8	2771.4

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 8410
Number of Invalid Surfaces: 11712

Error Codes:

Error Code -108 reported for 1 surface
Error Code -112 reported for 12 surfaces
Error Code -113 reported for 3012 surfaces
Error Code -121 reported for 109 surfaces
Error Code -124 reported for 1 surface
Error Code -1000 reported for 8577 surfaces

Method: janbu simplified

Number of Valid Surfaces: 7954
Number of Invalid Surfaces: 12168

Error Codes:

Error Code -112 reported for 3 surfaces
Error Code -113 reported for 3012 surfaces
Error Code -121 reported for 109 surfaces
Error Code -124 reported for 1 surface
Error Code -1000 reported for 9043 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-113 = Surface intersects outside slope limits.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.961382

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	16.6382	14529	-40.0208	Slide Mass	200	15	589.345	566.586	1368.12	0	1368.12	873.232	873.232
2	2.85674	5414.27	-37.1577	Slide Mass	200	15	933.439	897.391	2602.7	0	2602.7	1895.26	1895.26
3	13.7815	37876.5	-37.1577	Slide Mass	200	15	1103	1060.41	3584.31	373.221	3211.09	2748.37	2375.14
4	17.8414	74374.6	-29.8103	Slide Mass	200	15	1256.5	1207.98	4888.56	1126.73	3761.83	4168.65	3041.92
5	17.8414	103935	-29.8103	Slide Mass	200	15	1553.79	1493.79	6715.74	1887.25	4828.49	5825.5	3938.25
6	17.8414	133212	-29.8103	Slide Mass	200	15	1845.81	1774.53	8524	2647.77	5876.23	7466.46	4818.69
7	0.482768	4014.65	-29.8103	Parent	535	28	5087.44	4890.97	11230.7	3038.32	8192.4	8315.9	5277.58
8	16.1279	137322	5.75436	Parent	0	8.5	835.88	803.6	8430.38	3053.35	5377.03	8514.62	5461.27
9	16.1279	144747	5.75436	Parent	0	8.5	904.892	869.947	8883.76	3062.81	5820.95	8974.94	5912.13
10	16.1279	150882	5.75436	Parent	0	8.5	961.666	924.528	9258.41	3072.28	6186.13	9355.32	6283.04
11	28.4481	275807	5.75436	Parent	0	8.5	1011.66	972.596	9593.14	3085.36	6507.78	9695.08	6609.72
12	27.4622	274032	5.75436	Parent	0	8.5	1052.54	1011.89	9872.45	3101.77	6770.68	9978.52	6876.75
13	30.6714	308788	5.75436	Parent	0	8.5	1063.56	1022.49	9960.45	3118.83	6841.62	10067.6	6948.8
14	15.1966	154048	5.75994	Parent	0	8.5	1091.58	1049.43	10026.9	3004.97	7021.93	10137	7132.04
15	15.1966	154682	5.75994	Parent	0	8.5	1112.62	1069.65	10066.5	2909.32	7157.19	10178.7	7269.42
16	27.0195	275180	5.76212	Parent	0	8.5	1133.84	1090.05	10070.1	2776.43	7293.68	10184.5	7408.09
17	27.7848	282888	5.76317	Parent	0	8.5	1159.76	1114.97	10064.3	2603.87	7460.44	10181.4	7577.49
18	26.7881	272655	5.76317	Parent	0	8.5	1185.57	1139.79	10058.6	2432.02	7626.54	10178.2	7746.2
19	26.7881	277965	5.76317	Parent	0	8.5	1241.73	1193.78	10251.1	2263.31	7987.79	10376.4	8113.11
20	14.7984	165945	5.76317	Parent	0	8.5	1389.93	1336.25	11073.4	2132.36	8941.02	11213.7	9081.3
21	14.7984	172601	5.76317	Parent	0	8.5	1473.03	1416.14	11514.8	2039.16	9475.6	11663.4	9624.27
22	30.4385	370774	5.76317	Parent	0	8.5	1574.06	1513.27	12022.2	1896.72	10125.5	12181.1	10284.4
23	15.2194	190770	5.76317	Parent	0	8.5	1650.18	1586.45	12368.2	1752.94	10615.2	12534.7	10781.8
24	15.2194	193708	5.76317	Parent	0	8.5	1694.39	1628.96	12556.8	1657.09	10899.7	12727.8	11070.7
25	14.5288	185930	5.76317	Parent	0	8.5	1719.39	1652.99	12623.8	1563.42	11060.4	12797.4	11233.9
26	14.5288	186785	5.76317	Parent	0	8.5	1742.4	1675.11	12680.3	1471.92	11208.4	12856.2	11384.3
27	23.132	299154	5.76317	Parent	0	8.5	1772.22	1703.78	12753.6	1353.33	11400.3	12932.5	11579.1
28	23.132	301779	5.76317	Parent	0	8.5	1811.89	1741.92	12863.1	1207.65	11655.4	13046	11838.3
29	23.132	307739	5.76317	Parent	0	8.5	1873.63	1801.27	13114.5	1061.96	12052.6	13303.6	12241.7
30	23.132	314287	5.76317	Parent	0	8.5	1939.24	1864.35	13391	916.283	12474.7	13586.7	12670.4
31	23.1319	319531	5.76317	Parent	0	8.5	1996.24	1919.15	13611.9	770.602	12841.3	13813.4	13042.8
32	23.1319	324312	5.76317	Parent	0	8.5	2050.17	1971	13813.2	624.92	13188.3	14020.1	13395.2
33	23.132	327126	7.44354	Parent	0	8.5	2084.87	2004.36	13869.3	457.787	13411.5	14141.7	13683.9
34	23.132	326821	7.44354	Parent	0	8.5	2111.61	2030.06	13852.6	269.201	13583.4	14128.5	13859.3
35	17.5029	246474	9.09982	Parent	0	8.5	2122.64	2040.67	13741.9	87.4407	13654.5	14081.9	13994.4

36	25.9967	363637	9.09982	Parent	0	8.5	2121.64	2039.71	13648	0	13648	13987.8	13987.8
37	22.8026	317410	9.78033	Parent	0	8.5	2107.43	2026.05	13556.7	0	13556.7	13919.9	13919.9
38	22.8026	316206	9.78033	Parent	0	8.5	2099.45	2018.37	13505.2	0	13505.2	13867.1	13867.1
39	16.771	231797	9.88827	Parent	0	8.5	2091.88	2011.1	13456.6	0	13456.6	13821.2	13821.2
40	16.771	233615	9.88827	Parent	0	8.5	2108.3	2026.88	13562.1	0	13562.1	13929.6	13929.6
41	16.5606	233960	9.9973	Parent	0	8.5	2137.61	2055.06	13750.7	0	13750.7	14127.5	14127.5
42	16.5606	239017	9.9973	Parent	0	8.5	2183.81	2099.48	14047.9	0	14047.9	14432.9	14432.9
43	2.71714	39527.1	47.2804	Parent	535	28	5379.9	5172.14	8721.2	0	8721.2	14547.3	14547.3
44	18.0437	245499	47.2804	5lide Mass	200	15	3072.72	2954.06	10278.3	0	10278.3	13605.8	13605.8
45	17.607	207834	47.2804	5lide Mass	200	15	2686.97	2583.2	8894.23	0	8894.23	11804.1	11804.1
46	17.5517	175330	47.2804	5lide Mass	200	15	2298.44	2209.68	7500.24	0	7500.24	9989.33	9989.33
47	17.5517	141826	47.2804	5lide Mass	200	15	1889.77	1816.79	6033.95	0	6033.95	8080.47	8080.47
48	14.5715	92033.6	47.2804	5lide Mass	200	15	1512.01	1453.62	4678.54	0	4678.54	6315.96	6315.96
49	14.5715	68379.9	47.2804	5lide Mass	200	15	1164.47	1119.51	3431.64	0	3431.64	4692.7	4692.7
50	29.1428	55356.4	47.2866	5lide Mass	200	15	566.44	544.565	1285.93	0	1285.93	1899.49	1899.49

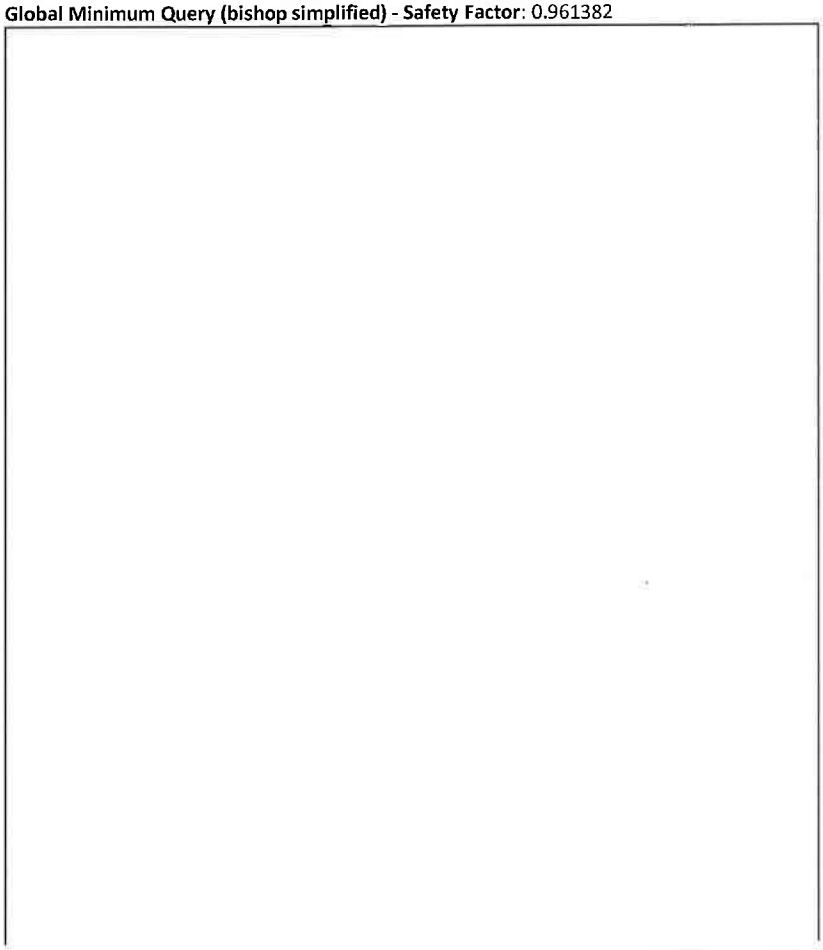
Global Minimum Query (janbu simplified) - Safety Factor: 0.929838

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	16.6382	14529	-40.0208	5lide Mass	200	15	615.695	572.497	1390.18	0	1390.18	873.167	873.167
2	2.85674	5414.27	-37.1577	5lide Mass	200	15	973.918	905.586	2633.28	0	2633.28	1895.17	1895.17
3	13.7815	37876.5	-37.1577	5lide Mass	200	15	1150.84	1070.09	3620.45	373.221	3247.23	2748.26	2375.04
4	17.8414	74374.6	-29.8103	5lide Mass	200	15	1307.53	1215.79	4917.69	1126.73	3790.96	4168.55	3041.82
5	17.8414	103935	-29.8103	5lide Mass	200	15	1616.88	1503.44	6751.78	1887.25	4864.53	5825.39	3938.14
6	17.8414	133212	-29.8103	5lide Mass	200	15	1920.76	1786	8566.8	2647.77	5919.03	7466.31	4818.54
7	0.482768	4014.65	-29.8103	Parent	535	28	5343.79	4968.86	11377.2	3038.32	8338.88	8315.5	5277.18
8	16.1279	137322	5.75436	Parent	0	8.5	863.786	803.181	8427.55	3053.35	5374.2	8514.59	5461.24
9	16.1279	144747	5.75436	Parent	0	8.5	935.103	869.494	8880.73	3062.81	5817.92	8974.97	5912.16
10	16.1279	150882	5.75436	Parent	0	8.5	993.771	924.046	9255.2	3072.28	6182.92	9355.35	6283.07
11	28.4481	275807	5.75436	Parent	0	8.5	1045.44	972.089	9589.74	3085.36	6504.38	9695.09	6609.73
12	27.4622	274032	5.75436	Parent	0	8.5	1087.67	1011.36	9868.94	3101.77	6767.17	9978.54	6876.77
13	30.6714	308788	5.75436	Parent	0	8.5	1099.07	1021.96	9956.89	3118.83	6838.06	10067.6	6948.81
14	15.1966	154048	5.75994	Parent	0	8.5	1128.04	1048.89	10023.2	3004.97	7018.27	10137	7132.05
15	15.1966	154682	5.75994	Parent	0	8.5	1149.76	1069.09	10062.8	2909.32	7153.46	10178.8	7269.44
16	27.0195	275180	5.76212	Parent	0	8.5	1171.69	1089.48	10066.3	2776.43	7289.85	10184.5	7408.08
17	27.7848	282888	5.76317	Parent	0	8.5	1198.48	1114.39	10060.4	2603.87	7456.54	10181.4	7577.5
18	26.7881	272655	5.76317	Parent	0	8.5	1225.16	1139.2	10054.6	2432.02	7622.57	10178.2	7746.22
19	26.7881	277965	5.76317	Parent	0	8.5	1283.19	1193.16	10246.9	2263.31	7983.63	10376.4	8113.14
20	14.7984	165945	5.76317	Parent	0	8.5	1436.33	1335.55	11068.7	2132.36	8936.38	11213.7	9081.34
21	14.7984	172601	5.76317	Parent	0	8.5	1522.2	1415.4	11509.9	2039.16	9470.69	11663.5	9624.32
22	30.4385	370774	5.76317	Parent	0	8.5	1626.61	1512.48	12016.9	1896.72	10120.2	12181.1	10284.4
23	15.2194	190770	5.76317	Parent	0	8.5	1705.26	1585.62	12362.6	1752.94	10609.7	12534.7	10781.8
24	15.2194	193708	5.76317	Parent	0	8.5	1750.96	1628.11	12551.1	1657.09	10894	12727.8	11070.7
25	14.5288	185930	5.76317	Parent	0	8.5	1776.78	1652.12	12618	1563.42	11054.6	12797.3	11233.9
26	14.5288	186785	5.76317	Parent	0	8.5	1800.56	1674.23	12674.5	1471.92	11202.6	12856.2	11384.3
27	23.132	299154	5.76317	Parent	0	8.5	1831.38	1702.89	12747.7	1353.33	11394.3	12932.5	11579.2
28	23.132	301779	5.76317	Parent	0	8.5	1872.38	1741.01	12857	1207.65	11649.4	13046	11838.4
29	23.132	307739	5.76317	Parent	0	8.5	1936.18	1800.33	13108.2	1061.96	12046.2	13303.6	12241.7
30	23.132	314287	5.76317	Parent	0	8.5	2003.98	1863.38	13384.5	916.283	12468.2	13586.7	12670.4

31	23.1319	319531	5.76317	Parent	0	8.5	2062.89	1918.15	13605.2	770.602	12834.6	13813.4	13042.8
32	23.1319	324312	5.76317	Parent	0	8.5	2118.62	1969.97	13806.3	624.92	13181.4	14020.1	13395.2
33	23.132	327126	7.44354	Parent	0	8.5	2154.15	2003.01	13860.3	457.787	13402.5	14141.7	13683.9
34	23.132	326821	7.44354	Parent	0	8.5	2181.77	2028.69	13843.5	269.201	13574.3	14128.6	13859.4
35	17.5029	246474	9.09982	Parent	0	8.5	2192.86	2039	13730.7	87.4407	13643.2	14081.9	13994.5
36	25.9967	363637	9.09982	Parent	0	8.5	2191.82	2038.04	13636.8	0	13636.8	13987.9	13987.9
37	22.8026	317410	9.78033	Parent	0	8.5	2177.01	2024.27	13544.7	0	13544.7	13920	13920
38	22.8026	316206	9.78033	Parent	0	8.5	2168.75	2016.59	13493.3	0	13493.3	13867.2	13867.2
39	16.771	231797	9.88827	Parent	0	8.5	2160.92	2009.31	13444.6	0	13444.6	13821.3	13821.3
40	16.771	233615	9.88827	Parent	0	8.5	2177.87	2025.07	13550.1	0	13550.1	13929.7	13929.7
41	16.5606	233960	9.9973	Parent	0	8.5	2208.14	2053.21	13738.3	0	13738.3	14127.6	14127.6
42	16.5606	239017	9.9973	Parent	0	8.5	2255.87	2097.59	14035.3	0	14035.3	14432.9	14432.9
43	2.71714	39527.1	47.2804	Parent	535	28	5492.88	5107.49	8599.61	0	8599.61	14548.1	14548.1
44	18.0437	245499	47.2804	Slide Mass	200	15	3152.26	2931.09	10192.6	0	10192.6	13606.3	13606.3
45	17.607	207834	47.2804	Slide Mass	200	15	2756.52	2563.12	8819.29	0	8819.29	11804.4	11804.4
46	17.5517	175330	47.2804	Slide Mass	200	15	2357.94	2192.5	7436.12	0	7436.12	9989.64	9989.64
47	17.5517	141826	47.2804	Slide Mass	200	15	1938.69	1802.67	5981.23	0	5981.23	8080.73	8080.73
48	14.5715	92033.6	47.2804	Slide Mass	200	15	1551.15	1442.32	4636.39	0	4636.39	6316.2	6316.2
49	14.5715	68379.9	47.2804	Slide Mass	200	15	1194.62	1110.8	3399.16	0	3399.16	4692.87	4692.87
50	29.1428	55356.4	47.2866	Slide Mass	200	15	581.101	540.33	1270.13	0	1270.13	1899.57	1899.57

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.961382



Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	388.665	2600	0	0	0
2	405.303	2586.03	28920.1	0	0
3	408.16	2583.86	37221.7	0	0
4	421.941	2573.42	89859.6	0	0
5	439.783	2563.2	162249	0	0
6	457.624	2552.97	258620	0	0
7	475.465	2542.75	378685	0	0
8	475.948	2542.48	384247	0	0
9	492.076	2544.1	384027	0	0
10	508.204	2545.73	384183	0	0
11	524.332	2547.35	384645	0	0
12	552.78	2550.22	385924	0	0
13	580.242	2552.99	387508	0	0
14	610.913	2556.08	389343	0	0
15	626.11	2557.61	390561	0	0
16	641.307	2559.14	392038	0	0
17	668.326	2561.87	395218	0	0
18	696.111	2564.67	399219	0	0
19	722.899	2567.38	403784	0	0
20	749.687	2570.08	409332	0	0
21	764.486	2571.57	413362	0	0
22	779.284	2573.07	417962	0	0
23	809.723	2576.14	428941	0	0
24	824.942	2577.68	435058	0	0
25	840.161	2579.21	441558	0	0
26	854.69	2580.68	448027	0	0
27	869.219	2582.14	454749	0	0
28	892.351	2584.48	465969	0	0
29	915.483	2586.81	477850	0	0
30	938.615	2589.15	490573	0	0
31	961.747	2591.48	504169	0	0
32	984.879	2593.82	518567	0	0
33	1008.01	2596.15	533742	0	0
34	1031.14	2599.17	540054	0	0
35	1054.27	2602.2	547034	0	0
36	1071.78	2605	545662	0	0
37	1097.77	2609.16	543988	0	0
38	1120.58	2613.09	538757	0	0
39	1143.38	2617.03	533546	0	0
40	1160.15	2619.95	529289	0	0
41	1176.92	2622.87	524999	0	0
42	1193.48	2625.79	520257	0	0
43	1210.04	2628.71	515412	0	0
44	1212.76	2631.65	504368	0	0
45	1230.8	2651.19	358970	0	0
46	1248.41	2670.26	236690	0	0
47	1265.96	2689.27	134470	0	0
48	1283.51	2708.28	52948.4	0	0
49	1298.09	2724.06	1152.1	0	0
50	1312.66	2739.84	-36031.6	0	0
51	1341.8	2771.4	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 0.929838

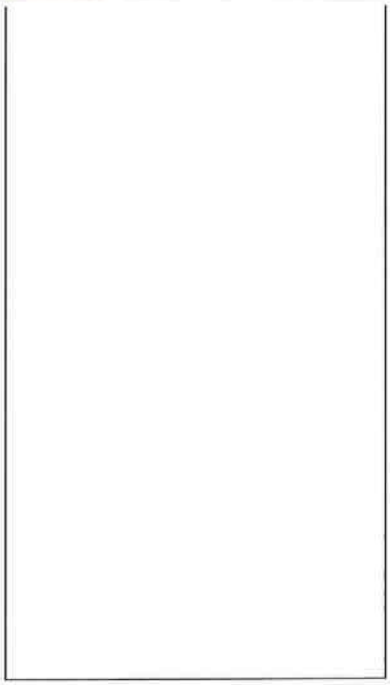
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	388.665	2600	0	0	0
2	405.303	2586.03	29665.5	0	0
3	408.16	2583.86	38148.6	0	0
4	421.941	2573.42	91821.2	0	0
5	439.783	2563.2	165416	0	0
6	457.624	2552.97	263277	0	0
7	475.465	2542.75	385113	0	0
8	475.948	2542.48	390839	0	0
9	492.076	2544.1	391071	0	0
10	508.204	2545.73	391718	0	0
11	524.332	2547.35	392701	0	0
12	552.78	2550.22	394947	0	0
13	580.242	2552.99	397501	0	0
14	610.913	2556.08	400432	0	0
15	626.11	2557.61	402208	0	0
16	641.307	2559.14	404253	0	0
17	668.326	2561.87	408462	0	0
18	696.111	2564.67	413545	0	0
19	722.899	2567.38	419177	0	0
20	749.687	2570.08	425842	0	0
21	764.486	2571.57	430563	0	0
22	779.284	2573.07	435896	0	0
23	809.723	2576.14	448484	0	0
24	824.942	2577.68	455445	0	0
25	840.161	2579.21	462811	0	0
26	854.69	2580.68	470120	0	0
27	869.219	2582.14	477691	0	0
28	892.351	2584.48	490288	0	0
29	915.483	2586.81	503578	0	0
30	938.615	2589.15	517757	0	0
31	961.747	2591.48	532859	0	0
32	984.879	2593.82	548809	0	0
33	1008.01	2596.15	565577	0	0
34	1031.14	2599.17	573512	0	0
35	1054.27	2602.2	582137	0	0
36	1071.78	2605	582020	0	0
37	1097.77	2609.16	582210	0	0
38	1120.58	2613.09	578606	0	0
39	1143.38	2617.03	575016	0	0
40	1160.15	2619.95	571947	0	0
41	1176.92	2622.87	568855	0	0
42	1193.48	2625.79	565312	0	0
43	1210.04	2628.71	561693	0	0
44	1212.76	2631.65	551311	0	0
45	1230.8	2651.19	409017	0	0
46	1248.41	2670.26	289384	0	0
47	1265.96	2689.27	189422	0	0
48	1283.51	2708.28	109756	0	0
49	1298.09	2724.06	59193	0	0
50	1312.66	2739.84	22958.9	0	0
51	1341.8	2771.4	0	0	0

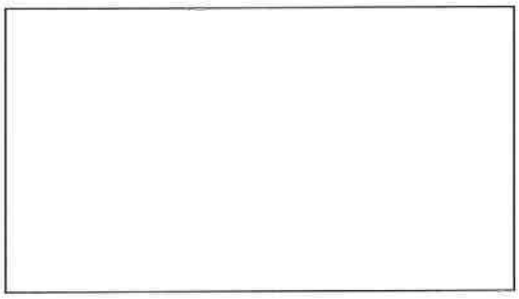
Entity Information

Group: Group 1

Shared Entities

Type	Coordinates	
	X	Y
External Boundary	0	2400
	325	2400
	2100	2400
	2100	2637
	2100	2863
	2100	2893
	1750	2890
	1733	2880
	1725	2870
	1715	2860
	1705	2850
	1688	2840
	1670	2830
	1655	2820
	1640	2810
	1635	2800
	1620	2790
	1555	2780
	1307	2770
	1258	2760
	1220	2750
	1195	2740
	1158	2730
	1093	2720
	1013	2710
	955	2700
	905	2690
	830	2680
	785	2670
	755	2660
	735	2650
	635	2640
	555	2630
	510	2620
	480	2610
	470	2608
	455	2606
	445	2604
	437	2602
	405	2600
	385	2600
	296	2598
	280	2596
	257	2594
	250	2592
	0	2590





Material Boundary

X	Y
250	2592
343.173	2571.24
456.053	2540.97
506.217	2545.57
625.989	2559.08
779.187	2574.58
929.108	2591.46
1070.69	2604.83
1238.02	2636.42
1419.39	2676.21
1552.78	2738.22
1620	2790

Material Boundary

X	Y
325	2400
2100	2637

Material Boundary

X	Y
1725	2870
2100	2863

Scenario-based Entities

Type	Coordinates	Master Scenario
Water Table	X: 0, 373.093, 600, 2100; Y: 2580, 2580, 2605, 2605	Assigned to materials: Slide Mass, Parent, Sandstone, Basalt

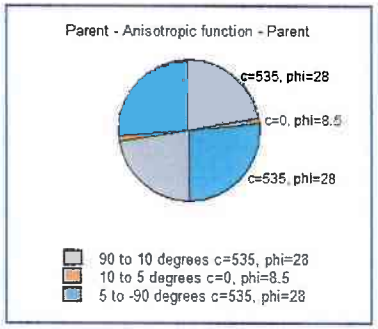
APPENDIX

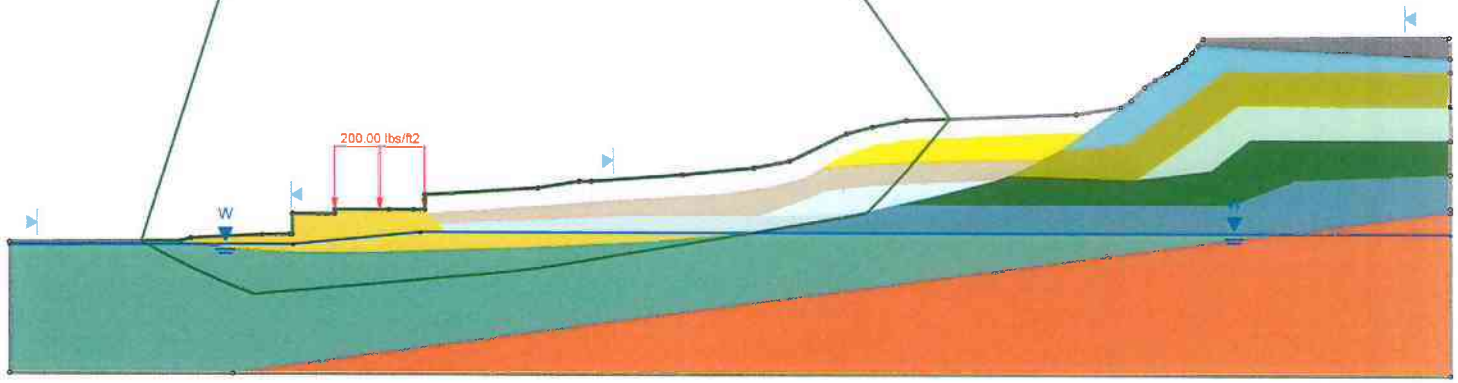
A-2 Proposed Profile - Static

Project No. 2180187

1.410 Spencer

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Basalt Cap		165	Mohr-Coulomb	75000	45		None	0
Slide Mass		125	Mohr-Coulomb	200	15		Water Surface	
Slide Mass 1		125	Mohr-Coulomb	1750	15		Water Surface	
Slide Mass 2		125	Mohr-Coulomb	3500	15		Water Surface	
Slide Mass 3		125	Mohr-Coulomb	2500	15		Water Surface	
Slide Mass 4		125	Mohr-Coulomb	1500	15		Water Surface	
Slide Mass 5		125	Mohr-Coulomb	750	15		Water Surface	
Parent		125	Anisotropic function			Parent	Water Surface	
Parent 1		125	Anisotropic function			Parent 1	Water Surface	
Parent 2		125	Anisotropic function			Parent 2	Water Surface	
Parent 3		125	Anisotropic function			Parent 3	Water Surface	
Parent 4		125	Anisotropic function			Parent 4	Water Surface	
Parent 5		125	Anisotropic function			Parent 5	Water Surface	
Sandstone		130	Mohr-Coulomb	3000	44		Water Surface	





3750
3500
3250
3000
2750
2500
2250

-500 -250 0 250 500 750 1000 1250 1500 1750 2000 2250

AGEC Applied GeoTech

SLIDEINTERPRET 8.014

Project: Blackstone Hotel - proposed profile, static, un-saturated soil,			
Analysis Description:			
Drawn By:	Scale: 1:3357	Company:	
Date: 9/21/2019 9:35:00 AM		File Name:	Unsaturated Building Profile A.slmd

Slide Analysis Information

Unsaturated Building Profile A

Project Summary

File Name:	Unsaturated Building Profile A.slmd
Slide Modeler Version:	8.014
Compute Time:	00h:00m:14.871s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	10/19/2018, 3:12:08 PM

General Settings

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

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
	Janbu simplified
	Spencer
Number of slices:	100
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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Simulated Annealing Search
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1

Distribution:	Constant
Magnitude [psf]:	200
Orientation:	Vertical

Materials

Property	Basalt Cap	Slide Mass	Slide Mass 1	Slide Mass 2	Slide Mass 3	Slide Mass 4	Slide Mass 5	Parent
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	165	125	125	125	125	125	125	125
Cohesion [psf]	75000	200	1750	3500	2500	1500	750	
Friction Angle [°]	45	15	15	15	15	15	15	
Water Surface	None	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value		1	1	1	1	1	1	1
Ru Value	0							

Anisotropic Functions

Name: Parent 5

Angle From	Angle To	c	phi
-90	5	1100	28
5	10	285	8.5
10	90	1100	28

Name: Parent 4

Angle From	Angle To	c	phi
-90	5	1850	28
5	10	750	8.5
10	90	1850	28

Name: Parent 3

Angle From	Angle To	c	phi
-90	5	3100	28
5	10	1600	8.5
10	90	3100	28

Name: Parent 2

Angle From	Angle To	c	phi
-90	5	4600	28
5	10	2500	8.5
10	90	4600	28

Name: Parent 1

Angle From	Angle To	c	phi
-90	5	2200	28
5	10	1140	8.5
10	90	2200	28

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Property	Parent 1	Parent 2	Parent 3	Parent 4	Parent 5	Sandstone
Color						
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	125	125	125	125	130
Cohesion [psf]						3000
Friction Angle [°]						44
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1

Anisotropic Functions

Name: Parent 5

Angle From	Angle To	c	phi
-90	5	1100	28
5	10	285	8.5
10	90	1100	28

Name: Parent 4

Angle From	Angle To	c	phi
-90	5	1850	28
5	10	750	8.5
10	90	1850	28

Name: Parent 3

Angle From	Angle To	c	phi
-90	5	3100	28
5	10	1600	8.5
10	90	3100	28

Name: Parent 2

Angle From	Angle To	c	phi
-90	5	4600	28
5	10	2500	8.5
10	90	4600	28

Name: Parent 1

Angle From	Angle To	c	phi
-90	5	2200	28
5	10	1140	8.5
10	90	2200	28

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Global Minimums

Method: bishop simplified

FS	1.351020
Axis Location:	659.778, 3753.008
Left Slip Surface Endpoint:	300.553, 2597.757
Right Slip Surface Endpoint:	1368.444, 2772.478
Resisting Moment:	2.97295e+09 lb-ft
Driving Moment:	2.2011e+09 lb-ft
Total Slice Area:	101799 ft2
Surface Horizontal Width:	1067.89 ft
Surface Average Height:	95.3268 ft

Method: janbu simplified

FS	1.325190
Axis Location:	659.778, 3753.008
Left Slip Surface Endpoint:	300.553, 2597.757
Right Slip Surface Endpoint:	1368.444, 2772.478
Resisting Horizontal Force:	2.19353e+06 lb
Driving Horizontal Force:	1.65526e+06 lb
Total Slice Area:	101799 ft2
Surface Horizontal Width:	1067.89 ft
Surface Average Height:	95.3268 ft

Method: spencer

FS	1.410030
Axis Location:	600.730, 3861.001
Left Slip Surface Endpoint:	192.315, 2591.539
Right Slip Surface Endpoint:	1371.251, 2772.591
Resisting Moment:	3.64608e+09 lb-ft
Driving Moment:	2.58582e+09 lb-ft
Resisting Horizontal Force:	2.47215e+06 lb
Driving Horizontal Force:	1.75326e+06 lb
Total Slice Area:	112598 ft2
Surface Horizontal Width:	1178.94 ft
Surface Average Height:	95.5081 ft

Global Minimum Coordinates

Method: bishop simplified



X	Y
300.553	2597.76
324.495	2579.4
348.437	2563.02
379.615	2543.13
411.939	2523.29
450.756	2526.95
489.548	2530.6
528.558	2534.05
567.752	2537.52
599.899	2540.35
632.114	2543.61
681.965	2550.55
731.816	2555.89
781.667	2560.76
831.518	2565.63
867.922	2571.41
904.327	2576.63
940.732	2582.55
977.136	2587.92
1023.09	2596.02
1068.94	2604.1
1114.8	2612.15
1160.23	2620.14
1206.54	2628.29
1252.92	2636.46
1280.12	2666.53
1309.56	2700.88
1339	2736.97
1368.44	2772.48

Method: janbu simplified

X	Y
300.553	2597.76
324.495	2579.4
348.437	2563.02
379.615	2543.13
411.939	2523.29
450.756	2526.95
489.548	2530.6
528.558	2534.05
567.752	2537.52
599.899	2540.35
632.114	2543.61
681.965	2550.55
731.816	2555.89
781.667	2560.76
831.518	2565.63
867.922	2571.41
904.327	2576.63
940.732	2582.55
977.136	2587.92
1023.09	2596.02
1068.94	2604.1
1114.8	2612.15
1160.23	2620.14
1206.54	2628.29
1252.92	2636.46
1280.12	2666.53
1309.56	2700.88
1339	2736.97
1368.44	2772.48

Method: spencer

X	Y
192.315	2591.54
227.728	2571.54
263.142	2553.32
309.562	2532.42
355.983	2514.18
409.689	2518.95
464.787	2523.84
517.913	2528.55
571.038	2533.27
630.331	2538.53
686.962	2543.55
740.177	2548.45
794.221	2556.19
843.512	2564.55
892.804	2572.92
942.095	2581.29
991.385	2589.66
1034.56	2596.99
1080.63	2604.83
1126.7	2612.67
1167.86	2619.69
1209.07	2626.84
1249.33	2633.92
1279.81	2665.51
1310.29	2699.48
1340.77	2736.03
1371.25	2772.59

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 7178
Number of Invalid Surfaces: 15932

Error Codes:

Error Code -1000 reported for 15932 surfaces

Method: janbu simplified

Number of Valid Surfaces: 8761
Number of Invalid Surfaces: 14349

Error Codes:

Error Code -1000 reported for 14349 surfaces

Method: spencer

Number of Valid Surfaces: 7177
Number of Invalid Surfaces: 15933

Error Codes:

Error Code -1000 reported for 15933 surfaces

Error Codes

The following errors were encountered during the computation:

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.35102

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	14.7345	11054	-37.4726	Slide Mass	200	15	349.902	472.724	1017.82	0	1017.82	749.596	749.596
2	5.31502	9413.13	-37.4726	Slide Mass	200	15	558.795	754.943	2198.41	127.335	2071.07	1770.05	1642.72
3	3.89243	8718.42	-37.4726	Parent	535	28	1631.7	2204.46	3487.78	347.97	3139.81	2236.97	1889
4	11.9711	35747.3	-34.3923	Parent	535	28	1773.39	2395.88	4197.27	697.456	3499.81	2983.36	2285.9
5	11.9711	48870.5	-34.3923	Parent	535	28	2087.62	2820.41	5508.11	1209.88	4298.23	4079.1	2869.22
6	10.3928	52754.8	-32.5341	Parent	535	28	2315.02	3127.64	6549.46	1673.42	4876.04	5072.69	3399.27
7	10.3928	62014.3	-32.5341	Parent	535	28	2565.12	3465.53	7599.59	2088.06	5511.53	5963.28	3875.22
8	10.3928	71085.6	-32.5341	Parent	535	28	2805.72	3790.59	8625.57	2502.7	6122.87	6835.78	4333.08
9	10.7746	82970	-31.5332	Parent	535	28	3001.97	4055.72	9538.32	2916.78	6621.54	7696.31	4779.53
10	10.7746	92237	-31.5332	Parent	535	28	3233.5	4368.52	10540.1	3330.31	7209.81	8556.05	5225.74
11	10.7746	101480	-31.5332	Parent	535	28	3463.86	4679.74	11539	3743.84	7795.15	9413.58	5669.74
12	9.70422	131083	5.37997	Parent	0	8.5	1047.22	1414.82	13409.4	3942.61	9466.83	13508.1	9565.46
13	9.70422	130202	5.37997	Parent	0	8.5	1037.02	1401.03	13319.6	3945.09	9374.48	13417.2	9472.14
14	9.70422	129094	5.37997	Parent	0	8.5	1024.24	1383.77	13206.6	3947.56	9259.06	13303.1	9355.51
15	9.70422	127985	5.37997	Parent	0	8.5	1011.47	1366.51	13093.6	3950.03	9143.53	13188.8	9238.78

16	9.69803	126796	5.37896	Parent	0	8.5	998.69	1349.25	12980.6	3952.51	9028.08	13074.6	9122.12
17	9.69803	125689	5.37896	Parent	0	8.5	985.922	1332	12867.7	3954.99	8912.68	12960.5	9005.51
18	9.69803	128970	5.37896	Parent	0	8.5	1035.9	1399.52	13321.8	3957.47	9364.36	13419.4	9461.9
19	9.69803	130749	5.37896	Parent	0	8.5	1064.4	1438.02	13582	3959.95	9622.02	13682.2	9722.24
20	9.75245	130400	5.04908	Parent	0	8.5	1052.46	1421.89	13478.3	3964.2	9514.06	13571.2	9607.04
21	9.75245	129350	5.04908	Parent	0	8.5	1039.99	1405.05	13371.6	3970.23	9401.39	13463.5	9493.28
22	9.75245	128300	5.04908	Parent	0	8.5	1027.53	1388.22	13265.1	3976.26	9288.83	13355.9	9379.61
23	9.75245	127249	5.04908	Parent	0	8.5	1015.08	1371.39	13158.5	3982.29	9176.16	13248.1	9265.85
24	9.79845	126791	5.05594	Parent	0	8.5	1002.57	1354.49	13051.4	3988.29	9063.11	13140.1	9151.81
25	9.79845	125729	5.05594	Parent	0	8.5	990.045	1337.57	12944.1	3994.28	8949.87	13031.7	9037.46
26	9.79845	124667	5.05594	Parent	0	8.5	977.513	1320.64	12836.9	4000.26	8836.64	12923.4	8923.12
27	9.79845	123606	5.05594	Parent	0	8.5	964.989	1303.72	12729.6	4006.24	8723.4	12815	8808.78
28	10.7157	133962	5.04761	Parent	0	8.5	951.896	1286.03	12617.6	4012.55	8605.03	12701.7	8689.1
29	10.7157	132695	5.04761	Parent	0	8.5	938.21	1267.54	12500.4	4019.19	8481.26	12583.3	8564.13
30	10.7157	131427	5.04761	Parent	0	8.5	924.516	1249.04	12383.4	4025.83	8357.58	12465.1	8439.24
31	10.7384	145964	5.77752	Parent	0	8.5	1061.01	1433.44	13580.6	3989.22	9591.36	13687.9	9698.71
32	10.7384	159308	5.77752	Parent	0	8.5	1193.97	1613.08	14714.8	3921.43	10793.4	14835.6	10914.2
33	10.7384	158723	5.77752	Parent	0	8.5	1195.44	1615.06	14660.2	3853.63	10806.6	14781.2	10927.6
34	9.97019	146610	7.91541	Parent	0	8.5	1190.63	1608.56	14539.6	3776.48	10763.1	14705.1	10928.7
35	9.97019	145635	7.91541	Parent	0	8.5	1189.41	1606.91	14442	3689.98	10752.1	14607.4	10917.4
36	9.97019	144661	7.91541	Parent	0	8.5	1188.18	1605.25	14344.5	3603.48	10741	14509.7	10906.2
37	9.97019	143686	7.91541	Parent	0	8.5	1186.96	1603.6	14246.9	3516.98	10729.9	14412	10895
38	9.97019	142712	7.91541	Parent	0	8.5	1185.73	1601.94	14149.4	3430.48	10718.9	14314.2	10883.8
39	12.4627	177327	6.1203	Parent	0	8.5	1189.82	1607.47	14101.3	3345.54	10755.8	14228.9	10883.3
40	12.4627	176422	6.1203	Parent	0	8.5	1190.99	1609.05	14028.6	3262.15	10766.5	14156.3	10894.2
41	12.4627	175517	6.1203	Parent	0	8.5	1192.17	1610.64	13955.9	3178.76	10777.1	14083.7	10904.9
42	12.4627	174612	6.1203	Parent	0	8.5	1193.34	1612.23	13883.1	3095.37	10787.7	14011.1	10915.7
43	12.4627	173800	5.57729	Parent	0	8.5	1196.18	1616.06	13829	3015.71	10813.3	13945.8	10930.1
44	12.4627	173080	5.57729	Parent	0	8.5	1198.18	1618.76	13771.1	2939.77	10831.4	13888.1	10948.4
45	12.4627	172361	5.57729	Parent	0	8.5	1200.17	1621.45	13713.2	2863.83	10849.4	13830.4	10966.6
46	12.4627	172544	5.57729	Parent	0	8.5	1210.09	1634.85	13727	2787.89	10939.1	13845.1	11057.2
47	9.97017	138997	5.57729	Parent	0	8.5	1228.12	1659.22	13821.6	2719.54	11102	13941.5	11222
48	9.97017	139854	5.57729	Parent	0	8.5	1244.19	1680.92	13906	2658.79	11247.2	14027.5	11368.7
49	9.97017	140712	5.57729	Parent	0	8.5	1260.25	1702.62	13990.5	2598.04	11392.4	14113.6	11515.5
50	9.97017	141569	5.57729	Parent	0	8.5	1276.31	1724.32	14074.9	2537.28	11537.7	14199.6	11662.3
51	9.97017	142403	5.57729	Parent	0	8.5	1292.11	1745.66	14157	2476.53	11680.5	14283.2	11806.6
52	12.1349	172027	9.02445	Parent	0	8.5	1281.78	1731.71	13973.2	2386.02	11587.1	14176.7	11790.7
53	12.1349	169389	9.02445	Parent	0	8.5	1271.22	1717.44	13757.4	2265.76	11491.7	13959.3	11693.5
54	12.1349	167760	9.02445	Parent	0	8.5	1269.7	1715.39	13623.4	2145.5	11477.9	13825.1	11679.6
55	12.1349	166363	8.16154	Parent	0	8.5	1271.74	1718.15	13527.5	2031.07	11496.4	13709.9	11678.8
56	12.1349	165107	8.16154	Parent	0	8.5	1272.3	1718.9	13423.9	1922.47	11501.4	13606.4	11683.9
57	12.1349	163851	8.16154	Parent	0	8.5	1272.85	1719.65	13320.4	1813.87	11506.5	13502.9	11689
58	12.1349	162417	9.24441	Parent	0	8.5	1269.94	1715.72	13178.1	1697.95	11480.2	13384.8	11686.9
59	12.1349	160805	9.24441	Parent	0	8.5	1268.9	1714.31	13045.4	1574.71	11470.7	13252	11677.3
60	12.1349	159193	9.24441	Parent	0	8.5	1267.86	1712.9	12912.8	1451.46	11461.3	13119.1	11667.7
61	12.1349	157723	8.38252	Parent	0	8.5	1269.57	1715.22	12810.9	1334.05	11476.8	12997.9	11663.9
62	12.1349	156395	8.38252	Parent	0	8.5	1269.8	1715.53	12701.4	1222.47	11478.9	12888.5	11666
63	12.1349	155066	8.38252	Parent	0	8.5	1270.03	1715.84	12591.8	1110.89	11480.9	12779	11668.1
64	11.4876	145409	9.99321	Parent	0	8.5	1265.88	1710.23	12435.4	991.946	11443.4	12658.4	11666.5
65	11.4876	144069	9.99321	Parent	0	8.5	1266.93	1711.65	12318.6	865.638	11453	12541.8	11676.2
66	11.4876	142749	9.99321	Parent	0	8.5	1268.16	1713.31	12203.4	739.329	11464	12426.8	11687.5
67	11.4876	141428	9.99321	Parent	0	8.5	1269.4	1714.98	12088.2	613.021	11475.2	12311.9	11698.9
68	11.464	139821	9.99617	Parent	0	8.5	1270.62	1716.63	11973	486.824	11486.2	12197	11710.2
69	11.464	138505	9.99617	Parent	0	8.5	1271.85	1718.29	11858.1	360.737	11497.4	12082.3	11721.5
70	11.464	137189	9.99617	Parent	0	8.5	1273.07	1719.94	11743.1	234.649	11508.4	11967.5	11732.8
71	11.464	135873	9.99617	Parent	0	8.5	1274.3	1721.6	11628	108.562	11519.5	11852.6	11744.1
72	4.15928	48971.8	9.95334	Parent	0	8.5	1275.25	1722.89	11550.8	22.7458	11528.1	11774.6	11751.9
73	10.4242	121982	9.95334	Parent 5	285	8.5	1476.81	1995.2	11443.3	0	11443.3	11702.4	11702.4
74	10.4242	121386	9.95334	Parent 5	285	8.5	1470.61	1986.82	11387.2	0	11387.2	11645.2	11645.2
75	10.4242	121601	9.95334	Parent 5	285	8.5	1472.85	1989.85	11407.4	0	11407.4	11665.8	11665.8
76	10.4242	121830	9.95334	Parent 5	285	8.5	1475.23	1993.06	11428.9	0	11428.9	11687.8	11687.8

77	11.3582	133001	9.9852	Parent 5	285	8.5	1477.58	1996.24	11450.2	0	11450.2	11710.3	11710.3
78	11.3582	133268	9.9852	Parent 5	285	8.5	1480.13	1999.68	11473.2	0	11473.2	11733.8	11733.8
79	11.3582	136073	9.9852	Parent 5	285	8.5	1506.92	2035.88	11715.4	0	11715.4	11980.7	11980.7
80	11.3582	141005	9.9852	Parent 5	285	8.5	1554.04	2099.54	12141.4	0	12141.4	12415	12415
81	11.5778	148808	9.97941	Parent 5	285	8.5	1601.65	2163.86	12571.7	0	12571.7	12853.5	12853.5
82	11.5778	153935	9.97941	Parent 5	285	8.5	1649.69	2228.77	13006.1	0	13006.1	13296.3	13296.3
83	11.5778	159062	9.97941	Parent 5	285	8.5	1697.75	2293.69	13440.5	0	13440.5	13739.2	13739.2
84	11.5778	164189	9.97941	Parent 5	285	8.5	1745.8	2358.61	13874.8	0	13874.8	14182	14182
85	11.5943	169560	9.98559	Parent 5	285	8.5	1793.85	2423.53	14309.3	0	14309.3	14625.1	14625.1
86	11.5943	173404	9.98559	Parent 5	285	8.5	1829.83	2472.14	14634.5	0	14634.5	14956.7	14956.7
87	11.5943	174915	9.98559	Parent 5	285	8.5	1843.98	2491.25	14762.3	0	14762.3	15087	15087
88	11.5943	176378	9.98559	Parent 5	285	8.5	1857.67	2509.75	14886.2	0	14886.2	15213.3	15213.3
89	1.1209	17056.3	47.8771	Parent 5	1100	28	4743.27	6408.25	9983.38	0	9983.38	15228.6	15228.6
90	13.0374	188358	47.8771	Slide Mass 4	1500	15	3261.91	4406.91	10848.7	0	10848.7	14455.9	14455.9
91	13.0374	169256	47.8771	Slide Mass 4	1500	15	3023.5	4084.81	9646.65	0	9646.65	12990.1	12990.1
92	7.71887	90953.4	49.3993	Slide Mass 4	1500	15	2800.69	3783.79	8523.22	0	8523.22	11790.8	11790.8
93	10.8618	115845	49.3993	Slide Mass 3	2500	15	3221.92	4352.88	6915.07	0	6915.07	10674.1	10674.1
94	10.8618	101582	49.3993	Slide Mass 3	2500	15	3010.33	4067.02	5848.2	0	5848.2	9360.34	9360.34
95	5.80829	47757.2	50.7905	Slide Mass 3	2500	15	2801.68	3785.12	4796.12	0	4796.12	8230.16	8230.16
96	11.8171	81732.5	50.7905	Slide Mass 2	3500	15	3188.95	4308.33	3016.73	0	3016.73	6925.45	6925.45
97	11.8171	61041	50.7905	Slide Mass 2	3500	15	2909.46	3930.74	1607.54	0	1607.54	5173.68	5173.68
98	5.99034	23084.2	50.3344	Slide Mass 2	3500	15	2708.57	3659.33	594.612	0	594.612	3861.08	3861.08
99	11.7261	30052.3	50.3344	Slide Mass 1	1750	15	1456.13	1967.26	810.837	0	810.837	2566.9	2566.9
100	11.7261	10017.4	50.3344	Slide Mass 1	1750	15	1182.55	1597.65	-568.564	0	-568.564	857.57	857.57

Global Minimum Query (janbu simplified) - Safety Factor: 1.32519

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	14.7345	11054	-37.4726	Slide Mass	200	15	358.119	474.576	1024.73	0	1024.73	750.207	750.207
2	5.31502	9413.13	-37.4726	Slide Mass	200	15	571.919	757.901	2209.44	127.335	2082.11	1771.03	1643.69
3	3.89243	8718.42	-37.4726	Parent	535	28	1679.29	2225.38	3527.11	347.97	3179.14	2239.82	1891.85
4	11.9711	35747.3	-34.3923	Parent	535	28	1822.58	2415.26	4233.71	697.456	3536.26	2986.13	2288.67
5	11.9711	48870.5	-34.3923	Parent	535	28	2145.52	2843.22	5551.01	1209.88	4341.13	4082.36	2872.48
6	10.3928	52754.8	-32.5341	Parent	535	28	2377.49	3150.62	6592.68	1673.42	4919.26	5076.06	3402.64
7	10.3928	62014.3	-32.5341	Parent	535	28	2634.34	3491	7647.48	2088.06	5559.42	5967.01	3878.95
8	10.3928	71085.6	-32.5341	Parent	535	28	2881.43	3818.44	8677.98	2502.7	6175.28	6839.89	4337.19
9	10.7746	82970	-31.5332	Parent	535	28	3081.83	4084.01	9591.48	2916.78	6674.7	7700.47	4783.69
10	10.7746	92237	-31.5332	Parent	535	28	3319.52	4398.99	10597.4	3330.31	7267.08	8560.54	5230.23
11	10.7746	101480	-31.5332	Parent	535	28	3556	4712.38	11600.4	3743.84	7856.54	9418.42	5674.58
12	9.70422	131083	5.37997	Parent	0	8.5	1067.4	1414.51	13407.3	3942.61	9464.68	13507.8	9565.2
13	9.70422	130202	5.37997	Parent	0	8.5	1057	1400.72	13317.5	3945.09	9372.43	13417.1	9471.97
14	9.70422	129094	5.37997	Parent	0	8.5	1043.97	1383.46	13204.5	3947.56	9256.9	13302.8	9355.22
15	9.70422	127985	5.37997	Parent	0	8.5	1030.95	1366.2	13091.5	3950.03	9141.47	13188.6	9238.56
16	9.69803	126796	5.37896	Parent	0	8.5	1017.93	1348.95	12978.5	3952.51	9026.03	13074.4	9121.87
17	9.69803	125689	5.37896	Parent	0	8.5	1004.91	1331.7	12865.6	3954.99	8910.62	12960.2	9005.24
18	9.69803	128970	5.37896	Parent	0	8.5	1055.86	1399.21	13319.8	3957.47	9362.31	13419.2	9461.73
19	9.69803	130749	5.37896	Parent	0	8.5	1084.9	1437.7	13579.8	3959.95	9619.87	13682	9722.02
20	9.75245	130400	5.04908	Parent	0	8.5	1072.74	1421.59	13476.3	3964.2	9512.11	13571.1	9606.89

21	9.75245	129350	5.04908	Parent	0	8.5	1060.04	1404.76	13369.7	3970.23	9399.45	13463.3	9493.11
22	9.75245	128300	5.04908	Parent	0	8.5	1047.34	1387.93	13263.1	3976.26	9286.89	13355.7	9379.42
23	9.75245	127249	5.04908	Parent	0	8.5	1034.64	1371.1	13156.5	3982.29	9174.22	13247.9	9265.64
24	9.79845	126791	5.05594	Parent	0	8.5	1021.89	1354.2	13049.5	3988.29	9061.18	13139.9	9151.59
25	9.79845	125729	5.05594	Parent	0	8.5	1009.12	1337.28	12942.2	3994.28	8947.93	13031.5	9037.21
26	9.79845	124667	5.05594	Parent	0	8.5	996.355	1320.36	12835.1	4000.26	8834.81	12923.2	8922.96
27	9.79845	123606	5.05594	Parent	0	8.5	983.587	1303.44	12727.8	4006.24	8721.57	12814.8	8808.59
28	10.7157	133962	5.04761	Parent	0	8.5	970.246	1285.76	12615.8	4012.55	8603.26	12701.5	8688.96
29	10.7157	132695	5.04761	Parent	0	8.5	956.293	1267.27	12498.7	4019.19	8479.49	12583.1	8563.96
30	10.7157	131427	5.04761	Parent	0	8.5	942.34	1248.78	12381.6	4025.83	8355.82	12464.9	8439.05
31	10.7384	145964	5.77752	Parent	0	8.5	1081.42	1433.09	13578.3	3989.22	9589.04	13687.7	9698.46
32	10.7384	159308	5.77752	Parent	0	8.5	1216.96	1612.7	14712.2	3921.43	10790.8	14835.3	10913.9
33	10.7384	158723	5.77752	Parent	0	8.5	1218.44	1614.67	14657.6	3853.63	10804	14780.9	10927.3
34	9.97019	146610	7.91541	Parent	0	8.5	1213.43	1608.03	14536.1	3776.48	10759.6	14704.8	10928.3
35	9.97019	145635	7.91541	Parent	0	8.5	1212.19	1606.38	14438.6	3689.98	10748.6	14607.1	10917.1
36	9.97019	144661	7.91541	Parent	0	8.5	1210.94	1604.72	14340.9	3603.48	10737.4	14509.3	10905.8
37	9.97019	143686	7.91541	Parent	0	8.5	1209.69	1603.07	14243.4	3516.98	10726.4	14411.5	10894.6
38	9.97019	142712	7.91541	Parent	0	8.5	1208.45	1601.42	14145.8	3430.48	10715.3	14313.8	10883.3
39	12.4627	177327	6.1203	Parent	0	8.5	1212.7	1607.06	14098.6	3345.54	10753	14228.6	10883.1
40	12.4627	176422	6.1203	Parent	0	8.5	1213.89	1608.64	14025.8	3262.15	10763.7	14156	10893.8
41	12.4627	175517	6.1203	Parent	0	8.5	1215.09	1610.23	13953.1	3178.76	10774.3	14083.4	10904.6
42	12.4627	174612	6.1203	Parent	0	8.5	1216.29	1611.82	13880.3	3095.37	10784.9	14010.7	10915.4
43	12.4627	173800	5.57729	Parent	0	8.5	1219.21	1615.69	13826.6	3015.71	10810.8	13945.6	10929.9
44	12.4627	173080	5.57729	Parent	0	8.5	1221.24	1618.38	13768.6	2939.77	10828.8	13887.8	10948.1
45	12.4627	172361	5.57729	Parent	0	8.5	1223.28	1621.08	13710.7	2863.83	10846.8	13830.1	10966.3
46	12.4627	172544	5.57729	Parent	0	8.5	1233.39	1634.47	13724.4	2787.89	10936.5	13844.9	11057
47	9.97017	138997	5.57729	Parent	0	8.5	1251.77	1658.83	13819	2719.54	11099.4	13941.2	11221.7
48	9.97017	139854	5.57729	Parent	0	8.5	1268.14	1680.53	13903.4	2658.79	11244.6	14027.3	11368.5
49	9.97017	140712	5.57729	Parent	0	8.5	1284.51	1702.22	13987.9	2598.04	11389.9	14113.3	11515.3
50	9.97017	141569	5.57729	Parent	0	8.5	1300.89	1723.92	14072.2	2537.28	11535	14199.3	11662
51	9.97017	142403	5.57729	Parent	0	8.5	1316.99	1745.26	14154.3	2476.53	11677.8	14282.9	11806.4
52	12.1349	172027	9.02445	Parent	0	8.5	1306.27	1731.06	13968.8	2386.02	11582.8	14176.2	11790.2
53	12.1349	169389	9.02445	Parent	0	8.5	1295.5	1716.79	13753.1	2265.76	11487.3	13958.9	11693.1
54	12.1349	167760	9.02445	Parent	0	8.5	1293.97	1714.75	13619.1	2145.5	11473.6	13824.6	11679.1
55	12.1349	166363	8.16154	Parent	0	8.5	1296.09	1717.57	13523.6	2031.07	11492.5	13709.4	11678.4
56	12.1349	165107	8.16154	Parent	0	8.5	1296.66	1718.32	13420	1922.47	11497.6	13606	11683.5
57	12.1349	163851	8.16154	Parent	0	8.5	1297.23	1719.07	13316.5	1813.87	11502.6	13502.5	11688.6
58	12.1349	162417	9.24441	Parent	0	8.5	1294.2	1715.06	13173.6	1697.95	11475.7	13384.3	11686.3
59	12.1349	160805	9.24441	Parent	0	8.5	1293.14	1713.65	13041	1574.71	11466.3	13251.4	11676.7
60	12.1349	159193	9.24441	Parent	0	8.5	1292.07	1712.24	12908.3	1451.46	11456.9	13118.6	11667.2
61	12.1349	157723	8.38252	Parent	0	8.5	1293.87	1714.62	12806.9	1334.05	11472.8	12997.5	11663.5
62	12.1349	156395	8.38252	Parent	0	8.5	1294.1	1714.93	12697.3	1222.47	11474.8	12888	11665.5
63	12.1349	155066	8.38252	Parent	0	8.5	1294.34	1715.24	12587.8	1110.89	11476.9	12778.5	11667.6
64	11.4876	145409	9.99321	Parent	0	8.5	1290.02	1709.52	12430.6	991.946	11438.7	12657.9	11666
65	11.4876	144069	9.99321	Parent	0	8.5	1291.09	1710.94	12313.8	865.638	11448.1	12541.3	11675.6
66	11.4876	142749	9.99321	Parent	0	8.5	1292.34	1712.6	12198.7	739.329	11459.3	12426.4	11687
67	11.4876	141428	9.99321	Parent	0	8.5	1293.6	1714.27	12083.4	613.021	11470.4	12311.4	11698.4
68	11.464	139821	9.99617	Parent	0	8.5	1294.85	1715.92	11968.3	486.824	11481.5	12196.5	11709.7
69	11.464	138505	9.99617	Parent	0	8.5	1296.09	1717.57	11853.3	360.737	11492.5	12081.7	11721
70	11.464	137189	9.99617	Parent	0	8.5	1297.35	1719.23	11738.3	234.649	11503.6	11966.9	11732.3
71	11.464	135873	9.99617	Parent	0	8.5	1298.59	1720.88	11623.2	108.562	11514.7	11852.1	11743.6
72	4.15928	48971.8	9.95334	Parent	0	8.5	1299.56	1722.17	11546.1	22.7458	11523.3	11774.1	11751.4
73	10.4242	121982	9.95334	Parent 5	285	8.5	1504.98	1994.38	11437.7	0	11437.7	11701.8	11701.8
74	10.4242	121386	9.95334	Parent 5	285	8.5	1498.65	1986	11381.6	0	11381.6	11644.6	11644.6
75	10.4242	121601	9.95334	Parent 5	285	8.5	1500.93	1989.02	11401.9	0	11401.9	11665.3	11665.3
76	10.4242	121830	9.95334	Parent 5	285	8.5	1503.36	1992.24	11423.3	0	11423.3	11687.2	11687.2
77	11.3582	133001	9.9852	Parent 5	285	8.5	1505.75	1995.41	11444.6	0	11444.6	11709.7	11709.7
78	11.3582	133268	9.9852	Parent 5	285	8.5	1508.35	1998.85	11467.6	0	11467.6	11733.2	11733.2
79	11.3582	136073	9.9852	Parent 5	285	8.5	1535.65	2035.03	11709.7	0	11709.7	11980.1	11980.1
80	11.3582	141005	9.9852	Parent 5	285	8.5	1583.67	2098.67	12135.5	0	12135.5	12414.3	12414.3
81	11.5778	148808	9.97941	Parent 5	285	8.5	1632.19	2162.96	12565.7	0	12565.7	12852.9	12852.9

82	11.5778	153935	9.97941	Parent 5	285	8.5	1681.16	2227.85	12999.8	0	12999.8	13295.7	13295.7
83	11.5778	159062	9.97941	Parent 5	285	8.5	1730.12	2292.74	13434.1	0	13434.1	13738.5	13738.5
84	11.5778	164189	9.97941	Parent 5	285	8.5	1779.09	2357.63	13868.3	0	13868.3	14181.3	14181.3
85	11.5943	169560	9.98559	Parent 5	285	8.5	1828.05	2422.52	14302.5	0	14302.5	14624.4	14624.4
86	11.5943	173404	9.98559	Parent 5	285	8.5	1864.73	2471.12	14627.6	0	14627.6	14955.9	14955.9
87	11.5943	174915	9.98559	Parent 5	285	8.5	1879.13	2490.21	14755.4	0	14755.4	15086.2	15086.2
88	11.5943	176378	9.98559	Parent 5	285	8.5	1893.09	2508.71	14879.1	0	14879.1	15212.4	15212.4
89	1.1209	17056.3	47.8771	Parent 5	1100	28	4803.98	6366.19	9904.28	0	9904.28	15216.7	15216.7
90	13.0374	188358	47.8771	Slide Mass 4	1500	15	3312.51	4389.7	10784.5	0	10784.5	14447.6	14447.6
91	13.0374	169256	47.8771	Slide Mass 4	1500	15	3070.4	4068.87	9587.12	0	9587.12	12982.5	12982.5
92	7.71887	90953.4	49.3993	Slide Mass 4	1500	15	2843.65	3768.37	8465.63	0	8465.63	11783.3	11783.3
93	10.8618	115845	49.3993	Slide Mass 3	2500	15	3271.33	4335.13	6848.8	0	6848.8	10665.4	10665.4
94	10.8618	101582	49.3993	Slide Mass 3	2500	15	3056.5	4050.44	5786.32	0	5786.32	9352.32	9352.32
95	5.80829	47757.2	50.7905	Slide Mass 3	2500	15	2844.17	3769.06	4736.2	0	4736.2	8222.31	8222.31
96	11.8171	81732.5	50.7905	Slide Mass 2	3500	15	3237.31	4290.05	2948.52	0	2948.52	6916.52	6916.52
97	11.8171	61041	50.7905	Slide Mass 2	3500	15	2953.59	3914.06	1545.3	0	1545.3	5165.53	5165.53
98	5.99034	23084.2	50.3344	Slide Mass 2	3500	15	2749.8	3644	537.425	0	537.425	3853.62	3853.62
99	11.7261	30052.3	50.3344	Slide Mass 1	1750	15	1478.3	1959.03	780.097	0	780.097	2562.89	2562.89
100	11.7261	10017.4	50.3344	Slide Mass 1	1750	15	1200.55	1590.96	-593.534	0	-593.534	854.31	854.31

Global Minimum Query (spencer) - Safety Factor: 1.41003

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	9.28297	3084.94	-29.4572	Parent	535	28	691.188	974.596	826.76	0	826.76	436.387	436.387
2	13.065	14794.4	-29.4572	Parent	535	28	1003.09	1414.38	1884.67	230.794	1653.87	1318.14	1087.35
3	13.065	27015.9	-29.4572	Parent	535	28	1270.02	1790.77	3054.21	692.437	2361.77	2336.91	1644.48
4	11.8049	34481.6	-27.2224	Parent	535	28	1464.31	2064.72	3990.25	1113.27	2876.98	3236.98	2123.71
5	11.8049	43612.9	-27.2224	Parent	535	28	1677.85	2365.82	4936.56	1493.28	3443.28	4073.43	2580.15
6	11.8049	55649	-27.2224	Parent	535	28	2019.22	2847.16	6221.83	1873.3	4348.53	5183.1	3309.8
7	11.6049	66037	-24.2424	Parent	535	28	2254.59	3179.04	7199.6	2226.88	4972.72	6184.34	3957.46
8	11.6049	74437.9	-24.2424	Parent	535	28	2459.13	3467.45	8069.15	2554.04	5515.11	6961.78	4407.74
9	11.6049	82827.8	-24.2424	Parent	535	28	2663.21	3755.2	8937.52	2881.19	6056.33	7738.26	4857.07
10	11.6049	91217.7	-24.2424	Parent	535	28	2867.28	4042.95	9805.82	3208.34	6597.48	8514.66	5306.32
11	11.6054	99127.6	-21.4435	Parent	535	28	2949.21	4158.48	10329.4	3514.66	6814.75	9171.04	5656.38
12	11.6054	106550	-21.4435	Parent	535	28	3124.63	4405.82	11080.1	3800.16	7279.95	9852.84	6052.68
13	11.6054	113972	-21.4435	Parent	535	28	3300.04	4653.16	11830.8	4085.66	7745.14	10534.6	6448.97
14	11.6054	121393	-21.4435	Parent	535	28	3475.47	4900.51	12581.5	4371.15	8210.34	11216.4	6845.28
15	10.7411	115494	5.07054	Parent	0	8.5	655.407	924.144	10668.3	4484.66	6183.64	10726.5	6241.79
16	10.7411	114779	5.07054	Parent	0	8.5	654.602	923.009	10602.2	4426.17	6176.01	10660.3	6234.09
17	10.7411	113862	5.07054	Parent	0	8.5	651.827	919.095	10517.5	4367.69	6149.82	10575.3	6207.66
18	10.7411	112943	5.07054	Parent	0	8.5	649.028	915.149	10432.6	4309.2	6123.36	10490.2	6180.95
19	10.7411	112019	5.07054	Parent	0	8.5	646.186	911.141	10347.3	4250.71	6096.63	10404.7	6153.96
20	11.0197	146384	5.07054	Parent	0	8.5	951.575	1341.75	13179.7	4201.93	8977.81	13264.2	9062.24
21	11.0197	153704	5.07054	Parent	0	8.5	1020.74	1439.28	13838.9	4208.48	9630.39	13929.4	9720.96
22	11.0197	152358	5.07054	Parent	0	8.5	1007.19	1420.17	13717.7	4215.03	9502.63	13807	9591.99
23	11.0197	151011	5.07054	Parent	0	8.5	993.646	1401.07	13596.4	4221.58	9374.77	13684.5	9462.94
24	11.0197	149664	5.07054	Parent	0	8.5	980.1	1381.97	13475.1	4228.13	9247.01	13562.1	9333.97
25	10.6251	144088	5.07054	Parent	0	8.5	980.071	1381.93	13481.3	4234.57	9246.77	13568.3	9333.73
26	10.6251	149745	5.07054	Parent	0	8.5	1053.64	1485.66	14181.6	4240.88	9940.76	14275.1	10034.2
27	10.6251	148493	5.07054	Parent	0	8.5	1040.57	1467.24	14064.7	4247.2	9817.53	14157.1	9909.86

28	10.6251	147241	5.07054	Parent	0	8.5	1027.51	1448.82	13947.8	4253.52	9694.31	14039	9785.48
29	10.6251	145989	5.07054	Parent	0	8.5	1014.45	1430.4	13830.9	4259.84	9571.09	13920.9	9661.1
30	13.2813	180725	5.07054	Parent	0	8.5	999.752	1409.68	13699.3	4266.94	9432.37	13788	9521.07
31	13.2813	178769	5.07054	Parent	0	8.5	983.426	1386.66	13553.2	4274.84	9278.37	13640.5	9365.63
32	13.2813	176812	5.07054	Parent	0	8.5	967.093	1363.63	13407	4282.73	9124.31	13492.8	9210.11
33	13.2813	174856	5.07054	Parent	0	8.5	950.767	1340.61	13260.9	4290.63	8970.23	13345.2	9054.59
34	11.8585	154470	5.07054	Parent	0	8.5	935.313	1318.82	13122.5	4298.1	8824.41	13205.5	8907.4
35	11.8585	152911	5.07054	Parent	0	8.5	920.732	1298.26	12992.1	4305.15	8686.91	13073.8	8768.61
36	11.8585	155799	5.07054	Parent	0	8.5	943.888	1330.91	13206.7	4301.36	8905.32	13290.4	8989.07
37	11.8585	183080	5.07054	Parent	0	8.5	1174.61	1656.24	15317.9	4235.7	11082.2	15422.1	11186.4
38	11.8585	182586	5.07054	Parent	0	8.5	1177.19	1659.87	15276.5	4170.04	11106.5	15381	11211
39	14.1577	217339	5.07054	Parent	0	8.5	1180.02	1663.86	15231.2	4098.02	11133.2	15335.9	11237.9
40	14.1577	216634	5.07054	Parent	0	8.5	1183.09	1668.19	15181.8	4019.63	11162.2	15286.8	11267.1
41	14.1577	215930	5.07054	Parent	0	8.5	1186.17	1672.53	15132.4	3941.25	11191.1	15237.6	11296.4
42	14.1577	215225	5.07054	Parent	0	8.5	1189.24	1676.87	15083	3862.86	11220.1	15188.5	11325.7
43	13.3039	201565	5.26273	Parent	0	8.5	1191.17	1679.59	15023.8	3785.43	11238.4	15133.6	11348.1
44	13.3039	200868	5.26273	Parent	0	8.5	1193.77	1683.25	14971.9	3708.96	11262.9	15081.8	11372.9
45	13.3039	200171	5.26273	Parent	0	8.5	1196.36	1686.91	14919.9	3632.5	11287.4	15030.1	11397.6
46	13.3039	199474	5.26273	Parent	0	8.5	1198.96	1690.57	14867.9	3556.03	11311.9	14978.4	11422.3
47	10.8088	161178	8.14482	Parent	0	8.5	1186.1	1672.43	14660	3469.53	11190.5	14829.8	11360.2
48	10.8088	159973	8.14482	Parent	0	8.5	1184.67	1670.42	14550	3373	11177	14719.6	11346.6
49	10.8088	158813	8.14482	Parent	0	8.5	1183.68	1669.02	14444.1	3276.47	11167.7	14613.6	11337.1
50	10.8088	158711	8.14482	Parent	0	8.5	1192.87	1681.98	14434.3	3179.94	11254.4	14605.1	11425.1
51	10.8088	159055	8.14482	Parent	0	8.5	1206.35	1700.99	14465	3083.41	11381.6	14637.7	11554.3
52	12.3228	181500	9.63455	Parent	0	8.5	1212.78	1710.05	14412.1	2969.88	11442.2	14618	11648.1
53	12.3228	181442	9.63455	Parent	0	8.5	1226	1728.7	14406.3	2839.35	11567	14614.4	11775.1
54	12.3228	181368	9.63455	Parent	0	8.5	1239.11	1747.18	14399.4	2708.81	11690.6	14609.8	11901
55	12.3228	179437	9.63455	Parent	0	8.5	1236.6	1743.64	14245.3	2578.28	11667	14455.2	11876.9
56	12.3228	176503	9.63455	Parent	0	8.5	1225.68	1728.24	14011.6	2447.75	11563.9	14219.7	11772
57	12.3228	174614	9.63455	Parent	0	8.5	1223.52	1725.2	13860.8	2317.21	11543.5	14068.5	11751.2
58	12.3228	172819	9.63455	Parent	0	8.5	1222.16	1723.28	13717.4	2186.68	11530.7	13924.9	11738.2
59	12.3228	171023	9.63455	Parent	0	8.5	1220.8	1721.36	13574	2056.14	11517.9	13781.3	11725.1
60	12.3227	169227	9.63455	Parent	0	8.5	1219.44	1719.44	13430.7	1925.61	11505	13637.7	11712.1
61	12.3227	167432	9.63455	Parent	0	8.5	1218.07	1717.52	13287.3	1795.08	11492.2	13494.1	11699
62	12.3227	165637	9.63455	Parent	0	8.5	1216.71	1715.6	13143.9	1664.54	11479.4	13350.5	11685.9
63	12.3227	163842	9.63455	Parent	0	8.5	1215.35	1713.68	13000.5	1534.01	11466.5	13206.9	11672.8
64	12.3227	162047	9.63455	Parent	0	8.5	1213.99	1711.76	12857.2	1403.48	11453.7	13063.3	11659.8
65	12.3227	160252	9.63455	Parent	0	8.5	1212.63	1709.84	12713.8	1272.95	11440.9	12919.7	11646.7
66	12.3227	158457	9.63455	Parent	0	8.5	1211.27	1707.92	12570.4	1142.41	11428	12776.1	11633.6
67	12.3227	156803	9.63455	Parent	0	8.5	1211.09	1707.68	12438.3	1011.88	11426.4	12643.9	11632
68	10.7939	136197	9.63455	Parent	0	8.5	1212.91	1710.24	12332.9	889.443	11443.5	12538.8	11649.4
69	10.7939	135125	9.63455	Parent	0	8.5	1214.65	1712.69	12235	775.105	11459.9	12441.2	11666.1
70	10.7939	134053	9.63455	Parent	0	8.5	1216.39	1715.14	12137	660.767	11476.3	12343.5	11682.7
71	10.7939	132981	9.63455	Parent	0	8.5	1218.12	1717.59	12039.1	546.428	11492.7	12245.9	11699.5
72	11.5174	140709	9.66072	Parent	0	8.5	1219.79	1719.94	11936.4	428.089	11508.3	12144.1	11716
73	11.5174	139480	9.66072	Parent	0	8.5	1221.61	1722.5	11831.3	305.749	11525.6	12039.3	11733.5
74	11.5174	138252	9.66072	Parent	0	8.5	1223.43	1725.07	11726.1	183.409	11542.7	11934.4	11751
75	11.5174	137024	9.66072	Parent	0	8.5	1225.24	1727.63	11620.9	61.0694	11559.9	11829.5	11768.4
76	11.5174	136103	9.66072	Parent 5	285	8.5	1423.83	2007.64	11526.4	0	11526.4	11768.8	11768.8
77	11.5174	136354	9.66072	Parent 5	285	8.5	1426.08	2010.82	11547.7	0	11547.7	11790.5	11790.5
78	11.5174	136720	9.66072	Parent 5	285	8.5	1429.37	2015.46	11578.8	0	11578.8	11822.1	11822.1
79	11.5174	137086	9.66072	Parent 5	285	8.5	1432.66	2020.1	11609.9	0	11609.9	11853.8	11853.8
80	13.7208	163999	9.68003	Parent 5	285	8.5	1437.75	2027.27	11657.8	0	11657.8	11903.1	11903.1
81	13.7208	169405	9.68003	Parent 5	285	8.5	1478.54	2084.79	12042.7	0	12042.7	12294.9	12294.9
82	13.7208	176732	9.68003	Parent 5	285	8.5	1533.82	2162.73	12564.2	0	12564.2	12825.8	12825.8
83	13.7344	184210	9.84523	Parent 5	285	8.5	1588.02	2239.15	13075.5	0	13075.5	13351.1	13351.1
84	13.7344	191482	9.84523	Parent 5	285	8.5	1642.79	2316.38	13592.3	0	13592.3	13877.4	13877.4
85	13.7344	198753	9.84523	Parent 5	285	8.5	1697.57	2393.62	14109.1	0	14109.1	14403.7	14403.7
86	13.4215	201139	9.97223	Parent 5	285	8.5	1750.15	2467.76	14605.2	0	14605.2	14912.9	14912.9
87	13.4215	204740	9.97223	Parent 5	285	8.5	1777.89	2506.88	14866.9	0	14866.9	15179.5	15179.5
88	13.4215	206707	9.97223	Parent 5	285	8.5	1793.04	2528.24	15009.9	0	15009.9	15325.1	15325.1

89	3.37525	51679.5	46.0225	Parent 5	1100	28	4569.92	6443.72	10050.1	0	10050.1	14786.1	14786.1
90	13.5507	196144	46.0225	Slide Mass 4	1500	15	3074.3	4334.86	10579.8	0	10579.8	13765.9	13765.9
91	13.5507	177145	46.0225	Slide Mass 4	1500	15	2865	4039.74	9478.44	0	9478.44	12447.6	12447.6
92	9.05199	107291	48.1013	Slide Mass 4	1500	15	2643.3	3727.13	8311.78	0	8311.78	11257.9	11257.9
93	10.7134	114933	48.1013	Slide Mass 3	2500	15	3080.79	4344	6881.89	0	6881.89	10315.6	10315.6
94	10.7134	101760	48.1013	Slide Mass 3	2500	15	2900.33	4089.55	5932.3	0	5932.3	9164.91	9164.91
95	7.1744	59634.9	50.177	Slide Mass 3	2500	15	2687.47	3789.41	4812.13	0	4812.13	8035.1	8035.1
96	11.6541	80976.9	50.177	Slide Mass 2	3500	15	3086.73	4352.38	3181.13	0	3181.13	6882.91	6882.91
97	11.6541	61301.3	50.177	Slide Mass 2	3500	15	2843.42	4009.3	1900.74	0	1900.74	5310.72	5310.72
98	6.90576	27040.9	50.177	Slide Mass 2	3500	15	2649.67	3736.11	881.19	0	881.19	4058.83	4058.83
99	11.7884	30197.5	50.177	Slide Mass 1	1750	15	1411.85	1990.75	898.493	0	898.493	2591.66	2591.66
100	11.7884	10065.8	50.177	Slide Mass 1	1750	15	1165.74	1643.73	-396.615	0	-396.615	1001.41	1001.41

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.35102

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	300.553	2597.76	0	0	0
2	315.288	2586.46	16640.1	0	0
3	320.603	2582.39	28560.3	0	0
4	324.495	2579.4	45303.8	0	0
5	336.466	2571.21	100878	0	0
6	348.437	2563.02	170947	0	0
7	358.83	2556.39	238372	0	0
8	369.223	2549.76	315352	0	0
9	379.615	2543.13	401629	0	0
10	390.39	2536.52	496959	0	0
11	401.165	2529.9	601402	0	0
12	411.939	2523.29	714925	0	0
13	421.643	2524.21	712809	0	0
14	431.348	2525.12	710677	0	0
15	441.052	2526.03	708524	0	0
16	450.756	2526.95	706351	0	0
17	460.454	2527.86	704161	0	0
18	470.152	2528.77	701950	0	0
19	479.85	2529.69	699808	0	0
20	489.548	2530.6	697705	0	0
21	499.301	2531.46	696332	0	0
22	509.053	2532.32	694929	0	0
23	518.806	2533.19	693497	0	0
24	528.558	2534.05	692036	0	0
25	538.356	2534.91	690523	0	0
26	548.155	2535.78	688980	0	0
27	557.953	2536.65	687408	0	0
28	567.752	2537.52	685807	0	0
29	578.468	2538.46	684041	0	0
30	589.183	2539.41	682240	0	0
31	599.899	2540.35	680404	0	0

32	610.637	2541.44	677015	0	0
33	621.376	2542.53	673820	0	0
34	632.114	2543.61	670699	0	0
35	642.084	2545	662387	0	0
36	652.055	2546.39	654199	0	0
37	662.025	2547.77	646133	0	0
38	671.995	2549.16	638191	0	0
39	681.965	2550.55	630372	0	0
40	694.428	2551.88	626322	0	0
41	706.891	2553.22	622383	0	0
42	719.353	2554.55	618557	0	0
43	731.816	2555.89	614843	0	0
44	744.279	2557.11	612886	0	0
45	756.741	2558.32	611025	0	0
46	769.204	2559.54	609259	0	0
47	781.667	2560.76	607599	0	0
48	791.637	2561.73	606359	0	0
49	801.607	2562.71	605197	0	0
50	811.577	2563.68	604111	0	0
51	821.548	2564.65	603104	0	0
52	831.518	2565.63	602173	0	0
53	843.653	2567.55	590762	0	0
54	855.788	2569.48	579638	0	0
55	867.922	2571.41	568754	0	0
56	880.057	2573.15	560608	0	0
57	892.192	2574.89	552649	0	0
58	904.327	2576.63	544878	0	0
59	916.462	2578.6	534225	0	0
60	928.597	2580.58	523822	0	0
61	940.732	2582.55	513668	0	0
62	952.867	2584.34	506131	0	0
63	965.001	2586.13	498793	0	0
64	977.136	2587.92	491653	0	0
65	988.624	2589.94	480990	0	0
66	1000.11	2591.97	470576	0	0
67	1011.6	2593.99	460409	0	0
68	1023.09	2596.02	450489	0	0
69	1034.55	2598.04	440829	0	0
70	1046.01	2600.06	431415	0	0
71	1057.48	2602.08	422248	0	0
72	1068.94	2604.1	413327	0	0
73	1073.1	2604.83	410187	0	0
74	1083.53	2606.66	404613	0	0
75	1093.95	2608.49	399077	0	0
76	1104.37	2610.32	393527	0	0
77	1114.8	2612.15	387963	0	0
78	1126.16	2614.15	381810	0	0
79	1137.52	2616.14	375639	0	0
80	1148.87	2618.14	369288	0	0
81	1160.23	2620.14	362619	0	0
82	1171.81	2622.18	355509	0	0
83	1183.39	2624.22	348069	0	0
84	1194.97	2626.26	340299	0	0
85	1206.54	2628.29	332200	0	0
86	1218.14	2630.33	323739	0	0
87	1229.73	2632.38	315032	0	0
88	1241.33	2634.42	306226	0	0
89	1252.92	2636.46	297327	0	0
90	1254.04	2637.7	290257	0	0
91	1267.08	2652.12	176278	0	0
92	1280.12	2666.53	76529.3	0	0

93	1287.83	2675.54	21341.4	0	0
94	1298.7	2688.21	-31373.4	0	0
95	1309.56	2700.88	-72861.7	0	0
96	1315.37	2708	-90771.1	0	0
97	1327.18	2722.49	-96869	0	0
98	1339	2736.97	-85850.8	0	0
99	1344.99	2744.19	-73958.5	0	0
100	1356.72	2758.34	-68389.5	0	0
101	1368.44	2772.48	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.32519

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	300.553	2597.76	0	0	0
2	315.288	2586.46	16851	0	0
3	320.603	2582.39	28892.7	0	0
4	324.495	2579.4	45953.3	0	0
5	336.466	2571.21	102464	0	0
6	348.437	2563.02	173635	0	0
7	358.83	2556.39	242050	0	0
8	369.223	2549.76	320128	0	0
9	379.615	2543.13	407605	0	0
10	390.39	2536.52	504222	0	0
11	401.165	2529.9	610050	0	0
12	411.939	2523.29	725057	0	0
13	421.643	2524.21	723162	0	0
14	431.348	2525.12	721249	0	0
15	441.052	2526.03	719312	0	0
16	450.756	2526.95	717352	0	0
17	460.454	2527.86	715372	0	0
18	470.152	2528.77	713370	0	0
19	479.85	2529.69	711446	0	0
20	489.548	2530.6	709567	0	0
21	499.301	2531.46	708417	0	0
22	509.053	2532.32	707235	0	0
23	518.806	2533.19	706021	0	0
24	528.558	2534.05	704775	0	0
25	538.356	2534.91	703475	0	0
26	548.155	2535.78	702143	0	0
27	557.953	2536.65	700779	0	0
28	567.752	2537.52	699383	0	0
29	578.468	2538.46	697839	0	0
30	589.183	2539.41	696257	0	0
31	599.899	2540.35	694636	0	0
32	610.637	2541.44	691495	0	0
33	621.376	2542.53	688578	0	0
34	632.114	2543.61	685736	0	0
35	642.084	2545	677684	0	0
36	652.055	2546.39	669755	0	0
37	662.025	2547.77	661949	0	0
38	671.995	2549.16	654265	0	0
39	681.965	2550.55	646704	0	0
40	694.428	2551.88	642977	0	0
41	706.891	2553.22	639361	0	0
42	719.353	2554.55	635858	0	0
43	731.816	2555.89	632468	0	0
44	744.279	2557.11	630835	0	0
45	756.741	2558.32	629299	0	0
46	769.204	2559.54	627858	0	0
47	781.667	2560.76	626527	0	0
48	791.637	2561.73	625553	0	0

49	801.607	2562.71	624660	0	0
50	811.577	2563.68	623848	0	0
51	821.548	2564.65	623117	0	0
52	831.518	2565.63	622467	0	0
53	843.653	2567.55	611396	0	0
54	855.788	2569.48	600610	0	0
55	867.922	2571.41	590064	0	0
56	880.057	2573.15	582256	0	0
57	892.192	2574.89	574635	0	0
58	904.327	2576.63	567201	0	0
59	916.462	2578.6	556887	0	0
60	928.597	2580.58	546822	0	0
61	940.732	2582.55	537006	0	0
62	952.867	2584.34	529806	0	0
63	965.001	2586.13	522805	0	0
64	977.136	2587.92	516002	0	0
65	988.624	2589.94	505660	0	0
66	1000.11	2591.97	495566	0	0
67	1011.6	2593.99	485719	0	0
68	1023.09	2596.02	476121	0	0
69	1034.55	2598.04	466781	0	0
70	1046.01	2600.06	457688	0	0
71	1057.48	2602.08	448842	0	0
72	1068.94	2604.1	440243	0	0
73	1073.1	2604.83	437220	0	0
74	1083.53	2606.66	431985	0	0
75	1093.95	2608.49	426786	0	0
76	1104.37	2610.32	421574	0	0
77	1114.8	2612.15	416348	0	0
78	1126.16	2614.15	410565	0	0
79	1137.52	2616.14	404764	0	0
80	1148.87	2618.14	398790	0	0
81	1160.23	2620.14	392510	0	0
82	1171.81	2622.18	385808	0	0
83	1183.39	2624.22	378788	0	0
84	1194.97	2626.26	371451	0	0
85	1206.54	2628.29	363796	0	0
86	1218.14	2630.33	355794	0	0
87	1229.73	2632.38	347553	0	0
88	1241.33	2634.42	339219	0	0
89	1252.92	2636.46	330793	0	0
90	1254.04	2637.7	323902	0	0
91	1267.08	2652.12	211605	0	0
92	1280.12	2666.53	113416	0	0
93	1287.83	2675.54	59127.3	0	0
94	1298.7	2688.21	7868.44	0	0
95	1309.56	2700.88	-32259.5	0	0
96	1315.37	2708	-49458.3	0	0
97	1327.18	2722.49	-53910.5	0	0
98	1339	2736.97	-41390.9	0	0
99	1344.99	2744.19	-28801.4	0	0
100	1356.72	2758.34	-22498.7	0	0
101	1368.44	2772.48	0	0	0

Global Minimum Query (spencer) - Safety Factor: 1.41003

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	192.315	2591.54	0	0	0
2	201.598	2586.3	10750.9	966.014	5.13448
3	214.663	2578.92	37763.2	3393.18	5.13447
4	227.728	2571.54	76893.1	6909.16	5.13447

5	239.532	2565.46	118411	10639.7	5.13447
6	251.337	2559.39	168196	15113.1	5.13447
7	263.142	2553.32	229816	20649.9	5.13447
8	274.747	2548.09	293604	26381.5	5.13447
9	286.352	2542.87	364310	32734.7	5.13446
10	297.957	2537.64	441921	39708.5	5.13448
11	309.562	2532.42	526439	47302.7	5.13447
12	321.167	2527.86	607750	54608.9	5.13448
13	332.773	2523.3	694519	62405.4	5.13447
14	344.378	2518.74	786746	70692.3	5.13447
15	355.983	2514.18	884430	79469.6	5.13447
16	366.724	2515.14	881302	79188.6	5.13447
17	377.466	2516.09	878229	78912.5	5.13447
18	388.207	2517.04	875207	78640.9	5.13447
19	398.948	2518	872235	78373.9	5.13447
20	409.689	2518.95	869314	78111.5	5.13448
21	420.708	2519.93	866914	77895.8	5.13447
22	431.728	2520.9	864631	77690.6	5.13447
23	442.748	2521.88	862317	77482.7	5.13447
24	453.768	2522.86	859973	77272.1	5.13447
25	464.787	2523.84	857597	77058.7	5.13448
26	475.413	2524.78	855301	76852.3	5.13447
27	486.038	2525.72	853126	76656.9	5.13447
28	496.663	2526.67	850923	76458.9	5.13447
29	507.288	2527.61	848691	76258.4	5.13447
30	517.913	2528.55	846431	76055.3	5.13447
31	531.194	2529.73	843565	75797.8	5.13447
32	544.476	2530.91	840654	75536.2	5.13447
33	557.757	2532.09	837699	75270.7	5.13447
34	571.038	2533.27	834700	75001.2	5.13447
35	582.897	2534.32	831983	74757.1	5.13447
36	594.755	2535.37	829232	74509.9	5.13447
37	606.614	2536.42	826529	74267	5.13447
38	618.472	2537.47	824341	74070.4	5.13447
39	630.331	2538.53	822227	73880.4	5.13447
40	644.489	2539.78	819800	73662.4	5.13447
41	658.646	2541.04	817478	73453.8	5.13448
42	672.804	2542.29	815262	73254.6	5.13447
43	686.962	2543.55	813152	73065	5.13447
44	700.266	2544.78	810588	72834.7	5.13448
45	713.569	2546	808123	72613.2	5.13447
46	726.873	2547.23	805756	72400.5	5.13447
47	740.177	2548.45	803487	72196.6	5.13447
48	750.986	2550	793629	71310.9	5.13448
49	761.795	2551.55	783926	70439	5.13447
50	772.604	2553.09	774376	69580.9	5.13448
51	783.412	2554.64	764940	68733	5.13447
52	794.221	2556.19	755603	67894	5.13447
53	806.544	2558.28	740399	66527.9	5.13447
54	818.867	2560.37	725371	65177.5	5.13447
55	831.19	2562.46	710518	63842.9	5.13447
56	843.512	2564.55	695957	62534.6	5.13447
57	855.835	2566.65	681750	61258	5.13447
58	868.158	2568.74	667832	60007.4	5.13447
59	880.481	2570.83	654197	58782.3	5.13447
60	892.804	2572.92	640845	57582.6	5.13448
61	905.126	2575.01	627777	56408.3	5.13447
62	917.449	2577.11	614991	55259.5	5.13448
63	929.772	2579.2	602489	54136.1	5.13447
64	942.095	2581.29	590270	53038.2	5.13447
65	954.417	2583.38	578334	51965.7	5.13447

66	966.74	2585.47	566682	50918.7	5.13447
67	979.063	2587.57	555312	49897.1	5.13448
68	991.385	2589.66	544217	48900.1	5.13447
69	1002.18	2591.49	534711	48046	5.13447
70	1012.97	2593.32	525403	47209.6	5.13447
71	1023.77	2595.15	516293	46391.1	5.13448
72	1034.56	2596.99	507382	45590.3	5.13447
73	1046.08	2598.95	498028	44749.9	5.13448
74	1057.6	2600.91	488902	43929.8	5.13447
75	1069.11	2602.87	480003	43130.2	5.13447
76	1080.63	2604.83	471331	42351	5.13447
77	1092.15	2606.79	465131	41793.9	5.13447
78	1103.67	2608.75	458916	41235.5	5.13447
79	1115.18	2610.71	452677	40674.9	5.13447
80	1126.7	2612.67	446416	40112.3	5.13447
81	1140.42	2615.01	438859	39433.3	5.13447
82	1154.14	2617.35	430961	38723.6	5.13447
83	1167.86	2619.69	422601	37972.4	5.13447
84	1181.6	2622.08	413246	37131.8	5.13447
85	1195.33	2624.46	403411	36248.1	5.13447
86	1209.07	2626.84	393097	35321.4	5.13448
87	1222.49	2629.2	382120	34335.1	5.13448
88	1235.91	2631.56	370898	33326.8	5.13449
89	1249.33	2633.92	359543	32306.4	5.13447
90	1252.71	2637.42	339813	30533.6	5.13447
91	1266.26	2651.46	232897	20926.8	5.13448
92	1279.81	2665.51	138613	12454.9	5.13445
93	1288.86	2675.6	78682.3	7069.93	5.13447
94	1299.57	2687.54	29512.9	2651.85	5.13446
95	1310.29	2699.48	-10251	-921.091	5.13445
96	1317.46	2708.08	-32373.3	-2908.87	5.13447
97	1329.11	2722.06	-40860.4	-3671.47	5.13447
98	1340.77	2736.03	-34288.1	-3080.92	5.13446
99	1347.67	2744.32	-23287.8	-2092.51	5.13449
100	1359.46	2758.45	-19346.6	-1738.37	5.13447
101	1371.25	2772.59	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates

X	Y
0	2400
325	2400
2100	2400
2100	2637
2100	2643
2100	2693
2100	2743
2100	2793
2100	2843
2100	2863
2100	2893
1740	2890
1733	2880
1725	2870
1715	2860
1705	2850
1688	2840
1670	2830
1655	2820
1635	2800
1620	2790
1555	2780
1307	2770
1258	2760
1220	2750
1137	2710
1085	2700
981	2690
848	2680
848	2680.01
848.017	2680.01
848	2680
830	2680
770	2670
605	2660
605	2638
588.901	2638
552.82	2638
474	2638
474	2632
412	2632
412	2602
408	2602
368	2601
264	2596
250	2592
0	2590

	X	Y
	250	2592
	336.843	2580.18
	408	2575.83
	410.443	2575.83
	412	2575.83
	426.415	2575
	520	2575
	639.276	2579.23
	748.665	2582.59
	929.108	2591.46
	1070.69	2604.83
	1153.89	2619.43
	1184.94	2624.6
	1232.69	2633.27
	1269.97	2641.01
	1295.65	2647.01
	1331.37	2655.36
	1352.55	2660.31
	1436.77	2682.3
	1456.52	2690.28
	1501.45	2711.7
	1533.28	2726.88
	1538.15	2730.43
	1571.12	2754.42
	1620	2790

	X	Y
	325	2400
Material Boundary	1859.05	2604.83
	2100	2637

	X	Y
	1533.28	2726.88
Material Boundary	1628.48	2735.95
	1772.43	2843
	2100	2843

	X	Y
	1456.52	2690.28
	1643.59	2684.57
Material Boundary	1725.74	2743
	1790.67	2793
	2100	2793

	X	Y
	1070.69	2604.83
Material Boundary	1142.96	2604.83
	1796.72	2604.83
	1859.05	2604.83

	X	Y
Material Boundary	625.172	2617.99
	635.144	2604.99

	X	Y
	605	2638
Material Boundary	608.98	2632.63
	625.172	2617.99

	X	Y
Material Boundary	1751.38	2697.67
	1807.8	2743

	X	Y
Material Boundary	1807.8	2743
	2100	2743

	X	Y
Material Boundary	1733	2880
	2100	2863

	X	Y
Material Boundary	1643.59	2684.57
	1671.74	2687.99
	1751.38	2697.67

	X	Y
Material Boundary	1295.65	2647.01
	1778.84	2647.01
	1872.68	2683.69
	2100	2693

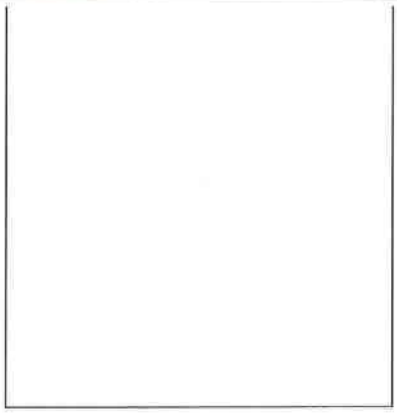
	X	Y
Material Boundary	635.144	2604.99
	1070.69	2604.83

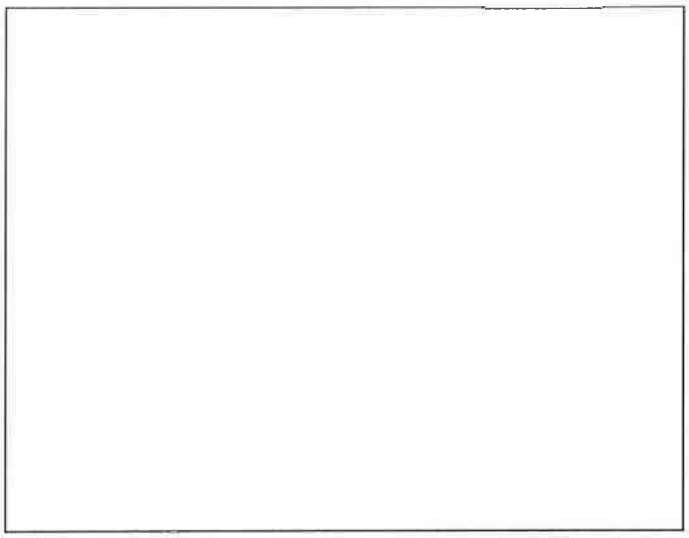
	X	Y
Material Boundary	608.98	2632.63
	771.118	2643.71
	889.239	2652.93
	1040.2	2662.15
	1107.04	2671.94
	1160.05	2685.77
	1183.23	2698.93
	1210.76	2717.23
	1263.67	2735.82

	X	Y
Material Boundary	1263.67	2735.82
	1311.94	2742.7
	1571.12	2754.42

	X	Y
Material Boundary	1183.23	2698.93
	1254.6	2705.68

	X	Y
Material Boundary	625.172	2617.99
	903.806	2628.93
	1042.92	2628.93
	1089.74	2628.93
	1232.69	2633.27





	X	Y
Material Boundary	1089.74	2628.93
	1150.23	2649.7
	1191.06	2667.09
	1259.1	2673.9
	1340.76	2678.55
	1436.77	2682.3

	X	Y
Material Boundary	1254.6	2705.68
	1412.45	2711.7
	1501.45	2711.7

Scenario-based Entities

Type	Coordinates	Master Scenario
		Assigned to materials:
Water Table	X: 0, Y: 2586 X: 413.466, Y: 2586.61 X: 598.915, Y: 2604.83 X: 2100, Y: 2604.83	Slide Mass Slide Mass 1 Slide Mass 2 Slide Mass 3 Slide Mass 4 Slide Mass 5 *... and 7 more*
Distributed Load	X: 474, Y: 2638 X: 605, Y: 2638	Constant Distribution Orientation: Vertical Magnitude: 200 lbs/ft2 Creates Excess Pore Pressure: No

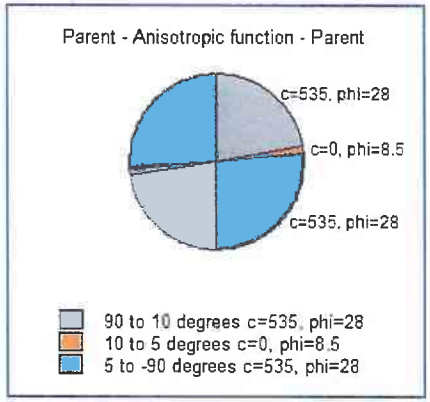
APPENDIX

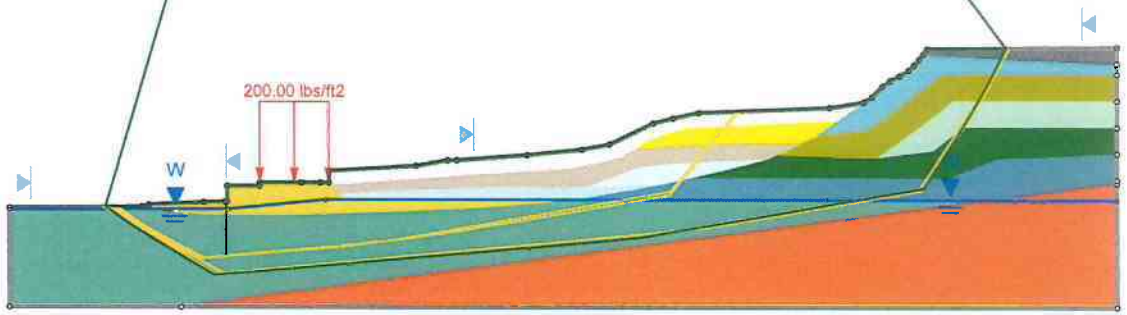
A-3 Proposed Profile with Reinforcement - Static

Project No. 2180187

1.464

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Ru
Basalt Cao		165	Mohr-Coulomb	7S000	45		None	0
Slide Mass		125	Mohr-Coulomb	200	15		Water Surface	
Slide Mass 1		125	Mohr-Coulomb	1750	1S		Water Surface	
Slide Mass 2		125	Mohr-Coulomb	3500	15		Water Surface	
Slide Mass 3		125	Mohr-Coulomb	2500	1S		Water Surface	
Slide Mass 4		125	Mohr-Coulomb	1500	15		Water Surface	
Slide Mass S		125	Mohr-Coulomb	7S0	15		Water Surface	
Parent		125	Anisotropic function			Parent	Water Surface	
Parent 1		125	Anisotropic function			Parent 1	Water Surface	
Parent 2		125	Anisotropic function			Parent 2	Water Surface	
Parent 3		125	Anisotropic function			Parent 3	Water Surface	
Parent 4		125	Anisotropic function			Parent 4	Water Surface	
Parent S		125	Anisotropic function			Parent S	Water Surface	
Sandstone		130	Mohr-Coulomb	3000	44		Water Surface	
Cut off wall		150	Mohr-Coulomb	30000	0		Water Surface	





4500
4000
3500
3000
2500
-500
0
500
1000
1500
2000
2500
3000

AGEC
Applied GeoTech

SLIDEINTERPRET 8.014

Project	Blackstone Hotel - proposed profile, static, un-saturated soil, with reinforcement		
Analysis Description			
Drawn By		Scale 1:4368	Company
Date	9/21/2019 9:30:55 AM		File Name Unsaturated Building Profile A with reinforcement.slmd

Slide Analysis Information

Unsaturated Building Profile A with reinforcement

Project Summary

File Name:	Unsaturated Building Profile A with reinforcement.slmd
Slide Modeler Version:	8.014
Compute Time:	00h:00m:3S.483s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	10/19/2018, 3:12:08 PM

General Settings

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

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
	Janbu simplified
	Spencer
Number of slices:	100
Tolerance:	0.005
Maximum number of iterations:	7S
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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Simulated Annealing Search
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1

Distribution:	Constant
Magnitude [psf]:	200
Orientation:	Vertical

Materials

Property	Basalt Cap	Slide Mass	Slide Mass 1	Slide Mass 2	Slide Mass 3	Slide Mass 4	Slide Mass 5	Parent
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	165	125	125	125	125	125	125	125
Cohesion [psf]	75000	200	1750	3500	2500	1500	750	
Friction Angle [°]	45	15	15	15	15	15	15	
Water Surface	None	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value		1	1	1	1	1	1	1
Ru Value	0							

Anisotropic Functions

Name: Parent 5

Angle From	Angle To	c	phi
-90	5	1100	28
5	10	285	8.5
10	90	1100	28

Name: Parent 4

Angle From	Angle To	c	phi
-90	5	1850	28
5	10	750	8.5
10	90	1850	28

Name: Parent 3

Angle From	Angle To	c	phi
-90	5	3100	28
5	10	1600	8.5
10	90	3100	28

Name: Parent 2

Angle From	Angle To	c	phi
-90	5	4600	28
5	10	2500	8.5
10	90	4600	28

Name: Parent 1

Angle From	Angle To	c	phi
-90	5	2200	28
5	10	1140	8.5
10	90	2200	28

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Property	Parent 1	Parent 2	Parent 3	Parent 4	Parent 5	Sandstone	Cut off wall
Color							
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	125	125	125	125	130	150
Cohesion [psf]						3000	30000
Friction Angle [°]						44	0
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1

Anisotropic Functions

Name: Parent 5

Angle From	Angle To	c	phi
-90	5	1100	28
5	10	285	8.5
10	90	1100	28

Name: Parent 4

Angle From	Angle To	c	phi
-90	5	1850	28
5	10	750	8.5
10	90	1850	28

Name: Parent 3

Angle From	Angle To	c	phi
-90	5	3100	28
5	10	1600	8.5
10	90	3100	28

Name: Parent 2

Angle From	Angle To	c	phi
-90	5	4600	28
5	10	2500	8.5
10	90	4600	28

Name: Parent 1

Angle From	Angle To	c	phi
-90	5	2200	28
5	10	1140	8.5
10	90	2200	28

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Global Minimums

Method: bishop simplified

FS	**1.395260**
Axis Location:	603.712, 3871.603
Left Slip Surface Endpoint:	190.438, 2591.524
Right Slip Surface Endpoint:	1379.811, 2772.936
Resisting Moment:	4.19513e+09 lb-ft
Driving Moment:	3.00669e+09 lb-ft
Total Slice Area:	131682 ft2
Surface Horizontal Width:	1189.37 ft
Surface Average Height:	110.715 ft

Method: janbu simplified

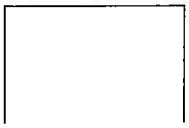
FS	**1.363340**
Axis Location:	603.712, 3871.603
Left Slip Surface Endpoint:	190.438, 2591.524
Right Slip Surface Endpoint:	1379.811, 2772.936
Resisting Horizontal Force:	2.76218e+06 lb
Driving Horizontal Force:	2.02605e+06 lb
Total Slice Area:	131682 ft2
Surface Horizontal Width:	1189.37 ft
Surface Average Height:	110.715 ft

Method: spencer

FS	**1.464150**
Axis Location:	736.044, 4449.873
Left Slip Surface Endpoint:	181.582, 2591.453
Right Slip Surface Endpoint:	1890.103, 2891.251
Resisting Moment:	1.44868e+10 lb-ft
Driving Moment:	9.89434e+09 lb-ft
Resisting Horizontal Force:	6.07724e+06 lb
Driving Horizontal Force:	4.1507e+06 lb
Total Slice Area:	287468 ft2
Surface Horizontal Width:	1708.52 ft
Surface Average Height:	168.256 ft

Global Minimum Coordinates

Method: bishop simplified



X	Y
190.438	2591.52
226.658	2568.88
262.878	2547.34
299.1	2527.84
335.321	2508.34
365.178	2492.26
409.845	2496.18
454.507	2500.1
499.164	2504.02
543.822	2507.94
588.48	2511.85
635.781	2516.01
686.864	2522.84
737.946	2529.78
789.115	2538.77
840.284	2547.79
885.783	2555.81
931.281	2563.82
976.78	2571.84
1022.28	2579.85
1062.02	2586.86
1101.77	2593.86
1139.99	2600.6
1178.1	2607.32
1215.71	2613.95
1253.33	2620.58
1291.96	2667.11
1330.59	2713.65
1355.2	2743.29
1379.81	2772.94

Method: janbu simplified

X	Y
190.438	2591.52
226.658	2568.88
262.878	2547.34
299.1	2527.84
335.321	2508.34
365.178	2492.26
409.845	2496.18
454.507	2500.1
499.164	2504.02
543.822	2507.94
588.48	2511.85
635.781	2516.01
686.864	2522.84
737.946	2529.78
789.115	2538.77
840.284	2547.79
885.783	2555.81
931.281	2563.82
976.78	2571.84
1022.28	2579.85
1062.02	2586.86
1101.77	2593.86
1139.99	2600.6
1178.1	2607.32
1215.71	2613.95
1253.33	2620.58
1291.96	2667.11
1330.59	2713.65
1355.2	2743.29
1379.81	2772.94

Method: spencer

X	Y
181.582	2591.45
234.069	2555.17
286.555	2522.29
339.042	2490.53
388.568	2460.95
477.718	2468.77
545.692	2474.73
612.39	2480.64
678.687	2486.52
729.439	2491.05
773.048	2494.93
818.688	2499.01
864.385	2503.09
907.963	2506.98
951.54	2510.87
996.992	2514.93
1042.44	2518.99
1118.39	2525.77
1194.33	2532.55
1270.27	2545.9
1316.33	2554.01
1361.94	2562.04
1427.74	2573.64
1493.6	2585.26
1553.28	2595.78
1613.33	2606.37
1673.78	2617.02
1734.33	2627.7
1764.12	2673.82
1793.91	2720.18
1824.97	2771.65
1856.03	2825.07
1890.1	2891.25

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 7708
Number of Invalid Surfaces: 15283

Error Codes:

Error Code -1000 reported for 15283 surfaces

Method: janbu simplified

Number of Valid Surfaces: 8758
Number of Invalid Surfaces: 14233

Error Codes:

Error Code -1000 reported for 14233 surfaces

Method: spencer

Number of Valid Surfaces: 6531
Number of Invalid Surfaces: 16460

Error Codes:

Error Code -1000 reported for 16460 surfaces

Error Codes

The following errors were encountered during the computation:

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.39526

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	8.36864	2771.55	-32.0131	Parent	535	28	668.366	932.545	747.674	0	747.674	329.819	329.819
2	13.9257	16898.4	-32.0131	Parent	535	28	973.241	1357.92	1819.94	272.243	1547.69	1211.48	939.236
3	13.9257	32247.3	-32.0131	Parent	535	28	1251.94	1746.78	3095.81	816.784	2279.02	2313.11	1496.32
4	12.0733	40101.2	-30.735	Parent	535	28	1483.7	2070.15	4200.77	1313.58	2887.19	3318.59	2005.01
5	12.0733	51091.9	-30.735	Parent	535	28	1710.77	2386.97	5245.67	1762.63	3483.04	4228.47	2465.84
6	12.0733	64927.5	-30.735	Parent	535	28	2053.83	2865.62	6594.94	2211.68	4383.26	5373.77	3162.09
7	12.0739	78678.2	-28.3007	Parent	535	28	2339.27	3263.89	7771.92	2639.6	5132.32	6512.32	3872.72
8	12.0739	89384.9	-28.3007	Parent	535	28	2569.21	3584.72	8782.07	3046.38	5735.69	7398.65	4352.27
9	12.0739	100073	-28.3007	Parent	535	28	2798.42	3904.52	9790.31	3453.17	6337.14	8283.47	4830.3
10	12.0738	110761	-28.3007	Parent	535	28	3027.61	4224.31	10798.5	3859.95	6938.56	9168.26	5308.31
11	12.0738	121449	-28.3007	Parent	535	28	3256.82	4544.11	11806.8	4266.74	7540.02	10053.1	5786.35
12	12.0738	132137	-28.3007	Parent	535	28	3486.02	4863.9	12815	4673.52	8141.49	10937.9	6264.41
13	14.9285	178155	-28.3007	Parent	535	28	3742.31	5221.5	13942.4	5128.39	8814.03	11927.3	6798.94
14	14.9285	194495	-28.3007	Parent	535	28	4025.71	5616.91	15189	5631.36	9557.65	13021.3	7389.96
15	11.1668	151188	5.01506	Parent	0	8.5	815.654	1138.05	13467.6	5852.77	7614.87	13539.2	7686.45
16	11.1668	150221	5.01506	Parent	0	8.5	812.852	1134.14	13381.4	5792.65	7588.73	13452.7	7660.06
17	11.1668	149243	5.01506	Parent	0	8.5	809.935	1130.07	13294	5732.52	7561.44	13365	7632.51
18	11.1668	153058	5.01506	Parent	0	8.5	852.565	1189.55	13631.9	5672.4	7959.48	13706.7	8034.29
19	11.1653	186399	5.01506	Parent	0	8.5	1174.78	1639.13	16591.8	5624.12	10967.7	16694.9	11070.8
20	11.1653	187510	5.01506	Parent	0	8.5	1184.56	1652.77	16690.4	5631.44	11058.9	16794.3	11162.9
21	11.1653	186142	5.01506	Parent	0	8.5	1170.79	1633.55	16569.1	5638.76	10930.4	16671.9	11033.1
22	11.1653	184775	5.01506	Parent	0	8.5	1157.01	1614.33	16447.8	5646.08	10801.7	16549.3	10903.2
23	11.1645	183394	5.01506	Parent	0	8.5	1143.23	1595.11	16326.6	5653.39	10673.2	16426.9	10773.5
24	11.1645	184153	5.01506	Parent	0	8.5	1155.07	1611.62	16444.4	5660.71	10783.7	16545.7	10885
25	11.1645	189032	5.01506	Parent	0	8.5	1216.5	1697.34	17025.2	5668.03	11357.2	17132	11464
26	11.1645	187665	5.01506	Parent	0	8.5	1202.74	1678.13	16904	5675.35	11228.6	17009.5	11334.2
27	11.1645	186298	5.01506	Parent	0	8.5	1188.96	1658.91	16782.7	5682.66	11100.1	16887	11204.4
28	11.1645	184931	5.01506	Parent	0	8.5	1175.19	1639.69	16661.5	5689.98	10971.5	16764.6	11074.6
29	11.1645	183563	5.01506	Parent	0	8.5	1161.42	1620.48	16540.2	5697.3	10842.9	16642.1	10944.8
30	11.1645	182196	5.01506	Parent	0	8.5	1147.64	1601.26	16418.9	5704.62	10714.3	16519.6	10815
31	11.1645	180829	5.01506	Parent	0	8.5	1133.87	1582.05	16297.7	5711.93	10585.7	16397.2	10685.2
32	11.1645	179462	5.01506	Parent	0	8.5	1120.1	1562.83	16176.4	5719.25	10457.2	16274.7	10555.5
33	11.1645	178094	5.01506	Parent	0	8.5	1106.32	1543.61	16055.2	5726.57	10328.6	16152.2	10425.7
34	11.1645	176727	5.01506	Parent	0	8.5	1092.56	1524.4	15933.9	5733.89	10200	16029.8	10295.9
35	11.8252	185695	5.01506	Parent	0	8.5	1078.37	1504.61	15809	5741.42	10067.6	15903.6	10162.2
36	11.8252	203963	5.01506	Parent	0	8.5	1233.44	1720.97	17219.7	5704.4	11515.3	17327.9	11623.5
37	11.8252	216315	5.01506	Parent	0	8.5	1342.73	1873.46	18175.2	5639.64	12535.6	18293.1	12653.4
38	11.8252	215841	5.01506	Parent	0	8.5	1345.35	1877.11	18134.9	5574.89	12560	18253	12678.1
39	12.7707	232096	7.61758	Parent	0	8.5	1339.6	1869.09	17995.6	5489.23	12506.4	18174.8	12685.5
40	12.7707	230605	7.61758	Parent	0	8.5	1338.52	1867.59	17879	5382.65	12496.3	18058	12675.3
41	12.7707	229114	7.61758	Parent	0	8.5	1337.45	1866.09	17762.4	5276.07	12486.3	17941.2	12665.2
42	12.7707	227623	7.61758	Parent	0	8.5	1336.37	1864.59	17645.8	5169.5	12476.3	17824.5	12655
43	12.7707	226111	7.73754	Parent	0	8.5	1334.91	1862.55	17524.7	5062.07	12462.6	17706	12644
44	12.7707	224576	7.73754	Parent	0	8.5	1333.66	1860.8	17404.7	4953.79	12450.9	17585.9	12632.1

45	12.7707	223042	7.73754	Parent	0	8.5	1332.4	1859.05	17284.8	4845.52	12439.2	17465.8	12620.3
46	12.7707	221507	7.73754	Parent	0	8.5	1331.15	1857.3	17164.7	4737.24	12427.5	17345.6	12608.3
47	12.7922	219934	9.97183	Parent	0	8.5	1322.65	1845.44	16961	4612.93	12348.1	17193.6	12580.6
48	12.7922	217578	9.97183	Parent	0	8.5	1318.03	1839	16777.6	4472.59	12305	17009.4	12536.8
49	12.7922	215486	9.97183	Parent	0	8.5	1315.6	1835.6	16614.6	4332.24	12282.3	16845.9	12513.6
50	12.7922	215021	9.97183	Parent	0	8.5	1326.53	1850.86	16576.3	4191.9	12384.4	16809.5	12617.6
51	12.7922	214830	9.9919	Parent	0	8.5	1339.69	1869.21	16558.6	4051.41	12507.2	16794.6	12743.2
52	12.7922	214636	9.9919	Parent	0	8.5	1352.87	1887.61	16541	3910.77	12630.2	16779.4	12868.6
53	12.7922	214441	9.9919	Parent	0	8.5	1366.06	1906.01	16523.5	3770.14	12753.4	16764.2	12994.1
54	12.7922	213145	9.9919	Parent	0	8.5	1370.19	1911.77	16421.5	3629.51	12791.9	16662.9	13033.3
55	11.3747	186620	9.9919	Parent	0	8.5	1357.3	1893.78	16168.3	3496.66	12671.6	16407.4	12910.7
56	11.3747	184707	9.9919	Parent	0	8.5	1352.77	1887.46	16000.9	3371.61	12629.3	16239.2	12867.6
57	11.3747	183073	9.9919	Parent	0	8.5	1350.82	1884.74	15857.6	3246.57	12611	16095.6	12849
58	11.3747	181440	9.9919	Parent	0	8.5	1348.86	1882.01	15714.3	3121.52	12592.8	15952	12830.5
59	11.3747	179807	9.9919	Parent	0	8.5	1346.91	1879.29	15571.1	2996.47	12574.7	15808.4	12812
60	11.3747	178173	9.9919	Parent	0	8.5	1344.96	1876.57	15427.8	2871.42	12556.4	15664.8	12793.4
61	11.3747	176540	9.9919	Parent	0	8.5	1343.01	1873.85	15284.6	2746.37	12538.3	15521.2	12774.9
62	11.3747	174906	9.9919	Parent	0	8.5	1341.06	1871.13	15141.3	2621.32	12520	15377.6	12756.3
63	11.3747	173273	9.9919	Parent	0	8.5	1339.11	1868.41	14998.1	2496.27	12501.9	15234.1	12737.8
64	11.3747	171640	9.9919	Parent	0	8.5	1337.16	1865.69	14854.8	2371.22	12483.6	15090.4	12719.2
65	11.3747	170006	9.9919	Parent	0	8.5	1335.21	1862.97	14711.6	2246.17	12465.5	14946.9	12700.7
66	11.3747	168373	9.9919	Parent	0	8.5	1333.26	1860.25	14568.3	2121.12	12447.2	14803.2	12682.1
67	11.3746	166807	9.9919	Parent	0	8.5	1331.93	1858.39	14430.9	1996.07	12434.8	14665.5	12669.4
68	11.3746	165489	9.9919	Parent	0	8.5	1332.91	1859.75	14314.8	1871.02	12443.8	14549.7	12678.7
69	11.3746	164195	9.9919	Parent	0	8.5	1334.09	1861.4	14200.9	1745.97	12454.9	14435.9	12690
70	11.3746	162901	9.9919	Parent	0	8.5	1335.27	1863.05	14086.9	1620.92	12465.9	14322.1	12701.2
71	13.2482	188100	9.99611	Parent	0	8.5	1336.54	1864.82	13963.3	1485.54	12477.8	14198.9	12713.4
72	13.2482	186343	9.99611	Parent	0	8.5	1337.92	1866.74	13830.4	1339.83	12490.6	14066.2	12726.4
73	13.2482	184586	9.99611	Parent	0	8.5	1339.28	1868.65	13697.6	1194.12	12503.5	13933.6	12739.5
74	13.2482	182828	9.99611	Parent	0	8.5	1340.66	1870.57	13564.7	1048.41	12516.3	13801	12752.6
75	13.2482	181145	9.99611	Parent	0	8.5	1342.62	1873.31	13437.3	902.701	12534.6	13673.9	12771.2
76	13.2482	180929	9.99611	Parent	0	8.5	1356.22	1892.28	13418.5	756.991	12661.5	13657.6	12900.6
77	12.741	174333	9.99611	Parent	0	8.5	1373.99	1917.07	13441.5	614.07	12827.4	13683.6	13069.6
78	12.741	174659	9.99611	Parent	0	8.5	1391.41	1941.38	13464	473.94	12990	13709.2	13235.3
79	12.741	175146	9.99611	Parent	0	8.5	1410.17	1967.55	13499	333.809	13165.2	13747.5	13413.7
80	11.9893	168858	9.99776	Parent	0	8.5	1459.93	2036.98	13827.6	197.801	13629.8	14085	13887.2
81	11.9893	174350	9.99776	Parent	0	8.5	1521.95	2123.52	14274.7	65.9156	14208.8	14543	14477.1
82	14.1347	212602	9.99776	Parent 5	285	8.5	1781.84	2486.13	14728.1	0	14728.1	15042.2	15042.2
83	12.5369	194957	9.99776	Parent 5	285	8.5	1835.4	2560.86	15228.1	0	15228.1	15551.7	15551.7
84	12.5369	200961	9.99776	Parent 5	285	8.5	1885.76	2631.12	15698.3	0	15698.3	16030.7	16030.7
85	12.5369	206966	9.99776	Parent 5	285	8.5	1936.11	2701.38	16168.4	0	16168.4	16509.7	16509.7
86	12.5369	212040	9.99776	Parent 5	285	8.5	1978.66	2760.75	16565.7	0	16565.7	16914.5	16914.5
87	12.5369	213998	9.99776	Parent 5	285	8.5	1995.08	2783.66	16718.9	0	16718.9	17070.6	17070.6
88	12.5369	215705	9.99776	Parent 5	285	8.5	2009.4	2803.63	16852.5	0	16852.5	17206.8	17206.8
89	17.0317	276571	50.2996	Parent 5	1100	28	4786.66	6678.64	10491.9	0	10491.9	16257.4	16257.4
90	10.8005	156640	50.2996	5lide Mass 4	1500	15	3137.01	4376.95	10736.9	0	10736.9	14515.4	14515.4
91	10.8005	142053	50.2996	5lide Mass 4	1500	15	2926.24	4082.86	9639.33	0	9639.33	13164	13164
92	7.54666	90599.8	50.3008	5lide Mass 4	1500	15	2747.18	3833.03	8707.02	0	8707.02	12016.1	12016.1
93	13.3719	142689	50.3008	Slide Mass 3	2500	15	3121.35	4355.1	6923.32	0	6923.32	10683.1	10683.1
94	13.3719	117243	50.3008	Slide Mass 3	2500	15	2824.38	3940.74	5376.9	0	5376.9	8778.98	8778.98
95	4.34115	32467.5	50.3008	5lide Mass 2	3500	15	3205.66	4472.73	3630.29	0	3630.29	7491.63	7491.63
96	12.3055	77127.9	50.3008	5lide Mass 2	3500	15	3016.63	4208.98	2645.96	0	2645.96	6279.61	6279.61
97	12.3055	55091.4	50.3008	5lide Mass 2	3500	15	2737.16	3819.05	1190.71	0	1190.71	4487.73	4487.73
98	1.17781	4117.48	50.3008	5lide	3500	15	2584.05	3605.42	393.441	0	393.441	3506.03	3506.03

99	11.7166	29966.7	50.3008	Mass 2 Slide	1750	15	1418.39	1979.02	854.705	0	854.705	2563.21	2563.21
100	11.7166	9988.9	50.3008	Mass 1 Slide	1750	15	1152.29	1607.74	-530.906	0	-530.906	857.073	857.073

Mass 1

Global Minimum Query (janbu simplified) - Safety Factor: 1.36334

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	8.36864	2771.55	-32.0131	Parent	535	28	689.76	940.378	762.405	0	762.405	331.175	331.175
2	13.9257	16898.4	-32.0131	Parent	535	28	1004.39	1369.33	1841.39	272.243	1569.15	1213.45	941.211
3	13.9257	32247.3	-32.0131	Parent	535	28	1292.01	1761.45	3123.4	816.784	2306.62	2315.65	1498.87
4	12.0733	40101.2	-30.735	Parent	535	28	1530.38	2086.43	4231.39	1313.58	2917.81	3321.45	2007.87
5	12.0733	51091.9	-30.735	Parent	535	28	1764.59	2405.74	5280.97	1762.63	3518.34	4231.78	2469.15
6	12.0733	64927.5	-30.735	Parent	535	28	2118.44	2888.16	6637.33	2211.68	4425.65	5377.73	3166.05
7	12.0739	78678.2	-28.3007	Parent	535	28	2410.62	3286.49	7814.44	2639.6	5174.84	6516.42	3876.82
8	12.0739	89384.9	-28.3007	Parent	535	28	2647.58	3609.55	8828.74	3046.38	5782.36	7403.12	4356.74
9	12.0739	100073	-28.3007	Parent	535	28	2883.77	3931.56	9841.14	3453.17	6387.97	8288.34	4835.17
10	12.0738	110761	-28.3007	Parent	535	28	3119.96	4253.57	10853.6	3859.95	6993.62	9173.59	5313.64
11	12.0738	121449	-28.3007	Parent	535	28	3356.15	4575.57	11866	4266.74	7599.23	10058.8	5792.08
12	12.0738	132137	-28.3007	Parent	535	28	3592.34	4897.58	12878.4	4673.52	8204.86	10944	6270.53
13	14.9285	178155	-28.3007	Parent	535	28	3856.46	5257.66	14010.4	5128.39	8882.03	11933.9	6805.49
14	14.9285	194495	-28.3007	Parent	535	28	4148.49	5655.8	15262.2	5631.36	9630.84	13028.4	7397.05
15	11.1668	151188	5.01506	Parent	0	8.5	834.546	1137.77	13465.8	5852.77	7613	13539	7686.24
16	11.1668	150221	5.01506	Parent	0	8.5	831.678	1133.86	13379.4	5792.65	7586.77	13452.4	7659.75
17	11.1668	149243	5.01506	Parent	0	8.5	828.693	1129.79	13292.1	5732.52	7559.56	13364.8	7632.28
18	11.1668	153058	5.01506	Parent	0	8.5	872.314	1189.26	13629.9	5672.4	7957.51	13706.5	8034.06
19	11.1653	186399	5.01506	Parent	0	8.5	1201.99	1638.72	16589	5624.12	10964.9	16694.5	11070.4
20	11.1653	187510	5.01506	Parent	0	8.5	1211.99	1652.36	16687.6	5631.44	11056.2	16794	11162.5
21	11.1653	186142	5.01506	Parent	0	8.5	1197.9	1633.14	16566.4	5638.76	10927.6	16671.5	11032.7
22	11.1653	184775	5.01506	Parent	0	8.5	1183.81	1613.93	16445.1	5646.08	10799	16549	10902.9
23	11.1645	183394	5.01506	Parent	0	8.5	1169.72	1594.72	16323.9	5653.39	10670.5	16426.6	10773.2
24	11.1645	184153	5.01506	Parent	0	8.5	1181.82	1611.22	16441.7	5660.71	10781	16545.4	10884.7
25	11.1645	189032	5.01506	Parent	0	8.5	1244.68	1696.92	17022.4	5668.03	11354.3	17131.6	11463.6
26	11.1645	187665	5.01506	Parent	0	8.5	1230.59	1677.71	16901.2	5675.35	11225.9	17009.2	11333.8
27	11.1645	186298	5.01506	Parent	0	8.5	1216.5	1658.5	16779.9	5682.66	11097.3	16886.7	11204
28	11.1645	184931	5.01506	Parent	0	8.5	1202.41	1639.29	16658.7	5689.98	10968.7	16764.2	11074.2
29	11.1645	183563	5.01506	Parent	0	8.5	1188.32	1620.08	16537.5	5697.3	10840.2	16641.8	10944.5
30	11.1645	182196	5.01506	Parent	0	8.5	1174.22	1600.86	16416.3	5704.62	10711.6	16519.3	10814.7
31	11.1645	180829	5.01506	Parent	0	8.5	1160.13	1581.65	16295	5711.93	10583.1	16396.8	10684.9
32	11.1645	179462	5.01506	Parent	0	8.5	1146.04	1562.44	16173.8	5719.25	10454.6	16274.4	10555.1
33	11.1645	178094	5.01506	Parent	0	8.5	1131.95	1543.23	16052.6	5726.57	10326	16151.9	10425.3
34	11.1645	176727	5.01506	Parent	0	8.5	1117.86	1524.02	15931.3	5733.89	10197.4	16029.4	10295.5
35	11.8252	185695	5.01506	Parent	0	8.5	1103.35	1504.24	15806.6	5741.42	10065.1	15903.4	10162
36	11.8252	203963	5.01506	Parent	0	8.5	1262	1720.54	17216.8	5704.4	11512.4	17327.6	11623.2
37	11.8252	216315	5.01506	Parent	0	8.5	1373.83	1873	18172.1	5639.64	12532.5	18292.7	12653.1
38	11.8252	215841	5.01506	Parent	0	8.5	1376.5	1876.64	18131.8	5574.89	12556.9	18252.6	12677.7
39	12.7707	232096	7.61758	Parent	0	8.5	1370.44	1868.38	17990.9	5489.23	12501.6	18174.2	12684.9
40	12.7707	230605	7.61758	Parent	0	8.5	1369.35	1866.89	17874.3	5382.65	12491.6	18057.4	12674.8
41	12.7707	229114	7.61758	Parent	0	8.5	1368.25	1865.39	17757.7	5276.07	12481.6	17940.7	12664.6
42	12.7707	227623	7.61758	Parent	0	8.5	1367.15	1863.89	17641.1	5169.5	12471.6	17823.9	12654.4
43	12.7707	226111	7.73754	Parent	0	8.5	1365.65	1861.84	17519.9	5062.07	12457.9	17705.5	12643.4
44	12.7707	224576	7.73754	Parent	0	8.5	1364.36	1860.09	17400	4953.79	12446.2	17585.4	12631.6
45	12.7707	223042	7.73754	Parent	0	8.5	1363.08	1858.34	17279.9	4845.52	12434.4	17465.1	12619.6
46	12.7707	221507	7.73754	Parent	0	8.5	1361.8	1856.59	17160	4737.24	12422.7	17345	12607.8
47	12.7922	219934	9.97183	Parent	0	8.5	1352.95	1844.53	16954.9	4612.93	12342	17192.8	12579.9
48	12.7922	217578	9.97183	Parent	0	8.5	1348.23	1838.09	16771.5	4472.59	12299	17008.6	12536
49	12.7922	215486	9.97183	Parent	0	8.5	1345.74	1834.7	16608.5	4332.24	12276.2	16845.1	12512.8
50	12.7922	215021	9.97183	Parent	0	8.5	1356.92	1849.95	16570.2	4191.9	12378.3	16808.8	12616.9
51	12.7922	214830	9.9919	Parent	0	8.5	1370.38	1868.29	16552.4	4051.41	12501	16793.8	12742.4

52	12.7922	214636	9.9919	Parent	0	8.5	1383.87	1886.68	16534.8	3910.77	12624	16778.6	12867.8
53	12.7922	214441	9.9919	Parent	0	8.5	1397.36	1905.07	16517.2	3770.14	12747.1	16763.4	12993.3
54	12.7922	213145	9.9919	Parent	0	8.5	1401.58	1910.83	16415.1	3629.51	12785.6	16662.1	13032.6
55	11.3747	186620	9.9919	Parent	0	8.5	1388.39	1892.85	16162	3496.66	12665.4	16406.6	12910
56	11.3747	184707	9.9919	Parent	0	8.5	1383.75	1886.52	15994.7	3371.61	12623.1	16238.5	12866.9
57	11.3747	183073	9.9919	Parent	0	8.5	1381.75	1883.8	15851.4	3246.57	12604.8	16094.8	12848.3
58	11.3747	181440	9.9919	Parent	0	8.5	1379.77	1881.09	15708.2	3121.52	12586.7	15951.3	12829.7
59	11.3747	179807	9.9919	Parent	0	8.5	1377.77	1878.37	15564.9	2996.47	12568.4	15807.6	12811.2
60	11.3747	178173	9.9919	Parent	0	8.5	1375.78	1875.65	15421.7	2871.42	12550.3	15664.1	12792.6
61	11.3747	176540	9.9919	Parent	0	8.5	1373.78	1872.93	15278.4	2746.37	12532	15520.4	12774.1
62	11.3747	174906	9.9919	Parent	0	8.5	1371.79	1870.21	15135.2	2621.32	12513.9	15376.9	12755.5
63	11.3747	173273	9.9919	Parent	0	8.5	1369.79	1867.49	14991.9	2496.27	12495.6	15233.2	12737
64	11.3747	171640	9.9919	Parent	0	8.5	1367.8	1864.77	14848.7	2371.22	12477.5	15089.7	12718.4
65	11.3747	170006	9.9919	Parent	0	8.5	1365.8	1862.05	14705.5	2246.17	12459.3	14946.1	12699.9
66	11.3747	168373	9.9919	Parent	0	8.5	1363.81	1859.33	14562.2	2121.12	12441.1	14802.5	12681.3
67	11.3746	166807	9.9919	Parent	0	8.5	1362.45	1857.48	14424.7	1996.07	12428.6	14664.7	12668.7
68	11.3746	165489	9.9919	Parent	0	8.5	1363.44	1858.83	14308.7	1871.02	12437.7	14548.9	12677.9
69	11.3746	164195	9.9919	Parent	0	8.5	1364.65	1860.48	14194.7	1745.97	12448.8	14435.2	12689.2
70	11.3746	162901	9.9919	Parent	0	8.5	1365.86	1862.13	14080.7	1620.92	12459.8	14321.4	12700.4
71	13.2482	188100	9.99611	Parent	0	8.5	1367.16	1863.9	13957.2	1485.54	12471.6	14198.1	12712.6
72	13.2482	186343	9.99611	Parent	0	8.5	1368.56	1865.81	13824.2	1339.83	12484.4	14065.5	12725.6
73	13.2482	184586	9.99611	Parent	0	8.5	1369.97	1867.73	13691.4	1194.12	12497.3	13932.9	12738.8
74	13.2482	182828	9.99611	Parent	0	8.5	1371.37	1869.64	13558.5	1048.41	12510.1	13800.2	12751.8
75	13.2482	181145	9.99611	Parent	0	8.5	1373.38	1872.38	13431.1	902.701	12528.4	13673.2	12770.4
76	13.2482	180929	9.99611	Parent	0	8.5	1387.29	1891.35	13412.3	756.991	12655.3	13656.8	12899.8
77	12.741	174333	9.99611	Parent	0	8.5	1405.46	1916.12	13435.1	614.07	12821.1	13682.9	13068.8
78	12.741	174659	9.99611	Parent	0	8.5	1423.28	1940.42	13457.5	473.94	12983.6	13708.4	13234.5
79	12.741	175146	9.99611	Parent	0	8.5	1442.46	1966.57	13492.5	333.809	13158.7	13746.7	13412.9
80	11.9893	168858	9.99776	Parent	0	8.5	1493.37	2035.97	13820.9	197.801	13623	14084.1	13886.3
81	11.9893	174350	9.99776	Parent	0	8.5	1556.82	2122.47	14267.7	65.9156	14201.8	14542.1	14476.2
82	14.1347	212602	9.99776	Parent 5	285	8.5	1822.66	2484.9	14719.9	0	14719.9	15041.2	15041.2
83	12.5369	194957	9.99776	Parent 5	285	8.5	1877.45	2559.6	15219.7	0	15219.7	15550.7	15550.7
84	12.5369	200961	9.99776	Parent 5	285	8.5	1928.95	2629.82	15689.6	0	15689.6	16029.6	16029.6
85	12.5369	206966	9.99776	Parent 5	285	8.5	1980.47	2700.05	16159.5	0	16159.5	16508.6	16508.6
86	12.5369	212040	9.99776	Parent 5	285	8.5	2023.99	2759.39	16556.6	0	16556.6	16913.4	16913.4
87	12.5369	213998	9.99776	Parent 5	285	8.5	2040.79	2782.29	16709.7	0	16709.7	17069.5	17069.5
88	12.5369	215705	9.99776	Parent 5	285	8.5	2055.43	2802.25	16843.3	0	16843.3	17205.6	17205.6
89	17.0317	276571	50.2996	Parent 5	1100	28	4857.95	6623.04	10387.3	0	10387.3	16238.7	16238.7
90	10.8005	156640	50.2996	5lide Mass 4	1500	15	3194.45	4355.12	10655.5	0	10655.5	14503.1	14503.1
91	10.8005	142053	50.2996	5lide Mass 4	1500	15	2979.81	4062.5	9563.39	0	9563.39	13152.5	13152.5
92	7.54666	90599.8	50.3008	5lide Mass 4	1500	15	2797.48	3813.92	8635.67	0	8635.67	12005.3	12005.3
93	13.3719	142689	50.3008	5lide Mass 3	2500	15	3178.5	4333.38	6842.3	0	6842.3	10670.9	10670.9
94	13.3719	117243	50.3008	5lide Mass 3	2500	15	2876.09	3921.09	5303.58	0	5303.58	8767.94	8767.94
95	4.34115	32467.5	50.3008	5lide Mass 2	3500	15	3264.36	4450.43	3547.05	0	3547.05	7479.1	7479.1
96	12.3055	77127.9	50.3008	5lide Mass 2	3500	15	3071.86	4188	2567.64	0	2567.64	6267.82	6267.82
97	12.3055	55091.4	50.3008	5lide Mass 2	3500	15	2787.28	3800.01	1119.64	0	1119.64	4477.03	4477.03
98	1.17781	4117.48	50.3008	5lide Mass 2	3500	15	2631.36	3587.44	326.346	0	326.346	3495.93	3495.93
99	11.7166	29966.7	50.3008	5lide Mass 1	1750	15	1444.36	1969.15	817.873	0	817.873	2557.66	2557.66
100	11.7166	9988.9	50.3008	5lide Mass 1	1750	15	1173.39	1599.73	-560.824	0	-560.824	852.568	852.568

Global Minimum Query (spencer) - Safety Factor: 1.46415

	Angle	Base	Base	Shear	Shear	Base	Pore	Effective	Base	Effective

Number	[ft]	[lbs]	of Slice Base [degrees]	Material	Cohesion [psf]	Friction Angle [degrees]	Stress [psf]	Strength [psf]	Normal Stress [psf]	Pressure [psf]	Normal Stress [psf]	Vertical Stress [psf]	Vertical Stress [psf]
1	7.48751	2449.96	-34.6524	Parent	535	28	644.978	944.344	769.864	0	769.864	324.052	324.052
2	14.9998	19648.3	-34.6524	Parent	535	28	962.796	1409.68	1969.17	324.138	1645.03	1303.68	979.54
3	14.9998	39312.8	-34.6524	Parent	535	28	1282.3	1877.48	3497.31	972.468	2524.84	2610.98	1638.51
4	14.9998	58977.3	-34.6524	Parent	535	28	1601.81	2345.29	5025.46	1620.8	3404.66	3918.28	2297.48
5	17.4956	92442	-32.0714	Parent	535	28	1874.07	2743.92	6442.2	2287.8	4154.4	5267.9	2980.1
6	17.4956	122563	-32.0714	Parent	535	28	2358.91	3453.8	8462.93	2973.48	5489.45	6984.82	4011.34
7	17.4956	150675	-32.0714	Parent	535	28	2789.93	4084.87	10335.5	3659.16	6676.33	8587.31	4928.15
8	17.4957	176076	-31.1716	Parent	535	28	3122.52	4571.84	11925.2	4333.02	7592.2	10036.3	5703.24
9	17.4957	201062	-31.1716	Parent	535	28	3477.38	5091.4	13564.4	4995.06	8569.34	11460.8	6465.72
10	17.4957	226048	-31.1716	Parent	535	28	3832.23	5610.96	15203.6	5657.1	9546.49	12885.3	7228.2
11	16.5087	236078	-30.8507	Parent	535	28	4160.69	6091.88	16747.5	6296.53	10451	14262.2	7965.7
12	16.5087	258041	-30.8507	Parent	535	28	4490.07	6574.13	18271.3	6913.37	11358	15589.3	8675.97
13	16.5087	279466	-30.8507	Parent	535	28	4804.34	7034.28	19753.6	7530.21	12223.4	16883.9	9353.65
14	22.2873	397065	5.01038	Parent	0	8.5	1015.58	1486.96	17728.1	7778.68	9949.47	17817.2	10038.5
15	22.2873	467048	5.01038	Parent	0	8.5	1340.15	1962.18	20839.6	7710.33	13129.3	20957.1	13246.8
16	22.2873	462920	5.01038	Parent	0	8.5	1319.93	1932.57	20656.2	7725.05	12931.1	20771.9	13046.8
17	22.2873	460265	5.01038	Parent	0	8.5	1309.76	1917.69	20571.3	7739.77	12831.5	20686.1	12946.3
18	16.9937	357906	5.01038	Parent	0	8.5	1366.75	2001.12	21142.6	7752.75	13389.8	21262.4	13509.7
19	16.9937	354741	5.01038	Parent	0	8.5	1346.77	1971.88	20958.1	7763.97	13194.1	21076.2	13312.2
20	16.9937	351577	5.01038	Parent	0	8.5	1326.8	1942.63	20773.6	7775.2	12998.4	20890	13114.8
21	16.9937	348412	5.01038	Parent	0	8.5	1306.82	1913.38	20589.2	7786.42	12802.7	20703.7	12917.3
22	16.6744	338773	5.06376	Parent	0	8.5	1286.87	1884.17	20404.3	7797.05	12607.3	20518.4	12721.3
23	16.6744	335693	5.06376	Parent	0	8.5	1267.17	1855.33	20221.4	7807.09	12414.3	20333.6	12526.6
24	16.6744	332614	5.06376	Parent	0	8.5	1247.47	1826.49	20038.4	7817.13	12221.3	20149	12331.8
25	16.6744	350064	5.06376	Parent	0	8.5	1346.54	1971.53	20987.5	7795.67	13191.8	21106.8	13311.1
26	16.5742	372046	5.07121	Parent	0	8.5	1491.56	2183.87	22316.3	7703.68	14612.6	22448.7	14745
27	16.5742	371080	5.07121	Parent	0	8.5	1494.95	2188.83	22257.7	7611.9	14645.8	22390.4	14778.5
28	16.5742	370114	5.07121	Parent	0	8.5	1498.34	2193.79	22199.1	7520.12	14679	22332	14811.9
29	16.5742	369148	5.07121	Parent	0	8.5	1501.72	2198.74	22140.5	7428.35	14712.1	22273.7	14845.4
30	16.9175	375790	5.0967	Parent	0	8.5	1505.05	2203.62	22080.1	7335.38	14744.8	22214.4	14879
31	16.9175	374768	5.0967	Parent	0	8.5	1508.46	2208.61	22019.4	7241.23	14778.2	22153.9	14912.7
32	16.9175	373745	5.0967	Parent	0	8.5	1511.87	2213.6	21958.6	7147.07	14811.6	22093.5	14946.4
33	21.8043	480199	5.0967	Parent	0	8.5	1515.77	2219.31	21889.1	7039.32	14849.7	22024.3	14984.9
34	21.8043	478561	5.0967	Parent	0	8.5	1520.45	2226.16	21813.5	6917.97	14895.5	21949.1	15031.1
35	15.2134	335003	5.0967	Parent	0	8.5	1538.17	2252.11	21884.2	6814.96	15069.3	22021.4	15206.5
36	15.2134	337245	5.0967	Parent	0	8.5	1561.64	2286.47	22029.4	6730.29	15299.1	22168.7	15438.4
37	15.2134	339486	5.0967	Parent	0	8.5	1585.1	2320.83	22174.7	6645.62	15529	22316	15670.4
38	15.2325	341997	5.10277	Parent	0	8.5	1607.5	2353.62	22309.3	6560.85	15748.4	22452.8	15892
39	15.2325	340746	5.10277	Parent	0	8.5	1607.77	2354.02	22227.1	6475.97	15751.2	22370.7	15894.7
40	15.2325	339405	5.10277	Parent	0	8.5	1607.45	2353.55	22139.1	6391.1	15748	22282.7	15891.6
41	21.7885	484773	5.10277	Parent	0	8.5	1614.58	2363.99	22105.8	6287.95	15817.8	22250	15962
42	21.7885	483936	5.10277	Parent	0	8.5	1622.98	2376.28	22066.6	6166.55	15900	22211.5	16045
43	21.7886	483100	5.10277	Parent	0	8.5	1631.36	2388.56	22027.4	6045.14	15982.3	22173.1	16127.9
44	21.7886	482262	5.10277	Parent	0	8.5	1639.76	2400.85	21988.2	5923.73	16064.4	22134.6	16210.9
45	15.1508	334849	5.10277	Parent	0	8.5	1646.87	2411.26	21954.9	5820.82	16134.1	22102	16281.2
46	15.1508	334445	5.10277	Parent	0	8.5	1652.71	2419.81	21927.8	5736.4	16191.4	22075.3	16338.9
47	15.1508	334374	5.10277	Parent	0	8.5	1660.77	2431.61	21922.2	5651.97	16270.3	22070.5	16418.6
48	15.1507	334570	5.10277	Parent	0	8.5	1670.62	2446.04	21934.4	5567.55	16366.8	22083.6	16516
49	15.1507	334767	5.10277	Parent	0	8.5	1680.47	2460.46	21946.4	5483.13	16463.3	22096.5	16613.3
50	15.1507	334963	5.10277	Parent	0	8.5	1690.32	2474.88	21958.5	5398.71	16559.8	22109.5	16710.7
51	18.9853	420019	5.10277	Parent	0	8.5	1701.42	2491.13	21972.1	5303.61	16668.5	22124.1	16820.4
52	18.9853	420328	5.10277	Parent	0	8.5	1713.76	2509.2	21987.3	5197.82	16789.5	22140.3	16942.5
53	18.9853	421883	5.10277	Parent	0	8.5	1732.75	2537	22067.5	5092.03	16975.4	22222.2	17130.1
54	18.9853	426398	5.10277	Parent	0	8.5	1767.5	2587.88	22302.1	4986.24	17315.9	22460	17473.7
55	18.9853	431041	5.10277	Parent	0	8.5	1802.93	2639.76	22543.5	4880.46	17663	22704.5	17824
56	18.9853	442459	5.10277	Parent	0	8.5	1874.46	2744.49	23138.5	4774.67	18363.8	23305.9	18531.2
57	18.9853	460149	5.10277	Parent	0	8.5	1979.41	2898.15	24060.9	4668.88	19392	24237.6	19568.7
58	18.9853	477839	5.10277	Parent	0	8.5	2084.35	3051.8	24983.2	4563.09	20420.1	25169.3	20606.2
59	18.9855	493585	9.97058	Parent	0	8.5	2165.75	3170.98	25623.6	4406.07	21217.5	26004.4	21598.3

60	18.9855	505310	9.97058	Parent	0	8.5	2248.57	3292.24	26226.7	4197.8	22028.9	26622	22424.2
61	18.9855	509858	9.97058	Parent	0	8.5	2293.47	3357.98	26458.3	3989.53	22468.8	26861.5	22872
62	18.9855	513238	9.97058	Parent	0	8.5	2332.21	3414.7	26629.6	3781.27	22848.3	27039.5	23258.3
63	15.3552	416163	9.98704	Parent	0	8.5	2357.98	3452.43	26693.5	3592.77	23100.7	27108.7	23515.9
64	15.3552	416988	9.98704	Parent	0	8.5	2380.28	3485.08	26743.2	3424.04	23319.2	27162.4	23738.4
65	15.3552	416921	9.98704	Parent	0	8.5	2396.75	3509.2	26735.9	3255.32	23480.6	27158	23902.7
66	15.2031	409217	9.98704	Parent	0	8.5	2390	3499.32	26501.9	3087.43	23414.5	26922.8	23835.3
67	15.2031	405295	9.98704	Parent	0	8.5	2380.87	3485.95	26245.4	2920.37	23325	26664.6	23744.3
68	15.2031	401372	9.98704	Parent	0	8.5	2371.74	3472.58	25988.9	2753.31	23235.6	26406.6	23653.3
69	16.4492	429847	9.9994	Parent	0	8.5	2362.17	3458.57	25721.1	2579.3	23141.8	26137.6	23558.3
70	16.4492	425248	9.9994	Parent	0	8.5	2352.27	3444.07	25443.2	2398.32	23044.8	25857.9	23459.6
71	16.4492	420648	9.9994	Parent	0	8.5	2342.37	3429.58	25165.2	2217.35	22947.8	25578.2	23360.8
72	16.4492	416049	9.9994	Parent	0	8.5	2332.47	3415.08	24887.2	2036.37	22850.8	25298.5	23262.1
73	16.4658	411861	9.9994	Parent	0	8.5	2322.56	3400.57	24609.1	1855.3	22753.8	25018.6	23163.3
74	16.4658	407252	9.9994	Parent	0	8.5	2312.65	3386.06	24330.8	1674.14	22656.7	24738.6	23064.4
75	16.4658	402643	9.9994	Parent	0	8.5	2302.74	3371.55	24052.5	1492.99	22559.5	24458.5	22965.6
76	16.4658	398034	9.9994	Parent	0	8.5	2292.83	3357.04	23774.3	1311.83	22462.5	24178.6	22866.7
77	19.8935	474748	9.9994	Parent	0	8.5	2281.88	3341.01	23467.1	1111.81	22355.3	23869.4	22757.6
78	19.8935	468020	9.9994	Parent	0	8.5	2269.9	3323.48	23130.8	892.941	22237.9	23531.1	22638.1
79	19.8935	461293	9.9994	Parent	0	8.5	2257.93	3305.95	22794.7	674.07	22120.6	23192.8	22518.7
80	17.1076	392993	9.9994	Parent	0	8.5	2256.65	3304.07	22578.6	470.524	22108.1	22976.5	22505.9
81	17.1076	392150	9.9994	Parent	0	8.5	2270.57	3324.46	22526.8	282.303	22244.5	22927.1	22644.8
82	17.1076	391328	9.9994	Parent	0	8.5	2284.62	3345.03	22476.2	94.0831	22382.1	22879	22784.9
83	8.72123	199177	9.9994	Parent 5	285	8.5	2481.57	3633.39	22404.6	0	22404.6	22842.2	22842.2
84	20.1514	465229	9.9994	Parent 5	285	8.5	2506.48	3669.87	22648.7	0	22648.7	23090.6	23090.6
85	20.1514	495924	9.9994	Parent 5	285	8.5	2659.24	3893.53	24145.3	0	24145.3	24614.1	24614.1
86	20.1514	530237	9.9994	Parent 5	285	8.5	2830.02	4143.57	25818.3	0	25818.3	26317.2	26317.2
87	20.1835	552351	9.9994	Parent 5	285	8.5	2935.71	4298.32	26853.8	0	26853.8	27371.4	27371.4
88	20.1835	575068	9.9994	Parent 5	285	8.5	3048.59	4463.59	27959.6	0	27959.6	28497.1	28497.1
89	20.1835	615311	9.9994	Parent 5	285	8.5	3248.55	4756.36	29918.5	0	29918.5	30491.3	30491.3
90	12.4727	395306	57.1397	Parent 5	1100	28	7862.45	11511.8	19581.8	0	19581.8	31753.8	31753.8
91	17.3178	505005	57.1397	Parent 4	1850	28	7599.73	11127.1	17447.8	0	17447.8	29213	29213
92	14.8959	388615	57.2729	Parent 4	1850	28	6871.47	10060.9	15442.4	0	15442.4	26134.7	26134.7
93	14.8959	346173	57.2729	Parent 4	1850	28	6209	9090.91	13618.2	0	13618.2	23279.6	23279.6
94	13.6652	279063	58.8931	Parent 4	1850	28	5426.79	7945.63	11464.2	0	11464.2	20457.8	20457.8
95	17.3921	300097	58.8931	Parent 3	3100	28	5239.05	7670.75	8596.33	0	8596.33	17278.8	17278.8
96	12.4127	175849	59.8297	Parent 3	3100	28	4473.73	6550.21	6488.92	0	6488.92	14184.7	14184.7
97	18.6449	202816	59.8297	Parent 2	4600	28	4365.99	6392.47	3371.15	0	3371.15	10881.6	10881.6
98	9.23008	71974.4	62.757	Parent 2	4600	28	3501.99	5127.44	991.974	0	991.974	7793.54	7793.54
99	15.5259	75031.9	62.757	Parent 1	2200	28	1910.4	2797.12	1123.02	0	1123.02	4833.41	4833.41
100	9.31753	13851	62.757	Basalt Cap	75000	45	22371.8	32755.7	-42244.4	0	-42244.4	1206.21	1206.21

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.39526

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	190.438	2591.52	0	0	0
2	198.807	2586.29	9486.87	0	0
3	212.732	2577.59	38840.4	0	0
4	226.658	2568.88	83170.3	0	0
5	238.731	2561.7	131181	0	0
6	250.805	2554.52	189425	0	0
7	262.878	2547.34	261483	0	0
8	274.952	2540.84	340162	0	0
9	287.026	2534.34	428176	0	0
10	299.1	2527.84	525503	0	0
11	311.174	2521.34	632143	0	0

12	323.247	2514.84	748096	0	0
13	335.321	2508.34	873362	0	0
14	350.25	2500.3	1.04112e+06	0	0
15	365.178	2492.26	1.22312e+06	0	0
16	376.345	2493.24	1.219e+06	0	0
17	387.512	2494.22	1.21493e+06	0	0
18	398.679	2495.2	1.21092e+06	0	0
19	409.845	2496.18	1.20705e+06	0	0
20	421.011	2497.16	1.20387e+06	0	0
21	432.176	2498.14	1.2007e+06	0	0
22	443.341	2499.12	1.19749e+06	0	0
23	454.507	2500.1	1.19426e+06	0	0
24	465.671	2501.08	1.19098e+06	0	0
25	476.836	2502.06	1.18772e+06	0	0
26	488	2503.04	1.18458e+06	0	0
27	499.164	2504.02	1.1814e+06	0	0
28	510.329	2505	1.17819e+06	0	0
29	521.493	2505.98	1.17495e+06	0	0
30	532.658	2506.96	1.17167e+06	0	0
31	543.822	2507.94	1.16835e+06	0	0
32	554.987	2508.92	1.165e+06	0	0
33	566.151	2509.89	1.16162e+06	0	0
34	577.316	2510.87	1.1582e+06	0	0
35	588.48	2511.85	1.15475e+06	0	0
36	600.305	2512.89	1.15105e+06	0	0
37	612.131	2513.93	1.14772e+06	0	0
38	623.956	2514.97	1.14469e+06	0	0
39	635.781	2516.01	1.14173e+06	0	0
40	648.552	2517.71	1.12804e+06	0	0
41	661.322	2519.42	1.11454e+06	0	0
42	674.093	2521.13	1.10123e+06	0	0
43	686.864	2522.84	1.0881e+06	0	0
44	699.634	2524.57	1.07469e+06	0	0
45	712.405	2526.31	1.06146e+06	0	0
46	725.176	2528.04	1.04843e+06	0	0
47	737.946	2529.78	1.03559e+06	0	0
48	750.739	2532.03	1.01431e+06	0	0
49	763.531	2534.28	993378	0	0
50	776.323	2536.53	972784	0	0
51	789.115	2538.77	952416	0	0
52	801.907	2541.03	932178	0	0
53	814.7	2543.28	912149	0	0
54	827.492	2545.54	892327	0	0
55	840.284	2547.79	872788	0	0
56	851.659	2549.79	855775	0	0
57	863.033	2551.8	839046	0	0
58	874.408	2553.8	822582	0	0
59	885.783	2555.81	806383	0	0
60	897.157	2557.81	790449	0	0
61	908.532	2559.81	774781	0	0
62	919.907	2561.82	759377	0	0
63	931.281	2563.82	744238	0	0
64	942.656	2565.83	729364	0	0
65	954.031	2567.83	714755	0	0
66	965.405	2569.83	700411	0	0
67	976.78	2571.84	686332	0	0
68	988.155	2573.84	672513	0	0
69	999.529	2575.85	658938	0	0
70	1010.9	2577.85	645604	0	0
71	1022.28	2579.85	632513	0	0
72	1035.53	2582.19	617556	0	0

73	1048.77	2584.52	602928	0	0
74	1062.02	2586.86	588628	0	0
75	1075.27	2589.19	574657	0	0
76	1088.52	2591.53	561009	0	0
77	1101.77	2593.86	547584	0	0
78	1114.51	2596.11	534847	0	0
79	1127.25	2598.36	522282	0	0
80	1139.99	2600.6	509875	0	0
81	1151.98	2602.71	498096	0	0
82	1163.97	2604.83	486114	0	0
83	1178.1	2607.32	474518	0	0
84	1190.64	2609.53	463798	0	0
85	1203.18	2611.74	452668	0	0
86	1215.71	2613.95	441128	0	0
87	1228.25	2616.16	429242	0	0
88	1240.79	2618.37	417222	0	0
89	1253.33	2620.58	405086	0	0
90	1270.36	2641.09	271108	0	0
91	1281.16	2654.1	165202	0	0
92	1291.96	2667.11	71305	0	0
93	1299.5	2676.2	12820.6	0	0
94	1312.88	2692.31	-57091	0	0
95	1326.25	2708.42	-106053	0	0
96	1330.59	2713.65	-111165	0	0
97	1342.89	2728.47	-113385	0	0
98	1355.2	2743.29	-97461.8	0	0
99	1356.38	2744.71	-94986.4	0	0
100	1368.09	2758.82	-90484.5	0	0
101	1379.81	2772.94	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.36334

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	190.438	2591.52	0	0	0
2	198.807	2586.29	9761.13	0	0
3	212.732	2577.59	39779.3	0	0
4	226.658	2568.88	84964	0	0
5	238.731	2561.7	133816	0	0
6	250.805	2554.52	193030	0	0
7	262.878	2547.34	266253	0	0
8	274.952	2540.84	346162	0	0
9	287.026	2534.34	435526	0	0
10	299.1	2527.84	534324	0	0
11	311.174	2521.34	642555	0	0
12	323.247	2514.84	760220	0	0
13	335.321	2508.34	887318	0	0
14	350.25	2500.3	1.05751e+06	0	0
15	365.178	2492.26	1.24212e+06	0	0
16	376.345	2493.24	1.23825e+06	0	0
17	387.512	2494.22	1.23442e+06	0	0
18	398.679	2495.2	1.23065e+06	0	0
19	409.845	2496.18	1.22703e+06	0	0
20	421.011	2497.16	1.2242e+06	0	0
21	432.176	2498.14	1.22138e+06	0	0
22	443.341	2499.12	1.21853e+06	0	0
23	454.507	2500.1	1.21563e+06	0	0
24	465.671	2501.08	1.2127e+06	0	0
25	476.836	2502.06	1.20978e+06	0	0
26	488	2503.04	1.207e+06	0	0
27	499.164	2504.02	1.20418e+06	0	0
28	510.329	2505	1.20132e+06	0	0

29	521.493	2505.98	1.19843e+06	0	0
30	532.658	2506.96	1.19549e+06	0	0
31	543.822	2507.94	1.19252e+06	0	0
32	554.987	2508.92	1.1895e+06	0	0
33	566.151	2509.89	1.18645e+06	0	0
34	577.316	2510.87	1.18336e+06	0	0
35	588.48	2511.85	1.18023e+06	0	0
36	600.305	2512.89	1.17688e+06	0	0
37	612.131	2513.93	1.17394e+06	0	0
38	623.956	2514.97	1.17132e+06	0	0
39	635.781	2516.01	1.16879e+06	0	0
40	648.552	2517.71	1.15556e+06	0	0
41	661.322	2519.42	1.14252e+06	0	0
42	674.093	2521.13	1.12966e+06	0	0
43	686.864	2522.84	1.11699e+06	0	0
44	699.634	2524.57	1.10403e+06	0	0
45	712.405	2526.31	1.09126e+06	0	0
46	725.176	2528.04	1.07868e+06	0	0
47	737.946	2529.78	1.0663e+06	0	0
48	750.739	2532.03	1.04547e+06	0	0
49	763.531	2534.28	1.025e+06	0	0
50	776.323	2536.53	1.00486e+06	0	0
51	789.115	2538.77	984947	0	0
52	801.907	2541.03	965172	0	0
53	814.7	2543.28	945609	0	0
54	827.492	2545.54	926258	0	0
55	840.284	2547.79	907192	0	0
56	851.659	2549.79	890595	0	0
57	863.033	2551.8	874281	0	0
58	874.408	2553.8	858232	0	0
59	885.783	2555.81	842447	0	0
60	897.157	2557.81	826926	0	0
61	908.532	2559.81	811670	0	0
62	919.907	2561.82	796678	0	0
63	931.281	2563.82	781950	0	0
64	942.656	2565.83	767487	0	0
65	954.031	2567.83	753288	0	0
66	965.405	2569.83	739354	0	0
67	976.78	2571.84	725683	0	0
68	988.155	2573.84	712273	0	0
69	999.529	2575.85	699107	0	0
70	1010.9	2577.85	686183	0	0
71	1022.28	2579.85	673501	0	0
72	1035.53	2582.19	659022	0	0
73	1048.77	2584.52	644871	0	0
74	1062.02	2586.86	631050	0	0
75	1075.27	2589.19	617558	0	0
76	1088.52	2591.53	604389	0	0
77	1101.77	2593.86	591449	0	0
78	1114.51	2596.11	579185	0	0
79	1127.25	2598.36	567097	0	0
80	1139.99	2600.6	555175	0	0
81	1151.98	2602.71	543868	0	0
82	1163.97	2604.83	532377	0	0
83	1178.1	2607.32	521461	0	0
84	1190.64	2609.53	511361	0	0
85	1203.18	2611.74	500869	0	0
86	1215.71	2613.95	489983	0	0
87	1228.25	2616.16	478766	0	0
88	1240.79	2618.37	467421	0	0
89	1253.33	2620.58	455964	0	0

90	1270.36	2641.09	325611	0	0
91	1281.16	2654.1	221494	0	0
92	1291.96	2667.11	129267	0	0
93	1299.5	2676.2	71877.7	0	0
94	1312.88	2692.31	4171.28	0	0
95	1326.25	2708.42	-42795.2	0	0
96	1330.59	2713.65	-47172.2	0	0
97	1342.89	2728.47	-47430.7	0	0
98	1355.2	2743.29	-29728.4	0	0
99	1356.38	2744.71	-27092.1	0	0
100	1368.09	2758.82	-21712.3	0	0
101	1379.81	2772.94	0	0	0

Global Minimum Query (spencer) - Safety Factor: 1.46415

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	181.582	2591.45	0	0	0
2	189.069	2586.28	8813.66	-23.6428	-0.153697
3	204.069	2575.91	43671.6	-117.15	-0.153697
4	219.069	2565.54	99165.7	-266.014	-0.153697
5	234.069	2555.17	175296	-470.235	-0.153697
6	251.564	2544.21	278709	-747.641	-0.153696
7	269.06	2533.25	412757	-1107.23	-0.153697
8	286.555	2522.29	574875	-1542.11	-0.153696
9	304.051	2511.7	755722	-2027.24	-0.153697
10	321.547	2501.12	960126	-2575.55	-0.153696
11	339.042	2490.53	1.18809e+06	-3187.06	-0.153696
12	355.551	2480.67	1.42192e+06	-3814.33	-0.153697
13	372.06	2470.81	1.67622e+06	-4496.49	-0.153697
14	388.568	2460.95	1.95032e+06	-5231.78	-0.153697
15	410.856	2462.9	1.93832e+06	-5199.57	-0.153696
16	433.143	2464.86	1.92747e+06	-5170.46	-0.153696
17	455.43	2466.81	1.91652e+06	-5141.11	-0.153697
18	477.718	2468.77	1.90552e+06	-5111.59	-0.153697
19	494.711	2470.26	1.89725e+06	-5089.39	-0.153696
20	511.705	2471.75	1.88891e+06	-5067.03	-0.153696
21	528.699	2473.24	1.88051e+06	-5044.49	-0.153696
22	545.692	2474.73	1.87204e+06	-5021.78	-0.153697
23	562.367	2476.2	1.86335e+06	-4998.47	-0.153697
24	579.041	2477.68	1.8546e+06	-4975	-0.153697
25	595.716	2479.16	1.8458e+06	-4951.38	-0.153696
26	612.39	2480.64	1.83724e+06	-4928.42	-0.153696
27	628.964	2482.11	1.82914e+06	-4906.69	-0.153696
28	645.538	2483.58	1.82118e+06	-4885.34	-0.153696
29	662.113	2485.05	1.81336e+06	-4864.37	-0.153697
30	678.687	2486.52	1.80569e+06	-4843.78	-0.153696
31	695.604	2488.03	1.79783e+06	-4822.71	-0.153697
32	712.522	2489.54	1.79013e+06	-4802.05	-0.153696
33	729.439	2491.05	1.78257e+06	-4781.78	-0.153697
34	751.243	2492.99	1.77305e+06	-4756.25	-0.153697
35	773.048	2494.93	1.76379e+06	-4731.38	-0.153696
36	788.261	2496.29	1.75749e+06	-4714.5	-0.153697
37	803.475	2497.65	1.75136e+06	-4698.05	-0.153696
38	818.688	2499.01	1.74539e+06	-4682.03	-0.153696
39	833.921	2500.37	1.73953e+06	-4666.31	-0.153696
40	849.153	2501.73	1.73378e+06	-4650.9	-0.153697
41	864.385	2503.09	1.72816e+06	-4635.81	-0.153696
42	886.174	2505.03	1.72033e+06	-4614.8	-0.153696
43	907.963	2506.98	1.71276e+06	-4594.49	-0.153696
44	929.751	2508.92	1.70544e+06	-4574.88	-0.153697
45	951.54	2510.87	1.69839e+06	-4555.96	-0.153697

46	966.69	2512.22	1.69364e+06	-4543.21	-0.153696
47	981.841	2513.57	1.68901e+06	-4530.8	-0.153697
48	996.992	2514.93	1.68452e+06	-4518.74	-0.153696
49	1012.14	2516.28	1.68015e+06	-4507.03	-0.153697
50	1027.29	2517.63	1.67592e+06	-4495.68	-0.153696
51	1042.44	2518.99	1.67182e+06	-4484.69	-0.153697
52	1061.43	2520.68	1.66688e+06	-4471.42	-0.153696
53	1080.41	2522.38	1.66214e+06	-4458.71	-0.153696
54	1099.4	2524.07	1.65762e+06	-4446.6	-0.153697
55	1118.39	2525.77	1.65337e+06	-4435.19	-0.153696
56	1137.37	2527.46	1.64938e+06	-4424.49	-0.153697
57	1156.36	2529.16	1.64574e+06	-4414.73	-0.153697
58	1175.34	2530.85	1.64253e+06	-4406.11	-0.153696
59	1194.33	2532.55	1.63975e+06	-4398.65	-0.153696
60	1213.31	2535.89	1.59534e+06	-4279.54	-0.153697
61	1232.3	2539.22	1.5505e+06	-4159.24	-0.153696
62	1251.28	2542.56	1.50574e+06	-4039.16	-0.153696
63	1270.27	2545.9	1.46114e+06	-3919.52	-0.153696
64	1285.62	2548.6	1.42517e+06	-3823.03	-0.153696
65	1300.98	2551.31	1.3894e+06	-3727.09	-0.153697
66	1316.33	2554.01	1.35391e+06	-3631.89	-0.153697
67	1331.54	2556.69	1.3193e+06	-3539.04	-0.153696
68	1346.74	2559.37	1.28523e+06	-3447.65	-0.153696
69	1361.94	2562.04	1.25171e+06	-3357.74	-0.153697
70	1378.39	2564.94	1.21597e+06	-3261.86	-0.153697
71	1394.84	2567.84	1.18087e+06	-3167.71	-0.153697
72	1411.29	2570.74	1.14642e+06	-3075.28	-0.153696
73	1427.74	2573.64	1.1126e+06	-2984.58	-0.153697
74	1444.21	2576.55	1.0794e+06	-2895.52	-0.153697
75	1460.67	2579.45	1.04685e+06	-2808.18	-0.153696
76	1477.14	2582.35	1.01493e+06	-2722.58	-0.153697
77	1493.6	2585.26	983666	-2638.7	-0.153696
78	1513.5	2588.76	946749	-2539.67	-0.153697
79	1533.39	2592.27	910773	-2443.16	-0.153696
80	1553.28	2595.78	875738	-2349.18	-0.153696
81	1570.39	2598.8	846239	-2270.05	-0.153696
82	1587.5	2601.81	817134	-2191.98	-0.153697
83	1604.61	2604.83	788423	-2114.96	-0.153697
84	1613.33	2606.37	775614	-2080.6	-0.153697
85	1633.48	2609.92	745652	-2000.22	-0.153696
86	1653.63	2613.47	713451	-1913.84	-0.153696
87	1673.78	2617.02	678748	-1820.75	-0.153696
88	1693.97	2620.58	642437	-1723.35	-0.153697
89	1714.15	2624.14	604470	-1621.5	-0.153696
90	1734.33	2627.7	563567	-1511.78	-0.153697
91	1746.81	2647.01	283524	-760.559	-0.153697
92	1764.12	2673.82	-52637.8	141.202	-0.153697
93	1779.02	2697	-308214	826.788	-0.153696
94	1793.91	2720.18	-531375	1425.42	-0.153696
95	1807.58	2742.82	-716844	1922.95	-0.153697
96	1824.97	2771.65	-873501	2343.18	-0.153696
97	1837.38	2793	-956524	2565.89	-0.153696
98	1856.03	2825.07	-983244	2637.57	-0.153697
99	1865.26	2843	-968703	2598.56	-0.153696
100	1880.79	2873.15	-972906	2609.84	-0.153697
101	1890.1	2891.25	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates	
	X	Y
External Boundary	0	2400
	325	2400
	2100	2400
	2100	2637
	2100	2643
	2100	2693
	2100	2743
	2100	2793
	2100	2843
	2100	2863
	2100	2893
	1740	2890
	1733	2880
	1725	2870
	1715	2860
	1705	2850
	1688	2840
	1670	2830
	1655	2820
	1635	2800
	1620	2790
	1555	2780
	1307	2770
	1258	2760
	1220	2750
	1137	2710
	1085	2700
	981	2690
	848	2680
	848	2680.01
	848.017	2680.01
	848	2680
	830	2680
	770	2670
	605	2660
	605	2638
	588.901	2638
	552.82	2638
	474	2638
	474	2632
	412	2632
	412	2602
	408	2602
	368	2601
	264	2596
	250	2592
	0	2590

X	Y
250	2592
336.843	2580.18
408	2575.83
410.443	2575.83
412	2575.83
426.415	2575
520	2575
639.276	2579.23
748.665	2582.59
929.108	2591.46
1070.69	2604.83
1153.89	2619.43
1184.94	2624.6
1232.69	2633.27
1269.97	2641.01
1295.65	2647.01
1331.37	2655.36
1352.55	2660.31
1436.77	2682.3
1456.52	2690.28
1501.45	2711.7
1533.28	2726.88
1538.15	2730.43
1571.12	2754.42
1620	2790

Material Boundary

X	Y
325	2400
1859.05	2604.83
2100	2637

Material Boundary

X	Y
1533.28	2726.88
1628.48	2735.95
1772.43	2843
2100	2843

Material Boundary

X	Y
1456.52	2690.28
1643.59	2684.57
1725.74	2743
1790.67	2793
2100	2793

Material Boundary

X	Y
1070.69	2604.83
1142.96	2604.83
1796.72	2604.83
1859.05	2604.83

Material Boundary

X	Y
625.172	2617.99
635.144	2604.99

Material Boundary

X	Y
605	2638
608.98	2632.63
625.172	2617.99

	X	Y
Material Boundary	1751.38	2697.67
	1807.8	2743

	X	Y
Material Boundary	1807.8	2743
	2100	2743

	X	Y
Material Boundary	1733	2880
	2100	2863

	X	Y
Material Boundary	1643.59	2684.57
	1671.74	2687.99
	1751.38	2697.67

	X	Y
Material Boundary	1295.65	2647.01
	1778.84	2647.01
	1872.68	2683.69
	2100	2693

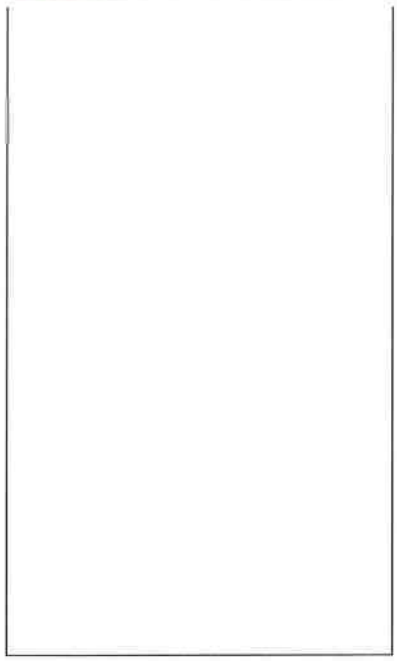
	X	Y
Material Boundary	635.144	2604.99
	1070.69	2604.83

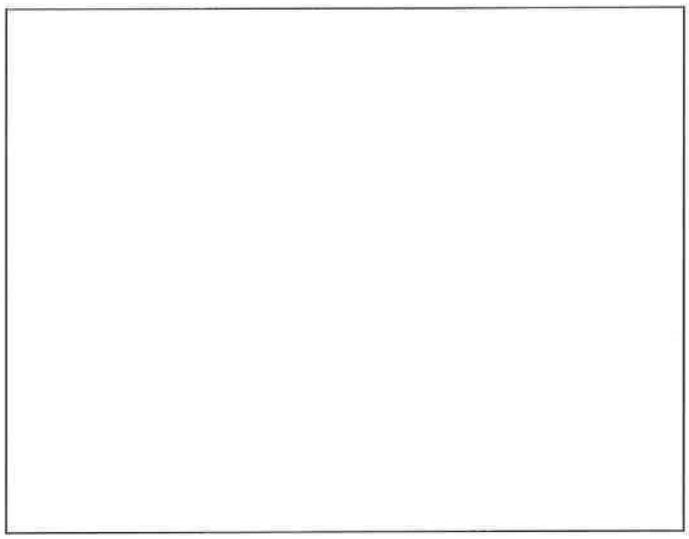
	X	Y
Material Boundary	608.98	2632.63
	771.118	2643.71
	889.239	2652.93
	1040.2	2662.15
	1107.04	2671.94
	1160.05	2685.77
	1183.23	2698.93
	1210.76	2717.23
	1263.67	2735.82

	X	Y
Material Boundary	1263.67	2735.82
	1311.94	2742.7
	1571.12	2754.42

	X	Y
Material Boundary	1183.23	2698.93
	1254.6	2705.68

	X	Y
Material Boundary	625.172	2617.99
	903.806	2628.93
	1042.92	2628.93
	1089.74	2628.93
	1232.69	2633.27





Material Boundary

X	Y
1089.74	2628.93
1150.23	2649.7
1191.06	2667.09
1259.1	2673.9
1340.76	2678.55
1436.77	2682.3

Material Boundary

X	Y
1254.6	2705.68
1412.45	2711.7
1501.45	2711.7

Material Boundary

X	Y
408	2602
408	2575.83
408	2498
412	2498
412	2575.83
412	2602

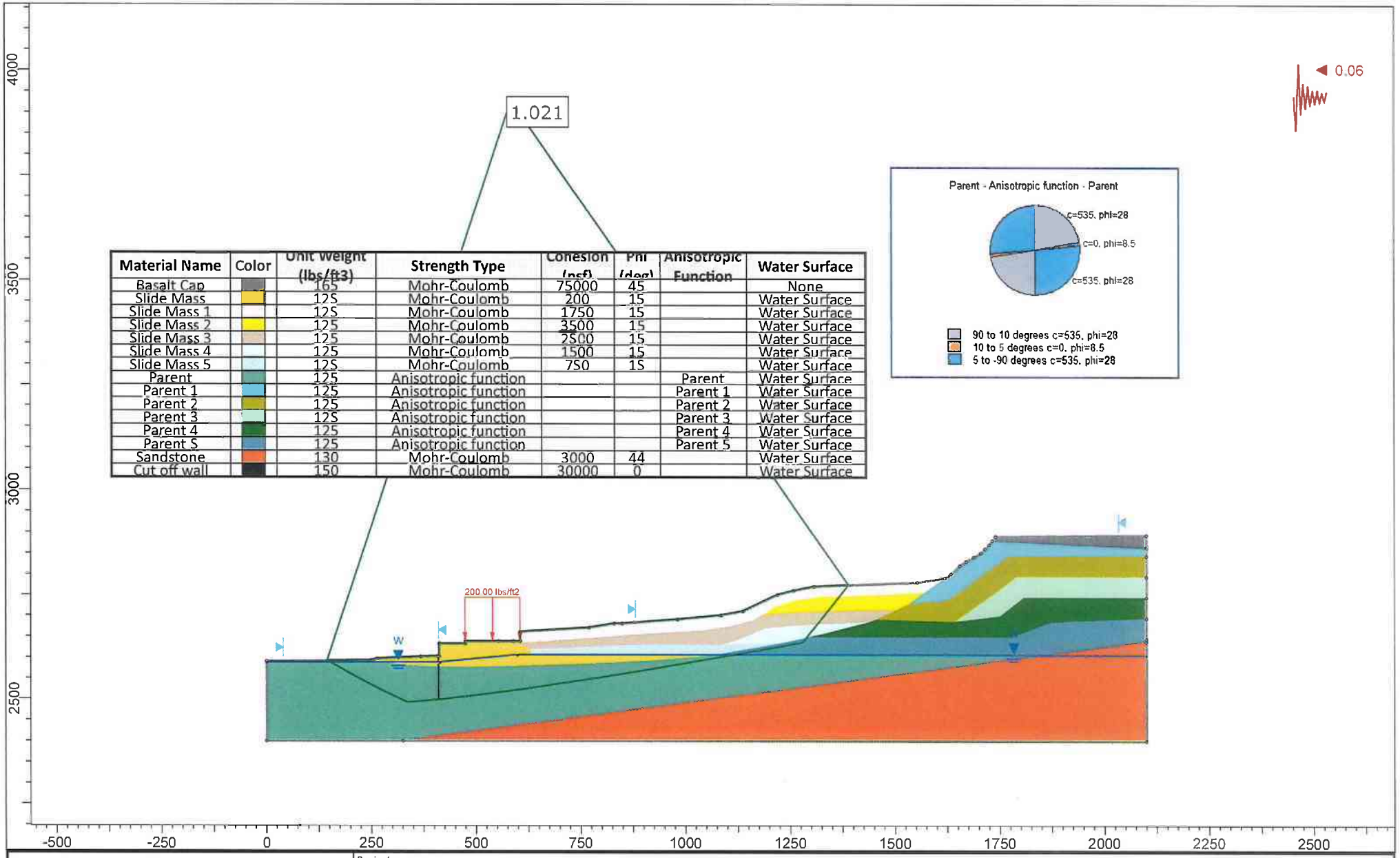
Scenario-based Entities

Type	Coordinates	Master Scenario
		Assigned to materials:
Water Table	X: 0, 413.466, 598.915, 2100 Y: 2586, 2586.61, 2604.83, 2604.83	Slide Mass Slide Mass 1 Slide Mass 2 Slide Mass 3 Slide Mass 4 Slide Mass 5 *... and 8 more*
Distributed Load	X: 474, 605 Y: 2638, 2638	Constant Distribution Orientation: Vertical Magnitude: 200 lbs/ft2 Creates Excess Pore Pressure: No

APPENDIX

A-4 Proposed Profile with Reinforcement - Seismic

Project No. 2180187



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface
Basalt Cap		165	Mohr-Coulomb	75000	45		None
Slide Mass		125	Mohr-Coulomb	200	15		Water Surface
Slide Mass 1		125	Mohr-Coulomb	1750	15		Water Surface
Slide Mass 2		125	Mohr-Coulomb	3500	15		Water Surface
Slide Mass 3		125	Mohr-Coulomb	2500	15		Water Surface
Slide Mass 4		125	Mohr-Coulomb	1500	15		Water Surface
Slide Mass 5		125	Mohr-Coulomb	750	15		Water Surface
Parent		125	Anisotropic function			Parent	Water Surface
Parent 1		125	Anisotropic function			Parent 1	Water Surface
Parent 2		125	Anisotropic function			Parent 2	Water Surface
Parent 3		125	Anisotropic function			Parent 3	Water Surface
Parent 4		125	Anisotropic function			Parent 4	Water Surface
Parent 5		125	Anisotropic function			Parent 5	Water Surface
Sandstone		130	Mohr-Coulomb	3000	44		Water Surface
Cut off wall		150	Mohr-Coulomb	30000	0		Water Surface

AGEC Applied GeoTech

SLIDEINTERPRET 8.014

Project	Blackstone Hotel - proposed profile, static, un-saturated soil, with reinforcement and earthquake		
Analysis Description			
Drawn By		Scale 1:3789	Company
Date	9/21/2019 9:46:10 AM		File Name Unsaturated Building Profile A with reinforcement eq.slmd

Slide Analysis Information

Unsaturated Building Profile A with reinforcement eq

Project Summary

File Name:	Unsaturated Building Profile A with reinforcement eq.slmd
Slide Modeler Version:	8.014
Compute Time:	00h:00m:17.461s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	10/19/2018, 3:12:08 PM

General Settings

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

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
	Janbu simplified
	Spencer
Number of slices:	100
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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Simulated Annealing Search
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Seismic Load Coefficient (Horizontal): 0.06

Loading

1 Distributed Load present

Distributed Load 1

Distribution:	Constant
Magnitude [psf]:	200
Orientation:	Vertical

Materials

Property	Basalt Cap	Slide Mass	Slide Mass 1	Slide Mass 2	Slide Mass 3	Slide Mass 4	Slide Mass 5	Parent
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Anisotropic function
Unit Weight [lbs/ft3]	165	12S	125	125	125	12S	125	125
Cohesion [psf]	75000	200	1750	3500	2500	1S00	750	
Friction Angle [°]	45	15	15	15	15	15	1S	
Water Surface	None	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value		1	1	1	1	1	1	1
Ru Value	0							

Anisotropic Functions

Name: Parent S

Angle From	Angle To	c	phi
-90	5	1100	28
5	10	285	8.S
10	90	1100	28

Name: Parent 4

Angle From	Angle To	c	phi
-90	5	1850	28
5	10	750	8.5
10	90	1850	28

Name: Parent 3

Angle From	Angle To	c	phi
-90	5	3100	28
5	10	1600	8.5
10	90	3100	28

Name: Parent 2

Angle From	Angle To	c	phi
-90	5	4600	28
5	10	2500	8.5
10	90	4600	28

Name: Parent 1

Angle From	Angle To	c	phi
-90	5	2200	28
5	10	1140	8.5
10	90	2200	28

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Property	Parent 1	Parent 2	Parent 3	Parent 4	Parent 5	Sandstone	Cut off wall
Color							
Strength Type	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	125	125	125	125	130	150
Cohesion [psf]						3000	30000
Friction Angle [°]						44	0
Water Surface	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1

Anisotropic Functions

Name: Parent 5

Angle From	Angle To	c	phi
-90	5	1100	28
5	10	285	8.5
10	90	1100	28

Name: Parent 4

Angle From	Angle To	c	phi
-90	5	1850	28
5	10	750	8.5
10	90	1850	28

Name: Parent 3

Angle From	Angle To	c	phi
-90	5	3100	28
5	10	1600	8.5
10	90	3100	28

Name: Parent 2

Angle From	Angle To	c	phi
-90	5	4600	28
5	10	2500	8.5
10	90	4600	28

Name: Parent 1

Angle From	Angle To	c	phi
-90	5	2200	28
5	10	1140	8.5
10	90	2200	28

Name: Parent

Angle From	Angle To	c	phi
-90	5	535	28
5	10	0	8.5
10	90	535	28

Global Minimums

Method: bishop simplified

FS	1.020540
Axis Location:	585.489, 3926.827
Left Slip Surface Endpoint:	145.384, 2591.163
Right Slip Surface Endpoint:	1389.957, 2773.345
Resisting Moment:	4.28715e+09 lb-ft
Driving Moment:	4.20237e+09 lb-ft
Total Slice Area:	130013 ft2
Surface Horizontal Width:	1244.57 ft
Surface Average Height:	104.464 ft

Method: janbu simplified

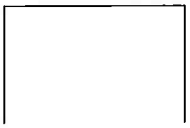
FS	0.996810
Axis Location:	585.489, 3926.827
Left Slip Surface Endpoint:	145.384, 2591.163
Right Slip Surface Endpoint:	1389.957, 2773.345
Resisting Horizontal Force:	2.75708e+06 lb
Driving Horizontal Force:	2.76591e+06 lb
Total Slice Area:	130013 ft2
Surface Horizontal Width:	1244.57 ft
Surface Average Height:	104.464 ft

Method: spencer

FS	1.066850
Axis Location:	593.236, 3923.925
Left Slip Surface Endpoint:	154.848, 2591.239
Right Slip Surface Endpoint:	1396.352, 2773.603
Resisting Moment:	3.87449e+09 lb-ft
Driving Moment:	3.6317e+09 lb-ft
Resisting Horizontal Force:	2.55283e+06 lb
Driving Horizontal Force:	2.39286e+06 lb
Total Slice Area:	110656 ft2
Surface Horizontal Width:	1241.5 ft
Surface Average Height:	89.1303 ft

Global Minimum Coordinates

Method: bishop simplified



X	Y
145.384	2591.16
192.163	2564.72
238.942	2538.74
285.726	2515.29
336.498	2490.86
375.382	2494.27
415.984	2497.82
450.113	2501.96
484.165	2506.24
518.859	2510.69
553.554	2515.13
607.99	2522.14
665.576	2530.89
723.161	2539.66
774.447	2547.48
825.733	2555.68
877.019	2564.04
928.306	2572.63
979.593	2581.58
1030.88	2590.53
1081.64	2599.45
1124.42	2606.97
1168.02	2614.65
1218.65	2623.58
1250.4	2629.18
1280.28	2634.45
1301.19	2660.66
1322.1	2686.88
1356.03	2729.43
1389.96	2773.35

Method: janbu simplified

X	Y
145.384	2591.16
192.163	2564.72
238.942	2538.74
285.726	2515.29
336.498	2490.86
375.382	2494.27
415.984	2497.82
450.113	2501.96
484.165	2506.24
518.859	2510.69
553.554	2515.13
607.99	2522.14
665.576	2530.89
723.161	2539.66
774.447	2547.48
825.733	2555.68
877.019	2564.04
928.306	2572.63
979.593	2581.58
1030.88	2590.53
1081.64	2599.45
1124.42	2606.97
1168.02	2614.65
1218.65	2623.58
1250.4	2629.18
1280.28	2634.45
1301.19	2660.66
1322.1	2686.88
1356.03	2729.43
1389.96	2773.35

Method: spencer

X	Y
154.848	2591.24
330.455	2524.25
538.743	2542.72
717.997	2559.79
970.205	2586
1111	2608.55
1284.53	2638.89
1396.35	2773.6

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 7712
Number of Invalid Surfaces: 16212

Error Codes:

Error Code -1000 reported for 16212 surfaces

Method: janbu simplified

Number of Valid Surfaces: 7458
Number of Invalid Surfaces: 16466

Error Codes:

Error Code -1000 reported for 16466 surfaces

Method: spencer

Number of Valid Surfaces: 8760
Number of Invalid Surfaces: 15164

Error Codes:

Error Code -1000 reported for 15164 surfaces

Error Codes

The following errors were encountered during the computation:

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.02054

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	8.73337	2732.97	-29.48	Parent	535	28	973.107	993.095	861.551	0	861.551	311.442	311.442
2	12.6817	13699.8	-29.48	Parent	535	28	1373.76	1401.98	1854.78	224.23	1630.55	1078.18	853.946
3	12.6817	25225.3	-29.48	Parent	535	28	1713.33	1748.52	2955.04	672.745	2282.3	1986.48	1313.73
4	12.6817	36750.8	-29.48	Parent	535	28	2052.89	2095.06	4055.3	1121.26	2934.04	2894.78	1773.52
5	11.6947	44020.8	-29.0501	Parent	535	28	2359.47	2407.93	5071.19	1548.72	3522.47	3760.62	2211.9
6	11.6947	53653.3	-29.0501	Parent	535	28	2665.06	2719.8	6064.15	1955.13	4109.02	4583.84	2628.71
7	11.6947	63285.9	-29.0501	Parent	535	28	2970.66	3031.68	7057.11	2361.54	4695.57	5407.05	3045.51
8	11.6947	72918.5	-29.0501	Parent	535	28	3276.26	3343.55	8050.09	2767.95	5282.14	6230.28	3462.33
9	11.696	82103.8	-26.6173	Parent	535	28	3431.62	3502.11	8734.87	3154.56	5580.31	7015.14	3860.58
10	11.696	93436.1	-26.6173	Parent	535	28	3855.75	3934.95	9915.76	3521.38	6394.38	7983.48	4462.1
11	11.696	105397	-26.6173	Parent	535	28	4317.73	4406.42	11169.3	3888.2	7281.06	9005.47	5117.27
12	11.696	114830	-26.6173	Parent	535	28	4627.45	4722.5	12130.5	4255.02	7875.53	9811.54	5556.52
13	12.693	135043	-25.6928	Parent	535	28	4873.61	4973.71	12977.5	4629.54	8347.98	10632.8	6003.22
14	12.693	145700	-25.6928	Parent	535	28	5191.35	5297.98	13969.6	5011.77	8957.82	11472	6460.19
15	12.693	156358	-25.6928	Parent	535	28	5509.08	5622.24	14961.7	5393.99	9567.74	12311.2	6917.25
16	12.693	167015	-25.6928	Parent	535	28	5826.83	5946.51	15953.8	5776.22	10177.6	13150.4	7374.22
17	12.9614	175574	5.0035	Parent	0	8.5	1100.85	1123.46	13449.8	5932.52	7517.24	13546.1	7613.62
18	12.9614	174745	5.0035	Parent	0	8.5	1101.66	1124.29	13385.7	5862.89	7522.85	13482.2	7619.3
19	12.9614	173837	5.0035	Parent	0	8.5	1101.61	1124.24	13315.7	5793.27	7522.45	13412.2	7618.9
20	13.534	180162	5.0035	Parent	0	8.5	1097.42	1119.96	13216	5722.11	7493.85	13312	7589.93
21	13.534	178729	5.0035	Parent	0	8.5	1092.64	1115.08	13110.6	5649.41	7461.15	13206.2	7556.81
22	13.534	202538	5.0035	Parent	0	8.5	1357.51	1385.39	14846.6	5576.71	9269.85	14965.4	9388.7
23	11.3762	189825	6.90536	Parent	0	8.5	1602.84	1635.76	16492.6	5547.45	10945.1	16686.7	11139.2
24	11.3762	187865	6.90536	Parent	0	8.5	1580.39	1612.85	16323.1	5531.23	10791.9	16514.5	10983.3
25	11.3762	185906	6.90536	Parent	0	8.5	1557.94	1589.94	16153.5	5515.01	10638.5	16342.2	10827.2
26	11.3508	183501	7.17316	Parent	0	8.5	1534.24	1565.75	15973.7	5497.13	10476.6	16166.8	10669.7
27	11.3508	181474	7.17316	Parent	0	8.5	1511.37	1542.41	15798.1	5477.58	10320.5	15988.3	10510.7
28	11.3508	187071	7.17316	Parent	0	8.5	1610.83	1643.92	16457.7	5458.03	10999.7	16660.5	11202.4
29	11.5648	189400	7.30024	Parent	0	8.5	1601.39	1634.28	16372.8	5437.49	10935.3	16577.9	11140.4
30	11.5648	187259	7.30024	Parent	0	8.5	1577.86	1610.27	16190.5	5415.95	10774.6	16392.6	10976.7
31	11.5648	185117	7.30024	Parent	0	8.5	1554.34	1586.27	16008.3	5394.41	10613.9	16207.5	10813.1
32	11.5648	182975	7.30024	Parent	0	8.5	1530.82	1562.26	15826.2	5372.87	10453.3	16022.3	10649.4
33	11.5648	180833	7.30024	Parent	0	8.5	1507.29	1538.25	15644	5351.32	10292.7	15837.1	10485.8
34	11.5648	178692	7.30024	Parent	0	8.5	1483.76	1514.24	15461.8	5329.78	10132	15651.9	10322.1
35	13.6092	207529	7.34073	Parent	0	8.5	1457.96	1487.91	15261.9	5306.03	9955.87	15449.7	10143.7

36	13.6092	204546	7.34073	Parent	0	8.5	1430.19	1459.57	15046.3	5280.07	9766.26	15230.6	9950.51
37	13.6092	201564	7.34073	Parent	0	8.5	1402.42	1431.23	14830.7	5254.12	9576.57	15011.4	9757.23
38	13.6092	206838	7.34073	Parent	0	8.5	1457.55	1487.49	15167.2	5214.24	9953	15355	10140.8
39	11.5171	197969	8.64022	Parent	0	8.5	1731.22	1766.78	16926.7	5104.94	11821.7	17189.8	12084.8
40	11.5171	196454	8.64022	Parent	0	8.5	1728.03	1763.52	16795.7	4995.73	11800	17058.3	12062.5
41	11.5171	194940	8.64022	Parent	0	8.5	1724.82	1760.25	16664.7	4886.53	11778.2	16926.8	12040.3
42	11.5171	193425	8.64022	Parent	0	8.5	1721.63	1756.99	16533.6	4777.32	11756.3	16795.2	12017.9
43	11.5171	191911	8.64022	Parent	0	8.5	1718.43	1753.73	16402.6	4668.12	11734.5	16663.7	11995.6
44	11.517	190390	8.66056	Parent	0	8.5	1715.13	1750.36	16270.8	4558.78	11712	16532	11973.2
45	11.517	188869	8.66056	Parent	0	8.5	1711.9	1747.06	16139.2	4449.32	11689.9	16399.9	11950.6
46	11.517	187349	8.66056	Parent	0	8.5	1708.66	1743.76	16007.7	4339.85	11667.8	16267.9	11928.1
47	11.517	185828	8.66056	Parent	0	8.5	1705.43	1740.46	15876.1	4230.39	11645.7	16135.8	11905.5
48	11.517	184308	8.66056	Parent	0	8.5	1702.21	1737.17	15744.6	4120.93	11623.6	16003.9	11882.9
49	12.8215	203394	8.66801	Parent	0	8.5	1698.75	1733.64	15605.3	4005.21	11600.1	15864.3	11859.1
50	12.8215	201507	8.66801	Parent	0	8.5	1695.13	1729.95	15458.6	3883.24	11575.4	15717.1	11833.8
51	12.8215	199620	8.66801	Parent	0	8.5	1691.52	1726.26	15312	3761.27	11550.7	15569.9	11808.6
52	12.8215	197864	8.66801	Parent	0	8.5	1689.37	1724.07	15175.3	3639.3	11536	15432.8	11793.5
53	12.8216	197615	9.08541	Parent	0	8.5	1702.67	1737.64	15141.2	3514.35	11626.8	15413.4	11899.1
54	12.8216	197754	9.08541	Parent	0	8.5	1722.53	1757.91	15148.8	3386.4	11762.4	15424.2	12037.8
55	12.8216	197893	9.08541	Parent	0	8.5	1742.38	1778.17	15156.5	3258.46	11898	15435.1	12176.7
56	12.8216	198031	9.08541	Parent	0	8.5	1762.24	1798.44	15164.1	3130.52	12033.6	15445.9	12315.4
57	12.8216	197377	9.25369	Parent	0	8.5	1772.65	1809.06	15106.1	3001.38	12104.7	15394.9	12393.5
58	12.8216	194273	9.25369	Parent	0	8.5	1756.66	1792.74	14866.5	2871.02	11995.5	15152.7	12281.7
59	12.8216	192050	9.25369	Parent	0	8.5	1750.51	1786.47	14694.3	2740.67	11953.6	14979.5	12238.8
60	12.8216	190247	9.25369	Parent	0	8.5	1749.04	1784.97	14553.9	2610.32	11943.5	14838.8	12228.5
61	12.8217	188400	9.50379	Parent	0	8.5	1746.2	1782.07	14402.3	2478.17	11924.1	14694.6	12216.5
62	12.8217	186505	9.50379	Parent	0	8.5	1744.22	1780.05	14254.9	2344.23	11910.6	14546.9	12202.6
63	12.8217	184610	9.50379	Parent	0	8.5	1742.24	1778.03	14107.3	2210.29	11897	14399	12188.7
64	12.8217	182715	9.50379	Parent	0	8.5	1740.26	1776	13959.9	2076.35	11883.5	14251.2	12174.8
65	12.8217	180746	9.90158	Parent	0	8.5	1736.1	1771.76	13794.6	1939.55	11855.1	14097.7	12158.1
66	12.8217	178704	9.90158	Parent	0	8.5	1733.3	1768.9	13635.9	1799.89	11836	13938.4	12138.6
67	12.8217	176662	9.90158	Parent	0	8.5	1730.5	1766.04	13477.1	1660.23	11816.8	13779.1	12118.9
68	12.8217	174620	9.90158	Parent	0	8.5	1727.7	1763.19	13318.3	1520.58	11797.8	13619.9	12099.3
69	12.8217	172749	9.90158	Parent	0	8.5	1726.8	1762.27	13172.5	1380.92	11791.6	13473.9	12093
70	12.8217	171135	9.90158	Parent	0	8.5	1728.77	1764.28	13046.4	1241.26	11805.1	13348.1	12106.9
71	12.8217	169524	9.90158	Parent	0	8.5	1730.77	1766.32	12920.4	1101.6	11818.8	13222.5	12120.9
72	12.8217	167913	9.90158	Parent	0	8.5	1732.77	1768.36	12794.4	961.944	11832.4	13096.8	12134.9
73	12.6911	164603	9.97	Parent	0	8.5	1734.39	1770.01	12665.9	822.509	11843.4	12970.8	12148.3
74	12.6911	163000	9.97	Parent	0	8.5	1736.23	1771.89	12539.3	683.299	11856	12844.5	12161.2
75	12.6911	161397	9.97	Parent	0	8.5	1738.07	1773.77	12412.6	544.089	11868.5	12718.1	12174.1
76	12.6911	159794	9.97	Parent	0	8.5	1739.9	1775.64	12286	404.879	11881.1	12591.8	12186.9
77	15.2839	191166	9.97	Parent	0	8.5	1749.92	1785.86	12200.9	251.449	11949.5	12508.6	12257.1
78	15.2839	191581	9.97	Parent	0	8.5	1777.74	1814.25	12223.2	83.7982	12139.4	12535.7	12451.9
79	12.2076	153367	9.97	Parent 5	285	8.5	2066.02	2108.46	12201	0	12201	12564.2	12564.2
80	14.5319	183034	9.98834	Parent 5	285	8.5	2070.5	2113.03	12231.7	0	12231.7	12596.3	12596.3
81	14.5319	188242	9.98834	Parent 5	285	8.5	2121.66	2165.24	12581	0	12581	12954.7	12954.7
82	14.5319	196314	9.98834	Parent 5	285	8.5	2200.97	2246.18	13122.6	0	13122.6	13510.2	13510.2
83	12.6588	177587	9.99898	Parent 5	285	8.5	2275.09	2321.82	13628.7	0	13628.7	14029.8	14029.8
84	12.6588	183709	9.99898	Parent 5	285	8.5	2344.13	2392.28	14100.1	0	14100.1	14513.4	14513.4
85	12.6588	189831	9.99898	Parent 5	285	8.5	2413.17	2462.74	14571.6	0	14571.6	14997	14997
86	12.6588	195952	9.99898	Parent 5	285	8.5	2482.22	2533.2	15043	0	15043	15480.7	15480.7
87	10.5833	167357	9.9999	Parent 5	285	8.5	2529.86	2581.82	15368.4	0	15368.4	15814.5	15814.5
88	10.5833	168598	9.9999	Parent 5	285	8.5	2546.59	2598.9	15482.7	0	15482.7	15931.7	15931.7
89	10.5833	169813	9.9999	Parent 5	285	8.5	2563	2615.64	15594.7	0	15594.7	16046.6	16046.6
90	14.9394	241578	9.9999	Parent 5	285	8.5	2580.87	2633.88	15716.7	0	15716.7	16171.8	16171.8
91	14.9394	242566	9.9999	Parent 5	285	8.5	2590.31	2643.51	15781.2	0	15781.2	16237.9	16237.9
92	8.79238	137915	51.4272	Parent 5	1100	28	5601.04	5716.09	8681.58	0	8681.58	15704.7	15704.7
93	12.1174	173445	51.4272	Slide Mass 4	1500	15	3935.76	4016.6	9392.07	0	9392.07	14327.1	14327.1
94	13.0624	164853	51.4272	Slide Mass 4	1500	15	3601.05	3675.02	8117.28	0	8117.28	12632.6	12632.6
95	7.84717	86796.7	51.4272	Slide	2500	15	4030.47	4113.26	6020.78	0	6020.78	11074.6	11074.6

96	17.5819	160560	51.4272	Mass 3 Slide	2500	15	3649.23	3724.19	4568.74	0	4568.74	9144.51	9144.51
97	16.3463	107211	51.4272	Mass 3 Slide	3500	15	3878.25	3957.91	1708.96	0	1708.96	6571.9	6571.9
98	12.2223	53300.2	52.312	Mass 2 Slide	3500	15	3416.55	3486.73	-49.5326	0	-49.5326	4372.88	4372.88
99	10.8538	27700.7	52.312	Mass 2 Slide	1750	15	1781.17	1817.75	252.864	0	252.864	2558.42	2558.42
100	10.8538	9233.57	52.312	Mass 1 Slide	1750	15	1447.53	1477.26	-1017.89	0	-1017.89	855.803	855.803

Global Minimum Query (janbu simplified) - Safety Factor: 0.99681

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	8.73337	2732.97	-29.48	Parent	535	28	1006.03	1002.82	879.839	0	879.839	311.12	311.12
2	12.6817	13699.8	-29.48	Parent	535	28	1420.23	1415.7	1880.6	224.23	1656.37	1077.72	853.49
3	12.6817	25225.3	-29.48	Parent	535	28	1771.29	1765.64	2987.24	672.745	2314.5	1985.91	1313.17
4	12.6817	36750.8	-29.48	Parent	535	28	2122.34	2115.57	4093.89	1121.26	2972.63	2894.1	1772.84
5	11.6947	44020.8	-29.0501	Parent	535	28	2438.71	2430.93	5114.44	1548.72	3565.72	3759.85	2211.13
6	11.6947	53653.3	-29.0501	Parent	535	28	2754.57	2745.78	6112.99	1955.13	4157.86	4582.96	2627.83
7	11.6947	63285.9	-29.0501	Parent	535	28	3070.42	3060.63	7111.55	2361.54	4750.01	5406.08	3044.54
8	11.6947	72918.5	-29.0501	Parent	535	28	3386.28	3375.48	8110.11	2767.95	5342.16	6229.19	3461.24
9	11.696	82103.8	-26.6173	Parent	535	28	3542.39	3531.09	8789.37	3154.56	5634.81	7014.13	3859.57
10	11.696	93436.1	-26.6173	Parent	535	28	3980.21	3967.51	9976.98	3521.38	6455.6	7982.34	4460.96
11	11.696	105397	-26.6173	Parent	535	28	4457.11	4442.89	11237.9	3888.2	7349.71	9004.27	5116.07
12	11.696	114830	-26.6173	Parent	535	28	4776.83	4761.59	12204.1	4255.02	7949.06	9810.22	5555.2
13	12.693	135043	-25.6928	Parent	535	28	5028.7	5012.66	13050.8	4629.54	8421.24	10631.4	6001.87
14	12.693	145700	-25.6928	Parent	535	28	5356.56	5339.47	14047.7	5011.77	9035.91	11470.6	6458.8
15	12.693	156358	-25.6928	Parent	535	28	5684.41	5666.28	15044.5	5393.99	9650.52	12309.7	6915.67
16	12.693	167015	-25.6928	Parent	535	28	6012.26	5993.08	16041.4	5776.22	10265.2	13148.8	7372.61
17	12.9614	175574	5.0035	Parent	0	8.5	1126.72	1123.13	13447.5	5932.52	7515.01	13546.2	7613.66
18	12.9614	174745	5.0035	Parent	0	8.5	1127.56	1123.96	13383.5	5862.89	7520.62	13482.2	7619.34
19	12.9614	173837	5.0035	Parent	0	8.5	1127.51	1123.91	13313.5	5793.27	7520.22	13412.2	7618.93
20	13.534	180162	5.0035	Parent	0	8.5	1123.21	1119.63	13213.8	5722.11	7491.64	13312.1	7589.98
21	13.534	178729	5.0035	Parent	0	8.5	1118.32	1114.75	13108.3	5649.41	7458.94	13206.3	7556.85
22	13.534	202538	5.0035	Parent	0	8.5	1389.41	1384.98	14843.8	5576.71	9267.13	14965.5	9388.77
23	11.3762	189825	6.90536	Parent	0	8.5	1640.33	1635.1	16488.1	5547.45	10940.7	16686.8	11139.3
24	11.3762	187865	6.90536	Parent	0	8.5	1617.36	1612.2	16318.7	5531.23	10787.5	16514.6	10983.4
25	11.3762	185906	6.90536	Parent	0	8.5	1594.39	1589.3	16149.3	5515.01	10634.2	16342.3	10827.3
26	11.3508	183501	7.17316	Parent	0	8.5	1570.1	1565.09	15969.4	5497.13	10472.2	16167	10669.8
27	11.3508	181474	7.17316	Parent	0	8.5	1546.69	1541.76	15793.8	5477.58	10316.2	15988.4	10510.8
28	11.3508	187071	7.17316	Parent	0	8.5	1648.49	1643.23	16453.1	5458.03	10995.1	16660.6	11202.5
29	11.5648	189400	7.30024	Parent	0	8.5	1638.81	1633.58	16368.1	5437.49	10930.6	16578	11140.5
30	11.5648	187259	7.30024	Parent	0	8.5	1614.73	1609.58	16186	5415.95	10770	16392.8	10976.9
31	11.5648	185117	7.30024	Parent	0	8.5	1590.66	1585.59	16003.8	5394.41	10609.4	16207.6	10813.2
32	11.5648	182975	7.30024	Parent	0	8.5	1566.59	1561.59	15821.7	5372.87	10448.8	16022.4	10649.5
33	11.5648	180833	7.30024	Parent	0	8.5	1542.51	1537.59	15639.6	5351.32	10288.3	15837.2	10485.9
34	11.5648	178692	7.30024	Parent	0	8.5	1518.43	1513.59	15457.4	5329.78	10127.7	15652	10322.2
35	13.6092	207529	7.34073	Parent	0	8.5	1492.03	1487.27	15257.6	5306.03	9951.57	15449.8	10143.8
36	13.6092	204546	7.34073	Parent	0	8.5	1463.61	1458.94	15042.1	5280.07	9762.04	15230.7	9950.59
37	13.6092	201564	7.34073	Parent	0	8.5	1435.2	1430.62	14826.6	5254.12	9572.49	15011.5	9757.38
38	13.6092	206838	7.34073	Parent	0	8.5	1491.61	1486.85	15163	5214.24	9948.77	15355.2	10140.9
39	11.5171	197969	8.64022	Parent	0	8.5	1771.53	1765.88	16920.8	5104.94	11815.8	17190	12085
40	11.5171	196454	8.64022	Parent	0	8.5	1768.26	1762.62	16789.7	4995.73	11794	17058.4	12062.6
41	11.5171	194940	8.64022	Parent	0	8.5	1764.99	1759.36	16658.7	4886.53	11772.2	16926.9	12040.4
42	11.5171	193425	8.64022	Parent	0	8.5	1761.72	1756.1	16527.7	4777.32	11750.4	16795.4	12018.1
43	11.5171	191911	8.64022	Parent	0	8.5	1758.46	1752.85	16396.7	4668.12	11728.6	16663.9	11995.8
44	11.517	190390	8.66056	Parent	0	8.5	1755.07	1749.47	16264.8	4558.78	11706	16532.1	11973.3
45	11.517	188869	8.66056	Parent	0	8.5	1751.77	1746.18	16133.3	4449.32	11683.9	16400.1	11950.8

46	11.517	187349	8.66056	Parent	0	8.5	1748.46	1742.88	16001.7	4339.85	11661.9	16268.1	11928.2
47	11.517	185828	8.66056	Parent	0	8.5	1745.15	1739.58	15870.2	4230.39	11639.9	16136.1	11905.7
48	11.517	184308	8.66056	Parent	0	8.5	1741.85	1736.29	15738.7	4120.93	11617.7	16004	11883
49	12.8215	203394	8.66801	Parent	0	8.5	1738.31	1732.76	15599.4	4005.21	11594.1	15864.4	11859.1
50	12.8215	201507	8.66801	Parent	0	8.5	1734.6	1729.07	15452.7	3883.24	11569.5	15717.1	11833.9
51	12.8215	199620	8.66801	Parent	0	8.5	1730.91	1725.39	15306.1	3761.27	11544.9	15570	11808.7
52	12.8215	197864	8.66801	Parent	0	8.5	1728.7	1723.19	15169.4	3639.3	11530.1	15433	11793.7
53	12.8216	197615	9.08541	Parent	0	8.5	1742.28	1736.72	15135	3514.35	11620.7	15413.6	11899.3
54	12.8216	197754	9.08541	Parent	0	8.5	1762.59	1756.97	15142.6	3386.4	11756.2	15424.4	12038
55	12.8216	197893	9.08541	Parent	0	8.5	1782.92	1777.23	15150.2	3258.46	11891.7	15435.3	12176.8
56	12.8216	198031	9.08541	Parent	0	8.5	1803.23	1797.48	15157.7	3130.52	12027.2	15446.1	12315.6
57	12.8216	197377	9.25369	Parent	0	8.5	1813.87	1808.08	15099.6	3001.38	12098.2	15395.1	12393.7
58	12.8216	194273	9.25369	Parent	0	8.5	1797.5	1791.77	14860.1	2871.02	11989.1	15152.9	12281.9
59	12.8216	192050	9.25369	Parent	0	8.5	1791.21	1785.5	14687.8	2740.67	11947.1	14979.6	12239
60	12.8216	190247	9.25369	Parent	0	8.5	1789.72	1784.01	14547.4	2610.32	11937.1	14839	12228.7
61	12.8217	188400	9.50379	Parent	0	8.5	1786.78	1781.08	14395.7	2478.17	11917.5	14694.8	12216.7
62	12.8217	186505	9.50379	Parent	0	8.5	1784.75	1779.06	14248.2	2344.23	11903.9	14546.9	12202.7
63	12.8217	184610	9.50379	Parent	0	8.5	1782.73	1777.04	14100.7	2210.29	11890.4	14399.1	12188.9
64	12.8217	182715	9.50379	Parent	0	8.5	1780.7	1775.02	13953.2	2076.35	11876.9	14251.3	12175
65	12.8217	180746	9.90158	Parent	0	8.5	1776.4	1770.73	13787.8	1939.55	11848.2	14097.9	12158.3
66	12.8217	178704	9.90158	Parent	0	8.5	1773.54	1767.88	13629.1	1799.89	11829.2	13938.6	12138.7
67	12.8217	176662	9.90158	Parent	0	8.5	1770.67	1765.02	13470.2	1660.23	11810	13779.3	12119.1
68	12.8217	174620	9.90158	Parent	0	8.5	1767.81	1762.17	13311.5	1520.58	11790.9	13620.1	12099.5
69	12.8217	172749	9.90158	Parent	0	8.5	1766.89	1761.25	13165.8	1380.92	11784.8	13474.2	12093.3
70	12.8217	171135	9.90158	Parent	0	8.5	1768.9	1763.26	13039.5	1241.26	11798.3	13348.3	12107
71	12.8217	169524	9.90158	Parent	0	8.5	1770.95	1765.3	12913.5	1101.6	11811.9	13222.7	12121.1
72	12.8217	167913	9.90158	Parent	0	8.5	1773	1767.34	12787.5	961.944	11825.6	13097	12135.1
73	12.6911	164603	9.97	Parent	0	8.5	1774.64	1768.98	12659	822.509	11836.5	12971	12148.5
74	12.6911	163000	9.97	Parent	0	8.5	1776.53	1770.86	12532.4	683.299	11849.1	12844.6	12161.3
75	12.6911	161397	9.97	Parent	0	8.5	1778.4	1772.73	12405.7	544.089	11861.6	12718.3	12174.2
76	12.6911	159794	9.97	Parent	0	8.5	1780.29	1774.61	12279.1	404.879	11874.2	12592	12187.1
77	15.2839	191166	9.97	Parent	0	8.5	1790.53	1784.82	12194	251.449	11942.5	12508.7	12257.3
78	15.2839	191581	9.97	Parent	0	8.5	1818.99	1813.19	12216.1	83.7982	12132.3	12535.8	12452
79	12.2076	153367	9.97	Parent 5	285	8.5	2113.97	2107.23	12192.8	0	12192.8	12564.4	12564.4
80	14.5319	183034	9.98834	Parent 5	285	8.5	2118.55	2111.79	12223.4	0	12223.4	12596.5	12596.5
81	14.5319	188242	9.98834	Parent 5	285	8.5	2170.91	2163.98	12572.5	0	12572.5	12954.9	12954.9
82	14.5319	196314	9.98834	Parent 5	285	8.5	2252.05	2244.87	13113.8	0	13113.8	13510.5	13510.5
83	12.6588	177587	9.99898	Parent 5	285	8.5	2327.89	2320.46	13619.6	0	13619.6	14030	14030
84	12.6588	183709	9.99898	Parent 5	285	8.5	2398.53	2390.88	14090.8	0	14090.8	14513.7	14513.7
85	12.6588	189831	9.99898	Parent 5	285	8.5	2469.18	2461.3	14561.9	0	14561.9	14997.3	14997.3
86	12.6588	195952	9.99898	Parent 5	285	8.5	2539.82	2531.72	15033.1	0	15033.1	15480.9	15480.9
87	10.5833	167357	9.9999	Parent 5	285	8.5	2588.57	2580.31	15358.3	0	15358.3	15814.7	15814.7
88	10.5833	168598	9.9999	Parent 5	285	8.5	2605.69	2597.38	15472.5	0	15472.5	15932	15932
89	10.5833	169813	9.9999	Parent 5	285	8.5	2622.48	2614.11	15584.5	0	15584.5	16046.9	16046.9
90	14.9394	241578	9.9999	Parent 5	285	8.5	2640.76	2632.34	15706.4	0	15706.4	16172.1	16172.1
91	14.9394	242566	9.9999	Parent 5	285	8.5	2650.42	2641.97	15770.8	0	15770.8	16238.2	16238.2
92	8.79238	137915	51.4272	Parent 5	1100	28	5682.12	5663.99	8583.65	0	8583.65	15708.5	15708.5
93	12.1174	173445	51.4272	5lide Mass 4	1500	15	4006.36	3993.58	9306.19	0	9306.19	14329.8	14329.8
94	13.0624	164853	51.4272	5lide Mass 4	1500	15	3665.65	3653.96	8038.71	0	8038.71	12635.1	12635.1
95	7.84717	86796.7	51.4272	5lide Mass 3	2500	15	4102.78	4089.69	5932.82	0	5932.82	11077.3	11077.3
96	17.5819	160560	51.4272	Slide Mass 3	2500	15	3714.7	3702.85	4489.12	0	4489.12	9146.99	9146.99
97	16.3463	107211	51.4272	5lide Mass 2	3500	15	3947.83	3935.24	1624.32	0	1624.32	6574.51	6574.51
98	12.2223	53300.2	52.312	5lide Mass 2	3500	15	3477.36	3466.27	-125.881	0	-125.881	4375.24	4375.24
99	10.8538	27700.7	52.312	Slide Mass 1	1750	15	1812.87	1807.09	213.06	0	213.06	2559.66	2559.66
100	10.8538	9233.57	52.312	5lide	1750	15	1473.29	1468.59	-1050.23	0	-1050.23	856.804	856.804

Mass 1

Global Minimum Query (spencer) - Safety Factor: 1.06685

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	13.0872	4169.28	-20.8809	Parent	535	28	905.401	965.927	810.457	0	810.457	465.064	465.064
2	12.5016	11769.9	-20.8809	Parent	535	28	1243.18	1326.29	1637.53	149.341	1488.19	1163.28	1013.94
3	12.5016	19378.8	-20.8809	Parent	535	28	1469.8	1568.06	2390.99	448.077	1942.91	1830.29	1382.21
4	12.5016	26987.7	-20.8809	Parent	535	28	1696.43	1809.84	3144.45	746.813	2397.63	2497.29	1750.48
5	12.5016	34596.7	-20.8809	Parent	535	28	1923.06	2051.62	3897.89	1045.55	2852.34	3164.28	2118.73
6	12.5016	42205.6	-20.8809	Parent	535	28	2149.69	2293.4	4651.35	1344.28	3307.07	3831.29	2487.01
7	12.5016	49814.5	-20.8809	Parent	535	28	2376.32	2535.18	5404.81	1643.02	3761.79	4498.29	2855.27
8	12.5016	57938.3	-20.8809	Parent	535	28	2631.96	2807.91	6216.47	1941.76	4274.71	5212.43	3270.67
9	12.5016	69877.1	-20.8809	Parent	535	28	3102.6	3310.01	7459.53	2240.49	5219.04	6275.95	4035.46
10	12.5016	79355.8	-20.8809	Parent	535	28	3434.6	3664.2	8424.38	2539.23	5885.15	7114.15	4574.92
11	12.5016	87747.7	-20.8809	Parent	535	28	3705.35	3953.05	9266.37	2837.96	6428.41	7852.85	5014.89
12	12.5016	96139.6	-20.8809	Parent	535	28	3976.11	4241.91	10108.3	3136.7	6971.65	8591.54	5454.84
13	12.5016	104531	-20.8809	Parent	535	28	4246.86	4530.76	10950.3	3435.44	7514.89	9330.24	5894.8
14	12.5016	112923	-20.8809	Parent	535	28	4517.61	4819.61	11792.3	3734.17	8058.14	10068.9	6334.76
15	12.9241	120654	5.06695	Parent	0	8.5	748.589	798.632	9192.19	3848.38	5343.81	9258.56	5410.18
16	12.9241	119807	5.06695	Parent	0	8.5	749.426	799.525	9127.83	3778.05	5349.78	9194.28	5416.23
17	12.9241	118957	5.06695	Parent	0	8.5	750.239	800.392	9063.24	3707.73	5355.51	9129.76	5422.03
18	12.9241	117825	5.06695	Parent	0	8.5	748.033	798.039	8977.23	3637.41	5339.82	9043.56	5406.15
19	12.9241	116496	5.06695	Parent	0	8.5	743.717	793.434	8876.11	3567.08	5309.03	8942.05	5374.97
20	12.9241	115167	5.06695	Parent	0	8.5	739.4	788.829	8774.92	3496.76	5278.16	8840.48	5343.72
21	4	42419.5	5.06695	Cut off wall	30000	0	28120.2	30000	11399	3450.72	7948.31	13892.3	10441.6
22	12.6743	158365	5.06695	Parent	0	8.5	1243.51	1326.64	12311.5	3434.77	8876.75	12421.8	8987.01
23	12.6743	156585	5.06695	Parent	0	8.5	1223.02	1304.78	12172.9	3442.35	8730.54	12281.3	8838.98
24	12.6743	154804	5.06695	Parent	0	8.5	1202.54	1282.93	12034.3	3449.94	8584.31	12140.9	8690.94
25	12.6743	153024	5.06695	Parent	0	8.5	1182.06	1261.08	11895.6	3457.52	8438.1	12000.4	8542.91
26	12.6743	152272	5.06695	Parent	0	8.5	1175.81	1254.41	11858.5	3465.11	8393.41	11962.8	8497.67
27	12.6743	158969	5.06695	Parent	0	8.5	1272.61	1357.68	12557.1	3472.69	9084.43	12670	9197.27
28	12.6743	157188	5.06695	Parent	0	8.5	1252.12	1335.82	12418.5	3480.28	8938.21	12529.5	9049.23
29	12.6743	155408	5.06695	Parent	0	8.5	1231.64	1313.97	12279.9	3487.87	8791.98	12389.1	8901.19
30	12.6743	153628	5.06695	Parent	0	8.5	1211.15	1292.12	12141.2	3495.45	8645.77	12248.6	8753.15
31	12.6743	151847	5.06695	Parent	0	8.5	1190.66	1270.26	12002.6	3503.04	8499.54	12108.2	8605.11
32	11.9503	141484	5.43983	Parent	0	8.5	1168.03	1246.11	11845.9	3507.96	8337.91	11957.1	8449.14
33	11.9503	139784	5.43983	Parent	0	8.5	1148.08	1224.83	11705.8	3510.22	8195.54	11815.1	8304.87
34	11.9503	138084	5.43983	Parent	0	8.5	1128.13	1203.55	11565.6	3512.47	8053.17	11673.1	8160.6
35	11.9503	136384	5.43983	Parent	0	8.5	1108.19	1182.27	11425.5	3514.73	7910.79	11531.1	8016.33
36	11.9503	134684	5.43983	Parent	0	8.5	1088.25	1161	11285.4	3516.99	7768.42	11389	7872.05
37	11.9503	148069	5.43983	Parent	0	8.5	1234.6	1317.13	12298.4	3485.19	8813.18	12415.9	8930.75
38	11.9503	165181	5.43983	Parent	0	8.5	1427.03	1522.43	13601	3414.18	10186.8	13736.9	10322.7
39	11.9503	164563	5.43983	Parent	0	8.5	1429.89	1525.48	13550.3	3343.17	10207.2	13686.5	10343.3
40	11.9503	163945	5.43983	Parent	0	8.5	1432.74	1528.52	13499.7	3272.16	10227.5	13636.1	10364
41	11.9503	163327	5.43983	Parent	0	8.5	1435.59	1531.56	13449	3201.14	10247.9	13585.8	10384.6
42	11.9503	162709	5.43983	Parent	0	8.5	1438.44	1534.6	13398.4	3130.13	10268.3	13535.4	10405.2
43	11.9503	162091	5.43983	Parent	0	8.5	1441.29	1537.64	13347.7	3059.12	10288.6	13485	10425.9
44	11.9503	161473	5.43983	Parent	0	8.5	1444.15	1540.69	13297.1	2988.11	10309	13434.6	10446.5
45	11.9503	160855	5.43983	Parent	0	8.5	1447	1543.73	13246.4	2917.1	10329.3	13384.2	10467.1
46	11.9503	160237	5.43983	Parent	0	8.5	1449.85	1546.77	13195.8	2846.08	10349.7	13333.9	10487.8
47	12.6104	168331	5.93372	Parent	0	8.5	1448.6	1545.44	13110.5	2769.68	10340.8	13261	10491.4
48	12.6104	167470	5.93372	Parent	0	8.5	1450.68	1547.66	13043.6	2687.9	10355.7	13194.4	10506.5
49	12.6104	166609	5.93372	Parent	0	8.5	1452.77	1549.89	12976.6	2606.11	10370.5	13127.6	10521.5
50	12.6104	165747	5.93372	Parent	0	8.5	1454.86	1552.12	12909.7	2524.33	10385.4	13061	10536.6
51	12.6104	165695	5.93372	Parent	0	8.5	1465.78	1563.77	12906	2442.54	10463.4	13058.3	10615.8
52	12.6104	166926	5.93372	Parent	0	8.5	1490.71	1590.36	13002.1	2360.76	10641.4	13157	10796.3
53	12.6104	168173	5.93372	Parent	0	8.5	1515.81	1617.14	13099.5	2278.97	10820.6	13257.1	10978.1
54	12.6104	169420	5.93372	Parent	0	8.5	1540.91	1643.92	13196.9	2197.19	10999.7	13357.1	11159.9

55	12.6104	170644	5.93372	Parent	0	8.5	1565.76	1670.43	13292.5	2115.4	11177.1	13455.3	11339.9
56	12.6104	169866	5.93372	Parent	0	8.5	1568.76	1673.63	13232.1	2033.62	11198.5	13395.2	11361.5
57	12.6104	168157	5.93372	Parent	0	8.5	1561.59	1665.98	13099.1	1951.83	11147.3	13261.4	11309.6
58	12.6104	167514	5.93372	Parent	0	8.5	1566.06	1670.75	13049.3	1870.05	11179.2	13212	11342
59	12.6104	166942	5.93372	Parent	0	8.5	1571.31	1676.35	13005	1788.26	11216.7	13168.3	11380
60	12.6104	166371	5.93372	Parent	0	8.5	1576.56	1681.95	12960.7	1706.48	11254.2	13124.6	11418.1
61	12.6104	165799	5.93372	Parent	0	8.5	1581.81	1687.55	12916.4	1624.69	11291.7	13080.8	11456.1
62	12.6104	165228	5.93372	Parent	0	8.5	1587.06	1693.16	12872	1542.91	11329.1	13037	11494.1
63	12.6104	164657	5.93372	Parent	0	8.5	1592.31	1698.76	12827.8	1461.12	11366.7	12993.3	11532.2
64	12.6104	164085	5.93372	Parent	0	8.5	1597.56	1704.36	12783.5	1379.34	11404.1	12949.5	11570.2
65	12.6104	163514	5.93372	Parent	0	8.5	1602.81	1709.96	12739.1	1297.55	11441.6	12905.7	11608.2
66	12.6104	162942	5.93372	Parent	0	8.5	1608.06	1715.56	12694.9	1215.77	11479.1	12862	11646.3
67	13.0629	167594	9.0988	Parent	0	8.5	1586.03	1692.06	12431.4	1109.6	11321.8	12685.4	11575.8
68	13.0629	166076	9.0988	Parent	0	8.5	1588.46	1694.65	12318.3	979.057	11339.2	12572.7	11593.6
69	13.0629	164711	9.0988	Parent	0	8.5	1592.48	1698.94	12216.4	848.513	11367.9	12471.4	11622.9
70	13.0629	163346	9.0988	Parent	0	8.5	1596.5	1703.23	12114.5	717.968	11396.6	12370.2	11652.3
71	13.0629	161981	9.0988	Parent	0	8.5	1600.52	1707.52	12012.7	587.423	11425.2	12269	11681.6
72	13.0629	160616	9.0988	Parent	0	8.5	1604.54	1711.8	11910.8	456.879	11454	12167.8	11710.9
73	13.0629	159251	9.0988	Parent	0	8.5	1608.56	1716.09	11808.9	326.334	11482.6	12066.6	11740.2
74	13.0629	157886	9.0988	Parent	0	8.5	1612.58	1720.38	11707.1	195.79	11511.3	11965.4	11769.6
75	13.0629	156567	9.0988	Parent	0	8.5	1617.08	1725.18	11608.7	65.2452	11543.5	11867.7	11802.4
76	11.6166	139242	9.0988	Parent 5	285	8.5	1892.12	2018.61	11599.8	0	11599.8	11902.9	11902.9
77	11.6166	139785	9.0988	Parent 5	285	8.5	1898.46	2025.37	11645.1	0	11645.1	11949.1	11949.1
78	12.3948	149605	9.91923	Parent 5	285	8.5	1896.75	2023.55	11632.8	0	11632.8	11964.5	11964.5
79	12.3948	149940	9.91923	Parent 5	285	8.5	1900.4	2027.44	11658.9	0	11658.9	11991.2	11991.2
80	12.3948	152541	9.91923	Parent 5	285	8.5	1928.76	2057.7	11861.4	0	11861.4	12198.7	12198.7
81	12.3948	158412	9.91923	Parent 5	285	8.5	1992.78	2126	12318.4	0	12318.4	12666.9	12666.9
82	12.3948	164308	9.91923	Parent 5	285	8.5	2057.08	2194.6	12777.4	0	12777.4	13137.1	13137.1
83	12.3948	170205	9.91923	Parent 5	285	8.5	2121.39	2263.2	13236.5	0	13236.5	13607.4	13607.4
84	12.3948	176101	9.91923	Parent 5	285	8.5	2185.69	2331.8	13695.5	0	13695.5	14077.7	14077.7
85	12.3948	181998	9.91923	Parent 5	285	8.5	2249.99	2400.4	14154.5	0	14154.5	14548	14548
86	12.3948	187805	9.91923	Parent 5	285	8.5	2313.31	2467.96	14606.6	0	14606.6	15011.1	15011.1
87	12.3948	190824	9.91923	Parent 5	285	8.5	2346.23	2503.08	14841.5	0	14841.5	15251.8	15251.8
88	12.3948	192519	9.91923	Parent 5	285	8.5	2364.72	2522.8	14973.5	0	14973.5	15387	15387
89	12.3948	194203	9.91923	Parent 5	285	8.5	2383.09	2542.4	15104.6	0	15104.6	15521.4	15521.4
90	12.3948	195183	9.91923	Parent 5	285	8.5	2393.78	2553.8	15180.9	0	15180.9	15599.5	15599.5
91	12.3948	195744	9.91923	Parent 5	285	8.5	2399.89	2560.32	15224.5	0	15224.5	15644.2	15644.2
92	5.68052	87819.7	50.3043	Parent 5	1100	28	5236.27	5586.31	8437.52	0	8437.52	14745.6	14745.6
93	13.0418	186354	50.3043	5lide Mass 4	1500	15	3647.25	3891.07	8923.59	0	8923.59	13317.4	13317.4
94	13.0418	164195	50.3043	5lide Mass 4	1500	15	3348.77	3572.64	7735.18	0	7735.18	11769.4	11769.4
95	13.2344	141458	50.3043	5lide Mass 3	2500	15	3772.82	4025.03	5691.52	0	5691.52	10236.6	10236.6
96	13.2344	115966	50.3043	5lide Mass 3	2500	15	3434.44	3664.03	4344.21	0	4344.21	8481.65	8481.65
97	15.1135	101253	50.3043	5lide Mass 2	3500	15	3830.06	4086.1	2187.36	0	2187.36	6801.41	6801.41
98	15.1135	68008.1	50.3043	5lide Mass 2	3500	15	3443.63	3673.84	648.773	0	648.773	4797.29	4797.29
99	11.6801	29784.1	50.3043	5lide Mass 1	1750	15	1774.53	1893.16	534.272	0	534.272	2672.03	2672.03
100	11.6801	9928.04	50.3043	5lide Mass 1	1750	15	1476.29	1574.98	-653.173	0	-653.173	1125.3	1125.3

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.02054

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]

1	145.384	2591.16	0	0	0
2	154.118	2586.23	12565	0	0
3	166.799	2579.06	42414.6	0	0
4	179.481	2571.89	83755.3	0	0
5	192.163	2564.72	136587	0	0
6	203.858	2558.22	194406	0	0
7	215.552	2551.73	261661	0	0
8	227.247	2545.23	338352	0	0
9	238.942	2538.74	424479	0	0
10	250.638	2532.87	510778	0	0
11	262.334	2527.01	608267	0	0
12	274.03	2521.15	717773	0	0
13	285.726	2515.29	835961	0	0
14	298.419	2509.18	968802	0	0
15	311.112	2503.08	1.11109e+06	0	0
16	323.805	2496.97	1.26281e+06	0	0
17	336.498	2490.86	1.42397e+06	0	0
18	349.459	2492	1.41241e+06	0	0
19	362.421	2493.13	1.40097e+06	0	0
20	375.382	2494.27	1.38967e+06	0	0
21	388.916	2495.45	1.37801e+06	0	0
22	402.45	2496.64	1.3665e+06	0	0
23	415.984	2497.82	1.35508e+06	0	0
24	427.36	2499.2	1.33916e+06	0	0
25	438.736	2500.58	1.32332e+06	0	0
26	450.113	2501.96	1.30759e+06	0	0
27	461.463	2503.38	1.29113e+06	0	0
28	472.814	2504.81	1.27478e+06	0	0
29	484.165	2506.24	1.25828e+06	0	0
30	495.73	2507.72	1.24113e+06	0	0
31	507.294	2509.2	1.2241e+06	0	0
32	518.859	2510.69	1.20721e+06	0	0
33	530.424	2512.17	1.19044e+06	0	0
34	541.989	2513.65	1.17379e+06	0	0
35	553.554	2515.13	1.15728e+06	0	0
36	567.163	2516.88	1.13786e+06	0	0
37	580.772	2518.64	1.11862e+06	0	0
38	594.381	2520.39	1.09956e+06	0	0
39	607.99	2522.14	1.08034e+06	0	0
40	619.507	2523.89	1.05872e+06	0	0
41	631.025	2525.64	1.03739e+06	0	0
42	642.542	2527.39	1.01634e+06	0	0
43	654.059	2529.14	995571	0	0
44	665.576	2530.89	975088	0	0
45	677.093	2532.65	954822	0	0
46	688.61	2534.4	934840	0	0
47	700.127	2536.16	915144	0	0
48	711.644	2537.91	895732	0	0
49	723.161	2539.66	876605	0	0
50	735.982	2541.62	855620	0	0
51	748.804	2543.57	834989	0	0
52	761.625	2545.53	814711	0	0
53	774.447	2547.48	794778	0	0
54	787.268	2549.53	773649	0	0
55	800.09	2551.58	752749	0	0
56	812.911	2553.63	732079	0	0
57	825.733	2555.68	711639	0	0
58	838.555	2557.77	690907	0	0
59	851.376	2559.86	670657	0	0
60	864.198	2561.95	650821	0	0
61	877.019	2564.04	631368	0	0

62	889.841	2566.19	611479	0	0
63	902.663	2568.33	591994	0	0
64	915.485	2570.48	572914	0	0
65	928.306	2572.63	554239	0	0
66	941.128	2574.86	534719	0	0
67	953.95	2577.1	515642	0	0
68	966.771	2579.34	497007	0	0
69	979.593	2581.58	478814	0	0
70	992.415	2583.82	461048	0	0
71	1005.24	2586.05	443686	0	0
72	1018.06	2588.29	426729	0	0
73	1030.88	2590.53	410176	0	0
74	1043.57	2592.76	393994	0	0
75	1056.26	2594.99	378215	0	0
76	1068.95	2597.22	362837	0	0
77	1081.64	2599.45	347862	0	0
78	1096.93	2602.14	330285	0	0
79	1112.21	2604.83	313047	0	0
80	1124.42	2606.97	302815	0	0
81	1138.95	2609.53	290535	0	0
82	1153.48	2612.09	277790	0	0
83	1168.02	2614.65	264324	0	0
84	1180.67	2616.88	251973	0	0
85	1193.33	2619.12	239074	0	0
86	1205.99	2621.35	225628	0	0
87	1218.65	2623.58	211633	0	0
88	1229.23	2625.45	199615	0	0
89	1239.82	2627.31	187485	0	0
90	1250.4	2629.18	175246	0	0
91	1265.34	2631.81	157803	0	0
92	1280.28	2634.45	140271	0	0
93	1289.07	2645.47	85396.2	0	0
94	1301.19	2660.66	-20151.6	0	0
95	1314.25	2677.04	-116085	0	0
96	1322.1	2686.88	-148992	0	0
97	1339.68	2708.93	-195362	0	0
98	1356.03	2729.43	-173599	0	0
99	1368.25	2745.25	-134368	0	0
100	1379.1	2759.3	-120303	0	0
101	1389.96	2773.35	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 0.99681

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	145.384	2591.16	0	0	0
2	154.118	2586.23	12937.8	0	0
3	166.799	2579.06	43551.7	0	0
4	179.481	2571.89	85845.5	0	0
5	192.163	2564.72	139819	0	0
6	203.858	2558.22	198829	0	0
7	215.552	2551.73	267430	0	0
8	227.247	2545.23	345621	0	0
9	238.942	2538.74	433403	0	0
10	250.638	2532.87	521294	0	0
11	262.334	2527.01	620571	0	0
12	274.03	2521.15	732080	0	0
13	285.726	2515.29	852414	0	0
14	298.419	2509.18	987636	0	0
15	311.112	2503.08	1.13245e+06	0	0
16	323.805	2496.97	1.28687e+06	0	0
17	336.498	2490.86	1.45088e+06	0	0

18	349.459	2492	1.43964e+06	0	0
19	362.421	2493.13	1.42854e+06	0	0
20	375.382	2494.27	1.41757e+06	0	0
21	388.916	2495.45	1.40625e+06	0	0
22	402.45	2496.64	1.39509e+06	0	0
23	415.984	2497.82	1.38409e+06	0	0
24	427.36	2499.2	1.36858e+06	0	0
25	438.736	2500.58	1.35317e+06	0	0
26	450.113	2501.96	1.33785e+06	0	0
27	461.463	2503.38	1.32179e+06	0	0
28	472.814	2504.81	1.30584e+06	0	0
29	484.165	2506.24	1.28976e+06	0	0
30	495.73	2507.72	1.27304e+06	0	0
31	507.294	2509.2	1.25644e+06	0	0
32	518.859	2510.69	1.23996e+06	0	0
33	530.424	2512.17	1.2236e+06	0	0
34	541.989	2513.65	1.20736e+06	0	0
35	553.554	2515.13	1.19124e+06	0	0
36	567.163	2516.88	1.17228e+06	0	0
37	580.772	2518.64	1.15349e+06	0	0
38	594.381	2520.39	1.13487e+06	0	0
39	607.99	2522.14	1.11611e+06	0	0
40	619.507	2523.89	1.09496e+06	0	0
41	631.025	2525.64	1.07409e+06	0	0
42	642.542	2527.39	1.0535e+06	0	0
43	654.059	2529.14	1.0332e+06	0	0
44	665.576	2530.89	1.01318e+06	0	0
45	677.093	2532.65	993370	0	0
46	688.61	2534.4	973847	0	0
47	700.127	2536.16	954608	0	0
48	711.644	2537.91	935653	0	0
49	723.161	2539.66	916982	0	0
50	735.982	2541.62	896503	0	0
51	748.804	2543.57	876378	0	0
52	761.625	2545.53	856605	0	0
53	774.447	2547.48	837176	0	0
54	787.268	2549.53	816555	0	0
55	800.09	2551.58	796169	0	0
56	812.911	2553.63	776020	0	0
57	825.733	2555.68	756106	0	0
58	838.555	2557.77	735903	0	0
59	851.376	2559.86	716178	0	0
60	864.198	2561.95	696865	0	0
61	877.019	2564.04	677935	0	0
62	889.841	2566.19	658568	0	0
63	902.663	2568.33	639604	0	0
64	915.485	2570.48	621045	0	0
65	928.306	2572.63	602891	0	0
66	941.128	2574.86	583891	0	0
67	953.95	2577.1	565333	0	0
68	966.771	2579.34	547216	0	0
69	979.593	2581.58	529540	0	0
70	992.415	2583.82	512291	0	0
71	1005.24	2586.05	495447	0	0
72	1018.06	2588.29	479007	0	0
73	1030.88	2590.53	462973	0	0
74	1043.57	2592.76	447306	0	0
75	1056.26	2594.99	432041	0	0
76	1068.95	2597.22	417179	0	0
77	1081.64	2599.45	402719	0	0
78	1096.93	2602.14	385767	0	0

79	1112.21	2604.83	369163	0	0
80	1124.42	2606.97	359520	0	0
81	1138.95	2609.53	347943	0	0
82	1153.48	2612.09	335918	0	0
83	1168.02	2614.65	323199	0	0
84	1180.67	2616.88	311521	0	0
85	1193.33	2619.12	299316	0	0
86	1205.99	2621.35	286583	0	0
87	1218.65	2623.58	273323	0	0
88	1229.23	2625.45	261929	0	0
89	1239.82	2627.31	250429	0	0
90	1250.4	2629.18	238824	0	0
91	1265.34	2631.81	222281	0	0
92	1280.28	2634.45	205653	0	0
93	1289.07	2645.47	152546	0	0
94	1301.19	2660.66	49133	0	0
95	1314.25	2677.04	-44694.1	0	0
96	1322.1	2686.88	-76185.7	0	0
97	1339.68	2708.93	-119683	0	0
98	1356.03	2729.43	-95082.2	0	0
99	1368.25	2745.25	-53922.8	0	0
100	1379.1	2759.3	-38964.4	0	0
101	1389.96	2773.35	0	0	0

Global Minimum Query (spencer) - Safety Factor: 1.06685

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	154.848	2591.24	0	0	0
2	167.935	2586.25	15633.5	1933.57	7.0506
3	180.437	2581.48	38263	4732.44	7.05064
4	192.938	2576.71	66859.7	8269.33	7.05064
5	205.44	2571.94	101424	12544.2	7.05058
6	217.941	2567.17	141955	17557.2	7.05062
7	230.443	2562.4	188453	23308.2	7.05064
8	242.944	2557.63	240918	29797.2	7.05065
9	255.446	2552.86	299960	37099.5	7.05062
10	267.948	2548.09	370091	45773.5	7.05064
11	280.449	2543.32	448401	55459.1	7.05065
12	292.951	2538.56	533605	65997.3	7.05065
13	305.452	2533.79	625703	77388	7.05063
14	317.954	2529.02	724694	89631.4	7.05063
15	330.455	2524.25	830578	102727	7.05061
16	343.379	2525.39	822470	101725	7.05067
17	356.304	2526.54	814498	100739	7.05067
18	369.228	2527.69	806661	99769.3	7.05064
19	382.152	2528.83	798963	98817.1	7.05063
20	395.076	2529.98	791404	97882.2	7.05063
21	408	2531.12	783985	96964.6	7.05063
22	412	2531.48	889765	110048	7.05066
23	424.674	2532.6	882173	109109	7.05066
24	437.349	2533.73	874584	108170	7.05063
25	450.023	2534.85	866998	107232	7.05065
26	462.697	2535.97	859415	106294	7.05064
27	475.371	2537.1	851840	105357	7.05063
28	488.046	2538.22	844304	104425	7.05064
29	500.72	2539.34	836771	103493	7.05062
30	513.394	2540.47	829241	102562	7.05064
31	526.069	2541.59	821714	101631	7.05063
32	538.743	2542.72	814191	100701	7.05067
33	550.693	2543.85	806166	99708	7.05063
34	562.643	2544.99	798164	98718.3	7.05063

35	574.594	2546.13	790185	97731.4	7.05063
36	586.544	2547.27	782229	96747.5	7.05064
37	598.494	2548.41	774297	95766.4	7.05064
38	610.445	2549.54	766156	94759.6	7.05064
39	622.395	2550.68	757804	93726.5	7.05063
40	634.345	2551.82	749580	92709.4	7.05064
41	646.295	2552.96	741485	91708.2	7.05064
42	658.246	2554.1	733519	90722.9	7.05064
43	670.196	2555.23	725681	89753.6	7.05064
44	682.146	2556.37	717973	88800.1	7.05063
45	694.097	2557.51	710393	87862.6	7.05063
46	706.047	2558.65	702942	86941.1	7.05064
47	717.997	2559.79	695619	86035.4	7.05064
48	730.608	2561.1	686585	84918.1	7.05064
49	743.218	2562.41	677717	83821.2	7.05063
50	755.828	2563.72	669014	82744.9	7.05064
51	768.439	2565.03	660477	81689	7.05064
52	781.049	2566.34	652086	80651.1	7.05063
53	793.66	2567.65	643808	79627.4	7.05064
54	806.27	2568.96	635645	78617.7	7.05064
55	818.88	2570.27	627595	77622.1	7.05064
56	831.491	2571.58	619660	76640.6	7.05063
57	844.101	2572.89	611888	75679.4	7.05064
58	856.712	2574.2	604303	74741.2	7.05063
59	869.322	2575.51	596878	73822.9	7.05063
60	881.932	2576.82	589611	72924.1	7.05063
61	894.543	2578.14	582503	72045	7.05064
62	907.153	2579.45	575553	71185.5	7.05065
63	919.764	2580.76	568762	70345.5	7.05064
64	932.374	2582.07	562130	69525.2	7.05063
65	944.984	2583.38	555656	68724.5	7.05064
66	957.595	2584.69	549340	67943.4	7.05064
67	970.205	2586	543183	67181.8	7.05063
68	983.268	2588.09	527818	65281.4	7.05063
69	996.331	2590.18	512812	63425.5	7.05064
70	1009.39	2592.28	498154	61612.5	7.05063
71	1022.46	2594.37	483843	59842.5	7.05063
72	1035.52	2596.46	469879	58115.5	7.05064
73	1048.58	2598.55	456263	56431.4	7.05064
74	1061.65	2600.64	442995	54790.4	7.05064
75	1074.71	2602.74	430073	53192.2	7.05064
76	1087.77	2604.83	417496	51636.6	7.05063
77	1099.39	2606.69	409519	50650	7.05063
78	1111	2608.55	401499	49658.1	7.05064
79	1123.4	2610.72	390794	48334.1	7.05064
80	1135.79	2612.88	380058	47006.3	7.05065
81	1148.19	2615.05	369079	45648.3	7.05063
82	1160.58	2617.22	357549	44222.3	7.05064
83	1172.98	2619.39	345467	42728	7.05064
84	1185.37	2621.55	332832	41165.3	7.05065
85	1197.77	2623.72	319645	39534.3	7.05064
86	1210.16	2625.89	305905	37834.9	7.05064
87	1222.56	2628.06	291621	36068.3	7.05066
88	1234.95	2630.22	277055	34266.6	7.05063
89	1247.35	2632.39	262329	32445.3	7.05063
90	1259.74	2634.56	247446	30604.5	7.05062
91	1272.14	2636.73	232471	28752.4	7.05063
92	1284.53	2638.89	217443	26893.7	7.05063
93	1290.21	2645.74	184149	22775.8	7.05061
94	1303.25	2661.45	80284.8	9929.76	7.05063
95	1316.3	2677.16	-7466.98	-923.53	7.05064

96	1329.53	2693.1	-56814.8	-7026.96	7.05064
97	1342.76	2709.05	-87626.7	-10837.8	7.05062
98	1357.88	2727.25	-75699.5	-9362.65	7.05064
99	1372.99	2745.46	-39598.9	-4897.67	7.05065
100	1384.67	2759.53	-28197.6	-3487.53	7.05064
101	1396.35	2773.6	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates
External Boundary	

X	Y
0	2400
325	2400
2100	2400
2100	2637
2100	2643
2100	2693
2100	2743
2100	2793
2100	2843
2100	2863
2100	2893
1740	2890
1733	2880
1725	2870
1715	2860
1705	2850
1688	2840
1670	2830
1655	2820
1635	2800
1620	2790
1555	2780
1307	2770
1258	2760
1220	2750
1137	2710
1085	2700
981	2690
848	2680
848	2680.01
848.017	2680.01
848	2680
830	2680
770	2670
605	2660
605	2638
588.901	2638
552.82	2638
474	2638
474	2632
412	2632
412	2602
408	2602
368	2601
264	2596
250	2592
0	2590

	X	Y
	250	2592
	336.843	2580.18
	408	2575.83
	410.443	2575.83
	412	2575.83
	426.415	2575
	520	2575
	639.276	2579.23
	748.665	2582.59
	929.108	2591.46
	1070.69	2604.83
	1153.89	2619.43
	1184.94	2624.6
	1232.69	2633.27
	1269.97	2641.01
	1295.65	2647.01
	1331.37	2655.36
	1352.55	2660.31
	1436.77	2682.3
	1456.52	2690.28
	1501.45	2711.7
	1533.28	2726.88
	1538.15	2730.43
	1571.12	2754.42
	1620	2790

	X	Y
	325	2400
Material Boundary	1859.05	2604.83
	2100	2637

	X	Y
	1533.28	2726.88
Material Boundary	1628.48	2735.95
	1772.43	2843
	2100	2843

	X	Y
	1456.52	2690.28
	1643.59	2684.57
Material Boundary	1725.74	2743
	1790.67	2793
	2100	2793

	X	Y
	1070.69	2604.83
Material Boundary	1142.96	2604.83
	1796.72	2604.83
	1859.05	2604.83

	X	Y
Material Boundary	625.172	2617.99
	635.144	2604.99

	X	Y
	605	2638
Material Boundary	608.98	2632.63
	625.172	2617.99

Material Boundary

X	Y
1751.38	2697.67
1807.8	2743

Material Boundary

X	Y
1807.8	2743
2100	2743

Material Boundary

X	Y
1733	2880
2100	2863

Material Boundary

X	Y
1643.59	2684.57
1671.74	2687.99
1751.38	2697.67

Material Boundary

X	Y
1295.65	2647.01
1778.84	2647.01
1872.68	2683.69
2100	2693

Material Boundary

X	Y
635.144	2604.99
1070.69	2604.83

Material Boundary

X	Y
608.98	2632.63
771.118	2643.71
889.239	2652.93
1040.2	2662.15
1107.04	2671.94
1160.05	2685.77
1183.23	2698.93
1210.76	2717.23
1263.67	2735.82

Material Boundary

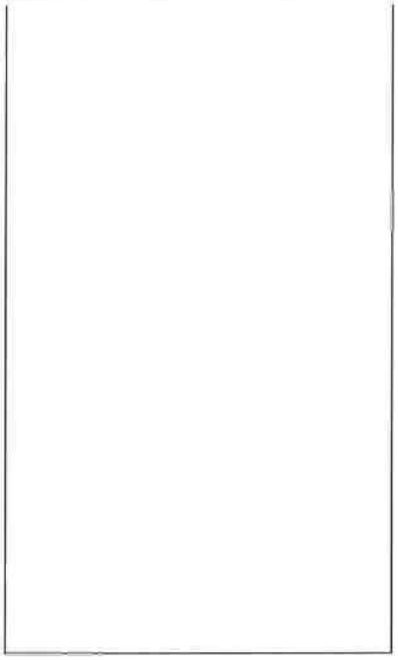
X	Y
1263.67	2735.82
1311.94	2742.7
1571.12	2754.42

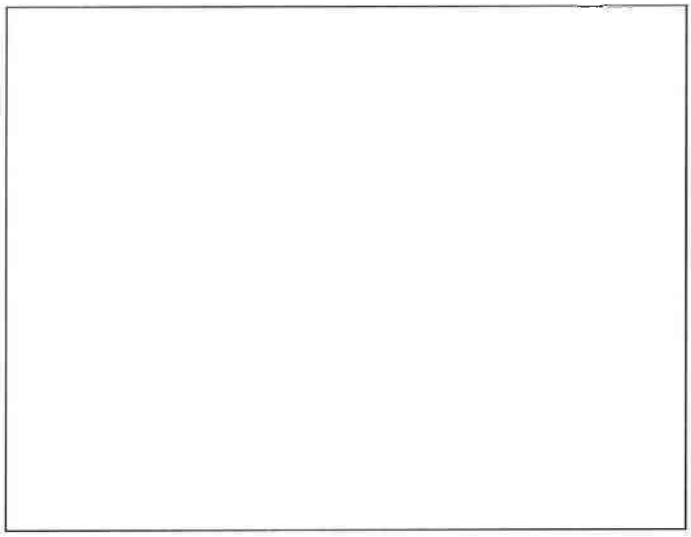
Material Boundary

X	Y
1183.23	2698.93
1254.6	2705.68

Material Boundary

X	Y
625.172	2617.99
903.806	2628.93
1042.92	2628.93
1089.74	2628.93
1232.69	2633.27





Material Boundary

X	Y
1089.74	2628.93
1150.23	2649.7
1191.06	2667.09
1259.1	2673.9
1340.76	2678.55
1436.77	2682.3

Material Boundary

X	Y
1254.6	2705.68
1412.45	2711.7
1501.45	2711.7

Material Boundary

X	Y
408	2602
408	2575.83
408	2498
412	2498
412	2575.83
412	2602

Scenario-based Entities

Type	Coordinates	Master Scenario
		Assigned to materials:
Water Table	X: 0, Y: 2586 X: 413.466, Y: 2586.61 X: 598.915, Y: 2604.83 X: 2100, Y: 2604.83	Slide Mass Slide Mass 1 Slide Mass 2 Slide Mass 3 Slide Mass 4 Slide Mass 5 *... and 8 more*
Distributed Load	X: 474, Y: 2638 X: 605, Y: 2638	Constant Distribution Orientation: Vertical Magnitude: 200 lbs/ft2 Creates Excess Pore Pressure: No

EXHIBIT J

2021 AGEC Slope Stability Report

AGEC
Applied GeoTech

September 28, 2021

Blackridge Development, LLC
2001 Park Avenue
Park City, Utah 84060

Attention: Glen Overton
EMAIL: glenaoverton@gmail.com

Subject: Slope Stability Consultation
Blackstone, West Hotel Project
250 West Blackridge Drive
St. George, Utah
Project No. 2-21-1175

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to conduct geotechnical analyses to evaluate the stability of the hillside upon which the Blackstone Hotel is proposed to be constructed. A geotechnical investigation for the proposed hotel, located on the west side of 250 West along Blackridge Drive in St. George, was conducted and the findings and recommendations were presented in a report dated September 8, 2021 under Project No. 2-21-1175. The hotel site was originally planned to be constructed on the east side of Blackridge Drive. A geotechnical investigation for the hotel on the east side of the road was presented in a report dated December 14, 2018 under project number 2-18-0187.

The reports indicate that both sites are located on an ancient landslide deposit, which has the potential, if environmental conditions change, for landslide movement. Our initial analyses, conducted for both sites, assume that the hillside is wet, reflecting a most adverse moisture condition. Our initial evaluation indicates the calculated factor of safety against landslide movement, using the saturated material strengths, does not meet minimum standards.

I. BACKGROUND

A. Landslide Deposit

The site for the proposed hotel is located in the lower section of a 300-foot high slope. The lower two-thirds of the slope has been identified and mapped

as a landslide deposit. The ground surface of the landslide deposit slopes down at average slope of approximately 7.3 horizontal to 1 vertical. During our earlier studies the landslide deposit has been logged to extend up to a depth of approximately 200 feet below the existing ground surface at the site.

B. Slope Movement

In order to determine if movement is occurring on the slope, five inclinometers were installed in 2007 on the east slope of Blackridge extending to depths of 79 to 259 feet below grade. Four of the five inclinometers indicate that there has been no movement since 2007 compared to measurements taken in 2018. Ground movement was measured at multiple depths prior to 2011 in the inclinometer installed immediately west of the vacant restaurant (Dairy Queen) located at 1090 South Bluff Street.

With the lack of measured movement in the four inclinometers over 10½ years (between 2007 and 2018), along with the lack of surficial evidence of movement, it is apparent that the portion of the slope for this project is currently maintaining its stability and is not showing evidence of creep (slow lateral movement).

C. Earlier Stability Analysis

1. The previously back-calculated saturated material strengths of the landslide materials were verified by calculating a static factor of safety of 1.0 for the pre-graded profile.

2. Changes in the internal conditions and the surficial geometry modifications may improve or reduce the ability of the slope to maintain its stability.

II. CURRENT STUDY

In order to understand the likelihood of future slope movement, the stability of the slope has been evaluated taking advantage of the desert environment and the resulting un-saturated condition of the soil and bedrock above the groundwater table.

In order to develop this additional understanding, samples of soil (weathered bedrock) from the hillside were obtained and tested in the laboratory to define the index properties and to measure strength characteristics with different moisture contents. Stability analyses have been conducted using this additional information.

A. Weak Layers

Samples of the subsurface materials were obtained during our subsurface exploration in June, 2021. Boring B-4 was cored, and weak zones were identified at the following depths, associated elevations and approximate thickness:

Weak Layers		
Depth (feet)	Elevation (feet)	Estimated Thickness (feet)
50	2633	5
77	2606	2
97	2589	1
114	2569	1
117	2566	2

Samples from the weak layers were testing in the laboratory for their index properties and their strength characteristics.

B. Existing Moisture Conditions

Based on laboratory testing completed on soil and bedrock samples obtained in the hillside, the following moisture contents, dry densities and relative degrees of saturation have been obtained.

Characteristic	Range		Average
	Low	High	
Moisture Content (%)	0.3	39.5	16.3
Dry Density (pcf)	88.0	147.0	106.2
Degree of Saturation (%)	10	100	71.9

C. Laboratory Testing

The predominant material in the hillside is mudstone bedrock.

Disturbed, weathered samples of the mudstone were obtained for testing. The samples obtained have distinct colors of "blue", "red", and "gray". A fourth sample, obtained from between basalt blocks in the debris portion of the landslide deposit was also obtained. These colors were used to identify the samples tested.

1. Index Properties

The disturb bulk samples were tested in the laboratory to determine their index properties. Listed below is a table summarizing the test results.

Index Property	Blue Clay	Red Clay	Gray Clay	Debris Clay
Moisture Content (%)	9.1	5.3	3.3	1.3
Grain-size Distribution				
+ #4 sieve (%) (gravel size)	0	0	0	17
- #4, + #200 sieves (%) (sand size)	33	21	6	31
- #200 sieve (%) (silt and clay size)	67	79	94	52
Atterberg Limits				
Liquid Limit (%)	55	46	47	38
Plasticity Index (%)	31	24	26	12
Moisture/density Relationship (standard Proctor)				
Maximum Dry Density (pcf)	98.0	104.5	104.2	108.2
Optimum Moisture Content (%)	22.0	17.6	19.2	15.1
Specific Gravity	2.64	2.64	2.71	2.65

These test results are presented on Figures 1-4.

The index properties of the samples tested for this project are presented below:

Index Property	Low	High	Average	Number of samples tested
Moisture Content (%)	0.3	39.5	16.2	45
Dry Density (pcf)	91.5	140.6	104.4	15
Degree of Saturation (%)	41	100	74	15
Grain-size Distribution				
- #200 sieve (%) (silt and clay size)	74	97	79	15
Atterberg Limits				
Liquid Limit (%)	43	77	60	10
Plasticity Index (%)	24	54	40	10

2. Strength Testing

Testing for the 2018 and this current study was conducted on disturbed samples that were remolded prior to strength testing. Testing was completed using the triaxial shear apparatus, the direct shear apparatus and the ring shear apparatus.

After reviewing the index properties of the four samples obtained in 2018, it was decided to focus the testing on the two mudstone sampled with colors which represent the predominant materials in the hillside. Two samples from boring B-4 were tested in the 2021 study.

a. Fully Softened and Residual Strength

i. 2018 Study

Samples of the blue and red clay were remolded at 38 and 36 percent moisture with densities of 73 and 84 pounds per cubic foot (pcf), respectively. The remolded moisture contents are 16 and 18.4 percent above the soil's optimum moisture contents and the remolded densities are approximately 74 and 80 percent compaction. Once the samples were remolded, they were placed in a triaxial shear apparatus and consolidated under a confining pressures of 2, 6 and 10 kips per square foot (ksf). The consolidated samples were then

sheared with pore pressure measurements. Test results are presented on Figures 6 and 7.

ii. 2021 Study

Two samples obtained from boring B-4 were tested for their fully softened and residual strengths. The soil properties and strength test results are presented below:

Sample Characteristic	B-4 @ 50 feet	B-4 @ 114 feet
Remolded Moisture Content (%)	44.2	50.1
Remolded Dry Density (pcf)	75.8 to 79.2	74.3 to 75.9
Liquid Limit (%)	58	65
Plasticity Index (%)	35	45
Specific Gravity	2.76	2.75
Grain Size Distribution (%)		
Coarse Sand (2.000 to 4.750 mm)	0	0
Medium Sand (0.425 to 2.000 mm)	0	0
Fine Sand (0.075 to 0.425 mm)	53	27
Silt (0.005 to 0.075 mm)	5	26
Clay (0.001 to 0.005 mm)	12	11
Colloidals (<0.001 mm)	30	36
Fully Softened Strength		
Friction (degrees)	18.3	17.0
Cohesion (psf)	240	180
Residual Strength - Friction (degrees)	8.9	11.5

Strength test results are presented on Figures 16 and 17.

b. Unsaturated Strengths

Samples of the blue and red clay were remolded at moisture contents between 12 and 24 percent with densities near 95 or 103.5 pcf (97 to 99 percent compaction) and tested in consolidated, undrained tests with confining pressures of 2, 6 and 10 ksf. The test results are included on Figures 8 through 13 and summarized in the table below.

c. Pre-sheared strength

Samples of the two materials were remolded at 10 and 13 percent moisture with densities of 95 and 101 pcf (97 percent compaction) and placed in a shear testing apparatus. The samples were then sheared and then reset and sheared at 2, 6 and 10 ksf normal load. The tests were conducted at an undrained shear rate. Test results are presented on Figures 14 and 15 and the table below.

d. Test Results

Listed below is a table summarizing the results of the tests conducted.

Blue Clay Strength Test Results

Moisture Content (%)	Dry Density (pcf)	Φ (°)	c (ksf)	Test Type
13.0	95.0	23.8	0.7	Direct Shear, pre-sheared with no water added
14.4	95.5	18.5	2.6	Triaxial, unsaturated
19.6	94.6	9.9	3.4	Triaxial, unsaturated
23.8	94.9	7.3	2.7	Triaxial, unsaturated
38.0	73.0	23.0	0.2	Triaxial, saturated

Red Clay Strength Test Results

Moisture Content (%)	Dry Density (pcf)	Φ (°)	c (ksf)	Test Type
10.0	101.0	14.5	0.9	Direct Shear, pre-sheared with no water added
12.6	103.5	20.1	2.2	Triaxial, unsaturated
14.9	102.0	16.2	3.3	Triaxial, unsaturated
17.9	105.1	12.7	3.3	Triaxial, unsaturated
36.0	84.0	24.0	0	Triaxial, saturated

Values of the shear strength at a confining pressure of 10,000 psf versus suction are presented on Figure 18.

e. Suction

Samples of the bulk mudstone were tested in the laboratory to define a soil-water characteristic curve (SWCC) for each of the blue and red clay samples. The suction was measured using a WP4C measuring device. A "best fit" relationship was visually estimated. The test results are presented on Figure 5.

Samples obtained during the 2021 study were also tested to measure their suction values. A plot of suction versus depth is presented on Figure 19.

D. Stability Model

1. Surface Conditions

The model of the hillside used in this analysis include the following characteristics.

Characteristics	Value
Top Elevation (feet)	2884
Toe Elevation (feet)	2584
Slope Height (feet)	300
Upper Intact Slope (Horizontal to Vertical)	2.5:1 (upper ~80')
Landslide Slope (Horizontal to Vertical)	7.3:1
Average overall Slope (Horizontal to Vertical)	5.8:1

2. Subsurface Profile

A subsurface profile has been developed from the deep borings drilled during earlier studies, geologic maps along with the results of the this and earlier analyses. The first figure of each stability condition (in the appendix) presents the profile used for our analysis.

The upper portion of the hillside consists of a basalt cap. It is estimated that the cap is from 20 to 30 feet thick.

The mudstone (referred to as "parent" material) in the slope extends from the basalt cap, down to sandstone.

The bedrock bedding planes in the area dips down to the north east. The interface between the mudstone and the sandstone is estimated to dip down to the east at 7.6 degrees.

Based on our prior studies and evaluation of other landslide events in the area, there are weak planes within the mudstone deposit. Measurements obtained by us and others indicate that this weak plane dips at approximately 8 to 9 degrees towards the northeast. With this orientation, the weak plane has been modeled dipping down towards the east, following the slope at an angle of 5 to 10 degrees.

Also based on the subsurface conditions encountered during our earlier studies, we have estimated the thickness of the landslide to be up to approximately 200 feet thick under the site.

3. Water & Moisture Conditions

Ground water has been measured in the deep borings drilled on the slope. Using this information, a groundwater elevation of 2605 feet (approximately 280 feet below the bluff) dropping down to elevation 2580 feet (approximately 5 feet below grade) near the toe of the slope was used in the model.

For the unsaturated model, the suction and moisture contents measured in the laboratory were used.

Using the values obtained along with the moisture contents of samples measured in this hillside, we have estimated a suction profile with depth. This profile is described below.

Landslide Deposit and Natural, Undisturbed Hillside

Depth	Suction (ksf)	(pF)
0 to15 feet	0.0	0
15 feet below grade to 10 feet above water	15.0	3.9
10' above water to water	7.5	3.6

4. Material Strengths

a. Saturated Strengths

The stability analysis conducted for our 2018 report, was based on saturated soil strengths. Listed below is a table summarizing the strengths used in that study.

Material	Unit Weight (psf)	Φ′ (°)	c′ (psf)
Landslide (residual)	125	13.5	0
Landslide - weak plane (residual)	125	8.5	0
Parent	125	25	470
Parent Weak Plane	125	17.0	180
Sandstone	125	44	3,000
Basalt	165	45	30,000

b. Unsaturated Strengths

The unsaturated strength of the on-site material (soil / weathered bedrock) was investigated by remolding the two soil samples at different moisture contents, compressing the samples and then shearing the samples in a triaxial shear apparatus. The testing allowed us to estimate the anticipated increase in soil strength as the moisture content decreases.

The unsaturated component of strength is modeled as friction in conjunction with the amount of suction. With the relatively high moisture contents and low suction values at depths from 15 to 80 feet below grade in B-4, a suction strength factor (Φ^b) slightly below the effective friction (Φ′) has been used.

E. Results

1. Factor of Safety

A common factor of safety used when designing earth slopes and retainage systems within undisturbed ground conditions is 1.5. This value is used because soil properties cannot be back-analyzed and greater uncertainties exist in the subsurface conditions and the strength values used in an analysis. The use of back-analyzed values allow the use of lower (less conservative) factors of safety.

Acceptable factors of safety for existing landslides is typically between 1.2 and 1.5 when back-calculated strengths can be determined.

Due to the large number of landslides in the state of Washington, the Washington State Highway Department assesses the stability of landslides through back-analysis. Their factor of safety for landslide repair is 1.25 (WSDOT Geotechnical Design Manual M 46-03.08 October 2013).

The Utah Department of Transportation accepts a safety factor of 1.3 for long-term static conditions for embankments and cut slopes located where failure or excessive deformation impacts adjacent bridges or critical facilities (Figure 12.1 - Minimum Acceptable Factors of Safety - Global Stability, UDOT Geotechnical Manual of Instruction, September 2017).

The stakeholders of this project may consider accepting factors of safety between 1.2 and 1.5 due to the following aspects of the analysis conducted:

a. Landslide strengths were back-calculated. The back-calculated values are considered "residual" strengths which are the weakest strengths of the material. This approach significantly reduces the likelihood of lower values being experienced.

b. The laboratory strength test results of the weak layer materials are reasonably consistent with the back-calculated strength values. This increases our confidence that the values used in the analysis are representative.

c. The lack of hillside movement over 10½ years is a good indicator that the strength of the hillside is sufficient to prevent creep.

d. There could be an improvement in the stability of the slope if the development reduces the amount of water available to seep into the subgrade.

2. Calculated Values

The stability of the hillside was evaluated assuming a number of conditions using the profile, strength and pore water pressures described above. The original profile stability (Safety Factor of 1.0) was verified using saturated soil strengths for what we anticipate the original profile was before significant grading occurred on the site.

With the grading that has occurred (removal of material from the hotel site and placement west of the hotel site) has resulted in essentially the same factor of safety.

Using the proposed grading of the hotel site, the unsaturated strengths of the materials at the site above the water level and the saturated strengths below the water level, result in a calculated factor of safety of 1.39 when using a suction of 15,000 psf. Extending tension cracks down below the existing scarp reduce the factor of safety to 1.38.

Using the same strengths and a seismic acceleration of 0.16g (which would reflect an event with a 2% probability of accedence in 50 years) results in a safety factor of less than 1.0. Using these same parameters, we estimate that approximately 7 inches of movement would occur under a major seismic event using the unsaturated conditions.

3. Considerations

With the regrading that was conducted years ago in the area proposed for the hotel, water has been allowed to pond in the area where boring B-4 was drilled. Therefore, the moisture condition of the below grade materials, in the area of B-4, were found to be higher than what has been found in other areas of the blackridge slope.

With other areas being drier, higher suction related strengths would be expected. These higher strengths would result in higher calculated stability factors of safety.

We anticipate that proper water management in conjunction with development should provide an opportunity for the strength of the slope to improve, and therefore improve the stability of the slope.

4. Recommendations

If the proposed improvements are constructed, we recommend that at least two inclinometers and two piezometers be installed and monitored over the lifetime of the facility. This would allow the stakeholders to know how the landslide mass is behaving and would also allow steps to be taken, if needed, to maintain the integrity of the slope.

III. LONG-TERM RECOMMENDATIONS

The soil and bedrock strengths in the hillside need to remain similar to that used in this analysis in order to maintain the level of stability. This can be achieved by keeping the moisture conditions as they currently are, and drier if possible.

There is also the opportunity to improve the existing conditions with strict adherence to the recommendations presented below.

Recommendations to maintain, if not to improve the current moisture conditions include:

A. Monitoring the landslide would be prudent to confirm that the acceptability of the approach being taken is providing the safety expected. The monitoring would also provide a warning if the conditions are changing.

B. Collect and remove surface drainage off the site in water tight storm drainage systems. This type of construction is not standard and therefore, would require specific attention to verify that the improvements are water tight. This would also include not storing storm water onsite without positive methods to eliminate and verify that water is not seeping into the subgrade.

C. Water ways should be lined to prevent seepage into the ground.

D. Positive measures need to be taken to eliminate the potential for water to ever pond on the site and on the hillside.

E. Eliminate, as much as possible, landscaping that requires irrigation.

F. Positive steps need to be taken with other improvements on the hillside and up on the bluff to help maintain the overall integrity of the slope.

Page 14

IV. LIMITATIONS

This letter has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client. The conclusions and recommendations included in the letter are based on conditions defined by our earlier studies and the testing conducted during this study. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface and/or surface drainage or proposed construction is found to be significantly different from what is described in this letter, we should be notified to reevaluate the recommendations given.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



James E. Nordquist, P.E., D. G.E.

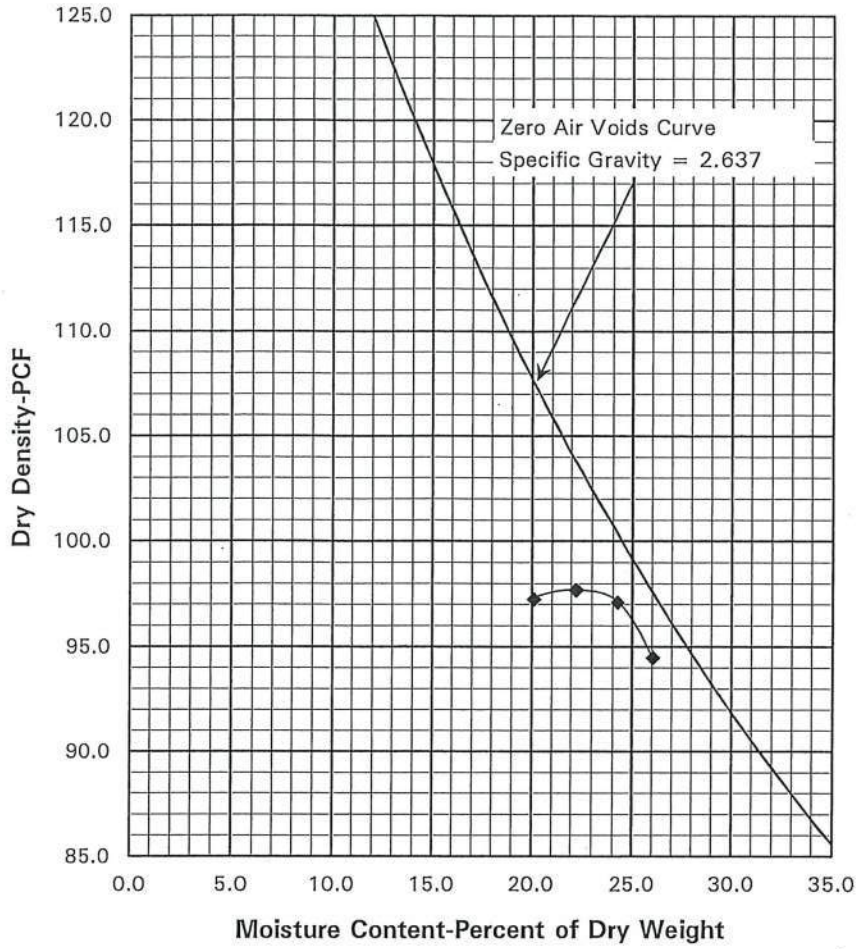
In consultation with Sandra Houston - Professor of Arizona State University
Chair - Soil Properties and Modeling
Committee, ASCE Geo-Institute

Reviewed by WR, P.E., AD, P.E.
JEN/bw

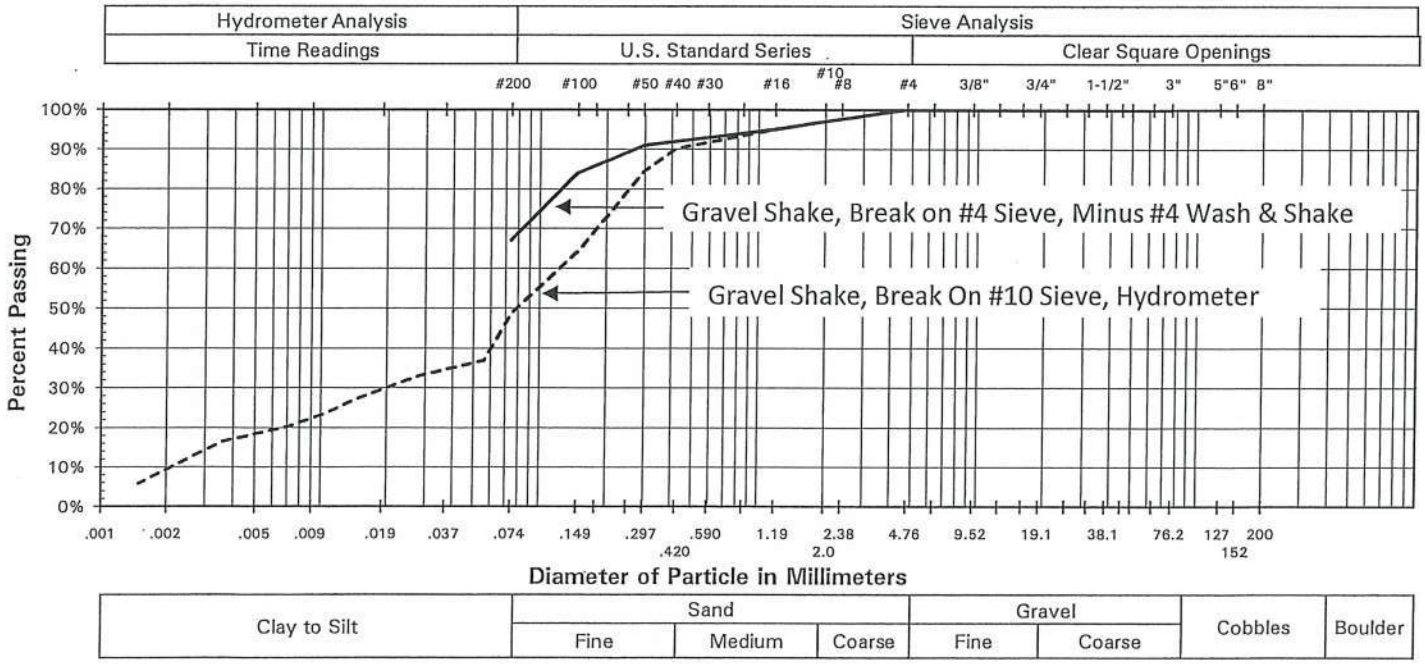
Enclosures

cc: Oscar Covarrubias, EMAIL: oscar@lodgingandhospitality.com

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



Project	Blackridge Hotel
Project No.	2180187
Sample No.	16527
Maximum Dry Density	97.7 pcf
Optimum Moisture	22.2%
Atterberg Limits	
Liquid Limit	55
Plasticity Index	31
Gradation	
Gravel	0%
Sand	33%
Silt & Clay	67%
Reviewed By:	KBB
Test Procedure:	ASTM D698 A
Sample Location:	Blue Clay
Soil Description:	Sandy Fat Clay
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 1

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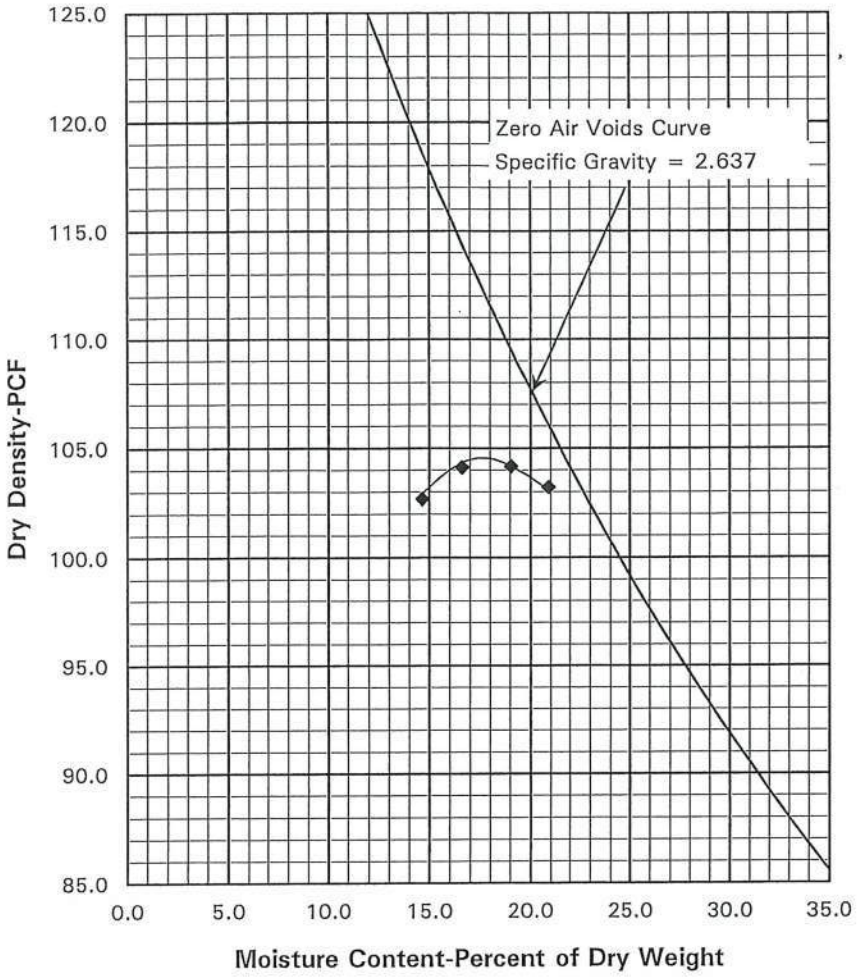
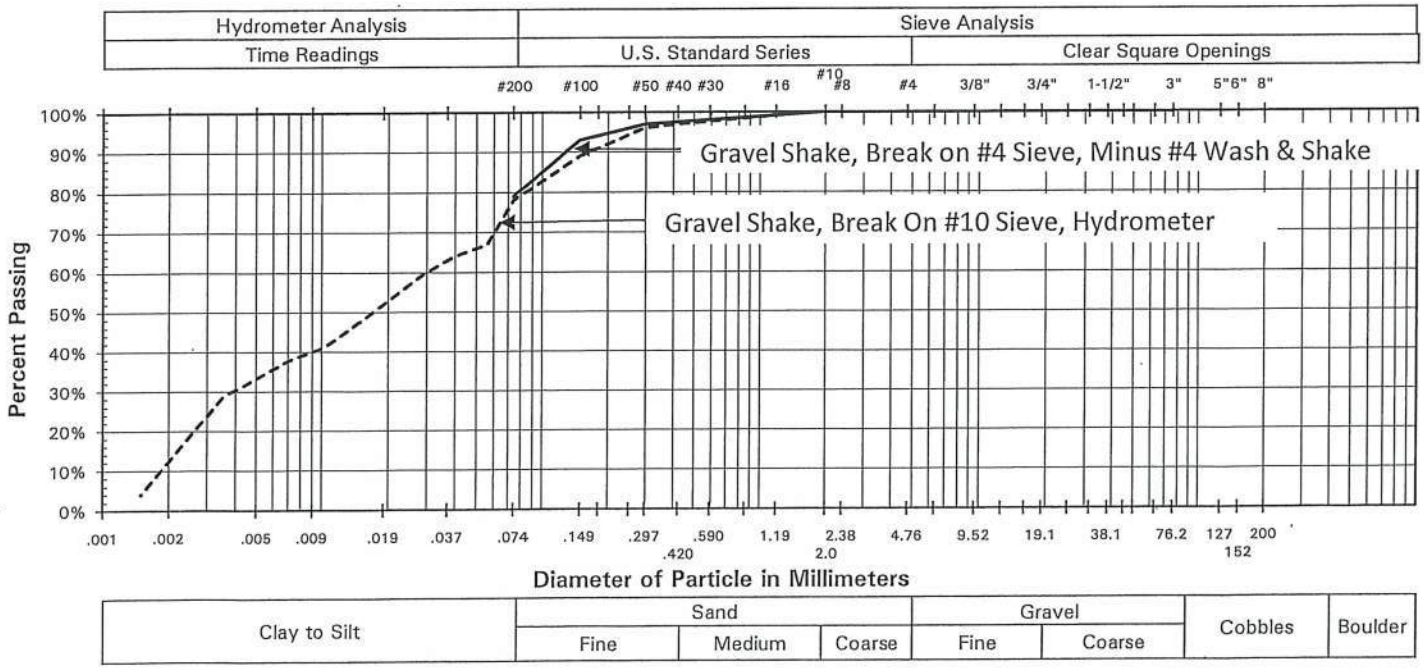


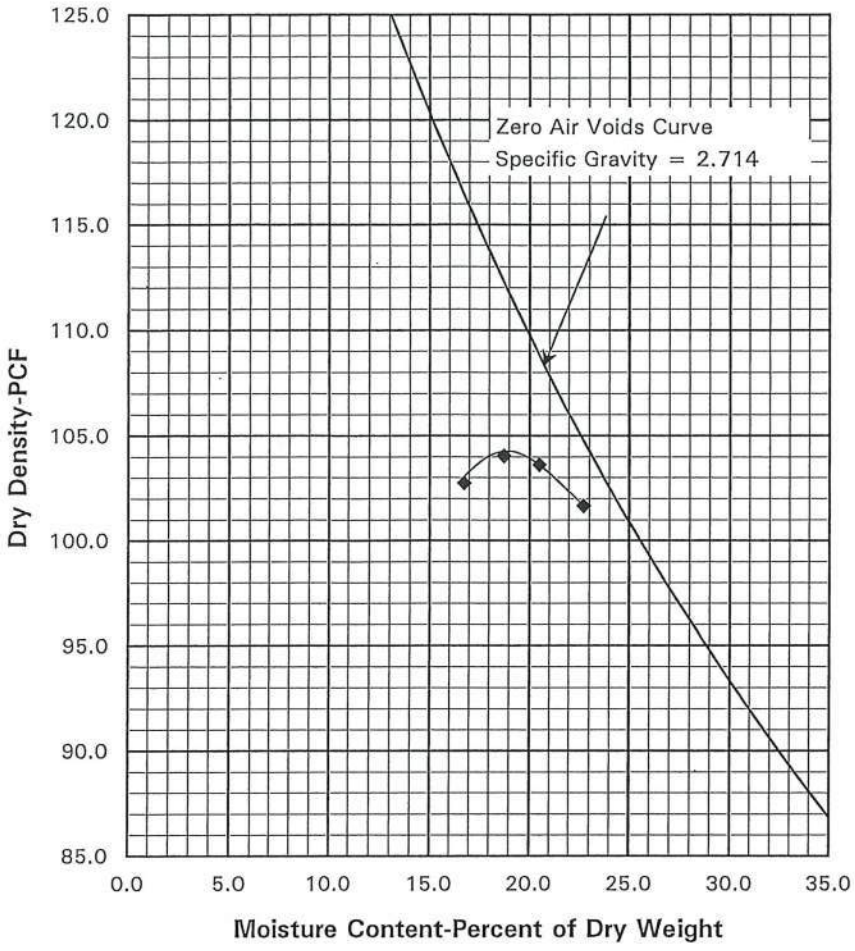
Project	Blackridge Hotel
Project No.	2180187
Sample No.	16528
Maximum Dry Density	104.5 pcf
Optimum Moisture	17.6%
Atterberg Limits	
Liquid Limit	46
Plasticity Index	24
Gradation	
Gravel	0%
Sand	21%
Silt & Clay	79%
Reviewed By:	KBB
Test Procedure:	ASTM D698 A
Sample Location:	Red Clay
Soil Description:	Lean Clay with Sand
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



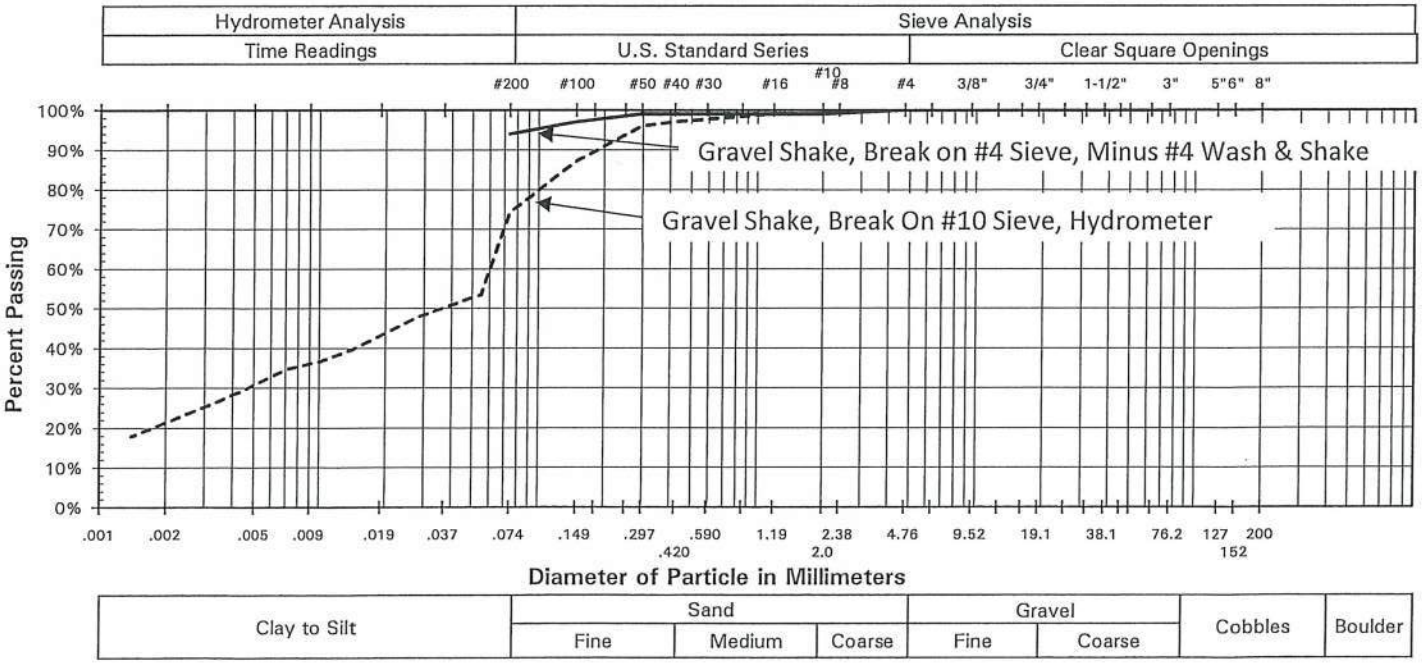
GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 2

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



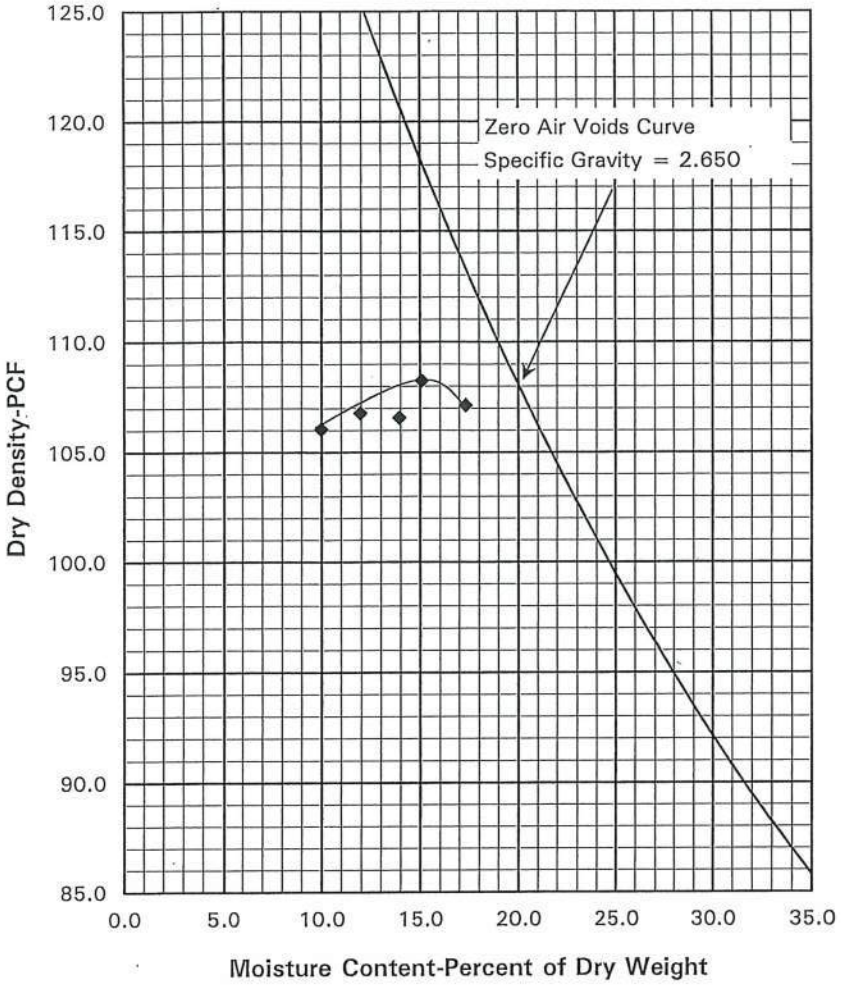
Project	Blackridge Hotel
Project No.	2180187
Sample No.	16529
Maximum Dry Density	104.2 pcf
Optimum Moisture	19.2%
Atterberg Limits	
Liquid Limit	47
Plasticity Index	26
Gradation	
Gravel	0%
Sand	6%
Silt & Clay	94%
Reviewed By:	KBB
Test Procedure:	ASTM D698 A
Sample Location:	Gray Clay
Soil Description:	Lean Clay
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



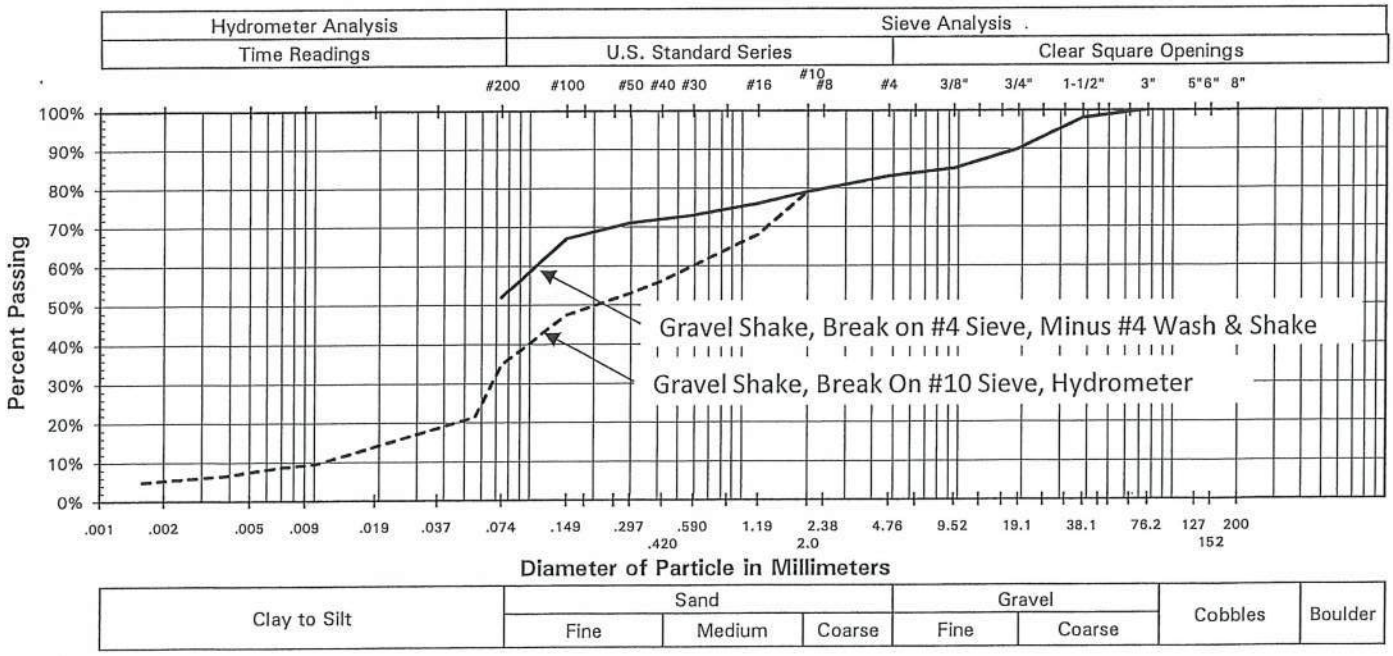
GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 3

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.



Project	Blackridge Hotel
Project No.	2180187
Sample No.	16530
Maximum Dry Density	108.2 pcf
Optimum Moisture	15.1%
Atterberg Limits	
Liquid Limit	38
Plasticity Index	12
Gradation	
Gravel	17%
Sand	31%
Silt & Clay	52%
Reviewed By:	KBB
Test Procedure:	ASTM D698 C
Sample Location:	Debris
Soil Description:	Sandy Lean Clay with Gravel
Date Sampled	-
Sampled By	AGEC
Date Tested	08/13/19
Tested By	AGEC



GRADATION & MOISTURE-DENSITY RELATIONSHIP

Figure 4

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, Inc.

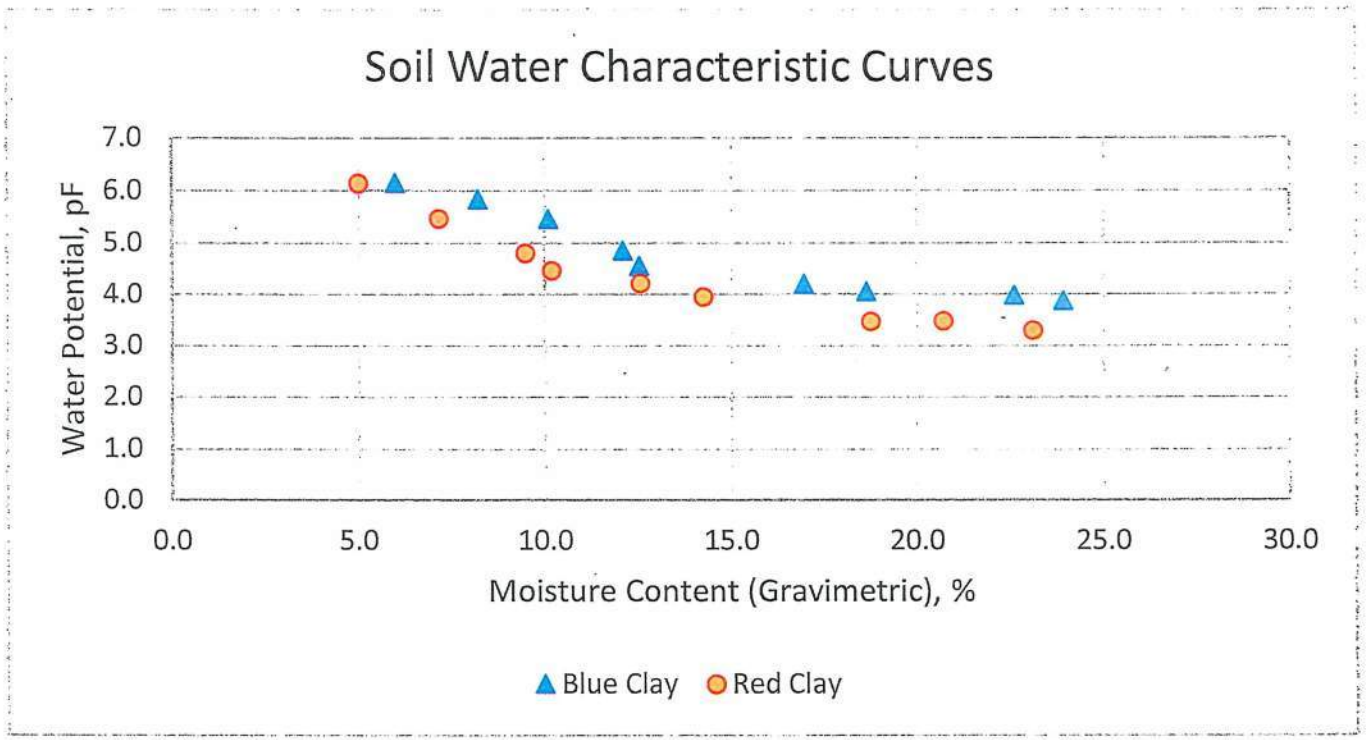
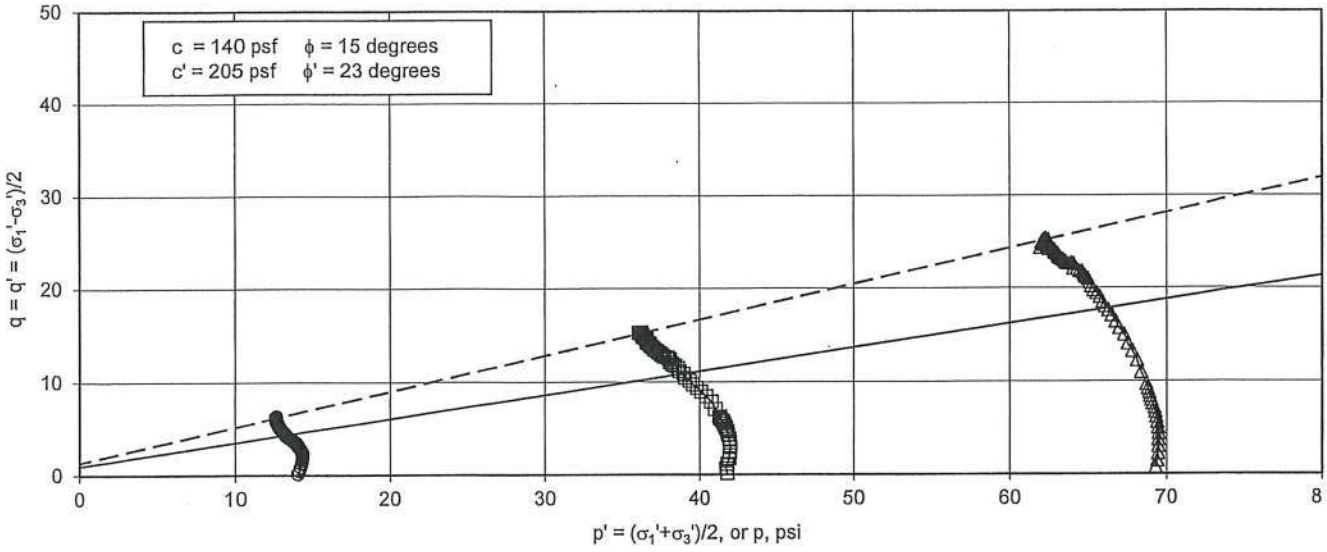
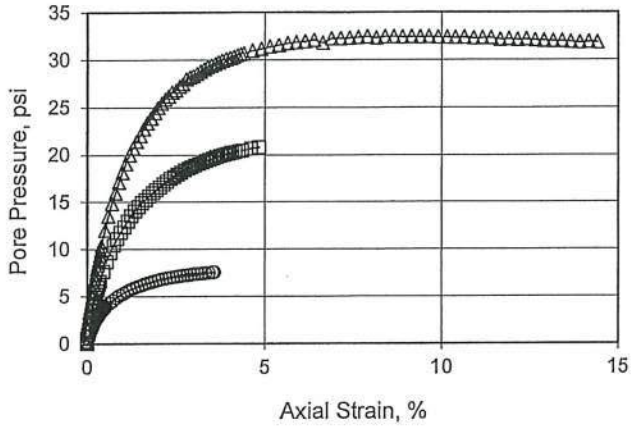
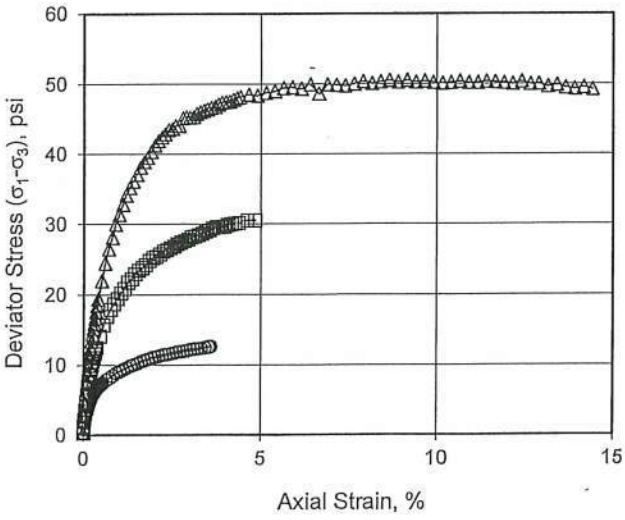


Figure 5

Applied Geotechnical Engineering Consultants, Inc.







Test No. (Symbol)	○	□	△
Sample Type	Remolded		
Length, in.	4.03	3.81	3.25
Diameter, in.	1.93	NM	NM
Dry Density, pcf	73	NM	NM
Moisture Content, %	38	NM	NM
Consolidation Pressure, psi	13.9	41.6	69.4
"B" Parameter	99	NA	NA
Total Confining Stress (σ_3), psi	13.9	41.6	69.4
Total Axial Stress (σ_1), psi	26.1	72.3	119.5
Deviator Stress (σ_1-σ_3), psi	12.2	30.5	50.0
Effective Lateral Stress (σ_3'), psi	6.6	20.8	37.1
Effective Axial Stress (σ_1'), psi	18.7	51.4	87.1
Pore Pressure (μ), psi	7.3	20.8	32.4
Strain, %	3.0	4.8	7.7

Remarks	Multistage Test (CU) Consolidated
Undrained with pore pressure measurements.	
Sample saturated with back pressure saturation.	
Sample pulverized to minus No. 40 sieve material	
and moisture-cured to a liquidity index of 45%.	

Sample Index Properties	
Remold Dry Density, pcf	73
Reold Moisture Content, %	38
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel	0
Percent Sand	46
Percent Passing No. 200 Sieve	54

Sample Description
Sandy Fat Clay

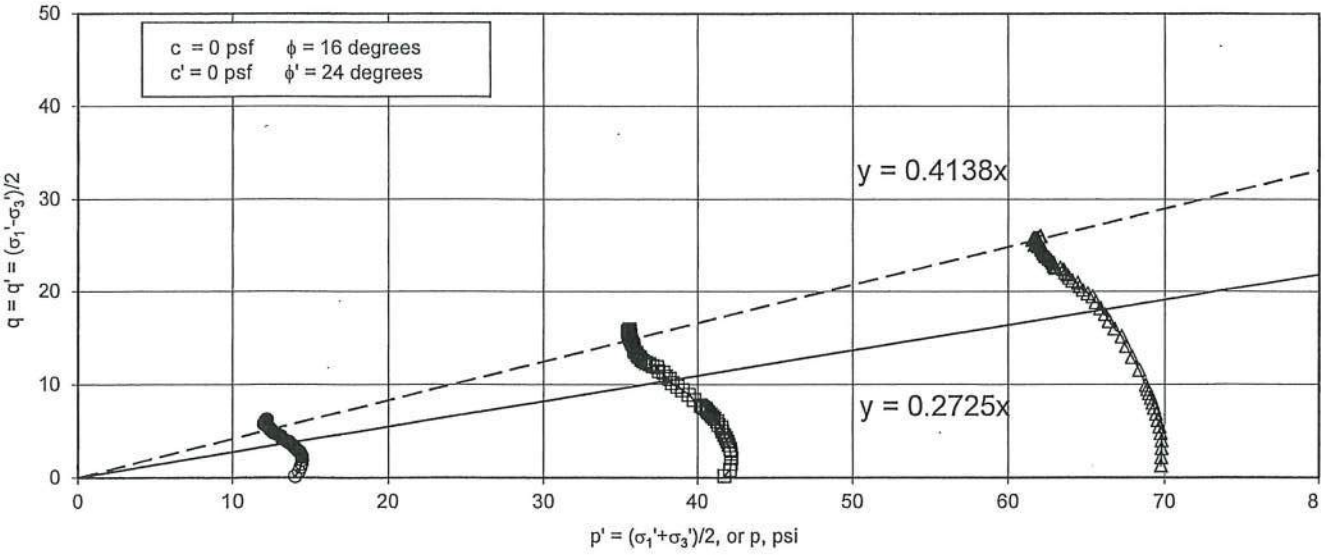
Test Description: Multi-Stage Triaxial Compression Test
Test Sample Location: Blue Clay
Project Name: Blackridge Hotel

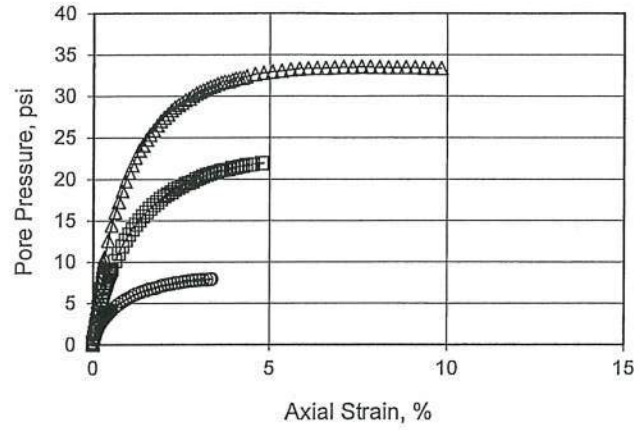
Project No. 2180187

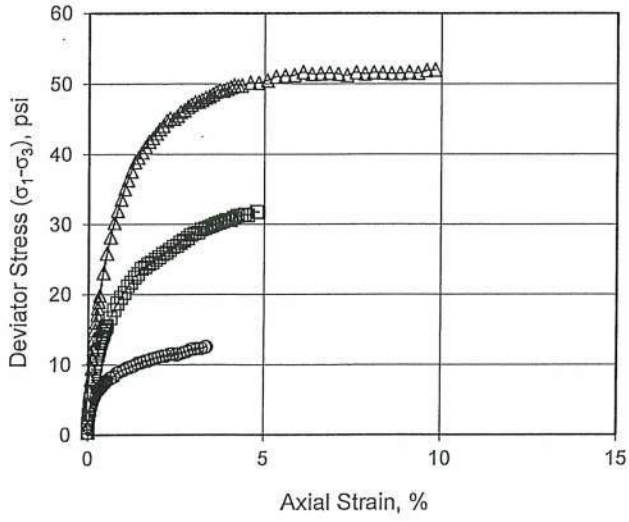
Triaxial Compression Test

Figure 6

Applied Geotechnical Engineering Consultants, Inc.







Test No. (Symbol)	○	□	△
Sample Type	Remolded		
Length, in.	3.96	3.61	3.39
Diameter, in.	1.93	NM	NM
Dry Density, pcf	84	NM	NM
Moisture Content, %	36	NM	NM
Consolidation Pressure, psi	13.9	41.6	69.4
"B" Parameter	99	NA	NA
Total Confining Stress (σ_3), psi	13.9	41.6	69.4
Total Axial Stress (σ_1), psi	26.4	73.4	120.5
Deviator Stress (σ_1-σ_3), psi	12.5	31.8	51.2
Effective Lateral Stress (σ_3'), psi	5.9	19.7	36.2
Effective Axial Stress (σ_1'), psi	18.5	51.5	87.4
Pore Pressure (μ), psi	7.9	21.9	33.2
Strain, %	3.4	4.8	5.6

Remarks	Multistage Test (CU) Consolidated
Undrained with pore pressure measurements.	
Sample saturated with back pressure saturation.	
Sample pulverized to minus No. 40 sieve material	
and moisture-cured to a liquidity index of 58%.	

Sample Index Properties	
Remold Dry Density, pcf	84
Reold Moisture Content, %	36
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel	0
Percent Sand	20
Percent Passing No. 200 Sieve	80

Sample Description
Lean Clay with Sand

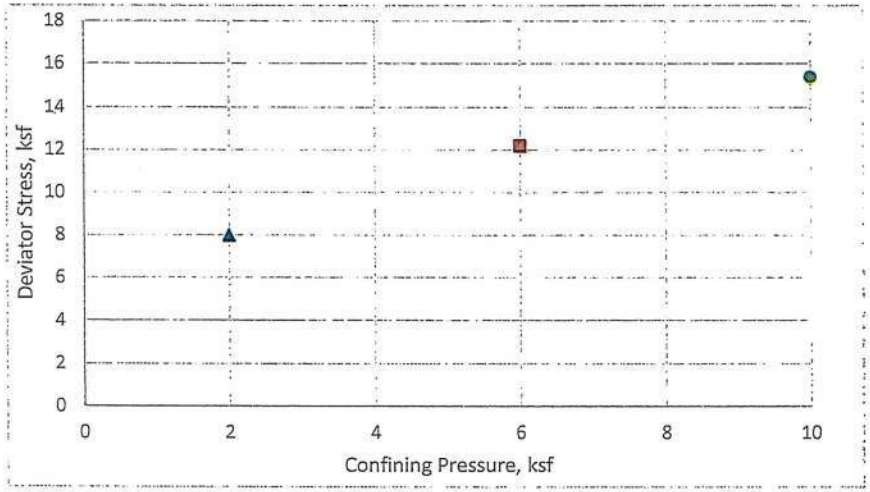
Test Description: Multi-Stage Triaxial Compression Test
Test Sample Location: Red Clay
Project Name: Blackridge Hotel

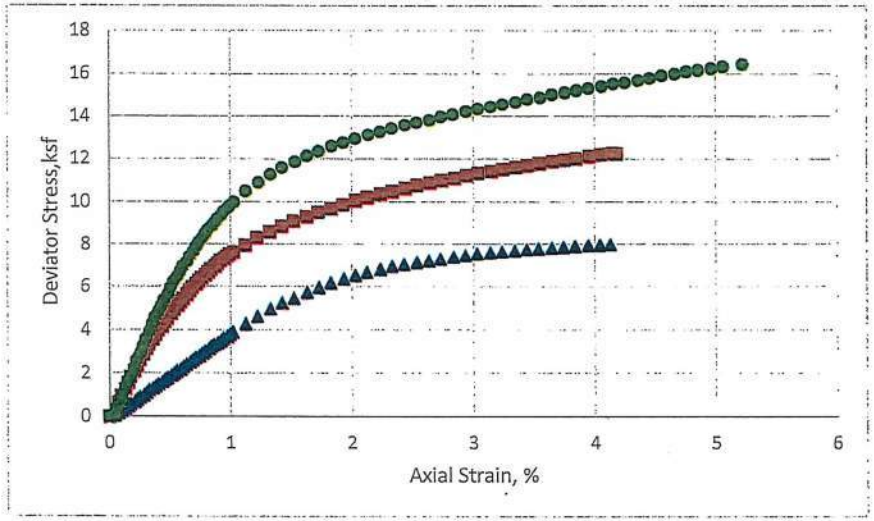
Project No. 2180187

Triaxial Compression Test

Figure 7

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	95.5	-	-
Moisture Content, %	14.4	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	8.0	12.2	15.4
Axial Strian, %	4.0	4.0	4.0
Rate of Strain, %/min	1.0	1.0	1.0

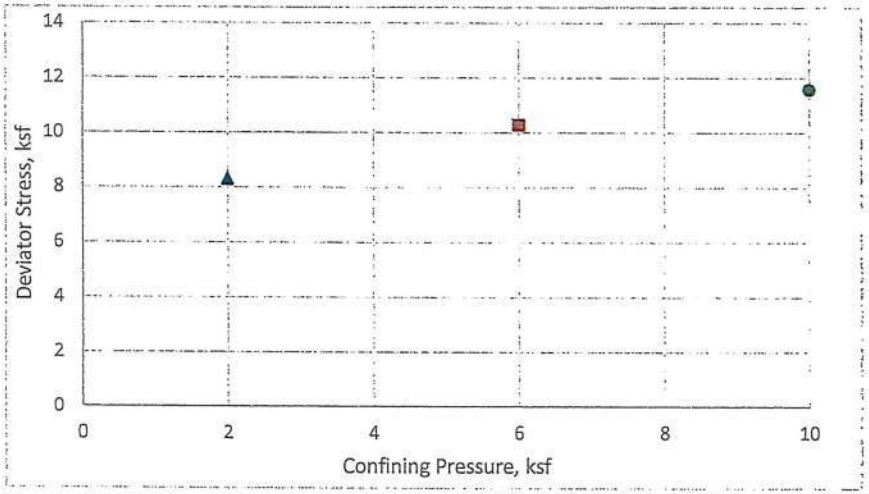
Remold Sample Properties	
Dry Density, pcf	95.5
Moisture Content, %	14.4
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

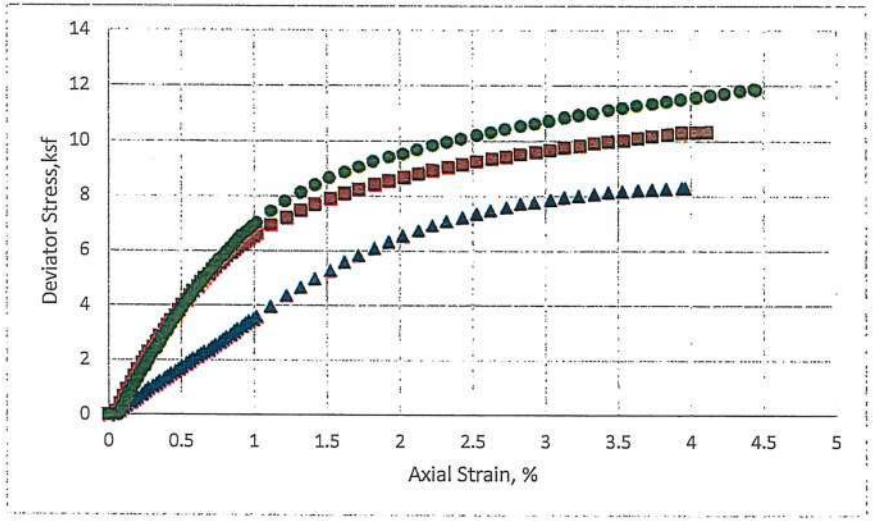
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	94.6	-	-
Moisture Content, %	19.6	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	8.30	10.30	11.60
Axial Strian, %	4.0	4.0	4.0
Rate of Strain, %/min	1.0	1.0	1.0

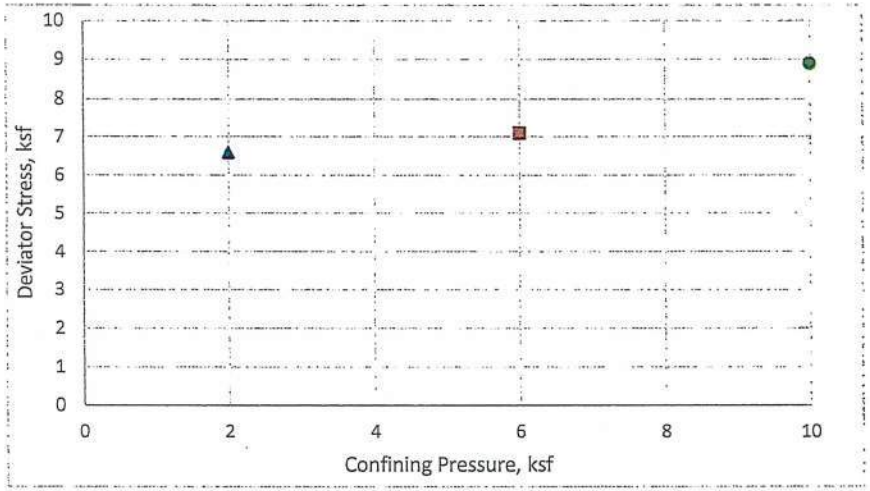
Remold Sample Properties	
Dry Density, pcf	94.6
Moisture Content, %	19.6
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

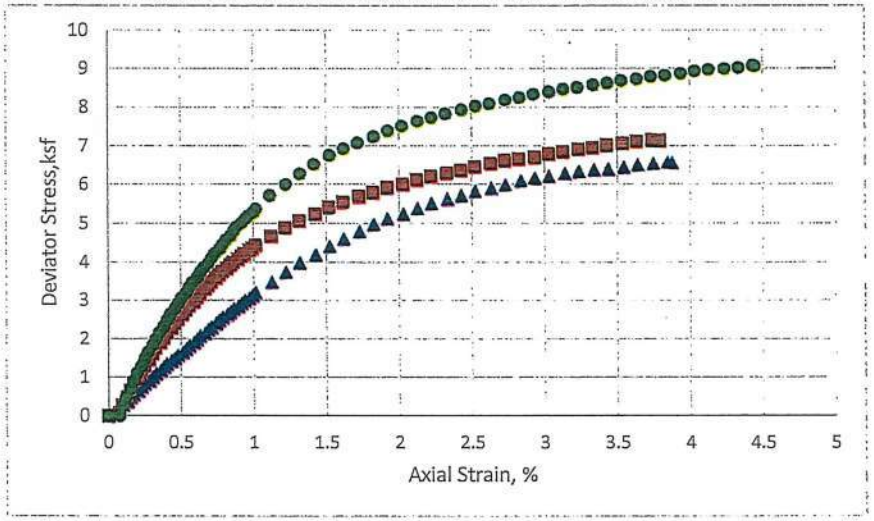
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Blue Clay	
Sample Description		Sandy Fat Clay	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	94.9		
Moisture Content, %	23.8		
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	6.60	7.10	8.90
Axial Strian, %	3.9	3.8	4.0
Rate of Strain, %/min	1.0	1.0	1.0

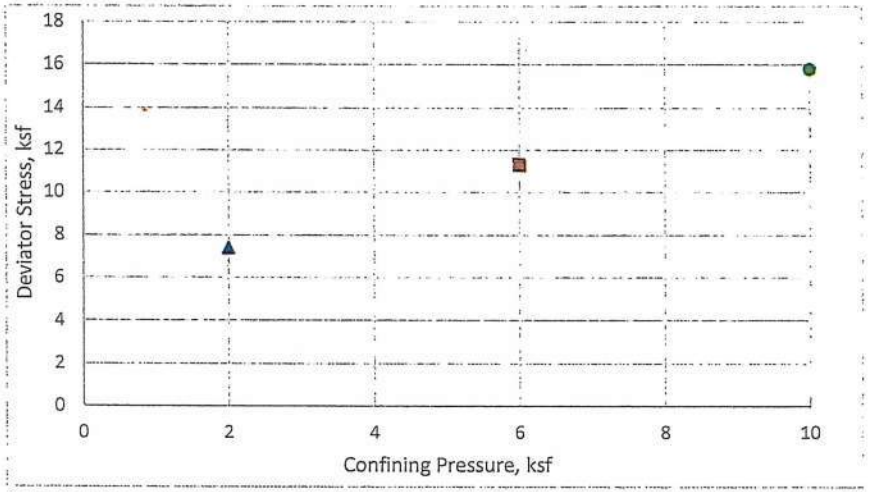
Remold Sample Properties	
Dry Density, pcf	94.9
Moisture Content, %	23.8
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

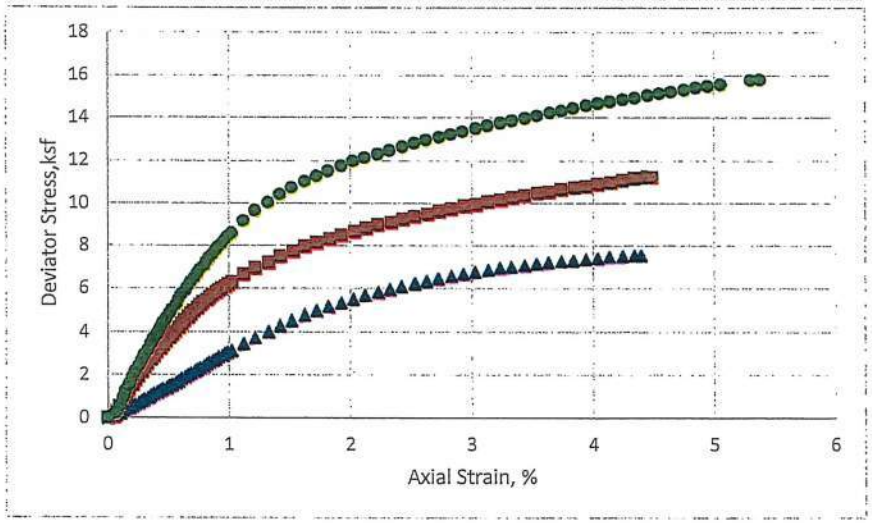
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay with Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	103.5	-	-
Moisture Content, %	12.6	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	7.40	11.30	15.80
Axial Strian, %	4.0	4.5	5.4
Rate of Strain, %/min	1.0	1.0	1.0

Remold Sample Properties	
Dry Density, pcf	103.5
Moisture Content, %	12.5
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

Notes

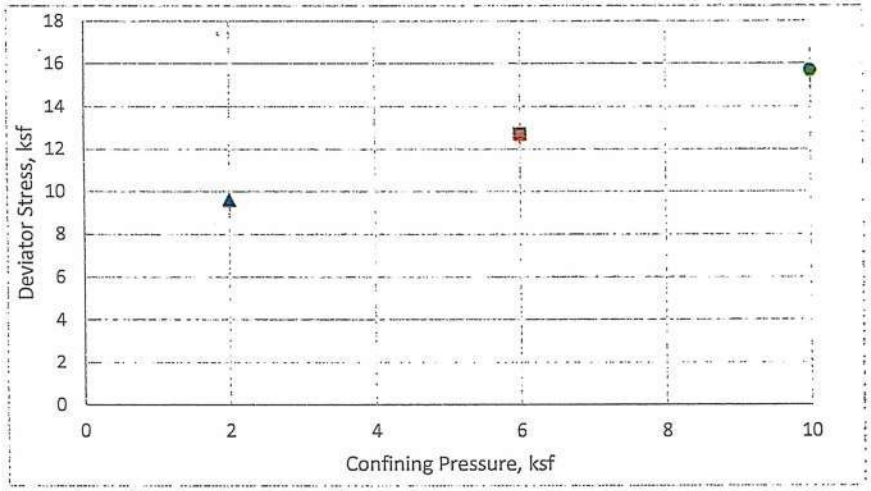
The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

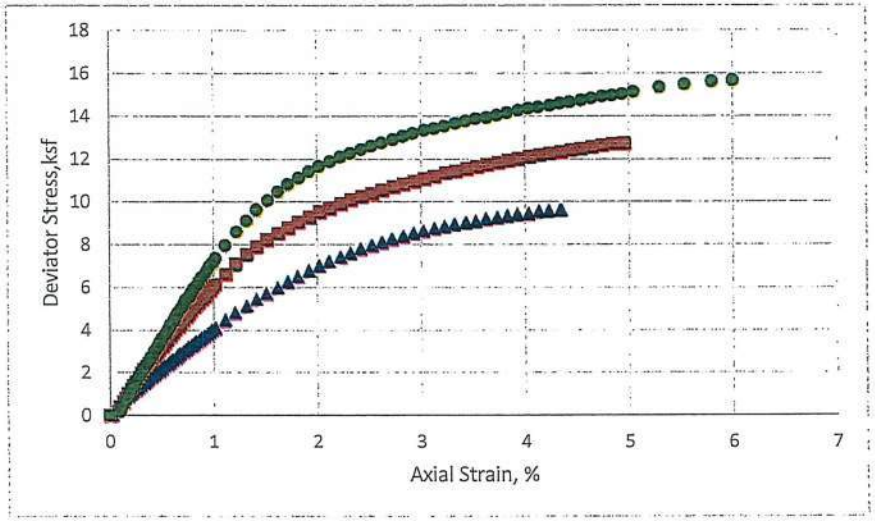
The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Project No. 2180187

Figure 11

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay with Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	102	-	-
Moisture Content, %	14.9	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	9.60	12.70	15.70
Axial Strian, %	4.4	5.0	6.0
Rate of Strain, %/min	1.0	1.0	1.0

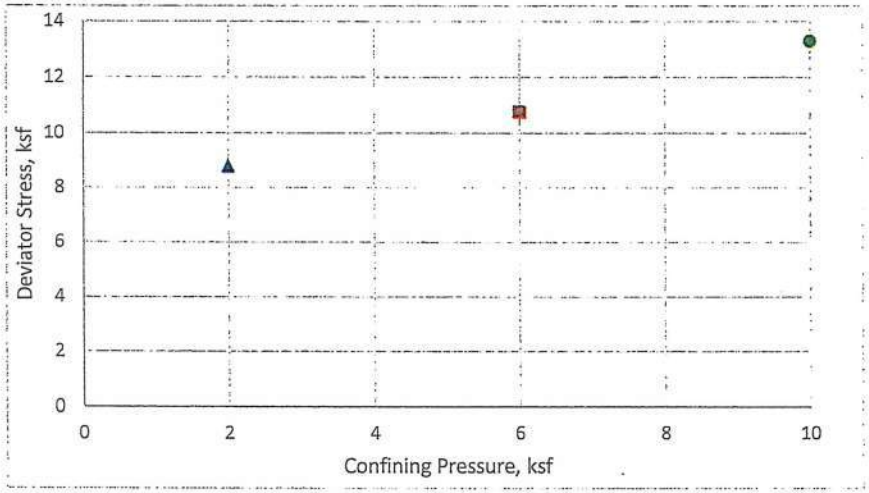
Remold Sample Properties	
Dry Density, pcf	102.0
Moisture Content, %	14.9
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

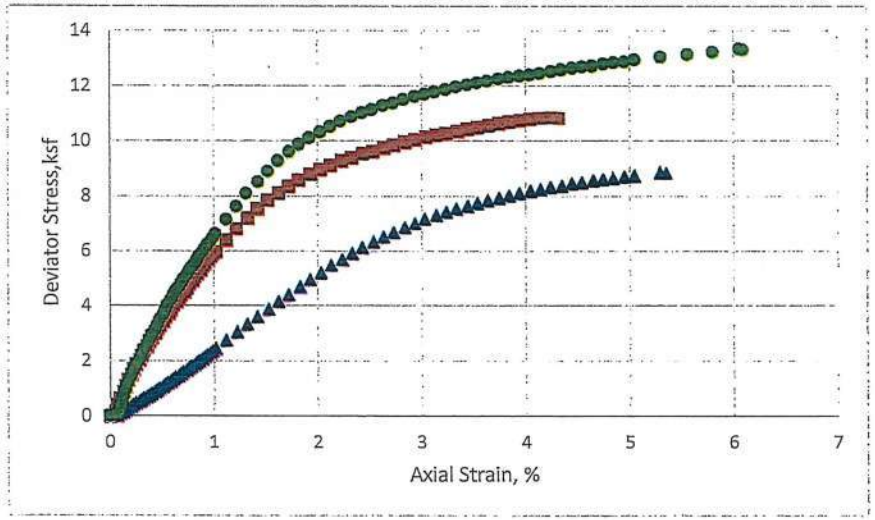
Notes

The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.





Multi-Stage Undrained Test

Project and Sample Information			
Project Number		2180187	
Project Name		Blackridge Hotel	
Sample Identification		Red Clay	
Sample Description		Lean Clay with Sand	
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Sample Type	Remolded		
Length, in.			
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	105.1	-	-
Moisture Content, %	17.9	-	-
Confining Pressure, ksf	2.0	6.0	10.0
Deviator Stress, ksf	8.80	10.80	13.30
Axial Strian, %	5.4	4.3	6.0
Rate of Strain, %/min	1.0	1.0	1.0

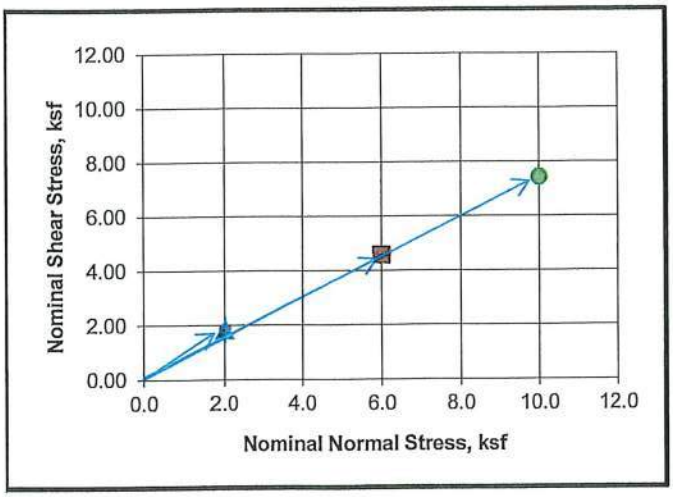
Remold Sample Properties	
Dry Density, pcf	105.1
Moisture Content, %	17.9
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0
Percent Clay Fraction, <0.002mm	

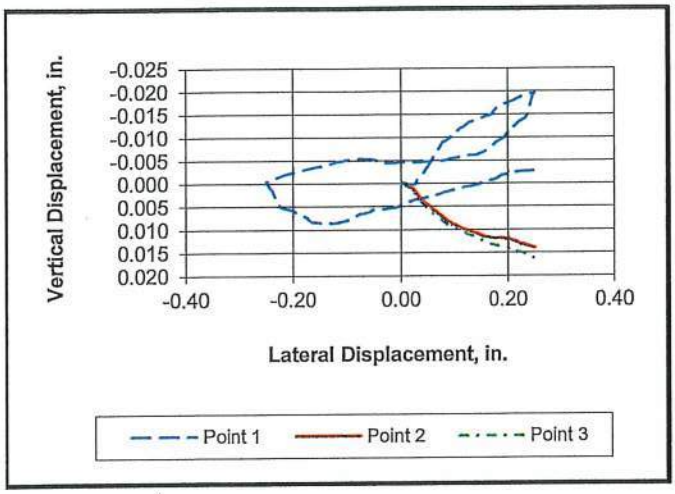
Notes

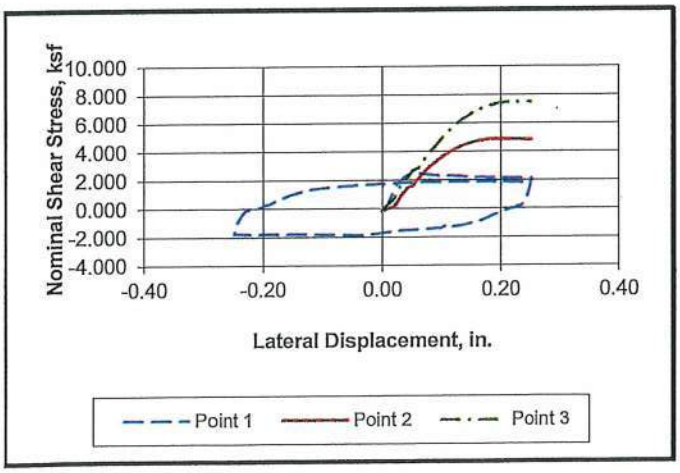
The Sigma 1 Trautwein Automated Load Test System and the Sigma-1 UU Triaxial Test Software was used for the three-stage undrained shear test. A cyclic loading procedure was employed to perform the multi-stage test.

The deviator stress was released to zero once a maximum value was reached. Each stage commenced from a condition of zero deviator stress. Material passing the # 10 seive was remolded to the approximate moisture content and dry density indicated above.

Applied Geotechnical Engineering Consultants, Inc.







DIRECT SHEAR TEST

Project and Sample Information			
Project Number			2180187
Project Name			Blackridge Hotel
Sample Identification			Blue Clay
Sample Description			Sandy Fat Clay
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Test Type	Consolidated Unsaturated		
Sample Type	Remolded		
Length, in.	1.00	-	-
Diameter, in.	2.42	2.42	2.42
Dry Density, pcf	95	-	-
Moisture Content, %	13	-	-
Consol. Load, ksf	2.0	6.0	10.0
Normal Load, ksf	2.0	6.0	10.0
Shear Stress, ksf	1.86	4.58	7.44
Secant Friction Angle	43	37	37
Lateral Displacement, in	0.200	0.200	0.200
Relative Lateral Displacement, %	8.26	8.26	8.26
Rate of Strain, in/min	0.04	0.04	0.040
Gap Width, in	0.075	0.080	0.070

Material passing the #10 sieve remolded to:
a dry density of approximately 95pcf
at a moisture content of approximately 13%.
A three-stage direct shear test was performed.
A pre-shear cycle was performed before the 1st shear stage.

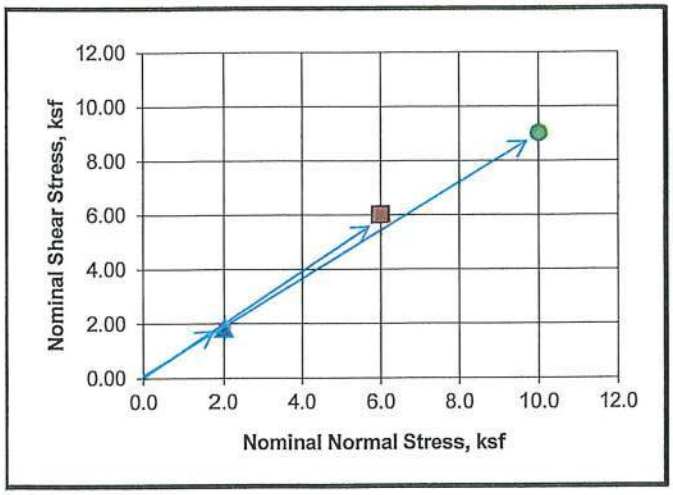
Sample Properties	
Dry Density, pcf	95
Moisture Content, %	13
Liquid Limit, %	55
Plasticity Index, %	31
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	7
Percent Fine Sand, 0.075mm-0.425mm	43
Percent Silt, 0.005mm-0.075mm	13
Percent Clay, 0.001mm-0.005mm	37
Percent Colloidals, <0.001mm	0

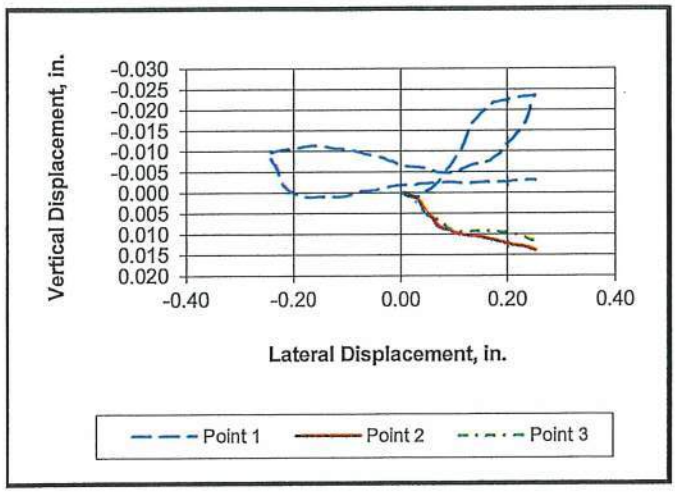
Project No. 2180187

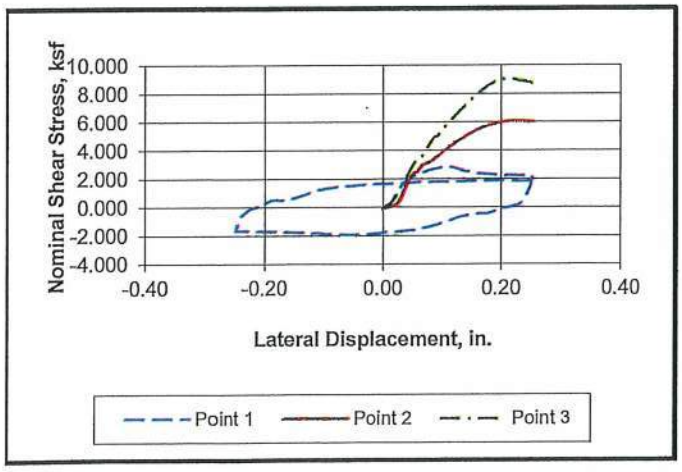
Direct Shear Results

Figure 14

Applied Geotechnical Engineering Consultants, Inc.







DIRECT SHEAR TEST

Project and Sample Information			
Project Number			2180187
Project Name			Blackridge Hotel
Sample Identification			Red Clay
Sample Description			Lean Clay w Sand
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)
Test Type	Consolidated Unsaturated		
Sample Type	Remolded		
Length, in.	1.00	-	-
Diameter, in.	2.42	2.42	2.42
Dry Density, pcf	101	-	-
Moisture Content, %	10	-	-
Consol. Load, ksf	2.0	6.0	10.0
Normal Load, ksf	2.0	6.0	10.0
Shear Stress, ksf	1.86	6.02	9.03
Secant Friction Angle	43	45	42
Lateral Displacement, in	0.202	0.203	0.202
Relative Lateral Displacement, %	8.35	8.39	8.35
Rate of Strain, in/min	0.04	0.04	0.040
Gap Width, in	0.075	0.080	0.070

Material passing the #10 sieve remolded to:
a dry density of approximately 105pcf
at a moisture content of approximately 10%.
A three-stage direct shear test was performed.
A pre-shear cycle was performed before the 1st shear stage.

Sample Properties	
Dry Density, pcf	105
Moisture Content, %	10
Liquid Limit, %	46
Plasticity Index, %	24
Percent Gravel, >4.750mm	0
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	3
Percent Fine Sand, 0.075mm-0.425mm	19
Percent Silt, 0.005mm-0.075mm	44
Percent Clay, 0.001mm-0.005mm	34
Percent Colloidals, <0.001mm	0

Project No. 2180187

Direct Shear Results

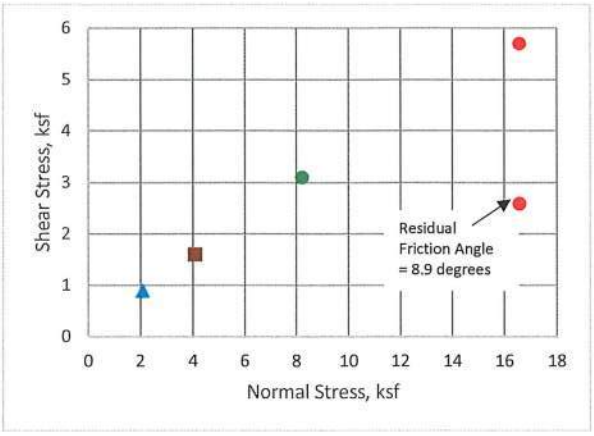
Figure 15

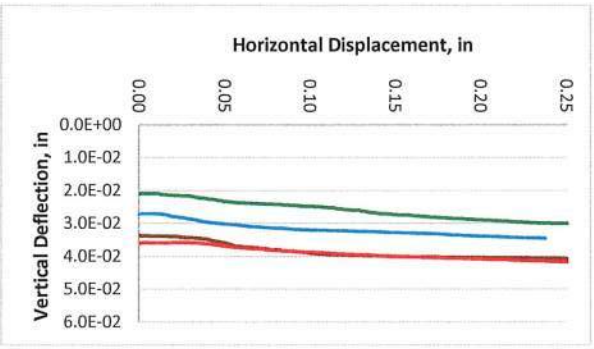
Applied Geotechnical Engineering Consultants, Inc.

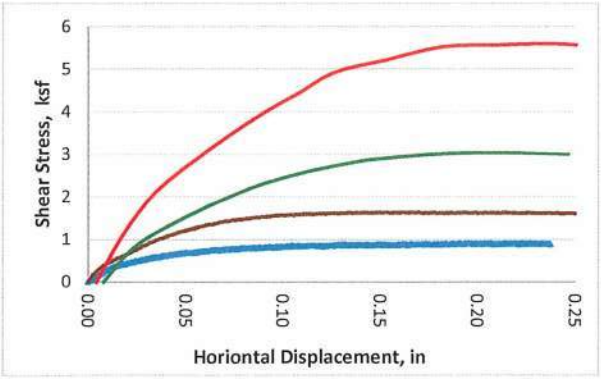
All Testing Completed Using a Wykeham Farrance Torshear Device

Project Number 2211175

Project Name Blackstone Hotel West







Sample and Test Information				
Sample Identification	B-4 at 50'			
Sample Description	Claystone (Fat Clay)			
Test Type	Fully Softened Shear Strength			
Sampe Type	Remolded			
Test Equipment and Procedures				
Specimen Container	Adjustable Modified Bromhead			
Porous Disc Construction	Serrated Stainless Steel			
	Manufactured by Illinois University			
Test Procedure	Consolidated by Incremental Loading,			
	Unloaded and Flushed by Lifting (Pts 3 & 4),			
	ReConsolidated by Incremental Loading (Pts 3 & 4),			
	and Sheared			
Test Data				
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)	4 (●)
Dry Density, pcf	78.8	76.3	75.8	79.2
Moisture Content, %	44.2	44.2	44.2	44.2
Initial Height of Sample, in	0.1815	0.1815	0.1815	0.1815
Radii of Sample, in	1.378-1.9685			
Initial Saturation, %	100.0	100.0	100.0	100.0
Final Saturation, %	100.0	100.0	100.0	100.0
Consol. Load, ksf	2.084	4.084	8.209	16.584
Normal Load, ksf	2.084	4.084	8.209	16.584
Shear Stress, ksf	0.9	1.6	3.1	5.7
Secant Friction Angle	23.4	21.4	20.7	19.0
Displacement, in	0.20	0.16	0.27	0.24
Shear Rate, in/min	0.0008	0.0008	0.0008	0.0008

Samples were pulverized using a mortar and pestle when wet and passed thru a No. 40 sieve with water. The samples were dried in a low-temperature oven and rolled on a glass plate to a moisture content approximately 76% of the liquid limit.

Sample Index Properties on Minus #40 Sieve Material		
Liquid Limit, %		57
Plasticity Index, %		31
Percent Clay Fraction, <0.002mm		37
Specific Gravity of Soil	Measured	2.763

Hydrometer Results on Minus #40 Sieve Material	
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	0
Percent Fine Sand, 0.075mm-0.425mm	53
Percent Silt, 0.005mm-0.075mm	5
Percent Clay, 0.001mm-0.005mm	12
Percent Colloidals, <0.001mm	30

Project No. 2211175

Ring Shear Results

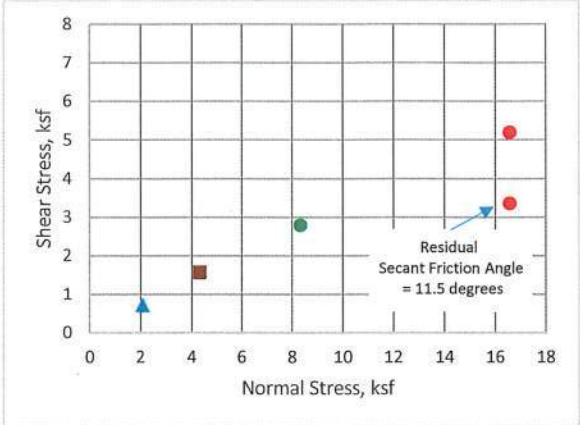
Figure 16

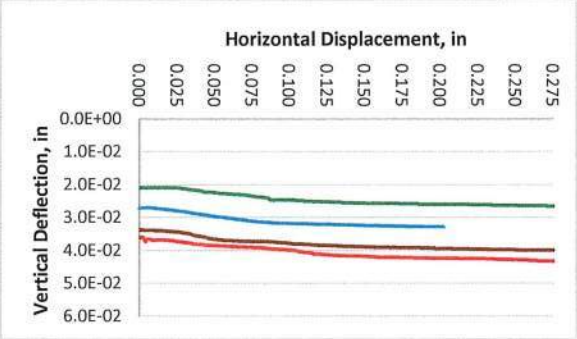
Applied Geotechnical Engineering Consultants, Inc.

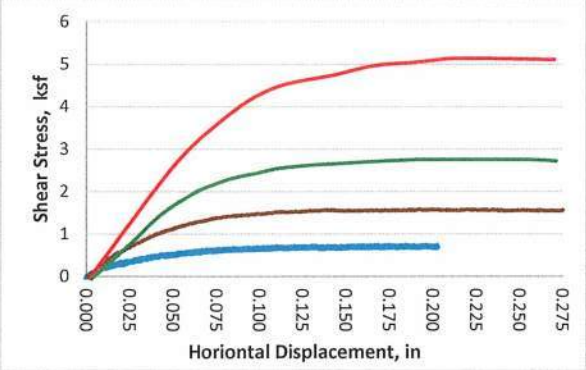
All Testing Completed Using a Wykeham Farrance Torshear Device

Project Number 2211175

Project Name Blackstone Hotel West







Sample and Test Information				
Sample Identification	B-4 at 114'			
Sample Description	Claystone (Fat Clay)			
Test Type	Fully Softened Shear Strength			
Sampe Type	Remolded			
Test Equipment and Procedures				
Specimen Container	Adjustable Modified Bromhead			
Porous Disc Construction	Serrated Stainless Steel			
	Manufactured by Illinois University			
Test Procedure	Consolidated by Incremental Loading,			
	Unloaded and Flushed by Lifting (Pts 2 ,3 & 4),			
	ReConsolidated by Incremental Loading (Pts 2,3,&4),			
	and Sheared			
Test Data				
Test No. (Symbol)	1 (▲)	2 (■)	3 (●)	4 (●)
Dry Density, pcf	74.8	75.0	75.9	74.3
Moisture Content, %	50.1	50.1	50.1	50.1
Initial Height of Sample, in	0.1815	0.1815	0.1815	0.1815
Radii of Sample, in	1.378-1.9685			
Initial Saturation, %	100.0	100.0	100.0	100.0
Final Saturation, %	100.0	100.0	100.0	100.0
Consol. Load, ksf	2.084	4.334	8.334	16.584
Normal Load, ksf	2.084	4.334	8.334	16.584
Shear Stress, ksf	0.726	1.564	2.799	5.199
Secant Friction Angle	19.2	19.8	18.6	17.4
Displacement, in	0.20	0.20	0.20	0.20
Rate of Strain, in/min	0.0008	0.0008	0.0008	0.0008

Samples were pulverized using a mortar and pestle when wet and passed thru a No. 40 sieve with water. The samples were dried in a low-temperature oven and rolled on a glass plate to a moisture content approximately 77% of the liquid limit.

Sample Index Properties on Minus #40 Sieve Material		
Liquid Limit, %		60
Plasticity Index, %		38
Percent Clay Fraction, <0.002mm		40
Specific Gravity of Soil	Measured	2.748

Hydrometer Results on Minus #40 Sieve Material	
Percent Coarse Sand, 2.000mm-4.750mm	0
Percent Medium Sand, 0.425mm-2.000mm	0
Percent Fine Sand, 0.075mm-0.425mm	27
Percent Silt, 0.005mm-0.075mm	26
Percent Clay, 0.001mm-0.005mm	11
Percent Colloidals, <0.001mm	36

Project No. 2211175

Ring Shear Results

Figure 17

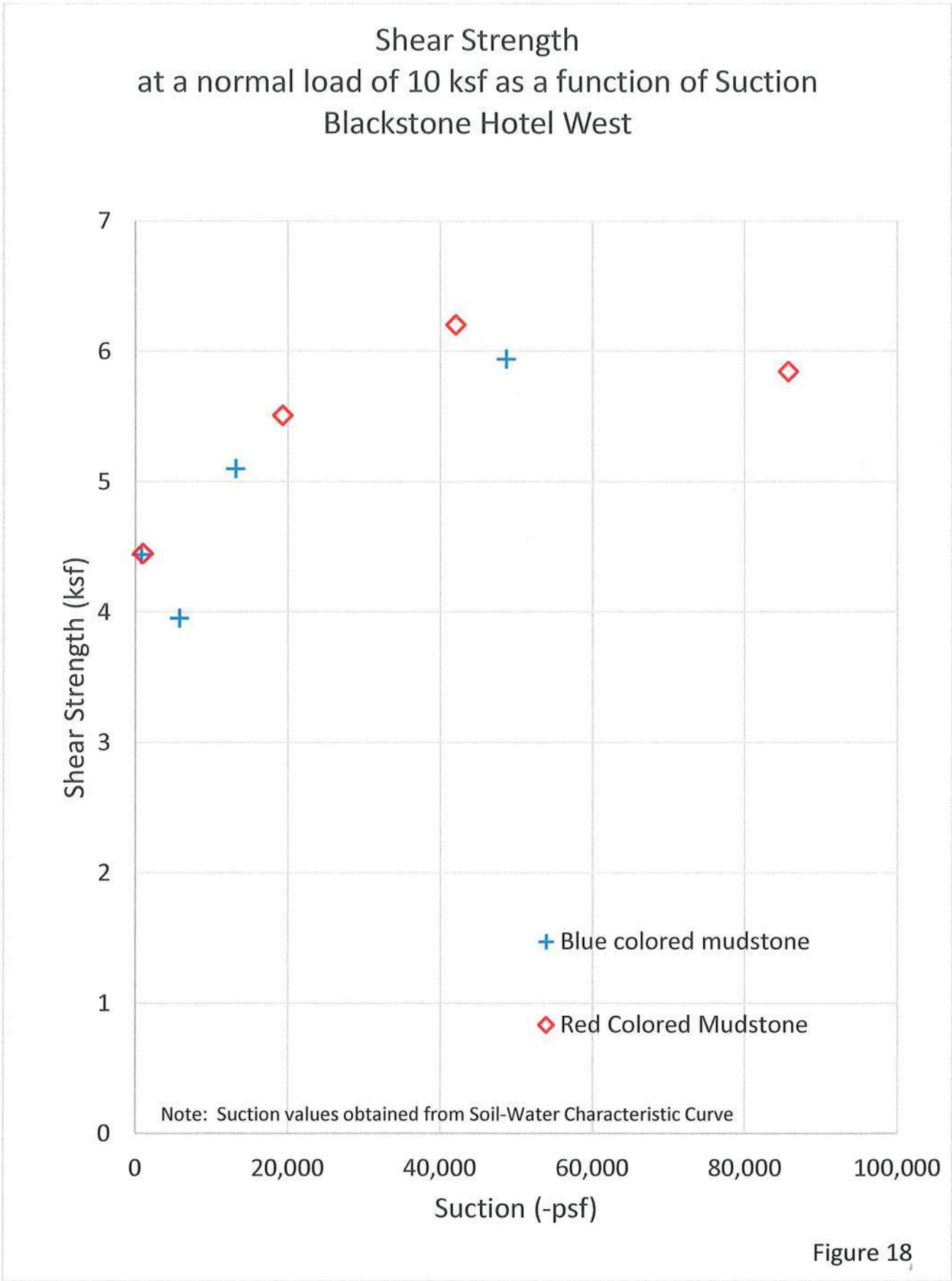
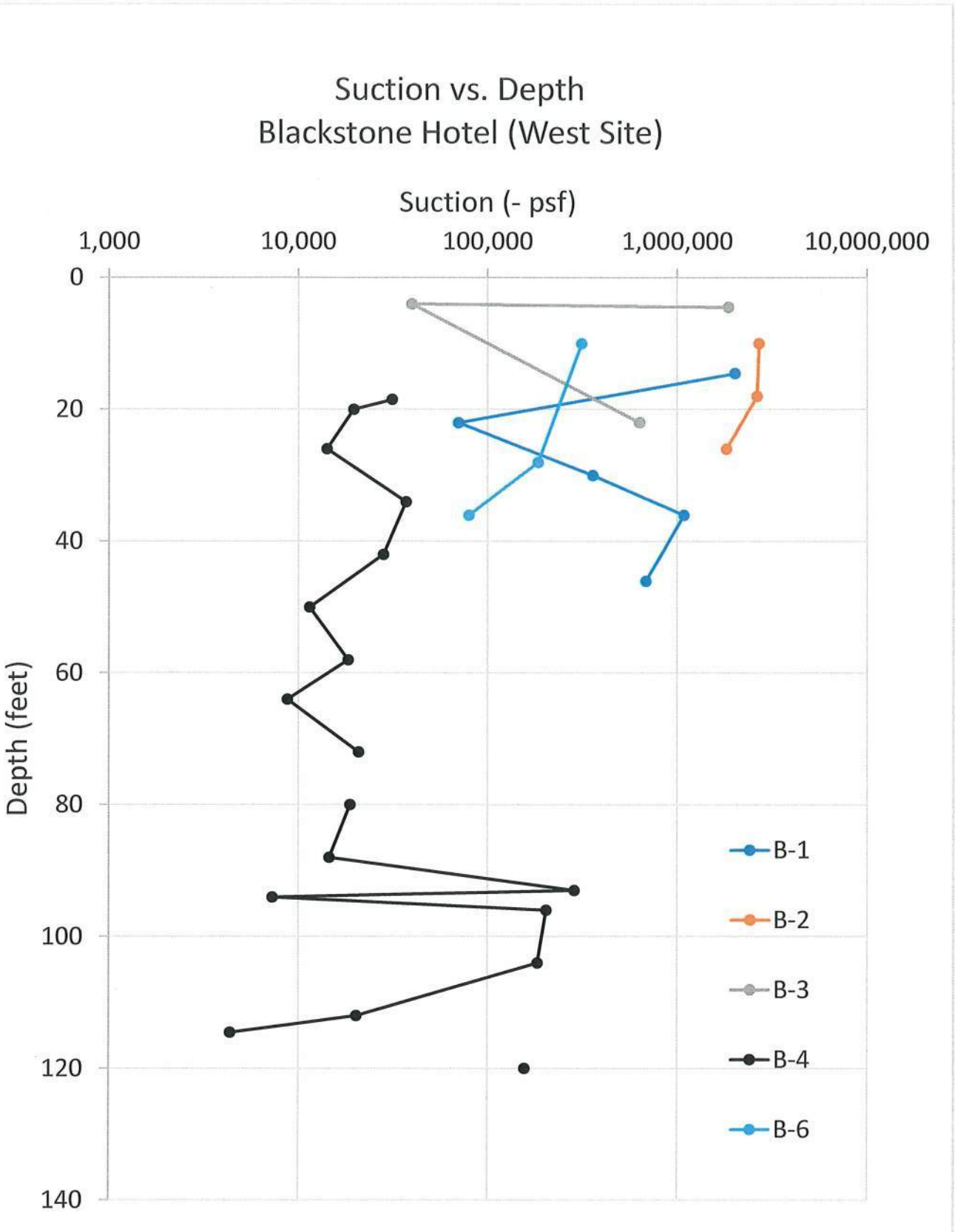

Shear Strength
at a normal load of 10 ksf as a function of Suction
Blackstone Hotel West
Shear Strength (ksf)
0
1
2
3
4
5
6
7
0
20,000
40,000
60,000
80,000
100,000
Suction (-psf)
Blue colored mudstone
Red Colored Mudstone
Note: Suction values obtained from Soil-Water Characteristic Curve

Figure 18



Project # 2-21-1175

Figure 19

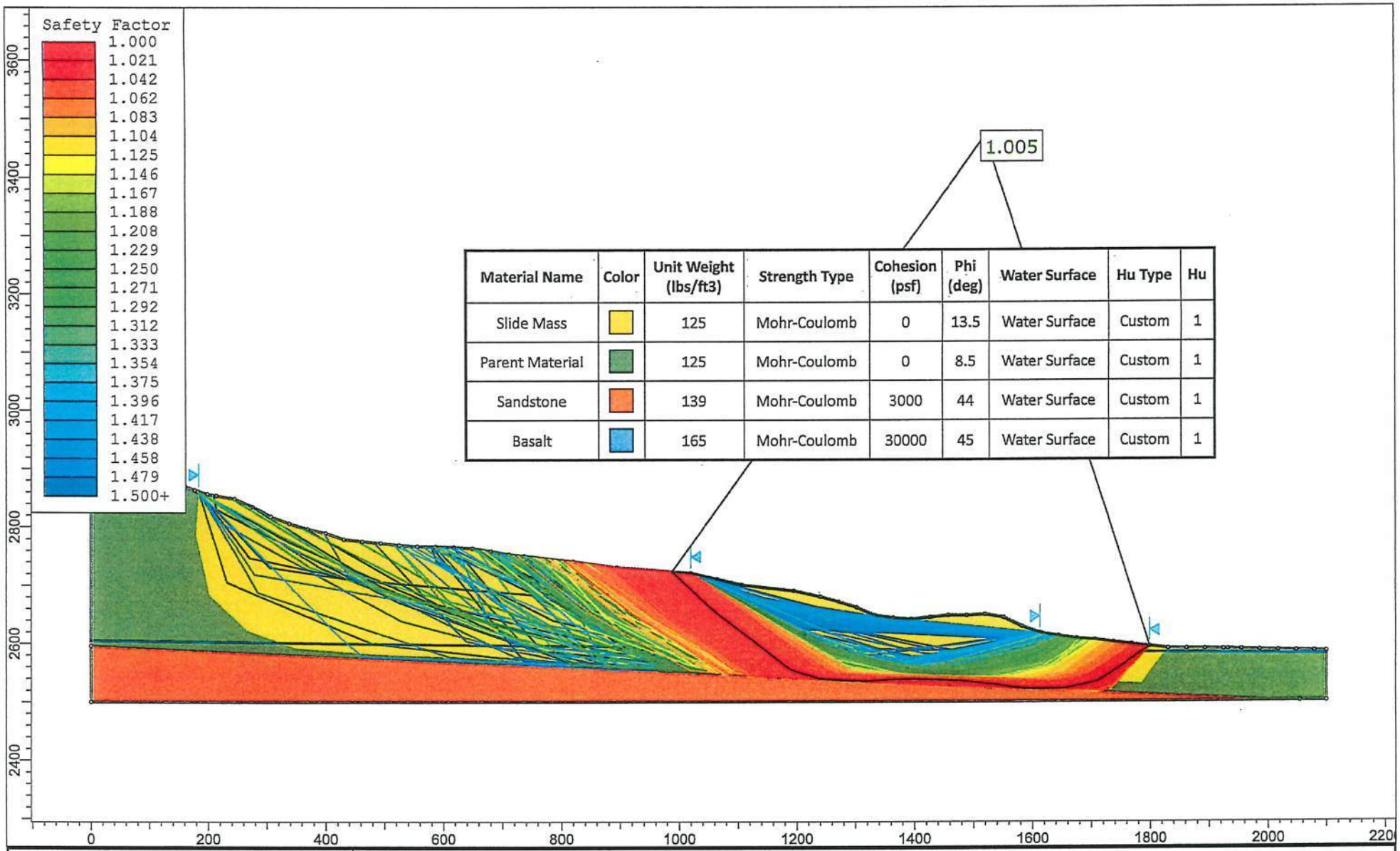
APPENDIX

A-1 Condition Before Grading
A-2 Proposed Profile - Static
A-3 Proposed Profile - Seismic (Yield Acceleration)

APPENDIX

A-1 Condition Before Grading

Project No. 2-21-1175



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Slide Mass		125	Mohr-Coulomb	0	13.5	Water Surface	Custom	1
Parent Material		125	Mohr-Coulomb	0	8.5	Water Surface	Custom	1
Sandstone		139	Mohr-Coulomb	3000	44	Water Surface	Custom	1
Basalt		165	Mohr-Coulomb	30000	45	Water Surface	Custom	1

AGEC
Applied GeoTech

SLIDEINTERPRET 8.032

Project	Blackstone Hotel (west)		
Analysis Description	Pre-excavation condtions - static residual strengths		
Drawn By		Scale 1:2702	Company
Date	1:24:26 PM9/16/2021		File Name Pre excavation conditions shallow 9 15 21.slmd

Slide Analysis Information

Pre excavation conditions shallow 9 15 21

Project Summary

File Name:	Pre excavation conditions shallow 9 15 21.slmd
Slide Modeler Version:	8.032
Compute Time:	00h:00m:04.331s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/24/2021, 2:35:12 PM

General Settings

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

Analysis Options

Analysis Methods Used	
Slices Type:	Vertical
	Bishop 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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116

Random Number Generation Method: Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Slide Mass	Parent Material	Sandstone	Basalt
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	125	139	165
Cohesion [psf]	0	0	3000	30000
Friction Angle [°]	13.5	8.5	44	45
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: bishop simplified

FS	1.004870
Axis Location:	1522.516, 3470.628
Left Slip Surface Endpoint:	987.608, 2722.591
Right Slip Surface Endpoint:	1800.000, 2593.879
Resisting Moment:	1.27247e+09 lb-ft
Driving Moment:	1.2663e+09 lb-ft
Total Slice Area:	75540.3 ft2
Surface Horizontal Width:	812.392 ft
Surface Average Height:	92.985 ft

Global Minimum Coordinates

Method: bishop simplified

X	Y
987.608	2722.59
1006.92	2705.02
1026.23	2686.77
1045.54	2667.84
1064.85	2650.76
1096.71	2626.7
1128.6	2602.01
1159.5	2577.14
1190.44	2553.71
1214.71	2546.04
1238.99	2538.96
1279.34	2536.3
1319.69	2534.97
1360.04	2537
1400.39	2537.63
1440.74	2536.85
1481.09	2534.66
1511.13	2531.98
1541.18	2528.25
1571.06	2523.63
1601.22	2521.42
1628.68	2521.77
1656.13	2522.01
1683.58	2527.85
1711.28	2533.96
1733.45	2547.23
1755.61	2562.04
1777.81	2578.34
1800	2593.88

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 24096
Number of Invalid Surfaces: 961

Error Codes:

Error Code -112 reported for 209 surfaces
Error Code -114 reported for 111 surfaces
Error Code -121 reported for 59 surfaces
Error Code -124 reported for 14 surfaces
Error Code -1000 reported for 568 surfaces

Error Codes

The following errors were encountered during the computation:

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-114 = Surface with Reverse Curvature.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-1000 = No valid slip surface is generated

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.00487**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	19.3098	19347.2	-42.3086	Slide Mass	0	13.5	196.621	197.579	822.976	0	822.976	1001.94	1001.94
2	19.3098	58510.8	-43.384	Slide Mass	0	13.5	590.584	593.46	2471.94	0	2471.94	3030.12	3030.12
3	19.3097	94539.2	-44.4226	Slide Mass	0	13.5	947.789	952.405	3967.04	0	3967.04	4895.92	4895.92
4	19.3097	127639	-41.5008	Slide Mass	0	13.5	1303.68	1310.03	5456.68	0	5456.68	6610.11	6610.11
5	15.9321	126254	-37.0481	Slide Mass	0	13.5	1604.01	1611.82	6713.75	0	6713.75	7924.57	7924.57
6	15.9321	142651	-37.0481	Slide Mass	0	13.5	1812.32	1821.15	7585.67	0	7585.67	8953.74	8953.74
7	15.9426	159719	-37.7577	Slide Mass	0	13.5	2019.8	2029.64	8454.06	0	8454.06	10018.4	10018.4
8	15.9426	179891	-37.7577	Slide Mass	0	13.5	2274.9	2285.98	9521.8	0	9521.8	11283.7	11283.7
9	13.1749	164833	-38.8213	Slide Mass	0	13.5	2507.14	2519.35	10493.8	0	10493.8	12511.1	12511.1
10	17.7338	245543	-38.8213	Slide Mass	0	13.5	2686.75	2699.83	11684.2	438.585	11245.6	13846	13407.5
11	15.3348	233530	-37.1365	Slide Mass	0	13.5	2831.34	2845.13	13084.7	1233.83	11850.8	15228.8	13995
12	15.3348	252450	-37.1365	Slide Mass	0	13.5	2936.65	2950.95	14238.7	1947.08	12291.6	16462.6	14515.5
13	0.267269	4567.69	-37.1365	Parent Material	0	8.5	1975.71	1985.33	15594.1	2309.93	13284.1	17090.3	14780.3
14	24.2684	419824	-17.534	Parent Material	0	8.5	2095.67	2105.88	16637.1	2546.36	14090.8	17299.2	14752.9
15	24.2822	426223	-16.2692	Parent Material	0	8.5	2075.98	2086.09	16947	2988.65	13958.3	17552.8	14564.2
16	20.1749	350764	-3.76698	Parent Material	0	8.5	2084.29	2094.44	17248.9	3234.68	14014.2	17386.1	14151.5
17	20.1749	339306	-3.76698	Parent Material	0	8.5	1990.65	2000.34	16687.2	3302.58	13384.6	16818.3	13515.7
18	20.175	325695	-1.89096	Parent Material	0	8.5	1893.47	1902.69	16081	3349.82	12731.2	16143.6	12793.7
19	20.175	308885	-1.89096	Parent Material	0	8.5	1766.22	1774.82	15252	3376.4	11875.6	15310.4	11934
20	13.45	193754	2.88958	Parent Material	0	8.5	1654.65	1662.71	14488.9	3363.51	11125.4	14405.4	11041.9
21	13.45	185958	2.88958	Parent Material	0	8.5	1575.64	1583.31	13905.4	3311.15	10594.2	13825.8	10514.7
22	13.45	181509	2.88958	Parent Material	0	8.5	1533.91	1541.38	13572.4	3258.8	10313.6	13495	10236.2
23	20.175	265921	0.89115	Parent Material	0	8.5	1485.55	1492.78	13203.8	3215.34	9988.44	13180.7	9965.34

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
24	20.175	261523	0.89115	Parent Material	0	8.5	1458.21	1465.31	12985.4	3180.77	9804.6	12962.7	9781.92
25	20.175	264471	-1.10945	Parent Material	0	8.5	1474.2	1481.38	13080.3	3168.18	9912.16	13108.9	9940.71
26	20.175	270939	-1.10945	Parent Material	0	8.5	1520.36	1527.76	13400	3177.57	10222.5	13429.5	10251.9
27	20.1749	277971	-3.10735	Parent Material	0	8.5	1559.32	1566.91	13693.4	3208.95	10484.4	13778	10569.1
28	20.1749	282408	-3.10735	Parent Material	0	8.5	1583.9	1591.61	13912	3262.3	10649.7	13998	10735.7
29	15.0212	212553	-5.09772	Parent Material	0	8.5	1588.88	1596.62	14008.4	3325.21	10683.2	14150.1	10824.9
30	15.0212	216317	-5.09772	Parent Material	0	8.5	1615.02	1622.89	14256.7	3397.67	10859	14400.7	11003.1
31	15.0212	220271	-7.07584	Parent Material	0	8.5	1632.26	1640.21	14461.4	3486.49	10974.9	14664	11177.5
32	15.0212	220102	-7.07584	Parent Material	0	8.5	1615.26	1623.13	14452.3	3591.68	10860.6	14652.8	11061.1
33	14.9439	217671	-8.79093	Parent Material	0	8.5	1578.14	1585.83	14321.8	3710.83	10611	14565.9	10855.1
34	14.9439	210395	-8.79093	Parent Material	0	8.5	1488	1495.25	13848.9	3843.93	10005	14079	10235.1
35	15.0782	201860	-4.19265	Parent Material	0	8.5	1390.03	1396.8	13285.6	3939.37	9346.25	13387.5	9448.15
36	15.0782	192993	-4.19265	Parent Material	0	8.5	1295.02	1301.33	12704.6	3997.15	8707.4	12799.5	8802.34
37	13.7278	167975	0.73102	Parent Material	0	8.5	1224.95	1230.92	12251.7	4015.47	8236.28	12236.1	8220.65
38	13.7278	161970	0.73102	Parent Material	0	8.5	1162.93	1168.59	11813.5	3994.34	7819.21	11798.7	7804.37
39	13.7277	157602	0.502822	Parent Material	0	8.5	1117.75	1123.19	11490.3	3974.92	7515.41	11480.5	7505.6
40	13.7277	153471	0.502822	Parent Material	0	8.5	1075.57	1080.81	11189.1	3957.2	7231.85	11179.6	7222.41
41	13.7242	147232	12.0151	Parent Material	0	8.5	1056.05	1061.19	10952.7	3852.11	7100.59	10727.9	6875.83
42	13.7242	138926	12.0151	Parent Material	0	8.5	992.65	997.484	10334	3659.65	6674.3	10122.7	6463.04
43	13.5609	130272	12.433	Parent Material	0	8.5	944.349	948.948	9814.68	3465.1	6349.58	9606.48	6141.38
44	13.5609	123316	12.433	Parent Material	0	8.5	895.708	900.07	9291.01	3268.47	6022.54	9093.54	5825.07
45	0.579103	5097.49	12.433	Slide Mass	0	13.5	1421.51	1428.43	9115.8	3165.95	5949.85	8802.4	5636.45
46	22.1651	172273	30.9125	Slide Mass	0	13.5	1403.15	1409.98	8612.43	2739.43	5873	7772.25	5032.82
47	22.1652	125788	33.7418	Slide Mass	0	13.5	1088.26	1093.56	6401.95	1846.94	4555.01	5675.02	3828.08
48	22.1943	76580.4	36.3096	Slide Mass	0	13.5	750.786	754.442	4002.15	859.678	3142.47	3450.45	2590.77
49	7.71363	14500.3	34.9886	Slide Mass	0	13.5	490.163	492.55	2222.91	171.282	2051.62	1879.84	1708.55
50	14.4807	10748	34.9886	Slide Mass	0	13.5	212.937	213.974	891.267	0	891.267	742.23	742.23

Interslice Data

- Global Minimum Query (bishop simplified) - Safety Factor: 1.00487

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	987.608	2722.59	0	0	0
2	1006.92	2705.02	10667.7	0	0
3	1026.23	2686.77	44376.9	0	0
4	1045.54	2667.84	101150	0	0
5	1064.85	2650.76	169199	0	0
6	1080.78	2638.73	224387	0	0
7	1096.71	2626.7	286743	0	0
8	1112.65	2614.36	358928	0	0
9	1128.6	2602.01	440231	0	0
10	1141.77	2591.41	518444	0	0
11	1159.5	2577.14	637522	0	0
12	1174.84	2565.53	746055	0	0
13	1190.17	2553.91	866376	0	0
14	1190.44	2553.71	869004	0	0
15	1214.71	2546.04	945712	0	0
16	1238.99	2538.96	1.0154e+06	0	0
17	1259.17	2537.63	996259	0	0
18	1279.34	2536.3	978264	0	0
19	1299.52	2535.63	950774	0	0
20	1319.69	2534.97	925300	0	0
21	1333.14	2535.65	893208	0	0
22	1346.59	2536.32	862575	0	0
23	1360.04	2537	832730	0	0
24	1380.22	2537.32	798615	0	0
25	1400.39	2537.63	765121	0	0
26	1420.57	2537.24	740489	0	0
27	1440.74	2536.85	715052	0	0
28	1460.92	2535.75	698590	0	0
29	1481.09	2534.66	681872	0	0
30	1496.11	2533.32	676776	0	0
31	1511.13	2531.98	671621	0	0
32	1526.16	2530.11	674066	0	0
33	1541.18	2528.25	676750	0	0
34	1556.12	2525.94	686264	0	0
35	1571.06	2523.63	696033	0	0
36	1586.14	2522.52	689758	0	0
37	1601.22	2521.42	684274	0	0
38	1614.95	2521.59	665313	0	0
39	1628.68	2521.77	647279	0	0
40	1642.4	2521.89	630550	0	0
41	1656.13	2522.01	614437	0	0
42	1669.86	2524.93	567952	0	0
43	1683.58	2527.85	524143	0	0
44	1697.14	2530.84	481994	0	0
45	1710.7	2533.83	442069	0	0

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
46	1711.28	2533.96	440082	0	0
47	1733.45	2547.23	294676	0	0
48	1755.61	2562.04	175769	0	0
49	1777.81	2578.34	93834.2	0	0
50	1785.52	2583.74	78052.2	0	0
51	1800	2593.88	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates	
External Boundary	X	Y
	0	2500
	2055	2500
	2100	2500
	2100	2582.57
	2100	2584
	2080	2584.86
	2048.8	2585.5
	2017.7	2586.12
	1986.6	2586.79
	1955.5	2587.95
	1931.9	2588.35
	1924.4	2588.47
	1893.3	2589.04
	1862.2	2589.45
	1831.1	2589.87
	1800	2593.88
	1768.9	2597.62
	1737.8	2600.68
	1706.7	2604.89
	1675.6	2607.37
	1644.5	2612.11
	1613.4	2617.54
	1582.3	2628.31
	1551.2	2643.45
	1520	2648.71
	1488.9	2647.09
	1457.8	2647.27
	1426.7	2644.08
	1395.6	2640.68
	1364.5	2642.99
	1333.4	2647.54
	1302.3	2660.95
	1271.2	2671.01
	1240	2680

Type	Coordinates	
	X	Y
	1195	2690
	1107	2700
	1065	2710
	1020	2720
	895	2730
	820	2740
	737	2750
	711.29	2752.81
	680.18	2758.49
	649.08	2763.35
	617.97	2765.31
	586.87	2766.13
	555.76	2766.66
	524.65	2769.07
	493.55	2772.29
	462.44	2775.32
	431.34	2779.05
	400.23	2789.67
	369.12	2796.46
	338.02	2805.78
	306.91	2817.8
	275.81	2834.28
	244.7	2848.45
	213.59	2853.8
	199.1	2856.2
	182.731	2860.95
	182.49	2861.02
	177.484	2863
	161.8	2869.2
	151.38	2874.05
	141	2878.9
	130.65	2883.4
	120.28	2884.98
	89.171	2885.5
	58.065	2885.13
	26.959	2884.32
	0	2883.71
	0	2863
	0	2596

Type	Coordinates

X	Y
182.731	2860.95
177.592	2787.91
200.955	2683.46
265.548	2622.99
347.29	2592.75
480.335	2581.3
567.939	2569.47
801.122	2558.58
998.653	2549.35
1253.03	2537.46
1706.31	2516.29
1787.1	2530.88
1802.74	2552.08
1831.1	2589.87

Material Boundary

X	Y
1931.9	2588.35
2100	2582.57

Material Boundary

X	Y
0	2596
567.939	2569.47

Material Boundary

X	Y
0	2863
177.484	2863

Material Boundary

X	Y
1706.31	2516.29
2055	2500

Material Boundary

X	Y
480.335	2581.3
1787.1	2530.88

Scenario-based Entities

Type	Coordinates	Master Scenario

X	Y
0	2605
2100	2580

Water Table

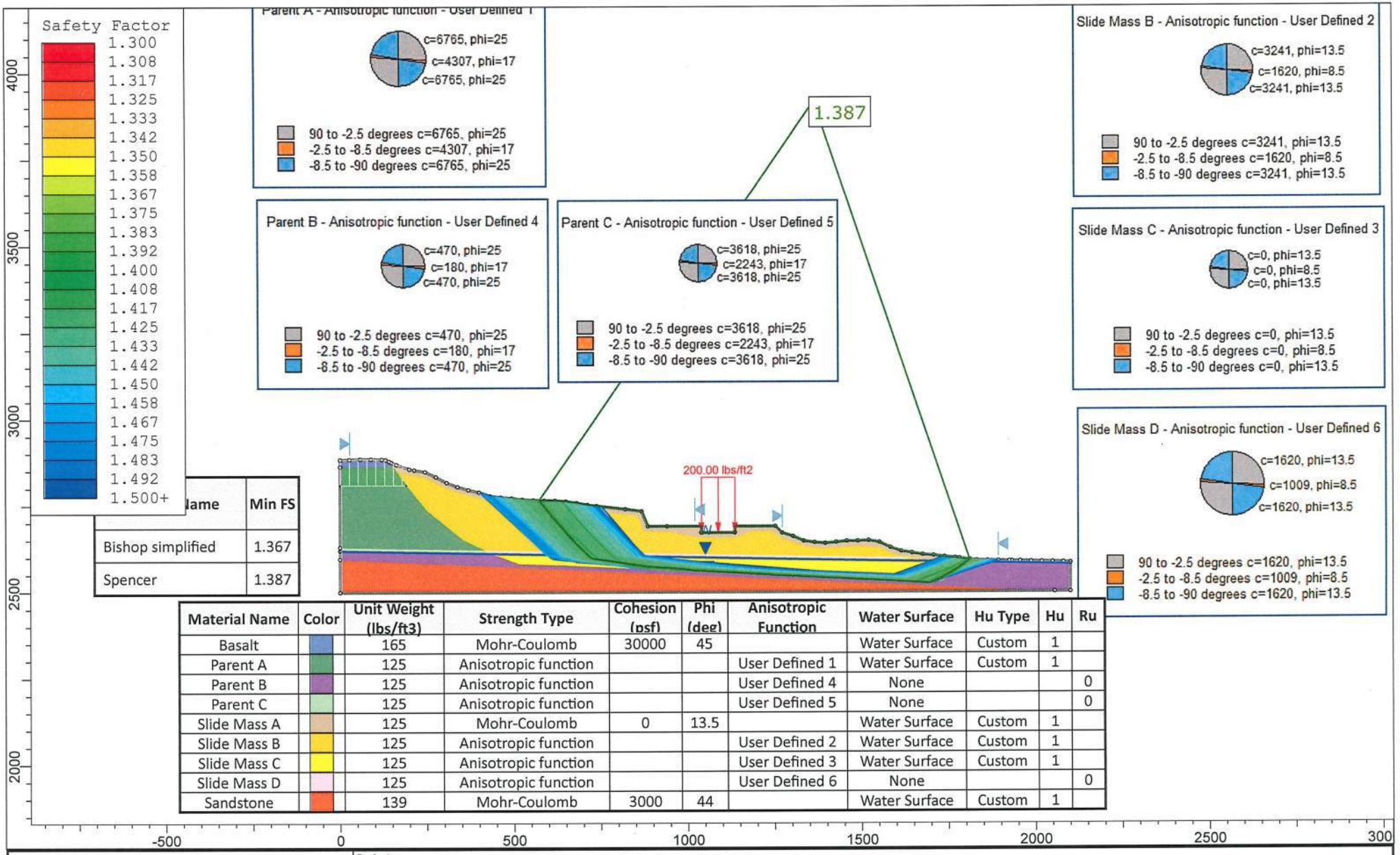
Assigned to materials:

- Slide Mass
- Parent Material
- Sandstone
- Basalt

APPENDIX

A-2 Proposed Profile - Static

Project No. 2-21-1175



lame	Min FS
Bishop simplified	1.367
Spencer	1.387

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Anisotropic Function	Water Surface	Hu Type	Hu	Ru
Basalt		165	Mohr-Coulomb	30000	45		Water Surface	Custom	1	
Parent A		125	Anisotropic function			User Defined 1	Water Surface	Custom	1	
Parent B		125	Anisotropic function			User Defined 4	None			0
Parent C		125	Anisotropic function			User Defined 5	None			0
Slide Mass A		125	Mohr-Coulomb	0	13.5		Water Surface	Custom	1	
Slide Mass B		125	Anisotropic function			User Defined 2	Water Surface	Custom	1	
Slide Mass C		125	Anisotropic function			User Defined 3	Water Surface	Custom	1	
Slide Mass D		125	Anisotropic function			User Defined 6	None			0
Sandstone		139	Mohr-Coulomb	3000	44		Water Surface	Custom	1	

AGEC Applied GeoTech

SLIDEINTERPRET 8.032

Project	Blackstone Hotel (west)		
Analysis Description	Proposed Construction - Static with unsaturated strengths		
Drawn By		Scale 1:4562	Company
Date	3:30:21 PM9/22/2021		File Name Unsaturated with Hotel 9 22 21.slmd

Slide Analysis Information

Unsaturated with Hotel 9 22 21

Project Summary

File Name:	Unsaturated with Hotel 9 22 21.slmd
Slide Modeler Version:	8.032
Compute Time:	00h:02m:35.982s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/24/2021, 2:35:12 PM

General Settings

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

Analysis Options

Analysis Methods Used	
Slices Type:	Vertical
	Bishop simplified
	Spencer
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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	5000
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

- 1 Distributed Load present

Distributed Load 1

Distribution:	Constant
Magnitude [psf]:	200
Orientation:	Normal to boundary

Tension Crack

-
- Water level: dry

Materials

Property	Basalt	Parent A	Parent B	Parent C	Slide Mass A	Slide Mass B	Slide Mass C	Slide Mass D
Color								
Strength Type	Mohr-Coulomb	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Anisotropic function	Anisotropic function	Anisotropic function
Unit Weight [lbs/ft3]	165	125	125	125	125	125	125	125
Cohesion [psf]	30000				0			
Friction Angle [°]	45				13.5			
Water Surface	Water Table	Water Table	None	None	Water Table	Water Table	Water Table	None

Property	Basalt	Parent A	Parent B	Parent C	Slide Mass A	Slide Mass B	Slide Mass C	Slide Mass D
Hu Value	1	1			1	1	1	
Ru Value			0	0				0

Anisotropic Functions

Name: User Defined 1

Angle From	Angle To	c	phi
-90	-8.5	6765	25
-8.5	-2.5	4307	17
-2.5	90	6765	25

Name: User Defined 2

Angle From	Angle To	c	phi
-90	-8.5	3241	13.5
-8.5	-2.5	1620	8.5
-2.5	90	3241	13.5

Name: User Defined 3

Angle From	Angle To	c	phi
-90	-8.5	0	13.5
-8.5	-2.5	0	8.5
-2.5	90	0	13.5

Name: User Defined 4

Angle From	Angle To	c	phi
-90	-8.5	470	25
-8.5	-2.5	180	17
-2.5	90	470	25

Name: User Defined 5

Angle From	Angle To	c	phi
-90	-8.5	3618	25
-8.5	-2.5	2243	17
-2.5	90	3618	25

Name: User Defined 6

Angle From	Angle To	c	phi
-90	-8.5	1620	13.5
-8.5	-2.5	1009	8.5
-2.5	90	1620	13.5

Property	Sandstone
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	139
Cohesion [psf]	3000
Friction Angle [°]	44
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.367310
Axis Location:	1395.082, 3852.534
Left Slip Surface Endpoint:	636.348, 2764.155
Right Slip Surface Endpoint:	1810.545, 2592.519
Resisting Moment:	3.55915e+09 lb-ft
Driving Moment:	2.60305e+09 lb-ft
Total Slice Area:	123466 ft2
Surface Horizontal Width:	1174.2 ft
Surface Average Height:	105.149 ft

Method: spencer

FS	1.387420
Axis Location:	1364.971, 3918.343
Left Slip Surface Endpoint:	571.656, 2766.390
Right Slip Surface Endpoint:	1810.545, 2592.519
Resisting Moment:	3.94983e+09 lb-ft
Driving Moment:	2.8469e+09 lb-ft
Resisting Horizontal Force:	2.53402e+06 lb
Driving Horizontal Force:	1.82643e+06 lb
Total Slice Area:	134250 ft2
Surface Horizontal Width:	1238.89 ft
Surface Average Height:	108.363 ft

Global Minimum Coordinates

Method: bishop simplified

X	Y
636.348	2764.15
666.875	2726.92
706.146	2682.42
745.413	2641.76
782.983	2605.14
818.076	2577.82
868.307	2570.35
920.2	2567.9
973.587	2565.49
1026.98	2562.31
1085.33	2559.11
1127.72	2557.23
1162.55	2555.57
1197.38	2553.49
1233	2550.12
1268.62	2548.03
1308.49	2546.21
1348.37	2544.21

X	Y
1383.24	2542.61
1422.89	2540.3
1473.47	2537.31
1523.67	2534.7
1555.42	2533.04
1586.71	2531.46
1645.89	2528.77
1700.83	2526.28
1728.27	2537.29
1755.51	2549.93
1782.57	2565.99
1810.55	2592.52

Method: spencer

X	Y
571.656	2766.39
606.353	2722.34
641.051	2681.71
680.866	2637.6
720.681	2598.13
776.597	2589.78
830.603	2581.71
884.72	2573.88
944.372	2570.4
981.178	2566.96
1016.46	2562.44
1073.35	2559.16
1130.24	2556.25
1187.13	2552.73
1221.83	2550.6
1256.53	2548.48
1313.99	2545.42
1359.16	2542.97
1404.34	2540.73
1448.81	2538.53
1493.25	2536.33
1537.8	2534.08
1581.87	2531.52
1626.09	2528.95
1661.45	2527.32
1696.87	2525.69
1725.62	2538.93
1754.38	2553.82
1783.1	2572
1810.55	2592.52

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 226498
Number of Invalid Surfaces: 273630

Error Codes:

Error Code -108 reported for 168 surfaces
Error Code -109 reported for 2 surfaces
Error Code -111 reported for 197 surfaces
Error Code -112 reported for 2593 surfaces
Error Code -114 reported for 1306 surfaces
Error Code -121 reported for 3456 surfaces
Error Code -124 reported for 268 surfaces
Error Code -1000 reported for 265640 surfaces

Method: spencer

Number of Valid Surfaces: 225642
Number of Invalid Surfaces: 274486

Error Codes:

Error Code -108 reported for 1237 surfaces
Error Code -109 reported for 2 surfaces
Error Code -111 reported for 1201 surfaces
Error Code -112 reported for 2473 surfaces
Error Code -114 reported for 1306 surfaces
Error Code -121 reported for 3456 surfaces
Error Code -124 reported for 268 surfaces
Error Code -1000 reported for 264543 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region,even though the slip surface is wholly within the soil region.
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-114 = Surface with Reverse Curvature.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-1000 = No valid slip surface is generated

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.36731**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	15.5561	17448.6	-50.6545	Slide Mass A	0	13.5	162.213	221.795	923.843	0	923.843	1121.71	1121.71

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
2	14.9717	48079.8	-50.6545	Slide Mass B	3241	13.5	2416.74	3304.43	264.207	0	264.207	3212.1	3212.1
3	19.6353	106061	-48.5679	Slide Mass B	3241	13.5	2768.21	3785.01	2265.95	0	2265.95	5402.33	5402.33
4	19.6353	152154	-48.5679	Slide Mass B	3241	13.5	3112.01	4255.08	4223.93	0	4223.93	7749.83	7749.83
5	19.6336	196553	-46.0006	Slide Mass B	3241	13.5	3493.14	4776.2	6394.56	0	6394.56	10011.9	10011.9
6	19.6336	241018	-46.0006	Slide Mass B	3241	13.5	3829.63	5236.29	8310.99	0	8310.99	12276.8	12276.8
7	27.1237	402818	-44.2629	Slide Mass B	3241	13.5	4250.75	5812.09	10709.4	0	10709.4	14852.1	14852.1
8	10.4464	176092	-44.2629	Slide Mass D	1620	13.5	3539.11	4839.06	13408.3	0	13408.3	16857.5	16857.5
9	17.5464	318224	-37.9068	Slide Mass C	0	13.5	2737.84	3743.47	16004.8	412.147	15592.6	18136.7	17724.5
10	17.5464	343553	-37.9068	Slide Mass C	0	13.5	2832.35	3872.7	17374.8	1243.85	16131	19580.3	18336.4
11	25.1156	510567	-8.45763	Slide Mass C	0	8.5	1997.02	2730.54	20031.8	1761.3	18270.5	20328.7	18567.4
12	25.1156	511532	-8.45763	Slide Mass C	0	8.5	1979.3	2706.31	20072.8	1964.48	18108.4	20367.2	18402.7
13	25.9461	432334	-2.70143	Slide Mass C	0	8.5	1584.8	2166.91	16588	2088.85	14499.1	16662.8	14573.9
14	25.9461	394012	-2.70143	Slide Mass C	0	8.5	1419.23	1940.53	15118.8	2134.4	12984.4	15185.8	13051.4
15	26.694	409424	-2.58793	Slide Mass C	0	8.5	1431.22	1956.92	15273	2178.96	13094.1	15337.7	13158.8
16	26.694	413450	-2.58793	Slide Mass C	0	8.5	1442.88	1972.87	15423.3	2222.52	13200.8	15488.5	13266
17	26.6941	418118	-3.40903	Slide Mass C	0	8.5	1453.58	1987.5	15576.7	2278.05	13298.7	15663.3	13385.3
18	26.6941	423424	-3.40903	Slide Mass C	0	8.5	1467.84	2006.99	15774.7	2345.55	13429.1	15862.1	13516.5
19	29.1787	430057	-3.14109	Slide Mass C	0	8.5	1352.1	1848.74	14782.1	2411.91	12370.2	14856.3	12444.4
20	29.1787	408842	-3.14109	Slide Mass C	0	8.5	1274.97	1743.28	14141.7	2477.15	11664.6	14211.7	11734.6
21	21.1928	300312	-2.5374	Slide Mass C	0	8.5	1288.34	1761.56	14313.4	2526.48	11786.9	14370.5	11844
22	21.1928	302800	-2.5374	Slide Mass C	0	8.5	1297.48	1774.06	14430.3	2559.89	11870.5	14487.8	11928
23	34.8324	565319	-2.72153	Slide Mass C	0	8.5	1485.79	2031.54	16200.9	2607.56	13593.3	16271.5	13664
24	34.8311	589818	-3.42175	Slide Mass C	0	8.5	1547.55	2115.98	16841.2	2682.79	14158.4	16933.7	14250.9
25	17.8095	305776	-5.40986	Slide Mass C	0	8.5	1557.85	2130.07	17021.8	2769.11	14252.7	17169.3	14400.2
26	17.8095	309531	-5.40986	Slide Mass C	0	8.5	1571.57	2148.82	17231.3	2853.18	14378.1	17380.1	14526.9
27	17.81	312580	-3.35815	Slide Mass C	0	8.5	1589.3	2173.07	17457.6	2917.24	14540.3	17550.8	14633.6
28	17.81	297825	-3.35815	Slide Mass C	0	8.5	1494.54	2043.5	16634.7	2961.29	13673.4	16722.4	13761.1

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
29	19.9362	301928	-2.61145	Slide Mass C	0	8.5	1320.89	1806.06	15084.5	2999.83	12084.7	15144.7	12144.9
30	19.9362	287601	-2.61145	Slide Mass C	0	8.5	1239.13	1694.28	14369.6	3032.87	11336.7	14426.1	11393.2
31	19.9362	269823	-2.87078	Slide Mass C	0	8.5	1137.69	1555.57	13477.3	3068.74	10408.5	13534.3	10465.6
32	19.9362	254872	-2.87078	Slide Mass C	0	8.5	1051.96	1438.35	12731.6	3107.43	9624.19	12784.4	9676.94
33	34.8701	434791	-2.62027	Slide Mass C	0	8.5	1012.87	1384.91	12422.5	3155.84	9266.67	12468.9	9313.03
34	19.8257	245550	-3.33401	Slide Mass C	0	8.5	996.65	1362.73	12327.4	3209.16	9118.23	12385.5	9176.29
35	19.8257	252035	-3.33401	Slide Mass C	0	8.5	1026.91	1404.11	12652.8	3257.66	9395.12	12712.6	9454.94
36	25.2927	333330	-3.38679	Slide Mass C	0	8.5	1071.38	1464.91	13115.5	3313.58	9801.93	13178.9	9865.33
37	25.2927	344595	-3.38679	Slide Mass C	0	8.5	1112.87	1521.64	13558.4	3376.92	10181.5	13624.3	10247.4
38	25.0997	346865	-2.97084	Slide Mass C	0	8.5	1128.73	1543.32	13760.9	3434.32	10326.6	13819.5	10385.2
39	25.0997	354006	-2.97084	Slide Mass C	0	8.5	1154.06	1577.96	14044.1	3485.77	10558.4	14104	10618.2
40	31.7439	442237	-2.99078	Slide Mass C	0	8.5	1128.89	1543.54	13872.4	3544.37	10328.1	13931.4	10387
41	31.2976	397363	-2.90307	Slide Mass C	0	8.5	987.881	1350.74	12646.2	3608.17	9038	12696.3	9088.1
42	29.5887	336185	-2.60251	Slide Mass C	0	8.5	837.308	1144.86	11323.9	3663.47	7660.43	11362	7698.49
43	29.5887	314413	-2.60251	Slide Mass C	0	8.5	751.973	1028.18	10591.9	3712.22	6879.72	10626.1	6913.9
44	27.468	280382	-2.59754	Slide Mass C	0	8.5	701.358	958.974	10175.8	3759.16	6416.64	10207.6	6448.46
45	27.468	273189	-2.59754	Slide Mass C	0	8.5	667.968	913.32	9915.44	3804.27	6111.17	9945.74	6141.47
46	27.4418	247029	21.8626	Slide Mass C	0	13.5	1045.49	1429.51	9421.31	3466.98	5954.33	9001.82	5534.84
47	27.2443	193198	24.8955	Slide Mass C	0	13.5	840.117	1148.7	7481.13	2696.46	4784.67	7091.24	4394.78
48	27.0522	133769	30.7019	Slide Mass C	0	13.5	622.614	851.306	5314.46	1768.52	3545.94	4944.75	3176.23
49	20.7356	48864.3	43.4714	Slide Mass C	0	13.5	364.601	498.522	2702.11	625.614	2076.5	2356.46	1730.85
50	7.24415	3510.86	43.4714	Slide Mass A	0	13.5	102.085	139.582	581.402	0	581.402	484.624	484.624

- **Global Minimum Query (spencer) - Safety Factor: 1.38742**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	12.8945	13014.6	-51.7742	Slide Mass A	0	13.5	132.524	183.867	765.862	0	765.862	934.115	934.115
2	21.8026	81005.9	-51.7742	Slide Mass B	3241	13.5	2461.88	3415.66	727.523	0	727.523	3853.12	3853.12

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
3	34.6977	272628	-49.5046	Slide Mass B	3241	13.5	3049.96	4231.57	4126.02	0	4126.02	7697.64	7697.64
4	19.9073	229482	-47.9272	Slide Mass B	3241	13.5	3577.27	4963.18	7173.39	0	7173.39	11136.2	11136.2
5	19.9073	276986	-47.9272	Slide Mass B	3241	13.5	3901.04	5412.38	9044.44	0	9044.44	13365.9	13365.9
6	21.1163	341297	-44.7517	Slide Mass B	3241	13.5	4289.88	5951.86	11291.6	0	11291.6	15544.4	15544.4
7	10.3229	183256	-44.7517	Slide Mass D	1620	13.5	3488.97	4840.66	13415	0	13415	16873.8	16873.8
8	8.37593	157005	-44.7517	Slide Mass C	0	13.5	2567.21	3561.8	15090	254.069	14836	17635.1	17381
9	27.958	538845	-8.49326	Slide Mass C	0	8.5	1969.21	2732.12	18902.9	621.81	18281.1	19196.9	18575.1
10	27.958	541851	-8.49326	Slide Mass C	0	8.5	1956.24	2714.13	19009.8	849.099	18160.7	19301.9	18452.8
11	27.0034	526029	-8.4966	Slide Mass C	0	8.5	1942.78	2695.45	19108.3	1072.56	18035.7	19398.5	18325.9
12	27.0034	528573	-8.4966	Slide Mass C	0	8.5	1929.22	2676.64	19202	1292.19	17909.8	19490.2	18198
13	27.0581	531111	-8.22925	Slide Mass C	0	8.5	1913.68	2655.08	19273.6	1508.01	17765.5	19550.3	18042.3
14	27.0581	487058	-8.22925	Slide Mass C	0	8.5	1718.85	2384.77	17676.9	1720.04	15956.8	17925.4	16205.4
15	19.884	290062	-3.34398	Slide Mass C	0	8.5	1368.42	1898.57	14554.1	1850.48	12703.6	14634.1	12783.6
16	19.884	292938	-3.34398	Slide Mass C	0	8.5	1378.69	1912.82	14698.3	1899.35	12799	14778.9	12879.5
17	19.884	295826	-3.34398	Slide Mass C	0	8.5	1389.02	1927.16	14843.1	1948.21	12894.9	14924.3	12976.1
18	36.8069	558173	-5.33314	Slide Mass C	0	8.5	1397.75	1939.27	15033.9	2057.97	12975.9	15164.4	13106.4
19	35.2861	552671	-7.30949	Slide Mass C	0	8.5	1418.32	1967.8	15430.4	2263.55	13166.8	15612.3	13348.8
20	28.4435	443160	-3.29224	Slide Mass C	0	8.5	1418.55	1968.13	15587	2417.94	13169.1	15668.6	13250.7
21	28.4435	398273	-3.29224	Slide Mass C	0	8.5	1258.51	1746.08	14169.5	2486.23	11683.3	14241.9	11755.7
22	28.4436	403768	-2.92757	Slide Mass C	0	8.5	1274.27	1767.95	14378.5	2548.85	11829.6	14443.7	11894.8
23	28.4436	408939	-2.92757	Slide Mass C	0	8.5	1287.69	1786.56	14560	2605.81	11954.2	14625.8	12020
24	28.4435	467946	-3.54858	Slide Mass C	0	8.5	1482.46	2056.8	16434.8	2672.42	13762.4	16526.7	13854.3
25	28.4435	484930	-3.54858	Slide Mass C	0	8.5	1534.78	2129.39	16996.7	2748.68	14248.1	17091.9	14343.2
26	34.7003	600031	-3.50107	Slide Mass C	0	8.5	1552.11	2153.43	17241.4	2832.43	14408.9	17336.3	14503.9
27	34.7003	607973	-3.50107	Slide Mass C	0	8.5	1566.84	2173.87	17469.4	2923.66	14545.7	17565.3	14641.6
28	28.731	452101	-3.04725	Slide Mass C	0	8.5	1369.16	1899.6	15710.4	2999.92	12710.5	15783.3	12783.4
29	28.731	414358	-3.04725	Slide Mass C	0	8.5	1221.15	1694.25	14397.7	3061.22	11336.5	14462.7	11401.5

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
30	22.5882	300122	-3.10513	Slide Mass C	0	8.5	1092.72	1516.06	13260.8	3116.67	10144.2	13320.1	10203.4
31	22.5882	287538	-3.10513	Slide Mass C	0	8.5	1027.4	1425.44	12704.1	3166.28	9537.86	12759.9	9593.59
32	22.5882	282864	-2.84532	Slide Mass C	0	8.5	1001.16	1389.03	12506.9	3212.69	9294.22	12556.7	9343.98
33	22.5882	282045	-2.84532	Slide Mass C	0	8.5	992.576	1377.12	12470.4	3255.9	9214.54	12519.8	9263.87
34	22.2328	285344	-2.82843	Slide Mass C	0	8.5	1025.51	1422.82	12818.8	3298.56	9520.29	12869.5	9570.96
35	22.2328	294944	-2.82843	Slide Mass C	0	8.5	1067.46	1481.02	13250.4	3340.68	9909.71	13303.1	9962.45
36	22.2239	303015	-2.82867	Slide Mass C	0	8.5	1102.59	1529.76	13618.6	3382.79	10235.8	13673.1	10290.3
37	22.2239	306328	-2.82867	Slide Mass C	0	8.5	1114.1	1545.72	13767.6	3424.89	10342.7	13822.6	10397.7
38	22.2744	312192	-2.89558	Slide Mass C	0	8.5	1134.13	1573.52	13996.5	3467.86	10528.6	14053.9	10586
39	22.2744	314187	-2.89558	Slide Mass C	0	8.5	1139.04	1580.32	14085.9	3511.69	10574.2	14143.5	10631.8
40	22.0344	302620	-3.32256	Slide Mass C	0	8.5	1091.91	1514.94	13697.2	3560.42	10136.7	13760.5	10200.1
41	22.0344	280164	-3.32256	Slide Mass C	0	8.5	976.539	1354.87	12679.7	3614.05	9065.64	12736.4	9122.33
42	22.1078	259078	-3.33428	Slide Mass C	0	8.5	863.581	1198.15	11684.9	3667.92	8017	11735.2	8067.32
43	22.1078	243210	-3.33428	Slide Mass C	0	8.5	780.557	1082.96	10968.3	3722.01	7246.28	11013.8	7291.76
44	35.3597	372137	-2.6332	Slide Mass C	0	8.5	725.361	1006.38	10512.6	3778.78	6733.83	10546	6767.19
45	35.4245	357752	-2.63753	Slide Mass C	0	8.5	673.056	933.812	10086.7	3838.37	6248.29	10117.7	6279.29
46	28.752	258321	24.7315	Slide Mass C	0	13.5	1139.83	1581.42	10025	3437.94	6587.1	9500.02	6062.08
47	28.7524	194740	27.3745	Slide Mass C	0	13.5	889.94	1234.72	7669.09	2526.08	5143.01	7208.29	4682.21
48	28.726	124387	32.3268	Slide Mass C	0	13.5	624.34	866.222	5068.33	1460.25	3608.08	4673.22	3212.97
49	18.3072	36421.1	36.7893	Slide Mass C	0	13.5	347.064	481.524	2443.68	437.988	2005.69	2184.14	1746.16
50	9.13545	4539.1	36.7893	Slide Mass A	0	13.5	109.088	151.351	630.424	0	630.424	548.847	548.847

Interslice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.36731**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	636.348	2764.15	0	0	0
2	651.904	2745.18	15007.2	0	0
3	666.875	2726.92	-16341.7	0	0

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
4	686.511	2704.67	-20273.3	0	0
5	706.146	2682.42	12605.2	0	0
6	725.78	2662.09	74051	0	0
7	745.413	2641.76	167856	0	0
8	772.537	2615.33	335686	0	0
9	782.983	2605.14	435234	0	0
10	800.53	2591.48	605878	0	0
11	818.076	2577.82	793581	0	0
12	843.192	2574.08	818247	0	0
13	868.307	2570.35	843511	0	0
14	894.253	2569.13	822709	0	0
15	920.2	2567.9	804403	0	0
16	946.893	2566.7	784635	0	0
17	973.587	2565.49	764737	0	0
18	1000.28	2563.9	750713	0	0
19	1026.98	2562.31	736624	0	0
20	1056.15	2560.71	720851	0	0
21	1085.33	2559.11	706302	0	0
22	1106.53	2558.17	692448	0	0
23	1127.72	2557.23	678509	0	0
24	1162.55	2555.57	653593	0	0
25	1197.38	2553.49	634777	0	0
26	1215.19	2551.8	635748	0	0
27	1233	2550.12	636828	0	0
28	1250.81	2549.07	626773	0	0
29	1268.62	2548.03	617546	0	0
30	1288.56	2547.12	604935	0	0
31	1308.49	2546.21	593303	0	0
32	1328.43	2545.21	584101	0	0
33	1348.37	2544.21	575863	0	0
34	1383.24	2542.61	560376	0	0
35	1403.06	2541.46	554859	0	0
36	1422.89	2540.3	549118	0	0
37	1448.18	2538.81	541658	0	0
38	1473.47	2537.31	533812	0	0
39	1498.57	2536.01	523413	0	0
40	1523.67	2534.7	512747	0	0
41	1555.42	2533.04	499928	0	0
42	1586.71	2531.46	489089	0	0
43	1616.3	2530.11	479550	0	0
44	1645.89	2528.77	471550	0	0
45	1673.36	2527.52	464971	0	0
46	1700.83	2526.28	458983	0	0
47	1728.27	2537.29	326565	0	0
48	1755.51	2549.93	209092	0	0
49	1782.57	2565.99	106883	0	0
50	1803.3	2585.65	46207.9	0	0
51	1810.55	2592.52	0	0	0

- **Global Minimum Query (spencer) - Safety Factor: 1.38742**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	571.656	2766.39	0	0	0
2	584.551	2750.02	10828.9	969.675	5.11691
3	606.353	2722.34	-22708.8	-2033.46	5.1169
4	641.051	2681.71	39113.9	3502.46	5.11691
5	660.958	2659.65	126094	11291.1	5.11691
6	680.866	2637.6	247890	22197.4	5.11692
7	701.982	2616.67	393681	35252.3	5.11692
8	712.305	2606.43	494952	44320.6	5.11692
9	720.681	2598.13	598751	53615.3	5.11692
10	748.639	2593.95	622615	55752.2	5.11692
11	776.597	2589.78	647287	57961.5	5.11692
12	803.6	2585.74	671909	60166.2	5.11691
13	830.603	2581.71	697275	62437.6	5.11691
14	857.661	2577.8	720915	64554.5	5.11692
15	884.72	2573.88	743580	66584	5.11691
16	904.604	2572.72	733279	65661.6	5.11691
17	924.488	2571.56	722942	64736	5.11692
18	944.372	2570.4	712567	63807	5.11692
19	981.178	2566.96	712776	63825.6	5.11691
20	1016.46	2562.44	732569	65598.1	5.11692
21	1044.91	2560.8	717723	64268.7	5.11692
22	1073.35	2559.16	705111	63139.3	5.11691
23	1101.8	2557.71	689780	61766.5	5.11692
24	1130.24	2556.25	674333	60383.3	5.11692
25	1158.68	2554.49	661155	59203.3	5.11692
26	1187.13	2552.73	647480	57978.8	5.11692
27	1221.83	2550.6	630225	56433.6	5.11691
28	1256.53	2548.48	612942	54886	5.11691
29	1285.26	2546.95	597633	53515.2	5.11692
30	1313.99	2545.42	584569	52345.4	5.11692
31	1336.58	2544.2	576136	51590.2	5.11691
32	1359.16	2542.97	568495	50906	5.11691
33	1381.75	2541.85	559922	50138.3	5.11691
34	1404.34	2540.73	551501	49384.3	5.11692
35	1426.57	2539.63	542781	48603.5	5.11692
36	1448.81	2538.53	533603	47781.6	5.11692
37	1471.03	2537.43	524053	46926.5	5.11692
38	1493.25	2536.33	514411	46063.1	5.11692
39	1515.53	2535.21	504918	45213	5.11692
40	1537.8	2534.08	495416	44362.2	5.11692
41	1559.84	2532.8	488878	43776.7	5.11692
42	1581.87	2531.52	483580	43302.3	5.11692
43	1603.98	2530.23	479538	42940.3	5.11691
44	1626.09	2528.95	476409	42660.1	5.11691
45	1661.45	2527.32	467856	41894.2	5.11691
46	1696.87	2525.69	460473	41233.1	5.11691
47	1725.62	2538.93	294933	26409.8	5.11691
48	1754.38	2553.82	155171	13894.8	5.11691
49	1783.1	2572	45100	4038.49	5.11692

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
50	1801.41	2585.69	5291.64	473.841	5.11692
51	1810.55	2592.52	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates	
External Boundary	X	Y
	0	2500
	2055	2500
	2100	2500
	2100	2582.57
	2100	2584
	2080	2584.86
	2048.8	2585.5
	2017.7	2586.12
	1986.6	2586.79
	1955.5	2587.95
	1931.9	2588.35
	1924.4	2588.47
	1893.3	2589.04
	1862.2	2589.45
	1831.1	2589.87
	1810.55	2592.52
	1780.66	2596.18
	1768.9	2597.62
	1737.8	2600.68
	1706.7	2604.89
	1675.6	2607.37
	1644.5	2612.11
	1613.4	2617.54
	1582.3	2628.31
	1551.2	2643.45
	1520	2648.71
	1488.9	2647.09
	1457.8	2647.27
	1426.7	2644.08
	1395.6	2640.68
	1364.5	2642.99
	1333.4	2647.54
	1302.3	2660.95
	1271.2	2671.01
	1252	2690
	1135	2690
	1135	2672
	1039	2672

Type	Coordinates	
	X	Y
	1039	2690
	940	2690
	885	2690
	866.991	2733.73
	820	2740
	737	2750
	711.29	2752.81
	680.18	2758.49
	649.08	2763.35
	617.97	2765.31
	586.87	2766.13
	555.76	2766.66
	524.65	2769.07
	493.55	2772.29
	462.44	2775.32
	431.34	2779.05
	400.23	2789.67
	369.12	2796.46
	338.02	2805.78
	306.91	2817.8
	275.81	2834.28
	244.7	2848.45
	213.59	2853.8
	199.1	2856.2
	161.8	2869.2
	147.608	2875.56
	141	2878.9
	130.65	2883.4
	120.28	2884.98
	89.171	2885.5
	58.065	2885.13
	26.959	2884.32
	0	2883.71
	0	2863
	0	2630
	0	2620
	0	2596

Type	Coordinates
Material Boundary	X: 182.308, 212.393, 248.409, 312.568, 353.568, 385.121, 415.734, 437.544, 514.019, 645.613, 908.026, 1119.06, 1374.9, 1584.25, 1691.6, 1728.07, 1761.29, 1803.3, 1803.5, 1810.55 Y: 2821.95, 2783.59, 2737.67, 2685.31, 2651.85, 2636.75, 2622.1, 2611.67, 2582.3, 2578.18, 2565.54, 2556.05, 2541.87, 2530.99, 2524.98, 2530.13, 2545.83, 2585.65, 2585.84, 2592.52
Material Boundary	X: 1931.9, 2100 Y: 2588.35, 2582.57
Material Boundary	X: 0, 2055 Y: 2596, 2500
Material Boundary	X: 0, 154.397 Y: 2863, 2863
Material Boundary	X: 147.608, 154.397, 162.358, 182.308 Y: 2875.56, 2863, 2849, 2821.95
Material Boundary	X: 437.544, 542.546 Y: 2611.67, 2609.67

Type	Coordinates	
	X	Y
Material Boundary	162.358	2849
	243.869	2833.47
	305.541	2802.42
	337.886	2790.78
	431.904	2764.9
	525.922	2754.12
	X	Y
Material Boundary	542.546	2609.67
	890.643	2603.04
	X	Y
	525.922	2754.12
Material Boundary	649.267	2745.49
	710.939	2738.16
	820.914	2725.22
	X	Y
	820.914	2725.22
	854.554	2720.05
	874.392	2674.33
	884.743	2674.76
Material Boundary	940.377	2674.76
	1038.71	2657.51
	1137.04	2657.51
	1182.32	2674.76
	1245.29	2674.33
	X	Y
	890.643	2603.04
	1645.59	2588.66
	1615.3	2599.32
	1594.04	2606.8
	1632.88	2598.98
Material Boundary	1644.22	2596.7
	1706.29	2589.83
	1769.26	2586.3
	1803.3	2585.65
	1803.58	2585.65
	1803.5	2585.84
	X	Y
	1332.84	2632.5
	1364.32	2627.32
	1395.8	2624.74
Material Boundary	1489.39	2632.07
	1550.2	2627.76
	1594.04	2606.8

Type	Coordinates

	X	Y
Material Boundary	1245.29	2674.33
	1269.01	2655.36
	1332.84	2632.5

	X	Y
Material Boundary	0	2620
	437.544	2611.67

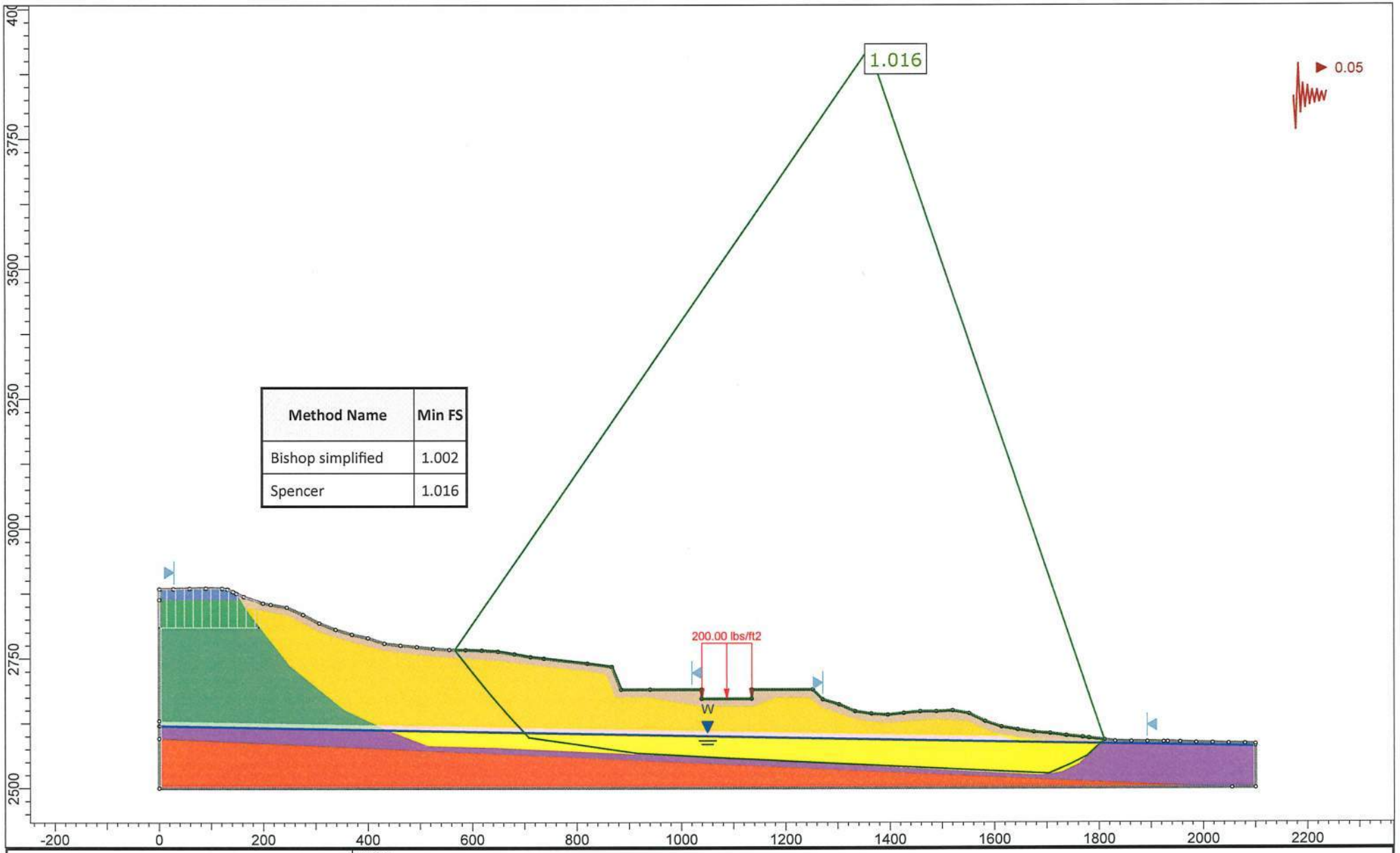
	X	Y
Material Boundary	0	2630
	415.734	2622.1
	1615.3	2599.32
	1632.88	2598.98
	1780.66	2596.18

Scenario-based Entities

Type	Coordinates	Master Scenario
		Assigned to materials:
Water Table	X: 0, Y: 2620 X: 2100, Y: 2580	Basalt Parent A Slide Mass A Slide Mass B Slide Mass C Sandstone
Distributed Load	X: 1135, Y: 2672 X: 1039, Y: 2672	Constant Distribution Orientation: Normal to boundary Magnitude: 200 lbs/ft2 Creates Excess Pore Pressure: No
Tension Crack	X: 0, Y: 2810 X: 191, Y: 2810	Water level: dry

A-3 Proposed Profile - Seismic (Yield Acceleration)

Project No. 2-21-1175



AGEC Applied GeoTech

SLIDEINTERPRET 8.032

Project	Blackstone Hotel (west)		
Analysis Description	Proposed Construction - Yield Acceleration with unsaturated strengths		
Drawn By		Scale 1:3043	Company
Date	4:06:16 PM9/22/2021		File Name Unsaturated with Hotel 9 22 21 eq.slmd

Slide Analysis Information

Unsaturated with Hotel 9 22 21 eq

Project Summary

File Name:	Unsaturated with Hotel 9 22 21 eq.slmd
Slide Modeler Version:	8.032
Compute Time:	00h:02m:29.293s
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/24/2021, 2:35:12 PM

General Settings

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

Analysis Options

Analysis Methods Used	
Slices Type:	Vertical
	Bishop simplified
	Spencer
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

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	5000
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.05

Loading

- 1 Distributed Load present

Distributed Load 1

Distribution:	Constant
Magnitude [psf]:	200
Orientation:	Normal to boundary

Tension Crack

-
- Water level: dry

Materials

Property	Basalt	Parent A	Parent B	Parent C	Slide Mass A	Slide Mass B	Slide Mass C	Slide Mass D
Color								
Strength Type	Mohr-Coulomb	Anisotropic function	Anisotropic function	Anisotropic function	Mohr-Coulomb	Anisotropic function	Anisotropic function	Anisotropic function
Unit Weight [lbs/ft3]	165	125	125	125	125	125	125	125
Cohesion [psf]	30000				0			
Friction Angle [°]	45				13.5			

Property	Basalt	Parent A	Parent B	Parent C	Slide Mass A	Slide Mass B	Slide Mass C	Slide Mass D
Water Surface	Water Table	Water Table	None	None	Water Table	Water Table	Water Table	None
Hu Value	1	1			1	1	1	
Ru Value			0	0				0

Anisotropic Functions

Name: User Defined 1

Angle From	Angle To	c	phi
-90	-8.5	6765	25
-8.5	-2.5	4307	17
-2.5	90	6765	25

Name: User Defined 2

Angle From	Angle To	c	phi
-90	-8.5	3241	13.5
-8.5	-2.5	1620	8.5
-2.5	90	3241	13.5

Name: User Defined 3

Angle From	Angle To	c	phi
-90	-8.5	0	13.5
-8.5	-2.5	0	8.5
-2.5	90	0	13.5

Name: User Defined 4

Angle From	Angle To	c	phi
-90	-8.5	470	25
-8.5	-2.5	180	17
-2.5	90	470	25

Name: User Defined 5

Angle From	Angle To	c	phi
-90	-8.5	3618	25
-8.5	-2.5	2243	17
-2.5	90	3618	25

Name: User Defined 6

Angle From	Angle To	c	phi
-90	-8.5	1620	13.5
-8.5	-2.5	1009	8.5
-2.5	90	1620	13.5

Property	Sandstone
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	139
Cohesion [psf]	3000
Friction Angle [°]	44
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.002440
Axis Location:	1361.958, 3924.638
Left Slip Surface Endpoint:	565.415, 2766.497
Right Slip Surface Endpoint:	1810.545, 2592.519
Resisting Moment:	3.90003e+09 lb-ft
Driving Moment:	3.89052e+09 lb-ft
Total Slice Area:	136335 ft2
Surface Horizontal Width:	1245.13 ft
Surface Average Height:	109.494 ft

Method: spencer

FS	1.016480
Axis Location:	1361.958, 3924.638
Left Slip Surface Endpoint:	565.415, 2766.497
Right Slip Surface Endpoint:	1810.545, 2592.519
Resisting Moment:	3.90506e+09 lb-ft
Driving Moment:	3.84175e+09 lb-ft
Resisting Horizontal Force:	2.50336e+06 lb
Driving Horizontal Force:	2.46277e+06 lb
Total Slice Area:	136335 ft2
Surface Horizontal Width:	1245.13 ft
Surface Average Height:	109.494 ft

Global Minimum Coordinates

Method: bishop simplified

X	Y
565.415	2766.5
600.507	2721.72
635.599	2678.61
670.691	2637.5
707.138	2597.85
756.05	2590.54
805.058	2583.26
858.068	2575.41
915.268	2567.04
979.271	2563.43
1016.94	2561.31
1054.7	2559.19
1092.46	2557.35
1130.21	2555.51
1167.97	2553.67
1205.73	2551.83
1240.39	2550.14

X	Y
1275.06	2548.45
1318.94	2546.31
1362.82	2544.17
1406.43	2542.04
1450.04	2539.92
1493.67	2537.79
1545.09	2535.29
1581.19	2533.57
1617.28	2531.84
1663.52	2529.64
1704.01	2527.71
1744.51	2544.75
1777.98	2561.66
1810.55	2592.52

Method: spencer

X	Y
565.415	2766.5
600.507	2721.72
635.599	2678.61
670.691	2637.5
707.138	2597.85
756.05	2590.54
805.058	2583.26
858.068	2575.41
915.268	2567.04
979.271	2563.43
1016.94	2561.31
1054.7	2559.19
1092.46	2557.35
1130.21	2555.51
1167.97	2553.67
1205.73	2551.83
1240.39	2550.14
1275.06	2548.45
1318.94	2546.31
1362.82	2544.17
1406.43	2542.04
1450.04	2539.92
1493.67	2537.79
1545.09	2535.29
1581.19	2533.57
1617.28	2531.84
1663.52	2529.64
1704.01	2527.71
1744.51	2544.75
1777.98	2561.66
1810.55	2592.52

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 227255
Number of Invalid Surfaces: 272865

Error Codes:

Error Code -108 reported for 77 surfaces
Error Code -109 reported for 3 surfaces
Error Code -111 reported for 62 surfaces
Error Code -112 reported for 2697 surfaces
Error Code -114 reported for 1329 surfaces
Error Code -121 reported for 3442 surfaces
Error Code -124 reported for 248 surfaces
Error Code -1000 reported for 265007 surfaces

Method: spencer

Number of Valid Surfaces: 227251
Number of Invalid Surfaces: 272869

Error Codes:

Error Code -108 reported for 615 surfaces
Error Code -109 reported for 3 surfaces
Error Code -111 reported for 1391 surfaces
Error Code -112 reported for 2414 surfaces
Error Code -114 reported for 1329 surfaces
Error Code -121 reported for 3442 surfaces
Error Code -124 reported for 248 surfaces
Error Code -1000 reported for 263427 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region,even though the slip surface is wholly within the soil region.
-111 = safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-114 = Surface with Reverse Curvature.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-1000 = No valid slip surface is generated

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.00244**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	12.5539	12398.5	-51.9127	Slide Mass A	0	13.5	181.169	181.611	756.463	0	756.463	987.621	987.621
2	22.5378	84374	-51.9127	Slide Mass B	3241	13.5	3163.12	3170.84	-292.239	0	-292.239	3743.68	3743.68
3	35.0918	285039	-50.8558	Slide Mass B	3241	13.5	4001.17	4010.94	3207.01	0	3207.01	8122.71	8122.71
4	35.0919	458032	-49.5146	Slide Mass B	3241	13.5	4965.87	4977.99	7235.08	0	7235.08	13052.4	13052.4
5	18.935	310602	-47.4124	Slide Mass B	3241	13.5	5681.34	5695.2	10222.5	0	10222.5	16403.6	16403.6
6	9.38947	169143	-47.4124	Slide Mass D	1620	13.5	4704.52	4716	12895.7	0	12895.7	18014.1	18014.1
7	8.12223	154363	-47.4124	Slide Mass C	0	13.5	3559.31	3567.99	15132.6	270.851	14861.8	19005	18734.2
8	24.456	476678	-8.49942	Slide Mass C	0	8.5	2749.05	2755.76	19080.4	641.223	18439.2	19491.3	18850
9	24.456	479352	-8.49942	Slide Mass C	0	8.5	2735.97	2742.65	19191.7	840.21	18351.5	19600.6	18760.4
10	24.504	482447	-8.44308	Slide Mass C	0	8.5	2720.26	2726.9	19284.7	1038.62	18246.1	19688.5	18649.9
11	24.504	484546	-8.44308	Slide Mass C	0	8.5	2703.89	2710.49	19372.8	1236.46	18136.3	19774.1	18537.7
12	26.5051	526359	-8.42872	Slide Mass C	0	8.5	2686.34	2692.89	19460.7	1442.17	18018.5	19858.8	18416.6
13	26.5051	527842	-8.42872	Slide Mass C	0	8.5	2663.34	2669.84	19520.1	1655.74	17864.3	19914.7	18259
14	57.1999	947928	-8.32927	Slide Mass C	0	8.5	2127.61	2132.8	16260.7	1989.82	14270.9	16572.2	14582.4
15	32.0017	495488	-3.22211	Slide Mass C	0	8.5	1955.84	1960.61	15373.1	2254.3	13118.8	15483.2	13228.9
16	32.0017	502695	-3.22211	Slide Mass C	0	8.5	1978.14	1982.97	15597	2328.68	13268.3	15708.4	13379.7
17	18.8362	299254	-3.21899	Slide Mass C	0	8.5	1995.86	2000.73	15774.9	2387.73	13387.2	15887.2	13499.5
18	18.8362	301748	-3.21899	Slide Mass C	0	8.5	2008.98	2013.88	15906.6	2431.44	13475.2	16019.6	13588.1
19	37.7571	577037	-3.21813	Slide Mass C	0	8.5	1902.65	1907.29	15259.1	2497.1	12762	15366	12868.9
20	18.8786	267296	-2.79113	Slide Mass C	0	8.5	1746.58	1750.84	14273.5	2558.39	11715.1	14358.7	11800.3
21	18.8786	269468	-2.79113	Slide Mass C	0	8.5	1758.43	1762.72	14388	2593.39	11794.6	14473.8	11880.4
22	37.7571	545452	-2.79113	Slide Mass C	0	8.5	1776.21	1780.54	14559.7	2645.88	11913.9	14646.3	12000.5
23	18.8786	307694	-2.79113	Slide Mass C	0	8.5	2020.49	2025.42	16250.8	2698.37	13552.4	16349.3	13650.9
24	18.8786	320633	-2.79113	Slide Mass C	0	8.5	2109.25	2114.4	16881.1	2733.36	14147.8	16984	14250.6
25	37.7571	647781	-2.79113	Slide Mass C	0	8.5	2127.02	2132.21	17052.8	2785.85	14267	17156.5	14370.7
26	34.6633	602351	-2.79113	Slide Mass C	0	8.5	2149.75	2155	17272.4	2852.97	14419.4	17377.2	14524.2
27	34.6633	577426	-2.79113	Slide Mass C	0	8.5	2033.81	2038.77	16559	2917.22	13641.8	16658.1	13740.9

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
28	21.9417	324467	-2.79113	Slide Mass C	0	8.5	1749.2	1753.47	14702.4	2969.69	11732.7	14787.7	11818
29	21.9417	306079	-2.79113	Slide Mass C	0	8.5	1619.14	1623.09	13870.7	3010.36	10860.3	13949.6	10939.3
30	21.9417	284236	-2.79113	Slide Mass C	0	8.5	1465.77	1469.35	12882.7	3051.03	9831.66	12954.2	9903.12
31	21.9417	274642	-2.79113	Slide Mass C	0	8.5	1395.04	1398.44	12448.9	3091.7	9357.17	12516.9	9425.19
32	21.8049	268938	-2.79094	Slide Mass C	0	8.5	1361.95	1365.27	12267.5	3132.24	9135.22	12333.8	9201.61
33	21.8049	268755	-2.79094	Slide Mass C	0	8.5	1354.71	1358.02	12259.4	3172.66	9086.73	12325.4	9152.78
34	21.8049	276775	-2.79094	Slide Mass C	0	8.5	1403.18	1406.6	12624.8	3213.07	9411.77	12693.2	9480.17
35	21.8049	285938	-2.79094	Slide Mass C	0	8.5	1459.4	1462.96	13042.3	3253.48	9788.84	13113.5	9859.99
36	21.8161	293738	-2.79094	Slide Mass C	0	8.5	1505.33	1509	13390.9	3293.91	10097	13464.3	10170.4
37	21.8161	296788	-2.79094	Slide Mass C	0	8.5	1520.04	1523.75	13530	3334.34	10195.6	13604.1	10269.7
38	25.7088	356204	-2.78687	Slide Mass C	0	8.5	1550.74	1554.52	13779.9	3378.32	10401.5	13855.3	10477
39	25.7088	355847	-2.78687	Slide Mass C	0	8.5	1541.64	1545.4	13766.4	3425.86	10340.6	13841.5	10415.6
40	36.0959	464940	-2.72994	Slide Mass C	0	8.5	1391.36	1394.75	12814.4	3481.87	9332.5	12880.7	9398.84
41	36.0959	405070	-2.72994	Slide Mass C	0	8.5	1136.27	1139.04	11167.9	3546.37	7621.51	11222.1	7675.69
42	23.1177	241433	-2.72994	Slide Mass C	0	8.5	1013.2	1015.67	10395.3	3599.27	6796.05	10443.6	6844.36
43	23.1177	233459	-2.72994	Slide Mass C	0	8.5	956.026	958.359	10053.1	3640.58	6412.53	10098.7	6458.12
44	20.2475	199018	-2.72994	Slide Mass C	0	8.5	910.408	912.629	9785.85	3679.32	6106.53	9829.26	6149.94
45	20.2475	196715	-2.72994	Slide Mass C	0	8.5	888.216	890.383	9673.17	3715.5	5957.67	9715.53	6000.03
46	20.2483	182002	22.8208	Slide Mass C	0	13.5	1473.56	1477.16	9608.52	3455.73	6152.79	8988.46	5532.73
47	20.2483	153620	22.8208	Slide Mass C	0	13.5	1248.26	1251.31	8112.06	2900	5212.06	7586.81	4686.81
48	33.4657	188809	26.8136	Slide Mass C	0	13.5	972.021	974.393	6133.15	2074.5	4058.65	5641.86	3567.36
49	25.3199	67408.8	43.4519	Slide Mass C	0	13.5	588.229	589.664	3219.55	763.423	2456.13	2662.28	1898.86
50	7.24899	3513.43	43.4519	Slide Mass A	0	13.5	150.144	150.51	626.92	0	626.92	484.678	484.678

- **Global Minimum Query (spencer) - Safety Factor: 1.01648**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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	12.5539	12398.5	-51.9127	Slide Mass A	0	13.5	160.163	162.802	678.118	0	678.118	882.474	882.474

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
2	22.5378	84374	-51.9127	Slide Mass B	3241	13.5	3200.37	3253.11	50.4474	0	50.4474	4133.89	4133.89
3	35.0918	285039	-50.8558	Slide Mass B	3241	13.5	3944.61	4009.62	3201.53	0	3201.53	8047.73	8047.73
4	35.0919	458032	-49.5146	Slide Mass B	3241	13.5	4808.42	4887.66	6858.85	0	6858.85	12491.7	12491.7
5	18.935	310602	-47.4124	Slide Mass B	3241	13.5	5462.32	5552.34	9627.41	0	9627.41	15570.2	15570.2
6	9.38947	169143	-47.4124	Slide Mass D	1620	13.5	4403.07	4475.63	11894.6	0	11894.6	16685	16685
7	8.12223	154363	-47.4124	Slide Mass C	0	13.5	3185.53	3238.03	13758.2	270.851	13487.4	17224	16953.1
8	24.456	476678	-8.49942	Slide Mass C	0	8.5	2689.41	2733.73	18933	641.223	18291.8	19334.9	18693.7
9	24.456	479352	-8.49942	Slide Mass C	0	8.5	2675.81	2719.91	19039.5	840.21	18199.3	19439.4	18599.2
10	24.504	482447	-8.44308	Slide Mass C	0	8.5	2660	2703.84	19130.5	1038.62	18091.8	19525.3	18486.7
11	24.504	484546	-8.44308	Slide Mass C	0	8.5	2643.18	2686.74	19213.9	1236.46	17977.4	19606.2	18369.8
12	26.5051	526359	-8.42872	Slide Mass C	0	8.5	2625.27	2668.53	19297.7	1442.17	17855.5	19686.7	18244.5
13	26.5051	527842	-8.42872	Slide Mass C	0	8.5	2601.89	2644.77	19352.3	1655.74	17696.6	19737.9	18082.1
14	57.1999	947928	-8.32927	Slide Mass C	0	8.5	2076.42	2110.64	16112.4	1989.82	14122.6	16416.4	14426.6
15	32.0017	495488	-3.22211	Slide Mass C	0	8.5	1935.14	1967.03	15416	2254.3	13161.7	15525	13270.7
16	32.0017	502695	-3.22211	Slide Mass C	0	8.5	1957.1	1989.35	15639.7	2328.68	13311	15749.9	13421.2
17	18.8362	299254	-3.21899	Slide Mass C	0	8.5	1974.56	2007.1	15817.6	2387.73	13429.8	15928.6	13540.9
18	18.8362	301748	-3.21899	Slide Mass C	0	8.5	1987.48	2020.23	15949.1	2431.44	13517.7	16060.9	13629.5
19	37.7571	577037	-3.21813	Slide Mass C	0	8.5	1881.95	1912.96	15297	2497.1	12799.9	15402.9	12905.8
20	18.8786	267296	-2.79113	Slide Mass C	0	8.5	1729.34	1757.84	14320.4	2558.39	11762	14404.7	11846.3
21	18.8786	269468	-2.79113	Slide Mass C	0	8.5	1741.04	1769.73	14434.9	2593.39	11841.5	14519.8	11926.4
22	37.7571	545452	-2.79113	Slide Mass C	0	8.5	1758.58	1787.56	14606.7	2645.88	11960.8	14692.4	12046.5
23	18.8786	307694	-2.79113	Slide Mass C	0	8.5	2000.9	2033.87	16307.3	2698.37	13608.9	16404.8	13706.5
24	18.8786	320633	-2.79113	Slide Mass C	0	8.5	2088.9	2123.33	16940.9	2733.36	14207.6	17042.8	14309.4
25	37.7571	647781	-2.79113	Slide Mass C	0	8.5	2106.45	2141.16	17112.7	2785.85	14326.9	17215.4	14429.5
26	34.6633	602351	-2.79113	Slide Mass C	0	8.5	2128.88	2163.96	17332.4	2852.97	14479.4	17436.2	14583.2
27	34.6633	577426	-2.79113	Slide Mass C	0	8.5	2013.62	2046.8	16612.7	2917.22	13695.5	16710.9	13793.6
28	21.9417	324467	-2.79113	Slide Mass C	0	8.5	1730.89	1759.42	14742.2	2969.69	11772.5	14826.6	11856.9

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	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]
29	21.9417	306079	-2.79113	Slide Mass C	0	8.5	1601.65	1628.05	13903.9	3010.36	10893.5	13982	10971.6
30	21.9417	284236	-2.79113	Slide Mass C	0	8.5	1449.28	1473.16	12908.2	3051.03	9857.15	12978.8	9927.81
31	21.9417	274642	-2.79113	Slide Mass C	0	8.5	1378.95	1401.68	12470.5	3091.7	9378.84	12537.8	9446.07
32	21.8049	268938	-2.79094	Slide Mass C	0	8.5	1346.01	1368.19	12287.1	3132.24	9154.82	12352.7	9220.44
33	21.8049	268755	-2.79094	Slide Mass C	0	8.5	1338.75	1360.81	12278.1	3172.66	9105.42	12343.3	9170.69
34	21.8049	276775	-2.79094	Slide Mass C	0	8.5	1386.79	1409.64	12645.2	3213.07	9432.15	12712.8	9499.76
35	21.8049	285938	-2.79094	Slide Mass C	0	8.5	1442.53	1466.3	13064.8	3253.48	9811.29	13135.1	9881.61
36	21.8161	293738	-2.79094	Slide Mass C	0	8.5	1488.06	1512.58	13414.8	3293.91	10120.9	13487.4	10193.5
37	21.8161	296788	-2.79094	Slide Mass C	0	8.5	1502.59	1527.35	13554.1	3334.34	10219.7	13627.3	10293
38	25.7088	356204	-2.78687	Slide Mass C	0	8.5	1533	1558.26	13804.9	3378.32	10426.6	13879.5	10501.2
39	25.7088	355847	-2.78687	Slide Mass C	0	8.5	1523.87	1548.98	13790.3	3425.86	10364.5	13864.5	10438.7
40	36.0959	464940	-2.72994	Slide Mass C	0	8.5	1374.78	1397.44	12832.4	3481.87	9350.48	12897.9	9416.04
41	36.0959	405070	-2.72994	Slide Mass C	0	8.5	1121.31	1139.79	11172.9	3546.37	7626.51	11226.4	7679.98
42	23.1177	241433	-2.72994	Slide Mass C	0	8.5	998.977	1015.44	10393.8	3599.27	6794.49	10441.4	6842.12
43	23.1177	233459	-2.72994	Slide Mass C	0	8.5	942.11	957.636	10048.3	3640.58	6407.69	10093.2	6452.61
44	20.2475	199018	-2.72994	Slide Mass C	0	8.5	896.725	911.503	9778.35	3679.32	6099.03	9821.11	6141.79
45	20.2475	196715	-2.72994	Slide Mass C	0	8.5	874.612	889.026	9664.1	3715.5	5948.6	9705.8	5990.3
46	20.2483	182002	22.8208	Slide Mass C	0	13.5	1656.38	1683.68	10468.7	3455.73	7013	9771.74	6316.01
47	20.2483	153620	22.8208	Slide Mass C	0	13.5	1402.71	1425.83	8838.99	2900	5938.99	8248.74	5348.74
48	33.4657	188809	26.8136	Slide Mass C	0	13.5	1116.22	1134.62	6800.53	2074.5	4726.03	6236.35	4161.85
49	25.3199	67408.8	43.4519	Slide Mass C	0	13.5	759.707	772.227	3979.97	763.423	3216.54	3260.24	2496.82
50	7.24899	3513.43	43.4519	Slide Mass A	0	13.5	170.899	173.715	723.577	0	723.577	561.673	561.673

Interslice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.00244**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	565.415	2766.5	0	0	0

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
2	577.969	2750.48	10462.5	0	0
3	600.507	2721.72	-65012.1	0	0
4	635.599	2678.61	-52905.6	0	0
5	670.691	2637.5	93158.4	0	0
6	689.626	2616.9	211703	0	0
7	699.015	2606.69	307723	0	0
8	707.138	2597.85	420254	0	0
9	731.594	2594.19	446591	0	0
10	756.05	2590.54	473788	0	0
11	780.554	2586.9	501397	0	0
12	805.058	2583.26	529832	0	0
13	831.563	2579.34	561381	0	0
14	858.068	2575.41	593846	0	0
15	915.268	2567.04	655718	0	0
16	947.269	2565.23	645598	0	0
17	979.271	2563.43	635528	0	0
18	998.107	2562.37	629608	0	0
19	1016.94	2561.31	623705	0	0
20	1054.7	2559.19	613113	0	0
21	1073.58	2558.27	606642	0	0
22	1092.46	2557.35	600162	0	0
23	1130.21	2555.51	587171	0	0
24	1149.09	2554.59	579369	0	0
25	1167.97	2553.67	571119	0	0
26	1205.73	2551.83	554588	0	0
27	1240.39	2550.14	539378	0	0
28	1275.06	2548.45	525734	0	0
29	1297	2547.38	519305	0	0
30	1318.94	2546.31	513920	0	0
31	1340.88	2545.24	509752	0	0
32	1362.82	2544.17	506191	0	0
33	1384.63	2543.11	502981	0	0
34	1406.43	2542.04	499911	0	0
35	1428.24	2540.98	496574	0	0
36	1450.04	2539.92	492913	0	0
37	1471.86	2538.85	489001	0	0
38	1493.67	2537.79	485069	0	0
39	1519.38	2536.54	480257	0	0
40	1545.09	2535.29	475643	0	0
41	1581.19	2533.57	470724	0	0
42	1617.28	2531.84	469184	0	0
43	1640.4	2530.74	469292	0	0
44	1663.52	2529.64	469946	0	0
45	1683.77	2528.67	470911	0	0
46	1704.01	2527.71	472102	0	0
47	1724.26	2536.23	369498	0	0
48	1744.51	2544.75	282787	0	0
49	1777.98	2561.66	155957	0	0
50	1803.3	2585.65	67205.6	0	0

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
51	1810.55	2592.52	0	0	0

- **Global Minimum Query (spencer) - Safety Factor: 1.01648**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	565.415	2766.5	0	0	0
2	577.969	2750.48	9463.86	1326.18	7.97697
3	600.507	2721.72	-57261.5	-8024.1	7.97696
4	635.599	2678.61	-43916.8	-6154.09	7.97695
5	670.691	2637.5	91584.7	12833.8	7.97694
6	689.626	2616.9	201636	28255.4	7.97696
7	699.015	2606.69	290107	40652.9	7.97696
8	707.138	2597.85	393433	55132.1	7.97696
9	731.594	2594.19	420448	58917.7	7.97696
10	756.05	2590.54	448319	62823.3	7.97696
11	780.554	2586.9	476603	66786.8	7.97697
12	805.058	2583.26	505710	70865.5	7.97696
13	831.563	2579.34	537980	75387.6	7.97696
14	858.068	2575.41	571162	80037.3	7.97695
15	915.268	2567.04	634282	88882.5	7.97697
16	947.269	2565.23	624674	87536	7.97695
17	979.271	2563.43	615123	86197.7	7.97696
18	998.107	2562.37	609513	85411.5	7.97696
19	1016.94	2561.31	603922	84628	7.97695
20	1054.7	2559.19	593930	83227.9	7.97696
21	1073.58	2558.27	587707	82355.9	7.97697
22	1092.46	2557.35	581477	81482.9	7.97697
23	1130.21	2555.51	568994	79733.6	7.97696
24	1149.09	2554.59	561475	78679.9	7.97696
25	1167.97	2553.67	553518	77564.9	7.97696
26	1205.73	2551.83	537581	75331.7	7.97697
27	1240.39	2550.14	522924	73277.8	7.97696
28	1275.06	2548.45	509814	71440.7	7.97697
29	1297	2547.38	503689	70582.4	7.97697
30	1318.94	2546.31	498594	69868.4	7.97696
31	1340.88	2545.24	494697	69322.3	7.97696
32	1362.82	2544.17	491402	68860.5	7.97695
33	1384.63	2543.11	488452	68447.1	7.97695
34	1406.43	2542.04	485642	68053.4	7.97696
35	1428.24	2540.98	482572	67623.2	7.97696
36	1450.04	2539.92	479187	67148.8	7.97695
37	1471.86	2538.85	475558	66640.3	7.97696
38	1493.67	2537.79	471911	66129.3	7.97696
39	1519.38	2536.54	467441	65502.9	7.97696
40	1545.09	2535.29	463170	64904.4	7.97696
41	1581.19	2533.57	458697	64277.6	7.97696
42	1617.28	2531.84	457557	64117.8	7.97696
43	1640.4	2530.74	457907	64166.8	7.97695
44	1663.52	2529.64	458796	64291.5	7.97697

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
45	1683.77	2528.67	459965	64455.2	7.97695
46	1704.01	2527.71	461357	64650.3	7.97696
47	1724.26	2536.23	347598	48709.2	7.97696
48	1744.51	2544.75	251462	35237.5	7.97694
49	1777.98	2561.66	108380	15187.4	7.97697
50	1803.3	2585.65	-3024.83	-423.872	7.97696
51	1810.55	2592.52	0	0	0

Entity Information

Group: Group 1

Shared Entities

Type	Coordinates	
External Boundary	X	Y
	0	2500
	2055	2500
	2100	2500
	2100	2582.57
	2100	2584
	2080	2584.86
	2048.8	2585.5
	2017.7	2586.12
	1986.6	2586.79
	1955.5	2587.95
	1931.9	2588.35
	1924.4	2588.47
	1893.3	2589.04
	1862.2	2589.45
	1831.1	2589.87
	1810.55	2592.52
	1780.66	2596.18
	1768.9	2597.62
	1737.8	2600.68
	1706.7	2604.89
	1675.6	2607.37
	1644.5	2612.11
	1613.4	2617.54
	1582.3	2628.31
	1551.2	2643.45
	1520	2648.71
	1488.9	2647.09
	1457.8	2647.27
	1426.7	2644.08
	1395.6	2640.68
	1364.5	2642.99
	1333.4	2647.54
	1302.3	2660.95

Type	Coordinates	
	X	Y
	1271.2	2671.01
	1252	2690
	1135	2690
	1135	2672
	1039	2672
	1039	2690
	940	2690
	885	2690
	866.991	2733.73
	820	2740
	737	2750
	711.29	2752.81
	680.18	2758.49
	649.08	2763.35
	617.97	2765.31
	586.87	2766.13
	555.76	2766.66
	524.65	2769.07
	493.55	2772.29
	462.44	2775.32
	431.34	2779.05
	400.23	2789.67
	369.12	2796.46
	338.02	2805.78
	306.91	2817.8
	275.81	2834.28
	244.7	2848.45
	213.59	2853.8
	199.1	2856.2
	161.8	2869.2
	147.608	2875.56
	141	2878.9
	130.65	2883.4
	120.28	2884.98
	89.171	2885.5
	58.065	2885.13
	26.959	2884.32
	0	2883.71
	0	2863
	0	2630
	0	2620
	0	2596

Type	Coordinates	
	X	Y
Material Boundary	182.308	2821.95
	212.393	2783.59
	248.409	2737.67
	312.568	2685.31
	353.568	2651.85
	385.121	2636.75
	415.734	2622.1
	437.544	2611.67
	514.019	2582.3
	645.613	2578.18
	908.026	2565.54
	1119.06	2556.05
	1374.9	2541.87
	1584.25	2530.99
	1691.6	2524.98
	1728.07	2530.13
	1761.29	2545.83
	1803.3	2585.65
	1803.5	2585.84
	1810.55	2592.52

Type	X	Y
Material Boundary	1931.9	2588.35
	2100	2582.57

Type	X	Y
Material Boundary	0	2596
	2055	2500

Type	X	Y
Material Boundary	0	2863
	154.397	2863

Type	X	Y
Material Boundary	147.608	2875.56
	154.397	2863
	162.358	2849
	182.308	2821.95

Type	X	Y
Material Boundary	437.544	2611.67
	542.546	2609.67

Type	Coordinates	
	X	Y
Material Boundary	162.358	2849
	243.869	2833.47
	305.541	2802.42
	337.886	2790.78
	431.904	2764.9
	525.922	2754.12
	X	Y
Material Boundary	542.546	2609.67
	890.643	2603.04
	X	Y
	525.922	2754.12
Material Boundary	649.267	2745.49
	710.939	2738.16
	820.914	2725.22
	X	Y
	820.914	2725.22
	854.554	2720.05
	874.392	2674.33
	884.743	2674.76
Material Boundary	940.377	2674.76
	1038.71	2657.51
	1137.04	2657.51
	1182.32	2674.76
	1245.29	2674.33
	X	Y
	890.643	2603.04
	1645.59	2588.66
	1615.3	2599.32
	1594.04	2606.8
	1632.88	2598.98
Material Boundary	1644.22	2596.7
	1706.29	2589.83
	1769.26	2586.3
	1803.3	2585.65
	1803.58	2585.65
	1803.5	2585.84
	X	Y
	1332.84	2632.5
	1364.32	2627.32
Material Boundary	1395.8	2624.74
	1489.39	2632.07
	1550.2	2627.76
	1594.04	2606.8

Type	Coordinates
Material Boundary	X: 1245.29, 1269.01, 1332.84 Y: 2674.33, 2655.36, 2632.5
Material Boundary	X: 0, 437.544 Y: 2620, 2611.67
Material Boundary	X: 0, 415.734, 1615.3, 1632.88, 1780.66 Y: 2630, 2622.1, 2599.32, 2598.98, 2596.18

Scenario-based Entities

Type	Coordinates	Master Scenario
Water Table	X: 0, 2100 Y: 2620, 2580	Assigned to materials: Basalt Parent A Slide Mass A Slide Mass B Slide Mass C Sandstone
Distributed Load	X: 1135, 1039 Y: 2672, 2672	Constant Distribution Orientation: Normal to boundary Magnitude: 200 lbs/ft2 Creates Excess Pore Pressure: No
Tension Crack	X: 0, 191 Y: 2810, 2810	Water level: dry

Agenda Date: 11/07/2024 **Agenda Item Number:** 10

Subject:

Consider approval of Resolution No. 2024-034R authorizing and approving the Power County, Idaho Power Project Power Sales Contract with Utah Associated Municipal Power Systems; and related matters.

Item at-a-glance:

Staff Contact: Bryan Dial

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

811 East Red Hills Pkwy

Item History (background/project status/public process):

This is a 400 Megawatt (MW) natural gas generation project being built by UAMPS. St. George is signing up for 21.00 (MW) of energy. This project will be located in Power County, Idaho.

Staff Narrative (need/purpose):

Future energy needs require us to look for new generation sources. This project provides dispatchable energy that will help to balance our energy use. By signing up on this project through UAMPS we will have a more active role in the operations of the plant.

Name of Legal Dept approver: Alicia Carlton

Budget Impact: No Impact

Recommendation (Include any conditions):

Staff recommends approval.

RESOLUTION NO. _____

A RESOLUTION AUTHORIZING AND APPROVING THE POWER COUNTY POWER PROJECT POWER SALES CONTRACT WITH UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS; AND RELATED MATTERS.

***** ***** *****

WHEREAS, St. George City, Utah (the *"Participant"*) is a member of Utah Associated Municipal Power Systems (*"UAMPS"*) pursuant to the provisions of the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action, as amended (the *"Joint Action Agreement"*);

WHEREAS, one of the purposes of UAMPS under the Joint Action Agreement is the acquisition and construction of electric generating, transmission and related facilities in order to secure reliable, economic sources of electric power and energy for its members;

WHEREAS, UAMPS proposes to acquire and construct a combined cycle natural gas-fired electric generating facility plant known as the "Power County Power Project" (the *"Project"*) to be located at a site in Power County, Idaho, and to sell the capacity and output of the Project pursuant to the Power County Power Project Power Sales Contracts (the *"Power Sales Contracts"*) between UAMPS and the Participants (capitalized terms used and not defined herein have the meanings assigned to them in the Power Sales Contracts);

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) certain descriptions and summaries of the Project and the Power Sales Contracts, and representatives of the Participant have participated in discussions and conferences with UAMPS and others regarding the Project and have received from UAMPS all requested information and materials necessary for the decision of the Governing Body to authorize and approve the Power Sales Contract;

WHEREAS, the Participant acknowledges that the obligation of the Participant to make the payments provided for in the Power Sales Contract will be a special obligation of the Participant and an operating expense of the Participant's electric system, payable from the revenues and other available funds of the electric system, and that the Participant shall be unconditionally obligated to make the payments required under the Power Sales Contract whether or not the Project or any portion thereof is acquired, constructed, completed, operable or operating and notwithstanding the suspension, interruption, interference, reduction or curtailment of the output thereof for any reason whatsoever; and

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) its current and projected needs for electric power and energy and information with respect to the Project prepared by UAMPS setting forth, among other things, preliminary estimates of the Development Costs, the Cost of Acquisition and Construction, the estimated timeline for the

development and construction of the Project and related matters, and now desires to authorize and approve the Power Sales Contract;

NOW, THEREFORE, BE IT RESOLVED by the Governing Body of St. George City, Utah, as follows:

Section 1. Approval of Power Sales Contract; Development Share. (a) The Power Sales Contract, in substantially the form attached hereto as *Annex A*, is hereby authorized and approved, and the Mayor is hereby authorized, empowered and directed to execute and deliver the Power Sales Contract on behalf of the Participant, and the City Recorder is hereby authorized, empowered and directed to attest and countersign such execution and to affix the corporate seal of the Participant to the Power Sales Contract, with such changes to the Power Sales Contract from the form attached hereto as *Annex A* as shall be necessary to conform to the Participant's legal status, to complete the form of the Power Sales Contract or to correct any minor irregularities or ambiguities therein and as are approved by the Mayor, his execution thereof to constitute conclusive evidence of such approval.

(b) A Development Share representing _____ kW of capacity in the Project is hereby authorized and approved. The Participant acknowledges that (i) its Development Share may be increased to provide for a full allocation of the Project Output and (ii) by virtue of its Development Share, the Participant will have an Entitlement Share with the same amount of Electric Power as its Development Share from and after the Completion of Development through the remaining term of the Power Sales Contract, all as provided in the Power Sales Contract.

Section 2. Participant's Representative. (a) The appointment of Brian Jeppson as the Participant's Representative to UAMPS and Bryan Dial as alternate Representatives is hereby confirmed.

(b) Such Representative (or, in his or her absence, such alternate(s)) is hereby delegated full authority to (i) approve any appendix to the Pooling Agreement between UAMPS and the Participant that may be necessary or desirable in connection with the utilization of the Participant's Entitlement Share, and (ii) act on all matters that may come before the Project Management Committee established by the Power Sales Contract, and shall be responsible for reporting regularly to the Governing Body regarding the activities of the Project Management Committee.

Section 3. Compliance with Tax Covenants. The Participant agrees in the Power Sales Contract that it will apply all of the electric power and energy acquired under the Power Sales Contract to a Qualified Use and that it will not take or omit to take any action which could adversely affect the Tax Status of any Bond or Bonds theretofore issued or thereafter issuable by UAMPS. In furtherance of that agreement, the Governing Body of the Participant hereby agrees that it will observe and comply with such instructions as may be provided from time to time by UAMPS with respect to the Qualified Use of the electric power and energy acquired under the Power Sales Contract.

Section 4. Further Authority. (a) The Mayor and the City Recorder are hereby authorized, empowered and directed to (i) execute the Certificate of the Participant in substantially

the form attached as EXHIBIT III to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Certificate of the Participant in substantially the form attached as *Exhibit IV* to the Power Sales Contract and to deliver the same to UAMPS.

(b) The Participant's legal counsel is hereby authorized, empowered and directed to (i) execute the Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT V to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT VI to the Power Sales Contract and to deliver the same to UAMPS.

Section 5. Miscellaneous; Effective Date. (a) This resolution shall be and remain irrepealable until the expiration or termination of the Power Sales Contract in accordance with its terms.

(b) All previous acts and resolutions in conflict with this resolution or any part hereof are hereby repealed to the extent of such conflict.

(c) In case any provision in this resolution shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

(d) This resolution shall take effect immediately upon its adoption and approval.

ADOPTED AND APPROVED on _____, 2024.

ST. GEORGE CITY, UTAH

By _____
Mayor

ATTEST:

_____
City Recorder

[SEAL]

APPROVAL COPY

POWER COUNTY POWER PROJECT
POWER SALES CONTRACT

BETWEEN

UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS

AND

ST. GEORGE CITY, UTAH

DATED AS OF DECEMBER 1, 2024

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POWER COUNTY POWER PROJECT
POWER SALES CONTRACT

This POWER SALES CONTRACT made and entered into as of December 1, 2024, is by and between UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS, a political subdivision of the State of Utah (*"UAMPS"*) and St. George City, a political subdivision of the State of Utah (the *"Participant"*).

RECITALS*

WHEREAS, UAMPS was organized by the Members under the Act and the Joint Action Agreement as a separate legal entity to accomplish the Members' joint and cooperative action, including securing power supply resources for the Members' present and future needs;

WHEREAS, UAMPS is organized as an energy services interlocal entity under the Act with the power, among other things, to (i) acquire supplies of electric power and energy by the acquisition or construction of electric generation and transmission facilities or by contracting for the purchase of electric power and energy and (ii) enter into contracts for the sale of the output, services and other benefits provided by such facilities or contracts to public agencies and others inside or outside the State of Utah;

WHEREAS, the Participant is authorized by applicable law to develop, acquire, construct, own and operate electric generating, transmission and related facilities and ownership interests therein and has entered into the Joint Action Agreement to provide for the joint exercise of such powers through UAMPS;

WHEREAS, UAMPS has adopted an integrated resource plan that identifies the need for an additional baseload generating resource to serve the electricity supply requirements of its Members, and has conducted studies to determine the optimal facilities, equipment and location for the additional generating resource;

WHEREAS, in order to develop a long-term source of reliable, cost-effective electricity for the benefit of those Members that elect to participate in the Project (the *"Participants,"* as defined herein), UAMPS has through its Resource Project examined and is continuing to examine the feasibility of the development, construction and operation of a combined cycle natural gas-fired electric generating facility located in Power County, Idaho (the *"Project"*);

WHEREAS, UAMPS and Utah Municipal Power Agency, an energy services interlocal entity organized under the Act (*"UMPA"*), have entered into the Study Costs Sharing Agreement under which UMPA shares in the study costs of the development of the Project and may elect to become an owner of the Project pursuant to a Joint Ownership Agreement between UAMPS and UMPA;

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* Capitalized terms used and not defined in the Recitals have the meanings assigned to them in Section 1.

WHEREAS, pursuant to the Power Sales Contracts, UAMPS will continue with the development of the Project and, if the Project Management Committee determines the Project to be feasible, will proceed with the acquisition, construction and operation of the Project and will sell Electric Energy from the Project to the Participants;

WHEREAS, in order to finance the Development Costs and the Cost of Acquisition and Construction of the Project, UAMPS will enter into the Financing Documents and may issue revenue bonds, notes or other obligations payable from a pledge of the payments to be made by the Participants under the Power Sales Contracts and any other revenues received by UAMPS in connection with the Project;

WHEREAS, prior to its authorization of the execution, delivery and performance by the Participant of this Power Sales Contract, the governing body of the Participant has reviewed (or caused a review to be made of) various descriptions and summaries of the Project and this Power Sales Contract, and the Participant's current and reasonably anticipated future requirements for Electric Power and Electric Energy, and the governing body of the Participant has determined that it is necessary and desirable for the Participant to enter into this Power Sales Contract in order to obtain a long-term, cost-based supply of Electric Energy by the acquisition of an Entitlement Share pursuant to the terms and conditions of this Power Sales Contract;

WHEREAS, UAMPS will cause the Project to be operated in accordance with Good Utility Practice and will schedule the Project Output in accordance with the Operating and Scheduling Procedures, all for the joint and ratable benefit of the Participants; and

WHEREAS, UAMPS and the Participant are duly authorized under applicable provisions of law, to execute, deliver and perform this Power Sales Contract and their respective governing bodies and any regulatory agencies having jurisdiction have taken all necessary actions and given all necessary approvals in order to constitute this Power Sales Contract as the legal, valid and binding obligation of the parties.

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements herein contained, it is agreed by and between the parties to this Power Sales Contract as follows:

Section 1. Definitions and Rules of Construction. (a). As used in this Power Sales Contract and in the Recitals set out above:

"Act" means the Interlocal Cooperation Act, Title 11, Chapter 13, Utah Code Annotated 1953, as amended, and other applicable provisions of law.

"Additional Bonds" means additional Bonds from time to time issued by UAMPS pursuant to the Financing Documents and in accordance with Section 18.

"Additional Facilities" means capital additions, betterments and replacements and other capital items directly and functionally related to the Project, including electric transmission, fuel transportation, storage, fuel storage and related facilities, additional electric generating and related facilities located at the Project site, long-term supplies of natural gas or other fuel for the use of

the Project and any other facilities, improvements and properties designated by the Project Management Committee as Additional Facilities under the Power Sales Contracts.

"Annual Budget" means the budget adopted by UAMPS for each Contract Year pursuant to the provisions of Section 24.

"Authorized Officer of UAMPS" means the Chairman of the Board of Directors, the Vice Chairman of the Board, the Secretary, the Treasurer and the Chief Executive Officer of UAMPS and any other officer or employee authorized or having delegated authority to perform specific acts or duties under the Power Sales Contracts by resolution duly adopted by the Board.

"Billing Period" means such period of time as shall be established from time to time by UAMPS for the preparation, calculation and billing of the amounts payable by the Participant hereunder.

"Board" means the Board of Directors of UAMPS or such other governing body of UAMPS as may be established from time to time pursuant to the Joint Action Agreement and the Act.

"Bond Counsel" means a firm of attorneys of recognized standing in matters relating to the tax status of municipal bonds, experienced in matters relating to public power systems and selected by UAMPS.

"Bond Fund" means the funds and accounts created by the Financing Documents for the payment of debt service on Bonds and reserves therefor.

"Bonds" means (i) bonds, notes, repayment obligations under loan agreements and lines of credit, and other debt obligations issued or incurred from time to time by UAMPS pursuant to the Financing Documents to finance Development Costs and the Cost of Acquisition and Construction, regardless of whether such bonds, notes and other obligations are senior or subordinated obligations, (ii) Additional Bonds and (iii) Refunding Bonds.

"Budget and Plan of Finance" means the comprehensive budget and plan of finance for the Development Costs, the Construction Costs and other items of the Cost of Acquisition and Construction approved from time to time by the Project Management Committee, together with proposed financing arrangements for Development Costs during the Development Period and for Construction Costs during the Construction Period, all as more fully described in Section 15.

"Capital Contribution" means (i) a capital contribution in respect of the Cost of Acquisition and Construction of, the Initial Facilities that is paid to UAMPS by the Participant pursuant to Section 17 and (ii) a capital contribution paid to UAMPS in connection with the issuance of Additional Bonds or Refunding Bonds as may be authorized by the Project Management Committee pursuant to Section 17(g).

"Capital Contribution Percentage" means with respect to each series of Bonds, a percentage calculated by UAMPS obtained by dividing (i) the dollar amount of the Capital

Contribution made by the Participant, by (ii) the Reference Project Costs, all as more fully provided in Section 17(e).

"Code" means the Internal Revenue Code of 1986, as amended. References herein to the Code are deemed to include the applicable U.S. Treasury Regulations thereunder.

"Commercial Operation" means, with respect to the Initial Facilities, the date on which the Initial Facilities (i) have been substantially completed pursuant to the EPC Agreement and any other Construction Agreements that may be applicable, including the satisfaction of all required performance tests thereunder, (ii) are capable of continuous firm operation, (iii) are interconnected and synchronized with, and capable of delivering Electric Energy to, the transmission grid, (iv) have received all Permits and Approvals required for their operation, and (v) meet such additional requirements as may be established by the Project Management Committee. The criteria and standards for the Commercial Operation of any Additional Facilities shall be developed by UAMPS and submitted to the Project Management Committee for its review and approval.

"Commercial Operation Date" means, with respect to the Initial Facilities and any Additional Facilities, the date on which all of the Initial Facilities and any Additional Facilities achieve Commercial Operation, as determined by the Project Management Committee.

"Commercially Reasonable" or *"Commercially Reasonable Efforts"* means, with respect to any action required to be made, attempted or taken by a party under this Contract or one of the Project Agreements, such efforts as a reasonably prudent business would undertake, consistent with Good Utility Practice, for the protection of its own interest under the conditions affecting such action, including without limitation, the amount of notice of the need to take such action, the duration and type of the action, the competitive environment in which such action occurs, the terms and provisions of the Project Agreements and the Financing Documents, the contractual and legal obligations of, and the risk to, such party in connection with such action; *provided, however,* an obligation to act in a "Commercially Reasonable" manner or to exercise "Commercially Reasonable Efforts" does not include taking actions that would, individually or in the aggregate, cause the party subject to such obligation to incur costs, or suffer any other detriment, that is out of reasonable proportion to the benefits to the other party under this Contract or the Project Agreements.

"Completion of Development" means, with respect to the Initial Facilities (i) the completion of all Development Work, (ii) the receipt of all Permits and Approvals necessary for the construction of the Project, (iii) the completion of definitive forms of the principal Construction Agreements, (iv) the completion of the definitive Budget and Plan of Finance for the Cost of Acquisition and Construction, and (v) a determination by the Project Management Committee that the Project is feasible and that the construction of the Initial Facilities should proceed, all as more fully described in Section 6.

"Construction Agreements" means the EPC Agreement and each other agreement entered into by UAMPS for the acquisition and construction of any part of the Initial Facilities and any Additional Facilities.

"Construction Costs" means all of the Cost of Acquisition and Construction of the Initial Facilities incurred during the Construction Period.

"Construction Period" means the period beginning on the date that the Project Management Committee determines that the Completion of Development has occurred and UAMPS delivers the task order directing the EPC Contractor to proceed with construction under the EPC Agreement and ending on the Commercial Operation Date.

"Contract" means this Power County Project Power Sales Contract dated as of December 1, 2024 between UAMPS and the Participant and any amendments permitted pursuant to Section 43.

"Contract Resolution" means the resolution of the Participant's governing body approving and authorizing the execution of this Contract, in substantially the form attached to EXHIBIT III.

"Contract Year" means the Fiscal Year of UAMPS, except that the first Contract Year shall commence on the Effective Date and shall end on the last day of the then-current Fiscal Year. In the event that UAMPS changes its Fiscal Year for accounting purposes, the Contract Year shall, without further action, be amended to conform to such Fiscal Year.

"Cost of Acquisition and Construction" means all costs and expenses paid or incurred by UAMPS in connection with the acquisition and construction of the Project, whether prior or subsequent to the Effective Date, including all Development Costs. "Cost of Acquisition and Construction" includes all costs incurred by UAMPS in connection with planning, designing, acquiring, constructing and placing in operation the Initial Facilities and any Additional Facilities, and amounts paid or payable under the Construction Agreements (including all costs, fees, compensation and incentives payable to the EPC Contractor under the EPC Agreement). "Cost of Acquisition and Construction" includes, without duplication of any cost, the following:

(1) working capital and reserve requirements of the Project, including, without limitation, amounts for deposit into the Reserve and Contingency Fund and those items set forth in the definition of Operation and Maintenance Costs, as may be determined from time to time by UAMPS;

(2) interest accruing in whole or in part on Bonds issued to pay all or any portion of the Cost of Acquisition and Construction or the Cost of Additional Facilities prior to and during the acquisition and construction thereof and for such additional period as UAMPS may determine to be reasonably necessary for placing the Project or the Additional Facilities in operation in accordance with the provisions of the Budget and Plan of Finance;

(3) the deposit or deposits, if any, required to be made under the Financing Documents from the proceeds of Bonds into any fund or account established pursuant to the Financing Documents to meet debt service reserve requirements for the Bonds and premiums and fees payable for any credit or liquidity facilities with respect to the Bonds;

(4) the deposit or deposits into the Bond Fund and any other fund or account required to be funded by the Financing Documents;

(5) the payment of principal or redemption price of and interest on any Bonds issued as bond anticipation notes;

(6) planning and development costs, engineering fees, contractors' fees, fiduciaries' fees, auditors' and accountants' fees, costs of obtaining all permits and approvals, the cost of real property, labor, materials, equipment, supplies, training and testing costs, insurance premiums, legal, financial advisory and financing costs and issuance costs of the Bonds, amounts payable under the Real Estate Agreements, administrative and general costs, and all other costs properly allocable to the acquisition and construction of the Project and placing the same in operation;

(7) all costs relating to litigation, claims or judgments not otherwise covered by insurance and arising out of the acquisition, construction or operation of the Project or otherwise related to the Project, the Project Agreements, the Power Sales Contracts or the transactions contemplated thereby;

(8) payment to UAMPS or any Participant to reimburse advances and payments made or incurred for costs preliminary or incidental to the acquisition and construction of the Project;

(9) legally required or permitted federal, state and local taxes, or payments in lieu of such taxes, relating to the Project incurred during the period of the acquisition or construction thereof;

(10) the cost of long-term supplies of natural gas or other fuel supplies necessary or desirable in connection with the operation of the Project and the costs of transporting fuel supplies to the Project and prepayments and advance payments therefor, including the costs of pipelines, laterals, receiving stations or capacity rights therein; and

(11) all other costs incurred by UAMPS, and properly allocable to the acquisition and construction of the Project, including all costs financed by the issuance of Additional Bonds.

"Debt Service Costs" means, for each Billing Period of each Contract Year, an amount equal to the sum of:

(1) the interest accruing on the Bonds during such Billing Period, except to the extent that amounts are on deposit under the Financing Documents to pay such interest, together with any other amounts required by the Financing Documents to be deposited into the Bond Fund in respect of the interest payments on the Bonds;

(2) the portion of the next due principal installment on the Bonds, together with any other amounts required by the Financing Documents to be deposited into the Bond

Fund in respect of the principal payments on the Bonds; provided however, that the amount included in Debt Service Costs pursuant to this clause (2) shall not include the principal of Bonds becoming due and payable solely as a result of the acceleration of the maturity thereof;

(3) the scheduled amounts falling due during such Billing Period under any Interest Rate Contract with respect to the Bonds;

(4) any additional amounts necessary or required to be deposited into the Bond Fund or the Subordinated Indebtedness Fund under the provisions of the Financing Documents;

(5) Trustee, paying agent, escrow agent and other fiduciaries' fees and expenses payable under the Financing Documents; fees and expenses of remarketing agents, broker-dealers, auction agents and other providing services with respect to Bonds;

(6) the amounts required to be paid to maintain any credit or liquidity facilities for and ratings on the Bonds and other costs payable by UAMPS from time to time in connection with the Bonds; and

(7) the amounts required to be paid under any Financing Document that is a credit agreement, credit facility, loan agreement or other instrument or facility used to finance Development Costs, including the repayment of all drawings thereunder, the interest on such drawings and the fees, expenses and other charges payable by UAMPS thereunder;

provided, however, that the additional interest expense on or in respect of any Bonds that are subject to federal income taxation (and not eligible for tax credits or interest subsidy payments) may, as determined by the Project Management Committee pursuant to Section 16(d), be allocated to those Participants whose legal status or use of the Project Capability or the Project Output adversely affects the Tax Status of such Bonds. In the event of such allocation, the Debt Service Costs payable by such Participants shall be increased to include amounts sufficient to pay any such additional interest expense.

"Debt Service Percentage" means, with respect to each Participant and as of any date of determination, the percentage obtained by subtracting the Participant's Capital Contribution Percentage from the Participant's Entitlement Share. The Participant's initial Debt Service Percentage will be calculated at the time that it pays a Capital Contribution and will be set forth on SCHEDULE I. The Debt Service Percentages for the Participants may be calculated separately for each separate series of Bonds.

"Debt Service Share" means, with respect to each Participant and as of any date of determination, the percentage of Debt Service Costs payable by the Participant, determined by dividing the Participant's Debt Service Percentage (expressed as a decimal) by the sum (expressed as a decimal) of the Debt Service Percentages of all Participants, including the Participant whose Debt Service Share is being determined. The Participant's initial Debt Service Share will be

calculated at the time that it pays a Capital Contribution and will be set forth on SCHEDULE I. The Debt Service Shares for the Participants may be calculated separately for each separate series of Bonds.

"Decommission" means all actions necessary to safely retire and remove the Project from service, restore the Project site, satisfy the decommissioning requirements of the Permits and Approvals and satisfy all requirements of the regulatory agencies having jurisdiction over the decommissioning of the Project.

"Decommissioning Costs" means the costs and expenses of Decommissioning the Project.

"Decommissioning Fund" means the fund or funds established by UAMPS for the payment of Decommissioning Costs as provided in Section 22.

"Decommissioning Period" means the period beginning at the end of the Operating Period and continuing to the date on which the Project has been Decommissioned and all Decommissioning Costs have been paid.

"Development Cost Share" means with respect to each Participant, the percentage of Development Costs payable by the Participant during the Development Period, determined by dividing the Participant's Development Share by the sum of the Development Shares of all Participants. The Participant's initial Development Cost Share will be set forth on SCHEDULE D.

"Development Costs" means all costs, fees and expenses incurred by UAMPS in performing the Development Work, including (i) costs, fees and expenses incurred by UAMPS in connection with its initial consideration and examination of the Project through its Resource Project, (ii) the costs of transmission and interconnection studies and deposits for such costs and (iii) pre-construction costs approved by the Project Management Committee, including deposits, advance payments and prepayments for items of the Cost of Acquisition and Construction of the Initial Facilities.

"Development Period" means the period beginning on the Effective Date and ending on the earlier of (i) the date that the Project Management Committee determines that the Completion of Development has occurred or (ii) the date that the Project Management Committee determines to terminate the Project, all as provided in Section 6.

"Development Share" means the quantity of Electric Power from the Project elected by the Participant as of the Effective Date and shown opposite the name of the Participant in SCHEDULE D attached hereto.

"Development Work" means all work and services necessary or desirable in connection with:

(i) the selection of the site for the Project, the negotiation of the Real Estate Agreements and all other work necessary to secure all rights and interests to the real property necessary for the Project;

(ii) obtaining the transmission and interconnection agreement(s) necessary to deliver Electric Energy from the Project to Participants;

(iii) the estimating, design and engineering work to be performed with respect to the Initial Facilities;

(iv) the development and negotiation of definitive Project Agreements and any other contracts and agreements necessary in connection with the Project;

(v) obtaining all Permits and Approvals necessary for the construction and operation of the Project;

(vi) the continued development of and updates to the Budget and Plan of Finance; and

(vii) such other work and services as shall be approved by the Project Management Committee.

"Effective Date" means (i) with respect to the initial Power Sales Contracts, the date established pursuant to the provisions of Section 2(a), and (ii) with respect to any Power Sales Contract executed by a Participant after the Effective Date, such date as shall be approved by the Project Management Committee.

"Electric Energy" means electric energy expressed in kilowatt-hours (kWh).

"Electric Power" means electric power expressed in kilowatts (kW).

"Electric System" means the Participant's electric utility system as established, maintained and operated pursuant to applicable State and local law. With respect to any Participant that does not own and operate an electric utility system that serves retail customers, the term "Electric System" shall be deemed to refer to the applicable utility system designated in its Power Sales Contract.

"Engineering Studies and Reports" means collectively, the written studies, analysis, summaries and reports (a) regarding the Participant's current power supply resources and projected power supply requirements provided by UAMPS in connection with the Participant's consideration of this Power Sales Contract and (b) regarding such aspects of the Project as the Project Management Committee shall deem necessary or advisable in connection with its governance and oversight of the Project.

"Enterprise Fund" means the electric enterprise fund of the Participant as established and maintained pursuant to applicable State and local law. With respect to any Participant that does maintain an electric enterprise fund, the term "Enterprise Fund" shall be deemed to refer to the applicable enterprise fund designated in its Power Sales Contract.

"Entitlement Share" means, with respect to each Participant and as the context may require, either the amount of Electric Power or the percentage of the initial Project Capability shown opposite the name of such Participant to be set forth in the SCHEDULE I that shall be approved by the Project Management Committee in connection with the Completion of Development, as the same may be revised from time to time in accordance with the provisions of this Power Sales Contract.

"EPC Agreement" means the agreement between UAMPS and the EPC Contractor with respect to the engineering, procurement and construction of the Initial Facilities.

"EPC Contractor" means the firm or corporation appointed as the engineering, procurement and construction contractor pursuant to the EPC Agreement.

"Final Completion" (or such similar term as may be used in the EPC Agreement) means the final completion of the Initial Facilities as determined pursuant to the EPC Agreement.

"Financing Documents" means the bond resolution, indenture, trust agreement or other instrument or instruments providing for the issuance of and the security for the Bonds and all amendments thereof and supplements thereto.

"Fiscal Year" means the annual accounting period of UAMPS as from time to time in effect, initially a period commencing on April 1 of each calendar year and ending on March 31 of the next succeeding calendar year.

"Fuel Agent" means any entity appointed by UAMPS to manage or facilitate the acquisition, transportation and storage of fuel for the operation of the Project and/or the management of the costs of fuel for the Project.

"Fuel Agreement" means any agreement entered into by or on behalf of UAMPS for the acquisition, transportation or storage of fuel for the Project, and also includes tolling agreements and any agreement entered into by UAMPS to manage the cost of fuel for the Project, including options, caps, collars, swaps and similar agreements.

"Good Utility Practice" means, as of any particular time, any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry at such time, or which, in the exercise of reasonable judgment in light of facts known at such time, could have been expected to accomplish the desired results at the lowest reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method or act to the exclusion of all others or to be limited to the lowest-cost practice, method or act, but rather to be a spectrum of possible practices, methods and acts, having due regard for manufacturers' warranties and the jurisdiction.

"Initial Facilities" means the real and personal property, facilities, structures, improvements and equipment to be acquired and constructed in connection with the initial operation of the Project as generally described on EXHIBIT I. In connection with the Completion

of Development and at such other times as it deems necessary, UAMPS shall submit updates to EXHIBIT I to the Project Management Committee for approval.

"Interconnection Agreement" means each agreement providing for the interconnection of the Project with the facilities of a transmission provider and all supplements and amendments thereto, together with any successor or replacement agreement providing for the interconnection of the Project with the transmission grid.

"Interest Rate Contract" means any International Swap Dealers Association (ISDA) Master Agreement, together with the schedules and confirmations thereto, that is an interest rate swap, cap, floor, collar or similar agreement to manage or hedge interest rates or expenses.

"Joint Action Agreement" means the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action dated as of March 20, 2009, as amended and supplemented from time to time.

"Joint Ownership Agreement" means (i) an agreement under which UAMPS and another person own the Project or a portion thereof as tenants in common, (ii) agreements between UAMPS and another person or persons for the organization and operation of a Special Purpose Entity and (iii) any other form of joint ownership arrangement approved by the Project Management Committee.

"Members" means, collectively, each entity which has executed the Joint Action Agreement or a supplement thereto.

"Minimum Subscription" is defined in Section 2.

"Month" means a calendar month.

"Operating Agreement" means any contract between UAMPS and an Operator providing for the operation and maintenance of all or any portion of the Project.

"Operating Period" means the period beginning on the Commercial Operation Date and continuing to the date on which the Project is retired and removed from service.

"Operating and Scheduling Procedures" means those standards, procedures and criteria approved from time to time by the Project Management Committee with respect to the operation of the Project and the Project Capability and the scheduling of the Project Output which shall, to the extent practicable, promote the efficient and economic utilization of the Project, the Project Capability and the Project Output consistent with Good Utility Practice for the benefit of the Participants taken as a whole.

"Operation and Maintenance Costs" means, with respect to each Billing Period of each Contract Year, all costs and expenses (other than Transmission Costs and Debt Service Costs) attributable to the Project that are paid, payable, incurred or accrued by UAMPS during each Billing Period resulting from the ownership, operation, maintenance and termination of, and

repairs, renewals, replacements, additions, improvements, and betterments and modifications to, the Project. Operation and Maintenance Costs shall further include, without limitation, the following items of cost:

(1) the costs of operating and maintaining the Project and of producing Electric Power and Electric Energy therefrom during such Billing Period, including the operation and maintenance expenses and fuel costs of the Project pursuant to the Project Agreements, amounts payable under the Operating Agreement and each Fuel Agreement (including fees, expenses, incentives and other compensation payable to the Operator and the Fuel Agent);

(2) any amount which UAMPS may be required during such Billing Period to pay for the prevention or correction of any unusual loss or damage or for renewals, replacements, repairs, additions, improvements, modifications and betterments which arise out of or are required by the Project Agreements for which UAMPS shall be obligated, but only to the extent that funds for such payment are not provided by the issuance of Bonds or Capital Contributions made by the Participants;

(3) legally required or permitted federal, state and local taxes and ad valorem taxes or payments in lieu of ad valorem taxes, in each case related to the Project;

(4) all other amounts, including fuel costs, payable by UAMPS pursuant to the provisions of the Project Agreements;

(5) any additional amount not specified in the other items of this definition which must be paid by UAMPS during such Billing Period under the Project Agreements;

(6) the portion of UAMPS' administrative and general expenses allocable or directly charged to the Project, working capital and reserves for the payment of operation and maintenance expenses, and all other costs and expenses (but excluding depreciation) not included in the costs specified in the other items of this definition and properly chargeable to the Project;

(7) amounts to be deposited into the Reserve and Contingency Fund established pursuant to Section 20;

(8) legal, engineering and accounting fees and expenses, the cost of any litigation related to the Project, the Project Agreements, this Power Sales Contract and the interests and transactions contemplated by such agreements and this Power Sales Contract, the costs of technical and advisory services and the cost of all Permits and Approvals, all to the extent allocable to the Project;

(9) the costs of Additional Facilities, but only to the extent not paid or financed as a portion of the Cost of Acquisition and Construction; and

(10) Decommissioning Costs and amounts for deposit into the Decommissioning Fund.

"Operator" means any entity that performs all or a substantial portion of the operation and maintenance work on the Project under an Operating Agreement with UAMPS.

"Participant" means the party defined as the Participant in the preamble of this Power Sales Contract and its permitted successors and assigns hereunder.

"Participants" means the parties, including the Participant, other than UAMPS, to the Power Sales Contracts and (i) initially named on SCHEDULE D, and (ii) from and after the Completion of Development, named on SCHEDULE I.

"Participant's Representative" means (i) the officer, employee or other agent of the Participant designated from time to time by the Participant as the Representative of the Participant for purposes of the Joint Action Agreement, to whom all notices and other communications to be given by UAMPS to the Participant hereunder shall be sent or (ii) in the event that the individual appointed as the Participant's Representative is unavailable to act on behalf of the Participant, the individual duly appointed or designated by the Participant as its alternate Representative pursuant to the Joint Action Agreement.

"Performance Tests" means all start-up and shakedown procedures and performance tests to be conducted under the EPC Agreement before Final Completion.

"Permits and Approvals" means all certificates, permits, licenses, approvals, rulings, orders or other authorizations from any federal, state or local governmental body, board or agency having jurisdiction over UAMPS, the Project or both that are required to be obtained or maintained for the construction, operation, maintenance or repair of the Project or any component of it.

"Permitted Output Contract" means a contract that:

(i) (A) has a term (including all renewal options) not longer than three years and is either a negotiated arrangement that provides for compensation at fair market value or is based on generally applicable and uniformly applied rates, or (B) is a requirements-type contract that provides for the sale of electricity to a retail consumer or other end user of electricity; and

(ii) in each case (A) complies with the provisions of U.S. Treasury Regulation Section 1.141-7 and (B) is approved by UAMPS based on guidance provided by Bond Counsel.

"Point of Delivery" means the point or points of physical interconnection of the Initial Facilities or Additional Facilities, as applicable, with the electric transmission grid, as determined pursuant to the Interconnection Agreement.

"Pooling Agreement" means, collectively, the Power Pooling Agreements between UAMPS and the Members and certain other entities providing for the establishment and operation of the UAMPS Pool and related matters, including all supplements and appendices thereto and as the same may be amended, restated or supplemented from time to time.

"Power Sales Contract" means this Power Sales Contract between UAMPS and the Participant and *"Power Sales Contracts"* means all of the Power Sales Contracts, dated the date hereof, between UAMPS and the Participants, all of which are uniform in all material respects in their terms, conditions and provisions, with the exception of: (i) the Development Share, the Development Cost Share, the Entitlement Share, the Capital Contribution Percentage, the Debt Service Percentage and the Debt Service Share for each of the Participants; (ii) for those Participants that are political subdivisions of a State other than Utah, revisions relating to the Participant's status as a political subdivision of another State and the fact that it is governed by and subject to the laws of that State; (iii) for those Participants that are cooperative utilities, revisions relating to the Participant's corporate status, the definition of "Qualified Use" and the provisions of Section 32(f); (iv) for those Participants that do not own and operate electric utility systems that serve retail customers, the revisions noted in the definitions of "Electric System" and "Enterprise Fund" and revisions relating to the Participant's corporate status, the definition of "Qualified Use" and the provisions of Section 32(f); and (v) the matters set forth in the Exhibits.

"Project" means the development, acquisition, ownership, construction, improvement, equipping, operation, retirement and decommissioning of the Initial Facilities and any Additional Facilities, and the rights, interests, obligations and liabilities of UAMPS under the Project Agreements and the Permits and Approvals.

"Project Agreements" means, collectively, the Construction Agreements, the Operating Agreement, the Real Estate Agreements, each Fuel Agreement, the Interconnection Agreement, the Transmission Agreements, any Joint Ownership Agreement and any other agreements entered by UAMPS to further the acquisition, development, construction, and operation of the Project.

"Project Capability" means the nominal Electric Power and associated Electric Energy that the Project is capable of producing, net of (reduced by) the Electric Power (project capability) owned by another person under a Joint Ownership Agreement. The Project Capability initially available to UAMPS shall be based on the aggregate nameplate rating of the generating units included in the Initial Facilities with such adjustments as the Project Management Committee deems necessary to reflect the actual capability of the Initial Facilities. Project Capability initially means the aggregate amount of Electric Power shown on EXHIBIT I hereto and associated Electric Energy.

"Project Management Committee" means the committee of the Participants established pursuant to Section 5 which shall make certain decisions and recommendations with respect to the operation and management of the Project as provided herein.

"Project Output" means the amount of Electric Power and Electric Energy, if any, which is actually generated by the Project in any particular hour.

"Qualified Use" means the sale of electricity to retail customers located within the Participant's electricity "service area" pursuant to generally applicable and uniformly applied rate schedules or tariffs; *provided that:*

(a) "Qualified Use" shall not include any sale of electricity that gives rise to "private business use" or a "private loan" within the meaning of Section 141 of the Code;

(b) "Qualified Use" shall include the use of electricity by a Participant to meet its own requirements; and

(c) "Qualified Use" shall include sales of electricity under Permitted Output Contracts and other sales and uses of electricity, in each case as may be approved by UAMPS based on guidance provided by Bond Counsel.

For purposes of this definition, "service area" has the meaning assigned to such term in U.S. Treasury Regulation Section 1.148-1(e)(2)(iii) and includes any area recognized as the electricity service area of the Participant under state or federal law.

"Real Estate Agreements" means the agreements entered into by UAMPS to obtain necessary site control and easement rights for the acquisition and construction of the Project.

"Reference Project Costs" means, for purposes of calculating the amount of a Capital Contribution to be made by the Participant as provided in Section 17, the estimated Cost of Acquisition and Construction determined by UAMPS and approved by the Project Management Committee prior to the first issuance of long-term Bonds to finance the Cost of Acquisition and Construction of the Initial Facilities or any Additional Facilities. Reference Project Costs shall not include amounts for (i) costs of issuance, debt service reserves or capitalized interest on Bonds and (ii) any other items in the definitions of "Development Costs" or "Cost of Acquisition and Construction" not properly allocable to Reference Project Costs, as determined by the Project Management Committee.

"Refunding Bonds" means refunding Bonds from time to time issued by UAMPS pursuant to the Financing Documents and in accordance with Section 18.

"Required Approvals" means all governmental, regulatory and lender approvals, consents and authorizations required or necessary for (i) the execution, delivery and performance of this Contract (or any amendment hereto) by the Participant and (ii) this Contract (or any amendment hereto) to be the legal, valid and binding obligation of the Participant.

"Reserve and Contingency Fund" means the fund, if any, established pursuant to Section 20.

"Study Costs Sharing Agreement" means the Agreement to Share and Participate in Study Costs dated as of July 1, 2024, between UAMPS and UMPA.

"Substantial Completion" (or such similar term as may be used in the EPC Agreement) means the substantial completion of the Initial Facilities as determined pursuant to the EPC Agreement.

"Super-Majority Vote" means the affirmative vote of Participants' Representatives that represent 75% of (i) the number (per capita) of Participants' Representatives serving on the Project Management Committee, and (ii) during the Development Period, the Development Cost Shares of all Participants or, after the Development Period, the Entitlement Shares of all Participants. For the avoidance of doubt, in the event that a Super-Majority Vote is required when a Participant's Representative is not entitled to vote on matters before the Project Management Committee pursuant to Section 5(b)(1), such Participant's Representative and such Participant's Development Cost Share or Entitlement Share (as applicable) shall be disregarded in computing the percentages of Participants' Representatives and Entitlement Shares that have voted on the matter requiring a Super-Majority Vote.

"System Point of Receipt" means (i) the point(s) of interconnection between the Participant's electric utility system and the transmission facilities of the applicable balancing authority or authorities, or (ii) such other point(s) for the receipt by the Participant of Electric Energy from the Project as may be agreed to by the parties.

"Tax Status" means (i) the exclusion from gross income for federal income tax purposes of the interest on any Bonds issued as tax-exempt obligations, or (ii) the right of a bondowner (or other investor) to receive tax credits or the right of UAMPS to receive interest subsidy payments on any Bonds issued as tax credit bonds or interest subsidy bonds, respectively, in each case pursuant to the provisions of the Code.

"Transmission Agreements" means each transmission contract, agreement or tariff that is used or necessary for the delivery of Electric Power and Energy from the Point of Delivery to the Participant's System Point of Receipt, whether by direct transmission, displacement, exchange or otherwise.

"Transmission Costs" means, for each Billing Period of each Contract Year, all capital, operating and other costs and expenses paid, payable, incurred or accrued by UAMPS during such Billing Period for the transmission of Electric Energy from the Project to the Participant's System Point of Receipt pursuant to the Transmission Agreements or otherwise. The Participant shall be responsible for the payment of Transmission Costs to UAMPS hereunder only to the extent that UAMPS has, at the request of the Participant, entered into or utilized Transmission Agreements for the transmission of Electric Energy from the Point of Delivery to the Participant's System Point of Receipt.

"Trustee" means the bank or trust company acting as the trustee under the Financing Documents.

"UAMPS" means Utah Associated Municipal Power Systems, a political subdivision organized and existing under the laws of the State of Utah, the Act and the Joint Action Agreement, and its successors. All references to UAMPS in this Power Sales Contract shall include Authorized Officers of UAMPS and their delegees acting pursuant to specific authorization by the Board.

"UAMPS Pool" means that electric power pool or pools established pursuant to the Pooling Agreement between UAMPS and the Members under which UAMPS provides certain services

with respect to the scheduling, dispatch and the sale of Electric Power and Electric Energy and other matters pursuant to the operating criteria and procedures provided for in the Pooling Agreement.

"UMPA" means Utah Municipal Power Agency, a political subdivision organized and existing under the laws of the State of Utah, the Act and the interlocal cooperation agreement among its members, and its successors.

"Uncontrollable Force" means any cause, event or force beyond the control of the party affected, including, but not restricted to failure, or threat of failure of facilities, flood, earthquake, storm, fire, lightning, epidemic, war, acts of a public enemy, riot, civil disturbance or disobedience, labor dispute, labor or material shortage, sabotage, and restraint by court or public authority and action or non-action by, or inability to obtain the necessary authorizations or approvals from, any governmental agency or authority, which by exercise of due diligence and foresight such party could not reasonably have been expected to avoid and which by exercise of due diligence it shall be unable to overcome. "Uncontrollable Force" includes any cause, event or force constituting "force majeure," "uncontrollable force" or similar term as defined in any Project Agreement.

"Uniform System of Accounts" means the Federal Energy Regulatory Commission Uniform Systems of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, 18 C.F.R. Part 101, as the same may be modified, amended or supplemented from time to time or such other system of accounting as may be applicable by law to UAMPS.

(b) References to Articles, Sections, Schedules and Exhibits are to the Articles and Sections of and Schedules and Exhibits to this Contract, unless otherwise provided. Article and Section headings are included herein for convenience of reference only and shall not constitute a part of this Contract for any other purpose or be given any substantive effect. Any of the defined terms may, unless the context otherwise requires, be used in the singular or the plural, depending on the reference. The use of the word "include" or its derivations shall not be construed as language of limitation.

(c) References to contracts and agreements, including the Project Agreements, refer to such contracts and agreements as they may be amended or supplemented from time to time in accordance with their respective provisions and, in the case of the Project Agreements, the provisions of Section 40.

(d) Any representation, warranty, certificate or legal opinion with respect to the enforceability of this Contract or any other contract or agreement made in or provided pursuant to this Contract shall be deemed to be qualified by reference to the effect of applicable bankruptcy, insolvency, moratorium, reorganization or similar laws affecting creditor's rights generally and by the application of equitable principles, regardless of whether such qualification is expressly stated herein or therein.

Section 2. Effective Date and Term of Contract. (a) Promptly upon its governing body's adoption of the Contract Resolution and its receipt of any other Required Approvals, the

Participant shall (i) cause this Contract to be executed by its authorized officers, and (ii) deliver to UAMPS notice of the requested amount of its Development Share (in kW) and an executed counterpart of this Contract, together with its executed certificate (in substantially the form attached hereto as EXHIBIT III) and its executed opinion of counsel (in substantially the form attached hereto as EXHIBIT V). The Effective Date of the Power Sales Contracts shall occur on the date on which UAMPS receives executed Power Sales Contracts and the other items described in the preceding sentence from Participants that have requested Development Shares totaling 85% of the expected Project Capability as of the Effective Date (the *"Minimum Subscription"*). At its initial meeting, the Project Management Committee shall confirm and declare that the Effective Date has occurred, shall approve any changes to the expected Project Capability and shall approve the completed form of SCHEDULE D. The Authorized Officers of UAMPS shall execute all such Power Sales Contracts as of the date that the Effective Date occurs. Once it has occurred, the Effective Date shall not be affected by any subsequent action, event or circumstance.

(b) If the Minimum Subscription is achieved but the total amount of Electric Power requested by the Participants is less than the expected amount of the Project Capability, UAMPS will during the Development Period solicit additional Project participation by third parties under Power Sales Contracts, Joint Ownership Agreements or other arrangements. Participants that have executed Power Sales Contracts may also elect to increase their Development Shares at such times and in such amounts as may be approved by the Project Management Committee up to and including the end of the Development Period. In the event that less than all of the expected Project Capability is fully subscribed at the end of the Development Period as described in this paragraph, UAMPS shall take such actions as are necessary to downsize the expected Project Capability to the amount of subscription under the Power Sales Contracts and any Joint Ownership Agreements or other arrangements. UAMPS and the Participant acknowledge and agree that it may not be possible to precisely match the final amount of the expected Project Capability with the amount of Project subscription and in this case the Project Management Committee will have the authority to approve such true up adjustments to the Entitlement Shares of all Participants as are necessary at the time that it approves the initial SCHEDULE I.

(c) This Contract will become effective upon the Effective Date, and will, unless terminated pursuant to Section 43, continue until the last to occur of : (i) the date on which all of the Project Agreements have terminated or expired in accordance with their respective terms and all obligations of UAMPS thereunder have been fully paid, satisfied or discharged; (ii) the date on which all Bonds have been paid in full as to principal, premium and interest, or sufficient funds shall have been irrevocably set aside for the full defeasance thereof and all other obligations of UAMPS under the Financing Documents have been paid or satisfied; and (iii) the date on which the Initial Facilities and any Additional Facilities shall be permanently removed from service and Decommissioned and all Decommissioning Costs shall have been paid or irrevocable arrangements have been made that fully fund all Decommissioning Costs.

Section 3. Development Share; Entitlement Share. (a) From the Effective Date through the end of the Development Period, the Participant shall have a Development Share and a

Development Cost Share as set forth on SCHEDULE D. A Participant's Development Cost Share shall not exceed [__][1] percent, unless otherwise approved by the Project Management Committee.

(b) By virtue of its Development Share and in consideration if its associated Development Cost Share, the Participant (i) shall have the right to participate in the decision-making over the development of the Project through its representative on the Project Management Committee, and (ii) shall, from and after the Completion of Development through the remaining term of this Contract and without any further action on its part or by any other person, have an Entitlement Share with the same amount of Electric Power as its Development Share.

Section 4. The Project and the Initial Facilities. (a). The Project shall initially be known as the "Power County Power Project." The Project Management Committee may in its discretion adopt a different name for the Project at any time. In such event, all references to "Power County Power Project" in this Contract shall be changed to the name adopted by the Project Management Committee.

(b) The Project shall consist of the Initial Facilities and any Additional Facilities approved by the Project Management Committee. A preliminary and general description of the Initial Facilities prepared by UAMPS is attached as EXHIBIT I to this Contract. EXHIBIT I shall be reviewed, modified as deemed necessary and approved by the Project Management Committee promptly after the Effective Date.

(c) As the development of the Project proceeds and as the components of the Initial Facilities are designed, engineered, constructed, installed and tested, UAMPS shall from time to time recommend revisions to EXHIBIT I to the Project Management Committee for approval in order that the description therein reasonably corresponds to the Initial Facilities being developed and constructed. EXHIBIT I shall be updated as necessary in connection with the Completion of Development. Following the Commercial Operation Date, UAMPS shall prepare and submit to the Project Management Committee for its review and approval a completed EXHIBIT I that includes a final description of the Initial Facilities and the Project Capability. UAMPS and the Participant agree that in no event will any revisions to EXHIBIT I alter or affect their respective rights and obligations under this Contract.

Section 5. Project Management Committee. (a). The Participants hereby establish the Project Management Committee, which shall consist of one voting representative from each Participant (who shall be the Participant's Representative) and shall be chaired by a Participant's Representative elected by the Project Management Committee. Pursuant to the Contract Resolution, the Participant has delegated full and complete authority to its Participant's Representative to act on all matters and decisions that come before the Project Management Committee. Each Representative appointed by the Participant shall serve on the Project Management Committee until the Participant appoints a successor. An Authorized Officer of UAMPS shall attend all meetings of the Project Management Committee and shall cause minutes to be kept of all such meetings.

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1 % amount will be inserted upon completion of credit review of Participant group.

(b) The Joint Action Agreement and the bylaws of UAMPS shall govern the procedures for and the voting rights on the Project Management Committee, *provided that*:

(1) The Participant's Representative of any Participant that is in default hereunder (A) shall not be entitled to vote on any matter during the period of such default. and the consent or approval of such Participant or such Participant's Representative shall not be required during the existence of such default and (B) shall be disregarded for purposes of determining whether a quorum of the Project Management Committee is present at any meeting;

(2) A Super-Majority vote of all Project Management Committee Representatives shall be required on all decisions which would result in the termination of the Project; and

(3) All decisions made by the Project Management Committee shall be made by resolution, order or other appropriate action of the Project Management Committee and, except in those instances when the Project Management Committee is acting pursuant to delegated authority from the Board, before such resolution, order or action of the Project Management Committee shall take effect, the same shall be ratified and approved by resolution, order or action of the Board, acting in accordance with the Joint Action Agreement and the bylaws of UAMPS.

The Participants acknowledge that the Joint Action Agreement provides, among other things, that decisions of the Board with respect to the Project shall be made only upon the recommendation of the Project Management Committee and that weighted votes may be called for on any recommendation or decision to be made by the Project Management Committee or the Board, respectively, all as more fully provided in the Joint Action Agreement.

(c) In addition to its other responsibilities under the Power Sales Contracts, the Project Management Committee shall:

(1) review, provide advice and recommendations to and consult with UAMPS regarding the Project,

(2) supervise, review and monitor the Development Work and the development of the Project in accordance with Section 6 and the other applicable provisions of the Power Sales Contracts and the resolutions of the Project Management Committee;

(3) review, provide advice and recommendations to UAMPS on, and approve the Project Agreements and any modifications or amendments thereto;

(4) supervise and provide direction to UAMPS during the construction of the Project, including approval of the construction budget for the Project and approval of all notices to proceed and notices to construct given by UAMPS under the EPC Agreement;

(5) review, approve and revise from to time the Budget and Plan of Finance for the Initial Facilities and any Additional Facilities;

(6) review, approve and provide advice and direction to UAMPS with respect to the issuance of Bonds, Additional Bonds and Refunding Bonds

(7) review, provide advice and recommendations to and consult with UAMPS regarding the Commercial Operation Date of the Initial Facilities, and the Performance Tests for and the Substantial Completion and the Final Completion of the Facility under the EPC Agreement;

(8) determine and declare the Project Capability upon the Final Completion of the Project and from time to time thereafter as it deems necessary to reflect the actual capability of the Project;

(9) review and approve the Operating and Scheduling Procedures, any Operator of the Project and any Operating Agreement;

(10) review and consult with UAMPS regarding the acquisition and management of supplies of natural gas and any other necessary fuels for the Project and review and approve each Fuel Agreement and any Fuel Agent to be appointed by UAMPS;

(11) review, recommend and approve any Additional Facilities;

(12) assist with the resolution of any billing disputes as provided in Section 28; and

(13) review, recommend and consult with UAMPS regarding any actions or remedies to be taken by UAMPS under Sections 34 and 35 of the Power Sales Contracts.

UAMPS and the Participant acknowledge and agree that the responsibilities of the Project Management Committee with respect to the Project are complete and comprehensive and are not limited to the specific responsibilities enumerated herein.

(d) The Project Management Committee may from time to time direct UAMPS to commission, obtain and provide such Engineering Studies and Reports that the Project Management Committee deems reasonably necessary or desirable with respect to the Project. The Project Management Committee shall be entitled to rely upon such Engineering Studies and Reports with respect to its determinations and decisions with respect to the Project, including particularly its determinations under Section 6.

Section 6. Development Period and Development Work. (a) During the Development Period, UAMPS shall use Commercially Reasonable Efforts to cause the Development Work to proceed in an expeditious and economical manner. UAMPS shall (i) report not less frequently than monthly to the Project Management Committee (unless otherwise approved by the Project Management Committee) with respect to the progress of the Development Work and the

Development Costs incurred or expended, (ii) recommend from time to time revisions and updates to the Budget and Plan of Finance to the Project Management Committee, and (iii) act consistently with and in furtherance of the directions given to it by the Project Management Committee.

(b) Promptly after the Effective Date of the Power Sales Contracts, the Project Management Committee shall by resolution establish a maximum target price for cost of energy ($/MWh) from the Project (the *"Target Price"*). The Target Price shall be the maximum cost of energy expected to be payable by the Participants under the Power Sales Contracts, and shall exclude only Transmission Costs, taking into account the information and assumptions utilized in the Development Work and the Budget and Plan of Finance. Such resolution shall establish such determination dates based on Project development milestones as the Project Management Committee deems necessary for determining whether the expected cost of energy from the Project exceeds the Target Price, together with such other matters as the Project Management Committee deems necessary or desirable. A determination by the Project Management Committee that the Target Price is exceeded as of any such determination date, shall constitute a determination by the Project Management Committee to terminate the Project.

(c) In addition to a determination under paragraph (b), the Project Management Committee may by a Super-Majority Vote suspend or terminate the Project at any time during Development Period upon its determination that the Project is not feasible for any reason. UAMPS shall give prompt written notice to all Participants of any such determination of the Project Management Committee under paragraph (b) above or this paragraph (c). In the event that the Project Management Committee determines to terminate the Project during Development Period, UAMPS shall proceed to wind up the Project and the Development Work, determine the remaining amount of the Development Costs and submit billings to the Participants for such Development Costs and the amount necessary to repay and retire any Bonds or obligations that have been issued or incurred to finance Development Costs.

(d) Upon substantial completion of the Development Work, including the Project Agreements and receipt of the Permits and Approvals (or an indication of the terms and conditions thereof), UAMPS will conduct a review and analysis and report to and consult with the Project Management Committee regarding the actions necessary to complete the Development Work, the terms and conditions of the Project Agreements and the Permits and Approvals and the definitive Budget and Plan of Finance, and will make recommendations to the Project Management Committee as to whether the Project should proceed to the Construction Period.

(e) Following its review of the report and recommendations of UAMPS, the Project Management Committee will in its discretion:

(i) determine whether or when Completion of Development has occurred;

(ii) review and approve definitive engineering and feasibility studies for the Initial Facilities, and such other materials as it deems necessary in order to determine that construction and operation of the Initial Facilities is feasible and should proceed;

(iii) review and approve the definitive Budget and Plan of Finance for the Cost of Acquisition and Construction of the Initial Facilities;

(iv) make a determination by a Super-Majority Vote as to whether construction of the Project is feasible and whether the Project should proceed to the Construction Period;

(v) approve the Power Sales Contracts to be entered into with any new Participants any additional terms and conditions for their participation in the Project; and

(vi) review and approve the initial SCHEDULE I for the Project.

A determination by the Project Management Committee that construction of the Initial Facilities is not feasible and should not proceed to the Construction Period will result in termination of the Project; notwithstanding any such termination, this Contract shall remain in effect until the conditions described above and in Section 2(b) have been satisfied.

(f) Upon a determination by the Project Management Committee that construction of the Initial Facilities is feasible and the Project should proceed to the Construction Period, UAMPS will then execute the Project Agreements, the Construction Contracts for the Initial Facilities and finance the Cost of Acquisition and Construction of the Initial Facilities through the issuance of Bonds.

(g) UAMPS may from time to time recommend the acquisition or construction of Additional Facilities to improve or add to the Project. Any such Additional Facilities shall be approved by the Project Management Committee. UAMPS may issue Bonds or incur other obligations pursuant to the Financing Documents to finance all or a portion of the costs incurred in the Development Work and construction of the Additional Facilities.

Section 7. Joint Ownership Agreement. (a) UAMPS and the Participants acknowledge and agree that UMPA shall have the right to become an owner of an undivided percentage interest in the Initial Facilities as provided in the Study Costs Sharing Agreement.

(b) If UMPA elects to become the owner of an undivided interest in the Initial Facilities, UAMPS shall negotiate the terms and provisions of the Joint Ownership Agreement between UAMPS and UMPA and present the same to the Project Management Committee for its approval. Additional parties may become owners of undivided interests in the Initial Facilities upon the approval of the Project Management Committee.

Section 8. Construction Period. (a) The Construction Period shall commence upon the determination of the Project Management Committee that Completion of Development has occurred. During the Construction Period, UAMPS shall (i) cause the construction of the Project to proceed in an expeditious and economical manner pursuant to the Construction Agreements and other Project Agreements, (ii) monitor the performance of the contractors under the Construction Agreements, and (iii) report to the Project Management Committee with respect to the progress of the acquisition and construction of the Project as provided herein.

(b) UAMPS shall perform its obligations under the Construction Agreements and shall:

(i) use Commercially Reasonable Efforts consistent with and subject to the terms and provisions of the Project Agreements to cause the Project to be expeditiously and economically acquired and constructed pursuant to the Construction Agreements;

(ii) diligently defend and protect the rights of UAMPS and the Project under the Construction Agreements and enforce the contractors' obligations thereunder;

(iii) monitor the performance of the contractors under the Construction Agreements and report promptly to the Project Management Committee with respect to any default or event of default under the Construction Agreements;

(iv) report not less frequently than monthly to the Project Management Committee (unless otherwise approved by the Project Management Committee) regarding the current status of construction and any changes to the estimated Commercial Operation Date and the estimated Cost of Acquisition and Construction; and

(v) give prompt notice to the Project Management Committee and the Participant of the occurrence of the Commercial Operation Date of the Initial Facilities and any Additional Facilities.

(c) As soon as practicable after the Commercial Operation Date of the Initial Facilities, UAMPS shall prepare a complete statement and reconciliation of the final (or substantially final) Cost of Acquisition and Construction of the Initial Facilities and submit the same to the Project Management Committee for its review and acceptance. In the event that a substantially final statement of the cost of construction of the Initial Facilities is submitted to and accepted by the Project Management Committee, UAMPS shall provide periodic reports to the Project Management Committee regarding the remaining items of the Cost of Acquisition and Construction of the Initial Facilities until a final statement is available for its review and approval.

Section 9. Operation and Maintenance of the Project. UAMPS covenants and agrees that, during the Operating Period, it will use Commercially Reasonable Efforts consistent with and subject to the terms and provisions of the Project Agreements to cause the Project to be operated, maintained and managed in an efficient and economical manner in accordance with Good Utility Practice for the joint and ratable benefit of all of the Participants. UAMPS agrees with and covenants to the Participant that UAMPS will vigorously enforce and defend its rights under the Project Agreements. The Participant acknowledges and agrees that UAMPS may, upon the approval of the Project Management Committee, from time to time enter into amendments of and supplements to any or all of the Project Agreements and that, except as otherwise required by Section 40, UAMPS will not be required to obtain the consent or approval of the Participant in connection with any such supplement or amendment.

Section 10. Scheduling of Electric Energy; Coordination with UAMPS Pool. (a) From and after the Commercial Operation Date of the Project, the Participant shall be entitled to use the Electric Energy allocable to the Participant's Entitlement Share. UAMPS shall schedule or cause

to be scheduled such Electric Energy in accordance with the Operating and Scheduling Procedures approved by the Project Management Committee. UAMPS shall provide the Participant with notice of any amendment to or modification of the Operating and Scheduling Procedures.

(b) At any time the Project is operable or operating the Participant shall not be entitled to use in any hour Electric Energy in excess of that which is allocable to the Participant's Entitlement Share, unless arrangements have been made for a planned purchase of such Electric Energy through the UAMPS Pool. The Participant agrees that, prior to the first delivery of Electric Energy under this Power Sales Contract, it will execute and deliver to UAMPS an appendix to the Pooling Agreement (in a form approved by the Project Management Committee) that assigns the Electric Energy allocable to the Participant's Entitlement Share to the UAMPS Pool. Any surplus Electric Energy attributable to the Participant's Entitlement Share shall be sold or otherwise disposed of by the Participant only in accordance with the provisions of such appendix to the Pooling Agreement. In addition to any sales of surplus Electric Energy requested by the Participant through the UAMPS Pool, UAMPS will utilize Commercially Reasonable Efforts to sell, exchange or otherwise dispose of any incidental surplus Electric Power and Electric Energy attributable to the Project for the benefit of the Participants.

(c) Prior to the first delivery of Electric Energy under this Power Sales Contract, the Participant shall provide to UAMPS a written schedule of the Participant's available electric resources and the order in which such resources are to be applied to meet the Participant's requirements for Electric Power and Electric Energy. UAMPS shall verify all such resources and promptly notify the Participant of any rejection of such resources. The Participant may revise or modify such schedule upon written notice to UAMPS at least one business day prior to the beginning of any Billing Period.

Section 11. Point of Delivery; Risk of Loss. (a) The Electric Energy allocable to the Participant's Entitlement Share shall be delivered by UAMPS to the Participant at the Point of Delivery. The Participant shall be responsible for, and shall pay all costs associated with, (i) the transmission of such Electric Energy from the Point of Delivery to its System Point of Receipt and (ii) the distribution and delivery of Electric Energy from its System Point of Receipt to its customers.

(b) Upon the request of the Participant, UAMPS will use Commercially Reasonable Efforts to enter into one or more Transmission Agreements, or will utilize its transmission rights under existing Transmission Agreements, to provide for transmission service for the Electric Energy allocable to the Participant's Entitlement Share from the Point of Delivery to the Participant's System Point of Receipt. Any future Transmission Agreements entered into by UAMPS for or on behalf of the Participant shall be approved by UAMPS and the Participant, and the Participant shall pay all Transmission Costs thereunder. The Participant agrees that it shall maintain (or cause UAMPS to maintain) during the term of this Contract, such Transmission Agreements as shall be necessary for the firm transmission of the Electric Energy allocable to its Entitlement Share from the Point of Delivery to its System Point of Receipt, except as may be otherwise approved by the Project Management Committee. The Participant shall provide UAMPS with copies of all Transmission Agreements utilized by it and with such other information regarding its transmission arrangements as UAMPS may reasonably request.

(c) From and after the Commercial Operation Date of the Project, the Participant shall be obligated to maintain an appropriate power factor at the Participant's System Point of Receipt consistent with the provisions of the Transmission Agreements. Should the power factor, as metered at such System Point of Receipt, not be maintained within the limits established under the Transmission Agreements, the Participant shall be notified and requested to correct such power factor. If the Participant has not begun corrective action at the end of 90 days, UAMPS may take corrective action and the Participant shall be obligated to reimburse or compensate UAMPS for all sums expended and all services contracted for or performed by UAMPS or for which UAMPS shall be obligated relating to such corrective action.

(d) Electric Energy delivered hereunder and risk of loss shall pass from UAMPS to the Participant at the Point of Delivery. As between the parties to this Contract, UAMPS shall be deemed to be in exclusive control and possession of the Electric Energy delivered hereunder, and responsible for any damage or injury caused thereby, prior to the time such Electric Energy shall have been delivered to the Participant at the Point of Delivery. After delivery of Electric Energy to the Participant at the Point of Delivery, the Participant shall be deemed to be in exclusive control and possession thereof and responsible for any injury or damage caused thereby. UAMPS assumes all liability for and shall indemnify, defend and hold harmless the Participant (individually) from any claims, including death of persons, arising from any act or incident occurring when title to Electric Energy is vested in it. All costs and expenses incurred by UAMPS under the foregoing indemnity shall constitute a Cost of Acquisition and Construction or an item of Operation and Maintenance Costs, as determined by the Project Management Committee. To the extent permitted by law and solely to the extent of the revenues of its Electric System and any available insurance proceeds, the Participant assumes all liability for and shall indemnify, defend and hold harmless UAMPS and the other Participants from any claims, including death of persons, arising from any act or incident occurring when title to Electric Energy is vested in it.

Section 12. Interruption or Reduction of Deliveries. UAMPS may interrupt or reduce deliveries under this Power Sales Contract of Electric Energy if: (a) the Operator has determined that such interruption or reduction is necessary in case of emergencies affecting the Project, in order to install equipment, to make repairs and replacements to, to make investigations and inspections of, or to perform maintenance work on, the Project or otherwise carry out its obligations as Operator under the Operating Agreement; (b) Electric Energy from the Project is otherwise unavailable whether due to an event of Uncontrollable Force or otherwise; or (c) the transmission of Electric Energy from the Project is interrupted or curtailed by the balancing area authority or other transmitting utility. In order that the operation of the Participant's Electric System will not be unreasonably interrupted or interfered with, UAMPS will, to the extent necessary, use Commercially Reasonable Efforts to make arrangements to serve the Participant's load through other projects of UAMPS or the UAMPS Pool. UAMPS will also use Commercially Reasonable Efforts, consistent with the provisions of the Project Agreements and the other Power Sales Contracts, to arrange for any planned interruption or reduction in the Project Output to be scheduled at a time which will cause the least interference with the operation of the Participant's Electric System.

Section 13. Availability of Electric Energy. (a) Except as provided otherwise by this Power Sales Contract and subject to the provisions of the Project Agreements, Electric Energy

allocable to the Participant's Entitlement Share shall be made available in accordance with this Power Sales Contract during the term hereof; *provided, however,* that nondelivery of Electric Energy hereunder for any reason whatsoever (1) shall not relieve the Participant from its obligation to make its payments under Section 27 and (2) shall not impose any liability upon UAMPS for any direct or consequential damages suffered by the Participant.

(b) The Participant acknowledges and agrees that deliveries of the Electric Energy allocable to its Entitlement Share are not firm and are contingent upon the operation of the Project, the availability of transmission and other factors. The Participant agrees that it is solely responsible for any firming transactions with respect to its Entitlement Share.

Section 14. Insurance. UAMPS shall maintain, or during the Construction Period shall cause the EPC Contractor to maintain, in force, as part of the Cost of Acquisition and Construction or Operation and Maintenance Costs, as appropriate, insurance with responsible insurers with policies against risk or direct physical loss, damage or destruction of the Project, including liability insurance and employers' liability insurance, all to the extent consistent with Good Utility Practice and to the extent available at reasonable cost, but in no case less than will satisfy applicable regulatory requirements and requirements of the Financing Documents.

Section 15. Budget and Plan of Finance. (a) The Budget and Plan of Finance for the Initial Facilities shall include the following information:

(i) the amount of Development Costs incurred to the date of the Budget and Plan of Finance and the estimated total Development Costs to the Completion of Development;

(ii) the estimated Cost of Acquisition and Construction;

(iii) the estimated timeline for the development and construction of the Initial Facilities to the Commercial Operation Date;

(iv) the estimated levelized cost of energy ($/MWh) for Project Output sold to the Participants under the Power Sales Contracts (which may be a range of such costs);

(v) the proposed funding and financing arrangements for all Development Costs during the Development Period; including Bonds and other funding and financing arrangements; and

(vi) such other information as may be required to be included in the Budget and Plan of Finance by the Project Management Committee.

(b) UAMPS and the Participant acknowledge and agree that as of the Effective Date, (i) UAMPS has not obtained the Permits and Approvals necessary for the construction and operation of the Project, (ii) the overall development of the Project is at a preliminary stage, and (iii) a definitive estimate of the Cost of Acquisition and Construction will not be available until the Completion of Development. Accordingly, the parties acknowledge and agree that the information

contained in the initial Budget and Plan of Finance is necessarily preliminary and is subject to change based on, among other things, additional information that becomes available to UAMPS during the Development Period, the negotiation of the terms and provisions of the Project Agreements, the terms and conditions of the Permits and Approvals, and the development and negotiation of funding sources and financing arrangements for Development Costs and the Cost of Acquisition and Construction.

(c) The Budget and Plan of Finance shall be updated by UAMPS from time to time during the Development Period as necessary. Each update of the Budget and Plan of Finance shall be subject to the approval of the Project Management Committee.

Section 16. Financing of the Project. (a) UAMPS shall finance the portion of the Cost of Acquisition and Construction of the Initial Facilities that is not paid from Capital Contributions made by the Participants through the issuance of one or more series of Bonds pursuant to the Budget and Plan of Finance approved by the Project Management Committee.

(b) Unless otherwise approved by the Project Management Committee, the Budget and Plan of Finance shall provide for the financing of all Development Costs, Construction Costs and other Costs of the Initial Facilities to a date not earlier than the estimated Commercial Operation Date of the Initial Facilities with the objective that the Participant will not be required to make any payments to UAMPS in respect of Debt Service Costs until a date that is after the estimated Commercial Operation Date. UAMPS shall use Commercially Reasonable Efforts to structure and implement the financings for the Development Costs and Construction Costs of the Initial Facilities to achieve this result. The Participant acknowledges and agrees that UAMPS cannot guarantee that it will be able to achieve this result, and under certain circumstances it may be necessary for UAMPS to submit billings to the Participant pursuant to Section 26 to enable it to pay Development Costs.

(c) UAMPS and the Participant acknowledge and agree that:

(i) as of the Effective Date, (A) UAMPS has not obtained the Permits and Approvals necessary for the construction and operation of the Project, and (B) the overall development of the Project is at a preliminary stage;

(ii) UAMPS shall use Commercially Reasonable Efforts to obtain all such Permits and Approvals as a part of the Development Work during the Development Period;

(iii) the Development Costs incurred by UAMPS will be financed by the issuance of Bonds;

(iv) in the event that UAMPS is unable to obtain transmission service for Project Output on reasonable terms, is unable to obtain the required Permits and Approvals for the construction and operation of the Project or the Project Management Committee determines that the continued development of the Project is not feasible for any reason, the Project Management Committee may determine to terminate the Project as provided herein; and

(v) if the Project Management Committee determines to terminate the Project during the Development Period, the Project will not be completed and the Participant will be required to pay, among other things, its Development Cost Share of all Development Costs incurred and its Development Cost Share of Debt Service Costs until all Bonds previously issued are fully paid and retired, as provided in Section 6.

(d) Each Participant may elect to make a Capital Contribution to UAMPS pursuant to Section 17. Prior to the giving by UAMPS of the notice required by Section 17(a), the Project Management Committee shall determine whether any additional interest expense on or in respect of any Bonds that are subject to federal income taxation shall be allocated to those Participants whose legal status or use of Project Output requires the issuance of such Bonds. In the event the Project Management Committee determines to make such allocation, the notice required by Section 17(a) shall include such information as shall be necessary to generally inform the affected Participants of the additional Debt Service Costs that may be payable by them in the event they elect not to make a Capital Contribution.

Section 17. Capital Contributions. (a) Prior to the first issuance of long-term Bonds to finance the Cost of Acquisition and Construction of the Initial Facilities, UAMPS shall give written notice to the Participant of:

(i) its right to elect to make a Capital Contribution;

(ii) the date by which it must notify UAMPS of its election, which shall be not earlier than 30 days after the date of such notice;

(iii) the applicable Reference Project Costs; and

(iv) the maximum amount of the Participant's Capital Contribution, which shall be an amount equal to the product of (A) such Reference Project Costs and (B) the ratio of the Entitlement Share of the Participant to the Entitlement Shares of all Participants.

The Participant may elect to make a Capital Contribution only from the retained earnings of its Electric System or other legally available funds not derived from any external borrowing.

(b) The Participant's election to make a Capital Contribution shall be made by written resolution adopted by its governing body. An original or certified copy of such resolution shall be submitted to UAMPS with the Participant's notice of its election to make the Capital Contribution. In the event that the Participant does not notify UAMPS of the determination of its governing body by the date specified in the notice provided by UAMPS, the Participant shall be deemed to have elected not to make a Capital Contribution.

(c) Following receipt of the Participant's election to make the Capital Contribution, UAMPS will provide the Participant with notice of:

(i) the date (which shall be not earlier than 30 days after the date of such notice) by which the Participant must make the Capital Contribution;

(ii) instructions for the deposit of the Capital Contribution into a separate and segregated special escrow account established under the Financing Documents; and

(iii) a written statement of information regarding UAMPS, the Project and the Project Agreements for the Participant's use in any offering material for any indebtedness to be issued to finance the Capital Contribution.

The Capital Contribution shall be held and invested in accordance with the provisions of the Financing Documents, which shall provide for the investment of the Capital Contribution, the crediting of any interest earnings for the account of the Participant and the application of the Capital Contribution by the Trustee upon the direction of UAMPS to fund a portion of the Cost of Acquisition and Construction of the Initial Facilities, and for deposit into certain funds and accounts established by the Financing Documents. If the Participant fails to make the Capital Contribution as and when required by the UAMPS' notice, it shall be deemed to have rescinded its election to make the Capital Contribution.

(d) The Participant acknowledges and agrees that the amount of the Capital Contribution to be made by the Participant will be based upon an estimate of the Cost of Acquisition and Construction of the Initial Facilities, which estimates will be subject to adjustment to reflect the final Cost of Acquisition and Construction of the Initial Facilities approved by the Project Management Committee. Not more than 30 days following the determination of the final Cost of Acquisition and Construction of the Initial Facilities, UAMPS shall deliver a final accounting statement to the Participant showing the Cost of Acquisition and Construction, the amount of and interest earnings on the Capital Contribution and any amounts payable by or credited to the Participant in respect of the final Cost of Acquisition and Construction. The Participant agrees that it will pay any additional amount payable by it shown on such accounting statement on or before the 30th day following the date of such final accounting statement, or on such later date as may be approved by the Project Management Committee.

(e) After Capital Contributions have been made by all electing Participants, UAMPS shall complete (or revise, as applicable) SCHEDULE I and provide a copy of the completed or revised SCHEDULE I to each of the Participants. With respect to all Participants and at all times, SCHEDULE I shall show that:

(i) the sum of each Participant's Capital Contribution Percentage and Debt Service Percentage equals its Entitlement Share;

(ii) the sum of the Capital Contribution Percentages and Debt Service Percentages of all Participants equals 100%; and

(iii) the sum of the Debt Service Shares of all Participants equals 100%.

UAMPS' calculation and determination of the Development Costs and the Cost of Acquisition and Construction of the Initial Facilities and the Participant's Capital Contribution Percentage, Debt Service Percentage and Debt Service Share in accordance with (i), (ii) and (iii) above shall be subject to the approval of the Project Management Committee, and upon such approval shall be

conclusive and binding upon UAMPS and the Participant. UAMPS shall revise SCHEDULE I from time to time as provided herein so that it sets forth the correct Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of all Participants.

(f) The Participant acknowledges and agrees with UAMPS that:

(i) its election to make a Capital Contribution shall be irrevocable and under no circumstances whatsoever shall the Participant be entitled to a return or rebate of all or any portion of any Capital Contribution in the event that Uncontrollable Force, termination of any Project Agreements or other circumstances result in the suspension, interruption, interference, reduction, curtailment or termination of the Project or the Project Output;

(ii) the Capital Contribution shall not be deemed to constitute an investment by the Participant and the Participant shall not be entitled to any investment earnings or rate of return on the Capital Contribution, except with respect to interest earnings on the Capital Contribution pending its application as provided above; and

(iii) any Capital Contribution made by the Participant shall not change or affect UAMPS' ownership in the Project or any of the rights and obligations of UAMPS and the Participant under this Contract, except as specifically provided herein, including the right of UAMPS to suspend or terminate the Participant's right to receive the Electric Energy allocable to its Entitlement Share as provided in Section 34.

(g) In connection with the issuance of Additional Bonds or Refunding Bonds, the Project Management Committee may determine to provide Participants with the option of making a capital contribution with respect to the Costs of the Project being financed or refinanced by the Additional Bonds or Refunding Bonds under procedures and standards substantially similar to those set forth in this Section, with such adjustments as the Project Management Committee shall determine to be advisable. Any capital contribution made by a Participant pursuant to this paragraph (g) shall constitute a Capital Contribution for all purposes of the Power Sales Contracts.

Section 18. Additional Bonds and Refunding Bonds. (a) Additional Bonds may be sold and issued by UAMPS in accordance with the provisions of the Financing Documents at any time and from time to time for the purpose of financing the Cost of Acquisition and Construction. UAMPS may incur other obligations pursuant to the Financing Documents to achieve purposes deemed beneficial to the Project.

(b) Any Additional Bonds shall be secured by the pledge made pursuant to the Financing Documents of the payments required to be made by the Participant under Section 27, as such payments may be increased and extended by reason of the issuance of Additional Bonds, and of other revenues of UAMPS attributable to the Project. Additional Bonds may be issued in amounts sufficient to pay the full amount of such costs and to provide such reserves as may be determined by UAMPS to be reasonably necessary. In the event that the Project Management Committee approves the issuance of Additional Bonds, it shall determine whether to make a capital contribution option available to the Participants and the procedures therefore.

(c) In the event Debt Service Costs may be reduced by the refunding of any Bonds then outstanding or in the event it shall otherwise be advantageous, in the opinion of UAMPS, to refund any Bonds, UAMPS may issue and sell Refunding Bonds in accordance with the Financing Documents.

Section 19. Pledge of Payments. All payments required to be made by the Participant pursuant to Section 27, together with other revenues of UAMPS attributable to the Project may be pledged by UAMPS pursuant to the Financing Documents to secure the payment of Bonds and any Additional Bonds or Refunding Bonds.

Section 20. Reserve and Contingency Fund. (a) In addition to various funds and accounts established under the Financing Documents, UAMPS may, upon the approval of the Project Management Committee, establish an additional fund with respect to the Project known as the "Reserve and Contingency Fund" to be funded, held and applied as provided herein. Amounts on deposit in the Reserve and Contingency Fund may be used to pay or provide reserves for unusual or extraordinary Operation and Maintenance Costs, renewals, repairs, replacements, additions or betterments of or to any items included in the Project, the cost of any Additional Facilities or the cost of or reserves for the retirement, decommissioning and termination of the Initial Facilities and any Additional Facilities that will not be paid from the Decommissioning Fund.

(b) The Project Management Committee may direct UAMPS to include in the Annual Budget adopted pursuant to Section 24 an amount for deposit into the Reserve and Contingency Fund. This amount may represent either an appropriation of excess revenues from the operation of the Project during the preceding Fiscal Year or amounts to be billed to and collected from the Participants as an item of Operation and Maintenance Costs during the Fiscal Year covered by the Annual Budget.

Section 21. Damage, Destruction or Condemnation. Subject to the provisions of the Project Agreements, UAMPS shall use Commercially Reasonable Efforts to collect or cause to be collected amounts arising from insurance proceeds, condemnation awards, damages due from contractors, subcontractors or others and proceeds from the sale or other disposition of surplus property, all related to the Project, and shall apply all receipts, revenues and other moneys received by it or credited to it from the foregoing sources to the repair, reconstruction or replacement of the Project, to the retirement or defeasance of Bonds (in whole or in part), by purchase, redemption or other arrangements therefor, to the payment of other costs and expenses of UAMPS in connection with the Project or to the credit, pro rata, of the Participants, based upon their Entitlement Shares in the Project, all as provided in the Financing Documents.

Section 22. Decommissioning. Upon the retirement of the Project and its removal from service, UAMPS shall take all actions necessary to Decommission the Project. The Decommissioning Fund shall be established as a separate and segregated trust fund or escrow account, and the amounts in the Decommissioning Fund shall be used solely for the payment of Decommissioning Costs and necessary administrative and other charges. The Decommissioning Fund may be funded by a prepayment, by sinking fund deposits or by another method approved by the Project Management Committee. Pending the application of amounts on deposit in the Decommissioning Fund to pay Decommissioning Costs, the Decommissioning Fund may be

invested as provided in the trust or escrow agreement. Any amounts remaining in the Decommissioning Fund upon the completion of the Decommissioning of the Project shall be applied or disbursed at the direction of the Project Management Committee.

(b) The Project Management Committee may direct UAMPS to establish other funds or accounts to provide additional reserves for the payment of Decommissioning Costs.

Section 23. Disposition or Termination of the Project. (a) Except as otherwise provided in the Power Sales Contracts, UAMPS shall not sell, lease or otherwise dispose of the Project or any substantial part of the Project without the approval of the Project Management Committee by a Super-Majority Vote. Subject to the provisions of the Financing Documents and the Project Agreements, this Section shall not prohibit a merger or consolidation or sale of all or substantially all of the property of UAMPS.

(b) Subject to the applicable provisions of the Project Agreements, if the Project shall be terminated, UAMPS shall use Commercially Reasonable Efforts to cause the Project to be economically salvaged, discontinued, disposed of or sold in whole or in part. UAMPS shall make accounting statements for each Billing Period to the Participant of all costs and any net proceeds associated therewith. Such accounting statements shall continue for such Billing Periods until the Project has been salvaged, discontinued or finally disposed of, at which time a final accounting statement with respect thereto shall be made by UAMPS at the earliest reasonable time. The costs of salvage, discontinuance or disposition shall include, but shall not be limited to, all accrued costs and liabilities resulting from the acquisition, construction, operation or maintenance of and renewals and replacements to the Project. Such costs and, subject to the provisions of the Financing Documents, the net proceeds, if any, from the sale or salvage of Project components or assets shall be allocated among the Participants based upon their respective Entitlement Shares.

Section 24. Annual Budget; Accounting. (a) On or before 15 days prior to the estimated commencement of the first Contract Year and on or before the beginning of each Contract Year thereafter, UAMPS shall prepare and mail to the Participant an Annual Budget for the Project recommended by the Project Management Committee and approved by the Board, based, to the extent appropriate, on budgets received under the Project Agreements, showing an annual estimate of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs, and the Participant's share of each, for the following Contract Year. The Participant shall, to the extent and in the manner deemed appropriate by the Participant, incorporate the estimates shown on the Annual Budget in its annual budgetary process for the Participant's Enterprise Fund.

(a) At the end of each quarter during each Contract Year and at such other times as it shall deem desirable, UAMPS shall review the Annual Budget of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs for the Contract Year. In the event such review indicates that the Annual Budget does not or will not substantially correspond with actual receipts or expenditures, or if at any time during such Contract Year there are or are expected to be extraordinary receipts, credits or expenditures of costs substantially affecting Operation and Maintenance Costs, Transmission Costs and Debt Service Costs, UAMPS shall prepare and provide to the Participant's Representative a revised Annual Budget, recommended by the Project Management Committee and approved by the Board, incorporating adjustments to reflect such

receipts, credits or expenditures which shall thereupon supersede the previous Annual Budget. The revised Annual Budget and any written materials that accompany it shall specifically identify the changes from the Annual Budget that was previously in effect.

(b) UAMPS agrees that it will, from and after the date of the acquisition by UAMPS of the Project, keep accurate records and accounts relating to the Project, the Cost of Acquisition and Construction, Reference Project Costs, Operation and Maintenance Costs, Transmission Costs and Debt Service Costs in accordance with the Financing Documents and which are generally consistent with the Uniform System of Accounts, separate and distinct from its other records and accounts; *provided* that UAMPS may establish revenue and operation and maintenance funds that account for more than one project of UAMPS so long as UAMPS shall maintain books and records adequate to show the amounts in each of such funds allocable to each such Project. Said accounts shall be audited annually by a firm of certified public accountants, experienced in public finance and electric utility accounting and of national reputation, to be employed by UAMPS. A copy of each annual audit, including all written comments and recommendations of such accountants, approved by the Members shall be furnished by UAMPS to the Participant not later than 180 days after the end of each Contract Year.

Section 25. Billing Periods. (a) The initial Billing Period to be used for the preparation, calculation and billing of the amounts payable by the Participant hereunder shall be a Month. In order to promote the efficient and economic administration of the Project, UAMPS may, at any time after the end of the initial Contract Year and from time to time thereafter, adopt another standard period of time as the Billing Period hereunder. In addition to the foregoing, UAMPS may, upon the approval of the Project Management Committee, from time to time revise the billing and payment procedures provided for in this Section to promote the efficient and economic administration of the Project or to conform such billing procedures to those utilized in connection with other projects of UAMPS.

(b) Any change in the Billing Period shall be made in the Annual Budget provided for in Section 24 and shall not be effective for at least 30 days after the mailing of notice of such change in the Billing Period or in the billing and payment procedures to the Participant. At the time of the mailing of such Annual Budget, UAMPS shall send to the Participant a revised form of the billing procedures set forth in Section 26(b), which shall reflect any changes in the dates of billing and payment and the method thereof that are necessary or desirable to make this Section correspond to the new Billing Period, such changes to become effective on the date the new Billing Period takes effect. In no event shall any such change in the Billing Period or in the billing and payment procedures increase the amounts payable by the Participant pursuant to this Section in respect of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs.

Section 26. Billings. (a) The Participant acknowledges and agrees that it is necessary for UAMPS to recover all of the costs and expenses associated with the Project through billings to and payments by the Participants under the Power Sales Contracts. UAMPS will exercise Commercially Reasonable Efforts to finance all Development Costs during the Development Period. In the event that Development Costs are not refinanced by the issuance of long-term Bonds, the Participant shall pay its Development Cost Share of the amount necessary to repay the financed Development Costs. UAMPS will exercise Commercially Reasonable Efforts to finance

all Construction Costs, net of any Capital Contributions, with the proceeds of Bonds issued at the beginning of the Construction Period. The Participant's share of Operation and Maintenance Costs and Debt Service Costs will equal its Entitlement Share (expressed as a percentage of all Entitlement Shares), subject to the adjustments provided for in the Power Sales Contracts.

(b) For so long as the Billing Period is a Month, on or before the 25th day after the end of each Billing Period beginning with the first Billing Period in the first Contract Year, UAMPS shall render to the Participant a billing statement showing the amount payable by the Participant for such Billing Period in respect of: (i) Development Costs, (ii) Operation and Maintenance Costs; (iii) Transmission Costs; (iv) Debt Service Costs; and (v) any other amounts, adjustments or reconciliations payable by or credited to the Participant pursuant to this Contract or the Financing Documents and not otherwise shown. The Participant shall pay the total of such amounts at the time specified in Section 27, as the same may be revised from time to time. The billing statement for each Billing Period shall be based, to the fullest extent practicable, upon the actual operation of the Project during such Billing Period. To the extent that any billing statement rendered by UAMPS shall have included any estimated amounts in respect of the Participant's share of Operation and Maintenance Costs, Debt Service Costs or the Transmission Costs or other costs allocable to the Participant, such estimated amounts shall be reconciled at least once during each Contract Year with the actual operation and scheduling of the Project and the Participant shall receive a bill or credit, as applicable, to reflect such reconciliations pursuant to clause (v) of this paragraph.

(c) Debt Service Costs, including any adjustments thereto, shall be determined by UAMPS in accordance with the Financing Documents. Operation and Maintenance Costs, including any adjustments thereto, shall be determined by UAMPS in accordance with the applicable provisions of the Power Sales Contracts and the Project Agreements. UAMPS and the Participant acknowledge and agree that certain categories of costs may be financed as a Cost of Acquisition and Construction (and paid by the Participant as Debt Service Costs or through Capital Contributions) or paid by the Participant as Operation and Maintenance Costs, as determined by the Project Management Committee, but without duplication of any item of cost. Transmission Costs, including any adjustments thereto, shall be determined by UAMPS in accordance with the applicable provisions of this Contract and the Transmission Agreements. The Participant shall pay all such amounts pursuant to Section 27.

(d) In the event that the failure of a Participant to make its payments in accordance with its Power Sales Contract shall have resulted in the application of amounts in any reserve or working capital funds for the Project, any amounts thereafter paid to UAMPS, including delayed-payment and interest charges, by such defaulting Participant in respect of past due payments (i) shall be used to replenish such fund or (ii) to the extent that the other Participants shall have made up the deficiency created by such application or paid additional amounts into any such funds, shall be credited, pro rata, on the billing statements of such other Participants in the next Billing Period or Billing Periods as shall be appropriate.

Section 27. Participant's Payment Obligations. (a) Payments required to be paid by the Participant to UAMPS shall be due and payable to UAMPS at its principal office or by wire transfer to such account as UAMPS shall designate in writing to the Participant, on the 10th day of the

Month following the Month in which the billing statement was rendered or at such other time as may be established by UAMPS pursuant to Section 25.

(b) If payment in full is not made by the Participant on or before the close of business on the due date, UAMPS shall impose a delayed payment charge on the unpaid amount due for each day overdue at a rate equal to the lesser of one percent per month, compounded monthly, or the maximum rate lawfully payable by the Participant; provided, however, that UAMPS, acting upon the direction of the Project Management Committee, may elect to waive such delayed payment charge (or portion thereof) but only to the extent that any such waiver will not adversely affect the ability of UAMPS to meet its payment obligations under the Project Agreements or the Financing Documents or materially increase the amounts payable by the other Participants. If said due date is not a business day, payment shall be made on the next following business day.

(c) The obligation of the Participant to make the payments for Development Costs, Operation and Maintenance Costs, Transmission Costs, Debt Service Costs and other amounts payable by the Participant pursuant to Section 26 is a several obligation and not a joint obligation with those of any other Participant. Prior to the Commercial Operation Date, the obligation of the Participant to make such payments shall constitute a cost of the development of a new power supply resource. From and after the Commercial Operation Date, the obligation of the Participant to make such payments shall constitute a cost of purchased electric power and electric energy. In all cases, the obligation of the Participant to make the payments required by Section 26 shall be payable as an operating expense and solely from the revenues and other legally available funds of its Electric System. In no event shall the Participant be obligated or required to levy or collect ad valorem property taxes or assessments to meet its payment obligations under this Contract. Such payments shall be made whether or not the Project or any portion thereof is acquired, completed, operable, operating, suspended or terminated, and notwithstanding the damage or destruction of the Project, the suspension, interruption, interference, reduction or curtailment of the Project Output, termination of any of the Project Agreements, loss or interruption of transmission from the Point of Delivery or termination of any Transmission Agreement, for any reason whatsoever, in whole or in part. The obligations of the Participant to make such payments shall not be subject to any reduction, whether by offset, counterclaim, or otherwise, and shall not be conditioned upon the performance by UAMPS under this or any other agreement or instrument.

(d) The payment obligations of the Participant under this Contract are special obligations payable solely from the revenues and other available income of its Electric System and do not, and shall not be deemed to, constitute an indebtedness or liability of the Participant under any constitutional, statutory or other legal limitation or requirement.

Section 28. Disputed Billings. In the event of any dispute as to any portion of the billing statement for such Billing Period, the Participant shall nevertheless pay the full amount of the disputed charges when due and shall give written notice of the dispute to UAMPS not later than the 60th day after such billing statement was submitted. Such notice shall identify the disputed billing statement, state the amount in dispute and set forth a full statement of the grounds for such dispute. No adjustment shall be considered or made for disputed charges unless such notice is given by the Participant. UAMPS shall give consideration to, and shall consult with the Project Management Committee with respect to, such dispute and shall advise the Participant with regard

to its position relative thereto within thirty (30) days following receipt of such written notice. Upon final determination (whether by agreement or determination by the Project Management Committee) of the correct amount, any difference between such correct amount and such full amount shall be accounted for in the billing statement next submitted to the Participant after such determination. For the avoidance of doubt, any overpayment or underpayment determined pursuant to Section 26(b) shall not be considered to be a disputed payment that is subject to this Section.

Section 29. Audit Rights. (a) At its cost, the Participant may, upon the giving of not less than 15 days' prior written notice to UAMPS, but not more often than once during any two-year period, inspect and audit the books and records of UAMPS relating to the Project for the purpose of verifying the amounts payable by the Participant under this Contract within the three-year period preceding the commencement of the audit. UAMPS agrees to make available to the Participant, to the extent Commercially Reasonable, all relevant records and all requested information relating to the subject matter of any such audit, subject in all cases to any confidentiality restrictions applicable to third-party information or contracts; provided that UAMPS shall make Commercially Reasonable Efforts to obtain a waiver of such restrictions for purposes of the audit and the Participant shall execute such non-disclosure agreements as may be reasonably requested by UAMPS. Any audit shall be conducted during normal business hours, and the Participant will use Commercially Reasonable Efforts to complete any audit within one month, subject to the availability of relevant records and information and the absence of material accounting irregularities.

(b) If any audit discloses that an overpayment or underpayment has been made during the three-year period described above, the amount of the overpayment or underpayment will be promptly paid by the appropriate party, together with interest calculated at an annual rate equal to the Secured Overnight Funding Rate (SOFR) reported on the website of the Federal Reserve Bank of New York, or reported by any successor to the Federal Reserve Bank of New York as administrator of SOFR, plus 100 basis points, compounded daily and on the basis of a 360-day year, from the date or dates of any such overpayment or underpayment through and including the date of the payment correcting the overpayment or underpayment. Any payment made by UAMPS pursuant to this Section shall constitute an item of Operation and Maintenance Costs.

Section 30. Representations and Warranties. (a) The Participant represents and warrants to UAMPS as follows:

(i) the Participant is a political subdivision, duly created and validly existing under the laws of the State of Utah, and has all corporate power and authority necessary to enter into and perform its obligations under this Contract;

(ii) this Contract has been duly authorized, executed and delivered by the Participant and constitutes its legal, valid and binding obligation enforceable in accordance with its terms;

(iii) the execution, delivery and performance by the Participant of this Contract does not and will not (A) conflict with any constitutional, statutory or regulatory provision,

judgment, decree or order applicable to the Participant and (B) constitute a breach of or a default under any bond ordinance, resolution or indenture or any contract or agreement to which the Participant is a party or to which any of the property, assets or revenues of its Electric System is subject;

(iv) all Required Approvals have been obtained;

(v) to the Participant's knowledge, there is no pending or threatened action or proceeding affecting the Participant which purports to affect the authorization, legality, validity or enforceability of this Contract, the Joint Action Agreement or the Pooling Agreement; and

(vi) prior to and in connection with its approval and execution of this Contract, the Participant conducted its own review of the descriptions, information and studies regarding the Project and this Contract provided by UAMPS and made an independent determination to enter into this Contract.

(b) UAMPS represents and warrants to the Participant as follows:

(i) UAMPS is a political subdivision of the State of Utah and an energy services interlocal entity, duly created and validly existing under the Act and the Joint Action Agreement;

(ii) UAMPS has all corporate power and authority necessary to enter into and perform its obligations under this Contract;

(iii) This Contract has been duly approved by the Project Management Committee and the Board and has been duly authorized, executed and delivered by UAMPS and constitutes its legal, valid and binding obligation enforceable in accordance with its terms;

(iv) the execution, delivery and performance by UAMPS of this Contract does not and will not (A) conflict with any constitutional, statutory or regulatory provision, judgment, decree or order applicable to UAMPS and (B) constitute a breach of or a default under any bond ordinance, resolution or indenture or any contract or agreement to which UAMPS is a party or to which any of its property, assets or revenues is subject;

(v) to UAMPS' knowledge, there is no pending or threatened action or proceeding affecting UAMPS which purports to affect the authorization, legality, validity or enforceability of this Contract, the Joint Action Agreement or the Pooling Agreement; and

(vi) the descriptions, information and studies regarding the Project and this Contract provided to the Participant by UAMPS have been prepared in good faith based upon the facts and information known to UAMPS at the time, and UAMPS has no reason

to believe that such descriptions, information and studies taken as a whole are incorrect or misleading in any material respect.

Section 31. Information to Be Made Available. (a) From and after the effective date of the Power Sales Contracts and subject to their availability under the applicable provisions of the Project Agreements, UAMPS shall make available for examination by the Participant:

(1) all books of accounts, records, documentation and contracts in the possession of UAMPS relating to the operation of the Project;

(2) copies of all agreements and data in the possession of UAMPS relating to the financing of the Project;

(3) copies of all operating and financial records and reports relating to the Project in the possession of UAMPS;

(4) copies of policies of insurance carried pursuant to Section 14; and

(5) such other information and documents with respect to the Project as the Participant may reasonably request from time to time.

(b) UAMPS may from time to time provide information to the Participant or the Participant's Representative that it designates as "non-public, "commercially sensitive," "confidential" or with similar words indicating that public disclosure of such information should not be made and can be expected to cause harm to UAMPS and the Participants. The Participant and the Participant's Representative agree to (i) classify any information as "non-public," "protected" or with such similar words as may be used under all public records laws that may apply to the Participant, (ii) notify UAMPS of any request or demand for disclosure of such information and (iii) cooperate with UAMPS in contesting any such disclosure request or demand.

(c) The Participant acknowledges that the ability of UAMPS to sell the Bonds depends upon, among other things, the credit standing of the Participants and their Electric Systems and that it will be necessary for UAMPS to provide certain information with respect to the Participants and their Electric Systems in connection with the sale of the Bonds (whether or not the Participant is making a Capital Contribution). Consequently, the Participant covenants to and agrees with UAMPS that the Participant will, upon request, provide to UAMPS all information with respect to the Participant and its Electric System, including financial and operating information and all contracts, documents, reports, bond resolutions and indentures, as may be requested by UAMPS or its counsel in connection with the financing of the Project and the issuance of the Bonds.

(d) The Participant covenants to and agrees with UAMPS that the Participant will furnish to UAMPS (1) not later than 180 days after the end of each fiscal year of the Participant, (A) a copy of the most recent annual financial statements of the Participant and its Enterprise Fund, audited by an independent certified public accountant or firm of such accountants, together with copies of all management letters and written recommendations and comments submitted by the accountants making such audit, and (B) the information and documents described in EXHIBIT II

attached hereto, and (2) such other information and documents as UAMPS may reasonably request from time to time.

(e) The Participant may notify UAMPS if non-public information is contained in the materials provided under EXHIBIT II. UAMPS agrees to (i) classify any such non-public information as "protected records" within the meaning of, and to the extent permitted under, the Utah Government Records Access and Management Act, (ii) agrees to cooperate with the Participant to appropriately classify any such non-public information under such other public records laws that apply to the Participant and (iii) notify the Participant of any demand for disclosure of such information and will cooperate with the Participant in contesting any such disclosure demand.

(f) Concurrently with its execution and delivery of this Contract, the Participant shall deliver to UAMPS (i) a certificate, together with attached exhibits, in substantially the form attached hereto as EXHIBIT III and (ii) an opinion of counsel in substantially the form attached hereto as EXHIBIT V. In connection with each issuance of Bonds by UAMPS and at such other times as UAMPS may reasonably request, the Participant shall deliver to UAMPS (iii) a bring-down certificate in substantially the form attached hereto as EXHIBIT IV, and (iv) a bring-down opinion of counsel in substantially the form attached hereto as EXHIBIT VI.

Section 32. Covenants and Agreements of the Participant. The Participant covenants to and agrees with UAMPS as follows:

(a) *Maintenance of Rates.* The Participant shall establish, maintain, revise, charge and collect rates for electric service rendered by it to its customers so that such rates shall provide revenues which, together with other funds reasonably estimated to be available, will be sufficient to meet the Participant's obligations to UAMPS under this Contract, to pay all other operating expenses of the Participant's Electric System and to provide revenues sufficient to pay all obligations of the Participant payable from, or constituting a charge or lien on, the revenues of its Electric System and, to the extent being paid from the revenues of its Electric System, all other bonds of the Participant now or hereafter outstanding.

(b) *Maintenance of Revenues*. The Participant shall promptly collect all charges due for electric utility services supplied by it as the same become due. The Participant shall at all times maintain and shall exercise Commercially Reasonable Efforts to enforce its rights against any person, customer or other entity that does not pay such charges when due.

(c) *Sale or Assignment of Electric System or Power Sales Contract*. During the term of this Contract, the Participant shall not sell, lease or otherwise dispose of all or substantially all of its Electric System, except upon compliance with the following provisions respecting the transfer or assignment of its Entitlement Share.

The Participant shall not assign, sell or transfer all or any part of its Entitlement Share or any or all of its interests under this Contract, except upon one hundred twenty (120) days' prior written notice to UAMPS and compliance with the provisions set forth below. Within thirty (30) days after receipt of such notice from the Participant (and if such notice indicates that the

Participant proposes to assign its Entitlement Share), UAMPS shall notify all of the other Participants of the proposed assignment or transfer by the Participant of all or part of its Entitlement Share. Each of the other Participants shall have the option of acquiring all or any portion of the Entitlement Share that is proposed to be assigned or transferred and shall notify UAMPS of its exercise of such option within forty-five days of its receipt of the notice from UAMPS referred to in the preceding sentence. In the event that two or more of the other Participants shall exercise their options with respect to the Entitlement Share that is proposed to be assigned or transferred in amounts which exceed the total Entitlement Share proposed to be assigned, UAMPS shall, to the extent necessary, make a pro rata allocation of the such Entitlement Share among the Participants which have exercised their options, based upon the existing Entitlement Shares of the requesting Participants. In the event that less than all of such Entitlement Share shall be acquired by other Participants, UAMPS shall notify the other Members of UAMPS of the proposed assignment of an Entitlement Share and shall provide such Members with an opportunity to acquire the remaining portion of the Participant's Entitlement Share.

In the event that less than all of the Entitlement Share proposed to be transferred or assigned is to be acquired by other Participants or other Members of UAMPS, the Participant may proceed to transfer or assign its Entitlement Share and its rights under this Contract upon satisfaction of the following conditions: (A) at the sole option of UAMPS either (i) the purchaser or assignee shall assume all obligations of the Participant under this Contract in such a manner as shall assure UAMPS to its sole satisfaction that the Participant's Entitlement Share to be purchased hereunder and the amounts to be paid therefor will not be reduced, and if and to the extent deemed necessary by UAMPS in its sole discretion to reflect such assignment and assumption, UAMPS and such purchaser or assignee shall enter into an agreement supplemental to this Contract to clarify the terms upon which the Participant's Entitlement Share is to be sold hereunder by UAMPS to such purchaser or assignee; or (ii) such purchaser or assignee shall enter into a new contract with UAMPS for the purchase of the Participant's Entitlement Share at a price and on terms which UAMPS in its sole discretion determines not to be less beneficial to it and the other Participants than this Contract; (B) the senior debt, if any, of such purchaser or assignee, if such purchaser or assignee is not a Participant shall be rated by at least "Baa2" or "BBB", as applicable, by at least one Rating Agency; (C) the Project Management Committee shall by resolution determine that such sale, lease or other disposition will not adversely affect UAMPS, the other Participants or the security for the payment of Bonds; and (D) UAMPS shall have received an opinion of Bond Counsel to the effect that such sale, assignment or disposition will not by itself adversely affect the Tax Status of Bonds theretofore issued or thereafter issuable. UAMPS shall make the determinations required by this subparagraph (3) within one hundred twenty (120) days of receipt by UAMPS of the notice referred to in the first sentence of this subparagraph and shall provide a written copy of such determinations to the Participant.

In the event any sale, lease or other disposition is permitted pursuant to this subparagraph (3), UAMPS may require as additional security to assure the flow of revenues under this Contract, and the transferring and assigning Participant shall provide or cause to be provided either a prepayment or a security deposit for amounts due under this Contract in such amounts as shall be determined by the Project Management Committee.

Upon the completion of any such sale, lease or other disposition, UAMPS shall prepare and send to each of the Participants a revised SCHEDULE I, setting forth the Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the Participants, as revised to reflect such sale, lease or other disposition.

(d) *Good Utility Practice*. The Participant shall, in accordance with Good Utility Practice, (i) at all times operate its Electric System and the business thereof in an efficient manner, (ii) maintain its Electric System in good repair, working order and condition, (iii) from time to time make all necessary and proper repairs, renewals, replacements, additions, betterments and improvements with respect to the Electric System, so that at all times the business thereof shall be properly conducted, and (iv) duly perform its obligations under all power supply and transmission service agreements to which it is a party.

(e) *Operating Expenses*. UAMPS and the Participant intend that the payments to be made by the Participant to UAMPS pursuant to this Contract will be payable (i) if and to the extent that any payments are required to be made prior to the Commercial Operation Date, from the revenues and income derived from the operation of the Participant's Electric System as a cost of the development of a new long-term power supply resource, (ii) from and after the Commercial Operation Date as a cost of purchased electric power and energy, and (iii) in each case as an operating expense of the Participant's Electric System and a first charge, together with all other operating expenses, on the revenues derived from the operation of the Participant's Electric System; *provided that* if any amount payable by the Participant under this Contract is prohibited from being paid as an operating expense of the Participant's Electric System under applicable law or a binding contractual obligation, such amount shall be payable from the available revenues and income of the Participant's Electric System. The Participant covenants to and agrees with UAMPS that it will, unless otherwise required by applicable law or under a binding contractual obligation, include the annual payments required to be made by it under this Contract as a cost of purchased electric power and energy as an operating expense in the annual operating budget of its Electric System and in any resolution, ordinance or indenture providing for future borrowings for the Participant's Electric System.

(f) *Tax Status*.

(i) The Participant agrees that it will apply all of the Electric Energy acquired under this Contract to a Qualified Use and that it will not take or omit to take any action (whether with respect to the Electric Energy acquired under this Contract or otherwise) which could, either alone or in conjunction with any other similar actions by the Participant or other Participants, adversely affect the Tax Status of any Bonds issued or issuable by UAMPS. Upon any breach of the foregoing covenants, the Participant shall take and pay the costs of all remedial actions as may be directed by UAMPS in order to maintain the Tax Status of the Bonds.

(ii) The Participant represents and warrants that, as of the Effective Date, it has no contracts (and has no current expectation of entering into any contracts) other than Permitted Output Contracts to provide electric service to any purchaser. At least thirty days prior to entering into any such contract, the Participant shall notify UAMPS of its

intent to enter into such contract and provide copies of such contract to UAMPS. Within thirty days after receipt of such notice, UAMPS shall advise the Participant as to whether, in the opinion of Bond Counsel, such contract would result in a violation of the covenant in clause (i) above. The cost of such opinion and other reports necessary in connection therewith shall be borne by the Participant.

(iii) The Participant agrees to provide such information as UAMPS may request and to comply with such additional instructions as may be provided by UAMPS in order to confirm and maintain the Qualified Use of the Electric Energy sold under this Contract.

Section 33. Default by Participant. Each of the following shall constitute a "default" by the Participant under this Power Sales Contract:

(a) failure of the Participant to make to UAMPS any of the payments for which provision is made in this Power Sales Contract within five business days after the due date of any such payment; or

(b) failure by the Participant to observe any of the covenants, agreements or obligations on its part contained herein and failure to remedy the same for a period of sixty days after written notice thereof, specifying such failure and requiring the same to be remedied, shall have been given by or on behalf of UAMPS; or

(c) bankruptcy, reorganization, arrangement, insolvency or liquidation proceedings, including without limitation proceedings under Title 11, Chapter 9, United States Code or other proceedings for relief under any federal or state bankruptcy law or similar law for the relief of debtors, are instituted by or against the Participant and, if instituted against the Participant, said proceedings are consented to or are not dismissed within thirty days after such institution.

Section 34. Continuing Obligation of Participant; Right of UAMPS to Discontinue Service. (a) In the event of any default referred to in Section 33, the Participant shall not be relieved of its liability for payment of any amounts in default or its failure to observe its covenants, agreements and obligations hereunder and UAMPS shall have the right to recover from the Participant any amount in default. In enforcement of any such right of recovery, UAMPS may bring any suit, action, or proceeding in law or in equity, including mandamus and action for specific performance, as may be necessary or appropriate to enforce any covenant, agreement or obligation of the Participant hereunder or the obligation of the Participant to make any payment for which provision is made in this Contract.

(b) In addition to proceeding with its rights against a defaulting Participant pursuant to paragraph (a) above, UAMPS may, upon not less than thirty days' written notice from UAMPS to the Participant, cease and discontinue providing all or any portion of the Participant's Entitlement Share and may terminate the Participant's right to receive the Electric Energy allocable to its Entitlement Share under this Power Sales Contract. In connection with its determination to discontinue providing all or any portion of a defaulting Participant's Entitlement Share, UAMPS shall take into account, among such other matters as UAMPS in its sole discretion shall deem

relevant, the amounts and due dates of its payment obligations under the Project Agreements and the Financing Documents and the funds and revenues available to UAMPS to enable it to meet its obligations thereunder. Any such termination of the Participant's Entitlement Share under this Power Sales Contract shall not, however, terminate, reduce or modify the Participant's outstanding obligations and liabilities hereunder.

(c) The suspension or termination of a defaulting Participant's right to receive its Entitlement Share and any actions taken by UAMPS pursuant to Section 35 shall not terminate, reduce or modify the defaulting Participant's obligations and liabilities under its Power Sales Contract. The defaulting Participant shall remain liable under all billing statements rendered by UAMPS, whether prior or subsequent to the default, and UAMPS for itself and on behalf of the nondefaulting Participants shall be entitled to recover from the defaulting Participant all damages, legal fees, costs and expenses incurred by UAMPS and the nondefaulting Participants as a result of such default. UAMPS shall exercise Commercially Reasonable Efforts to mitigate the damages resulting from the Participant's default.

Section 35. Transfer of Entitlement Share Following Default; Other Actions by UAMPS. (a) UAMPS and the Participant acknowledge that a default by any of the Participants under its Power Sales Contract could reduce the revenues available to UAMPS which are necessary in order for UAMPS to meet its obligations under the Project Agreements and the Financing Documents on a timely basis. In the event of an insufficiency of revenues and an inability on the part of UAMPS to meet its obligations under the Project Agreements and the Financing Documents on a timely basis, the ability of UAMPS to deliver Electric Energy from the Project and the interests of all of the Participants will be materially and adversely affected. The provisions of this Section are intended to assure the sufficiency of revenues to UAMPS following a default by a Participant under its Power Sales Contract by the reallocation of the defaulting Participant's Entitlement Share. As set forth below, UAMPS agrees to take certain actions to mitigate the impact of any such reallocation on the nondefaulting Participants. The Participants agree that the provisions of this Section are reasonable and necessary in order for them to achieve the benefits of their joint and cooperative undertaking with respect to the Project.

(b) In the event of a default by any Participant and discontinuance of service pursuant to Section 35 of such Participant's Power Sales Contract, but only if the Project has not been terminated, UAMPS and the nondefaulting Participants shall take the following actions in the order set forth below:

(1) UAMPS shall immediately make a mandatory allocation of the defaulting Participant's Entitlement Share among all of the nondefaulting Participants, pro rata on the basis of their original Entitlement Shares. UAMPS shall provide written notice to the nondefaulting Participants of the mandatory allocation of the defaulting Participant's Entitlement Share which notice shall (a) set forth the date of the mandatory allocation, (b) include a revised Schedule I showing the increased Entitlement Shares and (to the extent applicable) the revised Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the nondefaulting Participants as a result of such allocation, (c) direct each of the nondefaulting Participants to make an election pursuant to subparagraph (2) below, and (d) set forth the date by which each of the nondefaulting

Participants must notify UAMPS of its election pursuant to subparagraph (2) below. Such mandatory allocation of the defaulting Participant's Entitlement Share and the increased Entitlement Shares and the revised Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the nondefaulting Participants as a result of such allocation (as shown on the revised Schedule I prepared by UAMPS) shall remain in effect until the completion of the procedures provided for in this paragraph (a). During such period, each of the nondefaulting Participants shall have all of the rights, benefits, obligations and responsibilities associated with its increased Entitlement Share and its revised Capital Contribution Percentage, Debt Service Percentage and Debt Service Share as a result of such allocation.

(2) Within sixty days after the allocation of the defaulting Participant's Entitlement Share provided for in subparagraph (1) above, each of the nondefaulting Participants shall notify UAMPS in writing of its election of one of the following options: (A) to retain that portion of the defaulting Participant's Entitlement Share allocated to such nondefaulting Participant pursuant to subparagraph (1) above and the additional amount, if any, of the defaulting Participant's Entitlement Share that such nondefaulting Participant elects to acquire from any other nondefaulting Participant that may elect to retain less than all of the defaulting Participant's Entitlement Share allocated to it pursuant to subparagraph (1) above; or (B) to retain none or less than all of the defaulting Participant's Entitlement Share allocated to the Participant pursuant to subparagraph (1) above. Any Participant that shall have elected to retain all of that portion of the defaulting Participant's Entitlement Share allocated to it pursuant to subparagraph (1) above shall be deemed to have fully satisfied its obligations to UAMPS under this Section and shall not thereafter be required to accept any additional allocation of the defaulting Participant's Entitlement Share.

(3) Within thirty days after its receipt of the elections of all nondefaulting Participants pursuant to subparagraph (2), UAMPS shall determine whether the nondefaulting Participants have elected to retain all of the Entitlement Share of the defaulting Participants pursuant to subparagraph (2). In the event that any of the Participants shall have elected to retain less than all of its allocation of the defaulting Participant's Entitlement Share, UAMPS shall proportionally reallocate the remaining amount of the defaulting Participant's Entitlement Share among those nondefaulting Participants that have requested additional amounts of the defaulting Participant's Entitlement Share. To the extent necessary to provide for a complete reallocation of the defaulting Participant's Entitlement Share, UAMPS shall next reallocate any remaining portion of the defaulting Participant's Entitlement Share among those Participants that did not elect to retain all of their initial allocations of such Entitlement Share. Proportional reallocations shall be based upon the Entitlement Shares of the nondefaulting Participants in effect immediately prior to the defaulting Participant's default.

(4) In no event shall any reallocation of a defaulting Participant's Entitlement Share, or the total of all mandatory reallocations of Entitlement Shares in the event of two or more Participant defaults under the Power Sales Contracts, cause any nondefaulting

Participant's Entitlement Share to increase by more than [__]%* over its original Entitlement Share set forth on Schedule I.

(5) Each allocation or reallocation of a defaulting Participant's Entitlement Share shall also allocate or reallocate the defaulting Participant's Capital Contribution Percentage and Debt Service Percentage to the nondefaulting Participants receiving such allocation or reallocation. The Capital Contribution Percentage and the Debt Service Percentage of the defaulting Participant shall be allocated to each of such nondefaulting Participants proportionally based upon the respective amounts of the defaulting Participant's Entitlement Share that are allocated or reallocated to them.

(6) UAMPS shall deliver, promptly after making the determinations and reallocations required by this paragraph (b), a notice to the nondefaulting Participants which notice shall (A) set forth the reallocation of the defaulting Participant's Entitlement Share made by UAMPS pursuant to subparagraph (3) above, and the effective date of such reallocation, (B) set forth the amount, if any, of the Entitlement Share of the defaulting Participant that has been mandatorily reallocated to nondefaulting Participants that did not elect to retain or acquire the same, and (C) include a revised SCHEDULE I showing the revised Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares, respectively, of the nondefaulting Participants as a result of the reallocation provided for under subparagraph (3). The Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares shown on such revised SCHEDULE I shall thereafter be the Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the nondefaulting Participants.

(7) Any portion of the Entitlement Share of a defaulting Participant transferred pursuant to this paragraph (b) to a nondefaulting Participant shall become a part of and shall be added to the Entitlement Share of each transferee Participant, and from and after the date of such transfer the transferee Participant shall be obligated to pay for its increased Entitlement Share pursuant to the terms and provisions of this Power Sales Contract. The defaulting Participant shall remain liable to UAMPS and the other Participants for costs incurred and damages suffered by them in connection with the actions taken with respect to the defaulting Participant's Entitlement Share provided for in this Section.

(c) In the event that any portion of a defaulting Participant's Entitlement Share shall have been mandatorily reallocated to nondefaulting Participants pursuant to paragraph (b)(3) above or in the event that the procedures set forth in paragraph result in the reallocation of less than all of a defaulting Participant's Entitlement Share, UAMPS shall use Commercially Reasonable Efforts to sell or dispose of all or any part of the defaulting Participant's Entitlement Share as follows and in the following order:

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* This amount will not exceed 25% and will be determined by the Project Management Committee upon the Effective Date of the Power Sales Contracts.

(1) UAMPS shall first seek to sell all or any part of the defaulting Participant's Entitlement Share on terms and conditions comparable to those contained in the Power Sales Contracts; and

(2) UAMPS shall then seek to sell all or any part of such portion of the defaulting Participant's Entitlement Share or the Electric Energy associated therewith on the best obtainable terms and conditions.

Subject to the provisions of the Financing Documents, no sale, transfer or other disposition of all or a part of an Entitlement Share shall be made pursuant to this paragraph (c) if such sale, transfer or disposition will adversely affect the exclusion from gross income for federal income tax purposes of the interest on any of the Bonds issued as tax exempt obligations.

(d) In the event that UAMPS is unable to sell or dispose of any portion of the defaulting Participant's Entitlement Share pursuant to paragraph (c) above within 180 days of commencing Commercially Reasonable Efforts so to do and UAMPS, based upon determinations by the Project Management Committee and the Board, determines that the inability to sell or dispose of the defaulting Participant's Entitlement Share will materially and adversely affect the ability of the nondefaulting Participants to meet their obligations under the Power Sales Contract or the ability of UAMPS to meet its obligations under the Project Agreements and the Financing Documents, then UAMPS shall take such actions as UAMPS in its sole discretion shall deem necessary to ensure the availability of sufficient funds and revenues to enable UAMPS to meet its obligations under the Project Agreements and the Financing Documents. Such actions may include, without limitation, any of the following measures (or any combination thereof):

(1) UAMPS may sell all or any portion of the Project that is allocable to the defaulting Participant's Entitlement Share on such terms and conditions as UAMPS deems to be in the best interest of UAMPS and the nondefaulting Participants and shall apply the proceeds of such sale to the purchase, redemption or defeasance of the Bonds or to other purposes related to the Project; or

(2) UAMPS may enter into contractual arrangements for the sale of all or any portion of the defaulting Participant's Entitlement Share or the Electric Energy associated therewith on such terms and conditions as will maximize the revenues available to UAMPS without regard to any adverse effect that such sale may have on the exclusion of interest on the Bonds from gross income for federal income tax purposes.

In the event that UAMPS makes any sale pursuant to clause (2) above, UAMPS will obtain an opinion of Bond Counsel addressing the tax status of interest on the Bonds issued as tax exempt obligations. UAMPS will take such remedial actions as are available to it to preserve the tax exempt status of interest on such Bonds. In the event that such opinion indicates that interest on the Bonds is or will become includible in gross income for federal income tax purposes, the Participant acknowledges that it may be necessary for UAMPS to pay additional amounts as interest or penalties on the Bonds and that the Debt Service Costs payable by the Participant pursuant to Section 26 will increase correspondingly. The Participant agrees to pay its Debt

Service Share of such increased Debt Service Costs pursuant to the provisions of this Power Sales Contract.

(e) Upon any sale or disposition of all or any portion of a defaulting Participant's Entitlement Share or the Electric Energy associated therewith or any sale of the Project pursuant to paragraphs (c) and (d) above, UAMPS shall take into account the proceeds realized or the revenues to be received from such sale or disposition and shall, to the extent necessary, make adjustments to the Entitlement Share, Capital Contribution Percentage, Debt Service Percentage and Debt Service Share of each of the nondefaulting Participants to reflect such sale or disposition and to ensure the receipt of revenues sufficient to enable UAMPS to meet its obligations under the Project Agreements and the Financing Documents. The Participant acknowledges that such adjustments may, under certain circumstances, result in a change in the Participant's share of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs without a corresponding change in the Participant's Entitlement Share. Upon the completion of the procedures provided for in this Section, UAMPS shall prepare and send to each of the Participants a final revised SCHEDULE I, setting forth the Entitlement Shares, the Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares, respectively, of the nondefaulting Participants after the procedures and actions provided for in this Section.

Section 36. Other Default by Participant. In the event of a failure of the Participant to observe, keep and perform any of the covenants, agreements or obligations on its part contained in this Power Sales Contract, UAMPS may, in addition to its other rights hereunder, bring any suit, action, or proceeding in law or in equity, including mandamus, injunction and action for specific performance, as may be necessary or appropriate to enforce any covenant, agreement or obligation of this Power Sales Contract against the Participant.

Section 37. Default by UAMPS; Dispute Resolution. (a) In the event of any default by UAMPS under any covenant, agreement or obligation of this Power Sales Contract, the Participant's sole remedy for such default shall be limited to mandamus, injunction, action for specific performance or any other available equitable remedy as may be necessary or appropriate and in no event shall the Participant withhold or offset any payment owed to UAMPS hereunder.

(b) Prior to and as a condition to the filing of any action with respect to this Contract under paragraph (a) above, the Participant shall first submit the dispute or matter in question to the Project Management Committee for mediation by giving notice in writing to UAMPS and the Chair of the Project Management Committee describing the dispute or matter and the issue or issues to be resolved. The Participant agrees to participate fully and in good faith in all mediation proceedings of the Project Management Committee. In the event that the Project Management Committee is unable to resolve or mediate such dispute or matter within 120 days after UAMPS has received written notice of the dispute, the Participant shall have the right to initiate such proceedings as it may deem necessary pursuant to paragraph (a).

Section 38. Abandonment of Remedy. In case any proceeding taken on account of any default shall have been discontinued or abandoned for any reason, the parties to such proceedings shall be restored to their former positions and rights hereunder, respectively, and all rights,

remedies, powers and duties of UAMPS and the Participant shall continue as though no such proceedings had been taken.

Section 39. Waiver of Default. Any waiver at any time by either UAMPS or the Participant of its rights with respect to any default of the other party hereto, or with respect to any other matter arising in connection with this Power Sales Contract, shall not be a waiver with respect to any subsequent default, right or matter.

Section 40. Relationship to and Compliance with Other Instruments. (a) It is recognized by the parties hereto that UAMPS, in undertaking, or causing to be undertaken, the planning, financing, construction, acquisition, operation and maintenance of the Project, must comply with the requirements of the Financing Documents, the Project Agreements and all Permits and Approvals necessary therefor, and it is therefore agreed that this Power Sales Contract is made subject to the terms and provisions of the Financing Documents, the Project Agreements and all such Permits and Approvals.

(b) UAMPS covenants and agrees that it will use Commercially Reasonable Efforts for the benefit of the Participant to comply in all material respects with all terms, conditions and covenants applicable to it contained in the Financing Documents, the Project Agreements and all Permits and Approvals relating thereto and that it will not, without the consent of the Participant, enter into any amendment or modification of the Financing Documents or the Project Agreements which will change the Participant's Entitlement Share or which will materially and adversely affect the rights and obligations of the Participant hereunder.

Section 41. Liability of Parties. UAMPS and the Participant shall assume full responsibility and liability for the maintenance and operation of their respective properties and each shall, to the extent permitted by law, indemnify and save harmless the other from all liability and expense on account of any and all damages, claims, or actions, including injury to or death of persons arising from any act or accident in connection with the installation, presence, maintenance and operation of the property and equipment of the indemnifying party and not caused in whole or in part by the negligence of the other party; *provided* that any liability which is incurred by UAMPS through the operation and maintenance of the Project or pursuant to the Project Agreements and not covered, or not covered sufficiently, by insurance shall be paid solely from the revenues of UAMPS hereunder, and any payments made by UAMPS to satisfy such liability shall, except to the extent paid from proceeds of Bonds or Capital Contributions, become part of Operation and Maintenance Costs.

Section 42. Assignment of Power Sales Contract. (a) This Power Sales Contract shall inure to the benefit of and shall be binding upon the respective successors and assigns of the parties to this Power Sales Contract; *provided, however,* that neither this Power Sales Contract nor any interest herein shall be transferred or assigned by either party hereto except as follows:

(1) UAMPS may assign its interests under this Power Sales Contract or all or any portion of the amounts payable by the Participant hereunder pursuant to the Financing Documents as described in paragraph (b) below;

(2) UAMPS may sell, transfer or reallocate all or any portion of the Participant's Entitlement Share following a default by the Participant and a discontinuance of service as provided in Section 35;

(3) After such point in time as all Bonds issued under the Financing Documents have been paid or deemed to have been paid as provided in the Financing Documents, UAMPS may assign this Power Sales Contract and pledge the amounts payable by the Participant hereunder without limitation;

(4) the Participant shall assign the Electric Energy allocable to the Participant's Entitlement Share to the UAMPS Pool as provided in Section 10; and

(5) subject to the provisions of Section 32, the Participant may assign or transfer all or any portion of its Entitlement Share or its interests under this Power Sales Contract.

(b) The Participant acknowledges and agrees that UAMPS may assign and pledge to the Trustee designated in the Financing Documents all or any portion of its right, title, and interest in and to the payments to be made to UAMPS under the provisions of this Power Sales Contract, as security for the payment of the principal (including sinking fund installments) of, premium, if any, and interest on Bonds and, upon such assignment and pledge, UAMPS may grant to the Trustee any rights and remedies herein provided to UAMPS, and thereupon any reference herein to UAMPS shall be deemed, with the necessary changes in detail, to include the Trustee which on behalf of and together with the owners from time to time of the Bonds shall be third party beneficiaries of the covenants and agreements of the Participant herein contained.

Section 43. Termination or Amendment of Power Sales Contract. (a) This Power Sales Contract shall not be terminated by either party under any circumstances, whether based upon the default of the other party under this Power Sales Contract or any other instrument or otherwise except as specifically provided in this Power Sales Contract.

(b) This Power Sales Contract shall not be amended, modified, or otherwise altered in any manner that will adversely affect the security for the Bonds afforded by the provisions of this Power Sales Contract. So long as any of the Bonds are outstanding or until adequate provisions for the payment thereof have been made in accordance with the provisions of the Financing Documents, this Power Sales Contract shall not be amended, modified, or otherwise altered in any manner which will reduce the payments pledged as security for the Bonds or extend the time of such payments provided herein or which will in any manner impair or adversely affect the rights of the owners from time to time of the Bonds.

(c) Subject to Section 6, no Power Sales Contract entered into between UAMPS and another Participant may be amended so as to provide terms and conditions that are substantially and materially different from those herein contained except upon written notice to and written consent or waiver by each of the other Participants, and upon similar amendment being made to the Power Sales Contract of any other Participants requesting such amendment after receipt by such Participant of notice of such amendment.

(d) In connection with any revision or amendment of the billing procedures provided for in Section 25 or of any of the Exhibits, UAMPS shall promptly provide a copy of the revision or amendment to the Participant.

Section 44. Notices and Computation of Time. All notices, demands or other communications made pursuant to this Contract (each, a *"Notice"*) may be sent by facsimile, electronic mail, other mutually acceptable electronic means, a nationally recognized overnight courier service, first class mail or hand delivery. Notice shall be deemed given when received by the addressee, unless received on a day that is not a business day or received after 5:00 p.m. (receiving party's local time) on a business day, in which case Notice shall be deemed to have been received on the next following business day. In the absence of proof of the actual receipt date, the following presumptions will apply: (i) Notice sent by facsimile or electronic mail shall be deemed to have been received upon the sending party's receipt of electronic confirmation of successful transmission; (ii) Notice sent by overnight mail or courier shall be deemed to have been received on the next business day after it was sent or such earlier time as is confirmed by the receiving party; and (iii) Notice sent by first class mail shall be deemed to have been received five business days after mailing.

(b) All Notices shall be sent by UAMPS to the business address, facsimile address or e-mail address of the Participant's Representative. All Notices shall be sent by the Participant to the business address, facsimile address or designated e-mail address of UAMPS. Either party may change its Notice address(es) by Notice to the other party.

Section 45. Relationship of UAMPS and the Participant; Relationship among Participants. (a) This Power Sales Contract is not intended to create, nor shall it be deemed to create, any relationship between UAMPS and the Participant other than that of independent parties contracting with one another for the purpose of effectuating the provisions of this Power Sales Contract.

(b) The covenants, obligations, liabilities, rights and benefits of the Participant under this Power Sales Contract are individual and not joint and several, or collective, with those of any other Participant. Other than giving effect to the joint and cooperative action of UAMPS on behalf of the Participants, the Power Sales Contracts shall not be construed to create an association, joint venture, trust or partnership, or to impose a trust or partnership covenant, obligation or liability on, between or among the Participant and any one or more of the Participants. No Participant shall be or be deemed to be under the control of, nor shall any Participant control or be deemed to control, any or all of the other Participants or the Participants as a group. No Participant shall be bound by the actions of any other Participant, nor shall any Participant be deemed to be the agent of any other Participant or have the right to bind any other Participant.

S*ection 46. No Recourse Against Officers, Etc. of UAMPS or Participant*. No member of the governing body, nor any officer or employee of UAMPS or the Participant shall be individually or personally liable for any payment under this Power Sales Contract or be subject to any personal liability or accountability by reason of the execution of this Power Sales Contract; *provided, however,* that this Section shall not relieve any officer or employee of UAMPS or the Participant from the performance of any official duty imposed by law or this Power Sales Contract.

Section 47. Governing Law; Jurisdiction and Venue. (a). This Power Sales Contract is made under and shall be governed by the law of the State of Utah; *provided, however,* that if the Participant is organized or created pursuant to the laws of another state, then the authority of the Participant to execute and perform its obligations under this Power Sales Contract shall be determined under the laws of such state. Headings herein are for convenience only and shall not influence the construction hereof.

(b) All judicial proceedings brought against either party arising out of or relating hereto shall be brought exclusively in the courts of the State of Utah or of the United States of America for the District of Utah. By executing and delivering this Contract, each party, for itself and in connection with its properties, irrevocably accepts generally and unconditionally the nonexclusive jurisdiction and venue of such courts; waives any defense of *forum non conveniens*; agrees that service of all process in any such proceeding in any such court may be made by registered or certified mail, return receipt requested, to the party at its address provided in accordance with Section 44; and agrees that service as provided above is sufficient to confer personal jurisdiction over the party in any such proceeding in any such court, and otherwise constitutes effective and binding service in every respect.

Section 48. Severability; No Merger. (a) If any section, paragraph, clause or provision of this Power Sales Contract shall be finally adjudicated by a court of competent jurisdiction to be invalid, the remainder of this Power Sales Contract shall remain in full force and effect as though such section, paragraph, clause or provision or any part thereof so adjudicated to be invalid had not been included herein.

(b) This Power Sales Contract constitutes the entire and complete agreement of UAMPS and the Participant in respect of the Project and shall not be nor shall it be deemed to be modified, amended or superseded by any other agreement or contract between UAMPS and the Participant in respect of any other project or subject.

Section 49. Contract Beneficiaries. This Contract is entered for the benefit of and as the binding agreement of UAMPS and the Participant. The Trustee and the owners of the Bonds are the only third-party beneficiaries of this Contract, as and to the extent provided in the Financing Documents.

IN WITNESS WHEREOF, the parties hereto have caused this Power Sales Contract to be executed by their proper officers respectively, being thereunto duly authorized, and their respective corporate seals to be hereto affixed, as of the day, month and year first above written.

ST. GEORGE CITY, UTAH

By:_____
Its Mayor

[SEAL]

ATTEST AND COUNTERSIGN

By:_____
Title: City Recorder

UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS

By:_____
Chairman

[SEAL]

ATTEST AND COUNTERSIGN

By:_____
Assistant Secretary

PRELIMINARY

SCHEDULE D

SCHEDULE OF PARTICIPANTS, DEVELOPMENT SHARES AND DEVELOPMENT COST SHARES

PARTICIPANT	DEVELOPMENT SHARE (KW)	DEVELOPMENT COST SHARE (%)*
TOTAL		100.0000%

* Column may not total due to rounding.

SCHEDULE I

SCHEDULE OF PARTICIPANTS, ENTITLEMENT SHARES

SCHEDULE OF PARTICIPANTS, ENTITLEMENT SHARES, CAPITAL CONTRIBUTION PERCENTAGES, DEBT SERVICE PERCENTAGES AND DEBT SERVICE SHARES*

PARTICIPANT	ENTITLEMENT SHARE	
	kW	%**
TOTAL		%

* Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares to be added if Capital Contributions are made.

** Column may not total due to rounding.

EXHIBIT I

DESCRIPTION OF THE INITIAL FACILITIES

The following is a preliminary and summary description of the Initial Facilities. This description is subject to change based upon selection of the Contractor, the negotiation of the final terms of the Construction Contracts and the construction of the Initial Facilities. The final description of the Initial Facilities will be approved by the Project Management Committee after the Project achieves commercial operation.

PARTICIPANT _____
FISCAL YEAR _____

EXHIBIT II

FORM OF PARTICIPANT'S ANNUAL INFORMATION REPORT*

SYSTEM DESCRIPTION

Incorporated area of municipality _____ square miles.

Service area of utility _____ square miles.

Transmission and distribution lines _____ miles.

Number of employees in electrical department _____. (Include sum of shared employees' time in other city offices to determine equivalent full-time employees.)

Number of customers served outside the city limits _____.

Service area outside of the city limits _____ square miles.

NUMBER OF ELECTRICAL CUSTOMERS AND TYPE OF LOAD SERVED

CUSTOMER CLASS	NUMBER OF CUSTOMERS
Residential	
Commercial	
Industrial	
Agricultural and Pumping	
Military and Other	
TOTAL	

Annual audit will be sent to UAMPS as soon as completed after the fiscal year.

Electric Rate Schedules for the above classes of service are attached hereto.

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* Under Section 31(d) of the Power Sales Contract, UAMPS has agreed to classify certain of the information provided by the Participant on this Exhibit II as a "protected record," pursuant to the Participant's request. The Participant must also take any actions necessary on its part to appropriately classify and protect such information provided in this Exhibit.

Customer Sales by Class

Total sales to your customers _____ kWh.

Revenues from energy sales to your customers in $_____.

CUSTOMER CLASS	KWH SALES	REVENUES ($)
Residential		
Commercial		
Industrial		
Agricultural		
Other		
TOTAL		

GENERATION
PRODUCED FOR SYSTEM LOAD

	GENERATING UNIT PRODUCTION							
	#1		#2		#3		#4	
	kW	kWh	kW	kWh	kW	kWh	kW	kWh
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
TOTAL								

SYSTEM PEAK INCLUDING LOAD
COVERED BY OWN GENERATION

	kW		kW
July		January	
August		February	
September		March	
October		April	
November		May	
December		June	

FIVE LARGEST LOADS

	TYPE OF BUSINESS	KWH SOLD	ANNUAL ELECTRICAL BILLINGS
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

ACHIEVEMENTS

Provide below the achievements of your utility for the year.

EXHIBIT III

FORM OF CERTIFICATE OF PARTICIPANT

STATE OF _____)
)
COUNTY OF _____)

The undersigned hereby certify that they are the [Executive Officer] and [Clerk/Recorder/Secretary] of _____ (the *"Participant"*), a member of Utah Associated Municipal Power Systems (*"UAMPS"*), and that as such they are authorized to execute this Certificate on behalf of the Participant and hereby certify as follows:

1. This Certificate has been executed pursuant to Section 31(f) of the Power County Power Project Power Sales Contract, dated as of December 1, 2024 (the *"Power Sales Contract"*), between the Participant and UAMPS, in connection with the execution and delivery of the Power Sales Contract. Capitalized terms used and not otherwise defined herein have the meanings assigned to them in the Power Sales Contract.

2. The Participant is a _____, duly created and validly existing under the laws of the State of _____ (the *"State"*), and is governed by a _____ (the *"Governing Body"*).

3. Attached hereto as *Exhibit A* is a true, complete and correct copy of a resolution authorizing the execution and delivery of the Power Sales Contract and related matters (the *"Contract Resolution"*). The Contract Resolution was duly adopted by a majority of the Governing Body present and voting at a public meeting of the Governing Body held on _____, at which a quorum was present and acted throughout.

4. The meeting of the Governing Body at which the Contract Resolution was adopted was duly called, noticed and held in conformity with applicable laws of the State and procedural rules of the Governing Body. The Contract Resolution is in full force and effect and has not been amended, modified, repealed or supplemented.

5. The names of the [Executive Officer] and the [Clerk/Recorder/Secretary] authorized to execute and deliver the Power Sales Contract on behalf of the Participant are as follows:

NAME	OFFICE
«officer»	[Executive Officer]
«officer»	[Clerk/Recorder/Secretary]

6. (a) No petition was filed with the Participant or any of its officers seeking to refer the Contract Resolution to the electors of the Participant in accordance with the provisions of state law; and (b) no litigation has been instituted, is pending or has been threatened to require a referendum election on the Contract Resolution.

7. The Participant owns and operates an electric utility system (the *"System"*) that distributes and furnishes electric energy to consumers located within the established service area of the System. The Participant will use all of the electric energy from its Entitlement Share in a Qualified Use.

8. The Participant has previously executed the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action dated as of March 20, 2009, and all amendments thereof and supplements thereto (the *"Joint Action Agreement"*) and that certain Power Pooling Agreement (the *"Pooling Agreement"*) between the Participant and UAMPS relating to the power pool administered by UAMPS. The Joint Action Agreement and the Pooling Agreement are each in full force and effect and constitute the legal, valid and binding agreements of the Participant.

9. «Rep» has been duly appointed by the Governing Body as the Participant's representative to UAMPS.

10. The representations and warranties of the Participant in Section 30 of the Power Sales Contract are true and correct on and as of the date of this certificate.

11. The Participant acknowledges that the information it provides under Section 31(c) and (d) of the Power Sales Contract may be used by UAMPS in connection with the issuance of Bonds to finance the Development Costs and the Cost of Acquisition and Construction of the Project and to provide necessary information to lenders and other interested parties.

Dated: _____.

[PARTICIPANT]

By _____
[Executive Officer]

By _____
[Clerk/Recorder/Secretary]

[Seal]

EXHIBIT A

[Form of Contract Resolution]

RESOLUTION NO. _____

A RESOLUTION AUTHORIZING AND APPROVING THE POWER COUNTY POWER PROJECT POWER SALES CONTRACT WITH UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS; AND RELATED MATTERS.

***** ***** *****

WHEREAS, _____ (the *"Participant"*) is a member of Utah Associated Municipal Power Systems (*"UAMPS"*) pursuant to the provisions of the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action, as amended (the *"Joint Action Agreement"*);

WHEREAS, one of the purposes of UAMPS under the Joint Action Agreement is the acquisition and construction of electric generating, transmission and related facilities in order to secure reliable, economic sources of electric power and energy for its members;

WHEREAS, UAMPS proposes to acquire and construct a combined cycle natural gas-fired electric generating facility plant known as the "Power County Power Project" (the *"Project"*) to be located at a site in Power County, Idaho, and to sell the capacity and output of the Project pursuant to the Power County Power Project Power Sales Contracts (the *"Power Sales Contracts"*) between UAMPS and the Participants (capitalized terms used and not defined herein have the meanings assigned to them in the Power Sales Contracts);

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) certain descriptions and summaries of the Project and the Power Sales Contracts, and representatives of the Participant have participated in discussions and conferences with UAMPS and others regarding the Project and have received from UAMPS all requested information and materials necessary for the decision of the Governing Body to authorize and approve the Power Sales Contract;

WHEREAS, the Participant acknowledges that the obligation of the Participant to make the payments provided for in the Power Sales Contract will be a special obligation of the Participant and an operating expense of the Participant's electric system, payable from the revenues and other available funds of the electric system, and that the Participant shall be unconditionally obligated to make the payments required under the Power Sales Contract whether or not the Project or any portion thereof is acquired, constructed, completed, operable or operating and notwithstanding the suspension, interruption, interference, reduction or curtailment of the output thereof for any reason whatsoever; and

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) its current and projected needs for electric power and energy and information with respect to the Project prepared by UAMPS setting forth, among other things, preliminary estimates of the Development Costs, the Cost of Acquisition and Construction, the estimated timeline for the development and construction of the Project and related matters, and now desires to authorize and approve the Power Sales Contract;

NOW, THEREFORE, BE IT RESOLVED by the Governing Body of _____, as follows:

Section 1. Approval of Power Sales Contract; Development Share. (a) The Power Sales Contract, in substantially the form attached hereto as *Annex A*, is hereby authorized and approved, and the [Executive Officer] is hereby authorized, empowered and directed to execute and deliver the Power Sales Contract on behalf of the Participant, and the [Clerk/Recorder/Secretary] is hereby authorized, empowered and directed to attest and countersign such execution and to affix the corporate seal of the Participant to the Power Sales Contract, with such changes to the Power Sales Contract from the form attached hereto as *Annex A* as shall be necessary to conform to the Participant's legal status, to complete the form of the Power Sales Contract or to correct any minor irregularities or ambiguities therein and as are approved by the [Executive Officer], his execution thereof to constitute conclusive evidence of such approval.

(b) A Development Share representing _____ kW of capacity in the Project is hereby authorized and approved. The Participant acknowledges that (i) its Development Share may be increased to provide for a full allocation of the Project Output and (ii) by virtue of its Development Share, the Participant will have an Entitlement Share with the same amount of Electric Power as its Development Share from and after the Completion of Development through the remaining term of the Power Sales Contract, all as provided in the Power Sales Contract.

Section 2. Participant's Representative. (a) The appointment of _____ as the Participant's Representative to UAMPS and of _____ and _____ as alternate Representatives is hereby confirmed.

(b) Such Representative (or, in his or her absence, such alternate(s)) is hereby delegated full authority to (i) approve any appendix to the Pooling Agreement between UAMPS and the Participant that may be necessary or desirable in connection with the utilization of the Participant's Entitlement Share, and (ii) act on all matters that may come before the Project Management Committee established by the Power Sales Contract, and shall be responsible for reporting regularly to the Governing Body regarding the activities of the Project Management Committee.

Section 3. Compliance with Tax Covenants. The Participant agrees in the Power Sales Contract that it will apply all of the electric power and energy acquired under the Power Sales Contract to a Qualified Use and that it will not take or omit to take any action which could adversely affect the Tax Status of any Bond or Bonds theretofore issued or thereafter issuable by UAMPS. In furtherance of that agreement, the Governing Body of the Participant hereby agrees that it will observe and comply with such instructions as may be provided from time to time by UAMPS with respect to the Qualified Use of the electric power and energy acquired under the Power Sales Contract.

Section 4. Further Authority. (a) The [Executive Officer] and the [Clerk/Recorder/Secretary] are hereby authorized, empowered and directed to (i) execute the Certificate of the Participant in substantially the form attached as EXHIBIT III to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Certificate of the Participant in substantially the form attached as *Exhibit IV* to the Power Sales Contract and to deliver the same to UAMPS.

(b) The Participant's legal counsel is hereby authorized, empowered and directed to (i) execute the Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT V to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT VI to the Power Sales Contract and to deliver the same to UAMPS.

Section 5. Miscellaneous; Effective Date. (a) This resolution shall be and remain irrepealable until the expiration or termination of the Power Sales Contract in accordance with its terms.

(b) All previous acts and resolutions in conflict with this resolution or any part hereof are hereby repealed to the extent of such conflict.

(c) In case any provision in this resolution shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

(d) This resolution shall take effect immediately upon its adoption and approval.

ADOPTED AND APPROVED this __ day of _____, _____.

[PARTICIPANT]

By _____

_____

ATTEST:

_____

[Secretary/Clerk/Recorder]

[SEAL]

ANNEX A

[Attach Power Sales Contract]

EXHIBIT IV

FORM OF BRING DOWN CERTIFICATE OF THE PARTICIPANT

STATE OF _____)
)
COUNTY OF «COUNTY»)

The undersigned hereby certify that they are the [Executive Officer] and [Clerk/Recorder/Secretary] of _____ (the *"Participant"*), a member of Utah Associated Municipal Power Systems (*"UAMPS"*), and that as such they are authorized to execute this Certificate on behalf of the Participant and hereby certify as follows:

1. This certificate has been executed in connection with the issuance by UAMPS of its Power County Power Project Revenue Bonds, _____ Series ____ (the *"Bonds"*), as more fully described in the Official Statement of UAMPS dated _____ (the *"Official Statement"*) prepared in connection with the offering and sale of the Bonds.

2. Pursuant to Section 31(f) of the Power County Power Project Power Sales Contract, dated as of December 1, 2024, between the Participant and UAMPS, in connection with the execution and delivery of the Power County Power Project, the undersigned executed and delivered a certificate dated _____ (the *"Original Certificate"*). The undersigned hereby reaffirm the statements made in the Original Certificate on and as of the date hereof. Capitalized terms used and not otherwise defined herein have the meanings assigned to them in the Original Certificate.

[3. The undersigned have reviewed the statements and information relating to the Participant and its electric system contained in APPENDIX __ to the Preliminary Official Statement and the Official Statement under the caption, "THE PARTICIPANTS", and such statements and information, as of the respective dates of the Preliminary Official Statement and the Official Statement and as of the date hereof, (a) were and are true and correct in all material respects and fairly and accurately present the financial and operating position of the System for the periods and as of the dates presented and (b) did not and do not omit to state a material fact necessary in order to make such statements not misleading. Since the dates of the Preliminary Official Statement and the Official Statement, there has been no change in the business, financial position, results of operations or condition of the Participant or the System that would (x) materially affect the accuracy and completeness of such statements and information or (y) materially and adversely affect the ability of the Participant to meet its obligations under the Power Sales Contract.]

Dated this _____ day of _____.

[PARTICIPANT]

By _____
Its_____

[SEAL]

EXHIBIT V

FORM OF OPINION OF COUNSEL TO THE PARTICIPANT

_____

Utah Associated Municipal Power Systems
155 North 400 West, Suite 480
Salt Lake City, UT 84103

Ladies and Gentlemen:

I have acted as counsel to _____ (the "*Participant"*) in connection with the Power County Power Project Power Sales Contract, dated as of December 1, 2024 (the *"Power Sales Contract"*), between the Participant and Utah Associated Municipal Power Systems (*"UAMPS"*). I have been advised that, pursuant to the Power Sales Contract, UAMPS has undertaken the Project and has sold all of the Electric Energy from the Project to the Participant and others that have executed Power Sales Contracts with UAMPS.

This opinion is being delivered to you pursuant to Section 31(f) of the Power Sales Contract in connection with the execution and delivery of the Power Sales Contract. Capitalized terms used and not defined herein have the meanings assigned to such terms in the Power Sales Contract.

As counsel to the Participant, I have examined (i) those documents relating to the existence, organization and operation of the Participant and its electric utility system (the *"System"*), (ii) all resolutions and proceedings of the Participant relating to the due authorization, execution and delivery by the Participant of the Power Sales Contract, (iii) an executed counterpart of the Power Sales Contract, and (iv) such other documents, information, facts and matters of law as are necessary for me to render the opinions contained herein.

Based upon the foregoing, I am of the opinion that:

1. The Participant is a _____ duly organized and validly existing under the laws State of _____ (the *"State"*) and is qualified to own, operate and furnish electric service through the System.

2. The Participant has full legal right, power and authority to enter into the Power Sales Contract and to carry out and consummate all of the transactions contemplated thereby, and the Participant has complied with the provisions of applicable law which would be a condition precedent to entering into the Power Sales Contract or carrying out and consummating such transactions.

3. Each of the Power Sales Contract, the Joint Action Agreement and the Pooling Agreement has been duly authorized, executed and delivered by the Participant and constitutes the legal, valid and binding obligation of the Participant and is enforceable under the present law of the State in accordance with its terms, except as enforceability may be limited by bankruptcy, insolvency, moratorium, reorganization or other laws affecting creditors' rights generally or usual equity principles in the event equitable remedies should be sought.

4. Pursuant to the Power Sales Contract, the Participant's obligation to make payments to UAMPS under the Power Sales Contract is a special obligation payable solely from the revenues and other available income of the System initially as a cost of the development of a new power supply resource and from and after the commercial operation of the Project as a cost of purchased electric energy, in each case as an operating expense of the System. The application of the revenues and other available funds of the System to make such payments is not subject to any prior lien, encumbrance or restriction.

5. The Participant has obtained all Required Approvals.

6. There is no pending or, to my knowledge, threatened, action or proceeding affecting the Participant (nor to my knowledge is there any basis therefor), which (a) purports to affect the authorization, legality, validity or enforceability of the Power Sales Contract, the Joint Action Agreement or the Pooling Agreement or (b) involves the possibility of any judgment or liability, not fully covered by insurance, which may result in any material adverse change in the business, affairs, properties or assets, or in the condition, financial or otherwise, of the System.

7. The execution, delivery and performance by the Participant of the Power Sales Contract will not conflict with or constitute a breach of or default under any agreement, indenture, bond, note, resolution or other instrument to which the Participant is a party or by which it or the properties of the System is bound or affected, or any applicable law, ruling, regulation, ordinance, judgment, order or decree to which the Participant (or any of its officers in their respective capacities as such) or its properties is subject.

8. No event has occurred and is continuing which with the passage of time or the giving of notice, or both, would constitute a material default or event of default under any agreement, indenture, bond, note, resolution or other instrument to which the Participant is a party or by which it or the properties of the System is bound or affected, which breach or default would have a material adverse impact on UAMPS' ownership or operation of the Project or the ability of the Participant to fully perform its obligations under the Power Sales Contract.

9. The Participant has lawful authority to fix and collect rates, fees and charges for the services provided by the System. Such rates, fees and charges for utility services provided to customers located within the corporate boundaries of the Participant are not subject to regulation by any authority of the State or the United States and have been duly and validly adopted by the Participant and are in full force and effect.

10. The Participant has lawful authority to own the System and, to my knowledge, the Participant (a) has good and merchantable title to the properties comprising the System and (b) holds all permits, licenses and approvals necessary for the operation of the System.

I hereby authorize Chapman and Cutler LLP, as bond counsel, to rely on this opinion as though addressed to it.

Respectfully submitted,

EXHIBIT VI

FORM OF BRING-DOWN OPINION OF COUNSEL TO THE PARTICIPANT

_____

Utah Associated Municipal Power Systems
155 North 400 West, Suite 480
Salt Lake City, UT 84103

Ladies and Gentlemen:

I have acted as counsel to _____ (the *"Participant"*) in connection with the Power County Power Project Power Sales Contract dated as of December 1, 2024 (the *"Power Sales Contract"*) between the Participant and Utah Associated Municipal Power Systems (*"UAMPS"*). I have been advised that UAMPS has made arrangements for the issuance and sale on the date hereof of its Power County Power Project Revenue Bonds, _____ Series _____ (the *"Bonds"*).

Pursuant to Section 31(f) of the Power Sales Contract in connection with the execution and delivery of the Power County Power Project, I rendered to UAMPS an approving legal opinion, dated _____ (the *"Prior Opinion"*), with respect to the Participant. In connection with the issuance and sale by UAMPS of the Bonds, I hereby reaffirm the Prior Opinion, as though it was dated the date hereof, in the form it was so rendered on _____.

[In addition to the foregoing, I have examined (i) the material describing the Participant and its electric system contained in APPENDIX A to each of the Preliminary Official Statement (together with any supplements or amendments thereto as of the date hereof, the *"Preliminary Official Statement"*) and the Official Statement (together with any supplements or amendments thereto as of the date hereof, the "*Official Statement*") of UAMPS relating to the Bonds and (ii) such other documents, information, facts and matters of law as are necessary for me to render the following opinion. Based upon the foregoing, I am of the opinion that the statements and information with respect to the Participant and its electric system contained in APPENDIX A to the Preliminary Official Statement and the Official Statement were true and correct in all material respects as of the respective dates of the Preliminary Official Statement and the Official Statement and are true and correct in all material respects as of the date hereof, and no facts have come to my attention which would lead me to believe that such statements and information contained or contain any untrue statement of a material fact or omitted to state or omit to state any material fact necessary in order to make such statements, in the light of the circumstances under which they were made, not misleading; *provided, however*, that I express no view with respect to the tabular, financial and statistical information included therein.]

I hereby authorize the reference to this opinion and to the Prior Opinion set forth under the caption, "APPROVAL OF LEGAL PROCEEDINGS," in the Official Statement. I hereby further authorize [Bond Counsel] and [other reliance parties] to rely on the Prior Opinion and on this opinion in each case as though addressed to them.

Respectfully submitted,

CERTIFICATE OF PARTICIPANT

STATE OF UTAH)
)
COUNTY OF WASHINGTON)

The undersigned hereby certify that they are the Mayor and City Recorder of St. George City, Utah (the *"Participant"*), a member of Utah Associated Municipal Power Systems (*"UAMPS"*), and that as such they are authorized to execute this Certificate on behalf of the Participant and hereby certify as follows:

1. This Certificate has been executed pursuant to Section 31(f) of the Power County Power Project Power Sales Contract, dated as of December 1, 2024 (the *"Power Sales Contract"*), between the Participant and UAMPS, in connection with the execution and delivery of the Power Sales Contract. Capitalized terms used and not otherwise defined herein have the meanings assigned to them in the Power Sales Contract.

2. The Participant is a municipal corporation, duly created and validly existing under the laws of the State of Utah (the *"State"*), and is governed by a City Council (the *"Governing Body"*).

3. Attached hereto as *Exhibit A* is a true, complete and correct copy of a resolution authorizing the execution and delivery of the Power Sales Contract and related matters (the *"Contract Resolution"*). The Contract Resolution was duly adopted by a majority of the Governing Body present and voting at a public meeting of the Governing Body held on _____, at which a quorum was present and acted throughout.

4. The meeting of the Governing Body at which the Contract Resolution was adopted was duly called, noticed and held in conformity with applicable laws of the State and procedural rules of the Governing Body. The Contract Resolution is in full force and effect and has not been amended, modified, repealed or supplemented.

5. The names of the Mayor and the City Recorder authorized to execute and deliver the Power Sales Contract on behalf of the Participant are as follows:

NAME	OFFICE
Michele Randal	Mayor
Christina Fernandez	City Recorder

6. (a) No petition was filed with the Participant or any of its officers seeking to refer the Contract Resolution to the electors of the Participant in accordance with the provisions of state law; and (b) no litigation has been instituted, is pending or has been threatened to require a referendum election on the Contract Resolution.

7. The Participant owns and operates an electric utility system (the *"System"*) that distributes and furnishes electric energy to consumers located within the established service area of the System. The Participant will use all of the electric energy from its Entitlement Share in a Qualified Use.

8. The Participant has previously executed the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action dated as of March 20, 2009, and all amendments thereof and supplements thereto (the *"Joint Action Agreement"*) and that certain Power Pooling Agreement (the *"Pooling Agreement"*) between the Participant and UAMPS relating to the power pool administered by UAMPS. The Joint Action Agreement and the Pooling Agreement are each in full force and effect and constitute the legal, valid and binding agreements of the Participant.

9. Brian Jeppson has been duly appointed by the Governing Body as the Participant's representative to UAMPS.

10. The representations and warranties of the Participant in Section 30 of the Power Sales Contract are true and correct on and as of the date of this certificate.

11. The Participant acknowledges that the information it provides under Section 31(c) and (d) of the Power Sales Contract may be used by UAMPS in connection with the issuance of Bonds to finance the Development Costs and the Cost of Acquisition and Construction of the Project and to provide necessary information to lenders and other interested parties.

Dated: _____.

ST. GEORGE CITY, UTAH

By _____
Mayor

By _____
City Recorder

[SEAL]

Agenda Date: 11/07/2024 **Agenda Item Number:** 11

Subject:

Consider approval of Resolution No. 2024-035R authorizing and approving the Millard County, Utah Power Project Power Sales Contract with Utah Associated Municipal Power Systems; and related matters.

Item at-a-glance:

Staff Contact: Bryan Dial

Applicant Name: City of St. George

Reference Number: N/A

Address/Location:

811 East Red Hills Pkwy

Item History (background/project status/public process):

This is a 200 Megawatt (MW) natural gas generation project being built by UAMPS. St. George is signing up for 13.00 (MW) of energy. This project will be located in Millard County Utah.

Staff Narrative (need/purpose):

Future energy needs require us to look for new generation sources. This project provides dispatchable energy that will help to balance our energy use. By signing up on this project through UAMPS we will have a more active role in the operations of the plant.

Name of Legal Dept approver: Alicia Carlton

Budget Impact: No Impact

Recommendation (Include any conditions):

Staff recommends approval.

RESOLUTION NO. _____

A RESOLUTION AUTHORIZING AND APPROVING THE MILLARD COUNTY POWER PROJECT POWER SALES CONTRACT WITH UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS; AND RELATED MATTERS.

***** ***** *****

WHEREAS, St. George City, Utah (the *"Participant"*) is a member of Utah Associated Municipal Power Systems (*"UAMPS"*) pursuant to the provisions of the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action, as amended (the *"Joint Action Agreement"*);

WHEREAS, one of the purposes of UAMPS under the Joint Action Agreement is the acquisition and construction of electric generating, transmission and related facilities in order to secure reliable, economic sources of electric power and energy for its members;

WHEREAS, UAMPS proposes to acquire and construct a natural gas-fired electric generating facility consisting of multiple reciprocating internal combustion engines to be known as the "Millard County Power Project" (the *"Project"*) to be located at a site in Millard County, Utah, and to sell the capacity and output of the Project pursuant to the Millard County Power Project Power Sales Contracts (the *"Power Sales Contracts"*) between UAMPS and the Participants (capitalized terms used and not defined herein have the meanings assigned to them in the Power Sales Contracts);

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) certain descriptions and summaries of the Project and the Power Sales Contracts, and representatives of the Participant have participated in discussions and conferences with UAMPS and others regarding the Project and have received from UAMPS all requested information and materials necessary for the decision of the Governing Body to authorize and approve the Power Sales Contract;

WHEREAS, the Participant acknowledges that the obligation of the Participant to make the payments provided for in the Power Sales Contract will be a special obligation of the Participant and an operating expense of the Participant's electric system, payable from the revenues and other available funds of the electric system, and that the Participant shall be unconditionally obligated to make the payments required under the Power Sales Contract whether or not the Project or any portion thereof is acquired, constructed, completed, operable or operating and notwithstanding the suspension, interruption, interference, reduction or curtailment of the output thereof for any reason whatsoever; and

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) its current and projected needs for electric power and energy and information with respect to the Project prepared by UAMPS setting forth, among other things, preliminary estimates of the

Development Costs, the Cost of Acquisition and Construction, the estimated timeline for the development and construction of the Project and related matters, and now desires to authorize and approve the Power Sales Contract;

NOW, THEREFORE, BE IT RESOLVED by the Governing Body of St. George City, Utah, as follows:

Section 1. Approval of Power Sales Contract; Development Share. (a) The Power Sales Contract, in substantially the form attached hereto as *Annex A*, is hereby authorized and approved, and the Mayor is hereby authorized, empowered and directed to execute and deliver the Power Sales Contract on behalf of the Participant, and the City Recorder is hereby authorized, empowered and directed to attest and countersign such execution and to affix the corporate seal of the Participant to the Power Sales Contract, with such changes to the Power Sales Contract from the form attached hereto as *Annex A* as shall be necessary to conform to the Participant's legal status, to complete the form of the Power Sales Contract or to correct any minor irregularities or ambiguities therein and as are approved by the Mayor, his execution thereof to constitute conclusive evidence of such approval.

(b) A Development Share representing _____ kW of capacity in the Project is hereby authorized and approved. The Participant acknowledges that (i) its Development Share may be increased to provide for a full allocation of the Project Output and (ii) by virtue of its Development Share, the Participant will have an Entitlement Share with the same amount of Electric Power as its Development Share from and after the Completion of Development through the remaining term of the Power Sales Contract, all as provided in the Power Sales Contract.

Section 2. Participant's Representative. (a) The appointment of Brian Jeppson as the Participant's Representative to UAMPS and Bryan Dial as alternate Representatives is hereby confirmed.

(b) Such Representative (or, in his or her absence, such alternate(s)) is hereby delegated full authority to (i) approve any appendix to the Pooling Agreement between UAMPS and the Participant that may be necessary or desirable in connection with the utilization of the Participant's Entitlement Share, and (ii) act on all matters that may come before the Project Management Committee established by the Power Sales Contract, and shall be responsible for reporting regularly to the Governing Body regarding the activities of the Project Management Committee.

Section 3. Compliance with Tax Covenants. The Participant agrees in the Power Sales Contract that it will apply all of the electric power and energy acquired under the Power Sales Contract to a Qualified Use and that it will not take or omit to take any action which could adversely affect the Tax Status of any Bond or Bonds theretofore issued or thereafter issuable by UAMPS. In furtherance of that agreement, the Governing Body of the Participant hereby agrees that it will observe and comply with such instructions as may be provided from time to time by UAMPS with respect to the Qualified Use of the electric power and energy acquired under the Power Sales Contract.

Section 4. Further Authority. (a) The Mayor and the City Recorder are hereby authorized, empowered and directed to (i) execute the Certificate of the Participant in substantially the form attached as EXHIBIT III to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Certificate of the Participant in substantially the form attached as *Exhibit IV* to the Power Sales Contract and to deliver the same to UAMPS.

(b) The Participant's legal counsel is hereby authorized, empowered and directed to (i) execute the Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT V to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT VI to the Power Sales Contract and to deliver the same to UAMPS.

Section 5. Miscellaneous; Effective Date. (a) This resolution shall be and remain irrepealable until the expiration or termination of the Power Sales Contract in accordance with its terms.

(b) All previous acts and resolutions in conflict with this resolution or any part hereof are hereby repealed to the extent of such conflict.

(c) In case any provision in this resolution shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

(d) This resolution shall take effect immediately upon its adoption and approval.

ADOPTED AND APPROVED on _____, 2024.

ST. GEORGE CITY

By _____
Mayor

ATTEST:

_____
City Recorder

[SEAL]

APPROVAL COPY

MILLARD COUNTY POWER PROJECT
POWER SALES CONTRACT

BETWEEN

UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS

AND

ST. GEORGE CITY, UTAH

DATED AS OF DECEMBER 1, 2024

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MILLARD COUNTY POWER PROJECT
POWER SALES CONTRACT

This POWER SALES CONTRACT made and entered into as of December 1, 2024, is by and between UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS, a political subdivision of the State of Utah (*"UAMPS"*) and ST. GEORGE CITY, a political subdivision of the State of Utah (the *"Participant"*).

RECITALS*

WHEREAS, UAMPS was organized by the Members under the Act and the Joint Action Agreement as a separate legal entity to accomplish the Members' joint and cooperative action, including securing power supply resources for the Members' present and future needs;

WHEREAS, UAMPS is organized as an energy services interlocal entity under the Act with the power, among other things, to (i) acquire supplies of electric power and energy by the acquisition or construction of electric generation and transmission facilities or by contracting for the purchase of electric power and energy and (ii) enter into contracts for the sale of the output, services and other benefits provided by such facilities or contracts to public agencies and others inside or outside the State of Utah;

WHEREAS, the Participant is authorized by applicable law to develop, acquire, construct, own and operate electric generating, transmission and related facilities and ownership interests therein and has entered into the Joint Action Agreement to provide for the joint exercise of such powers through UAMPS;

WHEREAS, UAMPS has adopted an integrated resource plan that identifies the need for an additional peaking generating resource to serve the electricity supply requirements of its Members, and has conducted studies to determine the optimal facilities, equipment and location for the additional generating resource;

WHEREAS, in order to develop a long-term source of reliable, cost-effective electricity for the benefit of those Members that elect to participate in the Project (the *"Participants,"* as defined herein), UAMPS has through its Resource Project examined and is continuing to examine the feasibility of the development, construction and operation of a natural gas-fired electric generating facility consisting of multiple reciprocating internal combustion engines to be located in Millard County, Utah (the *"Project"*);

WHEREAS, pursuant to the Power Sales Contracts, UAMPS will continue with the development of the Project and, if the Project Management Committee determines the Project to be feasible, will proceed with the acquisition, construction and operation of the Project and will sell Electric Energy from the Project to the Participants;

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* Capitalized terms used and not defined in the Recitals have the meanings assigned to them in Section 1.

WHEREAS, in order to finance the Development Costs and the Cost of Acquisition and Construction of the Project, UAMPS will enter into the Financing Documents and may issue revenue bonds, notes or other obligations payable from a pledge of the payments to be made by the Participants under the Power Sales Contracts and any other revenues received by UAMPS in connection with the Project;

WHEREAS, prior to its authorization of the execution, delivery and performance by the Participant of this Power Sales Contract, the governing body of the Participant has reviewed (or caused a review to be made of) various descriptions and summaries of the Project and this Power Sales Contract, and the Participant's current and reasonably anticipated future requirements for Electric Power and Electric Energy, and the governing body of the Participant has determined that it is necessary and desirable for the Participant to enter into this Power Sales Contract in order to obtain a long-term, cost-based supply of Electric Energy by the acquisition of an Entitlement Share pursuant to the terms and conditions of this Power Sales Contract;

WHEREAS, UAMPS will cause the Project to be operated in accordance with Good Utility Practice and will schedule the Project Output in accordance with the Operating and Scheduling Procedures, all for the joint and ratable benefit of the Participants; and

WHEREAS, UAMPS and the Participant are duly authorized under applicable provisions of law, to execute, deliver and perform this Power Sales Contract and their respective governing bodies and any regulatory agencies having jurisdiction have taken all necessary actions and given all necessary approvals in order to constitute this Power Sales Contract as the legal, valid and binding obligation of the parties.

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements herein contained, it is agreed by and between the parties to this Power Sales Contract as follows:

Section 1. Definitions and Rules of Construction. (a). As used in this Power Sales Contract and in the Recitals set out above:

"Act" means the Interlocal Cooperation Act, Title 11, Chapter 13, Utah Code Annotated 1953, as amended, and other applicable provisions of law.

"Additional Bonds" means additional Bonds from time to time issued by UAMPS pursuant to the Financing Documents and in accordance with Section 18.

"Additional Facilities" means capital additions, betterments and replacements and other capital items directly and functionally related to the Project, including electric transmission, fuel transportation, storage, fuel storage and related facilities, additional electric generating and related facilities located at the Project site, long-term supplies of natural gas or other fuel for the use of the Project and any other facilities, improvements and properties designated by the Project Management Committee as Additional Facilities under the Power Sales Contracts.

"Annual Budget" means the budget adopted by UAMPS for each Contract Year pursuant to the provisions of Section 24.

"Authorized Officer of UAMPS" means the Chairman of the Board of Directors, the Vice Chairman of the Board, the Secretary, the Treasurer and the Chief Executive Officer of UAMPS and any other officer or employee authorized or having delegated authority to perform specific acts or duties under the Power Sales Contracts by resolution duly adopted by the Board.

"Billing Period" means such period of time as shall be established from time to time by UAMPS for the preparation, calculation and billing of the amounts payable by the Participant hereunder.

"Board" means the Board of Directors of UAMPS or such other governing body of UAMPS as may be established from time to time pursuant to the Joint Action Agreement and the Act.

"Bond Counsel" means a firm of attorneys of recognized standing in matters relating to the tax status of municipal bonds, experienced in matters relating to public power systems and selected by UAMPS.

"Bond Fund" means the funds and accounts created by the Financing Documents for the payment of debt service on Bonds and reserves therefor.

"Bonds" means (i) bonds, notes, repayment obligations under loan agreements and lines of credit, and other debt obligations issued or incurred from time to time by UAMPS pursuant to the Financing Documents to finance Development Costs and the Cost of Acquisition and Construction, regardless of whether such bonds, notes and other obligations are senior or subordinated obligations, (ii) Additional Bonds and (iii) Refunding Bonds.

"Budget and Plan of Finance" means the comprehensive budget and plan of finance for the Development Costs, the Construction Costs and other items of the Cost of Acquisition and Construction approved from time to time by the Project Management Committee, together with proposed financing arrangements for Development Costs during the Development Period and for Construction Costs during the Construction Period, all as more fully described in Section 15.

"Capital Contribution" means (i) a capital contribution in respect of the Cost of Acquisition and Construction of, the Initial Facilities that is paid to UAMPS by the Participant pursuant to Section 17 and (ii) a capital contribution paid to UAMPS in connection with the issuance of Additional Bonds or Refunding Bonds as may be authorized by the Project Management Committee pursuant to Section 17(g).

"Capital Contribution Percentage" means with respect to each series of Bonds, a percentage calculated by UAMPS obtained by dividing (i) the dollar amount of the Capital Contribution made by the Participant, by (ii) the Reference Project Costs, all as more fully provided in Section 17(e).

"Code" means the Internal Revenue Code of 1986, as amended. References herein to the Code are deemed to include the applicable U.S. Treasury Regulations thereunder.

"Commercial Operation" means, with respect to the Initial Facilities, the date on which the Initial Facilities (i) have been substantially completed pursuant to the EPC Agreement and any other Construction Agreements that may be applicable, including the satisfaction of all required performance tests thereunder, (ii) are capable of continuous firm operation, (iii) are interconnected and synchronized with, and capable of delivering Electric Energy to, the transmission grid, (iv) have received all Permits and Approvals required for their operation, and (v) meet such additional requirements as may be established by the Project Management Committee. The criteria and standards for the Commercial Operation of any Additional Facilities shall be developed by UAMPS and submitted to the Project Management Committee for its review and approval.

"Commercial Operation Date" means, with respect to the Initial Facilities and any Additional Facilities, the date on which all of the Initial Facilities and any Additional Facilities achieve Commercial Operation, as determined by the Project Management Committee.

"Commercially Reasonable" or *"Commercially Reasonable Efforts"* means, with respect to any action required to be made, attempted or taken by a party under this Contract or one of the Project Agreements, such efforts as a reasonably prudent business would undertake, consistent with Good Utility Practice, for the protection of its own interest under the conditions affecting such action, including without limitation, the amount of notice of the need to take such action, the duration and type of the action, the competitive environment in which such action occurs, the terms and provisions of the Project Agreements and the Financing Documents, the contractual and legal obligations of, and the risk to, such party in connection with such action; *provided, however,* an obligation to act in a "Commercially Reasonable" manner or to exercise "Commercially Reasonable Efforts" does not include taking actions that would, individually or in the aggregate, cause the party subject to such obligation to incur costs, or suffer any other detriment, that is out of reasonable proportion to the benefits to the other party under this Contract or the Project Agreements.

"Completion of Development" means, with respect to the Initial Facilities (i) the completion of all Development Work, (ii) the receipt of all Permits and Approvals necessary for the construction of the Project, (iii) the completion of definitive forms of the principal Construction Agreements, (iv) the completion of the definitive Budget and Plan of Finance for the Cost of Acquisition and Construction, and (v) a determination by the Project Management Committee that the Project is feasible and that the construction of the Initial Facilities should proceed, all as more fully described in Section 6.

"Construction Agreements" means the EPC Agreement and each other agreement entered into by UAMPS for the acquisition and construction of any part of the Initial Facilities and any Additional Facilities.

"Construction Costs" means all of the Cost of Acquisition and Construction of the Initial Facilities incurred during the Construction Period.

"Construction Period" means the period beginning on the date that the Project Management Committee determines that the Completion of Development has occurred and

UAMPS delivers the task order directing the EPC Contractor to proceed with construction under the EPC Agreement and ending on the Commercial Operation Date.

"Contract" means this Millard County Project Power Sales Contract dated as of December 1, 2024 between UAMPS and the Participant and any amendments permitted pursuant to Section 43.

"Contract Resolution" means the resolution of the Participant's governing body approving and authorizing the execution of this Contract, in substantially the form attached to EXHIBIT III.

"Contract Year" means the Fiscal Year of UAMPS, except that the first Contract Year shall commence on the Effective Date and shall end on the last day of the then-current Fiscal Year. In the event that UAMPS changes its Fiscal Year for accounting purposes, the Contract Year shall, without further action, be amended to conform to such Fiscal Year.

"Cost of Acquisition and Construction" means all costs and expenses paid or incurred by UAMPS in connection with the acquisition and construction of the Project, whether prior or subsequent to the Effective Date, including all Development Costs. "Cost of Acquisition and Construction" includes all costs incurred by UAMPS in connection with planning, designing, acquiring, constructing and placing in operation the Initial Facilities and any Additional Facilities, and amounts paid or payable under the Construction Agreements (including all costs, fees, compensation and incentives payable to the EPC Contractor under the EPC Agreement). "Cost of Acquisition and Construction" includes, without duplication of any cost, the following:

(1) working capital and reserve requirements of the Project, including, without limitation, amounts for deposit into the Reserve and Contingency Fund and those items set forth in the definition of Operation and Maintenance Costs, as may be determined from time to time by UAMPS;

(2) interest accruing in whole or in part on Bonds issued to pay all or any portion of the Cost of Acquisition and Construction or the Cost of Additional Facilities prior to and during the acquisition and construction thereof and for such additional period as UAMPS may determine to be reasonably necessary for placing the Project or the Additional Facilities in operation in accordance with the provisions of the Budget and Plan of Finance;

(3) the deposit or deposits, if any, required to be made under the Financing Documents from the proceeds of Bonds into any fund or account established pursuant to the Financing Documents to meet debt service reserve requirements for the Bonds and premiums and fees payable for any credit or liquidity facilities with respect to the Bonds;

(4) the deposit or deposits into the Bond Fund and any other fund or account required to be funded by the Financing Documents;

(5) the payment of principal or redemption price of and interest on any Bonds issued as bond anticipation notes;

(6) planning and development costs, engineering fees, contractors' fees, fiduciaries' fees, auditors' and accountants' fees, costs of obtaining all permits and approvals, the cost of real property, labor, materials, equipment, supplies, training and testing costs, insurance premiums, legal, financial advisory and financing costs and issuance costs of the Bonds, amounts payable under the Real Estate Agreements, administrative and general costs, and all other costs properly allocable to the acquisition and construction of the Project and placing the same in operation;

(7) all costs relating to litigation, claims or judgments not otherwise covered by insurance and arising out of the acquisition, construction or operation of the Project or otherwise related to the Project, the Project Agreements, the Power Sales Contracts or the transactions contemplated thereby;

(8) payment to UAMPS or any Participant to reimburse advances and payments made or incurred for costs preliminary or incidental to the acquisition and construction of the Project;

(9) legally required or permitted federal, state and local taxes, or payments in lieu of such taxes, relating to the Project incurred during the period of the acquisition or construction thereof;

(10) the cost of long-term supplies of natural gas or other fuel supplies necessary or desirable in connection with the operation of the Project and the costs of transporting fuel supplies to the Project and prepayments and advance payments therefor, including the costs of pipelines, laterals, receiving stations or capacity rights therein; and

(11) all other costs incurred by UAMPS, and properly allocable to the acquisition and construction of the Project, including all costs financed by the issuance of Additional Bonds.

"Debt Service Costs" means, for each Billing Period of each Contract Year, an amount equal to the sum of:

(1) the interest accruing on the Bonds during such Billing Period, except to the extent that amounts are on deposit under the Financing Documents to pay such interest, together with any other amounts required by the Financing Documents to be deposited into the Bond Fund in respect of the interest payments on the Bonds;

(2) the portion of the next due principal installment on the Bonds, together with any other amounts required by the Financing Documents to be deposited into the Bond Fund in respect of the principal payments on the Bonds; provided however, that the amount included in Debt Service Costs pursuant to this clause (2) shall not include the principal of Bonds becoming due and payable solely as a result of the acceleration of the maturity thereof;

(3) the scheduled amounts falling due during such Billing Period under any Interest Rate Contract with respect to the Bonds;

(4) any additional amounts necessary or required to be deposited into the Bond Fund or the Subordinated Indebtedness Fund under the provisions of the Financing Documents;

(5) Trustee, paying agent, escrow agent and other fiduciaries' fees and expenses payable under the Financing Documents; fees and expenses of remarketing agents, broker-dealers, auction agents and other providing services with respect to Bonds;

(6) the amounts required to be paid to maintain any credit or liquidity facilities for and ratings on the Bonds and other costs payable by UAMPS from time to time in connection with the Bonds; and

(7) the amounts required to be paid under any Financing Document that is a credit agreement, credit facility, loan agreement or other instrument or facility used to finance Development Costs, including the repayment of all drawings thereunder, the interest on such drawings and the fees, expenses and other charges payable by UAMPS thereunder;

provided, however, that the additional interest expense on or in respect of any Bonds that are subject to federal income taxation (and not eligible for tax credits or interest subsidy payments) may, as determined by the Project Management Committee pursuant to Section 16(d), be allocated to those Participants whose legal status or use of the Project Capability or the Project Output adversely affects the Tax Status of such Bonds. In the event of such allocation, the Debt Service Costs payable by such Participants shall be increased to include amounts sufficient to pay any such additional interest expense.

"Debt Service Percentage" means, with respect to each Participant and as of any date of determination, the percentage obtained by subtracting the Participant's Capital Contribution Percentage from the Participant's Entitlement Share. The Participant's initial Debt Service Percentage will be calculated at the time that it pays a Capital Contribution and will be set forth on SCHEDULE I. The Debt Service Percentages for the Participants may be calculated separately for each separate series of Bonds.

"Debt Service Share" means, with respect to each Participant and as of any date of determination, the percentage of Debt Service Costs payable by the Participant, determined by dividing the Participant's Debt Service Percentage (expressed as a decimal) by the sum (expressed as a decimal) of the Debt Service Percentages of all Participants, including the Participant whose Debt Service Share is being determined. The Participant's initial Debt Service Share will be calculated at the time that it pays a Capital Contribution and will be set forth on SCHEDULE I. The Debt Service Shares for the Participants may be calculated separately for each separate series of Bonds.

"Decommission" means all actions necessary to safely retire and remove the Project from service, restore the Project site, satisfy the decommissioning requirements of the Permits and Approvals and satisfy all requirements of the regulatory agencies having jurisdiction over the decommissioning of the Project.

"Decommissioning Costs" means the costs and expenses of Decommissioning the Project.

"Decommissioning Fund" means the fund or funds established by UAMPS for the payment of Decommissioning Costs as provided in Section 22.

"Decommissioning Period" means the period beginning at the end of the Operating Period and continuing to the date on which the Project has been Decommissioned and all Decommissioning Costs have been paid.

"Development Cost Share" means with respect to each Participant, the percentage of Development Costs payable by the Participant during the Development Period, determined by dividing the Participant's Development Share by the sum of the Development Shares of all Participants. The Participant's initial Development Cost Share will be set forth on SCHEDULE D.

"Development Costs" means all costs, fees and expenses incurred by UAMPS in performing the Development Work, including (i) costs, fees and expenses incurred by UAMPS in connection with its initial consideration and examination of the Project through its Resource Project, (ii) the costs of transmission and interconnection studies and deposits for such costs and (iii) pre-construction costs approved by the Project Management Committee, including deposits, advance payments and prepayments for items of the Cost of Acquisition and Construction of the Initial Facilities.

"Development Period" means the period beginning on the Effective Date and ending on the earlier of (i) the date that the Project Management Committee determines that the Completion of Development has occurred or (ii) the date that the Project Management Committee determines to terminate the Project, all as provided in Section 6.

"Development Share" means the quantity of Electric Power from the Project elected by the Participant as of the Effective Date and shown opposite the name of the Participant in SCHEDULE D attached hereto.

"Development Work" means all work and services necessary or desirable in connection with:

(i) the selection of the site for the Project, the negotiation of the Real Estate Agreements and all other work necessary to secure all rights and interests to the real property necessary for the Project;

(ii) obtaining the transmission and interconnection agreement(s) necessary to deliver Electric Energy from the Project to Participants;

(iii) the estimating, design and engineering work to be performed with respect to the Initial Facilities;

(iv) the development and negotiation of definitive Project Agreements and any other contracts and agreements necessary in connection with the Project;

(v) obtaining all Permits and Approvals necessary for the construction and operation of the Project;

(vi) the continued development of and updates to the Budget and Plan of Finance; and

(vii) such other work and services as shall be approved by the Project Management Committee.

"Effective Date" means (i) with respect to the initial Power Sales Contracts, the date established pursuant to the provisions of Section 2(a), and (ii) with respect to any Power Sales Contract executed by a Participant after the Effective Date, such date as shall be approved by the Project Management Committee.

"Electric Energy" means electric energy expressed in kilowatt-hours (kWh).

"Electric Power" means electric power expressed in kilowatts (kW).

"Electric System" means the Participant's electric utility system as established, maintained and operated pursuant to applicable State and local law. With respect to any Participant that does not own and operate an electric utility system that serves retail customers, the term "Electric System" shall be deemed to refer to the applicable utility system designated in its Power Sales Contract.

"Engineering Studies and Reports" means collectively, the written studies, analysis, summaries and reports (a) regarding the Participant's current power supply resources and projected power supply requirements provided by UAMPS in connection with the Participant's consideration of this Power Sales Contract and (b) regarding such aspects of the Project as the Project Management Committee shall deem necessary or advisable in connection with its governance and oversight of the Project.

"Enterprise Fund" means the electric enterprise fund of the Participant as established and maintained pursuant to applicable State and local law. With respect to any Participant that does maintain an electric enterprise fund, the term "Enterprise Fund" shall be deemed to refer to the applicable enterprise fund designated in its Power Sales Contract.

"Entitlement Share" means, with respect to each Participant and as the context may require, either the amount of Electric Power or the percentage of the initial Project Capability shown opposite the name of such Participant to be set forth in the SCHEDULE I that shall be approved by the Project Management Committee in connection with the Completion of

Development, as the same may be revised from time to time in accordance with the provisions of this Power Sales Contract.

"EPC Agreement" means the agreement between UAMPS and the EPC Contractor with respect to the engineering, procurement and construction of the Initial Facilities.

"EPC Contractor" means the firm or corporation appointed as the engineering, procurement and construction contractor pursuant to the EPC Agreement.

"Final Completion" (or such similar term as may be used in the EPC Agreement) means the final completion of the Initial Facilities as determined pursuant to the EPC Agreement.

"Financing Documents" means the bond resolution, indenture, trust agreement or other instrument or instruments providing for the issuance of and the security for the Bonds and all amendments thereof and supplements thereto.

"Fiscal Year" means the annual accounting period of UAMPS as from time to time in effect, initially a period commencing on April 1 of each calendar year and ending on March 31 of the next succeeding calendar year.

"Fuel Agent" means any entity appointed by UAMPS to manage or facilitate the acquisition, transportation and storage of fuel for the operation of the Project and/or the management of the costs of fuel for the Project.

"Fuel Agreement" means any agreement entered into by or on behalf of UAMPS for the acquisition, transportation or storage of fuel for the Project, and also includes tolling agreements and any agreement entered into by UAMPS to manage the cost of fuel for the Project, including options, caps, collars, swaps and similar agreements.

"Good Utility Practice" means, as of any particular time, any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry at such time, or which, in the exercise of reasonable judgment in light of facts known at such time, could have been expected to accomplish the desired results at the lowest reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method or act to the exclusion of all others or to be limited to the lowest-cost practice, method or act, but rather to be a spectrum of possible practices, methods and acts, having due regard for manufacturers' warranties and the jurisdiction.

"Initial Facilities" means the real and personal property, facilities, structures, improvements and equipment to be acquired and constructed in connection with the initial operation of the Project as generally described on EXHIBIT I. In connection with the Completion of Development and at such other times as it deems necessary, UAMPS shall submit updates to EXHIBIT I to the Project Management Committee for approval.

"Interconnection Agreement" means each agreement providing for the interconnection of the Project with the facilities of a transmission provider and all supplements and amendments

thereto, together with any successor or replacement agreement providing for the interconnection of the Project with the transmission grid.

"Interest Rate Contract" means any International Swap Dealers Association (ISDA) Master Agreement, together with the schedules and confirmations thereto, that is an interest rate swap, cap, floor, collar or similar agreement to manage or hedge interest rates or expenses.

"Joint Action Agreement" means the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action dated as of March 20, 2009, as amended and supplemented from time to time.

"Joint Ownership Agreement" means (i) an agreement under which UAMPS and another person own the Project or a portion thereof as tenants in common, (ii) agreements between UAMPS and another person or persons for the organization and operation of a Special Purpose Entity and (iii) any other form of joint ownership arrangement approved by the Project Management Committee.

"Members" means, collectively, each entity which has executed the Joint Action Agreement or a supplement thereto.

"Minimum Subscription" is defined in Section 2.

"Month" means a calendar month.

"Operating Agreement" means any contract between UAMPS and an Operator providing for the operation and maintenance of all or any portion of the Project.

"Operating Period" means the period beginning on the Commercial Operation Date and continuing to the date on which the Project is retired and removed from service.

"Operating and Scheduling Procedures" means those standards, procedures and criteria approved from time to time by the Project Management Committee with respect to the operation of the Project and the Project Capability and the scheduling of the Project Output which shall, to the extent practicable, promote the efficient and economic utilization of the Project, the Project Capability and the Project Output consistent with Good Utility Practice for the benefit of the Participants taken as a whole.

"Operation and Maintenance Costs" means, with respect to each Billing Period of each Contract Year, all costs and expenses (other than Transmission Costs and Debt Service Costs) attributable to the Project that are paid, payable, incurred or accrued by UAMPS during each Billing Period resulting from the ownership, operation, maintenance and termination of, and repairs, renewals, replacements, additions, improvements, and betterments and modifications to, the Project. Operation and Maintenance Costs shall further include, without limitation, the following items of cost:

(1) the costs of operating and maintaining the Project and of producing Electric Power and Electric Energy therefrom during such Billing Period, including the operation and maintenance expenses and fuel costs of the Project pursuant to the Project Agreements, amounts payable under the Operating Agreement and each Fuel Agreement (including fees, expenses, incentives and other compensation payable to the Operator and the Fuel Agent);

(2) any amount which UAMPS may be required during such Billing Period to pay for the prevention or correction of any unusual loss or damage or for renewals, replacements, repairs, additions, improvements, modifications and betterments which arise out of or are required by the Project Agreements for which UAMPS shall be obligated, but only to the extent that funds for such payment are not provided by the issuance of Bonds or Capital Contributions made by the Participants;

(3) legally required or permitted federal, state and local taxes and ad valorem taxes or payments in lieu of ad valorem taxes, in each case related to the Project;

(4) all other amounts, including fuel costs, payable by UAMPS pursuant to the provisions of the Project Agreements;

(5) any additional amount not specified in the other items of this definition which must be paid by UAMPS during such Billing Period under the Project Agreements;

(6) the portion of UAMPS' administrative and general expenses allocable or directly charged to the Project, working capital and reserves for the payment of operation and maintenance expenses, and all other costs and expenses (but excluding depreciation) not included in the costs specified in the other items of this definition and properly chargeable to the Project;

(7) amounts to be deposited into the Reserve and Contingency Fund established pursuant to Section 20;

(8) legal, engineering and accounting fees and expenses, the cost of any litigation related to the Project, the Project Agreements, this Power Sales Contract and the interests and transactions contemplated by such agreements and this Power Sales Contract, the costs of technical and advisory services and the cost of all Permits and Approvals, all to the extent allocable to the Project;

(9) the costs of Additional Facilities, but only to the extent not paid or financed as a portion of the Cost of Acquisition and Construction; and

(10) Decommissioning Costs and amounts for deposit into the Decommissioning Fund.

"Operator" means any entity that performs all or a substantial portion of the operation and maintenance work on the Project under an Operating Agreement with UAMPS.

"Participant" means the party defined as the Participant in the preamble of this Power Sales Contract and its permitted successors and assigns hereunder.

"Participants" means the parties, including the Participant, other than UAMPS, to the Power Sales Contracts and (i) initially named on SCHEDULE D, and (ii) from and after the Completion of Development, named on SCHEDULE I.

"Participant's Representative" means (i) the officer, employee or other agent of the Participant designated from time to time by the Participant as the Representative of the Participant for purposes of the Joint Action Agreement, to whom all notices and other communications to be given by UAMPS to the Participant hereunder shall be sent or (ii) in the event that the individual appointed as the Participant's Representative is unavailable to act on behalf of the Participant, the individual duly appointed or designated by the Participant as its alternate Representative pursuant to the Joint Action Agreement.

"Performance Tests" means all start-up and shakedown procedures and performance tests to be conducted under the EPC Agreement before Final Completion.

"Permits and Approvals" means all certificates, permits, licenses, approvals, rulings, orders or other authorizations from any federal, state or local governmental body, board or agency having jurisdiction over UAMPS, the Project or both that are required to be obtained or maintained for the construction, operation, maintenance or repair of the Project or any component of it.

"Permitted Output Contract" means a contract that:

(i) (A) has a term (including all renewal options) not longer than three years and is either a negotiated arrangement that provides for compensation at fair market value or is based on generally applicable and uniformly applied rates, or (B) is a requirements-type contract that provides for the sale of electricity to a retail consumer or other end user of electricity; and

(ii) in each case (A) complies with the provisions of U.S. Treasury Regulation Section 1.141-7 and (B) is approved by UAMPS based on guidance provided by Bond Counsel.

"Point of Delivery" means the point or points of physical interconnection of the Initial Facilities or Additional Facilities, as applicable, with the electric transmission grid, as determined pursuant to the Interconnection Agreement.

"Pooling Agreement" means, collectively, the Power Pooling Agreements between UAMPS and the Members and certain other entities providing for the establishment and operation of the UAMPS Pool and related matters, including all supplements and appendices thereto and as the same may be amended, restated or supplemented from time to time.

"Power Sales Contract" means this Power Sales Contract between UAMPS and the Participant and *"Power Sales Contracts"* means all of the Power Sales Contracts, dated the date

hereof, between UAMPS and the Participants, all of which are uniform in all material respects in their terms, conditions and provisions, with the exception of: (i) the Development Share, the Development Cost Share, the Entitlement Share, the Capital Contribution Percentage, the Debt Service Percentage and the Debt Service Share for each of the Participants; (ii) for those Participants that are political subdivisions of a State other than Utah, revisions relating to the Participant's status as a political subdivision of another State and the fact that it is governed by and subject to the laws of that State; (iii) for those Participants that are cooperative utilities, revisions relating to the Participant's corporate status, the definition of "Qualified Use" and the provisions of Section 32(f); (iv) for those Participants that do not own and operate electric utility systems that serve retail customers, the revisions noted in the definitions of "Electric System" and "Enterprise Fund" and revisions relating to the Participant's corporate status, the definition of "Qualified Use" and the provisions of Section 32(f); and (v) the matters set forth in the Exhibits.

"Project" means the development, acquisition, ownership, construction, improvement, equipping, operation, retirement and decommissioning of the Initial Facilities and any Additional Facilities, and the rights, interests, obligations and liabilities of UAMPS under the Project Agreements and the Permits and Approvals.

"Project Agreements" means, collectively, the Construction Agreements, the Operating Agreement, the Real Estate Agreements, each Fuel Agreement, the Interconnection Agreement, the Transmission Agreements, any Joint Ownership Agreement and any other agreements entered by UAMPS to further the acquisition, development, construction, and operation of the Project.

"Project Capability" means the nominal Electric Power and associated Electric Energy that the Project is capable of producing, net of (reduced by) the Electric Power (project capability) owned by another person under a Joint Ownership Agreement. The Project Capability initially available to UAMPS shall be based on the aggregate nameplate rating of the generating units included in the Initial Facilities with such adjustments as the Project Management Committee deems necessary to reflect the actual capability of the Initial Facilities. Project Capability initially means the aggregate amount of Electric Power shown on EXHIBIT I hereto and associated Electric Energy.

"Project Management Committee" means the committee of the Participants established pursuant to Section 5 which shall make certain decisions and recommendations with respect to the operation and management of the Project as provided herein.

"Project Output" means the amount of Electric Power and Electric Energy, if any, which is actually generated by the Project in any particular hour.

"Qualified Use" means the sale of electricity to retail customers located within the Participant's electricity "service area" pursuant to generally applicable and uniformly applied rate schedules or tariffs; *provided that:*

(a) "Qualified Use" shall not include any sale of electricity that gives rise to "private business use" or a "private loan" within the meaning of Section 141 of the Code;

(b) "Qualified Use" shall include the use of electricity by a Participant to meet its own requirements; and

(c) "Qualified Use" shall include sales of electricity under Permitted Output Contracts and other sales and uses of electricity, in each case as may be approved by UAMPS based on guidance provided by Bond Counsel.

For purposes of this definition, "service area" has the meaning assigned to such term in U.S. Treasury Regulation Section 1.148-1(e)(2)(iii) and includes any area recognized as the electricity service area of the Participant under state or federal law.

"Real Estate Agreements" means the agreements entered into by UAMPS to obtain necessary site control and easement rights for the acquisition and construction of the Project.

"Reference Project Costs" means, for purposes of calculating the amount of a Capital Contribution to be made by the Participant as provided in Section 17, the estimated Cost of Acquisition and Construction determined by UAMPS and approved by the Project Management Committee prior to the first issuance of long-term Bonds to finance the Cost of Acquisition and Construction of the Initial Facilities or any Additional Facilities. Reference Project Costs shall not include amounts for (i) costs of issuance, debt service reserves or capitalized interest on Bonds and (ii) any other items in the definitions of "Development Costs" or "Cost of Acquisition and Construction" not properly allocable to Reference Project Costs, as determined by the Project Management Committee.

"Refunding Bonds" means refunding Bonds from time to time issued by UAMPS pursuant to the Financing Documents and in accordance with Section 18.

"Required Approvals" means all governmental, regulatory and lender approvals, consents and authorizations required or necessary for (i) the execution, delivery and performance of this Contract (or any amendment hereto) by the Participant and (ii) this Contract (or any amendment hereto) to be the legal, valid and binding obligation of the Participant.

"Reserve and Contingency Fund" means the fund, if any, established pursuant to Section 20.

"Substantial Completion" (or such similar term as may be used in the EPC Agreement) means the substantial completion of the Initial Facilities as determined pursuant to the EPC Agreement.

"Super-Majority Vote" means the affirmative vote of Participants' Representatives that represent 75% of (i) the number (per capita) of Participants' Representatives serving on the Project Management Committee, and (ii) during the Development Period, the Development Cost Shares of all Participants or, after the Development Period, the Entitlement Shares of all Participants. For the avoidance of doubt, in the event that a Super-Majority Vote is required when a Participant's Representative is not entitled to vote on matters before the Project Management Committee pursuant to Section 5(b)(1), such Participant's Representative and such Participant's Development

Cost Share or Entitlement Share (as applicable) shall be disregarded in computing the percentages of Participants' Representatives and Entitlement Shares that have voted on the matter requiring a Super-Majority Vote.

"System Point of Receipt" means (i) the point(s) of interconnection between the Participant's electric utility system and the transmission facilities of the applicable balancing authority or authorities, or (ii) such other point(s) for the receipt by the Participant of Electric Energy from the Project as may be agreed to by the parties.

"Tax Status" means (i) the exclusion from gross income for federal income tax purposes of the interest on any Bonds issued as tax-exempt obligations, or (ii) the right of a bondowner (or other investor) to receive tax credits or the right of UAMPS to receive interest subsidy payments on any Bonds issued as tax credit bonds or interest subsidy bonds, respectively, in each case pursuant to the provisions of the Code.

"Transmission Agreements" means each transmission contract, agreement or tariff that is used or necessary for the delivery of Electric Power and Energy from the Point of Delivery to the Participant's System Point of Receipt, whether by direct transmission, displacement, exchange or otherwise.

"Transmission Costs" means, for each Billing Period of each Contract Year, all capital, operating and other costs and expenses paid, payable, incurred or accrued by UAMPS during such Billing Period for the transmission of Electric Energy from the Project to the Participant's System Point of Receipt pursuant to the Transmission Agreements or otherwise. The Participant shall be responsible for the payment of Transmission Costs to UAMPS hereunder only to the extent that UAMPS has, at the request of the Participant, entered into or utilized Transmission Agreements for the transmission of Electric Energy from the Point of Delivery to the Participant's System Point of Receipt.

"Trustee" means the bank or trust company acting as the trustee under the Financing Documents.

"UAMPS" means Utah Associated Municipal Power Systems, a political subdivision organized and existing under the laws of the State of Utah, the Act and the Joint Action Agreement, and its successors. All references to UAMPS in this Power Sales Contract shall include Authorized Officers of UAMPS and their delegees acting pursuant to specific authorization by the Board.

"UAMPS Pool" means that electric power pool or pools established pursuant to the Pooling Agreement between UAMPS and the Members under which UAMPS provides certain services with respect to the scheduling, dispatch and the sale of Electric Power and Electric Energy and other matters pursuant to the operating criteria and procedures provided for in the Pooling Agreement.

"Uncontrollable Force" means any cause, event or force beyond the control of the party affected, including, but not restricted to failure, or threat of failure of facilities, flood, earthquake, storm, fire, lightning, epidemic, war, acts of a public enemy, riot, civil disturbance or disobedience,

labor dispute, labor or material shortage, sabotage, and restraint by court or public authority and action or non-action by, or inability to obtain the necessary authorizations or approvals from, any governmental agency or authority, which by exercise of due diligence and foresight such party could not reasonably have been expected to avoid and which by exercise of due diligence it shall be unable to overcome. "Uncontrollable Force" includes any cause, event or force constituting "force majeure," "uncontrollable force" or similar term as defined in any Project Agreement.

"Uniform System of Accounts" means the Federal Energy Regulatory Commission Uniform Systems of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, 18 C.F.R. Part 101, as the same may be modified, amended or supplemented from time to time or such other system of accounting as may be applicable by law to UAMPS.

(b) References to Articles, Sections, Schedules and Exhibits are to the Articles and Sections of and Schedules and Exhibits to this Contract, unless otherwise provided. Article and Section headings are included herein for convenience of reference only and shall not constitute a part of this Contract for any other purpose or be given any substantive effect. Any of the defined terms may, unless the context otherwise requires, be used in the singular or the plural, depending on the reference. The use of the word "include" or its derivations shall not be construed as language of limitation.

(c) References to contracts and agreements, including the Project Agreements, refer to such contracts and agreements as they may be amended or supplemented from time to time in accordance with their respective provisions and, in the case of the Project Agreements, the provisions of Section 40.

(d) Any representation, warranty, certificate or legal opinion with respect to the enforceability of this Contract or any other contract or agreement made in or provided pursuant to this Contract shall be deemed to be qualified by reference to the effect of applicable bankruptcy, insolvency, moratorium, reorganization or similar laws affecting creditor's rights generally and by the application of equitable principles, regardless of whether such qualification is expressly stated herein or therein.

Section 2. Effective Date and Term of Contract. (a) Promptly upon its governing body's adoption of the Contract Resolution and its receipt of any other Required Approvals, the Participant shall (i) cause this Contract to be executed by its authorized officers, and (ii) deliver to UAMPS notice of the requested amount of its Development Share (in kW) and an executed counterpart of this Contract, together with its executed certificate (in substantially the form attached hereto as EXHIBIT III) and its executed opinion of counsel (in substantially the form attached hereto as EXHIBIT V). The Effective Date of the Power Sales Contracts shall occur on the date on which UAMPS receives executed Power Sales Contracts and the other items described in the preceding sentence from Participants that have requested Development Shares totaling 85% of the expected Project Capability as of the Effective Date (the *"Minimum Subscription"*). At its initial meeting, the Project Management Committee shall confirm and declare that the Effective Date has occurred, shall approve any changes to the expected Project Capability and shall approve the completed form of SCHEDULE D. The Authorized Officers of UAMPS shall execute all such

Power Sales Contracts as of the date that the Effective Date occurs. Once it has occurred, the Effective Date shall not be affected by any subsequent action, event or circumstance.

(b) If the Minimum Subscription is achieved but the total amount of Electric Power requested by the Participants is less than the expected amount of the Project Capability, UAMPS will during the Development Period solicit additional Project participation by third parties under Power Sales Contracts, Joint Ownership Agreements or other arrangements. Participants that have executed Power Sales Contracts may also elect to increase their Development Shares at such times and in such amounts as may be approved by the Project Management Committee up to and including the end of the Development Period. In the event that less than all of the expected Project Capability is fully subscribed at the end of the Development Period as described in this paragraph, UAMPS shall take such actions as are necessary to downsize the expected Project Capability to the amount of subscription under the Power Sales Contracts and any Joint Ownership Agreements or other arrangements. UAMPS and the Participant acknowledge and agree that it may not be possible to precisely match the final amount of the expected Project Capability with the amount of Project subscription and in this case the Project Management Committee will have the authority to approve such true up adjustments to the Entitlement Shares of all Participants as are necessary at the time that it approves the initial SCHEDULE I.

(c) This Contract will become effective upon the Effective Date, and will, unless terminated pursuant to Section 43, continue until the last to occur of : (i) the date on which all of the Project Agreements have terminated or expired in accordance with their respective terms and all obligations of UAMPS thereunder have been fully paid, satisfied or discharged; (ii) the date on which all Bonds have been paid in full as to principal, premium and interest, or sufficient funds shall have been irrevocably set aside for the full defeasance thereof and all other obligations of UAMPS under the Financing Documents have been paid or satisfied; and (iii) the date on which the Initial Facilities and any Additional Facilities shall be permanently removed from service and Decommissioned and all Decommissioning Costs shall have been paid or irrevocable arrangements have been made that fully fund all Decommissioning Costs.

Section 3. Development Share; Entitlement Share. (a) From the Effective Date through the end of the Development Period, the Participant shall have a Development Share and a Development Cost Share as set forth on SCHEDULE D. A Participant's Development Cost Share shall not exceed [__][1] percent, unless otherwise approved by the Project Management Committee.

(b) By virtue of its Development Share and in consideration if its associated Development Cost Share, the Participant (i) shall have the right to participate in the decision-making over the development of the Project through its representative on the Project Management Committee, and (ii) shall, from and after the Completion of Development through the remaining term of this Contract and without any further action on its part or by any other person, have an Entitlement Share with the same amount of Electric Power as its Development Share.

1 % amount will be inserted upon completion of credit review of Participant group.

Section 4. The Project and the Initial Facilities. (a). The Project shall initially be known as the "Millard County Power Project." The Project Management Committee may in its discretion adopt a different name for the Project at any time. In such event, all references to "Millard County Power Project" in this Contract shall be changed to the name adopted by the Project Management Committee.

(b) The Project shall consist of the Initial Facilities and any Additional Facilities approved by the Project Management Committee. A preliminary and general description of the Initial Facilities prepared by UAMPS is attached as EXHIBIT I to this Contract. EXHIBIT I shall be reviewed, modified as deemed necessary and approved by the Project Management Committee promptly after the Effective Date.

(c) As the development of the Project proceeds and as the components of the Initial Facilities are designed, engineered, constructed, installed and tested, UAMPS shall from time to time recommend revisions to EXHIBIT I to the Project Management Committee for approval in order that the description therein reasonably corresponds to the Initial Facilities being developed and constructed. EXHIBIT I shall be updated as necessary in connection with the Completion of Development. Following the Commercial Operation Date, UAMPS shall prepare and submit to the Project Management Committee for its review and approval a completed EXHIBIT I that includes a final description of the Initial Facilities and the Project Capability. UAMPS and the Participant agree that in no event will any revisions to EXHIBIT I alter or affect their respective rights and obligations under this Contract.

Section 5. Project Management Committee. (a). The Participants hereby establish the Project Management Committee, which shall consist of one voting representative from each Participant (who shall be the Participant's Representative) and shall be chaired by a Participant's Representative elected by the Project Management Committee. Pursuant to the Contract Resolution, the Participant has delegated full and complete authority to its Participant's Representative to act on all matters and decisions that come before the Project Management Committee. Each Representative appointed by the Participant shall serve on the Project Management Committee until the Participant appoints a successor. An Authorized Officer of UAMPS shall attend all meetings of the Project Management Committee and shall cause minutes to be kept of all such meetings.

(b) The Joint Action Agreement and the bylaws of UAMPS shall govern the procedures for and the voting rights on the Project Management Committee, *provided that*:

(1) The Participant's Representative of any Participant that is in default hereunder (A) shall not be entitled to vote on any matter during the period of such default. and the consent or approval of such Participant or such Participant's Representative shall not be required during the existence of such default and (B) shall be disregarded for purposes of determining whether a quorum of the Project Management Committee is present at any meeting;

(2) A Super-Majority vote of all Project Management Committee Representatives shall be required on all decisions which would result in the termination of the Project; and

(3) All decisions made by the Project Management Committee shall be made by resolution, order or other appropriate action of the Project Management Committee and, except in those instances when the Project Management Committee is acting pursuant to delegated authority from the Board, before such resolution, order or action of the Project Management Committee shall take effect, the same shall be ratified and approved by resolution, order or action of the Board, acting in accordance with the Joint Action Agreement and the bylaws of UAMPS.

The Participants acknowledge that the Joint Action Agreement provides, among other things, that decisions of the Board with respect to the Project shall be made only upon the recommendation of the Project Management Committee and that weighted votes may be called for on any recommendation or decision to be made by the Project Management Committee or the Board, respectively, all as more fully provided in the Joint Action Agreement.

(c) In addition to its other responsibilities under the Power Sales Contracts, the Project Management Committee shall:

(1) review, provide advice and recommendations to and consult with UAMPS regarding the Project,

(2) supervise, review and monitor the Development Work and the development of the Project in accordance with Section 6 and the other applicable provisions of the Power Sales Contracts and the resolutions of the Project Management Committee;

(3) review, provide advice and recommendations to UAMPS on, and approve the Project Agreements and any modifications or amendments thereto;

(4) supervise and provide direction to UAMPS during the construction of the Project, including approval of the construction budget for the Project and approval of all notices to proceed and notices to construct given by UAMPS under the EPC Agreement;

(5) review, approve and revise from to time the Budget and Plan of Finance for the Initial Facilities and any Additional Facilities;

(6) review, approve and provide advice and direction to UAMPS with respect to the issuance of Bonds, Additional Bonds and Refunding Bonds

(7) review, provide advice and recommendations to and consult with UAMPS regarding the Commercial Operation Date of the Initial Facilities, and the Performance Tests for and the Substantial Completion and the Final Completion of the Facility under the EPC Agreement;

(8) determine and declare the Project Capability upon the Final Completion of the Project and from time to time thereafter as it deems necessary to reflect the actual capability of the Project;

(9) review and approve the Operating and Scheduling Procedures, any Operator of the Project and any Operating Agreement;

(10) review and consult with UAMPS regarding the acquisition and management of supplies of natural gas and any other necessary fuels for the Project and review and approve each Fuel Agreement and any Fuel Agent to be appointed by UAMPS;

(11) review, recommend and approve any Additional Facilities;

(12) assist with the resolution of any billing disputes as provided in Section 28;

(13) review, recommend and consult with UAMPS regarding any actions or remedies to be taken by UAMPS under Sections 34 and 35 of the Power Sales Contracts.

UAMPS and the Participant acknowledge and agree that the responsibilities of the Project Management Committee with respect to the Project are complete and comprehensive and are not limited to the specific responsibilities enumerated herein.

(d) The Project Management Committee may from time to time direct UAMPS to commission, obtain and provide such Engineering Studies and Reports that the Project Management Committee deems reasonably necessary or desirable with respect to the Project. The Project Management Committee shall be entitled to rely upon such Engineering Studies and Reports with respect to its determinations and decisions with respect to the Project, including particularly its determinations under Section 6.

Section 6. Development Period and Development Work. (a) During the Development Period, UAMPS shall use Commercially Reasonable Efforts to cause the Development Work to proceed in an expeditious and economical manner. UAMPS shall (i) report not less frequently than monthly to the Project Management Committee (unless otherwise approved by the Project Management Committee) with respect to the progress of the Development Work and the Development Costs incurred or expended, (ii) recommend from time to time revisions and updates to the Budget and Plan of Finance to the Project Management Committee, and (iii) act consistently with and in furtherance of the directions given to it by the Project Management Committee.

(b) Promptly after the Effective Date of the Power Sales Contracts, the Project Management Committee shall by resolution establish a maximum target price for cost of energy ($/MWh) from the Project (the *"Target Price"*). The Target Price shall be the maximum cost of energy expected to be payable by the Participants under the Power Sales Contracts, and shall exclude only Transmission Costs, taking into account the information and assumptions utilized in the Development Work and the Budget and Plan of Finance. Such resolution shall establish such determination dates based on Project development milestones as the Project Management Committee deems necessary for determining whether the expected cost of energy from the Project

exceeds the Target Price, together with such other matters as the Project Management Committee deems necessary or desirable. A determination by the Project Management Committee that the Target Price is exceeded as of any such determination date, shall constitute a determination by the Project Management Committee to terminate the Project.

(c) In addition to a determination under paragraph (b), the Project Management Committee may by a Super-Majority Vote suspend or terminate the Project at any time during Development Period upon its determination that the Project is not feasible for any reason. UAMPS shall give prompt written notice to all Participants of any such determination of the Project Management Committee under paragraph (b) above or this paragraph (c). In the event that the Project Management Committee determines to terminate the Project during Development Period, UAMPS shall proceed to wind up the Project and the Development Work, determine the remaining amount of the Development Costs and submit billings to the Participants for such Development Costs and the amount necessary to repay and retire any Bonds or obligations that have been issued or incurred to finance Development Costs.

(d) Upon substantial completion of the Development Work, including the Project Agreements and receipt of the Permits and Approvals (or an indication of the terms and conditions thereof), UAMPS will conduct a review and analysis and report to and consult with the Project Management Committee regarding the actions necessary to complete the Development Work, the terms and conditions of the Project Agreements and the Permits and Approvals and the definitive Budget and Plan of Finance, and will make recommendations to the Project Management Committee as to whether the Project should proceed to the Construction Period.

(e) Following its review of the report and recommendations of UAMPS, the Project Management Committee will in its discretion:

(i) determine whether or when Completion of Development has occurred;

(ii) review and approve definitive engineering and feasibility studies for the Initial Facilities, and such other materials as it deems necessary in order to determine that construction and operation of the Initial Facilities is feasible and should proceed;

(iii) review and approve the definitive Budget and Plan of Finance for the Cost of Acquisition and Construction of the Initial Facilities;

(iv) make a determination by a Super-Majority Vote as to whether construction of the Project is feasible and whether the Project should proceed to the Construction Period;

(v) approve the Power Sales Contracts to be entered into with any new Participants any additional terms and conditions for their participation in the Project; and

(vi) review and approve the initial SCHEDULE I for the Project.

A determination by the Project Management Committee that construction of the Initial Facilities is not feasible and should not proceed to the Construction Period will result in termination of the

Project; notwithstanding any such termination, this Contract shall remain in effect until the conditions described above and in Section 2(b) have been satisfied.

(f) Upon a determination by the Project Management Committee that construction of the Initial Facilities is feasible and the Project should proceed to the Construction Period, UAMPS will then execute the Project Agreements, the Construction Contracts for the Initial Facilities and finance the Cost of Acquisition and Construction of the Initial Facilities through the issuance of Bonds.

(g) UAMPS may from time to time recommend the acquisition or construction of Additional Facilities to improve or add to the Project. Any such Additional Facilities shall be approved by the Project Management Committee. UAMPS may issue Bonds or incur other obligations pursuant to the Financing Documents to finance all or a portion of the costs incurred in the Development Work and construction of the Additional Facilities.

Section 7. Joint Ownership Agreement. As a part of the Development Work and to the extent authorized by the Project Management Committee, UAMPS may also solicit indications of interest from other entities regarding the acquisition of ownership interest in the Initial Facilities. Subject to the negotiation of a definitive Joint Ownership Agreement and the approval of the Project Management Committee, UAMPS may sell a portion of its ownership interest in the Initial Facilities to another entity. UAMPS shall make recommendations to the Project Management Committee regarding (i) the terms and provisions of any Joint Ownership Agreement, and (ii) the identity, operating experience and financial capability of the joint owner under a Joint Ownership Agreement and its ability to meet its obligations thereunder, each of which shall be subject to the approval of the Project Management Committee.

Section 8. Construction Period. (a) The Construction Period shall commence upon the determination of the Project Management Committee that Completion of Development has occurred. During the Construction Period, UAMPS shall (i) cause the construction of the Project to proceed in an expeditious and economical manner pursuant to the Construction Agreements and other Project Agreements, (ii) monitor the performance of the contractors under the Construction Agreements, and (iii) report to the Project Management Committee with respect to the progress of the acquisition and construction of the Project as provided herein.

(b) UAMPS shall perform its obligations under the Construction Agreements and shall:

(i) use Commercially Reasonable Efforts consistent with and subject to the terms and provisions of the Project Agreements to cause the Project to be expeditiously and economically acquired and constructed pursuant to the Construction Agreements;

(ii) diligently defend and protect the rights of UAMPS and the Project under the Construction Agreements and enforce the contractors' obligations thereunder;

(iii) monitor the performance of the contractors under the Construction Agreements and report promptly to the Project Management Committee with respect to any default or event of default under the Construction Agreements;

(iv) report not less frequently than monthly to the Project Management Committee (unless otherwise approved by the Project Management Committee) regarding the current status of construction and any changes to the estimated Commercial Operation Date and the estimated Cost of Acquisition and Construction; and

(v) give prompt notice to the Project Management Committee and the Participant of the occurrence of the Commercial Operation Date of the Initial Facilities and any Additional Facilities.

(c) As soon as practicable after the Commercial Operation Date of the Initial Facilities, UAMPS shall prepare a complete statement and reconciliation of the final (or substantially final) Cost of Acquisition and Construction of the Initial Facilities and submit the same to the Project Management Committee for its review and acceptance. In the event that a substantially final statement of the cost of construction of the Initial Facilities is submitted to and accepted by the Project Management Committee, UAMPS shall provide periodic reports to the Project Management Committee regarding the remaining items of the Cost of Acquisition and Construction of the Initial Facilities until a final statement is available for its review and approval.

Section 9. Operation and Maintenance of the Project. UAMPS covenants and agrees that, during the Operating Period, it will use Commercially Reasonable Efforts consistent with and subject to the terms and provisions of the Project Agreements to cause the Project to be operated, maintained and managed in an efficient and economical manner in accordance with Good Utility Practice for the joint and ratable benefit of all of the Participants. UAMPS agrees with and covenants to the Participant that UAMPS will vigorously enforce and defend its rights under the Project Agreements. The Participant acknowledges and agrees that UAMPS may, upon the approval of the Project Management Committee, from time to time enter into amendments of and supplements to any or all of the Project Agreements and that, except as otherwise required by Section 40, UAMPS will not be required to obtain the consent or approval of the Participant in connection with any such supplement or amendment.

Section 10. Scheduling of Electric Energy; Coordination with UAMPS Pool. (a) From and after the Commercial Operation Date of the Project, the Participant shall be entitled to use the Electric Energy allocable to the Participant's Entitlement Share. UAMPS shall schedule or cause to be scheduled such Electric Energy in accordance with the Operating and Scheduling Procedures approved by the Project Management Committee. UAMPS shall provide the Participant with notice of any amendment to or modification of the Operating and Scheduling Procedures.

(b) At any time the Project is operable or operating the Participant shall not be entitled to use in any hour Electric Energy in excess of that which is allocable to the Participant's Entitlement Share, unless arrangements have been made for a planned purchase of such Electric Energy through the UAMPS Pool. The Participant agrees that, prior to the first delivery of Electric Energy under this Power Sales Contract, it will execute and deliver to UAMPS an appendix to the Pooling Agreement (in a form approved by the Project Management Committee) that assigns the Electric Energy allocable to the Participant's Entitlement Share to the UAMPS Pool. Any surplus Electric Energy attributable to the Participant's Entitlement Share shall be sold or otherwise disposed of by the Participant only in accordance with the provisions of such appendix to the Pooling

Agreement. In addition to any sales of surplus Electric Energy requested by the Participant through the UAMPS Pool, UAMPS will utilize Commercially Reasonable Efforts to sell, exchange or otherwise dispose of any incidental surplus Electric Power and Electric Energy attributable to the Project for the benefit of the Participants.

(c) Prior to the first delivery of Electric Energy under this Power Sales Contract, the Participant shall provide to UAMPS a written schedule of the Participant's available electric resources and the order in which such resources are to be applied to meet the Participant's requirements for Electric Power and Electric Energy. UAMPS shall verify all such resources and promptly notify the Participant of any rejection of such resources. The Participant may revise or modify such schedule upon written notice to UAMPS at least one business day prior to the beginning of any Billing Period.

Section 11. Point of Delivery; Risk of Loss. (a) The Electric Energy allocable to the Participant's Entitlement Share shall be delivered by UAMPS to the Participant at the Point of Delivery. The Participant shall be responsible for, and shall pay all costs associated with, (i) the transmission of such Electric Energy from the Point of Delivery to its System Point of Receipt and (ii) the distribution and delivery of Electric Energy from its System Point of Receipt to its customers.

(b) Upon the request of the Participant, UAMPS will use Commercially Reasonable Efforts to enter into one or more Transmission Agreements, or will utilize its transmission rights under existing Transmission Agreements, to provide for transmission service for the Electric Energy allocable to the Participant's Entitlement Share from the Point of Delivery to the Participant's System Point of Receipt. Any future Transmission Agreements entered into by UAMPS for or on behalf of the Participant shall be approved by UAMPS and the Participant, and the Participant shall pay all Transmission Costs thereunder. The Participant agrees that it shall maintain (or cause UAMPS to maintain) during the term of this Contract, such Transmission Agreements as shall be necessary for the firm transmission of the Electric Energy allocable to its Entitlement Share from the Point of Delivery to its System Point of Receipt, except as may be otherwise approved by the Project Management Committee. The Participant shall provide UAMPS with copies of all Transmission Agreements utilized by it and with such other information regarding its transmission arrangements as UAMPS may reasonably request.

(c) From and after the Commercial Operation Date of the Project, the Participant shall be obligated to maintain an appropriate power factor at the Participant's System Point of Receipt consistent with the provisions of the Transmission Agreements. Should the power factor, as metered at such System Point of Receipt, not be maintained within the limits established under the Transmission Agreements, the Participant shall be notified and requested to correct such power factor. If the Participant has not begun corrective action at the end of 90 days, UAMPS may take corrective action and the Participant shall be obligated to reimburse or compensate UAMPS for all sums expended and all services contracted for or performed by UAMPS or for which UAMPS shall be obligated relating to such corrective action.

(d) Electric Energy delivered hereunder and risk of loss shall pass from UAMPS to the Participant at the Point of Delivery. As between the parties to this Contract, UAMPS shall be

deemed to be in exclusive control and possession of the Electric Energy delivered hereunder, and responsible for any damage or injury caused thereby, prior to the time such Electric Energy shall have been delivered to the Participant at the Point of Delivery. After delivery of Electric Energy to the Participant at the Point of Delivery, the Participant shall be deemed to be in exclusive control and possession thereof and responsible for any injury or damage caused thereby. UAMPS assumes all liability for and shall indemnify, defend and hold harmless the Participant (individually) from any claims, including death of persons, arising from any act or incident occurring when title to Electric Energy is vested in it. All costs and expenses incurred by UAMPS under the foregoing indemnity shall constitute a Cost of Acquisition and Construction or an item of Operation and Maintenance Costs, as determined by the Project Management Committee. To the extent permitted by law and solely to the extent of the revenues of its Electric System and any available insurance proceeds, the Participant assumes all liability for and shall indemnify, defend and hold harmless UAMPS and the other Participants from any claims, including death of persons, arising from any act or incident occurring when title to Electric Energy is vested in it.

Section 12. Interruption or Reduction of Deliveries. UAMPS may interrupt or reduce deliveries under this Power Sales Contract of Electric Energy if: (a) the Operator has determined that such interruption or reduction is necessary in case of emergencies affecting the Project, in order to install equipment, to make repairs and replacements to, to make investigations and inspections of, or to perform maintenance work on, the Project or otherwise carry out its obligations as Operator under the Operating Agreement; (b) Electric Energy from the Project is otherwise unavailable whether due to an event of Uncontrollable Force or otherwise; or (c) the transmission of Electric Energy from the Project is interrupted or curtailed by the balancing area authority or other transmitting utility. In order that the operation of the Participant's Electric System will not be unreasonably interrupted or interfered with, UAMPS will, to the extent necessary, use Commercially Reasonable Efforts to make arrangements to serve the Participant's load through other projects of UAMPS or the UAMPS Pool. UAMPS will also use Commercially Reasonable Efforts, consistent with the provisions of the Project Agreements and the other Power Sales Contracts, to arrange for any planned interruption or reduction in the Project Output to be scheduled at a time which will cause the least interference with the operation of the Participant's Electric System.

Section 13. Availability of Electric Energy. (a) Except as provided otherwise by this Power Sales Contract and subject to the provisions of the Project Agreements, Electric Energy allocable to the Participant's Entitlement Share shall be made available in accordance with this Power Sales Contract during the term hereof; *provided, however,* that nondelivery of Electric Energy hereunder for any reason whatsoever (1) shall not relieve the Participant from its obligation to make its payments under Section 27 and (2) shall not impose any liability upon UAMPS for any direct or consequential damages suffered by the Participant.

(b) The Participant acknowledges and agrees that deliveries of the Electric Energy allocable to its Entitlement Share are not firm and are contingent upon the operation of the Project, the availability of transmission and other factors. The Participant agrees that it is solely responsible for any firming transactions with respect to its Entitlement Share.

Section 14. Insurance. UAMPS shall maintain, or during the Construction Period shall cause the EPC Contractor to maintain, in force, as part of the Cost of Acquisition and Construction or Operation and Maintenance Costs, as appropriate, insurance with responsible insurers with policies against risk or direct physical loss, damage or destruction of the Project, including liability insurance and employers' liability insurance, all to the extent consistent with Good Utility Practice and to the extent available at reasonable cost, but in no case less than will satisfy applicable regulatory requirements and requirements of the Financing Documents.

Section 15. Budget and Plan of Finance. (a) The Budget and Plan of Finance for the Initial Facilities shall include the following information:

(i) the amount of Development Costs incurred to the date of the Budget and Plan of Finance and the estimated total Development Costs to the Completion of Development;

(ii) the estimated Cost of Acquisition and Construction;

(iii) the estimated timeline for the development and construction of the Initial Facilities to the Commercial Operation Date;

(iv) the estimated levelized cost of energy ($/MWh) for Project Output sold to the Participants under the Power Sales Contracts (which may be a range of such costs);

(v) the proposed funding and financing arrangements for all Development Costs during the Development Period; including Bonds and other funding and financing arrangements; and

(vi) such other information as may be required to be included in the Budget and Plan of Finance by the Project Management Committee.

(b) UAMPS and the Participant acknowledge and agree that as of the Effective Date, (i) UAMPS has not obtained the Permits and Approvals necessary for the construction and operation of the Project, (ii) the overall development of the Project is at a preliminary stage, and (iii) a definitive estimate of the Cost of Acquisition and Construction will not be available until the Completion of Development. Accordingly, the parties acknowledge and agree that the information contained in the initial Budget and Plan of Finance is necessarily preliminary and is subject to change based on, among other things, additional information that becomes available to UAMPS during the Development Period, the negotiation of the terms and provisions of the Project Agreements, the terms and conditions of the Permits and Approvals, and the development and negotiation of funding sources and financing arrangements for Development Costs and the Cost of Acquisition and Construction.

(c) The Budget and Plan of Finance shall be updated by UAMPS from time to time during the Development Period as necessary. Each update of the Budget and Plan of Finance shall be subject to the approval of the Project Management Committee.

Section 16. Financing of the Project. (a) UAMPS shall finance the portion of the Cost of Acquisition and Construction of the Initial Facilities that is not paid from Capital Contributions made by the Participants through the issuance of one or more series of Bonds pursuant to the Budget and Plan of Finance approved by the Project Management Committee.

(b) Unless otherwise approved by the Project Management Committee, the Budget and Plan of Finance shall provide for the financing of all Development Costs, Construction Costs and other Costs of the Initial Facilities to a date not earlier than the estimated Commercial Operation Date of the Initial Facilities with the objective that the Participant will not be required to make any payments to UAMPS in respect of Debt Service Costs until a date that is after the estimated Commercial Operation Date. UAMPS shall use Commercially Reasonable Efforts to structure and implement the financings for the Development Costs and Construction Costs of the Initial Facilities to achieve this result. The Participant acknowledges and agrees that UAMPS cannot guarantee that it will be able to achieve this result, and under certain circumstances it may be necessary for UAMPS to submit billings to the Participant pursuant to Section 26 to enable it to pay Development Costs.

(c) UAMPS and the Participant acknowledge and agree that:

(i) as of the Effective Date, (A) UAMPS has not obtained the Permits and Approvals necessary for the construction and operation of the Project, and (B) the overall development of the Project is at a preliminary stage;

(ii) UAMPS shall use Commercially Reasonable Efforts to obtain all such Permits and Approvals as a part of the Development Work during the Development Period;

(iii) the Development Costs incurred by UAMPS will be financed by the issuance of Bonds;

(iv) in the event that UAMPS is unable to obtain transmission service for Project Output on reasonable terms, is unable to obtain the required Permits and Approvals for the construction and operation of the Project or the Project Management Committee determines that the continued development of the Project is not feasible for any reason, the Project Management Committee may determine to terminate the Project as provided herein; and

(v) if the Project Management Committee determines to terminate the Project during the Development Period, the Project will not be completed and the Participant will be required to pay, among other things, its Development Cost Share of all Development Costs incurred and its Development Cost Share of Debt Service Costs until all Bonds previously issued are fully paid and retired, as provided in Section 6.

(d) Each Participant may elect to make a Capital Contribution to UAMPS pursuant to Section 17. Prior to the giving by UAMPS of the notice required by Section 17(a), the Project Management Committee shall determine whether any additional interest expense on or in respect of any Bonds that are subject to federal income taxation shall be allocated to those Participants

whose legal status or use of Project Output requires the issuance of such Bonds. In the event the Project Management Committee determines to make such allocation, the notice required by Section 17(a) shall include such information as shall be necessary to generally inform the affected Participants of the additional Debt Service Costs that may be payable by them in the event they elect not to make a Capital Contribution.

Section 17. Capital Contributions. (a) Prior to the first issuance of long-term Bonds to finance the Cost of Acquisition and Construction of the Initial Facilities, UAMPS shall give written notice to the Participant of:

(i) its right to elect to make a Capital Contribution;

(ii) the date by which it must notify UAMPS of its election, which shall be not earlier than 30 days after the date of such notice;

(iii) the applicable Reference Project Costs; and

(iv) the maximum amount of the Participant's Capital Contribution, which shall be an amount equal to the product of (A) such Reference Project Costs and (B) the ratio of the Entitlement Share of the Participant to the Entitlement Shares of all Participants.

The Participant may elect to make a Capital Contribution only from the retained earnings of its Electric System or other legally available funds not derived from any external borrowing.

(b) The Participant's election to make a Capital Contribution shall be made by written resolution adopted by its governing body. An original or certified copy of such resolution shall be submitted to UAMPS with the Participant's notice of its election to make the Capital Contribution. In the event that the Participant does not notify UAMPS of the determination of its governing body by the date specified in the notice provided by UAMPS, the Participant shall be deemed to have elected not to make a Capital Contribution.

(c) Following receipt of the Participant's election to make the Capital Contribution, UAMPS will provide the Participant with notice of:

(i) the date (which shall be not earlier than 30 days after the date of such notice) by which the Participant must make the Capital Contribution;

(ii) instructions for the deposit of the Capital Contribution into a separate and segregated special escrow account established under the Financing Documents; and

(iii) a written statement of information regarding UAMPS, the Project and the Project Agreements for the Participant's use in any offering material for any indebtedness to be issued to finance the Capital Contribution.

The Capital Contribution shall be held and invested in accordance with the provisions of the Financing Documents, which shall provide for the investment of the Capital Contribution, the

crediting of any interest earnings for the account of the Participant and the application of the Capital Contribution by the Trustee upon the direction of UAMPS to fund a portion of the Cost of Acquisition and Construction of the Initial Facilities, and for deposit into certain funds and accounts established by the Financing Documents. If the Participant fails to make the Capital Contribution as and when required by the UAMPS' notice, it shall be deemed to have rescinded its election to make the Capital Contribution.

(d) The Participant acknowledges and agrees that the amount of the Capital Contribution to be made by the Participant will be based upon an estimate of the Cost of Acquisition and Construction of the Initial Facilities, which estimates will be subject to adjustment to reflect the final Cost of Acquisition and Construction of the Initial Facilities approved by the Project Management Committee. Not more than 30 days following the determination of the final Cost of Acquisition and Construction of the Initial Facilities, UAMPS shall deliver a final accounting statement to the Participant showing the Cost of Acquisition and Construction, the amount of and interest earnings on the Capital Contribution and any amounts payable by or credited to the Participant in respect of the final Cost of Acquisition and Construction. The Participant agrees that it will pay any additional amount payable by it shown on such accounting statement on or before the 30th day following the date of such final accounting statement, or on such later date as may be approved by the Project Management Committee.

(e) After Capital Contributions have been made by all electing Participants, UAMPS shall complete (or revise, as applicable) SCHEDULE I and provide a copy of the completed or revised SCHEDULE I to each of the Participants. With respect to all Participants and at all times, SCHEDULE I shall show that:

(i) the sum of each Participant's Capital Contribution Percentage and Debt Service Percentage equals its Entitlement Share;

(ii) the sum of the Capital Contribution Percentages and Debt Service Percentages of all Participants equals 100%; and

(iii) the sum of the Debt Service Shares of all Participants equals 100%.

UAMPS' calculation and determination of the Development Costs and the Cost of Acquisition and Construction of the Initial Facilities and the Participant's Capital Contribution Percentage, Debt Service Percentage and Debt Service Share in accordance with (i), (ii) and (iii) above shall be subject to the approval of the Project Management Committee, and upon such approval shall be conclusive and binding upon UAMPS and the Participant. UAMPS shall revise SCHEDULE I from time to time as provided herein so that it sets forth the correct Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of all Participants.

(f) The Participant acknowledges and agrees with UAMPS that:

(i) its election to make a Capital Contribution shall be irrevocable and under no circumstances whatsoever shall the Participant be entitled to a return or rebate of all or any portion of any Capital Contribution in the event that Uncontrollable Force, termination

of any Project Agreements or other circumstances result in the suspension, interruption, interference, reduction, curtailment or termination of the Project or the Project Output;

(ii) the Capital Contribution shall not be deemed to constitute an investment by the Participant and the Participant shall not be entitled to any investment earnings or rate of return on the Capital Contribution, except with respect to interest earnings on the Capital Contribution pending its application as provided above; and

(iii) any Capital Contribution made by the Participant shall not change or affect UAMPS' ownership in the Project or any of the rights and obligations of UAMPS and the Participant under this Contract, except as specifically provided herein, including the right of UAMPS to suspend or terminate the Participant's right to receive the Electric Energy allocable to its Entitlement Share as provided in Section 34.

(g) In connection with the issuance of Additional Bonds or Refunding Bonds, the Project Management Committee may determine to provide Participants with the option of making a capital contribution with respect to the Costs of the Project being financed or refinanced by the Additional Bonds or Refunding Bonds under procedures and standards substantially similar to those set forth in this Section, with such adjustments as the Project Management Committee shall determine to be advisable. Any capital contribution made by a Participant pursuant to this paragraph (g) shall constitute a Capital Contribution for all purposes of the Power Sales Contracts.

Section 18. Additional Bonds and Refunding Bonds. (a) Additional Bonds may be sold and issued by UAMPS in accordance with the provisions of the Financing Documents at any time and from time to time for the purpose of financing the Cost of Acquisition and Construction. UAMPS may incur other obligations pursuant to the Financing Documents to achieve purposes deemed beneficial to the Project.

(b) Any Additional Bonds shall be secured by the pledge made pursuant to the Financing Documents of the payments required to be made by the Participant under Section 27, as such payments may be increased and extended by reason of the issuance of Additional Bonds, and of other revenues of UAMPS attributable to the Project. Additional Bonds may be issued in amounts sufficient to pay the full amount of such costs and to provide such reserves as may be determined by UAMPS to be reasonably necessary. In the event that the Project Management Committee approves the issuance of Additional Bonds, it shall determine whether to make a capital contribution option available to the Participants and the procedures therefore.

(c) In the event Debt Service Costs may be reduced by the refunding of any Bonds then outstanding or in the event it shall otherwise be advantageous, in the opinion of UAMPS, to refund any Bonds, UAMPS may issue and sell Refunding Bonds in accordance with the Financing Documents.

Section 19. Pledge of Payments. All payments required to be made by the Participant pursuant to Section 27, together with other revenues of UAMPS attributable to the Project may be pledged by UAMPS pursuant to the Financing Documents to secure the payment of Bonds and any Additional Bonds or Refunding Bonds.

Section 20. Reserve and Contingency Fund. (a) In addition to various funds and accounts established under the Financing Documents, UAMPS may, upon the approval of the Project Management Committee, establish an additional fund with respect to the Project known as the "Reserve and Contingency Fund" to be funded, held and applied as provided herein. Amounts on deposit in the Reserve and Contingency Fund may be used to pay or provide reserves for unusual or extraordinary Operation and Maintenance Costs, renewals, repairs, replacements, additions or betterments of or to any items included in the Project, the cost of any Additional Facilities or the cost of or reserves for the retirement, decommissioning and termination of the Initial Facilities and any Additional Facilities that will not be paid from the Decommissioning Fund.

(b) The Project Management Committee may direct UAMPS to include in the Annual Budget adopted pursuant to Section 24 an amount for deposit into the Reserve and Contingency Fund. This amount may represent either an appropriation of excess revenues from the operation of the Project during the preceding Fiscal Year or amounts to be billed to and collected from the Participants as an item of Operation and Maintenance Costs during the Fiscal Year covered by the Annual Budget.

Section 21. Damage, Destruction or Condemnation. Subject to the provisions of the Project Agreements, UAMPS shall use Commercially Reasonable Efforts to collect or cause to be collected amounts arising from insurance proceeds, condemnation awards, damages due from contractors, subcontractors or others and proceeds from the sale or other disposition of surplus property, all related to the Project, and shall apply all receipts, revenues and other moneys received by it or credited to it from the foregoing sources to the repair, reconstruction or replacement of the Project, to the retirement or defeasance of Bonds (in whole or in part), by purchase, redemption or other arrangements therefor, to the payment of other costs and expenses of UAMPS in connection with the Project or to the credit, pro rata, of the Participants, based upon their Entitlement Shares in the Project, all as provided in the Financing Documents.

Section 22. Decommissioning. Upon the retirement of the Project and its removal from service, UAMPS shall take all actions necessary to Decommission the Project. The Decommissioning Fund shall be established as a separate and segregated trust fund or escrow account, and the amounts in the Decommissioning Fund shall be used solely for the payment of Decommissioning Costs and necessary administrative and other charges. The Decommissioning Fund may be funded by a prepayment, by sinking fund deposits or by another method approved by the Project Management Committee. Pending the application of amounts on deposit in the Decommissioning Fund to pay Decommissioning Costs, the Decommissioning Fund may be invested as provided in the trust or escrow agreement. Any amounts remaining in the Decommissioning Fund upon the completion of the Decommissioning of the Project shall be applied or disbursed at the direction of the Project Management Committee.

(b) The Project Management Committee may direct UAMPS to establish other funds or accounts to provide additional reserves for the payment of Decommissioning Costs.

Section 23. Disposition or Termination of the Project. (a) Except as otherwise provided in the Power Sales Contracts, UAMPS shall not sell, lease or otherwise dispose of the Project or any substantial part of the Project without the approval of the Project Management Committee by

a Super-Majority Vote. Subject to the provisions of the Financing Documents and the Project Agreements, this Section shall not prohibit a merger or consolidation or sale of all or substantially all of the property of UAMPS.

(b) Subject to the applicable provisions of the Project Agreements, if the Project shall be terminated, UAMPS shall use Commercially Reasonable Efforts to cause the Project to be economically salvaged, discontinued, disposed of or sold in whole or in part. UAMPS shall make accounting statements for each Billing Period to the Participant of all costs and any net proceeds associated therewith. Such accounting statements shall continue for such Billing Periods until the Project has been salvaged, discontinued or finally disposed of, at which time a final accounting statement with respect thereto shall be made by UAMPS at the earliest reasonable time. The costs of salvage, discontinuance or disposition shall include, but shall not be limited to, all accrued costs and liabilities resulting from the acquisition, construction, operation or maintenance of and renewals and replacements to the Project. Such costs and, subject to the provisions of the Financing Documents, the net proceeds, if any, from the sale or salvage of Project components or assets shall be allocated among the Participants based upon their respective Entitlement Shares.

Section 24. Annual Budget; Accounting. (a) On or before 15 days prior to the estimated commencement of the first Contract Year and on or before the beginning of each Contract Year thereafter, UAMPS shall prepare and mail to the Participant an Annual Budget for the Project recommended by the Project Management Committee and approved by the Board, based, to the extent appropriate, on budgets received under the Project Agreements, showing an annual estimate of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs, and the Participant's share of each, for the following Contract Year. The Participant shall, to the extent and in the manner deemed appropriate by the Participant, incorporate the estimates shown on the Annual Budget in its annual budgetary process for the Participant's Enterprise Fund.

(a) At the end of each quarter during each Contract Year and at such other times as it shall deem desirable, UAMPS shall review the Annual Budget of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs for the Contract Year. In the event such review indicates that the Annual Budget does not or will not substantially correspond with actual receipts or expenditures, or if at any time during such Contract Year there are or are expected to be extraordinary receipts, credits or expenditures of costs substantially affecting Operation and Maintenance Costs, Transmission Costs and Debt Service Costs, UAMPS shall prepare and provide to the Participant's Representative a revised Annual Budget, recommended by the Project Management Committee and approved by the Board, incorporating adjustments to reflect such receipts, credits or expenditures which shall thereupon supersede the previous Annual Budget. The revised Annual Budget and any written materials that accompany it shall specifically identify the changes from the Annual Budget that was previously in effect.

(b) UAMPS agrees that it will, from and after the date of the acquisition by UAMPS of the Project, keep accurate records and accounts relating to the Project, the Cost of Acquisition and Construction, Reference Project Costs, Operation and Maintenance Costs, Transmission Costs and Debt Service Costs in accordance with the Financing Documents and which are generally consistent with the Uniform System of Accounts, separate and distinct from its other records and accounts; *provided* that UAMPS may establish revenue and operation and maintenance funds that

account for more than one project of UAMPS so long as UAMPS shall maintain books and records adequate to show the amounts in each of such funds allocable to each such Project. Said accounts shall be audited annually by a firm of certified public accountants, experienced in public finance and electric utility accounting and of national reputation, to be employed by UAMPS. A copy of each annual audit, including all written comments and recommendations of such accountants, approved by the Members shall be furnished by UAMPS to the Participant not later than 180 days after the end of each Contract Year.

Section 25. Billing Periods. (a) The initial Billing Period to be used for the preparation, calculation and billing of the amounts payable by the Participant hereunder shall be a Month. In order to promote the efficient and economic administration of the Project, UAMPS may, at any time after the end of the initial Contract Year and from time to time thereafter, adopt another standard period of time as the Billing Period hereunder. In addition to the foregoing, UAMPS may, upon the approval of the Project Management Committee, from time to time revise the billing and payment procedures provided for in this Section to promote the efficient and economic administration of the Project or to conform such billing procedures to those utilized in connection with other projects of UAMPS.

(b) Any change in the Billing Period shall be made in the Annual Budget provided for in Section 24 and shall not be effective for at least 30 days after the mailing of notice of such change in the Billing Period or in the billing and payment procedures to the Participant. At the time of the mailing of such Annual Budget, UAMPS shall send to the Participant a revised form of the billing procedures set forth in Section 26(b), which shall reflect any changes in the dates of billing and payment and the method thereof that are necessary or desirable to make this Section correspond to the new Billing Period, such changes to become effective on the date the new Billing Period takes effect. In no event shall any such change in the Billing Period or in the billing and payment procedures increase the amounts payable by the Participant pursuant to this Section in respect of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs.

Section 26. Billings. (a) The Participant acknowledges and agrees that it is necessary for UAMPS to recover all of the costs and expenses associated with the Project through billings to and payments by the Participants under the Power Sales Contracts. UAMPS will exercise Commercially Reasonable Efforts to finance all Development Costs during the Development Period. In the event that Development Costs are not refinanced by the issuance of long-term Bonds, the Participant shall pay its Development Cost Share of the amount necessary to repay the financed Development Costs. UAMPS will exercise Commercially Reasonable Efforts to finance all Construction Costs, net of any Capital Contributions, with the proceeds of Bonds issued at the beginning of the Construction Period. The Participant's share of Operation and Maintenance Costs and Debt Service Costs will equal its Entitlement Share (expressed as a percentage of all Entitlement Shares), subject to the adjustments provided for in the Power Sales Contracts.

(b) For so long as the Billing Period is a Month, on or before the 25th day after the end of each Billing Period beginning with the first Billing Period in the first Contract Year, UAMPS shall render to the Participant a billing statement showing the amount payable by the Participant for such Billing Period in respect of: (i) Development Costs, (ii) Operation and Maintenance Costs; (iii) Transmission Costs; (iv) Debt Service Costs; and (v) any other amounts, adjustments or

reconciliations payable by or credited to the Participant pursuant to this Contract or the Financing Documents and not otherwise shown. The Participant shall pay the total of such amounts at the time specified in Section 27, as the same may be revised from time to time. The billing statement for each Billing Period shall be based, to the fullest extent practicable, upon the actual operation of the Project during such Billing Period. To the extent that any billing statement rendered by UAMPS shall have included any estimated amounts in respect of the Participant's share of Operation and Maintenance Costs, Debt Service Costs or the Transmission Costs or other costs allocable to the Participant, such estimated amounts shall be reconciled at least once during each Contract Year with the actual operation and scheduling of the Project and the Participant shall receive a bill or credit, as applicable, to reflect such reconciliations pursuant to clause (v) of this paragraph.

(c) Debt Service Costs, including any adjustments thereto, shall be determined by UAMPS in accordance with the Financing Documents. Operation and Maintenance Costs, including any adjustments thereto, shall be determined by UAMPS in accordance with the applicable provisions of the Power Sales Contracts and the Project Agreements. UAMPS and the Participant acknowledge and agree that certain categories of costs may be financed as a Cost of Acquisition and Construction (and paid by the Participant as Debt Service Costs or through Capital Contributions) or paid by the Participant as Operation and Maintenance Costs, as determined by the Project Management Committee, but without duplication of any item of cost. Transmission Costs, including any adjustments thereto, shall be determined by UAMPS in accordance with the applicable provisions of this Contract and the Transmission Agreements. The Participant shall pay all such amounts pursuant to Section 27.

(d) In the event that the failure of a Participant to make its payments in accordance with its Power Sales Contract shall have resulted in the application of amounts in any reserve or working capital funds for the Project, any amounts thereafter paid to UAMPS, including delayed-payment and interest charges, by such defaulting Participant in respect of past due payments (i) shall be used to replenish such fund or (ii) to the extent that the other Participants shall have made up the deficiency created by such application or paid additional amounts into any such funds, shall be credited, pro rata, on the billing statements of such other Participants in the next Billing Period or Billing Periods as shall be appropriate.

Section 27. Participant's Payment Obligations. (a) Payments required to be paid by the Participant to UAMPS shall be due and payable to UAMPS at its principal office or by wire transfer to such account as UAMPS shall designate in writing to the Participant, on the 10th day of the Month following the Month in which the billing statement was rendered or at such other time as may be established by UAMPS pursuant to Section 25.

(b) If payment in full is not made by the Participant on or before the close of business on the due date, UAMPS shall impose a delayed payment charge on the unpaid amount due for each day overdue at a rate equal to the lesser of one percent per month, compounded monthly, or the maximum rate lawfully payable by the Participant; provided, however, that UAMPS, acting upon the direction of the Project Management Committee, may elect to waive such delayed payment charge (or portion thereof) but only to the extent that any such waiver will not adversely affect the ability of UAMPS to meet its payment obligations under the Project Agreements or the Financing

Documents or materially increase the amounts payable by the other Participants. If said due date is not a business day, payment shall be made on the next following business day.

(c) The obligation of the Participant to make the payments for Development Costs, Operation and Maintenance Costs, Transmission Costs, Debt Service Costs and other amounts payable by the Participant pursuant to Section 26 is a several obligation and not a joint obligation with those of any other Participant. Prior to the Commercial Operation Date, the obligation of the Participant to make such payments shall constitute a cost of the development of a new power supply resource. From and after the Commercial Operation Date, the obligation of the Participant to make such payments shall constitute a cost of purchased electric power and electric energy. In all cases, the obligation of the Participant to make the payments required by Section 26 shall be payable as an operating expense and solely from the revenues and other legally available funds of its Electric System. In no event shall the Participant be obligated or required to levy or collect ad valorem property taxes or assessments to meet its payment obligations under this Contract. Such payments shall be made whether or not the Project or any portion thereof is acquired, completed, operable, operating, suspended or terminated, and notwithstanding the damage or destruction of the Project, the suspension, interruption, interference, reduction or curtailment of the Project Output, termination of any of the Project Agreements, loss or interruption of transmission from the Point of Delivery or termination of any Transmission Agreement, for any reason whatsoever, in whole or in part. The obligations of the Participant to make such payments shall not be subject to any reduction, whether by offset, counterclaim, or otherwise, and shall not be conditioned upon the performance by UAMPS under this or any other agreement or instrument.

(d) The payment obligations of the Participant under this Contract are special obligations payable solely from the revenues and other available income of its Electric System and do not, and shall not be deemed to, constitute an indebtedness or liability of the Participant under any constitutional, statutory or other legal limitation or requirement.

Section 28. Disputed Billings. In the event of any dispute as to any portion of the billing statement for such Billing Period, the Participant shall nevertheless pay the full amount of the disputed charges when due and shall give written notice of the dispute to UAMPS not later than the 60th day after such billing statement was submitted. Such notice shall identify the disputed billing statement, state the amount in dispute and set forth a full statement of the grounds for such dispute. No adjustment shall be considered or made for disputed charges unless such notice is given by the Participant. UAMPS shall give consideration to, and shall consult with the Project Management Committee with respect to, such dispute and shall advise the Participant with regard to its position relative thereto within thirty (30) days following receipt of such written notice. Upon final determination (whether by agreement or determination by the Project Management Committee) of the correct amount, any difference between such correct amount and such full amount shall be accounted for in the billing statement next submitted to the Participant after such determination. For the avoidance of doubt, any overpayment or underpayment determined pursuant to Section 26(b) shall not be considered to be a disputed payment that is subject to this Section.

Section 29. Audit Rights. (a) At its cost, the Participant may, upon the giving of not less than 15 days' prior written notice to UAMPS, but not more often than once during any two-year

period, inspect and audit the books and records of UAMPS relating to the Project for the purpose of verifying the amounts payable by the Participant under this Contract within the three-year period preceding the commencement of the audit. UAMPS agrees to make available to the Participant, to the extent Commercially Reasonable, all relevant records and all requested information relating to the subject matter of any such audit, subject in all cases to any confidentiality restrictions applicable to third-party information or contracts; provided that UAMPS shall make Commercially Reasonable Efforts to obtain a waiver of such restrictions for purposes of the audit and the Participant shall execute such non-disclosure agreements as may be reasonably requested by UAMPS. Any audit shall be conducted during normal business hours, and the Participant will use Commercially Reasonable Efforts to complete any audit within one month, subject to the availability of relevant records and information and the absence of material accounting irregularities.

(b) If any audit discloses that an overpayment or underpayment has been made during the three-year period described above, the amount of the overpayment or underpayment will be promptly paid by the appropriate party, together with interest calculated at an annual rate equal to the Secured Overnight Funding Rate (SOFR) reported on the website of the Federal Reserve Bank of New York, or reported by any successor to the Federal Reserve Bank of New York as administrator of SOFR, plus 100 basis points, compounded daily and on the basis of a 360-day year, from the date or dates of any such overpayment or underpayment through and including the date of the payment correcting the overpayment or underpayment. Any payment made by UAMPS pursuant to this Section shall constitute an item of Operation and Maintenance Costs.

Section 30. Representations and Warranties. (a) The Participant represents and warrants to UAMPS as follows:

(i) the Participant is a political subdivision, duly created and validly existing under the laws of the State of Utah, and has all corporate power and authority necessary to enter into and perform its obligations under this Contract;

(ii) this Contract has been duly authorized, executed and delivered by the Participant and constitutes its legal, valid and binding obligation enforceable in accordance with its terms;

(iii) the execution, delivery and performance by the Participant of this Contract does not and will not (A) conflict with any constitutional, statutory or regulatory provision, judgment, decree or order applicable to the Participant and (B) constitute a breach of or a default under any bond ordinance, resolution or indenture or any contract or agreement to which the Participant is a party or to which any of the property, assets or revenues of its Electric System is subject;

(iv) all Required Approvals have been obtained;

(v) to the Participant's knowledge, there is no pending or threatened action or proceeding affecting the Participant which purports to affect the authorization, legality,

validity or enforceability of this Contract, the Joint Action Agreement or the Pooling Agreement; and

(vi) prior to and in connection with its approval and execution of this Contract, the Participant conducted its own review of the descriptions, information and studies regarding the Project, the Project Agreement and this Contract provided by UAMPS and made an independent determination to enter into this Contract.

(b) UAMPS represents and warrants to the Participant as follows:

(i) UAMPS is a political subdivision of the State of Utah and an energy services interlocal entity, duly created and validly existing under the Act and the Joint Action Agreement;

(ii) UAMPS has all corporate power and authority necessary to enter into and perform its obligations under this Contract;

(iii) This Contract has been duly approved by the Project Management Committee and the Board and has been duly authorized, executed and delivered by UAMPS and constitutes its legal, valid and binding obligation enforceable in accordance with its terms;

(iv) the execution, delivery and performance by UAMPS of this Contract does not and will not (A) conflict with any constitutional, statutory or regulatory provision, judgment, decree or order applicable to UAMPS and (B) constitute a breach of or a default under any bond ordinance, resolution or indenture or any contract or agreement to which UAMPS is a party or to which any of its property, assets or revenues is subject;

(v) to UAMPS' knowledge, there is no pending or threatened action or proceeding affecting UAMPS which purports to affect the authorization, legality, validity or enforceability of this Contract, the Joint Action Agreement or the Pooling Agreement; and

(vi) the descriptions, information and studies regarding the Project and this Contract provided to the Participant by UAMPS have been prepared in good faith based upon the facts and information known to UAMPS at the time, and UAMPS has no reason to believe that such descriptions, information and studies taken as a whole are incorrect or misleading in any material respect.

Section 31. Information to Be Made Available. (a) From and after the effective date of the Power Sales Contracts and subject to their availability under the applicable provisions of the Project Agreements, UAMPS shall make available for examination by the Participant:

(1) all books of accounts, records, documentation and contracts in the possession of UAMPS relating to the operation of the Project;

(2) copies of all agreements and data in the possession of UAMPS relating to the financing of the Project;

(3) copies of all operating and financial records and reports relating to the Project in the possession of UAMPS;

(4) copies of policies of insurance carried pursuant to Section 14; and

(5) such other information and documents with respect to the Project as the Participant may reasonably request from time to time.

(b) UAMPS may from time to time provide information to the Participant or the Participant's Representative that it designates as "non-public, "commercially sensitive," "confidential" or with similar words indicating that public disclosure of such information should not be made and can be expected to cause harm to UAMPS and the Participants. The Participant and the Participant's Representative agree to (i) classify any information as "non-public," "protected" or with such similar words as may be used under all public records laws that may apply to the Participant, (ii) notify UAMPS of any request or demand for disclosure of such information and (iii) cooperate with UAMPS in contesting any such disclosure request or demand.

(c) The Participant acknowledges that the ability of UAMPS to sell the Bonds depends upon, among other things, the credit standing of the Participants and their Electric Systems and that it will be necessary for UAMPS to provide certain information with respect to the Participants and their Electric Systems in connection with the sale of the Bonds (whether or not the Participant is making a Capital Contribution). Consequently, the Participant covenants to and agrees with UAMPS that the Participant will, upon request, provide to UAMPS all information with respect to the Participant and its Electric System, including financial and operating information and all contracts, documents, reports, bond resolutions and indentures, as may be requested by UAMPS or its counsel in connection with the financing of the Project and the issuance of the Bonds.

(d) The Participant covenants to and agrees with UAMPS that the Participant will furnish to UAMPS (1) not later than 180 days after the end of each fiscal year of the Participant, (A) a copy of the most recent annual financial statements of the Participant and its Enterprise Fund, audited by an independent certified public accountant or firm of such accountants, together with copies of all management letters and written recommendations and comments submitted by the accountants making such audit, and (B) the information and documents described in EXHIBIT II attached hereto, and (2) such other information and documents as UAMPS may reasonably request from time to time.

(e) The Participant may notify UAMPS if non-public information is contained in the materials provided under EXHIBIT II. UAMPS agrees to (i) classify any such non-public information as "protected records" within the meaning of, and to the extent permitted under, the Utah Government Records Access and Management Act, (ii) agrees to cooperate with the Participant to appropriately classify any such non-public information under such other public records laws that apply to the Participant and (iii) notify the Participant of any demand for

disclosure of such information and will cooperate with the Participant in contesting any such disclosure demand.

(f) Concurrently with its execution and delivery of this Contract, the Participant shall deliver to UAMPS (i) a certificate, together with attached exhibits, in substantially the form attached hereto as EXHIBIT III and (ii) an opinion of counsel in substantially the form attached hereto as EXHIBIT V. In connection with each issuance of Bonds by UAMPS and at such other times as UAMPS may reasonably request, the Participant shall deliver to UAMPS (iii) a bring-down certificate in substantially the form attached hereto as EXHIBIT IV, and (iv) a bring-down opinion of counsel in substantially the form attached hereto as EXHIBIT VI.

Section 32. Covenants and Agreements of the Participant. The Participant covenants to and agrees with UAMPS as follows:

(a) *Maintenance of Rates.* The Participant shall establish, maintain, revise, charge and collect rates for electric service rendered by it to its customers so that such rates shall provide revenues which, together with other funds reasonably estimated to be available, will be sufficient to meet the Participant's obligations to UAMPS under this Contract, to pay all other operating expenses of the Participant's Electric System and to provide revenues sufficient to pay all obligations of the Participant payable from, or constituting a charge or lien on, the revenues of its Electric System and, to the extent being paid from the revenues of its Electric System, all other bonds of the Participant now or hereafter outstanding.

(b) *Maintenance of Revenues*. The Participant shall promptly collect all charges due for electric utility services supplied by it as the same become due. The Participant shall at all times maintain and shall exercise Commercially Reasonable Efforts to enforce its rights against any person, customer or other entity that does not pay such charges when due.

(c) *Sale or Assignment of Electric System or Power Sales Contract*. During the term of this Contract, the Participant shall not sell, lease or otherwise dispose of all or substantially all of its Electric System, except upon compliance with the following provisions respecting the transfer or assignment of its Entitlement Share.

The Participant shall not assign, sell or transfer all or any part of its Entitlement Share or any or all of its interests under this Contract, except upon one hundred twenty (120) days' prior written notice to UAMPS and compliance with the provisions set forth below. Within thirty (30) days after receipt of such notice from the Participant (and if such notice indicates that the Participant proposes to assign its Entitlement Share), UAMPS shall notify all of the other Participants of the proposed assignment or transfer by the Participant of all or part of its Entitlement Share. Each of the other Participants shall have the option of acquiring all or any portion of the Entitlement Share that is proposed to be assigned or transferred and shall notify UAMPS of its exercise of such option within forty-five days of its receipt of the notice from UAMPS referred to in the preceding sentence. In the event that two or more of the other Participants shall exercise their options with respect to the Entitlement Share that is proposed to be assigned or transferred in amounts which exceed the total Entitlement Share proposed to be assigned, UAMPS shall, to the extent necessary, make a pro rata allocation of the such Entitlement

Share among the Participants which have exercised their options, based upon the existing Entitlement Shares of the requesting Participants. In the event that less than all of such Entitlement Share shall be acquired by other Participants, UAMPS shall notify the other Members of UAMPS of the proposed assignment of an Entitlement Share and shall provide such Members with an opportunity to acquire the remaining portion of the Participant's Entitlement Share.

In the event that less than all of the Entitlement Share proposed to be transferred or assigned is to be acquired by other Participants or other Members of UAMPS, the Participant may proceed to transfer or assign its Entitlement Share and its rights under this Contract upon satisfaction of the following conditions: (A) at the sole option of UAMPS either (i) the purchaser or assignee shall assume all obligations of the Participant under this Contract in such a manner as shall assure UAMPS to its sole satisfaction that the Participant's Entitlement Share to be purchased hereunder and the amounts to be paid therefor will not be reduced, and if and to the extent deemed necessary by UAMPS in its sole discretion to reflect such assignment and assumption, UAMPS and such purchaser or assignee shall enter into an agreement supplemental to this Contract to clarify the terms upon which the Participant's Entitlement Share is to be sold hereunder by UAMPS to such purchaser or assignee; or (ii) such purchaser or assignee shall enter into a new contract with UAMPS for the purchase of the Participant's Entitlement Share at a price and on terms which UAMPS in its sole discretion determines not to be less beneficial to it and the other Participants than this Contract; (B) the senior debt, if any, of such purchaser or assignee, if such purchaser or assignee is not a Participant shall be rated by at least "Baa2" or "BBB", as applicable, by at least one Rating Agency; (C) the Project Management Committee shall by resolution determine that such sale, lease or other disposition will not adversely affect UAMPS, the other Participants or the security for the payment of Bonds; and (D) UAMPS shall have received an opinion of Bond Counsel to the effect that such sale, assignment or disposition will not by itself adversely affect the Tax Status of Bonds theretofore issued or thereafter issuable. UAMPS shall make the determinations required by this subparagraph (3) within one hundred twenty (120) days of receipt by UAMPS of the notice referred to in the first sentence of this subparagraph and shall provide a written copy of such determinations to the Participant.

In the event any sale, lease or other disposition is permitted pursuant to this subparagraph (3), UAMPS may require as additional security to assure the flow of revenues under this Contract, and the transferring and assigning Participant shall provide or cause to be provided either a prepayment or a security deposit for amounts due under this Contract in such amounts as shall be determined by the Project Management Committee.

Upon the completion of any such sale, lease or other disposition, UAMPS shall prepare and send to each of the Participants a revised SCHEDULE I, setting forth the Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the Participants, as revised to reflect such sale, lease or other disposition.

(d) *Good Utility Practice*. The Participant shall, in accordance with Good Utility Practice, (i) at all times operate its Electric System and the business thereof in an efficient manner, (ii) maintain its Electric System in good repair, working order and condition, (iii) from time to time make all necessary and proper repairs, renewals, replacements, additions, betterments and improvements with respect to the Electric System, so that at all times the business thereof shall be

properly conducted, and (iv) duly perform its obligations under all power supply and transmission service agreements to which it is a party.

(e) *Operating Expenses*. UAMPS and the Participant intend that the payments to be made by the Participant to UAMPS pursuant to this Contract will be payable (i) if and to the extent that any payments are required to be made prior to the Commercial Operation Date, from the revenues and income derived from the operation of the Participant's Electric System as a cost of the development of a new long-term power supply resource, (ii) from and after the Commercial Operation Date as a cost of purchased electric power and energy, and (iii) in each case as an operating expense of the Participant's Electric System and a first charge, together with all other operating expenses, on the revenues derived from the operation of the Participant's Electric System; *provided that* if any amount payable by the Participant under this Contract is prohibited from being paid as an operating expense of the Participant's Electric System under applicable law or a binding contractual obligation, such amount shall be payable from the available revenues and income of the Participant's Electric System. The Participant covenants to and agrees with UAMPS that it will, unless otherwise required by applicable law or under a binding contractual obligation, include the annual payments required to be made by it under this Contract as a cost of purchased electric power and energy as an operating expense in the annual operating budget of its Electric System and in any resolution, ordinance or indenture providing for future borrowings for the Participant's Electric System.

(f) *Tax Status*.

(i) The Participant agrees that it will apply all of the Electric Energy acquired under this Contract to a Qualified Use and that it will not take or omit to take any action (whether with respect to the Electric Energy acquired under this Contract or otherwise) which could, either alone or in conjunction with any other similar actions by the Participant or other Participants, adversely affect the Tax Status of any Bonds issued or issuable by UAMPS. Upon any breach of the foregoing covenants, the Participant shall take and pay the costs of all remedial actions as may be directed by UAMPS in order to maintain the Tax Status of the Bonds.

(ii) The Participant represents and warrants that, as of the Effective Date, it has no contracts (and has no current expectation of entering into any contracts) other than Permitted Output Contracts to provide electric service to any purchaser. At least thirty days prior to entering into any such contract, the Participant shall notify UAMPS of its intent to enter into such contract and provide copies of such contract to UAMPS. Within thirty days after receipt of such notice, UAMPS shall advise the Participant as to whether, in the opinion of Bond Counsel, such contract would result in a violation of the covenant in clause (i) above. The cost of such opinion and other reports necessary in connection therewith shall be borne by the Participant.

(iii) The Participant agrees to provide such information as UAMPS may request and to comply with such additional instructions as may be provided by UAMPS in order to confirm and maintain the Qualified Use of the Electric Energy sold under this Contract.

Section 33. Default by Participant. Each of the following shall constitute a "default" by the Participant under this Power Sales Contract:

(a) failure of the Participant to make to UAMPS any of the payments for which provision is made in this Power Sales Contract within five business days after the due date of any such payment; or

(b) failure by the Participant to observe any of the covenants, agreements or obligations on its part contained herein and failure to remedy the same for a period of sixty days after written notice thereof, specifying such failure and requiring the same to be remedied, shall have been given by or on behalf of UAMPS; or

(c) bankruptcy, reorganization, arrangement, insolvency or liquidation proceedings, including without limitation proceedings under Title 11, Chapter 9, United States Code or other proceedings for relief under any federal or state bankruptcy law or similar law for the relief of debtors, are instituted by or against the Participant and, if instituted against the Participant, said proceedings are consented to or are not dismissed within thirty days after such institution.

Section 34. Continuing Obligation of Participant; Right of UAMPS to Discontinue Service. (a) In the event of any default referred to in Section 33, the Participant shall not be relieved of its liability for payment of any amounts in default or its failure to observe its covenants, agreements and obligations hereunder and UAMPS shall have the right to recover from the Participant any amount in default. In enforcement of any such right of recovery, UAMPS may bring any suit, action, or proceeding in law or in equity, including mandamus and action for specific performance, as may be necessary or appropriate to enforce any covenant, agreement or obligation of the Participant hereunder or the obligation of the Participant to make any payment for which provision is made in this Contract.

(b) In addition to proceeding with its rights against a defaulting Participant pursuant to paragraph (a) above, UAMPS may, upon not less than thirty days' written notice from UAMPS to the Participant, cease and discontinue providing all or any portion of the Participant's Entitlement Share and may terminate the Participant's right to receive the Electric Energy allocable to its Entitlement Share under this Power Sales Contract. In connection with its determination to discontinue providing all or any portion of a defaulting Participant's Entitlement Share, UAMPS shall take into account, among such other matters as UAMPS in its sole discretion shall deem relevant, the amounts and due dates of its payment obligations under the Project Agreements and the Financing Documents and the funds and revenues available to UAMPS to enable it to meet its obligations thereunder. Any such termination of the Participant's Entitlement Share under this Power Sales Contract shall not, however, terminate, reduce or modify the Participant's outstanding obligations and liabilities hereunder.

(c) The suspension or termination of a defaulting Participant's right to receive its Entitlement Share and any actions taken by UAMPS pursuant to Section 35 shall not terminate, reduce or modify the defaulting Participant's obligations and liabilities under its Power Sales Contract. The defaulting Participant shall remain liable under all billing statements rendered by

UAMPS, whether prior or subsequent to the default, and UAMPS for itself and on behalf of the nondefaulting Participants shall be entitled to recover from the defaulting Participant all damages, legal fees, costs and expenses incurred by UAMPS and the nondefaulting Participants as a result of such default. UAMPS shall exercise Commercially Reasonable Efforts to mitigate the damages resulting from the Participant's default.

Section 35. Transfer of Entitlement Share Following Default; Other Actions by UAMPS. (a) UAMPS and the Participant acknowledge that a default by any of the Participants under its Power Sales Contract could reduce the revenues available to UAMPS which are necessary in order for UAMPS to meet its obligations under the Project Agreements and the Financing Documents on a timely basis. In the event of an insufficiency of revenues and an inability on the part of UAMPS to meet its obligations under the Project Agreements and the Financing Documents on a timely basis, the ability of UAMPS to deliver Electric Energy from the Project and the interests of all of the Participants will be materially and adversely affected. The provisions of this Section are intended to assure the sufficiency of revenues to UAMPS following a default by a Participant under its Power Sales Contract by the reallocation of the defaulting Participant's Entitlement Share. As set forth below, UAMPS agrees to take certain actions to mitigate the impact of any such reallocation on the nondefaulting Participants. The Participants agree that the provisions of this Section are reasonable and necessary in order for them to achieve the benefits of their joint and cooperative undertaking with respect to the Project.

(b) In the event of a default by any Participant and discontinuance of service pursuant to Section 35 of such Participant's Power Sales Contract, but only if the Project has not been terminated, UAMPS and the nondefaulting Participants shall take the following actions in the order set forth below:

(1) UAMPS shall immediately make a mandatory allocation of the defaulting Participant's Entitlement Share among all of the nondefaulting Participants, pro rata on the basis of their original Entitlement Shares. UAMPS shall provide written notice to the nondefaulting Participants of the mandatory allocation of the defaulting Participant's Entitlement Share which notice shall (a) set forth the date of the mandatory allocation, (b) include a revised Schedule I showing the increased Entitlement Shares and (to the extent applicable) the revised Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the nondefaulting Participants as a result of such allocation, (c) direct each of the nondefaulting Participants to make an election pursuant to subparagraph (2) below, and (d) set forth the date by which each of the nondefaulting Participants must notify UAMPS of its election pursuant to subparagraph (2) below. Such mandatory allocation of the defaulting Participant's Entitlement Share and the increased Entitlement Shares and the revised Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the nondefaulting Participants as a result of such allocation (as shown on the revised Schedule I prepared by UAMPS) shall remain in effect until the completion of the procedures provided for in this paragraph (a). During such period, each of the nondefaulting Participants shall have all of the rights, benefits, obligations and responsibilities associated with its increased Entitlement Share and its revised Capital Contribution Percentage, Debt Service Percentage and Debt Service Share as a result of such allocation.

(2) Within sixty days after the allocation of the defaulting Participant's Entitlement Share provided for in subparagraph (1) above, each of the nondefaulting Participants shall notify UAMPS in writing of its election of one of the following options: (A) to retain that portion of the defaulting Participant's Entitlement Share allocated to such nondefaulting Participant pursuant to subparagraph (1) above and the additional amount, if any, of the defaulting Participant's Entitlement Share that such nondefaulting Participant elects to acquire from any other nondefaulting Participant that may elect to retain less than all of the defaulting Participant's Entitlement Share allocated to it pursuant to subparagraph (1) above; or (B) to retain none or less than all of the defaulting Participant's Entitlement Share allocated to the Participant pursuant to subparagraph (1) above. Any Participant that shall have elected to retain all of that portion of the defaulting Participant's Entitlement Share allocated to it pursuant to subparagraph (1) above shall be deemed to have fully satisfied its obligations to UAMPS under this Section and shall not thereafter be required to accept any additional allocation of the defaulting Participant's Entitlement Share.

(3) Within thirty days after its receipt of the elections of all nondefaulting Participants pursuant to subparagraph (2), UAMPS shall determine whether the nondefaulting Participants have elected to retain all of the Entitlement Share of the defaulting Participants pursuant to subparagraph (2). In the event that any of the Participants shall have elected to retain less than all of its allocation of the defaulting Participant's Entitlement Share, UAMPS shall proportionally reallocate the remaining amount of the defaulting Participant's Entitlement Share among those nondefaulting Participants that have requested additional amounts of the defaulting Participant's Entitlement Share. To the extent necessary to provide for a complete reallocation of the defaulting Participant's Entitlement Share, UAMPS shall next reallocate any remaining portion of the defaulting Participant's Entitlement Share among those Participants that did not elect to retain all of their initial allocations of such Entitlement Share. Proportional reallocations shall be based upon the Entitlement Shares of the nondefaulting Participants in effect immediately prior to the defaulting Participant's default.

(4) In no event shall any reallocation of a defaulting Participant's Entitlement Share, or the total of all mandatory reallocations of Entitlement Shares in the event of two or more Participant defaults under the Power Sales Contracts, cause any nondefaulting Participant's Entitlement Share to increase by more than [__]%* over its original Entitlement Share set forth on Schedule I.

(5) Each allocation or reallocation of a defaulting Participant's Entitlement Share shall also allocate or reallocate the defaulting Participant's Capital Contribution Percentage and Debt Service Percentage to the nondefaulting Participants receiving such allocation or reallocation. The Capital Contribution Percentage and the Debt Service Percentage of the defaulting Participant shall be allocated to each of such nondefaulting

* This amount will not exceed 25% and will be determined by the Project Management Committee upon the Effective Date of the Power Sales Contracts.

Participants proportionally based upon the respective amounts of the defaulting Participant's Entitlement Share that are allocated or reallocated to them.

(6) UAMPS shall deliver, promptly after making the determinations and reallocations required by this paragraph (b), a notice to the nondefaulting Participants which notice shall (A) set forth the reallocation of the defaulting Participant's Entitlement Share made by UAMPS pursuant to subparagraph (3) above, and the effective date of such reallocation, (B) set forth the amount, if any, of the Entitlement Share of the defaulting Participant that has been mandatorily reallocated to nondefaulting Participants that did not elect to retain or acquire the same, and (C) include a revised SCHEDULE I showing the revised Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares, respectively, of the nondefaulting Participants as a result of the reallocation provided for under subparagraph (3). The Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares shown on such revised SCHEDULE I shall thereafter be the Entitlement Shares, Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares of the nondefaulting Participants.

(7) Any portion of the Entitlement Share of a defaulting Participant transferred pursuant to this paragraph (b) to a nondefaulting Participant shall become a part of and shall be added to the Entitlement Share of each transferee Participant, and from and after the date of such transfer the transferee Participant shall be obligated to pay for its increased Entitlement Share pursuant to the terms and provisions of this Power Sales Contract. The defaulting Participant shall remain liable to UAMPS and the other Participants for costs incurred and damages suffered by them in connection with the actions taken with respect to the defaulting Participant's Entitlement Share provided for in this Section.

(c) In the event that any portion of a defaulting Participant's Entitlement Share shall have been mandatorily reallocated to nondefaulting Participants pursuant to paragraph (b)(3) above or in the event that the procedures set forth in paragraph result in the reallocation of less than all of a defaulting Participant's Entitlement Share, UAMPS shall use Commercially Reasonable Efforts to sell or dispose of all or any part of the defaulting Participant's Entitlement Share as follows and in the following order:

(1) UAMPS shall first seek to sell all or any part of the defaulting Participant's Entitlement Share on terms and conditions comparable to those contained in the Power Sales Contracts; and

(2) UAMPS shall then seek to sell all or any part of such portion of the defaulting Participant's Entitlement Share or the Electric Energy associated therewith on the best obtainable terms and conditions.

Subject to the provisions of the Financing Documents, no sale, transfer or other disposition of all or a part of an Entitlement Share shall be made pursuant to this paragraph (c) if such sale, transfer or disposition will adversely affect the exclusion from gross income for federal income tax purposes of the interest on any of the Bonds issued as tax exempt obligations.

(d) In the event that UAMPS is unable to sell or dispose of any portion of the defaulting Participant's Entitlement Share pursuant to paragraph (c) above within 180 days of commencing Commercially Reasonable Efforts so to do and UAMPS, based upon determinations by the Project Management Committee and the Board, determines that the inability to sell or dispose of the defaulting Participant's Entitlement Share will materially and adversely affect the ability of the nondefaulting Participants to meet their obligations under the Power Sales Contract or the ability of UAMPS to meet its obligations under the Project Agreements and the Financing Documents, then UAMPS shall take such actions as UAMPS in its sole discretion shall deem necessary to ensure the availability of sufficient funds and revenues to enable UAMPS to meet its obligations under the Project Agreements and the Financing Documents. Such actions may include, without limitation, any of the following measures (or any combination thereof):

(1) UAMPS may sell all or any portion of the Project that is allocable to the defaulting Participant's Entitlement Share on such terms and conditions as UAMPS deems to be in the best interest of UAMPS and the nondefaulting Participants and shall apply the proceeds of such sale to the purchase, redemption or defeasance of the Bonds or to other purposes related to the Project; or

(2) UAMPS may enter into contractual arrangements for the sale of all or any portion of the defaulting Participant's Entitlement Share or the Electric Energy associated therewith on such terms and conditions as will maximize the revenues available to UAMPS without regard to any adverse effect that such sale may have on the exclusion of interest on the Bonds from gross income for federal income tax purposes.

In the event that UAMPS makes any sale pursuant to clause (2) above, UAMPS will obtain an opinion of Bond Counsel addressing the tax status of interest on the Bonds issued as tax exempt obligations. UAMPS will take such remedial actions as are available to it to preserve the tax exempt status of interest on such Bonds. In the event that such opinion indicates that interest on the Bonds is or will become includible in gross income for federal income tax purposes, the Participant acknowledges that it may be necessary for UAMPS to pay additional amounts as interest or penalties on the Bonds and that the Debt Service Costs payable by the Participant pursuant to Section 26 will increase correspondingly. The Participant agrees to pay its Debt Service Share of such increased Debt Service Costs pursuant to the provisions of this Power Sales Contract.

(e) Upon any sale or disposition of all or any portion of a defaulting Participant's Entitlement Share or the Electric Energy associated therewith or any sale of the Project pursuant to paragraphs (c) and (d) above, UAMPS shall take into account the proceeds realized or the revenues to be received from such sale or disposition and shall, to the extent necessary, make adjustments to the Entitlement Share, Capital Contribution Percentage, Debt Service Percentage and Debt Service Share of each of the nondefaulting Participants to reflect such sale or disposition and to ensure the receipt of revenues sufficient to enable UAMPS to meet its obligations under the Project Agreements and the Financing Documents. The Participant acknowledges that such adjustments may, under certain circumstances, result in a change in the Participant's share of Operation and Maintenance Costs, Transmission Costs and Debt Service Costs without a corresponding change in the Participant's Entitlement Share. Upon the completion of the

procedures provided for in this Section, UAMPS shall prepare and send to each of the Participants a final revised SCHEDULE I, setting forth the Entitlement Shares, the Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares, respectively, of the nondefaulting Participants after the procedures and actions provided for in this Section.

Section 36. Other Default by Participant. In the event of a failure of the Participant to observe, keep and perform any of the covenants, agreements or obligations on its part contained in this Power Sales Contract, UAMPS may, in addition to its other rights hereunder, bring any suit, action, or proceeding in law or in equity, including mandamus, injunction and action for specific performance, as may be necessary or appropriate to enforce any covenant, agreement or obligation of this Power Sales Contract against the Participant.

Section 37. Default by UAMPS; Dispute Resolution. (a) In the event of any default by UAMPS under any covenant, agreement or obligation of this Power Sales Contract, the Participant's sole remedy for such default shall be limited to mandamus, injunction, action for specific performance or any other available equitable remedy as may be necessary or appropriate and in no event shall the Participant withhold or offset any payment owed to UAMPS hereunder.

(b) Prior to and as a condition to the filing of any action with respect to this Contract under paragraph (a) above, the Participant shall first submit the dispute or matter in question to the Project Management Committee for mediation by giving notice in writing to UAMPS and the Chair of the Project Management Committee describing the dispute or matter and the issue or issues to be resolved. The Participant agrees to participate fully and in good faith in all mediation proceedings of the Project Management Committee. In the event that the Project Management Committee is unable to resolve or mediate such dispute or matter within 120 days after UAMPS has received written notice of the dispute, the Participant shall have the right to initiate such proceedings as it may deem necessary pursuant to paragraph (a).

Section 38. Abandonment of Remedy. In case any proceeding taken on account of any default shall have been discontinued or abandoned for any reason, the parties to such proceedings shall be restored to their former positions and rights hereunder, respectively, and all rights, remedies, powers and duties of UAMPS and the Participant shall continue as though no such proceedings had been taken.

Section 39. Waiver of Default. Any waiver at any time by either UAMPS or the Participant of its rights with respect to any default of the other party hereto, or with respect to any other matter arising in connection with this Power Sales Contract, shall not be a waiver with respect to any subsequent default, right or matter.

Section 40. Relationship to and Compliance with Other Instruments. (a) It is recognized by the parties hereto that UAMPS, in undertaking, or causing to be undertaken, the planning, financing, construction, acquisition, operation and maintenance of the Project, must comply with the requirements of the Financing Documents, the Project Agreements and all Permits and Approvals necessary therefor, and it is therefore agreed that this Power Sales Contract is made subject to the terms and provisions of the Financing Documents, the Project Agreements and all such Permits and Approvals.

(b) UAMPS covenants and agrees that it will use Commercially Reasonable Efforts for the benefit of the Participant to comply in all material respects with all terms, conditions and covenants applicable to it contained in the Financing Documents, the Project Agreements and all Permits and Approvals relating thereto and that it will not, without the consent of the Participant, enter into any amendment or modification of the Financing Documents or the Project Agreements which will change the Participant's Entitlement Share or which will materially and adversely affect the rights and obligations of the Participant hereunder.

Section 41. Liability of Parties. UAMPS and the Participant shall assume full responsibility and liability for the maintenance and operation of their respective properties and each shall, to the extent permitted by law, indemnify and save harmless the other from all liability and expense on account of any and all damages, claims, or actions, including injury to or death of persons arising from any act or accident in connection with the installation, presence, maintenance and operation of the property and equipment of the indemnifying party and not caused in whole or in part by the negligence of the other party; *provided* that any liability which is incurred by UAMPS through the operation and maintenance of the Project or pursuant to the Project Agreements and not covered, or not covered sufficiently, by insurance shall be paid solely from the revenues of UAMPS hereunder, and any payments made by UAMPS to satisfy such liability shall, except to the extent paid from proceeds of Bonds or Capital Contributions, become part of Operation and Maintenance Costs.

Section 42. Assignment of Power Sales Contract. (a) This Power Sales Contract shall inure to the benefit of and shall be binding upon the respective successors and assigns of the parties to this Power Sales Contract; *provided, however,* that neither this Power Sales Contract nor any interest herein shall be transferred or assigned by either party hereto except as follows:

(1) UAMPS may assign its interests under this Power Sales Contract or all or any portion of the amounts payable by the Participant hereunder pursuant to the Financing Documents as described in paragraph (b) below;

(2) UAMPS may sell, transfer or reallocate all or any portion of the Participant's Entitlement Share following a default by the Participant and a discontinuance of service as provided in Section 35;

(3) After such point in time as all Bonds issued under the Financing Documents have been paid or deemed to have been paid as provided in the Financing Documents, UAMPS may assign this Power Sales Contract and pledge the amounts payable by the Participant hereunder without limitation;

(4) the Participant shall assign the Electric Energy allocable to the Participant's Entitlement Share to the UAMPS Pool as provided in Section 10; and

(5) subject to the provisions of Section 32, the Participant may assign or transfer all or any portion of its Entitlement Share or its interests under this Power Sales Contract.

(b) The Participant acknowledges and agrees that UAMPS may assign and pledge to the Trustee designated in the Financing Documents all or any portion of its right, title, and interest in and to the payments to be made to UAMPS under the provisions of this Power Sales Contract, as security for the payment of the principal (including sinking fund installments) of, premium, if any, and interest on Bonds and, upon such assignment and pledge, UAMPS may grant to the Trustee any rights and remedies herein provided to UAMPS, and thereupon any reference herein to UAMPS shall be deemed, with the necessary changes in detail, to include the Trustee which on behalf of and together with the owners from time to time of the Bonds shall be third party beneficiaries of the covenants and agreements of the Participant herein contained.

Section 43. Termination or Amendment of Power Sales Contract. (a) This Power Sales Contract shall not be terminated by either party under any circumstances, whether based upon the default of the other party under this Power Sales Contract or any other instrument or otherwise except as specifically provided in this Power Sales Contract.

(b) This Power Sales Contract shall not be amended, modified, or otherwise altered in any manner that will adversely affect the security for the Bonds afforded by the provisions of this Power Sales Contract. So long as any of the Bonds are outstanding or until adequate provisions for the payment thereof have been made in accordance with the provisions of the Financing Documents, this Power Sales Contract shall not be amended, modified, or otherwise altered in any manner which will reduce the payments pledged as security for the Bonds or extend the time of such payments provided herein or which will in any manner impair or adversely affect the rights of the owners from time to time of the Bonds.

(c) Subject to Section 6, no Power Sales Contract entered into between UAMPS and another Participant may be amended so as to provide terms and conditions that are substantially and materially different from those herein contained except upon written notice to and written consent or waiver by each of the other Participants, and upon similar amendment being made to the Power Sales Contract of any other Participants requesting such amendment after receipt by such Participant of notice of such amendment.

(d) In connection with any revision or amendment of the billing procedures provided for in Section 25 or of any of the Exhibits, UAMPS shall promptly provide a copy of the revision or amendment to the Participant.

Section 44. Notices and Computation of Time. All notices, demands or other communications made pursuant to this Contract (each, a *"Notice"*) may be sent by facsimile, electronic mail, other mutually acceptable electronic means, a nationally recognized overnight courier service, first class mail or hand delivery. Notice shall be deemed given when received by the addressee, unless received on a day that is not a business day or received after 5:00 p.m. (receiving party's local time) on a business day, in which case Notice shall be deemed to have been received on the next following business day. In the absence of proof of the actual receipt date, the following presumptions will apply: (i) Notice sent by facsimile or electronic mail shall be deemed to have been received upon the sending party's receipt of electronic confirmation of successful transmission; (ii) Notice sent by overnight mail or courier shall be deemed to have been received on the next business day after it was sent or such earlier time as is confirmed by the receiving

party; and (iii) Notice sent by first class mail shall be deemed to have been received five business days after mailing.

(b) All Notices shall be sent by UAMPS to the business address, facsimile address or e-mail address of the Participant's Representative. All Notices shall be sent by the Participant to the business address, facsimile address or designated e-mail address of UAMPS. Either party may change its Notice address(es) by Notice to the other party.

Section 45. Relationship of UAMPS and the Participant; Relationship among Participants. (a) This Power Sales Contract is not intended to create, nor shall it be deemed to create, any relationship between UAMPS and the Participant other than that of independent parties contracting with one another for the purpose of effectuating the provisions of this Power Sales Contract.

(b) The covenants, obligations, liabilities, rights and benefits of the Participant under this Power Sales Contract are individual and not joint and several, or collective, with those of any other Participant. Other than giving effect to the joint and cooperative action of UAMPS on behalf of the Participants, the Power Sales Contracts shall not be construed to create an association, joint venture, trust or partnership, or to impose a trust or partnership covenant, obligation or liability on, between or among the Participant and any one or more of the Participants. No Participant shall be or be deemed to be under the control of, nor shall any Participant control or be deemed to control, any or all of the other Participants or the Participants as a group. No Participant shall be bound by the actions of any other Participant, nor shall any Participant be deemed to be the agent of any other Participant or have the right to bind any other Participant.

S*ection 46. No Recourse Against Officers, Etc. of UAMPS or Participant*. No member of the governing body, nor any officer or employee of UAMPS or the Participant shall be individually or personally liable for any payment under this Power Sales Contract or be subject to any personal liability or accountability by reason of the execution of this Power Sales Contract; *provided, however,* that this Section shall not relieve any officer or employee of UAMPS or the Participant from the performance of any official duty imposed by law or this Power Sales Contract.

Section 47. Governing Law; Jurisdiction and Venue. (a). This Power Sales Contract is made under and shall be governed by the law of the State of Utah; *provided, however,* that if the Participant is organized or created pursuant to the laws of another state, then the authority of the Participant to execute and perform its obligations under this Power Sales Contract shall be determined under the laws of such state. Headings herein are for convenience only and shall not influence the construction hereof.

(b) All judicial proceedings brought against either party arising out of or relating hereto shall be brought exclusively in the courts of the State of Utah or of the United States of America for the District of Utah. By executing and delivering this Contract, each party, for itself and in connection with its properties, irrevocably accepts generally and unconditionally the nonexclusive jurisdiction and venue of such courts; waives any defense of *forum non conveniens*; agrees that service of all process in any such proceeding in any such court may be made by registered or certified mail, return receipt requested, to the party at its address provided in accordance with

Section 44; and agrees that service as provided above is sufficient to confer personal jurisdiction over the party in any such proceeding in any such court, and otherwise constitutes effective and binding service in every respect.

Section 48. Severability; No Merger. (a) If any section, paragraph, clause or provision of this Power Sales Contract shall be finally adjudicated by a court of competent jurisdiction to be invalid, the remainder of this Power Sales Contract shall remain in full force and effect as though such section, paragraph, clause or provision or any part thereof so adjudicated to be invalid had not been included herein.

(b) This Power Sales Contract constitutes the entire and complete agreement of UAMPS and the Participant in respect of the Project and shall not be nor shall it be deemed to be modified, amended or superseded by any other agreement or contract between UAMPS and the Participant in respect of any other project or subject.

Section 49. Contract Beneficiaries. This Contract is entered for the benefit of and as the binding agreement of UAMPS and the Participant. The Trustee and the owners of the Bonds are the only third-party beneficiaries of this Contract, as and to the extent provided in the Financing Documents.

IN WITNESS WHEREOF, the parties hereto have caused this Power Sales Contract to be executed by their proper officers respectively, being thereunto duly authorized, and their respective corporate seals to be hereto affixed, as of the day, month and year first above written.

ST. GEORGE CITY, UTAH

By:_____
Its Mayor

[SEAL]

ATTEST AND COUNTERSIGN

By:_____
Title: City Recorder

UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS

By:_____
Chairman

[SEAL]

ATTEST AND COUNTERSIGN

By:_____
Assistant Secretary

PRELIMINARY

SCHEDULE D

SCHEDULE OF PARTICIPANTS, DEVELOPMENT SHARES AND DEVELOPMENT COST SHARES

PARTICIPANT	DEVELOPMENT SHARE (KW)	DEVELOPMENT COST SHARE (%)*
TOTAL		100.0000%

* Column may not total due to rounding.

SCHEDULE I

SCHEDULE OF PARTICIPANTS, ENTITLEMENT SHARES

SCHEDULE OF PARTICIPANTS, ENTITLEMENT SHARES, CAPITAL CONTRIBUTION PERCENTAGES, DEBT SERVICE PERCENTAGES AND DEBT SERVICE SHARES*

PARTICIPANT	ENTITLEMENT SHARE	
	kW	%**
TOTAL		%

* Capital Contribution Percentages, Debt Service Percentages and Debt Service Shares to be added if Capital Contributions are made.

** Column may not total due to rounding.

EXHIBIT I

DESCRIPTION OF THE INITIAL FACILITIES

The following is a preliminary and summary description of the Initial Facilities. This description is subject to change based upon selection of the Contractor, the negotiation of the final terms of the Construction Contracts and the construction of the Initial Facilities. The final description of the Initial Facilities will be approved by the Project Management Committee after the Project achieves commercial operation.

PARTICIPANT _____
FISCAL YEAR _____

EXHIBIT II

FORM OF PARTICIPANT'S ANNUAL INFORMATION REPORT*

SYSTEM DESCRIPTION

Incorporated area of municipality _____ square miles.

Service area of utility _____ square miles.

Transmission and distribution lines _____ miles.

Number of employees in electrical department _____. (Include sum of shared employees' time in other city offices to determine equivalent full-time employees.)

Number of customers served outside the city limits _____.

Service area outside of the city limits _____ square miles.

NUMBER OF ELECTRICAL CUSTOMERS AND TYPE OF LOAD SERVED

CUSTOMER CLASS	NUMBER OF CUSTOMERS
Residential	
Commercial	
Industrial	
Agricultural and Pumping	
Military and Other	
TOTAL	

Annual audit will be sent to UAMPS as soon as completed after the fiscal year.

Electric Rate Schedules for the above classes of service are attached hereto.

---

* Under Section 31(d) of the Power Sales Contract, UAMPS has agreed to classify certain of the information provided by the Participant on this Exhibit II as a "protected record," pursuant to the Participant's request. The Participant must also take any actions necessary on its part to appropriately classify and protect such information provided in this Exhibit.

Customer Sales by Class

Total sales to your customers _____ kWh.

Revenues from energy sales to your customers in $_____.

CUSTOMER CLASS	KWH SALES	REVENUES ($)
Residential		
Commercial		
Industrial		
Agricultural		
Other		
TOTAL		

GENERATION
PRODUCED FOR SYSTEM LOAD

	GENERATING UNIT PRODUCTION							
	#1		#2		#3		#4	
	kW	kWh	kW	kWh	kW	kWh	kW	kWh
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
TOTAL								

SYSTEM PEAK INCLUDING LOAD
COVERED BY OWN GENERATION

	kW		kW
July		January	
August		February	
September		March	
October		April	
November		May	
December		June	

FIVE LARGEST LOADS

	TYPE OF BUSINESS	KWH SOLD	ANNUAL ELECTRICAL BILLINGS
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

ACHIEVEMENTS

Provide below the achievements of your utility for the year.

EXHIBIT III

FORM OF CERTIFICATE OF PARTICIPANT

STATE OF _____)
)
COUNTY OF _____)

The undersigned hereby certify that they are the [Executive Officer] and [Clerk/Recorder/Secretary] of _____ (the *"Participant"*), a member of Utah Associated Municipal Power Systems (*"UAMPS"*), and that as such they are authorized to execute this Certificate on behalf of the Participant and hereby certify as follows:

1. This Certificate has been executed pursuant to Section 31(f) of the Millard County Power Project Power Sales Contract, dated as of December 1, 2024 (the *"Power Sales Contract"*), between the Participant and UAMPS, in connection with the execution and delivery of the Power Sales Contract. Capitalized terms used and not otherwise defined herein have the meanings assigned to them in the Power Sales Contract.

2. The Participant is a _____, duly created and validly existing under the laws of the State of _____ (the *"State"*), and is governed by a _____ (the *"Governing Body"*).

3. Attached hereto as *Exhibit A* is a true, complete and correct copy of a resolution authorizing the execution and delivery of the Power Sales Contract and related matters (the *"Contract Resolution"*). The Contract Resolution was duly adopted by a majority of the Governing Body present and voting at a public meeting of the Governing Body held on _____, at which a quorum was present and acted throughout.

4. The meeting of the Governing Body at which the Contract Resolution was adopted was duly called, noticed and held in conformity with applicable laws of the State and procedural rules of the Governing Body. The Contract Resolution is in full force and effect and has not been amended, modified, repealed or supplemented.

5. The names of the [Executive Officer] and the [Clerk/Recorder/Secretary] authorized to execute and deliver the Power Sales Contract on behalf of the Participant are as follows:

NAME	OFFICE
«officer»	«office»
«officer»	«office»

6. (a) No petition was filed with the Participant or any of its officers seeking to refer the Contract Resolution to the electors of the Participant in accordance with the provisions of state law; and (b) no litigation has been instituted, is pending or has been threatened to require a referendum election on the Contract Resolution.

7. The Participant owns and operates an electric utility system (the *"System"*) that distributes and furnishes electric energy to consumers located within the established service area of the System. The Participant will use all of the electric energy from its Entitlement Share in a Qualified Use.

8. The Participant has previously executed the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action dated as of March 20, 2009, and all amendments thereof and supplements thereto (the *"Joint Action Agreement"*) and that certain Power Pooling Agreement (the *"Pooling Agreement"*) between the Participant and UAMPS relating to the power pool administered by UAMPS. The Joint Action Agreement and the Pooling Agreement are each in full force and effect and constitute the legal, valid and binding agreements of the Participant.

9. «Rep» has been duly appointed by the Governing Body as the Participant's representative to UAMPS.

10. The representations and warranties of the Participant in Section 30 of the Power Sales Contract are true and correct on and as of the date of this certificate.

11. The Participant acknowledges that the information it provides under Section 31(c) and (d) of the Power Sales Contract may be used by UAMPS in connection with the issuance of Bonds to finance the Development Costs and the Cost of Acquisition and Construction of the Project and to provide necessary information to lenders and other interested parties.

Dated: _____.

[PARTICIPANT]

By _____
[Executive Officer]

By _____
[Clerk/Recorder/Secretary]

[Seal]

EXHIBIT A

[Form of Contract Resolution]

RESOLUTION NO. _____

A RESOLUTION AUTHORIZING AND APPROVING THE MILLARD COUNTY POWER PROJECT POWER SALES CONTRACT WITH UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS; AND RELATED MATTERS.

***** ***** *****

WHEREAS, _____ (the *"Participant"*) is a member of Utah Associated Municipal Power Systems (*"UAMPS"*) pursuant to the provisions of the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action, as amended (the *"Joint Action Agreement"*);

WHEREAS, one of the purposes of UAMPS under the Joint Action Agreement is the acquisition and construction of electric generating, transmission and related facilities in order to secure reliable, economic sources of electric power and energy for its members;

WHEREAS, UAMPS proposes to acquire and construct a natural gas-fired electric generating facility consisting of multiple reciprocating internal combustion engines to be known as the "Millard County Power Project" (the *"Project"*) to be located at a site in Millard County, Utah, and to sell the capacity and output of the Project pursuant to the Millard County Power Project Power Sales Contracts (the *"Power Sales Contracts"*) between UAMPS and the Participants (capitalized terms used and not defined herein have the meanings assigned to them in the Power Sales Contracts);

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) certain descriptions and summaries of the Project and the Power Sales Contracts, and representatives of the Participant have participated in discussions and conferences with UAMPS and others regarding the Project and have received from UAMPS all requested information and materials necessary for the decision of the Governing Body to authorize and approve the Power Sales Contract;

WHEREAS, the Participant acknowledges that the obligation of the Participant to make the payments provided for in the Power Sales Contract will be a special obligation of the Participant and an operating expense of the Participant's electric system, payable from the revenues and other available funds of the electric system, and that the Participant shall be unconditionally obligated to make the payments required under the Power Sales Contract whether or not the Project or any portion thereof is acquired, constructed, completed, operable or operating and notwithstanding the suspension, interruption, interference, reduction or curtailment of the output thereof for any reason whatsoever; and

WHEREAS, the Governing Body has reviewed (or caused to be reviewed on its behalf) its current and projected needs for electric power and energy and information with respect to the Project prepared by UAMPS setting forth, among other things, preliminary estimates of the Development Costs, the Cost of Acquisition and Construction, the estimated timeline for the development and construction of the Project and related matters, and now desires to authorize and approve the Power Sales Contract;

NOW, THEREFORE, BE IT RESOLVED by the Governing Body of _____, as follows:

Section 1. Approval of Power Sales Contract; Development Share. (a) The Power Sales Contract, in substantially the form attached hereto as *Annex A*, is hereby authorized and approved, and the [Executive Officer] is hereby authorized, empowered and directed to execute and deliver the Power Sales Contract on behalf of the Participant, and the [Clerk/Recorder/Secretary] is hereby authorized, empowered and directed to attest and countersign such execution and to affix the corporate seal of the Participant to the Power Sales Contract, with such changes to the Power Sales Contract from the form attached hereto as *Annex A* as shall be necessary to conform to the Participant's legal status, to complete the form of the Power Sales Contract or to correct any minor irregularities or ambiguities therein and as are approved by the [Executive Officer], his execution thereof to constitute conclusive evidence of such approval.

(b) A Development Share representing _____ kW of capacity in the Project is hereby authorized and approved. The Participant acknowledges that (i) its Development Share may be increased to provide for a full allocation of the Project Output and (ii) by virtue of its Development Share, the Participant will have an Entitlement Share with the same amount of Electric Power as its Development Share from and after the Completion of Development through the remaining term of the Power Sales Contract, all as provided in the Power Sales Contract.

Section 2. Participant's Representative. (a) The appointment of _____ as the Participant's Representative to UAMPS and of _____ and _____ as alternate Representatives is hereby confirmed.

(b) Such Representative (or, in his or her absence, such alternate(s)) is hereby delegated full authority to (i) approve any appendix to the Pooling Agreement between UAMPS and the Participant that may be necessary or desirable in connection with the utilization of the Participant's Entitlement Share, and (ii) act on all matters that may come before the Project Management Committee established by the Power Sales Contract, and shall be responsible for reporting regularly to the Governing Body regarding the activities of the Project Management Committee.

Section 3. Compliance with Tax Covenants. The Participant agrees in the Power Sales Contract that it will apply all of the electric power and energy acquired under the Power Sales Contract to a Qualified Use and that it will not take or omit to take any action which could adversely affect the Tax Status of any Bond or Bonds theretofore issued or thereafter issuable by UAMPS. In furtherance of that agreement, the Governing Body of the Participant hereby agrees that it will observe and comply with such instructions as may be provided from time to time by UAMPS with respect to the Qualified Use of the electric power and energy acquired under the Power Sales Contract.

Section 4. Further Authority. (a) The [Executive Officer] and the [Clerk/Recorder/Secretary] are hereby authorized, empowered and directed to (i) execute the Certificate of the Participant in substantially the form attached as EXHIBIT III to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Certificate of the Participant in substantially the form attached as *Exhibit IV* to the Power Sales Contract and to deliver the same to UAMPS.

(b) The Participant's legal counsel is hereby authorized, empowered and directed to (i) execute the Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT V to the Power Sales Contract and to deliver the same to UAMPS, and (ii) from time thereafter and upon the request of UAMPS, execute the Bring-Down Opinion of Counsel to the Participant in substantially the form attached as EXHIBIT VI to the Power Sales Contract and to deliver the same to UAMPS.

Section 5. Miscellaneous; Effective Date. (a) This resolution shall be and remain irrepealable until the expiration or termination of the Power Sales Contract in accordance with its terms.

(b) All previous acts and resolutions in conflict with this resolution or any part hereof are hereby repealed to the extent of such conflict.

(c) In case any provision in this resolution shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

(d) This resolution shall take effect immediately upon its adoption and approval.

ADOPTED AND APPROVED on _____, ____.

[PARTICIPANT]

By _____

_____

ATTEST:

_____

[Clerk/Recorder/Secretary]

[SEAL]

ANNEX A

[Attach Power Sales Contract]

EXHIBIT IV

FORM OF BRING DOWN CERTIFICATE OF THE PARTICIPANT

STATE OF _____)
)
COUNTY OF «COUNTY»)

The undersigned hereby certify that they are the [Executive Officer] and [Clerk/Recorder/Secretary] of _____ (the *"Participant"*), a member of Utah Associated Municipal Power Systems (*"UAMPS"*), and that as such they are authorized to execute this Certificate on behalf of the Participant and hereby certify as follows:

1. This certificate has been executed in connection with the issuance by UAMPS of its Millard County Power Project Revenue Bonds, _____ Series ____ (the *"Bonds"*), as more fully described in the Official Statement of UAMPS dated _____ (the *"Official Statement"*) prepared in connection with the offering and sale of the Bonds.

2. Pursuant to Section 31(f) of the Millard County Power Project Power Sales Contract, dated as of December 1, 2024, between the Participant and UAMPS, in connection with the execution and delivery of the Millard County Power Project, the undersigned executed and delivered a certificate dated _____ (the *"Original Certificate"*). The undersigned hereby reaffirm the statements made in the Original Certificate on and as of the date hereof. Capitalized terms used and not otherwise defined herein have the meanings assigned to them in the Original Certificate.

[3. The undersigned have reviewed the statements and information relating to the Participant and its electric system contained in APPENDIX __ to the Preliminary Official Statement and the Official Statement under the caption, "THE PARTICIPANTS", and such statements and information, as of the respective dates of the Preliminary Official Statement and the Official Statement and as of the date hereof, (a) were and are true and correct in all material respects and fairly and accurately present the financial and operating position of the System for the periods and as of the dates presented and (b) did not and do not omit to state a material fact necessary in order to make such statements not misleading. Since the dates of the Preliminary Official Statement and the Official Statement, there has been no change in the business, financial position, results of operations or condition of the Participant or the System that would (x) materially affect the accuracy and completeness of such statements and information or (y) materially and adversely affect the ability of the Participant to meet its obligations under the Power Sales Contract.]

Dated this _____ day of _____.

[PARTICIPANT]

By _____
Its_____

[SEAL]

EXHIBIT V

FORM OF OPINION OF COUNSEL TO THE PARTICIPANT

_____

Utah Associated Municipal Power Systems
155 North 400 West, Suite 480
Salt Lake City, UT 84103

Ladies and Gentlemen:

I have acted as counsel to _____ (the "*Participant"*) in connection with the Millard County Power Project Power Sales Contract, dated as of December 1, 2024 (the *"Power Sales Contract"*), between the Participant and Utah Associated Municipal Power Systems (*"UAMPS"*). I have been advised that, pursuant to the Power Sales Contract, UAMPS has undertaken the Project and has sold all of the Electric Energy from the Project to the Participant and others that have executed Power Sales Contracts with UAMPS.

This opinion is being delivered to you pursuant to Section 31(f) of the Power Sales Contract in connection with the execution and delivery of the Power Sales Contract. Capitalized terms used and not defined herein have the meanings assigned to such terms in the Power Sales Contract.

As counsel to the Participant, I have examined (i) those documents relating to the existence, organization and operation of the Participant and its electric utility system (the *"System"*), (ii) all resolutions and proceedings of the Participant relating to the due authorization, execution and delivery by the Participant of the Power Sales Contract, (iii) an executed counterpart of the Power Sales Contract, and (iv) such other documents, information, facts and matters of law as are necessary for me to render the opinions contained herein.

Based upon the foregoing, I am of the opinion that:

1. The Participant is a _____ duly organized and validly existing under the laws State of _____ (the *"State"*) and is qualified to own, operate and furnish electric service through the System.

2. The Participant has full legal right, power and authority to enter into the Power Sales Contract and to carry out and consummate all of the transactions contemplated thereby, and the Participant has complied with the provisions of applicable law which would be a condition precedent to entering into the Power Sales Contract or carrying out and consummating such transactions.

3. Each of the Power Sales Contract, the Joint Action Agreement and the Pooling Agreement has been duly authorized, executed and delivered by the Participant and constitutes the legal, valid and binding obligation of the Participant and is enforceable under the present law of the State in accordance with its terms, except as enforceability may be limited by bankruptcy, insolvency, moratorium, reorganization or other laws affecting creditors' rights generally or usual equity principles in the event equitable remedies should be sought.

4. Pursuant to the Power Sales Contract, the Participant's obligation to make payments to UAMPS under the Power Sales Contract is a special obligation payable solely from the revenues and other available income of the System initially as a cost of the development of a new power supply resource and from and after the commercial operation of the Project as a cost of purchased electric energy, in each case as an operating expense of the System. The application of the revenues and other available funds of the System to make such payments is not subject to any prior lien, encumbrance or restriction.

5. The Participant has obtained all Required Approvals.

6. There is no pending or, to my knowledge, threatened, action or proceeding affecting the Participant (nor to my knowledge is there any basis therefor), which (a) purports to affect the authorization, legality, validity or enforceability of the Power Sales Contract, the Joint Action Agreement or the Pooling Agreement or (b) involves the possibility of any judgment or liability, not fully covered by insurance, which may result in any material adverse change in the business, affairs, properties or assets, or in the condition, financial or otherwise, of the System.

7. The execution, delivery and performance by the Participant of the Power Sales Contract will not conflict with or constitute a breach of or default under any agreement, indenture, bond, note, resolution or other instrument to which the Participant is a party or by which it or the properties of the System is bound or affected, or any applicable law, ruling, regulation, ordinance, judgment, order or decree to which the Participant (or any of its officers in their respective capacities as such) or its properties is subject.

8. No event has occurred and is continuing which with the passage of time or the giving of notice, or both, would constitute a material default or event of default under any agreement, indenture, bond, note, resolution or other instrument to which the Participant is a party or by which it or the properties of the System is bound or affected, which breach or default would have a material adverse impact on UAMPS' ownership or operation of the Project or the ability of the Participant to fully perform its obligations under the Power Sales Contract.

9. The Participant has lawful authority to fix and collect rates, fees and charges for the services provided by the System. Such rates, fees and charges for utility services provided to customers located within the corporate boundaries of the Participant are not subject to regulation by any authority of the State or the United States and have been duly and validly adopted by the Participant and are in full force and effect.

10. The Participant has lawful authority to own the System and, to my knowledge, the Participant (a) has good and merchantable title to the properties comprising the System and (b) holds all permits, licenses and approvals necessary for the operation of the System.

I hereby authorize Chapman and Cutler LLP, as bond counsel, to rely on this opinion as though addressed to it.

Respectfully submitted,

EXHIBIT VI

FORM OF BRING-DOWN OPINION OF COUNSEL TO THE PARTICIPANT

_____

Utah Associated Municipal Power Systems
155 North 400 West, Suite 480
Salt Lake City, UT 84103

Ladies and Gentlemen:

I have acted as counsel to _____ (the *"Participant"*) in connection with the Millard County Power Project Power Sales Contract dated as of December 1, 2024 (the *"Power Sales Contract"*) between the Participant and Utah Associated Municipal Power Systems (*"UAMPS"*). I have been advised that UAMPS has made arrangements for the issuance and sale on the date hereof of its Millard County Power Project Revenue Bonds, _____ Series _____ (the *"Bonds"*).

Pursuant to Section 31(f) of the Power Sales Contract in connection with the execution and delivery of the Millard County Power Project, I rendered to UAMPS an approving legal opinion, dated _____ (the *"Prior Opinion"*), with respect to the Participant. In connection with the issuance and sale by UAMPS of the Bonds, I hereby reaffirm the Prior Opinion, as though it was dated the date hereof, in the form it was so rendered on _____.

[In addition to the foregoing, I have examined (i) the material describing the Participant and its electric system contained in APPENDIX A to each of the Preliminary Official Statement (together with any supplements or amendments thereto as of the date hereof, the *"Preliminary Official Statement"*) and the Official Statement (together with any supplements or amendments thereto as of the date hereof, the "*Official Statement*") of UAMPS relating to the Bonds and (ii) such other documents, information, facts and matters of law as are necessary for me to render the following opinion. Based upon the foregoing, I am of the opinion that the statements and information with respect to the Participant and its electric system contained in APPENDIX A to the Preliminary Official Statement and the Official Statement were true and correct in all material respects as of the respective dates of the Preliminary Official Statement and the Official Statement and are true and correct in all material respects as of the date hereof, and no facts have come to my attention which would lead me to believe that such statements and information contained or contain any untrue statement of a material fact or omitted to state or omit to state any material fact necessary in order to make such statements, in the light of the circumstances under which they were made, not misleading; *provided, however*, that I express no view with respect to the tabular, financial and statistical information included therein.]

I hereby authorize the reference to this opinion and to the Prior Opinion set forth under the caption, "APPROVAL OF LEGAL PROCEEDINGS," in the Official Statement. I hereby further authorize [Bond Counsel] and [other reliance parties] to rely on the Prior Opinion and on this opinion in each case as though addressed to them.

Respectfully submitted,

CERTIFICATE OF PARTICIPANT

STATE OF UTAH)
)
COUNTY OF WASHINGTON)

The undersigned hereby certify that they are the Mayor and City Recorder of St. George City, Utah (the *"Participant"*), a member of Utah Associated Municipal Power Systems (*"UAMPS"*), and that as such they are authorized to execute this Certificate on behalf of the Participant and hereby certify as follows:

1. This Certificate has been executed pursuant to Section 31(f) of the Millard County Power Project Power Sales Contract, dated as of December 1, 2024 (the *"Power Sales Contract"*), between the Participant and UAMPS, in connection with the execution and delivery of the Power Sales Contract. Capitalized terms used and not otherwise defined herein have the meanings assigned to them in the Power Sales Contract.

2. The Participant is a political subdivision, duly created and validly existing under the laws of the State of Utah (the *"State"*), and is governed by a City Council (the *"Governing Body"*).

3. Attached hereto as *Exhibit A* is a true, complete and correct copy of a resolution authorizing the execution and delivery of the Power Sales Contract and related matters (the *"Contract Resolution"*). The Contract Resolution was duly adopted by a majority of the Governing Body present and voting at a public meeting of the Governing Body held on _____, at which a quorum was present and acted throughout.

4. The meeting of the Governing Body at which the Contract Resolution was adopted was duly called, noticed and held in conformity with applicable laws of the State and procedural rules of the Governing Body. The Contract Resolution is in full force and effect and has not been amended, modified, repealed or supplemented.

5. The names of the Mayor and the City Recorder authorized to execute and deliver the Power Sales Contract on behalf of the Participant are as follows:

NAME	OFFICE
Michele Randal	Mayor
Christina Fernandez	City Recorder

6. (a) No petition was filed with the Participant or any of its officers seeking to refer the Contract Resolution to the electors of the Participant in accordance with the provisions of state law; and (b) no litigation has been instituted, is pending or has been threatened to require a referendum election on the Contract Resolution.

7. The Participant owns and operates an electric utility system (the *"System"*) that distributes and furnishes electric energy to consumers located within the established service area of the System. The Participant will use all of the electric energy from its Entitlement Share in a Qualified Use.

8. The Participant has previously executed the Utah Associated Municipal Power Systems Amended and Restated Agreement for Joint and Cooperative Action dated as of March 20, 2009, and all amendments thereof and supplements thereto (the *"Joint Action Agreement"*) and that certain Power Pooling Agreement (the *"Pooling Agreement"*) between the Participant and UAMPS relating to the power pool administered by UAMPS. The Joint Action Agreement and the Pooling Agreement are each in full force and effect and constitute the legal, valid and binding agreements of the Participant.

9. Brian Jeppson has been duly appointed by the Governing Body as the Participant's representative to UAMPS.

10. The representations and warranties of the Participant in Section 30 of the Power Sales Contract are true and correct on and as of the date of this certificate.

11. The Participant acknowledges that the information it provides under Section 31(c) and (d) of the Power Sales Contract may be used by UAMPS in connection with the issuance of Bonds to finance the Development Costs and the Cost of Acquisition and Construction of the Project and to provide necessary information to lenders and other interested parties.

Dated: _____.

ST. GEORGE CITY, UTAH

By _____
Mayor

By _____
City Recorder

[SEAL]